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NAS CECIL FIELD, FL
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SAMPLING AND ANALYSIS REPORT FOR FACILITY 802LS BASE REALIGNMENT AND
CLOSURE ZONE C DEVELOPED NON-INDUSTRIAL AREA NAS CECIL FIELD FL
4/1/1999
HARDING LAWSON ASSOCIATES

SAMPLING AND ANALYSIS REPORT
FACILITY 802LS
BASE REALIGNMENT AND CLOSURE
ZONE C, DEVELOPED NON-INDUSTRIAL AREA

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Unit Identification Code: N60200

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Base Realignment and Closure
Zone C, Developed Non-Industrial Area
Naval Air Station Cecil Field, Jacksonville, Florida

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GLOSSARY

ABB-ES	ABB Environmental Services, Inc
BCT	Base Realignment and Closure (BRAC) cleanup team
CLP	Contract Laboratory Program
EBS	environmental baseline survey
ELCR	excess lifetime cancer risk
FDEP	Florida Department of Environmental Protection
GCTL	groundwater cleanup target level
HI	hazard index
HQ	hazard quotient
$\mu\text{g}/\ell$	micrograms per liter
NAS	Naval Air Station
PRE	preliminary risk evaluation
RBC	risk-based concentration
SAO	sampling and analysis outline
TAL	target analyte list
TCL	target compound list
USEPA	U.S. Environmental Protection Agency

1.0 INTRODUCTION

Facility 802LS is a lift station located on the east side of D Avenue, between 9th and 10th Streets, at Naval Air Station (NAS) Cecil Field. Wastewater is pumped from Facility 802LS to the base wastewater treatment plant.

Facility 802LS was color-coded 1/White in the NAS Cecil Field Environmental Baseline Survey (EBS) Report (ABB Environmental Services, Inc. [ABB-ES], 1994a). Although no known or suspected releases of petroleum or hazardous materials were observed during the EBS for Facility 802LS, the Base Realignment and Closure cleanup team (BCT) regards lift stations as potential pathways for wastewater contaminants to enter the groundwater, and identified a requirement for evaluation of groundwater in the vicinity of Facility 802LS. A Phase II Sampling and Analysis Outline (SAO) to assess whether or not groundwater has been contaminated by wastewater which could potentially seep from Facility 802LS was presented during the BCT meeting on January 13, 1998, and approved by the BCT. This report outlines the plan for assessment of Facility 802LS, and provides conclusions and recommendations based upon data collected during the assessment.

2.0 SAMPLING AND ANALYSIS OUTLINE

The SAO for assessment of shallow groundwater at 802LS included installation of one shallow groundwater monitoring well, and collection and analysis of one groundwater sample to be analyzed for the full Contract Laboratory Program (CLP) suite of target compound list (TCL) organics and target analyte list (TAL) inorganics. The results of the Phase II Sampling and Analysis program are discussed below.

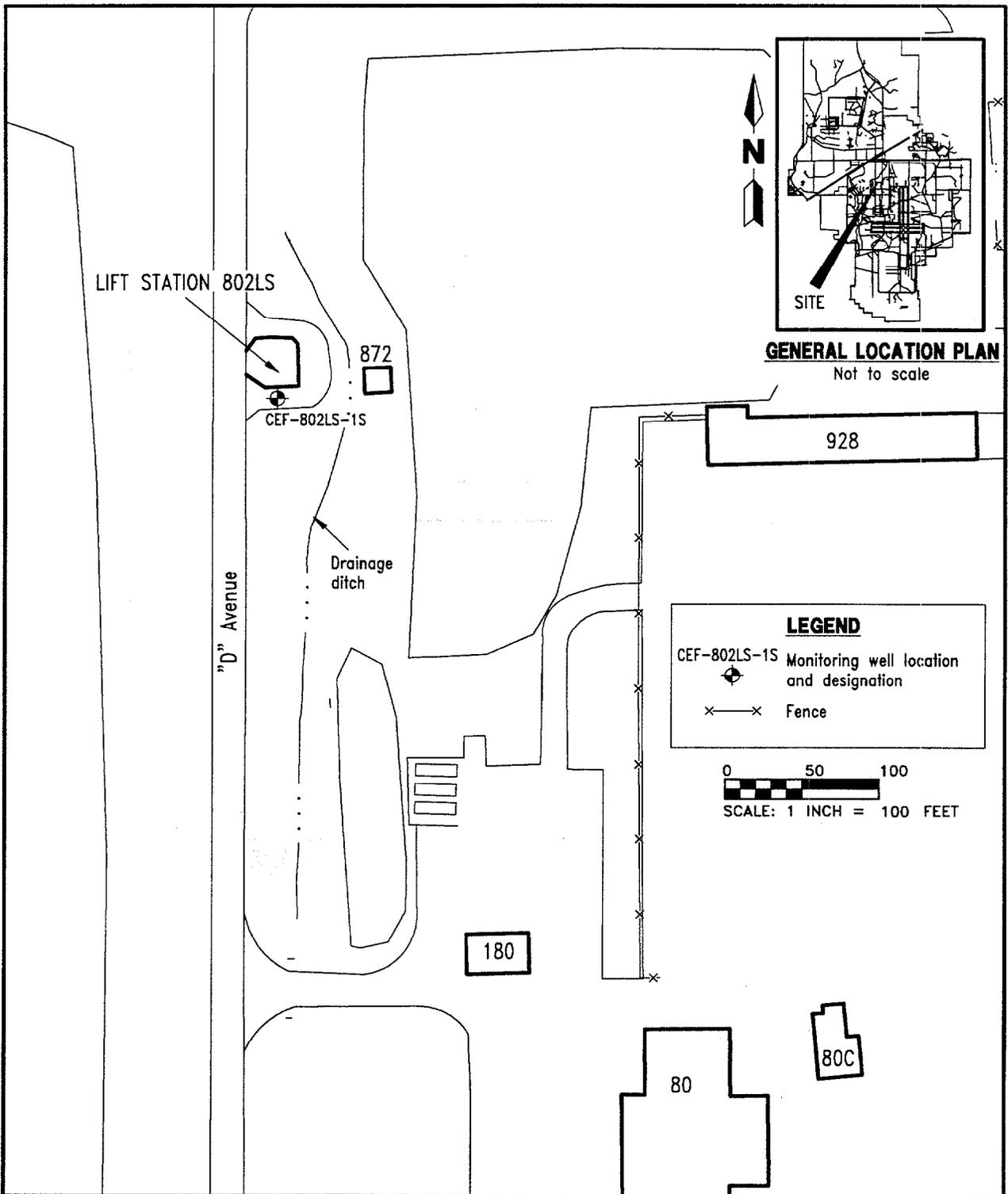
3.0 PHASE II INVESTIGATION

One groundwater monitoring well was installed downgradient (south) of Facility 802LS. The well was completed at a depth of 16 feet below land surface. The groundwater flow direction in this area is likely to be south-southeast, based on the groundwater flow model produced for NAS Cecil Field by the U.S. Geological Survey. One groundwater sample was collected from the monitoring well. Field activities were undertaken in general conformance with the Project Operations Plan (ABB-ES, 1994b).

The groundwater sample was analyzed for the full CLP suite of TCL organics and TAL inorganics. A site plan indicating the location of the monitoring well and surface soil sample is presented on Figure 1. The soil boring log is included in Appendix A.

4.0 PRELIMINARY RISK EVALUATION

A preliminary risk evaluation (PRE) was conducted to assess potential risks to human and ecological receptors posed by contaminants in groundwater. Primary



**FIGURE 1
FACILITY 802LS
SAMPLE LOCATION PLAN**



SAMPLING AND ANALYSIS REPORT

**NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

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exposure pathways were evaluated to determine those pathways that potentially contribute to human health and ecological risks. The evaluation was conducted in general conformance with methodology provided in the U.S. Environmental Protection Agency (USEPA) Region IV memorandum entitled "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)" (USEPA, 1994), USEPA Region IV bulletins on ecological risk assessment (USEPA, 1995), and minutes of meetings with the USEPA and the Florida Department of Environmental Protection (FDEP) concerning PREs (ABB-ES, 1995). Site background information and rationale for sample collection and analysis are detailed in the EBS Report (ABB-ES, 1994a).

Inorganic analytes were compared to NAS Cecil Field screening criteria for inorganics established by the NAS Cecil Field partnering team. The NAS Cecil Field screening criteria were determined by using the nonparametric upper-outside value cutoffs as described in *Understanding Robust and Exploratory Data Analysis* (Hoaglin et al., 1983). These screening values were developed from data collected throughout NAS Cecil Field. No risk evaluation is conducted for inorganic analytes detected below NAS Cecil Field screening criteria for inorganics.

4.1 PUBLIC HEALTH PRE. All detected analytes were compared to readily available risk-based screening values to assess the likelihood of adverse human health effects associated with potential exposure to groundwater. Risk-based screening values were obtained from USEPA Region III Risk-Based Concentrations (RBCs) (USEPA, 1998) and FDEP Groundwater Cleanup Target Levels (GCTLs) (FDEP, 1998). Most screening values published in the references listed above are based on toxicity constants and standard human exposure scenarios and correspond to fixed levels of risk. The designated level of risk for noncarcinogenic chemicals is based on a hazard quotient (HQ) of 1. The level of risk for carcinogenic chemicals is based on an excess lifetime cancer risk (ELCR) of 1×10^{-6} . Cancer and noncancer risks associated with industrial and residential land use are estimated by dividing the maximum detected analyte concentration by the corresponding USEPA Region III RBC value at the designated level of risk (HQ of 1 or ELCR of 1×10^{-6}). For noncarcinogens, the HQs are summed to determine the cumulative noncancer risk or hazard index (HI).

Seven inorganic analytes were detected in the groundwater sample collected in the study area. Manganese was the only inorganic analyte detected at a concentration in excess of NAS Cecil Field screening criteria for inorganics and Florida GCTLs. No other inorganic analytes exceeded the screening criteria.

Acetone is the only organic compounds detected in the groundwater sample. It was detected at a concentration of 7 micrograms per liter ($\mu\text{g}/\ell$), which does not exceed the Florida GCTL of 700 $\mu\text{g}/\ell$. Acetone is commonly encountered at low concentrations, as an artifact of the sampling or laboratory environment, and may not be site related.

The groundwater monitoring well was repurged, and filtered and unfiltered groundwater samples (802LS-1S and 802LS-1SF) were collected and analyzed for manganese to assure that suspended solids would not influence the analysis. The manganese concentration in both samples was below the NAS Cecil Field screening criteria for inorganics.

Concentrations of detected analytes in groundwater have been compared with RBCs for tap water and GCTLs and, where applicable, with NAS Cecil Field Inorganic Background Data Set (see Appendix A). No compounds or analytes were detected at concentrations in excess of GCTLs. Therefore, no HI or ELCR was calculated in association with a potential groundwater exposure scenario.

4.2 ECOLOGICAL PRE. Potential exposure pathways and ecological habitat associated with Facility 802LS were characterized by Harding Lawson Associates ecological risk assessors in June 1996. Facility 802LS is located within a developed area and is surrounded by maintained grass and pavement. No exposure pathway from groundwater to surface water was identified in the study area. Therefore, no further ecological risk evaluation for groundwater was conducted.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Analytes detected in groundwater collected downgradient of Facility 802LS do not represent a hazard to human health or the environment at the detected concentrations. No other environmental concerns have been identified for this facility.

Based upon the findings of this evaluation, the color-code for Facility 802LS should be reclassified to 3/Light Green to indicate that inorganic analytes have been detected at concentrations which exceed background data set values, but do not represent a hazard to human health or the environment. No remedial action or further evaluation is recommended. Appropriate site operation and management procedures should be undertaken in order to ensure that current and future site activities do not result in release of hazardous substances to the environment.

REFERENCES

- ABB Environmental Services, Inc. (ABB-ES). 1994a. *Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station Cecil Field, Jacksonville, Florida*. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina (November).
- ABB-ES. 1994b. *Project Operations Plan for Cecil Field and Health and Safety Plan*. Prepared for Southern Division, Naval Facilities Engineering Command (SOUTHNAVFACENGCOC), North Charleston, South Carolina (December).
- ABB-ES. 1995. Minutes of September 25, 1995, conference call to discuss preliminary risk evaluations.
- Florida Department of Environmental Protection. 1998. *Brownfields Cleanup Criteria Rule: Chapter 62-785, Florida Administrative Code*. Tallahassee, Florida.
- Hoaglin, D.C., F. Mosteller, and J.W. Tukey. 1983. *Understanding Robust and Exploratory Data Analysis*. New York: John Wiley and Sons, Inc.
- U.S. Environmental Protection Agency (USEPA). 1994. Memorandum from USEPA Region IV. Subject: "Amended Guidance on Preliminary Risk Evaluations (PREs) for the Purpose of Reaching a Finding of Suitability to Lease (FOSL)." Atlanta, Georgia (December 20).
- USEPA. 1995. *Supplemental Guidance to RAGS. Region IV bulletins*. USEPA Region IV Waste Management Division. Atlanta, Georgia.
- USEPA. 1998. *Risk-Based Concentration Table. Region III*. Philadelphia, Pennsylvania.

APPENDIX A

SOIL BORING LOG AND PRELIMINARY RISK EVALUATION TABLE

TITLE: NAS Cecil Field, 802LS Site Assessment Report		LOG of WELL: CEF-802-LS	BORING NO. CEF-802-LS
CLIENT: SOUTHDIVNAVFACENGCOM		PROJECT NO: 02523.13	
CONTRACTOR: U.S. Probe and Drill		DATE STARTED: 11-03-98	COMPLTD: 11-03-98
METHOD: HSA	CASE SIZE: 2in.	SCREEN INT.: 1-11 ft.	PROTECTION LEVEL: D
TOC ELEV.: FT.	MONITOR INST.: FID	TOT DPTH: 11.5FT.	DPTH TO ∇ 3.25 FT.
LOGGED BY: E. Allen	WELL DEVELOPMENT DATE: 11-06-98		SITE: Lift Station 802

DEPTH FT.	LABORATORY SAMPLE ID.	RECOVERY	HEADSPACE (ppm)	SOIL/ROCK DESCRIPTION AND COMMENTS	LITHOLOGIC SYMBOL	SOIL CLASS	BLOWS/6-IN	WELL DATA
1				<> See Note		SM		
2								
3							posthole	
4				SILTY SAND: Dark brown silty fine sand. Root material at 10 bls.				
5								
6							x	
7							xx	
8								
9								
10				<> Soil description taken from posthole and auger				
11				* no split spoon samples taken ** no OVA readings taken				
12								
13								
14								
15								

**Preliminary Human Health Risk Evaluation Table for Analytes Detected in Groundwater
Facility 802LS, Naval Air Station Cecil Field**

Analyte ¹	CEF-802LS-1S	802LS-1S	802LS-1SF	Screening Values			Calculated Risk Values ²	
				BKGRD	GCTL	RBC(T)	ELCR	HQ
Acetone	7				700	3700 n		
Aluminum-DISS	110			13100	200	37000 n		
Calcium	100000			81100				
Iron	1600			7760	300	11000 n		
Magnesium	4700			10000				
Manganese	360	13		96.2	50	840 n		0.4
Manganese-DISS	330		14	96.2	50	840 n		
Potassium	1000			4330				
Sodium	2300			16500	160000			

0.4

Notes:

¹All detected analytes are reported. Concentrations and screening values are expressed in ug/l

²ELCR and HQ are only calculated for analytes detected at concentrations in excess of BKGRD and GWCTL

*= Background screening criteria or GWCTLs have been exceeded

BKGRD= NAS Cecil Field Inorganic Background Data Set

GCTL = Groundwater Cleanup Target Levels, FDEP, Chapter 62-785, Florida Administrative Code

RBC(T)= Risk-based Concentration (Tap Water), USEPA Region III, April 1998

n=non-carcinogenic risk

c=carcinogenic risk

ELCR = calculated excess lifetime cancer risk, based on RBC(T) values.

(ELCR = maximum detected concentration/RBC(T) * 1E-06)

HQ = calculated Hazard Quotient for non-carcinogenic analytes

(HQ=maximum detected concentration/RBC(T))

APPENDIX B

LABORATORY ANALYTICAL DATA

Lab Sample Number: JR42234
 Site: UST GREY
 Locator: CEF-802LS-1S
 Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

BRAC VOLATILES

1,1,1-Trichloroethane	1 U	ug/l	1
1,1,2,2-Tetrachloroethane	1 U	ug/l	1
1,1,2-Trichloroethane	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1
1,1-Dichloroethane	1 U	ug/l	1
1,2-Dichloroethane	1 U	ug/l	1
1,2-Dichloropropane	1 U	ug/l	1
Benzene	1 U	ug/l	1
Bromodichloromethane	1 U	ug/l	1
Bromoform	1 U	ug/l	1
Bromomethane	1 U	ug/l	1
Carbon tetrachloride	1 U	ug/l	1
Chlorobenzene	1 U	ug/l	1
Chloroethane	1 U	ug/l	1
Chloroform	1 U	ug/l	1
Chloromethane	1 U	ug/l	1
Dibromochloromethane	1 U	ug/l	1
Ethyl benzene	1 U	ug/l	1
Methylene chloride	1 U	ug/l	1
Tetrachloroethene	1 U	ug/l	1
Toluene	1 U	ug/l	1
Trichloroethene	1 U	ug/l	1
Vinyl chloride	1 U	ug/l	1
cis-1,3-Dichloropropene	1 U	ug/l	1
m,p-Xylene	1 U	ug/l	1
o-Xylene	1 U	ug/l	1
trans-1,2-Dichloroethene	1 U	ug/l	1
trans-1,3-Dichloropropene	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
 UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
 R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD FACILITY 802LS
GROUNDWATER -- SEMIVOLATILES -- REQUEST NO. 10929

Lab Sample Number: JR42234
Site: UST GREY
Locator: CEF-802LS-1S
Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

BRAC SEMIVOLATILES

Chemical Name	VALUE	QUAL	UNITS	DL
Phenol	10	U	ug/l	10
bis(2-Chloroethyl) ether	10	U	ug/l	10
1,3-Dichlorobenzene	10	U	ug/l	10
1,4-Dichlorobenzene	10	U	ug/l	10
1,2-Dichlorobenzene	10	U	ug/l	10
N-Nitroso-di-n-propylamine	10	U	ug/l	10
Nitrobenzene	10	U	ug/l	10
Isophorone	10	U	ug/l	10
2-Methylphenol	10	U	ug/l	10
2-Nitrophenol	10	U	ug/l	10
2,4-Dimethylphenol	10	U	ug/l	10
bis(2-Chloroethoxy) methane	10	U	ug/l	10
2,4-Dichlorophenol	10	U	ug/l	10
1,2,4-Trichlorobenzene	10	U	ug/l	10
Naphthalene	10	U	ug/l	10
Hexachlorobutadiene	10	U	ug/l	10
Hexachlorocyclopentadiene	10	U	ug/l	10
Hexachloroethane	10	U	ug/l	10
4-Chloro-3-methylphenol	10	U	ug/l	10
2-Methylnaphthalene	10	U	ug/l	10
2,4,6-Trichlorophenol	10	U	ug/l	10
2-Chloronaphthalene	10	U	ug/l	10
Dimethylphthalate	10	U	ug/l	10
Acenaphthylene	10	U	ug/l	10
2,4-Dinitrophenol	50	U	ug/l	50
3- & 4-Methylphenol (2)	10	U	ug/l	10
4-Nitrophenol	10	U	ug/l	10
2,4-Dinitrotoluene	10	U	ug/l	10
Diethylphthalate	10	U	ug/l	10
4-Chlorophenyl-phenylether	10	U	ug/l	10
Fluorene	10	U	ug/l	10
4,6-Dinitro-2-methylphenol	30	U	ug/l	30
4-Bromophenyl-phenylether	10	U	ug/l	10
Hexachlorobenzene	10	U	ug/l	10
Pentachlorophenol	10	U	ug/l	10
Phenanthrene	10	U	ug/l	10
Pyrene	10	U	ug/l	10
Anthracene	10	U	ug/l	10
Acenaphthene	10	U	ug/l	10
Di-n-butylphthalate	10	U	ug/l	10
Fluoranthene	10	U	ug/l	10
3,3-Dichlorobenzidine	20	U	ug/l	20
Benzo (a) anthracene	10	U	ug/l	10
Carbazole	10	U	ug/l	10
Chrysene	10	U	ug/l	10
bis(2-Ethylhexyl) phthalate	10	U	ug/l	10
Di-n-octylphthalate	10	U	ug/l	10
Benzo (b) fluoranthene	10	U	ug/l	10
Benzo (k) fluoranthene	10	U	ug/l	10
Benzo (a) pyrene	10	U	ug/l	10

NAS CECIL FIELD -- FACILITY 802LS
GROUNDWATER -- SEMIVOLATILES -- REQUEST NO. 10929

Lab Sample Number: JR42234
Site: UST GREY
Locator: CEF-802LS-1S
Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

Indeno (1,2,3-cd) pyrene	10 U	ug/l	10
Dibenzo (a,h) anthracene	10 U	ug/l	10
Benzo (g,h,i) perylene	10 U	ug/l	10
2,6-Dinitrotoluene	10 U	ug/l	10
4-Chloroaniline	10 U	ug/l	10
2-Nitroaniline	10 U	ug/l	10
3-Nitroaniline	10 U	ug/l	10
4-Nitroaniline	10 U	ug/l	10

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 802LS
GROUNDWATER -- PESTICIDES & PCBs -- REQUEST NO. 10930

Lab Sample Number: JR42234
Site: UST GREY
Locator: CEF-802LS-1S
Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

BRAC PESTICIDES/PCBS

alpha-BHC	.05 U	ug/l	.05
beta-BHC	.05 U	ug/l	.05
gamma-BHC (Lindane)	.05 U	ug/l	.05
Heptachlor	.05 U	ug/l	.05
Aldrin	.05 U	ug/l	.05
Heptachlor epoxide	.05 U	ug/l	.05
Endosulfan I	.05 U	ug/l	.05
Dieldrin	.05 U	ug/l	.05
4,4-DDE	.05 U	ug/l	.05
Endrin	.05 U	ug/l	.05
Endosulfan II			
4,4-DDD			
Endosulfan sulfate	.05 U	ug/l	.05
4,4-DDT	.05 U	ug/l	.05
Methoxychlor	.05 U	ug/l	.05
Endrin ketone	.05 U	ug/l	.05
Endrin aldehyde	.05 U	ug/l	.05
alpha-Chlordane	1 U	ug/l	1
gamma-Chlordane	1 U	ug/l	1
Toxaphene	2 U	ug/l	2
Aroclor-1221	1 U	ug/l	1
Aroclor-1232	1 U	ug/l	1
Aroclor-1248	1 U	ug/l	1
Aroclor-1254	1 U	ug/l	1
Aroclor-1260	1 U	ug/l	1
Aroclor-1016/1242	1 U	ug/l	1

U = NOT DETECTED J = ESTIMATED VALUE
UJ = REPORTED QUANTITATION LIMIT IS QUALIFIED AS ESTIMATED
R = RESULT IS REJECTED AND UNUSABLE

NAS CECIL FIELD -- FACILITY 802LS
GROUNDWATER -- INORGANICS -- REQUEST NO. 10931

Lab Sample Number: JR42234
Site: UST GREY
Locator: CEF-802LS-1S
Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

CLP METALS AND CYANIDE

Aluminum	.97	mg/l	.05
Antimony	.006 U	mg/l	.006
Arsenic	.01 U	mg/l	.01
Barium	.1 U	mg/l	.1
Beryllium	.001 U	mg/l	.001
Cadmium	.001 U	mg/l	.001
Calcium	100	mg/l	.5
Chromium	.01 U	mg/l	.01
Cobalt	.05 U	mg/l	.05
Copper	.05 U	mg/l	.05
Iron	1.6	mg/l	.05
Lead	.005 U	mg/l	.005
Magnesium	4.7	mg/l	.5
Manganese	.36	mg/l	.01
Mercury	.0002 U	mg/l	.0002
Nickel	.01 U	mg/l	.01
Potassium	1	mg/l	.5
Selenium	.01 U	mg/l	.01
Silver	.01 U	mg/l	.01
Sodium	2.3	mg/l	.5
Thallium	.004 U	mg/l	.004
Vanadium	.01 U	mg/l	.01
Zinc	.1 U	mg/l	.1
Cyanide	-		

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NAS CECIL FIELD -- FACILITY 802LS
 GROUNDWATER -- INORGANICS -- REQUEST NO. 10932

Lab Sample Number: JR42234
 Site: UST GREY
 Locator: CEF-802LS-1S
 Collect Date: 19-NOV-98

VALUE QUAL UNITS DL

DISSOLVED METALS

Aluminum-DISS	.11	mg/l	.05
Antimony-DISS	.006 U	mg/l	.006
Arsenic-DISS	.01 U	mg/l	.01
Barium-DISS	.1 U	mg/l	.1
Beryllium-DISS	.001 U	mg/l	.001
Cadmium-DISS	.001 U	mg/l	.001
Calcium-DISS	96	mg/l	.5
Chromium-DISS	.01 U	mg/l	.01
Cobalt-DISS	.05 U	mg/l	.05
Copper-DISS	.05 U	mg/l	.05
Iron-DISS	2.2	mg/l	.05
Lead-DISS	.005 U	mg/l	.005
Magnesium-DISS	4.5	mg/l	.5
Manganese-DISS	.33	mg/l	.01
Mercury-DISS	.0002 U	mg/l	.0002
Nickel-DISS	.01 U	mg/l	.01
Potassium-DISS	.92	mg/l	.07
Selenium-DISS	.01 U	mg/l	.01
Silver-DISS	.01 U	mg/l	.01
Sodium-DISS	2.1	mg/l	.54
Thallium-DISS	.004 U	mg/l	.004
Vanadium-DISS	.01 U	mg/l	.01
Zinc-DISS	.1 U	mg/l	.1

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NAS CECIL FIELD FACILITY 802LS
 GROUNDWATER -- MANGANESE -- REQUEST NO. 10933

Lab Sample Number:	JR58663	JR58664			
Site	BRAC	BRAC			
Locator	CF-802LS-1S	CF-802LS-1SF			
Collect Date:	13-MAR-99	13-MAR-99			
VALUE	QUAL UNITS	DL	VALUE	QUAL UNITS	DL

Manganese	.013	mg/l	.01	.014	mg/l	.01
-----------	------	------	-----	------	------	-----

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 R = RESULT IS REJECTED AND UNUSABLE