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FINAL TECHNICAL MEMORANDUM FOR NO FURTHER ACTION POTENTIAL SOURCE OF CONTAMINATION 48 LAKE FRETWELL SEDIMENTS NAS CECIL FIELD FL

4/7/2000

TETRA TECH NUS INC

Rev. 1
04/07/00

Technical Memorandum
for
No Further Action

Potential Source of Contamination 48
Lake Fretwell Sediments

Naval Air Station Cecil Field
Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888

Contract Task Order 0078

April 2000

Rev. 1
04/07/00

TECHNICAL MEMORANDUM FOR NO FURTHER ACTION

POTENTIAL SOURCE OF CONTAMINATION 48 LAKE FRETWELL SEDIMENTS

NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0078

APRIL 2000

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The professional opinions rendered in this decision document identified as Technical Memorandum for No Further Action for PSC 48, Lake Fretwell Sediments, Naval Air Station Cecil Field, Jacksonville, Florida were developed in accordance with commonly accepted procedures consistent with applicable standards of practice. Decision documents are based on information obtained from others and under the supervision of the signing engineer. If conditions are determined to exist differently than those described in this document, then the undersigned professional engineer should be notified to evaluate the effects of any additional information on this project described in this report.

Mark P. Speranza

Mark Speranza, P.E.
Professional Engineer No. PE0050304

Date: 4/7/00

Mark Speranza

TABLE OF CONTENTS

SECTION **PAGE NO.**

PROFESSIONAL ENGINEER AUTHORIZATION ii

ACRONYMS v

1.0 INTRODUCTION 1-1

2.0 SITE DESCRIPTION 2-1

3.0 PREVIOUS INVESTIGATIONS 3-1
3.1 PSC 48 3-1
3.2 PSC 6 3-1

4.0 FIELD INVESTIGATION 4-1

5.0 NATURE AND EXTENT OF CONTAMINATION 5-1
5.1 PSC 48 5-1
5.2 PSC 6 5-1

6.0 PRELIMINARY RISK EVALUATIONS 6-1
6.1 HUMAN HEALTH RISKS 6-1
6.2 ECOLOGICAL RISKS 6-1
6.2.1 PSC 48 (1999 Samples) 6-1
6.2.2 PSC 6 (1999 Samples) 6-2

7.0 CONCLUSIONS AND RECOMMENDATIONS 7-1

REFERENCES R-1

APPENDICES

A ANALYTICAL DATA

B LAKE FRETWELL ECOLOGICAL RISK ASSESSMENT AND SUPPORTING INFORMATION FROM BASEWIDE ECOLOGICAL ASSESSMENT REPORT

C SEDIMENT TOXICITY TESTING REPORT

D ECOLOGICAL EFFECTS EVALUATION – FOOD CHAIN MODELING; SEDIMENT SAMPLES ASSOCIATED WITH PSC 6

TABLES

NUMBER **PAGE NO.**

5-1 Organic Analytical Results, Sediment Samples 5-3
5-2 Inorganic Analytical Results in Sediment 5-7
5-3 Surface Water Organic Analytical Results 5-8
5-4 Surface Water Inorganic Analytical Results 5-10
6-1 Sediment Concentrations in PSC 48 Sample SD-001 6-4
6-2 Sediment Analytes Detected at PSC 6....6-5
6-3 Results of Food Chain Modeling, PSC 6....6-6

FIGURES

NUMBER **PAGE NO.**

2-1 Site Location Map....2-3
2-2 Site Map 2-5
4-1 Sample Locations....4-3
5-1 Site Area Map....5-11
6-1 Summary of Analytes in Surface Water Exceeding Ecological Screening Criteria....6-7
6-2 Summary of Analytes in Sediment Exceeding Ecological Screening Criteria....6-9

ACRONYMS

ASTM	American Society of Testing and Materials
BCT	Base Realignment and Closure Team
BEAR	Base-Wide Ecological Assessment Report
BSAF	Biota-sediment accumulation factor
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	Contract Task Order
ERA	Ecological Risk Assessment
ER-M	Effects range median
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
HI	Hazard index
HLA	Harding Lawson and Associates, Inc.
HQ	Hazard quotient
NAS	Naval Air Station
NAVFACENGCOM	Naval Facilities Engineering Command
ORNL	Oak Ridge National Laboratory
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PEL	Probable effects level
PRE	Preliminary Risk Evaluation
PSC	Potential Source of Contamination
SOUTHDIV	Southern Division
STCL	Soil Target Cleanup Level
SVOC	Semivolatile organic compound
TEL	Threshold-effects level
TRV	Toxicity reference value
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound

1.0 INTRODUCTION

This technical memorandum for Potential Source of Contamination (PSC) 48, Lake Fretwell Sediments, located at Naval Air Station (NAS) Cecil Field, has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Department of the Navy Southern Division (SOUTHDIV), Naval Facilities Engineering Command (NAVFAC) under the Navy Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0078. Sediment samples collected from Lake Fretwell as part of the PSC 6 investigation also are included in this assessment.

The purpose of this technical memorandum is to present information from the field investigations and evaluate whether further investigation of the site is necessary. This technical memorandum also summarizes the related field operations, results, conclusions, and recommendations of the PSC 48 field investigation. The goals of the PSC 48 field investigations were to assess the presence of contamination and provide information for a preliminary risk evaluation (PRE). The PRE uses the investigation results to assess the nature, pathway, and extent of contamination and to identify potential risks to human and ecological receptors.

2.0 SITE DESCRIPTION

Lake Fretwell, located in the southwestern portion of NAS Cecil Field, is approximately 20 acres in size and was created by the construction of an earthen dam across Rowell Creek (see Figures 2-1 and 2-2). Lake Fretwell and Rowell Creek are classified by the Florida Department of Environmental Protection (FDEP) as Class III fresh waters and, as such, are designated for recreation, propagation, and management of fish and wildlife and are not used for drinking water resources (FDEP, 1996a).

A recreational complex has been developed along the lake's northeastern shoreline. Wooded areas exist along the lake's western and southeastern shorelines and along Rowell Creek upstream and downstream of the lake. The wooded areas consist primarily of pine flatwoods habitat along the southeastern and most of the western shorelines and bottomland hardwood forest along the northwestern shoreline and Rowell Creek. Aquatic and semi-aquatic receptors in the lake and creek include various invertebrates, fish, amphibians, reptiles, and aquatic plants. Terrestrial receptors that utilize the lake and creek include mammals and birds. Piscivorous (i.e., fish-eating) wading birds are frequently observed foraging throughout the area. PSC 6, the Lake Fretwell Rubble Disposal Area, is located on the southeast side of the lake.

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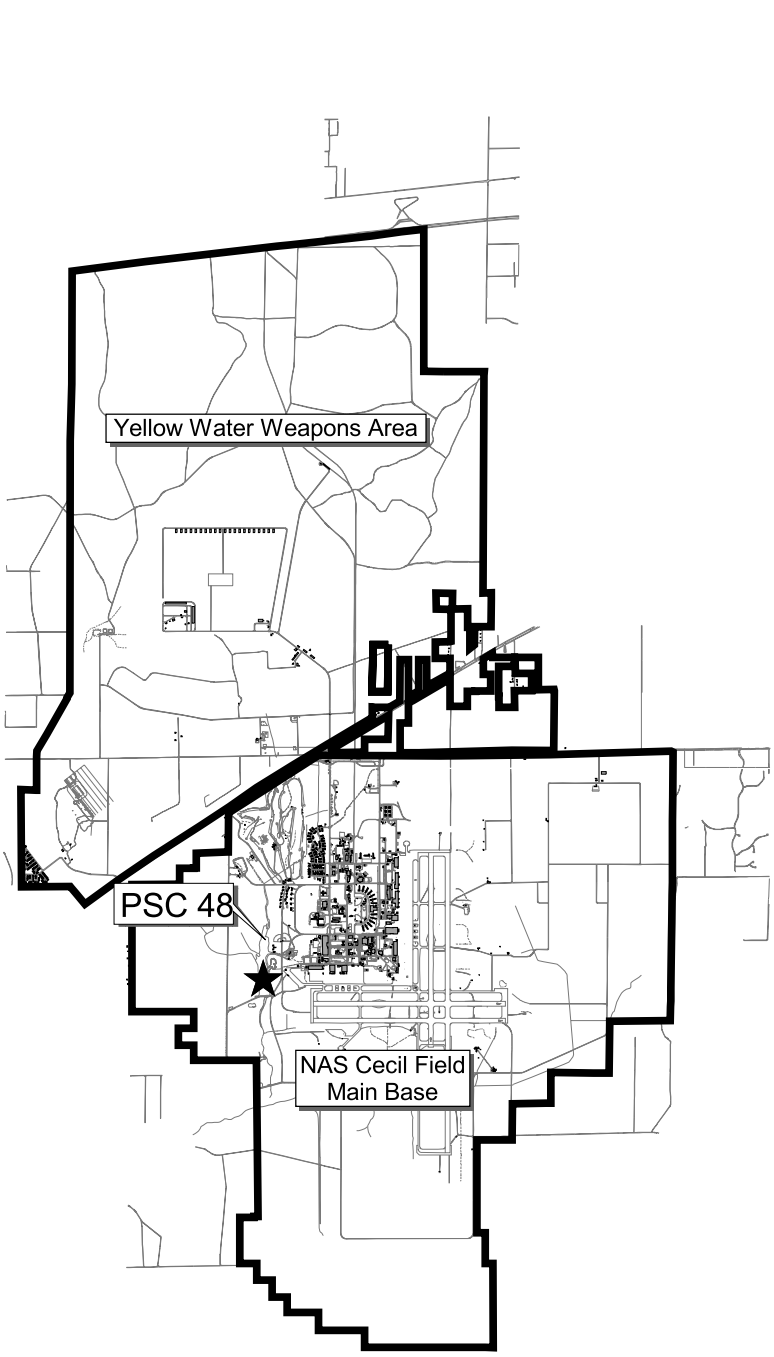

DRAWN BY MJJ	DATE 15Oct99	SITE LOCATION MAP PSC 48, LAKE FRETWELL AND ROWELL CREEK NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

P:\GIS\CECIL\PSC48.apr 15Oct99 MJJ 2-1 Site Location Map Layout

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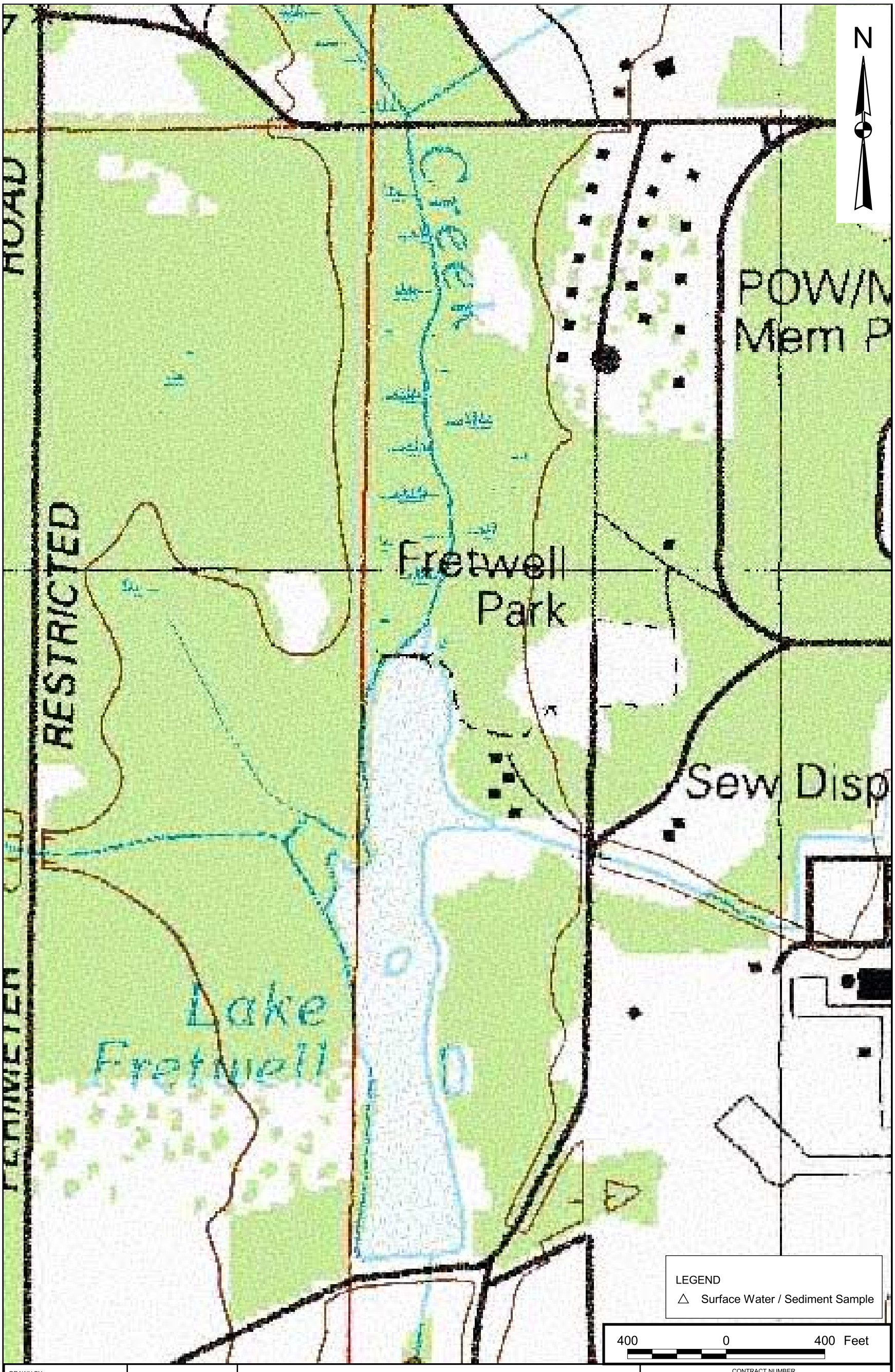
P:\GIS\CECIL\PSC48.APR 11/30/99 jcb usgs LAYOUT PSC 48



DRAWN BY YLI	DATE 22/04/99	PSC 48, LAKE FRETWELL AND ROWELL CREEK NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY RD	DATE 26/04/99		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-2 REV 0

3.0 PREVIOUS INVESTIGATIONS

3.1 PSC 48

An ecological risk assessment (ERA) was conducted by Harding Lawson and Associates, Inc. (HLA) for Lake Fretwell and for Rowell Creek upstream of Lake Fretwell as part of a Basewide Ecological Assessment Report (BEAR) (HLA, 1998a). The ERA was based on the collection and analyses of surface water, sediment, benthic macroinvertebrates, and fish samples. Specifically, 10 surface water and sediment samples (eight in Lake Fretwell and two in Rowell Creek between the lake and Sixth Street) were collected in 1993 for chemical analyses, and benthic macroinvertebrates were collected from eight locations in Lake Fretwell for analyses of diversity and abundance. In 1995, 10 sediment samples (eight in Lake Fretwell and two in Rowell Creek between the lake and Sixth Street) were collected for chemical analyses and for sediment toxicity tests using the invertebrates *Hyalella azteca* and *Chironomus tentans* as test organisms. The 1995 sampling effort also included the analyses of fish samples collected from the lake and creek. The ERA and supporting ecological information are included as Appendix B.

Volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were not ecological chemicals of potential concern as determined by the ERA. Potential risks to piscivorous mammals could occur from Aroclor-1260, and potential risks to piscivorous birds could occur from mercury. The ERA further concluded, however, that the magnitude of the Hazard Indices (HIs) suggested that population level effects were not likely, and overall, pesticides, polychlorinated biphenyls (PCBs), and metals posed negligible risks to terrestrial and avian piscivorous receptors [BEAR, (HLA, 1998a)]. Analyses of the benthic community metrics relative to contaminant concentrations were inconclusive. The sediment toxicity tests showed 100 percent mortality of *Hyalella azteca* in two samples, but normal survival of *Chironomus tentans* in samples collected from the same two locations. At two other locations, the survival of *Chironomus tentans* was poor (18 to 42 percent), and the survival of *Hyalella azteca* was normal. The ERA concluded that impacts to aquatic invertebrates may be occurring at these four locations. However, no adequate explanation for the conflicting toxicity test results was identified.

3.2 PSC 6

Sediment samples were collected at PSC 6 in 1996 and 1997 from the eastern shoreline of Lake Fretwell (which is the western boundary of PSC 6), from an “embayment” of the lake that extends into the southern portion of PSC 6. The results were reported in an ERA conducted by HLA (HLA, 1998b). Concentrations of metals in these samples were generally less than ecological screening values. Concentrations of some metals did exceed ecological screening values in sample CF6SD6, collected from the embayment. These concentrations were, however, generally less than effects range median

(ER-M) and/or probable effects level (PEL) values. The ERA concluded that ecological risks from pesticides and PCBs in PSC 6 sediments were negligible based on infrequent detections and comparisons to ecological screening criteria (HLA, 1998b). Concentrations of other organic compounds were generally indicative of negligible ecological risks. Concentrations of some PAH compounds were elevated in one sample collected from the ditch near the wastewater treatment plant. The observed concentrations suggest that potential risks to sediment invertebrates could occur in that area. Because the ditch is upgradient from PSC 6 and will be assessed in a separate report (PSC 44), the ditch samples will not be considered further in this report. PAH detection limits were greater than ecological screening values in some sediment samples, precluding a complete assessment of ecological risks from these compounds.

4.0 FIELD INVESTIGATION

Because of the conflicting toxicity test results at PSC 48 and high detection limits for PAHs at PSC 6, the NAS Cecil Field Base Realignment and Closure Team (BCT) determined that additional sampling and analyses were needed to determine the extent of potential contamination in Lake Fretwell. The additional sampling was conducted by TtNUS at PSCs 6 and 48 in May and June 1999.

Sampling activities at PSC 48 included the collection of six sediment and two surface water samples (see Figure 4-1). Sediment samples were collected from the following locations:

- Two locations where previous sediment toxicity tests indicated 100 percent mortality of *Hyalella azteca*
- Two locations where survival of *Chironomus tentans* was lowest in previous sediment toxicity tests
- One location where concentrations of metals were highest in previous analyses
- One sample from a reference site.

In addition, one surface water sample was collected from Rowell Creek at the inlet into Lake Fretwell, and one surface water sample was collected from Lake Fretwell at the drainage structure adjacent to the dam (i.e., outlet point into Rowell Creek).

At PSC 6, one sediment sample was collected from the ditch north of PSC 6 and seven sediment samples were collected from the shoreline of Lake Fretwell, including four from the embayment within the site (see Figure 4-1).

Sediment samples were collected at previous PSC 48 and PSC 6 sample locations, as indicated below:

Previous Sample Identification	**1999 Sample Identification**
PSC 48	
LF-SD-9	CEF-P48-SD-001
LF-SD-11	CEF-P48-SD-002
LF-SD-12	CEF-P48-SD-003
LF-SD-14	CEF-P48-SD-004
RC-SD-18	CEF-P48-SD-005

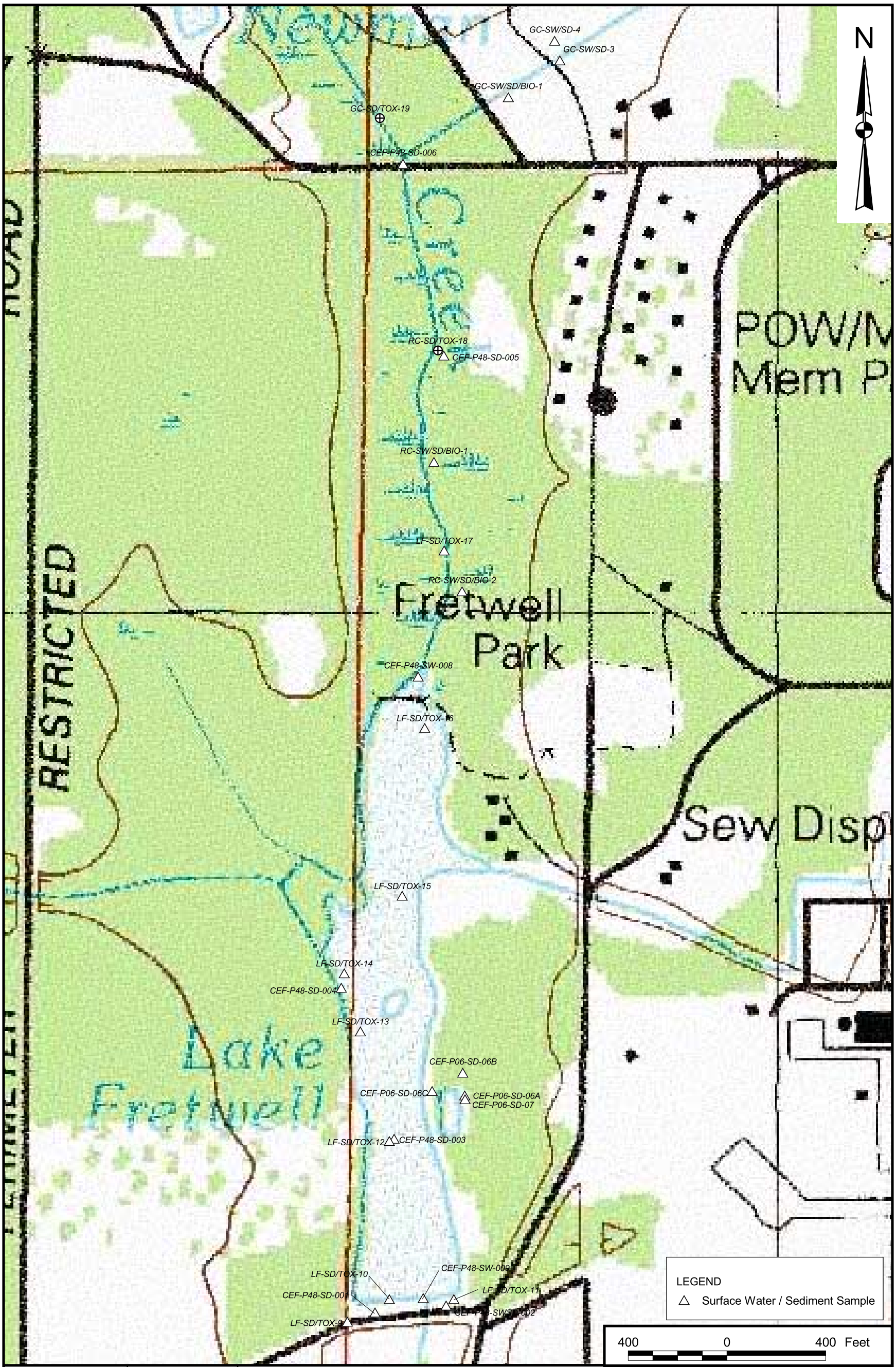
Previous Sample Identification	1999 Sample Identification
PSC 6	
CF6SD1	CEF-P06-SD-001
CF6SD4	CEF-P06-SD-004
CF6SD5	CEF-P06-SD-005
CF6SD6	CEF-P06-SD-006
CF6SD6A	CEF-P06-SD-06A
CF6SD6B	CEF-P06-SD-06B
CF6SD6C	CEF-P06-SD-06C
15 feet south of CF6SD6A	CEF-P06-SD-007

The PSC 48 reference sediment sample (CEF-P48-SD-006) was collected in Rowell Creek slightly upstream of the golf course tributary.

Sediment and surface water samples from PSC 48 were analyzed for SVOCs, pesticides, PCBs, and metals. Although SVOCs were not previously considered to be chemicals of potential concern, current data on PAH compounds were desired to ensure that concentrations of these common contaminants would be adequately characterized. For sediment samples from PSC 48, interstitial pore water was extracted from each sample at the analytical laboratory and analyzed for ammonia and sulfide. Each PSC 48 sediment sample also was subjected to toxicity testing. Ten-day whole sediment toxicity tests using *Chironomus tentans* and *Hyalella azteca* (the same organisms used in the 1995 toxicity tests) were conducted in accordance with methodology contained in American Society of Testing and Materials (ASTM) E-1706-95 and EPA/600/R-94/024 [ASTM, 1995 and United States Environmental Protection Agency (U.S. EPA), 1994]. Survival and growth (dry weight) were the test endpoints. Sediment samples form PSC 6 were analyzed for PAHs.

Sampling followed the Sampling and Analysis Work Plan (TtNUS, 1999) approved by the NAS Cecil Field BCT, and concentrations of analytes detected in surface water and sediment were compared to ecological screening values established by U.S. EPA Region IV (U.S. EPA, 1998) and FDEP (FDEP, 1994 and FDEP, 1996b). Concentrations of inorganic analytes also were compared to NAS Cecil Field Inorganic Background Data Set (hi-cut) values (HLA, 1998c).

P:\GIS\CECIL\PSC2.APR 13Oct99 MJJ LAYOUT PSC 48



DRAWN BY YLI	DATE 22/04/99	SAMPLE LOCATIONS PSC 48, LAKE FRETWELL AND ROWELL CREEK NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY RD	DATE 26/04/99		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 4-1 / REV 0

5.0 NATURE AND EXTENT OF CONTAMINATION

Several sources of potential contamination exist for Lake Fretwell. These include Site 5 (Oil Sludge Disposal Area), PSC 6 (Lake Fretwell Rubble Disposal Area), PSC 44 (Ditch from DRMO to WWTP), Site 11 (Golf Course Disposal Area), and PSC 19 (Rowell Creek Rubble Disposal Area). In addition, site drainage drawings show that the southwestern portion of the base, roughly bounded by Fourth Street, “B” area, and the area west of Hangar 13, drain to Lake Fretwell (see Figure 5-1).

Analytical results for organic compounds in PSC 48 and PSC 6 sediment samples collected in 1999 are presented in Table 5-1, and metals data are presented in Table 5-2. Surface water results for organic compounds and metals are presented in Tables 5-3 and 5-4, respectively. Complete laboratory analytical data are included as Appendix A.

5.1 PSC 48

Sediment samples from PSC 48 were analyzed for SVOCs, pesticides/PCBs, and metals. No SVOCs or pesticides/PCBs were detected in sediment samples collected as part of the PSC 48 investigation. Metals including aluminum, barium, copper, iron, lead, manganese, nickel, vanadium, and zinc were detected in sample CEF-P48-SD-001 at concentrations greater than their sediment hi-cut values. Concentrations of chromium and nickel in the duplicate sample from CEF-P48-SD-002 and copper in CEF-P48-SD-004 exceeded sediment hi-cut values.

Surface water samples were analyzed for SVOCs, pesticides/PCBs, and inorganics. SVOCs and pesticides/PCBs were not detected. Various metals were detected; however, their concentrations did not exceed hi-cut surface water values (HLA, 1998c).

5.2 PSC 6

Sediment samples from PSC 6 were analyzed for PAHs only. Various PAHs were detected in sediment samples collected at PSC 6 with the exception of CEF-P06-SD-06B. The highest concentrations of PAHs were detected in sample CEF-P06-SD-006 and SD-06A, collected on the eastern (inland) side of the Lake Fretwell embayment.

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TABLE 5-1

ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CEF-P48-						
	SD-001	SD-002		SD-003	SD-004	SD-005	SD-006
		Sample	Duplicate				
SEMIVOLATILE ORGANICS (in ug/kg)							
1,2,4-TRICHLOROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
1,2-DICHLOROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
1,3-DICHLOROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
1,4-DICHLOROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2,4,5-TRICHLOROPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2,4,6-TRICHLOROPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2,4-DICHLOROPHENOL	760 U	300 U	280 U	260 U	650 U	300 U	230 U
2,4-DIMETHYLPHENOL	1,700 U	670 U	630 U	580 U	1,400 U	670 U	520 U
2,4-DINITROPHENOL	4,200 U	1,700 U	1,600 U	1,500 U	3,600 U	1,700 U	1,300 U
2,4-DINITROTOLUENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2,6-DINITROTOLUENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-CHLORONAPHTHALENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-CHLOROPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-METHYLNAPHTHALENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-METHYLPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-NITROANILINE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
2-NITROPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
3,3'-DICHLOROBENZIDINE	1,700 U	670 U	630 U	580 U	1,400 U	670 U	520 U
3-NITROANILINE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4,6-DINITRO-2-METHYLPHENOL	1,700 U	670 U	630 U	580 U	1,400 U	670 U	520 U
4-BROMOPHENYL PHENYL ETHER	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4-CHLORO-3-METHYLPHENOL	1,700 U	670 U	630 U	580 U	1,400 U	670 U	520 U
4-CHLOROANILINE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4-CHLOROPHENYL PHENYL ETHER	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4-METHYLPHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4-NITROANILINE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
4-NITROPHENOL	4,200 U	1,700 U	1,600 U	1,500 U	3,600 U	1,700 U	1,300 U
ACENAPHTHENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
ACENAPHTHYLENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
ANTHRACENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U

TABLE 5-1

ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CEF-P48-						
	SD-001	SD-002		SD-003	SD-004	SD-005	SD-006
		Sample	Duplicate				
SEMIVOLATILE ORGANICS (in ug/kg)							
BENZO(A)ANTHRACENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BENZO(A)PYRENE	420 U	170 U	160 U	150 U	360 U	170 U	130 U
BENZO(B)FLUORANTHENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BENZO(G,H,I)PERYLENE	850 U	330 U	320 U	290 U	720 U	340 U	260 UJ
BENZO(K)FLUORANTHENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BIS(2-CHLOROETHOXY)METHANE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BIS(2-CHLOROETHYL)ETHER	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BIS(2-CHLOROISOPROPYL) ETHER	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BIS(2-ETHYLHEXYL)PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
BUTYLBENZYL PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
CARBAZOLE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
CHRYSENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
DI-N-BUTYL PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
DI-N-OCTYL PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
DIBENZO(A,H)ANTHRACENE	420 U	170 U	160 U	150 U	360 U	170 U	130 UJ
DIBENZOFURAN	850 U	330 U	320 U	290 U	720 U	340 U	260 U
DIETHYL PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
DIMETHYL PHTHALATE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
FLUORANTHENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
FLUORENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
HEXACHLOROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
HEXACHLOROBUTADIENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
HEXACHLOROCYCLOPENTADIENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
HEXACHLOROETHANE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
INDENO(1,2,3-CD)PYRENE	850 U	330 U	320 U	290 U	720 U	340 U	260 UJ
ISOPHORONE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
N-NITROSO-DI-N-PROPYLAMINE	310 U	120 U	110 U	100 U	260 U	120 U	93 U
N-NITROSODIPHENYLAMINE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
NAPHTHALENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
NITROBENZENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
PENTACHLOROPHENOL	4,200 U	1,700 U	1,600 U	1,500 U	3,600 U	1,700 U	1,300 U
PHENANTHRENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U
PHENOL	850 U	330 U	320 U	290 U	720 U	340 U	260 U
PYRENE	850 U	330 U	320 U	290 U	720 U	340 U	260 U

TABLE 5-1

ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CEF-P48-						
	SD-001	SD-002		SD-003	SD-004	SD-005	SD-006
		Sample	Duplicate				
SEMIVOLATILE ORGANICS (in ug/kg)							
PESTICIDES/PCBs (in ug/kg)							
4,4'-DDD	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 U
4,4'-DDE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 U
4,4'-DDT	85 U	33 U	32 U	29 U	72 U	34 U	26 UJ
ALDRIN	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
ALPHA-BHC	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
ALPHA-CHLORDANE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 U
AROCLOR-1016	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1221	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1232	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1242	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1248	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1254	170 U	67 U	63 U	58 U	140 U	67 U	52 U
AROCLOR-1260	170 U	67 U	63 U	58 U	140 U	67 U	52 U
BETA-BHC	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
DELTA-BHC	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
DIELDRIN	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
ENDOSULFAN I	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
ENDOSULFAN II	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 UJ
ENDOSULFAN SULFATE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 UJ
ENDRIN	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 UJ
ENDRIN ALDEHYDE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 U
ENDRIN KETONE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 UJ
GAMMA-BHC (LINDANE)	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
GAMMA-CHLORDANE	17 U	6.7 U	6.3 U	5.8 U	14 U	6.7 U	26 U
HEPTACHLOR	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
HEPTACHLOR EPOXIDE	8.5 U	3.3 U	3.2 U	2.9 U	7.2 U	3.4 U	13 U
METHOXYCHLOR	170 U	67 U	63 U	58 U	140 U	67 U	52 UJ
TOXAPHENE	850 U	330 U	320 U	290 U	720 U	340 U	1,300 U

TABLE 5-1

ORGANIC ANALYTICAL RESULTS
SEDIMENT SAMPLES
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CEF-P06-								
	SD-001	SD-004	SD-005	SD-006		SD-06A	SD-06B	SD-06C	SD-007
				Sample	Duplicate				
POLYCYCLIC AROMATIC HYDROCARBONS (in ug/kg)									
1-METHYLNAPHTHALENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
2-METHYLNAPHTHALENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
ACENAPHTHENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
ACENAPHTHYLENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
ANTHRACENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
BENZO(A)ANTHRACENE	21 U	23 U	21 U	223 J	150 UJ	810 U	20 U	42 U	105 U
BENZO(A)PYRENE	21 U	23 U	21 U	**150 J**	**1,070 J**	**323 J**	20 U	**144**	**133 J**
BENZO(B)FLUORANTHENE	**264**	**135 J**	**337**	**3,180 J**	**2,660 J**	**1,790 J**	20 U	**1,150**	**343 J**
BENZO(G,H,I)PERYLENE	21 U	**186 J**	21 U	**19,000 J**	**6,220 J**	**55,900 J**	20 U	42 U	**9,500 J**
BENZO(K)FLUORANTHENE	**131**	23 U	**368**	**3,700 J**	**2,030 J**	**4,024 J**	20 U	**1,060**	**831 J**
CHRYSENE	21 U	**177 J**	**908**	**299 J**	150 UJ	120 U	20 U	42 U	**106 J**
DIBENZO(A,H)ANTHRACENE	21 U	23 U	21 U	**288 J**	150 UJ	**140 J**	20 U	42 U	100 U
FLUORANTHENE	21 U	23 U	21 U	140 U	150 U	120 U	20 U	42 U	100 U
FLUORENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	**291 J**
INDENO(1,2,3-CD)PYRENE	21 U	23 U	21 U	140 U	150 U	120 U	20 U	42 U	100 U
NAPHTHALENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
PHENANTHRENE	140 U	340 U	140 U	940 U	980 U	810 U	135 U	280 U	700 U
PYRENE	21 U	23 U	21 U	140 U	150 U	120 U	20 U	42 U	100 U

U = Not detected at or above method detection limit.
NOTE: Samples from PSC 6 were analyzed for PAHs only.
Bolded values exceed method detection limit.
J = Estimated concentration.

TABLE 5-2

INORGANIC ANALYTICAL RESULTS IN SEDIMENT
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	Hi-Cut Value(1)	CEF-P48-						
		SD-001	SD-002		SD-003	SD-004	SD-005	SD-006
			Sample	Duplicate				
INORGANICS (in mg/kg)								
ALUMINUM	10,200	**10300 J**	**2580**	**3160**	**1950**	**2630 J**	**3670**	**1690**
ANTIMONY	15.1	1.3 U	0.48 U	0.45 U	0.42 U	1 U	0.48 U	0.44 U
ARSENIC	2.62	1.8 U	0.69 U	0.65 U	0.61 U	1.5 U	0.69 U	0.54 U
BARIUM	36.1	**69.2 J**	**14.8**	**16.5**	**14.2**	**16.8 J**	**19.7**	**10.3**
BERYLLIUM	0.625	1.6 U	0.57 U	0.56 U	0.51 U	0.94 U	0.61 U	0.45 U
CADMIUM	2.05	1.6 U	0.42 U	0.51 U	0.32 U	0.45 U	0.12 U	0.12 U
CALCIUM	5,920	**11700 J**	**1360**	**1490**	**1350**	**1510 J**	**1540**	**1250**
CHROMIUM	16	**14.7 J**	**3.5 J**	**22.9 J**	**2.9 J**	**3.7 J**	**4.5 J**	**2.6**
COBALT	3	**2.7 J**	**0.77**	**1.1**	**0.43**	**0.68 J**	**0.6**	**0.36**
COPPER	12.5	**42.2 J**	**8.9**	**10.7**	**6.5**	**12.8 J**	**9.3**	**4.7**
IRON	3,330	**7460 J**	**1550**	**1910**	**1310**	**1480 J**	**1670**	**1000**
LEAD	44.6	**52.5 J**	**13.4**	**16.4**	**9.6**	**16.5 J**	**11.6**	**9.2**
MAGNESIUM	379	**2690 J**	**202**	**217**	**182**	**232 J**	**201**	**131**
MANGANESE	17	**38.8 J**	**7.4**	**10.4**	**9.2**	**11.9 J**	**9.8**	**6**
MERCURY	0.305	0.21 U	0.08 U	0.08 U	0.07 U	0.18 U	0.08 U	0.06 U
NICKEL	7	**7.3 J**	**1.9 J**	**13.8 J**	**1.6 J**	**2.9 J**	**1.5 J**	0.95 U
POTASSIUM	289	244 U	68.2 U	86.4 U	61.7 U	121 U	86.6 U	51.1 U
SELENIUM	2.27	1 U	0.41 U	0.39 U	0.36 U	0.88 U	0.41 U	0.32 U
SILVER	1.87	0.55 U	0.22 U	0.21 U	0.25 U	0.42 U	0.19 U	0.15 U
SODIUM	388	**152 J**	**42.5**	**51.2**	**54.1**	**170 J**	30.8 U	**31.6**
THALLIUM	2.67	1.4 U	0.54 U	0.51 U	0.47 U	2 U	0.54 U	0.42 U
VANADIUM	15	**15.5 J**	**4.3**	**5.2**	**3.2**	**4.9 J**	**4.9**	**3**
ZINC	92.1	**162 J**	**39.3**	**44.3**	**28.3**	**47.7 J**	**30.1**	**20.3**

U = Not detected at or above method detection limit (associated value)
J = Estimated concentration
NOTE: PSC 6 sediment samples were not analyzed for inorganics.

(1) NAS Cecil Field sediment hi-cut value (HLA, 1998)
Bolded values exceed method detection limit.
Shaded values exceed SCTL.

TABLE 5-3

SURFACE WATER ORGANIC ANALYTICAL RESULTS
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CRITERIA[1]	CEF-P48-SW-008	CEF-P48-SW-009	
			Sample	Duplicate
Semivolatile Organics (in ug/L)				
1,2,4-TRICHLOROBENZENE	22.5	5 U	5 U	5 U
1,2-DICHLOROBENZENE	99	5 U	5 U	5 U
1,3-DICHLOROBENZENE	85	5 U	5 U	5 U
1,4-DICHLOROBENZENE	100	5 U	5 U	5 U
2,4,5-TRICHLOROPHENOL	22.5	4 U	4 U	4 U
2,4,6-TRICHLOROPHENOL	6.5	5 U	5 U	5 U
2,4-DICHLOROPHENOL	13	4 U	4 U	4 U
2,4-DIMETHYLPHENOL	261	10 U	10 U	10 U
2,4-DINITROPHENOL	3	25 U	25 U	25 U
2,4-DINITROTOLUENE	9.1	0.2 U	0.2 U	0.2 U
2,6-DINITROTOLUENE	4	0.2 U	0.2 U	0.2 U
2-CHLORONAPHTHALENE	-	5 U	5 U	5 U
2-CHLOROPHENOL	130	5 U	5 U	5 U
2-METHYLNAPHTHALENE	30	5 U	5 U	5 U
2-METHYLPHENOL	250	5 U	5 U	5 U
2-NITROANILINE	-	5 U	5 U	5 U
2-NITROPHENOL	-	5 U	5 U	5 U
3,3'-DICHLOROBENZIDINE	0.06	7.5 U	7.5 U	7.5 U
3-NITROANILINE	-	5 U	5 U	5 U
4,6-DINITRO-2-METHYLPHENOL	-	25 U	25 U	25 U
4-BROMOPHENYL PHENYL ETHER	-	5 U	5 U	5 U
4-CHLORO-3-METHYLPHENOL	100	10 U	10 U	10 U
4-CHLOROANILINE	2.5	5 U	5 U	5 U
4-CHLOROPHENYL PHENYL ETHER	-1	5 U	5 U	5 U
4-METHYLPHENOL	70	5 U	5 U	5 U
4-NITROANILINE	1200	5 U	5 U	5 U
4-NITROPHENOL	55	15 U	15 U	15 U
ACENAPHTHENE	3	5 U	5 U	5 U
ACENAPHTHYLENE	0.031	5 U	5 U	5 U
ANTHRACENE	0.3	5 U	5 U	5 U
BENZO(A)ANTHRACENE	0.031	5 U	5 U	5 U
BENZO(A)PYRENE	0.031	5 U	5 U	5 U
BENZO(B)FLUORANTHENE	0.031	5 U	5 U	5 U
BENZO(G,H,I)PERYLENE	0.031	5 U	5 U	5 U
BENZO(K)FLUORANTHENE	0.031	5 U	5 U	5 U
BIS(2-CHLOROETHOXY)METHANE	0	5 U	5 U	5 U
BIS(2-CHLOROETHYL)ETHER	9.99	1.5 U	1.5 U	1.5 U
BIS(2-CHLOROISOPROPYL) ETHER	0.5	5 U	5 U	5 U
BIS(2-ETHYLHEXYL)PHTHALATE	0.02	5 U	5 U	5 U
BUTYLBENZYL PHTHALATE	25.5	5 U	5 U	5 U
CARBAZOLE	46.5	4 U	4 U	4 U
CHRYSENE	0.031	5 U	5 U	5 U
DI-N-BUTYL PHTHALATE	0.031	5 U	5 U	5 U
DI-N-OCTYL PHTHALATE	67	5 U	5 U	5 U
DIBENZO(A,H)ANTHRACENE	380	5 U	5 U	5 U
DIBENZOFURAN	1450	5 U	5 U	5 U
DIETHYL PHTHALATE	23	5 U	5 U	5 U
DIMETHYL PHTHALATE	-	5 U	5 U	5 U
FLUORANTHENE	0.3	5 U	5 U	5 U
FLUORENE	30	5 U	5 U	5 U

TABLE 5-3

SURFACE WATER ORGANIC ANALYTICAL RESULTS
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	CRITERIA[1]	CEF-P48-SW-008	CEF-P48-SW-009	
			Sample	Duplicate
Semivolatile Organics (in ug/L) (continued)				
HEXACHLOROBENZENE	0.00036	1 U	1 U	1 U
HEXACHLOROBUTADIENE	49.7	5 U	5 U	5 U
HEXACHLOROCYCLOPENTADIENE	2.95	5 U	5 U	5 U
HEXACHLOROETHANE	1.1	5 U	5 U	5 U
INDENO(1,2,3-CD)PYRENE	0.031	5 U	5 U	5 U
ISOPHORONE	645	5 U	5 U	5 U
N-NITROSO-DI-N-PROPYLAMINE	26	4 U	4 U	4 U
N-NITROSODIPHENYLAMINE	90	5 U	5 U	5 U
NAPHTHALENE	0.83	5 U	5 U	5 U
NITROBENZENE	44	4 U	4 U	4 U
PENTACHLOROPHENOL	8.2	1 U	1 U	1 U
PHENANTHRENE	0.031	5 U	5 U	5 U
PHENOL	6.5	5 U	5 U	5 U
PYRENE	0.3	5 U	5 U	5 U
Pesticides/PCBs (in ug/L)				
4,4'-DDD	0.003	0.1 U	0.1 U	0.1 U
4,4'-DDE	0.0006	0.1 U	0.1 U	0.1 U
4,4'-DDT	0.00059	0.1 U	0.1 U	0.1 U
ALDRIN	1.3	0.05 U	0.05 U	0.05 U
ALPHA-BHC	0.0116	0.05 U	0.05 U	0.05 U
ALPHA-CHLORDANE	0.00059*	0.1 U	0.1 U	0.1 U
AROCLOR-1016	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1221	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1232	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1242	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1248	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1254	0.014**	0.5 U	0.5 U	0.5 U
AROCLOR-1260	0.014**	0.5 U	0.5 U	0.5 U
BETA-BHC	0.046	0.05 U	0.05 U	0.05 U
DELTA-BHC	-	0.05 U	0.05 U	0.05 U
DIELDRIN	0.00014	0.05 U	0.05 U	0.05 U
ENDOSULFAN I	0.056	0.05 U	0.05 U	0.05 U
ENDOSULFAN II	-	0.1 U	0.1 U	0.1 U
ENDOSULFAN SULFATE	-	0.1 U	0.1 U	0.1 U
ENDRIN	0.0023	0.1 U	0.1 U	0.1 U
ENDRIN ALDEHYDE	-	0.1 U	0.1 U	0.1 U
ENDRIN KETONE	-	0.1 U	0.1 U	0.1 U
GAMMA-BHC (LINDANE)	0.063	0.05 U	0.05 U	0.05 U
GAMMA-CHLORDANE	-	0.1 U	0.1 U	0.1 U
HEPTACHLOR	0.0021	0.05 U	0.05 U	0.05 U
HEPTACHLOR EPOXIDE	0.002	0.05 U	0.05 U	0.05 U
METHOXYCHLOR	0.03	0.2 U	0.2 U	0.2 U
TOXAPHENE	0.002	2.5 U	2.5 U	2.5 U

(1) FDEP, Freshwater surface water criteria, F.A.C. 62-777, 1999.
U = Not detected at or above method detection limit.
* = Criterion is for total chlordane.
** = Criterion is for Aroclor mixture.

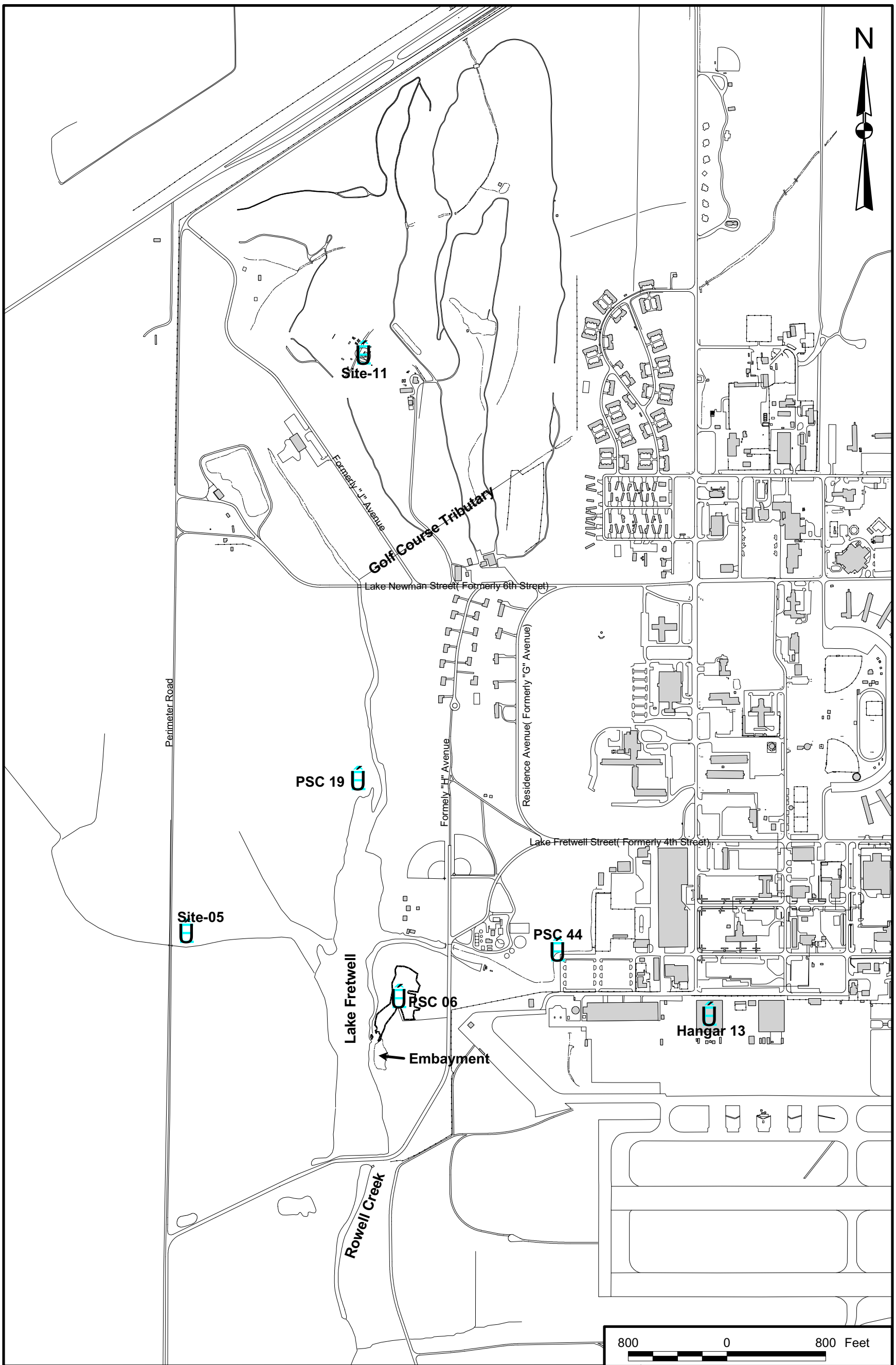
TABLE 5-4

SURFACE WATER INORGANIC ANALYTICAL RESULTS
PSC 48, LAKE FRETWELL SEDIMENTS
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

PARAMETER	HI-CUT VALUE[1]	CEF-P48-SW-008	CEF-P48-SW-009	
			Sample	Duplicate
Inorganics (in ug/L)				
ALUMINUM	1,040	**253**	**253**	**292**
ANTIMONY	46	2.4 U	2.4 U	2.4 U
ARSENIC	5.45	3.4 U	3.4 U	3.4 U
BARIUM	43.7	**36.4**	**27.1**	**27.2**
BERYLLIUM	2.16	0.61 U	0.42 U	0.63 U
CADMIUM	2.25	0.33 U	0.33 U	0.33 U
CALCIUM	43,000	**15,100**	**15,000**	**15,100**
CHROMIUM	4.75	1 U	8.3 U	1 U
COBALT	10.5	0.8 U	0.8 U	0.8 U
COPPER	7.35	0.75 U	0.75 U	0.75 U
IRON	3,030	**1,320**	**1,270**	**1,310**
LEAD	5.35	1.6 U	2.7 U	3.6 U
MAGNESIUM	5,580	**3,170**	**3,300**	**3,340**
MANGANESE	49.3	**10.3**	**13.5**	**14.1**
MERCURY	0.38	0.25 U	0.25 U	0.25 U
NICKEL	20	1 U	1 U	1 U
POTASSIUM	2,060	**1,070**	**1,030**	**1,030**
SELENIUM	7.6	2 U	2 U	2 U
SILVER	2.29	0.96 U	0.96 U	0.96 U
SODIUM	12,200	**6,180**	**6,090**	**6,350**
THALLIUM	10.1	2.7 U	2.7 U	2.7 U
VANADIUM	4.5	1.7 U	2.8 U	2.7 U
ZINC	51.4	4.8 U	**8.6**	**9.3**

1 NAS Cecil Field surface water hi-cut value (HLA, 1998)
U = Not detected at or above method detection limit.
Bolded values exceed method detection limit.
Shaded values exceed surface water hi-cut value.

P:\GIS\CECIL\PSC48.APR 22Nov99 MJJ PSC 48 Site Layout



DRAWN BY MJJ	DATE 22Nov99	SITE AREA MAP PSC 48, LAKE FRETWELL AND ROWELL CREEK NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 5-1 / REV 0

6.0 PRELIMINARY RISK EVALUATIONS

6.1 HUMAN HEALTH RISKS

Exposure to surface water and sediments at PSCs 48 and 6 would be infrequent relative to typical residential or industrial exposures to soil. Exposure to surface water and sediment would be of short duration, thus rendering the dermal uptake of constituents negligible. Moreover, the presence of surface water reduces the adherence of sediments to the skin, further reducing the potential for constituent uptake. Overall, there would be no significant impact to human health as a result of exposure to surface water and sediment.

Typically, a Preliminary Risk Evaluation (PRE) entails a comparison of maximum detected concentrations to FDEP risk-based criteria to arrive at quantitative estimates of risk. At PSC 48 (and associated samples at PSC 6) surface water and sediment were the only media evaluated. FDEP has no human health risk-based criteria for surface water and sediment. Therefore, a qualitative assessment of potential risk to human health was conducted.

6.2 ECOLOGICAL RISKS

6.2.1 PSC 48 (1999 Samples)

6.2.1.1 Surface Water

Concentrations of aluminum and iron exceeded ecological screening values in both surface water samples from PSC 48 (Figure 6-1), but concentrations were much less than NAS Cecil Field hi-cut values (aluminum hi-cut = 1,040 µg/L; iron hi-cut = 3,030 µg/L). Concentrations of iron and aluminum were approximately the same in the inlet sample (Al:253 µg/L; Fe:1320 µg/L) as in the outlet sample (Al:272 µg/L; Fe:1290 µg/L). Concentrations of other surface water analytes were less than ecological screening values. Analytical data for surface water samples are included in Appendix A.

6.2.1.2 Sediment

Concentrations of sediment analytes in sample CEF-P48-SD-001 exceeded ecological screening values (Figure 6-2). Sediment concentrations in this sample, compared to ecological screening values and NAS Cecil hi-cut values, are shown in Table 6-1. Concentrations of copper, lead, and zinc exceeded ecological screening and hi-cut values, but associated hazard quotients were relatively low (1.3 to 2.3). Concentrations of aluminum, barium, iron, manganese, and vanadium in this sample also exceeded hi-cut

values. There are no FDEP or U.S. EPA Region IV ecological screening values for these five metals. Analytical data for sediment samples are included in Appendix A.

6.2.1.3 Sediment Toxicity Tests

The survival and growth of the test organisms were not significantly reduced (compared to the laboratory control or to the reference sample) in the five samples collected from Lake Fretwell and Rowell Creek (see Tables 1 and 2 of Appendix B). Thus, the sediments samples tested were not toxic to *Chironomus tentans* or *Hyalella azteca*. The complete toxicity report from the testing laboratory is included in Appendix C.

Pore water was analyzed to help explain potential toxicological impacts that might be indicated by sediment toxicity tests. However, because these tests showed no toxicity, evaluation of pore water analytical results was not required. Laboratory data from the pore water sample is included in Appendix A.

6.2.2 PSC 6 (1999 Samples)

At PSC 6, few PAH compounds were detected in sediment samples, and detection limits were generally adequate (Appendix A). Overall, the data from the ditch sample and the three samples along the Lake Fretwell shoreline (outside of the embayment) indicate negligible ecological risks from PAH compounds. Concentrations of some PAH compounds in three of the four samples collected from within the embayment (samples SD-006, SD-06A, and SD-007) exceeded PEL and ER-M values (Table 6-2). In addition, detection limits of some PAHs in these three samples exceeded PEL and ER-M values. Because PAH concentrations in some samples exceeded ecological screening values, and since detection limits in some samples were elevated, a food chain model was used to predict dietary exposures to COPCs for representative wildlife species. The predicted dietary exposures were then compared to toxicity reference values (TRVs) obtained primarily from Oak Ridge National Laboratory (ORNL) wildlife toxicity data (Sample et al., 1996). This process is described in Appendix C.

Exposure point concentrations used in the food chain model consisted of maximum detected concentrations of each PAH analyte, except that for sample SD-006, the mean concentration of the sample and its duplicate were used. In addition, the maximum detection limit (Table 5-1) was used as exposure point concentrations for PAHs that were not detected in any sample.

The results of the food chain modeling are presented in Table 6-3. Benzo(g,h,i)perylene was the only PAH with an HQ greater than 1.0. The maximum HQ for benzo(g,h,i)perylene, however, was relatively low (HQ = 1.49), in spite of the maximum detected concentration (55,900 µg/kg) of this compound. The low HQs shown in Table 6-3 reflect the fact that PAHs generally do not bioaccumulate. The biota-sediment

accumulation factor (BSAF) for benzo(g,h,i)perylene was especially low at 0.0152 (Appendix D, Table D-3). The maximum HQ for benzo(g,h,i)perylene using the average sediment concentration was 0.269 (Table 6-3).

The raccoon and kingfisher have large home ranges, but the HQs were calculated by assuming that these representative receptors foraged exclusively at PSC 6. All HQs in Table 6-3 would be considerably less if more realistic area-use factors were used.

In summary, exceedances of ER-M and PEL values indicate that potential risks to benthic invertebrates exist in the embayment from some PAHs. However, an examination of the sampling locations indicates that potential ecological risks from PAHs are limited to a small area of the embayment, and significant migration into Lake Frewell does not appear to be occurring. This conclusion is supported by the results of the analytical results of sediment samples recently collected from other areas within the lake. In addition, based on results of the food chain modeling, the risks to upper level receptors from PAHs are negligible.

TABLE 6-1

SEDIMENT CONCENTRATIONS IN PSC 48 SAMPLE SD-001 (MAY 1999)
COMPARED TO ECOLOGICAL SCREENING VALUES
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Concentration (mg/kg)	U.S. EPA/FDEP Ecological Screening Value (mg/kg)	NAS Cecil Field Hi-Cut Value (mg/kg)	Alternate Ecological Screening Value (mg/kg)	Hazard Quotient
Aluminum	10,300	Not available	10,200	Not available	NA
Barium	69.2	Not available	36.1	20-60[a]	NA
Copper	42.2	18.7	12.5	108[b]; 270[c]	2.3
Iron	7,460	Not available	3,330	17000-25000[a] 20000[d]	NA
Lead	52.5	30.2	44.6	112[b]; 218[c]	1.7
Manganese	38.8	Not available	17.0	300-500[a] 460[d]	NA
Vanadium	15.5	Not available	15.0	Not available	NA
Zinc	162	124	92.1	271[b]; 410[c]	1.3

Notes:

Hazard quotient = Detected concentration divided by U.S. EPA/FDEP ecological screening value.
NA Hazard quotient not applicable since an ecological screening value was not available from U.S. EPA Region IV or FDEP.
a U.S. EPA Region 5 guideline indicating moderate pollution (Giesy and Hoeke, 1990)
b PEL - Probable Effects Level (FDEP, 1994)
c ER-M - Effects Range Medium (Long et al., 1995)
d Ontario Ministry of Environment lowest effect level (Jones et al ,1997)

TABLE 6-2

SEDIMENT ANALYTES DETECTED AT PSC 6
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Analyte	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Location of Maximum Detection	Ecological Screening Value (µg/kg)[a]	Maximum Hazard Quotient[b]	Alternate Ecological Screening Value (µg/kg)	
						PEL[c]	ER-M[d]
Benzo(a)anthracene	1 / 8	223 J	CEF-P06-SD-006	74.8	3.0	693	1600
Benzo(a)pyrene	4 / 8	133 J – 1,070 J	CEF-P06-SD-006 (dup)	88.8	12.0	763	1600
Benzo(b)fluoranthene	7 / 8	135 J – 3,180 J	CEF-P06-SD-006	88.8[e]	35.8	NA	NA
Benzo(g,h,i)perylene	4 / 8	186 J – 55,900 J	CEF-P06-SD-06A	88.8[e]	629.5	NA	NA
Benzo(k)fluoranthene	6 / 8	131 – 4,024 J	CEF-P06-SD-06A	88.8[e]	45.3	NA	NA
Chrysene	4 / 8	106 J - 908	CEF-P06-SD-005	108	8.4	846	2800
Dibenzo(a,h)anthracene	2 / 8	140 J – 288 J	CEF-P06-SD-006	6.22	46.3	135	260
Fluorene	1 / 8	291 J	CEF-P06-SD-007	21.2	13.7	144	540

Note: Samples collected in June 1999.

a EPA Region IV and FDEP ecological screening values are threshold-effects levels (TELs) (FDEP, 1994)
b Hazard quotient = maximum detected concentration divided by ecological screening value
c Probable effects level (FDEP, 1994)
d Effects-range-median (Long et al, 1995)
e Benzo(a)pyrene used as a surrogate
NA not available

TABLE 6-3

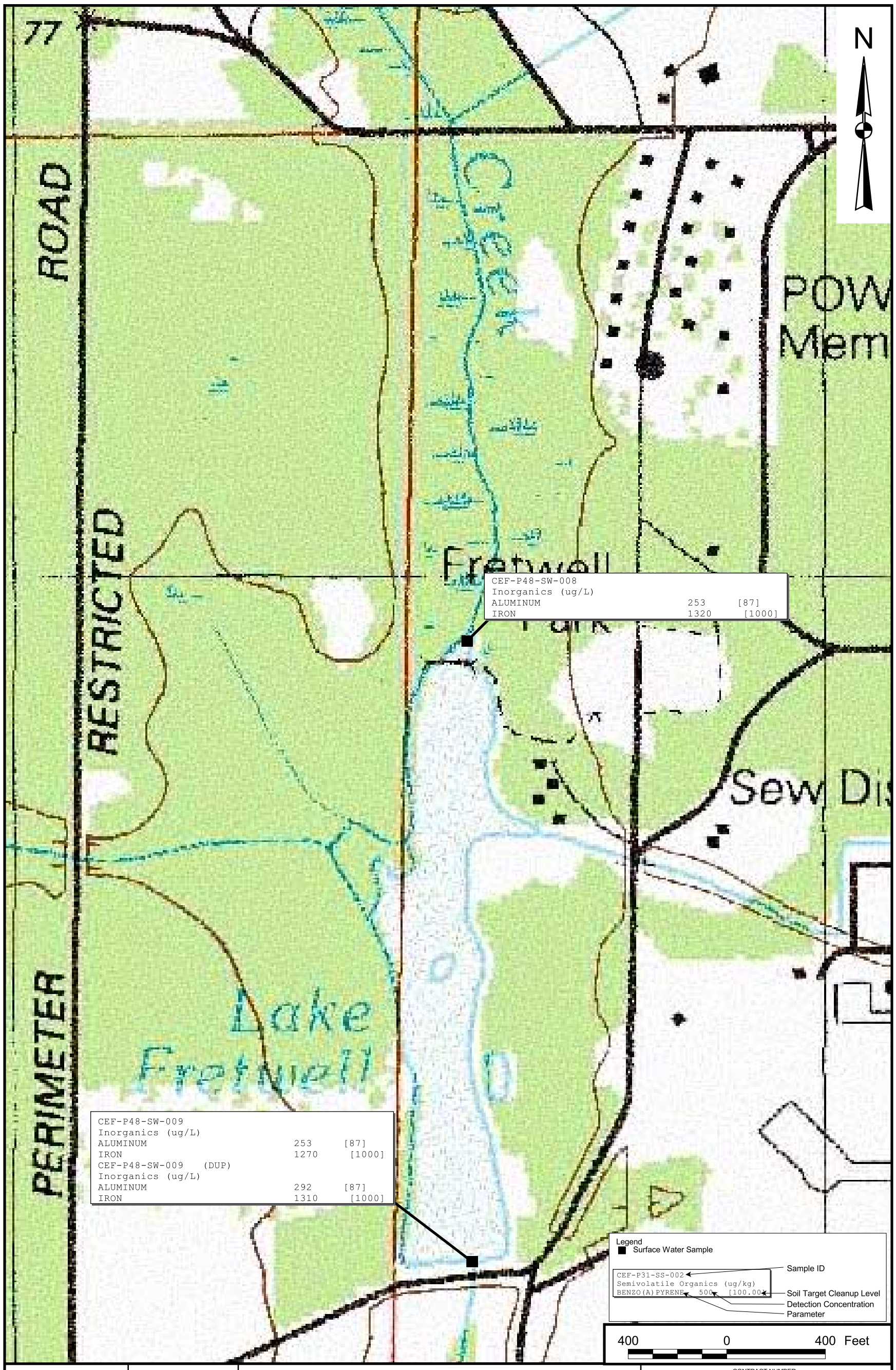
RESULTS OF FOOD CHAIN MODELING
PSC 48, LAKE FRETWELL SEDIMENTS
SEDIMENT SAMPLES ASSOCIATED WITH PSC 6
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Ecological Contaminant of Potential Concern	Raccoon		Kingfisher		Bullfrog	
	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ	NOAEL HQ	LOAEL HQ
1-METHYLNAPHTHALENE	4.30E-01	4.30E-02	6.24E-02	6.24E-03	2.73E-01	2.73E-02
2-METHYLNAPHTHALENE	4.30E-01	4.30E-02	6.24E-02	6.24E-03	2.73E-01	2.73E-02
ACENAPHTHENE	1.06E-01	5.32E-02	1.81E-02	1.81E-03	8.44E-02	8.44E-03
ACENAPHTHYLENE	1.84E-02	9.20E-03	6.93E-04	6.93E-05	1.05E-02	1.05E-03
ANTHRACENE	1.06E-01	5.32E-02	1.81E-02	1.81E-03	8.44E-02	8.44E-03
BENZO(A)ANTHRACENE	2.69E-02	2.69E-03	3.52E-03	3.52E-04	1.64E-02	1.64E-03
BENZO(A)PYRENE	8.79E-02	8.79E-03	1.15E-02	1.15E-03	5.36E-02	5.36E-03
BENZO(B)FLUORANTHENE	4.21E-01	4.21E-02	5.50E-02	5.50E-03	2.57E-01	2.57E-02
BENZO(G,H,I)PERYLENE	**1.49E+00**	1.49E-01	5.52E-02	5.52E-03	6.74E-01	6.74E-02
BENZO(G,H,I)PERYLENE (Average)[a]	2.69E-01	2.69E-02	9.98E-03	9.98E-04	1.22E-01	1.22E-02
BENZO(K)FLUORANTHENE	5.80E-01	5.80E-02	7.59E-02	7.59E-03	3.54E-01	3.54E-02
CHRYSENE	1.31E-01	1.31E-02	1.71E-02	1.71E-03	7.98E-02	7.98E-03
DIBENZO(A,H)ANTHRACENE	2.43E-02	1.21E-02	4.13E-03	4.13E-04	1.93E-02	1.93E-03
FLUORANTHENE	2.09E-02	2.09E-03	2.73E-03	2.73E-04	1.27E-02	1.27E-03
FLUORENE	1.06E-01	5.32E-02	1.81E-02	1.81E-03	8.44E-02	8.44E-03
INDENO(1,2,3-CD)PYRENE	2.09E-02	2.09E-03	2.73E-03	2.73E-04	1.27E-02	1.27E-03
NAPHTHALENE	1.06E-01	5.32E-02	1.81E-02	1.81E-03	8.44E-02	8.44E-03
PHENANTHRENE	2.20E-01	1.10E-01	4.05E-02	4.05E-03	1.80E-01	1.80E-02
PYRENE	2.09E-02	2.09E-03	2.73E-03	2.73E-04	1.27E-02	1.27E-03

a = Hazard Quotients (HQs) on this row are based on the average concentration of benzo(g,h,i)perylene; all other HQs are based on maximum concentrations.

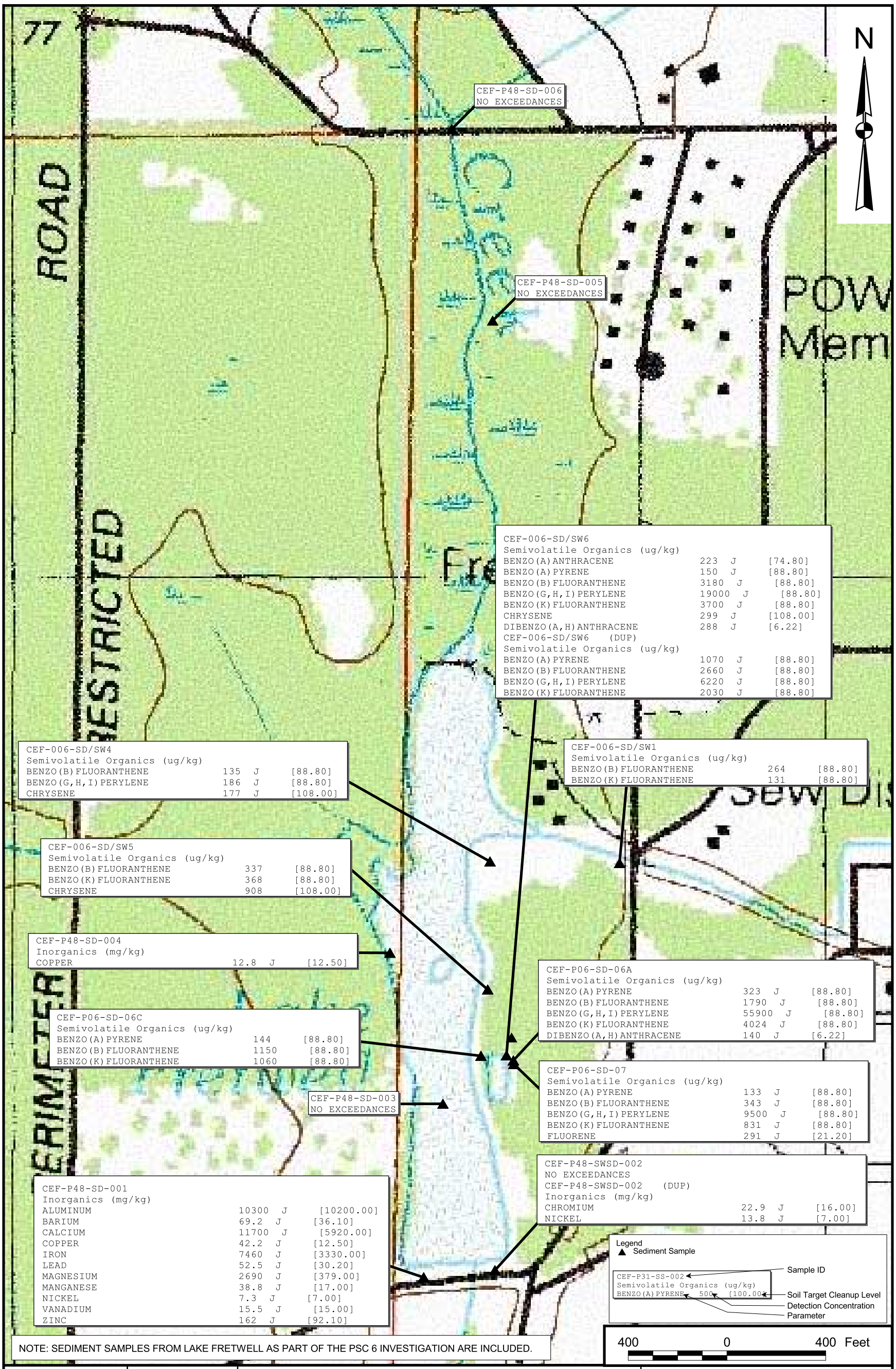
Note: Bolded values are HQs greater than 1.0.

P:\GIS\CECIL\PSC48.APR 04Apr00 MJJ Layout SW Tag Map



DRAWN BY MJJ	DATE 07Oct99	SUMMARY OF ANALYTES IN SURFACE WATER EXCEEDING ECOLOGICAL CRITERIA PSC 48, LAKE FRETWELL AND ROWELL CREEK NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 6-1 / REV 0

P:\GIS\CECIL\PSC48.APR 05Apr00 MJJ Layout SD Tag Map



NOTE: SEDIMENT SAMPLES FROM LAKE FRETWELL AS PART OF THE PSC 6 INVESTIGATION ARE INCLUDED.

DRAWN BY	DATE	CONTRACT NUMBER
MJJ	07Oct99	0039
CHECKED BY	DATE	APPROVED BY / DATE
COST/SCHEDULE-AREA		APPROVED BY / DATE
SCALE: AS NOTED		DRAWING NO.: FIGURE 6-2 / REV: 0

SUMMARY OF ANALYTES IN SEDIMENT EXCEEDING ECOLOGICAL CRITERIA
PSC 48, LAKE FRETWELL AND ROWELL CREEK
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

7.0 CONCLUSIONS AND RECOMMENDATIONS

The previous ERA concluded that contaminants of potential concern posed negligible risks to terrestrial and avian piscivorous receptors (HLA, 1998). The ERA also concluded that impacts to aquatic invertebrates might be occurring at locations where sediment toxicity tests showed low survival of test organisms. However, the 1995 toxicity test results were contradictory between species, and no adequate explanation for the conflicting toxicity test results was identified.

The most recent sampling and analyses at Lake Fretwell indicated that few analytes were present in surface water and sediment at concentrations that exceeded ecological guidelines. No analytes were present in surface water samples from PSC 48 at concentrations exceeding hi-cut values. Concentrations of analytes in four of five sediment samples from PSC 48 were less than ecological screening values or were less than hi-cut values. Concentrations of three metals in one sediment sample exceeded conservative ecological screening values, and concentrations of eight metals in the same sample exceeded hi-cut values. The concentrations were relatively minor in magnitude and were not elevated in comparison to alternate (less conservative) ecological screening values. Analyses of the remaining sediment and surface water samples collected in 1999 show negligible potential for risks to human and ecological receptors.

The BEAR stated that detected concentrations of pesticides, PCBs, and metals were considerably lower in the 1995 data set than in the 1993 data set. Pesticides and PCBs were not detected in the 1999 data set. Concentrations of metals in the 1999 data set tended to be similar to those in the 1995 data set, except at CEF-P48-SD-001, where concentrations tended to be greater in 1999 than in 1995. As mentioned above, however, the concentrations were not excessively high.

Survival and growth of test organisms were normal in toxicity tests performed on sediments collected in 1999 from the same locations where survival was poor in 1995 samples. Thus, the results of the recent sediment toxicity tests indicate no potential ecological risks to sediment-dwelling organisms.

Based on samples collected at PSC 6, potential ecological risks from PAH compounds appear to be limited to benthic invertebrates within a portion of the embayment. PAH compounds would not be expected to bioaccumulate in higher organisms at the concentrations observed here. These compounds do not appear to have significantly migrated into the lake. Therefore, risks to human and ecological receptors also are negligible for the PSC 6 portion of Lake Fretwell.

Based on evaluation of historical and recent sampling activities in Lake Fretwell, the number and spatial extent of samples appear to be adequate to characterize potential human and ecological risks. In addition, the potential risks to human and ecological receptors from contaminants in Lake Fretwell are negligible and no further sampling or remediation based on human health and/orecological risks is warranted.

It is recommended that the color classification for PSC 48 be changed from Yellow to Light Green to denote that releases of hazardous substances have occurred, but at concentrations that do not require a removal or response action.

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APPENDIX A

ANALYTICAL DATA

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-085

TO: **M. SPERANZA** **DATE:** **JULY 13, 1999**

FROM: **GRETCHEN PHIPPS** **COPIES:** **DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – SEMIVOLATILES, PESTICIDES/PCBs**
CTO 078 - NAS, CECIL FIELD
SDG – F4273

SAMPLES: 6/Soils/

CEF-P48-SD-001 CEF-P48-SD-002
CEF-P48-SD-003 CEF-P48-SD-004
CEF-P48-SD-005 CEF-P48-SD-DU01

3/Aqueous/

CEF-P48-SW-008 CEF-P48-SW-009
CEF-P48-SW-DU01

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F4273, consists of six (6) soil and three (3) aqueous environmental samples. Two (2) field duplicate pairs (CEF-P48-SD-002 / CEF-P48-SD-DU01 and CEF-P48-SW-009 / CEF-P48-SW-DU01) were included within this SDG.

All samples were analyzed for semivolatile organic compounds, pesticide/PCBs, The samples were collected by Tetra Tech NUS on June 7, 1999 and analyzed by Accutest Laboratory. Semivolatile organics analyses were conducted using SW 846 method 8270C. Pesticide analyses were conducted using SW 846 method 8081A. PCB analyses were conducted using SW 846 method 8082.

The data was evaluated based on the following parameters:

* • Data Completeness
• Calibration Verifications
* • Holding Times
* • Laboratory Blank Analyses
* • Field Duplicate Analyses

* - All quality control criteria were met for this parameter.

Notes

The Continuing Calibration Verification (CCV) Percent Difference (%D) for indeno(1,2,3-cd)pyrene affecting the aqueous samples was >25% quality control limit. The CCV %Ds for indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,I)perylene affecting sample CEF-P48-SD-001, CEF-P48-SD-005 and CEF-P48-SD-DU01 were <25% quality control limit. Several CCVs %Ds for several pesticides affecting all samples were >25% quality control limit. No validation action was taken on this basis.

All result reported for field duplicate pairs (CEF-P48-SD-002 / CEF-P48-SD-DU01 and CEF-P48-SW-009 / CEF-P48-SW-DU01) were nondetected. Therefore, a comparison was not included in Appendix C.

Samples CEF-P48-SD-001 and Cef-P48-SD-004 have Percent Solids <30%. Therefore, the reported limits were elevated.

Executive Summary

Laboratory Performance: Several CCV %Ds for several compounds were >25% quality control limit

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENIDX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01					
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			/ /		
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U		5	U		5	U				
1,2-DICHLOROBENZENE	5	U		5	U		5	U				
1,3-DICHLOROBENZENE	5	U		5	U		5	U				
1,4-DICHLOROBENZENE	5	U		5	U		5	U				
2,4,5-TRICHLOROPHENOL	4	U		4	U		4	U				
2,4,6-TRICHLOROPHENOL	5	U		5	U		5	U				
2,4-DICHLOROPHENOL	4	U		4	U		4	U				
2,4-DIMETHYLPHENOL	10	U		10	U		10	U				
2,4-DINITROPHENOL	25	U		25	U		25	U				
2,4-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2,6-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2-CHLORONAPHTHALENE	5	U		5	U		5	U				
2-CHLOROPHENOL	5	U		5	U		5	U				
2-METHYLNAPHTHALENE	5	U		5	U		5	U				
2-METHYLPHENOL	5	U		5	U		5	U				
2-NITROANILINE	5	U		5	U		5	U				
2-NITROPHENOL	5	U		5	U		5	U				
3,3'-DICHLOROBENZIDINE	7.5	U		7.5	U		7.5	U				
3-NITROANILINE	5	U		5	U		5	U				
4,6-DINITRO-2-METHYLPHENOL	25	U		25	U		25	U				
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-CHLORO-3-METHYLPHENOL	10	U		10	U		10	U				
4-CHLOROANILINE	5	U		5	U		5	U				
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-METHYLPHENOL	5	U		5	U		5	U				
4-NITROANILINE	5	U		5	U		5	U				
4-NITROPHENOL	15	U		15	U		15	U				
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U				
BIS(2-CHLOROETHYL)ETHER	1.5	U		1.5	U		1.5	U				
BIS(2-CHLOROISOPROPYL) ETHER	5	U		5	U		5	U				
BIS(2-ETHYLHEXYL)PHTHALATE	5	U		5	U		5	U				
BUTYLBENZYL PHTHALATE	5	U		5	U		5	U				
CARBAZOLE	4	U		4	U		4	U				
DI-N-BUTYL PHTHALATE	5	U		5	U		5	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01			/ /		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99					
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U				
DIBENZOFURAN	5	U		5	U		5	U				
DIETHYL PHTHALATE	5	U		5	U		5	U				
DIMETHYL PHTHALATE	5	U		5	U		5	U				
HEXACHLOROBENZENE	1	U		1	U		1	U				
HEXACHLOROBUTADIENE	5	U		5	U		5	U				
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U				
HEXACHLOROETHANE	5	U		5	U		5	U				
ISOPHORONE	5	U		5	U		5	U				
N-NITROSO-DI-N-PROPYLAMINE	4	U		4	U		4	U				
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U				
NITROBENZENE	4	U		4	U		4	U				
PENTACHLOROPHENOL	1	U		1	U		1	U				
PHENOL	5	U		5	U		5	U				

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-001			CEF-P48-SD-002			CEF-P48-SD-003			CEF-P48-SD-004		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-12			F4273-10			F4273-6			F4273-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	19.6 %			49.8 %			57.0 %			23.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	850	U		330	U		290	U		720	U	
1,2-DICHLOROBENZENE	850	U		330	U		290	U		720	U	
1,3-DICHLOROBENZENE	850	U		330	U		290	U		720	U	
1,4-DICHLOROBENZENE	850	U		330	U		290	U		720	U	
2,4,5-TRICHLOROPHENOL	850	U		330	U		290	U		720	U	
2,4,6-TRICHLOROPHENOL	850	U		330	U		290	U		720	U	
2,4-DICHLOROPHENOL	760	U		300	U		260	U		650	U	
2,4-DIMETHYLPHENOL	1700	U		670	U		580	U		1400	U	
2,4-DINITROPHENOL	4200	U		1700	U		1500	U		3600	U	
2,4-DINITROTOLUENE	850	U		330	U		290	U		720	U	
2,6-DINITROTOLUENE	850	U		330	U		290	U		720	U	
2-CHLORONAPHTHALENE	850	U		330	U		290	U		720	U	
2-CHLOROPHENOL	850	U		330	U		290	U		720	U	
2-METHYLNAPHTHALENE	850	U		330	U		290	U		720	U	
2-METHYLPHENOL	850	U		330	U		290	U		720	U	
2-NITROANILINE	850	U		330	U		290	U		720	U	
2-NITROPHENOL	850	U		330	U		290	U		720	U	
3,3'-DICHLOROBENZIDINE	1700	U		670	U		580	U		1400	U	
3-NITROANILINE	850	U		330	U		290	U		720	U	
4,6-DINITRO-2-METHYLPHENOL	1700	U		670	U		580	U		1400	U	
4-BROMOPHENYL PHENYL ETHER	850	U		330	U		290	U		720	U	
4-CHLORO-3-METHYLPHENOL	1700	U		670	U		580	U		1400	U	
4-CHLOROANILINE	850	U		330	U		290	U		720	U	
4-CHLOROPHENYL PHENYL ETHER	850	U		330	U		290	U		720	U	
4-METHYLPHENOL	850	U		330	U		290	U		720	U	
4-NITROANILINE	850	U		330	U		290	U		720	U	
4-NITROPHENOL	4200	U		1700	U		1500	U		3600	U	
ACENAPHTHENE	850	U		330	U		290	U		720	U	
ACENAPHTHYLENE	850	U		330	U		290	U		720	U	
ANTHRACENE	850	U		330	U		290	U		720	U	
BENZO(A)ANTHRACENE	850	U		330	U		290	U		720	U	
BENZO(A)PYRENE	420	U		170	U		150	U		360	U	
BENZO(B)FLUORANTHENE	850	U		330	U		290	U		720	U	
	850	U		330	U		290	U		720	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-001			CEF-P48-SD-002			CEF-P48-SD-003			CEF-P48-SD-004		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-12			F4273-10			F4273-6			F4273-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	19.6 %			49.8 %			57.0 %			23.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
BENZO(K)FLUORANTHENE	850	U		330	U		290	U		720	U	
BIS(2-CHLOROETHOXY)METHANE	850	U		330	U		290	U		720	U	
BIS(2-CHLOROETHYL)ETHER	850	U		330	U		290	U		720	U	
BIS(2-CHLOROISOPROPYL) ETHER	850	U		330	U		290	U		720	U	
BIS(2-ETHYLHEXYL)PHTHALATE	850	U		330	U		290	U		720	U	
BUTYLBENZYL PHTHALATE	850	U		330	U		290	U		720	U	
CARBAZOLE	850	U		330	U		290	U		720	U	
CHRYSENE	850	U		330	U		290	U		720	U	
DI-N-BUTYL PHTHALATE	850	U		330	U		290	U		720	U	
DI-N-OCTYL PHTHALATE	850	U		330	U		290	U		720	U	
DIBENZO(A,H)ANTHRACENE	420	U		170	U		150	U		360	U	
DIBENZOFURAN	850	U		330	U		290	U		720	U	
DIETHYL PHTHALATE	850	U		330	U		290	U		720	U	
DIMETHYL PHTHALATE	850	U		330	U		290	U		720	U	
FLUORANTHENE	850	U		330	U		290	U		720	U	
FLUORENE	850	U		330	U		290	U		720	U	
HEXACHLOROBENZENE	850	U		330	U		290	U		720	U	
HEXACHLOROBUTADIENE	850	U		330	U		290	U		720	U	
HEXACHLOROCYCLOPENTADIENE	850	U		330	U		290	U		720	U	
HEXACHLOROETHANE	850	U		330	U		290	U		720	U	
INDENO(1,2,3-CD)PYRENE	850	U		330	U		290	U		720	U	
ISOPHORONE	850	U		330	U		290	U		720	U	
N-NITROSO-DI-N-PROPYLAMINE	310	U		120	U		100	U		260	U	
N-NITROSODIPHENYLAMINE	850	U		330	U		290	U		720	U	
NAPHTHALENE	850	U		330	U		290	U		720	U	
NITROBENZENE	850	U		330	U		290	U		720	U	
PENTACHLOROPHENOL	4200	U		1700	U		1500	U		3600	U	
PHENANTHRENE	850	U		330	U		290	U		720	U	
PHENOL	850	U		330	U		290	U		720	U	
PYRENE	850	U		330	U		290	U		720	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-005			CEF-P48-SD-DU01								
SAMPLE DATE:	06/07/99			06/07/99			/ /			/ /		
LABORATORY ID:	F4273-14			F4273-8								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	49.7 %			52.8 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P48-SD-002								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	340	U		320	U							
1,2-DICHLOROBENZENE	340	U		320	U							
1,3-DICHLOROBENZENE	340	U		320	U							
1,4-DICHLOROBENZENE	340	U		320	U							
2,4,5-TRICHLOROPHENOL	340	U		320	U							
2,4,6-TRICHLOROPHENOL	340	U		320	U							
2,4-DICHLOROPHENOL	300	U		280	U							
2,4-DIMETHYLPHENOL	670	U		630	U							
2,4-DINITROPHENOL	1700	U		1600	U							
2,4-DINITROTOLUENE	340	U		320	U							
2,6-DINITROTOLUENE	340	U		320	U							
2-CHLORONAPHTHALENE	340	U		320	U							
2-CHLOROPHENOL	340	U		320	U							
2-METHYLNAPHTHALENE	340	U		320	U							
2-METHYLPHENOL	340	U		320	U							
2-NITROANILINE	340	U		320	U							
2-NITROPHENOL	340	U		320	U							
3,3'-DICHLOROBENZIDINE	670	U		630	U							
3-NITROANILINE	340	U		320	U							
4,6-DINITRO-2-METHYLPHENOL	670	U		630	U							
4-BROMOPHENYL PHENYL ETHER	340	U		320	U							
4-CHLORO-3-METHYLPHENOL	670	U		630	U							
4-CHLOROANILINE	340	U		320	U							
4-CHLOROPHENYL PHENYL ETHER	340	U		320	U							
4-METHYLPHENOL	340	U		320	U							
4-NITROANILINE	340	U		320	U							
4-NITROPHENOL	1700	U		1600	U							
ACENAPHTHENE	340	U		320	U							
ACENAPHTHYLENE	340	U		320	U							
ANTHRACENE	340	U		320	U							
BENZO(A)ANTHRACENE	340	U		320	U							
BENZO(A)PYRENE	170	U		160	U							
BENZO(B)FLUORANTHENE	340	U		320	U							
BENZO(G,H,I)PERYLENE	340	U		320	U							

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-005			CEF-P48-SD-DU01			/ /			/ /		
SAMPLE DATE:	06/07/99			06/07/99								
LABORATORY ID:	F4273-14			F4273-8								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	49.7 %			52.8 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P48-SD-002								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
BENZO(K)FLUORANTHENE	340	U		320	U							
BIS(2-CHLOROETHOXY)METHANE	340	U		320	U							
BIS(2-CHLOROETHYL)ETHER	340	U		320	U							
BIS(2-CHLOROISOPROPYL) ETHER	340	U		320	U							
BIS(2-ETHYLHEXYL)PHTHALATE	340	U		320	U							
BUTYLBENZYL PHTHALATE	340	U		320	U							
CARBAZOLE	340	U		320	U							
CHRYSENE	340	U		320	U							
DI-N-BUTYL PHTHALATE	340	U		320	U							
DI-N-OCTYL PHTHALATE	340	U		320	U							
DIBENZO(A,H)ANTHRACENE	170	U		160	U							
DIBENZOFURAN	340	U		320	U							
DIETHYL PHTHALATE	340	U		320	U							
DIMETHYL PHTHALATE	340	U		320	U							
FLUORANTHENE	340	U		320	U							
FLUORENE	340	U		320	U							
HEXACHLOROBENZENE	340	U		320	U							
HEXACHLOROBUTADIENE	340	U		320	U							
HEXACHLOROCYCLOPENTADIENE	340	U		320	U							
HEXACHLOROETHANE	340	U		320	U							
INDENO(1,2,3-CD)PYRENE	340	U		320	U							
ISOPHORONE	340	U		320	U							
N-NITROSO-DI-N-PROPYLAMINE	120	U		110	U							
N-NITROSODIPHENYLAMINE	340	U		320	U							
NAPHTHALENE	340	U		320	U							
NITROBENZENE	340	U		320	U							
PENTACHLOROPHENOL	1700	U		1600	U							
PHENANTHRENE	340	U		320	U							
PHENOL	340	U		320	U							
PYRENE	340	U		320	U							

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01			/ /		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99					
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	5	U		5	U		5	U				
1,2-DICHLOROBENZENE	5	U		5	U		5	U				
1,3-DICHLOROBENZENE	5	U		5	U		5	U				
1,4-DICHLOROBENZENE	5	U		5	U		5	U				
2,4,5-TRICHLOROPHENOL	4	U		4	U		4	U				
2,4,6-TRICHLOROPHENOL	5	U		5	U		5	U				
2,4-DICHLOROPHENOL	4	U		4	U		4	U				
2,4-DIMETHYLPHENOL	10	U		10	U		10	U				
2,4-DINITROPHENOL	25	U		25	U		25	U				
2,4-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2,6-DINITROTOLUENE	0.2	U		0.2	U		0.2	U				
2-CHLORONAPHTHALENE	5	U		5	U		5	U				
2-CHLOROPHENOL	5	U		5	U		5	U				
2-METHYLNAPHTHALENE	5	U		5	U		5	U				
2-METHYLPHENOL	5	U		5	U		5	U				
2-NITROANILINE	5	U		5	U		5	U				
2-NITROPHENOL	5	U		5	U		5	U				
3,3'-DICHLOROBENZIDINE	7.5	U		7.5	U		7.5	U				
3-NITROANILINE	5	U		5	U		5	U				
4,6-DINITRO-2-METHYLPHENOL	25	U		25	U		25	U				
4-BROMOPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-CHLORO-3-METHYLPHENOL	10	U		10	U		10	U				
4-CHLOROANILINE	5	U		5	U		5	U				
4-CHLOROPHENYL PHENYL ETHER	5	U		5	U		5	U				
4-METHYLPHENOL	5	U		5	U		5	U				
4-NITROANILINE	5	U		5	U		5	U				
4-NITROPHENOL	15	U		15	U		15	U				
BIS(2-CHLOROETHOXY)METHANE	5	U		5	U		5	U				
BIS(2-CHLOROETHYL)ETHER	1.5	U		1.5	U		1.5	U				
BIS(2-CHLOROISOPROPYL) ETHER	5	U		5	U		5	U				
BIS(2-ETHYLHEXYL)PHTHALATE	5	U		5	U		5	U				
BUTYLBENZYL PHTHALATE	5	U		5	U		5	U				
CARBAZOLE	4	U		4	U		4	U				
	5	U		5	U		5	U				

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01			/ /		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99					
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
DI-N-OCTYL PHTHALATE	5	U		5	U		5	U				
DIBENZOFURAN	5	U		5	U		5	U				
DIETHYL PHTHALATE	5	U		5	U		5	U				
DIMETHYL PHTHALATE	5	U		5	U		5	U				
HEXACHLOROBENZENE	1	U		1	U		1	U				
HEXACHLOROBUTADIENE	5	U		5	U		5	U				
HEXACHLOROCYCLOPENTADIENE	5	U		5	U		5	U				
HEXACHLOROETHANE	5	U		5	U		5	U				
ISOPHORONE	5	U		5	U		5	U				
N-NITROSO-DI-N-PROPYLAMINE	4	U		4	U		4	U				
N-NITROSODIPHENYLAMINE	5	U		5	U		5	U				
NITROBENZENE	4	U		4	U		4	U				
PENTACHLOROPHENOL	1	U		1	U		1	U				
PHENOL	5	U		5	U		5	U				

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4303

SAMPLE NUMBER:	CEF-P43-SS-101-01			CEF-P43-SS-102-01			CEF-P43-SS-103-01			CEF-P43-SS-104-01		
SAMPLE DATE:	06/10/99			06/10/99			06/10/99			06/10/99		
LABORATORY ID:	F4303-3			F4303-4			F4303-7			F4303-6		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	98.7 %			98.3 %			98.8 %			97.6 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	38			150			34	U		160		
2-METHYLNAPHTHALENE	63			47			82			48		
ACENAPHTHENE	110			110			130			100		
ACENAPHTHYLENE	76	U		69	U		69	U		73	U	
ANTHRACENE	20			18			21			22		
BENZO(A)ANTHRACENE	49			39			56			65		
BENZO(A)PYRENE	36			42			43			54		
BENZO(B)FLUORANTHENE	50			53			55			65		
BENZO(G,H,I)PERYLENE	27			13			26			37		
BENZO(K)FLUORANTHENE	22			19			23			32		
CHRYSENE	110			180			140			230		
DIBENZO(A,H)ANTHRACENE	9.4	U		8.6	U		8.6	U		9.1	U	
FLUORANTHENE	120			95			120			150		
FLUORENE	7.6	U		6.9	U		6.8	U		7.4	U	
INDENO(1,2,3-CD)PYRENE	21			32			25			34		
NAPHTHALENE	37	U		49			34	U		200		
PHENANTHRENE	50			44			67			73		
PYRENE	86			79			86			100		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4303

SAMPLE NUMBER:	CEF-P43-SS-105-01			CEF-P43-SS-106-01			CEF-P43-SS-107-01			CEF-P43-SS-108-01		
SAMPLE DATE:	06/10/99			06/10/99			06/10/99			06/10/99		
LABORATORY ID:	F4303-5			F4303-8			F4303-9			F4303-1		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	98.3 %			96.7 %			91.3 %			99.6 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	50			36	U		40	U		390		
2-METHYLNAPHTHALENE	170			290			84			3400		
ACENAPHTHENE	350			640			160			5500		
ACENAPHTHYLENE	72	U		74	U		81	U		160		
ANTHRACENE	30			71			19			930		
BENZO(A)ANTHRACENE	93			230			63			1600		
BENZO(A)PYRENE	100			210			56			1300		
BENZO(B)FLUORANTHENE	120			190			66			1400		
BENZO(G,H,I)PERYLENE	56			110			39			700		
BENZO(K)FLUORANTHENE	61			110			33			780		
CHRYSENE	160			170			110			1300		
DIBENZO(A,H)ANTHRACENE	9.1			20			10	U		84		
FLUORANTHENE	260			530			170			4400		
FLUORENE	12			21			11			500		
INDENO(1,2,3-CD)PYRENE	60			95			35			710		
NAPHTHALENE	58			36	U		40	U		420		
PHENANTHRENE	170			300			92			3600		
PYRENE	210			420			110			3100		

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4303

SAMPLE NUMBER:	CEF-P43-SS-109-02			CEF-P43-SS-DU01								
SAMPLE DATE:	06/10/99			06/10/99			/ /			/ /		
LABORATORY ID:	F4303-2			F4303-10								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	97.8 %			97.2 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P43-SS-109-02								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	60	J	G	1200	J	G						
2-METHYLNAPHTHALENE	500	J	G	19000	J	G						
ACENAPHTHENE	990	J	G	27000	J	G						
ACENAPHTHYLENE	360	U		520	U							
ANTHRACENE	170	J	G	6500	J	G						
BENZO(A)ANTHRACENE	270	J	G	7300	J	G						
BENZO(A)PYRENE	230	J	G	5900	J	G						
BENZO(B)FLUORANTHENE	210	J	G	5500	J	G						
BENZO(G,H,I)PERYLENE	110	J	G	2300	J	G						
BENZO(K)FLUORANTHENE	120	J	G	3200	J	G						
CHRYSENE	210	J	G	6500	J	G						
DIBENZO(A,H)ANTHRACENE	23	J	G	65	U							
FLUORANTHENE	740	J	G	20000	J	G						
FLUORENE	83	J	G	2600	J	G						
INDENO(1,2,3-CD)PYRENE	95	J	G	2300	J	G						
NAPHTHALENE	78	J	G	1200	J	G						
PHENANTHRENE	570	J	G	16000	J	G						
PYRENE	520	J	G	14000	J	G						

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01			/ /		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99					
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	0.10	U		0.10	U		0.10	U				
4,4'-DDE	0.10	U		0.10	U		0.10	U				
4,4'-DDT	0.10	U		0.10	U		0.10	U				
ALDRIN	0.050	U		0.050	U		0.050	U				
ALPHA-BHC	0.050	U		0.050	U		0.050	U				
ALPHA-CHLORDANE	0.10	U		0.10	U		0.10	U				
AROCLOR-1016	0.50	U		0.50	U		0.50	U				
AROCLOR-1221	0.50	U		0.50	U		0.50	U				
AROCLOR-1232	0.50	U		0.50	U		0.50	U				
AROCLOR-1242	0.50	U		0.50	U		0.50	U				
AROCLOR-1248	0.50	U		0.50	U		0.50	U				
AROCLOR-1254	0.50	U		0.50	U		0.50	U				
AROCLOR-1260	0.50	U		0.50	U		0.50	U				
BETA-BHC	0.050	U		0.050	U		0.050	U				
DELTA-BHC	0.050	U		0.050	U		0.050	U				
DIELDRIN	0.050	U		0.050	U		0.050	U				
ENDOSULFAN I	0.050	U		0.050	U		0.050	U				
ENDOSULFAN II	0.10	U		0.10	U		0.10	U				
ENDOSULFAN SULFATE	0.10	U		0.10	U		0.10	U				
ENDRIN	0.10	U		0.10	U		0.10	U				
ENDRIN ALDEHYDE	0.10	U		0.10	U		0.10	U				
ENDRIN KETONE	0.10	U		0.10	U		0.10	U				
GAMMA-BHC (LINDANE)	0.050	U		0.050	U		0.050	U				
GAMMA-CHLORDANE	0.10	U		0.10	U		0.10	U				
HEPTACHLOR	0.050	U		0.050	U		0.050	U				
HEPTACHLOR EPOXIDE	0.050	U		0.050	U		0.050	U				
METHOXYCHLOR	0.20	U		0.20	U		0.20	U				
TOXAPHENE	2.5	U		2.5	U		2.5	U				

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-001			CEF-P48-SD-002			CEF-P48-SD-003			CEF-P48-SD-004		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-12			F4273-10			F4273-6			F4273-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	19.6 %			49.8 %			57.0 %			23.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	17	U		6.7	U		5.8	U		14	U	
4,4'-DDE	17	U		6.7	U		5.8	U		14	U	
4,4'-DDT	85	U		33	U		29	U		72	U	
ALDRIN	8.5	U		3.3	U		2.9	U		7.2	U	
ALPHA-BHC	8.5	U		3.3	U		2.9	U		7.2	U	
ALPHA-CHLORDANE	17	U		6.7	U		5.8	U		14	U	
AROCLOR-1016	170	U		67	U		58	U		140	U	
AROCLOR-1221	170	U		67	U		58	U		140	U	
AROCLOR-1232	170	U		67	U		58	U		140	U	
AROCLOR-1242	170	U		67	U		58	U		140	U	
AROCLOR-1248	170	U		67	U		58	U		140	U	
AROCLOR-1254	170	U		67	U		58	U		140	U	
AROCLOR-1260	170	U		67	U		58	U		140	U	
BETA-BHC	8.5	U		3.3	U		2.9	U		7.2	U	
DELTA-BHC	8.5	U		3.3	U		2.9	U		7.2	U	
DIELDRIN	8.5	U		3.3	U		2.9	U		7.2	U	
ENDOSULFAN I	8.5	U		3.3	U		2.9	U		7.2	U	
ENDOSULFAN II	17	U		6.7	U		5.8	U		14	U	
ENDOSULFAN SULFATE	17	U		6.7	U		5.8	U		14	U	
ENDRIN	17	U		6.7	U		5.8	U		14	U	
ENDRIN ALDEHYDE	17	U		6.7	U		5.8	U		14	U	
ENDRIN KETONE	17	U		6.7	U		5.8	U		14	U	
GAMMA-BHC (LINDANE)	8.5	U		3.3	U		2.9	U		7.2	U	
GAMMA-CHLORDANE	17	U		6.7	U		5.8	U		14	U	
HEPTACHLOR	8.5	U		3.3	U		2.9	U		7.2	U	
HEPTACHLOR EPOXIDE	8.5	U		3.3	U		2.9	U		7.2	U	
METHOXYCHLOR	170	U		67	U		58	U		140	U	
TOXAPHENE	850	U		330	U		290	U		720	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-005			CEF-P48-SD-DU01			/ /			/ /		
SAMPLE DATE:	06/07/99			06/07/99								
LABORATORY ID:	F4273-14			F4273-8								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	49.7 %			52.8 %			100.0 %			100.0 %		
UNITS:	UG/KG			UG/KG								
FIELD DUPLICATE OF:				CEF-P48-SD-002								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	6.7	U		6.3	U							
4,4'-DDE	6.7	U		6.3	U							
4,4'-DDT	34	U		32	U							
ALDRIN	3.4	U		3.2	U							
ALPHA-BHC	3.4	U		3.2	U							
ALPHA-CHLORDANE	6.7	U		6.3	U							
AROCLOR-1016	67	U		63	U							
AROCLOR-1221	67	U		63	U							
AROCLOR-1232	67	U		63	U							
AROCLOR-1242	67	U		63	U							
AROCLOR-1248	67	U		63	U							
AROCLOR-1254	67	U		63	U							
AROCLOR-1260	67	U		63	U							
BETA-BHC	3.4	U		3.2	U							
DELTA-BHC	3.4	U		3.2	U							
DIELDRIN	3.4	U		3.2	U							
ENDOSULFAN I	3.4	U		3.2	U							
ENDOSULFAN II	6.7	U		6.3	U							
ENDOSULFAN SULFATE	6.7	U		6.3	U							
ENDRIN	6.7	U		6.3	U							
ENDRIN ALDEHYDE	6.7	U		6.3	U							
ENDRIN KETONE	6.7	U		6.3	U							
GAMMA-BHC (LINDANE)	3.4	U		3.2	U							
GAMMA-CHLORDANE	6.7	U		6.3	U							
HEPTACHLOR	3.4	U		3.2	U							
HEPTACHLOR EPOXIDE	3.4	U		3.2	U							
METHOXYCHLOR	67	U		63	U							
TOXAPHENE	340	U		320	U							

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001866.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004587.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND [a]	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [a]	10	ug/l	
120-83-2	2,4-Dichlorophenol	ND [a]	4.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND [a]	10	ug/l	
51-28-5	2,4-Dinitrophenol	ND [a]	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [a]	25	ug/l	
95-48-7	2-Methylphenol	ND [a]	5.0	ug/l	
	3&4-Methylphenol	ND [a]	5.0	ug/l	
88-75-5	2-Nitrophenol	ND [a]	5.0	ug/l	
100-02-7	4-Nitrophenol	ND [a]	15	ug/l	
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
108-95-2	Phenol	ND [a]	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [a]	4.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [a]	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [a]	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND [a]	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND [a]	5.0	ug/l	
106-47-8	4-Chloroaniline	ND [a]	5.0	ug/l	
86-74-8	Carbazole	ND [a]	4.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [a]	5.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [a]	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [a]	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [a]	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [a]	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [a]	5.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [a]	7.5	ug/l	
132-64-9	Dibenzofuran	ND [a]	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND [a]	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND [a]	5.0	ug/l	
84-66-2	Diethyl phthalate	ND [a]	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND [a]	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [a]	5.0	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001866.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004587.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
87-68-3	Hexachlorobutadiene	ND [a]	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [a]	5.0	ug/l	
67-72-1	Hexachloroethane	ND [a]	5.0	ug/l	
78-59-1	Isophorone	ND [a]	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND [a]	5.0	ug/l	
91-57-6	2-Methylnaphthalene	ND [a]	5.0	ug/l	
88-74-4	2-Nitroaniline	ND [a]	5.0	ug/l	
99-09-2	3-Nitroaniline	ND [a]	5.0	ug/l	
100-01-6	4-Nitroaniline	ND [a]	5.0	ug/l	
98-95-3	Nitrobenzene	ND [a]	4.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [a]	4.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [a]	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [a]	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		53%	21-100%
4165-62-2	Phenol-d5		36%	10-94%
118-79-6	2,4,6-Tribromophenol		90%	10-123%
4165-60-0	Nitrobenzene-d5		105%	35-114%
321-60-8	2-Fluorobiphenyl		92%	43-116%
1718-51-0	Terphenyl-d14		107%	33-141%

(a) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001863.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004584.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND [a]	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [a]	10	ug/l	
120-83-2	2,4-Dichlorophenol	ND [a]	4.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND [a]	10	ug/l	
51-28-5	2,4-Dinitrophenol	ND [a]	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [a]	25	ug/l	
95-48-7	2-Methylphenol	ND [a]	5.0	ug/l	
	3&4-Methylphenol	ND [a]	5.0	ug/l	
88-75-5	2-Nitrophenol	ND [a]	5.0	ug/l	
100-02-7	4-Nitrophenol	ND [a]	15	ug/l	
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
108-95-2	Phenol	ND [a]	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [a]	4.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [a]	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [a]	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND [a]	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND [a]	5.0	ug/l	
106-47-8	4-Chloroaniline	ND [a]	5.0	ug/l	
86-74-8	Carbazole	ND [a]	4.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [a]	5.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [a]	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [a]	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [a]	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [a]	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [a]	5.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [a]	7.5	ug/l	
132-64-9	Dibenzofuran	ND [a]	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND [a]	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND [a]	5.0	ug/l	
84-66-2	Diethyl phthalate	ND [a]	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND [a]	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [a]	5.0	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

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ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001863.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004584.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
87-68-3	Hexachlorobutadiene	ND [a]	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [a]	5.0	ug/l	
67-72-1	Hexachloroethane	ND [a]	5.0	ug/l	
78-59-1	Isophorone	ND [a]	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND [a]	5.0	ug/l	
91-57-6	2-Methylnaphthalene	ND [a]	5.0	ug/l	
88-74-4	2-Nitroaniline	ND [a]	5.0	ug/l	
99-09-2	3-Nitroaniline	ND [a]	5.0	ug/l	
100-01-6	4-Nitroaniline	ND [a]	5.0	ug/l	
98-95-3	Nitrobenzene	ND [a]	4.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [a]	4.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [a]	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [a]	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		53%	21-100%
4165-62-2	Phenol-d5		36%	10-94%
118-79-6	2,4,6-Tribromophenol		90%	10-123%
4165-60-0	Nitrobenzene-d5		82%	35-114%
321-60-8	2-Fluorobiphenyl		77%	43-116%
1718-51-0	Terphenyl-d14		88%	33-141%

(a) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001867.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004588.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND [a]	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND [a]	10	ug/l	
120-83-2	2,4-Dichlorophenol	ND [a]	4.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND [a]	10	ug/l	
51-28-5	2,4-Dinitrophenol	ND [a]	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND [a]	25	ug/l	
95-48-7	2-Methylphenol	ND [a]	5.0	ug/l	
	3&4-Methylphenol	ND [a]	5.0	ug/l	
88-75-5	2-Nitrophenol	ND [a]	5.0	ug/l	
100-02-7	4-Nitrophenol	ND [a]	15	ug/l	
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
108-95-2	Phenol	ND [a]	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND [a]	4.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND [a]	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND [a]	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND [a]	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND [a]	5.0	ug/l	
106-47-8	4-Chloroaniline	ND [a]	5.0	ug/l	
86-74-8	Carbazole	ND [a]	4.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND [a]	5.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND [a]	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND [a]	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND [a]	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND [a]	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND [a]	5.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND [a]	7.5	ug/l	
132-64-9	Dibenzofuran	ND [a]	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND [a]	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND [a]	5.0	ug/l	
84-66-2	Diethyl phthalate	ND [a]	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND [a]	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND [a]	5.0	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8270C	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001867.D	1	06/14/99	ME	06/14/99	OP847	SL117
Run #2	H004588.D	1	06/15/99	ME	06/14/99	OP846	SH227

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
87-68-3	Hexachlorobutadiene	ND [a]	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND [a]	5.0	ug/l	
67-72-1	Hexachloroethane	ND [a]	5.0	ug/l	
78-59-1	Isophorone	ND [a]	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND [a]	5.0	ug/l	
91-57-6	2-Methylnaphthalene	ND [a]	5.0	ug/l	
88-74-4	2-Nitroaniline	ND [a]	5.0	ug/l	
99-09-2	3-Nitroaniline	ND [a]	5.0	ug/l	
100-01-6	4-Nitroaniline	ND [a]	5.0	ug/l	
98-95-3	Nitrobenzene	ND [a]	4.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND [a]	4.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND [a]	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND [a]	5.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol		48%	21-100%
4165-62-2	Phenol-d5		32%	10-94%
118-79-6	2,4,6-Tribromophenol		88%	10-123%
4165-60-0	Nitrobenzene-d5		98%	35-114%
321-60-8	2-Fluorobiphenyl		90%	43-116%
1718-51-0	Terphenyl-d14		104%	33-141%

(a) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	19.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001969.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	850	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	1700	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	760	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	1700	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	4200	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	1700	ug/kg	
95-48-7	2-Methylphenol	ND	850	ug/kg	
	3&4-Methylphenol	ND	850	ug/kg	
88-75-5	2-Nitrophenol	ND	850	ug/kg	
100-02-7	4-Nitrophenol	ND	4200	ug/kg	
87-86-5	Pentachlorophenol	ND	4200	ug/kg	
108-95-2	Phenol	ND	850	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	850	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	850	ug/kg	
83-32-9	Acenaphthene	ND	850	ug/kg	
208-96-8	Acenaphthylene	ND	850	ug/kg	
120-12-7	Anthracene	ND	850	ug/kg	
56-55-3	Benzo(a)anthracene	ND	850	ug/kg	
50-32-8	Benzo(a)pyrene	ND	420	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	850	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	850	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	850	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	850	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	850	ug/kg	
91-58-7	2-Chloronaphthalene	ND	850	ug/kg	
106-47-8	4-Chloroaniline	ND	850	ug/kg	
86-74-8	Carbazole	ND	850	ug/kg	
218-01-9	Chrysene	ND	850	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	850	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	850	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	850	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	850	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	850	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	850	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	850	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	850	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	19.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001969.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	850	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	1700	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	420	ug/kg	
132-64-9	Dibenzofuran	ND	850	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	850	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	850	ug/kg	
84-66-2	Diethyl phthalate	ND	850	ug/kg	
131-11-3	Dimethyl phthalate	ND	850	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	850	ug/kg	
206-44-0	Fluoranthene	ND	850	ug/kg	
86-73-7	Fluorene	ND	850	ug/kg	
118-74-1	Hexachlorobenzene	ND	850	ug/kg	
87-68-3	Hexachlorobutadiene	ND	850	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	850	ug/kg	
67-72-1	Hexachloroethane	ND	850	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	850	ug/kg	
78-59-1	Isophorone	ND	850	ug/kg	
90-12-0	1-Methylnaphthalene	ND	850	ug/kg	
91-57-6	2-Methylnaphthalene	ND	850	ug/kg	
88-74-4	2-Nitroaniline	ND	850	ug/kg	
99-09-2	3-Nitroaniline	ND	850	ug/kg	
100-01-6	4-Nitroaniline	ND	850	ug/kg	
91-20-3	Naphthalene	ND	850	ug/kg	
98-95-3	Nitrobenzene	ND	850	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	310	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	850	ug/kg	
85-01-8	Phenanthrene	ND	850	ug/kg	
129-00-0	Pyrene	ND	850	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	850	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	72%		25-121%
4165-62-2	Phenol-d5	79%		24-113%
118-79-6	2,4,6-Tribromophenol	104%		19-122%
4165-60-0	Nitrobenzene-d5	77%		23-120%

00120

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	19.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001969.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	82%		30-115%
1718-51-0	Terphenyl-d14	90%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-002		
Lab Sample ID:	F4273-10	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001948.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	330	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	670	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	300	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	670	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1700	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	670	ug/kg	
95-48-7	2-Methylphenol	ND	330	ug/kg	
	3&4-Methylphenol	ND	330	ug/kg	
88-75-5	2-Nitrophenol	ND	330	ug/kg	
100-02-7	4-Nitrophenol	ND	1700	ug/kg	
87-86-5	Pentachlorophenol	ND	1700	ug/kg	
108-95-2	Phenol	ND	330	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	330	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	330	ug/kg	
83-32-9	Acenaphthene	ND	330	ug/kg	
208-96-8	Acenaphthylene	ND	330	ug/kg	
120-12-7	Anthracene	ND	330	ug/kg	
56-55-3	Benzo(a)anthracene	ND	330	ug/kg	
50-32-8	Benzo(a)pyrene	ND	170	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	330	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	330	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	330	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	330	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	330	ug/kg	
91-58-7	2-Chloronaphthalene	ND	330	ug/kg	
106-47-8	4-Chloroaniline	ND	330	ug/kg	
86-74-8	Carbazole	ND	330	ug/kg	
218-01-9	Chrysene	ND	330	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	330	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	330	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	330	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	330	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	330	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	330	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	330	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	330	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-002		
Lab Sample ID:	F4273-10	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001948.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	330	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	670	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	170	ug/kg	
132-64-9	Dibenzofuran	ND	330	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	330	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	330	ug/kg	
84-66-2	Diethyl phthalate	ND	330	ug/kg	
131-11-3	Dimethyl phthalate	ND	330	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	330	ug/kg	
206-44-0	Fluoranthene	ND	330	ug/kg	
86-73-7	Fluorene	ND	330	ug/kg	
118-74-1	Hexachlorobenzene	ND	330	ug/kg	
87-68-3	Hexachlorobutadiene	ND	330	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	330	ug/kg	
67-72-1	Hexachloroethane	ND	330	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	
78-59-1	Isophorone	ND	330	ug/kg	
90-12-0	1-Methylnaphthalene	ND	330	ug/kg	
91-57-6	2-Methylnaphthalene	ND	330	ug/kg	
88-74-4	2-Nitroaniline	ND	330	ug/kg	
99-09-2	3-Nitroaniline	ND	330	ug/kg	
100-01-6	4-Nitroaniline	ND	330	ug/kg	
91-20-3	Naphthalene	ND	330	ug/kg	
98-95-3	Nitrobenzene	ND	330	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	120	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	330	ug/kg	
85-01-8	Phenanthrene	ND	330	ug/kg	
129-00-0	Pyrene	ND	330	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	330	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	74%		25-121%
4165-62-2	Phenol-d5	83%		24-113%
118-79-6	2,4,6-Tribromophenol	97%		19-122%
4165-60-0	Nitrobenzene-d5	76%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-002		
Lab Sample ID:	F4273-10	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001948.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	80%		30-115%
1718-51-0	Terphenyl-d14	120%		18-137%

00116

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	57.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001944.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	290	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	580	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	260	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	580	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	580	ug/kg	
95-48-7	2-Methylphenol	ND	290	ug/kg	
	3&4-Methylphenol	ND	290	ug/kg	
88-75-5	2-Nitrophenol	ND	290	ug/kg	
100-02-7	4-Nitrophenol	ND	1500	ug/kg	
87-86-5	Pentachlorophenol	ND	1500	ug/kg	
108-95-2	Phenol	ND	290	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	290	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	290	ug/kg	
83-32-9	Acenaphthene	ND	290	ug/kg	
208-96-8	Acenaphthylene	ND	290	ug/kg	
120-12-7	Anthracene	ND	290	ug/kg	
56-55-3	Benzo(a)anthracene	ND	290	ug/kg	
50-32-8	Benzo(a)pyrene	ND	150	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	290	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	290	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	290	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	290	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	290	ug/kg	
91-58-7	2-Chloronaphthalene	ND	290	ug/kg	
106-47-8	4-Chloroaniline	ND	290	ug/kg	
86-74-8	Carbazole	ND	290	ug/kg	
218-01-9	Chrysene	ND	290	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	290	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	290	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	290	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	290	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	290	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	290	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	290	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	290	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	57.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001944.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	290	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	580	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	150	ug/kg	
132-64-9	Dibenzofuran	ND	290	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	290	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	290	ug/kg	
84-66-2	Diethyl phthalate	ND	290	ug/kg	
131-11-3	Dimethyl phthalate	ND	290	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	290	ug/kg	
206-44-0	Fluoranthene	ND	290	ug/kg	
86-73-7	Fluorene	ND	290	ug/kg	
118-74-1	Hexachlorobenzene	ND	290	ug/kg	
87-68-3	Hexachlorobutadiene	ND	290	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	290	ug/kg	
67-72-1	Hexachloroethane	ND	290	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	290	ug/kg	
78-59-1	Isophorone	ND	290	ug/kg	
90-12-0	1-Methylnaphthalene	ND	290	ug/kg	
91-57-6	2-Methylnaphthalene	ND	290	ug/kg	
88-74-4	2-Nitroaniline	ND	290	ug/kg	
99-09-2	3-Nitroaniline	ND	290	ug/kg	
100-01-6	4-Nitroaniline	ND	290	ug/kg	
91-20-3	Naphthalene	ND	290	ug/kg	
98-95-3	Nitrobenzene	ND	290	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	100	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	290	ug/kg	
85-01-8	Phenanthrene	ND	290	ug/kg	
129-00-0	Pyrene	ND	290	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	290	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	72%		25-121%
4165-62-2	Phenol-d5	82%		24-113%
118-79-6	2,4,6-Tribromophenol	99%		19-122%
4165-60-0	Nitrobenzene-d5	74%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	57.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001944.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	81%		30-115%
1718-51-0	Terphenyl-d14	107%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	23.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001943.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	720	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	1400	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	650	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	1400	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	3600	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	1400	ug/kg	
95-48-7	2-Methylphenol	ND	720	ug/kg	
	3&4-Methylphenol	ND	720	ug/kg	
88-75-5	2-Nitrophenol	ND	720	ug/kg	
100-02-7	4-Nitrophenol	ND	3600	ug/kg	
87-86-5	Pentachlorophenol	ND	3600	ug/kg	
108-95-2	Phenol	ND	720	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	720	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	720	ug/kg	
83-32-9	Acenaphthene	ND	720	ug/kg	
208-96-8	Acenaphthylene	ND	720	ug/kg	
120-12-7	Anthracene	ND	720	ug/kg	
56-55-3	Benzo(a)anthracene	ND	720	ug/kg	
50-32-8	Benzo(a)pyrene	ND	360	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	720	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	720	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	720	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	720	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	720	ug/kg	
91-58-7	2-Chloronaphthalene	ND	720	ug/kg	
106-47-8	4-Chloroaniline	ND	720	ug/kg	
86-74-8	Carbazole	ND	720	ug/kg	
218-01-9	Chrysene	ND	720	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	720	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	720	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	720	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	720	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	720	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	720	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	720	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	720	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	23.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001943.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	720	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	1400	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	360	ug/kg	
132-64-9	Dibenzofuran	ND	720	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	720	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	720	ug/kg	
84-66-2	Diethyl phthalate	ND	720	ug/kg	
131-11-3	Dimethyl phthalate	ND	720	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	720	ug/kg	
206-44-0	Fluoranthene	ND	720	ug/kg	
86-73-7	Fluorene	ND	720	ug/kg	
118-74-1	Hexachlorobenzene	ND	720	ug/kg	
87-68-3	Hexachlorobutadiene	ND	720	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	720	ug/kg	
67-72-1	Hexachloroethane	ND	720	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	720	ug/kg	
78-59-1	Isophorone	ND	720	ug/kg	
90-12-0	1-Methylnaphthalene	ND	720	ug/kg	
91-57-6	2-Methylnaphthalene	ND	720	ug/kg	
88-74-4	2-Nitroaniline	ND	720	ug/kg	
99-09-2	3-Nitroaniline	ND	720	ug/kg	
100-01-6	4-Nitroaniline	ND	720	ug/kg	
91-20-3	Naphthalene	ND	720	ug/kg	
98-95-3	Nitrobenzene	ND	720	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	260	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	720	ug/kg	
85-01-8	Phenanthrene	ND	720	ug/kg	
129-00-0	Pyrene	ND	720	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	69%		25-121%
4165-62-2	Phenol-d5	78%		24-113%
118-79-6	2,4,6-Tribromophenol	95%		19-122%
4165-60-0	Nitrobenzene-d5	72%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	23.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001943.D	1	06/18/99	ME	06/17/99	OP853	SL121
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	82%		30-115%
1718-51-0	Terphenyl-d14	95%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001970.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	340	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	670	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	300	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	670	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1700	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	670	ug/kg	
95-48-7	2-Methylphenol	ND	340	ug/kg	
	3&4-Methylphenol	ND	340	ug/kg	
88-75-5	2-Nitrophenol	ND	340	ug/kg	
100-02-7	4-Nitrophenol	ND	1700	ug/kg	
87-86-5	Pentachlorophenol	ND	1700	ug/kg	
108-95-2	Phenol	ND	340	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	340	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	340	ug/kg	
83-32-9	Acenaphthene	ND	340	ug/kg	
208-96-8	Acenaphthylene	ND	340	ug/kg	
120-12-7	Anthracene	ND	340	ug/kg	
56-55-3	Benzo(a)anthracene	ND	340	ug/kg	
50-32-8	Benzo(a)pyrene	ND	170	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	340	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	340	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	340	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	340	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	340	ug/kg	
91-58-7	2-Chloronaphthalene	ND	340	ug/kg	
106-47-8	4-Chloroaniline	ND	340	ug/kg	
86-74-8	Carbazole	ND	340	ug/kg	
218-01-9	Chrysene	ND	340	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	340	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	340	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	340	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	340	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	340	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	340	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	340	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	340	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001970.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	340	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	670	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	170	ug/kg	
132-64-9	Dibenzofuran	ND	340	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	340	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	340	ug/kg	
84-66-2	Diethyl phthalate	ND	340	ug/kg	
131-11-3	Dimethyl phthalate	ND	340	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	340	ug/kg	
206-44-0	Fluoranthene	ND	340	ug/kg	
86-73-7	Fluorene	ND	340	ug/kg	
118-74-1	Hexachlorobenzene	ND	340	ug/kg	
87-68-3	Hexachlorobutadiene	ND	340	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	340	ug/kg	
67-72-1	Hexachloroethane	ND	340	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	340	ug/kg	
78-59-1	Isophorone	ND	340	ug/kg	
90-12-0	1-Methylnaphthalene	ND	340	ug/kg	
91-57-6	2-Methylnaphthalene	ND	340	ug/kg	
88-74-4	2-Nitroaniline	ND	340	ug/kg	
99-09-2	3-Nitroaniline	ND	340	ug/kg	
100-01-6	4-Nitroaniline	ND	340	ug/kg	
91-20-3	Naphthalene	ND	340	ug/kg	
98-95-3	Nitrobenzene	ND	340	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	120	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	340	ug/kg	
85-01-8	Phenanthrene	ND	340	ug/kg	
129-00-0	Pyrene	ND	340	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	340	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	63%		25-121%
4165-62-2	Phenol-d5	72%		24-113%
118-79-6	2,4,6-Tribromophenol	95%		19-122%
4165-60-0	Nitrobenzene-d5	69%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	49.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001970.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	82%		30-115%
1718-51-0	Terphenyl-d14	84%		18-137%

00126

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	52.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001966.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	320	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	630	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	280	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	630	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1600	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	630	ug/kg	
95-48-7	2-Methylphenol	ND	320	ug/kg	
	3&4-Methylphenol	ND	320	ug/kg	
88-75-5	2-Nitrophenol	ND	320	ug/kg	
100-02-7	4-Nitrophenol	ND	1600	ug/kg	
87-86-5	Pentachlorophenol	ND	1600	ug/kg	
108-95-2	Phenol	ND	320	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	320	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	320	ug/kg	
83-32-9	Acenaphthene	ND	320	ug/kg	
208-96-8	Acenaphthylene	ND	320	ug/kg	
120-12-7	Anthracene	ND	320	ug/kg	
56-55-3	Benzo(a)anthracene	ND	320	ug/kg	
50-32-8	Benzo(a)pyrene	ND	160	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	320	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	320	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	320	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	320	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	320	ug/kg	
91-58-7	2-Chloronaphthalene	ND	320	ug/kg	
106-47-8	4-Chloroaniline	ND	320	ug/kg	
86-74-8	Carbazole	ND	320	ug/kg	
218-01-9	Chrysene	ND	320	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	320	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	320	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	320	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	320	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	320	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	320	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	320	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	320	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	52.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001966.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	320	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	630	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	160	ug/kg	
132-64-9	Dibenzofuran	ND	320	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	320	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	320	ug/kg	
84-66-2	Diethyl phthalate	ND	320	ug/kg	
131-11-3	Dimethyl phthalate	ND	320	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	320	ug/kg	
206-44-0	Fluoranthene	ND	320	ug/kg	
86-73-7	Fluorene	ND	320	ug/kg	
118-74-1	Hexachlorobenzene	ND	320	ug/kg	
87-68-3	Hexachlorobutadiene	ND	320	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	320	ug/kg	
67-72-1	Hexachloroethane	ND	320	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	320	ug/kg	
78-59-1	Isophorone	ND	320	ug/kg	
90-12-0	1-Methylnaphthalene	ND	320	ug/kg	
91-57-6	2-Methylnaphthalene	ND	320	ug/kg	
88-74-4	2-Nitroaniline	ND	320	ug/kg	
99-09-2	3-Nitroaniline	ND	320	ug/kg	
100-01-6	4-Nitroaniline	ND	320	ug/kg	
91-20-3	Naphthalene	ND	320	ug/kg	
98-95-3	Nitrobenzene	ND	320	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	110	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	320	ug/kg	
85-01-8	Phenanthrene	ND	320	ug/kg	
129-00-0	Pyrene	ND	320	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	320	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	77%		25-121%
4165-62-2	Phenol-d5	81%		24-113%
118-79-6	2,4,6-Tribromophenol	105%		19-122%
4165-60-0	Nitrobenzene-d5	83%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8270C	**Percent Solids:**	52.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001966.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	88%		30-115%
1718-51-0	Terphenyl-d14	98%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

00111

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8081A	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03828.D	1	06/12/99	SKW	06/11/99	OP844	GMN160
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	84%		30-160%
2051-24-3	Decachlorobiphenyl	85%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8081A	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03825.D	1	06/12/99	SKW	06/11/99	OP844	GMN160
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	75%		30-160%
2051-24-3	Decachlorobiphenyl	74%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 3510C/8081A	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03829.D	1	06/12/99	SKW	06/11/99	OP844	GMN160
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	73%		30-160%
2051-24-3	Decachlorobiphenyl	71%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	19.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03978.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04033.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	8.5	ug/kg	
319-84-6	alpha-BHC	ND	8.5	ug/kg	
319-85-7	beta-BHC	ND	8.5	ug/kg	
319-86-8	delta-BHC	ND	8.5	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	8.5	ug/kg	
5103-71-9	alpha-Chlordane	ND	17	ug/kg	
5103-74-2	gamma-Chlordane	ND	17	ug/kg	
60-57-1	Dieldrin	ND	8.5	ug/kg	
72-54-8	4,4'-DDD	ND	17	ug/kg	
72-55-9	4,4'-DDE	ND	17	ug/kg	
50-29-3	4,4'-DDT	ND [b]	85	ug/kg	
72-20-8	Endrin	ND	17	ug/kg	
1031-07-8	Endosulfan sulfate	ND	17	ug/kg	
7421-93-4	Endrin aldehyde	ND	17	ug/kg	
53494-70-5	Endrin ketone	ND	17	ug/kg	
959-98-8	Endosulfan-I	ND	8.5	ug/kg	
33213-65-9	Endosulfan-II	ND	17	ug/kg	
76-44-8	Heptachlor	ND	8.5	ug/kg	
1024-57-3	Heptachlor epoxide	ND	8.5	ug/kg	
72-43-5	Methoxychlor	ND [b]	170	ug/kg	
8001-35-2	Toxaphene	ND	850	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	74%	87%	40-150%
2051-24-3	Decachlorobiphenyl	80%	71%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.
(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-002		
Lab Sample ID:	F4273-10	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03977.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04032.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	3.3	ug/kg	
319-84-6	alpha-BHC	ND	3.3	ug/kg	
319-85-7	beta-BHC	ND	3.3	ug/kg	
319-86-8	delta-BHC	ND	3.3	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	3.3	ug/kg	
5103-71-9	alpha-Chlordane	ND	6.7	ug/kg	
5103-74-2	gamma-Chlordane	ND	6.7	ug/kg	
60-57-1	Dieldrin	ND	3.3	ug/kg	
72-54-8	4,4'-DDD	ND	6.7	ug/kg	
72-55-9	4,4'-DDE	ND	6.7	ug/kg	
50-29-3	4,4'-DDT	ND [b]	33	ug/kg	
72-20-8	Endrin	ND	6.7	ug/kg	
1031-07-8	Endosulfan sulfate	ND	6.7	ug/kg	
7421-93-4	Endrin aldehyde	ND	6.7	ug/kg	
53494-70-5	Endrin ketone	ND	6.7	ug/kg	
959-98-8	Endosulfan-I	ND	3.3	ug/kg	
33213-65-9	Endosulfan-II	ND	6.7	ug/kg	
76-44-8	Heptachlor	ND	3.3	ug/kg	
1024-57-3	Heptachlor epoxide	ND	3.3	ug/kg	
72-43-5	Methoxychlor	ND [b]	67	ug/kg	
8001-35-2	Toxaphene	ND	330	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	79%	93%	40-150%
2051-24-3	Decachlorobiphenyl	84%	69%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.

(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	57.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03973.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04030.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	2.9	ug/kg	
319-84-6	alpha-BHC	ND	2.9	ug/kg	
319-85-7	beta-BHC	ND	2.9	ug/kg	
319-86-8	delta-BHC	ND	2.9	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	2.9	ug/kg	
5103-71-9	alpha-Chlordane	ND	5.8	ug/kg	
5103-74-2	gamma-Chlordane	ND	5.8	ug/kg	
60-57-1	Dieldrin	ND	2.9	ug/kg	
72-54-8	4,4'-DDD	ND	5.8	ug/kg	
72-55-9	4,4'-DDE	ND	5.8	ug/kg	
50-29-3	4,4'-DDT	ND [b]	29	ug/kg	
72-20-8	Endrin	ND	5.8	ug/kg	
1031-07-8	Endosulfan sulfate	ND	5.8	ug/kg	
7421-93-4	Endrin aldehyde	ND	5.8	ug/kg	
53494-70-5	Endrin ketone	ND	5.8	ug/kg	
959-98-8	Endosulfan-I	ND	2.9	ug/kg	
33213-65-9	Endosulfan-II	ND	5.8	ug/kg	
76-44-8	Heptachlor	ND	2.9	ug/kg	
1024-57-3	Heptachlor epoxide	ND	2.9	ug/kg	
72-43-5	Methoxychlor	ND [b]	58	ug/kg	
8001-35-2	Toxaphene	ND	290	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	77%	87%	40-150%
2051-24-3	Decachlorobiphenyl	86%	62%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.
(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	23.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03972.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04029.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	7.2	ug/kg	
319-84-6	alpha-BHC	ND	7.2	ug/kg	
319-85-7	beta-BHC	ND	7.2	ug/kg	
319-86-8	delta-BHC	ND	7.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	7.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	14	ug/kg	
5103-74-2	gamma-Chlordane	ND	14	ug/kg	
60-57-1	Dieldrin	ND	7.2	ug/kg	
72-54-8	4,4'-DDD	ND	14	ug/kg	
72-55-9	4,4'-DDE	ND	14	ug/kg	
50-29-3	4,4'-DDT	ND [b]	72	ug/kg	
72-20-8	Endrin	ND	14	ug/kg	
1031-07-8	Endosulfan sulfate	ND	14	ug/kg	
7421-93-4	Endrin aldehyde	ND	14	ug/kg	
53494-70-5	Endrin ketone	ND	14	ug/kg	
959-98-8	Endosulfan-I	ND	7.2	ug/kg	
33213-65-9	Endosulfan-II	ND	14	ug/kg	
76-44-8	Heptachlor	ND	7.2	ug/kg	
1024-57-3	Heptachlor epoxide	ND	7.2	ug/kg	
72-43-5	Methoxychlor	ND [b]	140	ug/kg	
8001-35-2	Toxaphene	ND	720	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	83%	92%	40-150%
2051-24-3	Decachlorobiphenyl	111%	60%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.
(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	49.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03979.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04034.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	3.4	ug/kg	
319-84-6	alpha-BHC	ND	3.4	ug/kg	
319-85-7	beta-BHC	ND	3.4	ug/kg	
319-86-8	delta-BHC	ND	3.4	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	3.4	ug/kg	
5103-71-9	alpha-Chlordane	ND	6.7	ug/kg	
5103-74-2	gamma-Chlordane	ND	6.7	ug/kg	
60-57-1	Dieldrin	ND	3.4	ug/kg	
72-54-8	4,4'-DDD	ND	6.7	ug/kg	
72-55-9	4,4'-DDE	ND	6.7	ug/kg	
50-29-3	4,4'-DDT	ND [b]	34	ug/kg	
72-20-8	Endrin	ND	6.7	ug/kg	
1031-07-8	Endosulfan sulfate	ND	6.7	ug/kg	
7421-93-4	Endrin aldehyde	ND	6.7	ug/kg	
53494-70-5	Endrin ketone	ND	6.7	ug/kg	
959-98-8	Endosulfan-I	ND	3.4	ug/kg	
33213-65-9	Endosulfan-II	ND	6.7	ug/kg	
76-44-8	Heptachlor	ND	3.4	ug/kg	
1024-57-3	Heptachlor epoxide	ND	3.4	ug/kg	
72-43-5	Methoxychlor	ND [b]	67	ug/kg	
8001-35-2	Toxaphene	ND	340	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	67%	79%	40-150%
2051-24-3	Decachlorobiphenyl	75%	59%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.
(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 3550B/8081A	**Percent Solids:**	52.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	MN03974.D	1	06/18/99	SKW	06/16/99	OP852	GMN165
Run #2 [a]	MN04031.D	5	06/21/99	SKW	06/16/99	OP852	GMN166

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	3.2	ug/kg	
319-84-6	alpha-BHC	ND	3.2	ug/kg	
319-85-7	beta-BHC	ND	3.2	ug/kg	
319-86-8	delta-BHC	ND	3.2	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	3.2	ug/kg	
5103-71-9	alpha-Chlordane	ND	6.3	ug/kg	
5103-74-2	gamma-Chlordane	ND	6.3	ug/kg	
60-57-1	Dieldrin	ND	3.2	ug/kg	
72-54-8	4,4'-DDD	ND	6.3	ug/kg	
72-55-9	4,4'-DDE	ND	6.3	ug/kg	
50-29-3	4,4'-DDT	ND [b]	32	ug/kg	
72-20-8	Endrin	ND	6.3	ug/kg	
1031-07-8	Endosulfan sulfate	ND	6.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	6.3	ug/kg	
53494-70-5	Endrin ketone	ND	6.3	ug/kg	
959-98-8	Endosulfan-I	ND	3.2	ug/kg	
33213-65-9	Endosulfan-II	ND	6.3	ug/kg	
76-44-8	Heptachlor	ND	3.2	ug/kg	
1024-57-3	Heptachlor epoxide	ND	3.2	ug/kg	
72-43-5	Methoxychlor	ND [b]	63	ug/kg	
8001-35-2	Toxaphene	ND	320	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	81%	90%	40-150%
2051-24-3	Decachlorobiphenyl	88%	56%	30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.
(b) Result is from Run# 2

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09149.D	1	06/14/99	SKW	06/11/99	OP843	GAB345
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	108%		30-160%
2051-24-3	Decachlorobiphenyl	117%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09148.D	1	06/14/99	SKW	06/11/99	OP843	GAB345
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	94%		30-160%
2051-24-3	Decachlorobiphenyl	99%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09150.D	1	06/14/99	SKW	06/11/99	OP843	GAB345
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	90%		30-160%
2051-24-3	Decachlorobiphenyl	90%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	19.6
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09212.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	170	ug/kg	
11104-28-2	Aroclor 1221	ND	170	ug/kg	
11141-16-5	Aroclor 1232	ND	170	ug/kg	
53469-21-9	Aroclor 1242	ND	170	ug/kg	
12672-29-6	Aroclor 1248	ND	170	ug/kg	
11097-69-1	Aroclor 1254	ND	170	ug/kg	
11096-82-5	Aroclor 1260	ND	170	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	107%		40-150%
2051-24-3	Decachlorobiphenyl	108%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-002		
Lab Sample ID:	F4273-10	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09211.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	67	ug/kg	
11104-28-2	Aroclor 1221	ND	67	ug/kg	
11141-16-5	Aroclor 1232	ND	67	ug/kg	
53469-21-9	Aroclor 1242	ND	67	ug/kg	
12672-29-6	Aroclor 1248	ND	67	ug/kg	
11097-69-1	Aroclor 1254	ND	67	ug/kg	
11096-82-5	Aroclor 1260	ND	67	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	110%		40-150%
2051-24-3	Decachlorobiphenyl	108%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	57.0
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09209.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	58	ug/kg	
11104-28-2	Aroclor 1221	ND	58	ug/kg	
11141-16-5	Aroclor 1232	ND	58	ug/kg	
53469-21-9	Aroclor 1242	ND	58	ug/kg	
12672-29-6	Aroclor 1248	ND	58	ug/kg	
11097-69-1	Aroclor 1254	ND	58	ug/kg	
11096-82-5	Aroclor 1260	ND	58	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	100%		40-150%
2051-24-3	Decachlorobiphenyl	101%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	23.2
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09208.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	140	ug/kg	
11104-28-2	Aroclor 1221	ND	140	ug/kg	
11141-16-5	Aroclor 1232	ND	140	ug/kg	
53469-21-9	Aroclor 1242	ND	140	ug/kg	
12672-29-6	Aroclor 1248	ND	140	ug/kg	
11097-69-1	Aroclor 1254	ND	140	ug/kg	
11096-82-5	Aroclor 1260	ND	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	103%		40-150%
2051-24-3	Decachlorobiphenyl	110%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	49.7
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09213.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	67	ug/kg	
11104-28-2	Aroclor 1221	ND	67	ug/kg	
11141-16-5	Aroclor 1232	ND	67	ug/kg	
53469-21-9	Aroclor 1242	ND	67	ug/kg	
12672-29-6	Aroclor 1248	ND	67	ug/kg	
11097-69-1	Aroclor 1254	ND	67	ug/kg	
11096-82-5	Aroclor 1260	ND	67	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	105%		40-150%
2051-24-3	Decachlorobiphenyl	99%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
Method:	SW846 8082	**Percent Solids:**	52.8
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09210.D	1	06/16/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	63	ug/kg	
11104-28-2	Aroclor 1221	ND	63	ug/kg	
11141-16-5	Aroclor 1232	ND	63	ug/kg	
53469-21-9	Aroclor 1242	ND	63	ug/kg	
12672-29-6	Aroclor 1248	ND	63	ug/kg	
11097-69-1	Aroclor 1254	ND	63	ug/kg	
11096-82-5	Aroclor 1260	ND	63	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	107%		40-150%
2051-24-3	Decachlorobiphenyl	108%		30-160%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

07-9-085

APPENDIX C
SUPPORT DOCUMENTATION

F4273
HOLDING TIME
07/07/99

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8

Units	Nsample								EXTR_DATE	ANAL_DATE	ANAL_DATE
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
MG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
MG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11

									EXTR_DATE	ANAL_DATE	ANAL_DATE
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
%	CEF-P48-SD-001	F4273-12	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-002	F4273-10	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-003	F4273-6	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-004	F4273-5	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21

Units	Reanalysis								EXTR_DATE	ANAL_DATE	ANAL_DATE
%	CEF-P48-SD-005	F4273-14	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	TOC	06/07/99	06/17/99	06/17/99	10	0	10
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	TOC	06/07/99	06/17/99	06/17/99	10	0	10
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4

ACCUTEST

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
Tetra Tech NVS
ADDRESS: 900 Trail Ridge Road
CITY: Aiken STATE: SC ZIP: 29803
SEND REPORT TO: Rob Simcick
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL - PSC 48
LOCATION: NAS Cecil Field
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD = SEDIMENT
SW - surface water

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals, nitrate, nitrite	SVOCs, Pest, PCBs, nitrite	TOC, metals, grainsize, AGT, PCB, SVOC	PORE WATER, ammonia, sulfide, nitrate, nitrite							LAB USE ONLY
F4273	[redacted]	6/7/99	1056	MW	SW	4			1		3	1	3					MS/MSD				
-2	[redacted]	6/7/99	1625	MW	SW	4			1		3	1	3									
-3	[redacted]	6/7/99	000	MW	SW	4			1		3	1	3									←
-4	CEF - P48 - PW - 004		1515	MW	SD	1					1				1							NH2
-5	[redacted]		1515	MW	SD	1					1			1								
-6	[redacted]		1436	MW	SD	1					1			1								
-7	CEF - P48 - PW - 003		1436	MW	SD	1					1				1							
-8	[redacted]		1129	MW	SD	1					1			1				MS/MSD				
-8	CEF - P48 - SD - MS/MSD01		1129	MW	SD	1					1			1								
-9	CEF - P48 - PW - 002		1129	MW	SD	1					1				1							oil
-10	[redacted]		1129	MW	SD	1					1			1								

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

F4273

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1800	1. [illegible] 1345	2.		2.
RELINQUISHED BY: 3.	DATE TIME:	RECEIVED BY: 3.	RELINQUISHED BY: 4.	DATE TIME:	RECEIVED BY: 4.
RELINQUISHED BY: 5.	DATE TIME:	RECEIVED BY: 5.	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C

ACCUTEST

CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-[illegible]707

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
Tetra Tech NUS
ADDRESS: 900 Trail Ridge Road
CITY: Aiken STATE: SC ZIP: 29803
SEND REPORT TO:
PHONE #: ROB SIMCIK 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL PSC 48
LOCATION: NAS CECIL FIELD
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD - SEDIMENT

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals	SVOCs, PEST, PCBs, nitrate, nitrite		TOC, grain size, metals, SVOCs, PEST, PCBs		PORE WATER, ammonia, sulfide, nitrate, nitrite					LAB USE ONLY
F4/228-11	CEF-P48-PW-DU01	6/7/99	1129	MW	SD	1					1						1			MS/MSD		
-12	CEF-P48-P[redacted]D01		1129	MW	SD	1					1						1					
-13	[redacted]-SD-001		1257	MW	SD	1					1				1							
-13	CEF-P48-PW-001		1257	MW	SD ~~SW~~	1					1						1					*H2
-1	CEF-P48-SW-MS/MSD 01		1056	MW	SW	8			2		6	2	6									
-14	[redacted]		1705		SD	1					1				1							
-15	CEF-P48-PW-005		1705		SD	1					1						1					
														MW								

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1600	1. [signature] 1345 6/8/99	2.		2.
RELINQUISHED BY: 3.	DATE TIME:	RECEIVED BY: 3.	RELINQUISHED BY: 4.	DATE TIME:	RECEIVED BY: 4.
RELINQUISHED BY: 5.	DATE TIME:	RECEIVED BY: 5.	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 3510C/8270C **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
F4273-1	H004584.D	53.0	36.0	90.0	82.0	77.0	88.0
F4273-1	L001863.D						
F4273-2	H004587.D	53.0	36.0	90.0	105.0	92.0	107.0
F4273-2	L001866.D						
F4273-3	H004588.D	48.0	32.0	88.0	98.0	90.0	104.0
F4273-3	L001867.D						
OP846-BS	H004582.D	58.0	39.0	92.0	108.0	94.0	109.0
OP846-MB	H004583.D	54.0	38.0	90.0	107.0	92.0	109.0
OP846-MS	H004585.D	54.0	37.0	91.0	98.0	86.0	104.0
OP846-MSD	H004586.D	50.0	35.0	87.0	100.0	90.0	102.0
OP847-BS	L001861.D						
OP847-MB	L001862.D						
OP847-MS	L001864.D						
OP847-MSD	L001865.D						

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	21-100%
S2 = Phenol-d5	10-94%
S3 = 2,4,6-Tribromophenol	10-123%
S4 = Nitrobenzene-d5	35-114%
S5 = 2-Fluorobiphenyl	43-116%
S6 = Terphenyl-d14	33-141%

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 3550B/8270C **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4	S5	S6
F4273-5	L001943.D	69.0	78.0	95.0	72.0	82.0	95.0
F4273-6	L001944.D	72.0	82.0	99.0	74.0	81.0	107.0
F4273-8	L001966.D	77.0	81.0	105.0	83.0	88.0	98.0
F4273-10	L001948.D	74.0	83.0	97.0	76.0	80.0	120.0
F4273-12	L001969.D	72.0	79.0	104.0	77.0	82.0	90.0
F4273-14	L001970.D	63.0	72.0	95.0	69.0	82.0	84.0
OP853-BS	L001938.D	87.0	91.0	103.0	90.0	93.0	91.0
OP853-MB	L001939.D	88.0	95.0	100.0	93.0	94.0	88.0
OP853-MB	L001965.D	85.0	92.0	101.0	91.0	96.0	91.0
OP853-MS	L001967.D	74.0	83.0	102.0	79.0	95.0	90.0
OP853-MSD	L001968.D	71.0	77.0	104.0	77.0	83.0	98.0

Surrogate Compounds	Recovery Limits
S1 = 2-Fluorophenol	25-121%
S2 = Phenol-d5	24-113%
S3 = 2,4,6-Tribromophenol	19-122%
S4 = Nitrobenzene-d5	23-120%
S5 = 2-Fluorobiphenyl	30-115%
S6 = Terphenyl-d14	18-137%

Instrument Performance Check (DFTPP)

Laboratory DRAFT - Not for Release

Sample:	SH227-DFTPP	Injection Date:	06/15/99
Lab File ID:	H004580.D	Injection Time:	09:02
Instrument ID:	GCMSH	THIS TUNE HAS NOT YET BEEN APPROVED. DO NOT REPORT.	

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	17893	45.0		Pass
68	Less than 2.0% of mass 69	106	0.27	(0.46) [a]	Pass
69	Mass 69 relative abundance	22989	57.8		Pass
70	Less than 2.0% of mass 69	58	0.15	(0.25) [a]	Pass
127	40.0 - 60.0% of mass 198	17807	44.8		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	39789	100.0		Pass
199	5.0 - 9.0% of mass 198	2678	6.7		Pass
275	10.0 - 30.0% of mass 198	7547	19.0		Pass
365	1.0 - 100.0% of mass 198	772	1.9		Pass
441	Present, but less than mass 443	2869	7.2	(79.0) [b]	Pass
442	40.0 - 100.0% of mass 198	17650	44.4		Pass
443	17.0 - 23.0% of mass 442	3633	9.1	(20.6) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SH227-CC222	H004581.D	06/15/99	09:21	00:19	Continuing cal 60
OP846-BS	H004582.D	06/15/99	09:53	00:51	Blank Spike
OP846-MB	H004583.D	06/15/99	10:23	01:21	Method Blank
F4273-1	H004584.D	06/15/99	10:53	01:51	CEF-P48-SW-009
OP846-MS	H004585.D	06/15/99	11:24	02:22	Matrix Spike
OP846-MSD	H004586.D	06/15/99	11:55	02:53	Matrix Spike Duplicate
F4273-2	H004587.D	06/15/99	12:25	03:23	CEF-P48-SW-008
F4273-3	H004588.D	06/15/99	12:55	03:53	CEF-P48-SW-DU01
F4281-1	H004589.D	06/15/99	13:26	04:24	CEF-P39-SW-001
F4281-5	H004590.D	06/15/99	13:56	04:54	CEF-P39-SW-004
F4281-8	H004591.D	06/15/99	14:26	05:24	CEF-P39-SW-007
F4281-12	H004592.D	06/15/99	14:57	05:55	CEF-P39-SW-010
F4281-15	H004593.D	06/15/99	15:27	06:25	CEF-P39-SW-023
F4281-21	H004594.D	06/15/99	15:58	06:56	CEF-P39-SW-012
F4281-23	H004595.D	06/15/99	16:28	07:26	CEF-P39-SW-013
F4281-27	H004596.D	06/15/99	16:59	07:57	CEF-P39-SW-016
F4281-31	H004597.D	06/15/99	17:29	08:27	CEF-P39-SW-DU01
F4285-1	H004598.D	06/15/99	17:59	08:57	CEF-P39-SW-025
F4285-3	H004599.D	06/15/99	18:30	09:28	CEF-P39-SW-022

Instrument Performance Check (DFTPP)

Laboratory DRAFT - Not for Release

Sample:	SH227-DFTPP	**Injection Date:**	06/15/99
Lab File ID:	H004580.D	**Injection Time:**	09:02
Instrument ID:	GCMSH	**THIS TUNE HAS NOT YET BEEN APPROVED. DO NOT REPORT.**	

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
F4285-6	H004600.D	06/15/99	19:00	09:58	CEF-P39-SW-020
F4285-7	H004601.D	06/15/99	19:31	10:29	CEF-P39-SW-019
F4285-10	H004602.D	06/15/99	20:01	10:59	CEF-P39-SW-DU02

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\061599\H004581.D Vial: 2
Acq On : 15 Jun 1999 9:21 am Operator: marke
Sample : cc222-60 Inst : MSBNA01
Misc : op846,sh227,water,,,1, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\8270C.M (RTE Integrator)
Title : SW846 8270C OR EPA 625
Last Update : Tue Jun 08 15:29:06 1999
Response via : Multiple Level Calibration

Min. RRF : 0.010 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	127	-0.02
2		1,4-Dioxane	0.497	0.527	-6.0	138	0.00
3		N-nitrosodimethylamine	0.843	0.936	-11.0	146	0.00
4		Pyridine	1.355	1.445	-6.6	134	0.00
5		Aniline	1.575	1.666	-5.8	140	-0.01
6	S	2-Fluorophenol	1.110	1.096	1.3	127	-0.01
7		bis(2-Chloroethyl)ether	1.144	1.190	-4.0	137	-0.01
8	S	Phenol-d5	1.209	1.231	-1.8	136	0.00
9	C	Phenol	1.442	1.457	-1.0	131	-0.01
10		2-Chlorophenol	1.282	1.310	-2.2	134	-0.01
11		1,3-Dichlorobenzene	1.489	1.435	3.6	124	-0.02
12	C	1,4-Dichlorobenzene	1.467	1.406	4.2	126	-0.01
13		1,2-Dichlorobenzene	1.404	1.340	4.6	124	-0.02
14		Benzyl alcohol	0.716	0.790	-10.3	142	-0.01
15		bis(2-chloroisopropyl)ether	2.181	2.346	-7.6	139	-0.02
16		2-Methylphenol	0.983	1.016	-3.4	134	-0.02
17		Hexachloroethane	0.616	0.636	-3.2	132	-0.02
18	P	N-Nitroso-di-n-propylamine	0.807	0.894	-10.8	144	-0.01
19		3&4-Methylphenol	1.002	1.040	-3.8	136	-0.01
20	I	Naphthalene-d8	1.000	1.000	0.0	129	-0.02
21	S	Nitrobenzene-d5	0.408	0.439	-7.6	144	0.00
22		Nitrobenzene	0.405	0.429	-5.9	136	-0.01
23		Isophorone	0.748	0.821	-9.8	145	0.00
24	C	2-Nitrophenol	0.261	0.278	-6.5	138	-0.02
25		2,4-Dimethylphenol	0.405	0.407	-0.5	130	-0.01
26		bis(2-Chloroethoxy)methane	0.478	0.485	-1.5	132	-0.01
27		Benzoic Acid	0.226	0.255	-12.8	141	0.04
28	C	2,4-Dichlorophenol	0.395	0.373	5.6	126	-0.02
29		1,2,4-Trichlorobenzene	0.433	0.419	3.2	126	-0.01
30		Naphthalene	1.031	0.970	5.9	123	-0.02
31		4-Chloroaniline	0.501	0.492	1.8	128	-0.02
32		2,6-Dichlorophenol	0.380	0.362	4.7	125	-0.02
33	C	Hexachlorobutadiene	0.285	0.252	11.6	114	-0.01
34	C	4-Chloro-3-methylphenol	0.339	0.345	-1.8	132	-0.02
35		2-Methylnaphthalene	0.688	0.659	4.2	126	-0.02
36		1-Methylnaphthalene	0.670	0.634	5.4	126	-0.02
37	I	Acenaphthene-d10	1.000	1.000	0.0	128	-0.02
38	P	Hexachlorocyclopentadiene	0.480	0.458	4.6	119	-0.02
39	C	2,4,6-Trichlorophenol	0.542	0.533	1.7	130	-0.02
40		2,4,5-Trichlorophenol	0.569	0.557	2.1	128	-0.02
41	S	2-Fluorobiphenyl	1.426	1.341	6.0	125	-0.02
42		2-Chloronaphthalene	1.289	1.265	1.9	131	-0.02
43		2-Nitroaniline	0.443	0.494	-11.5	142	-0.01

44		Acenaphthylene	1.627	1.553	4.5	126	-0.01
45		Dimethylphthalate	1.415	1.457	-3.0	134	-0.01
46		2,6-Dinitrotoluene	0.329	0.342	-4.0	130	0.00
47	C	Acenaphthene	1.195	1.150	3.8	127	-0.02
48		3-Nitroaniline	0.420	0.449	-6.9	138	-0.01
49	P	2,4-Dinitrophenol	0.261	0.296	-13.4	144	0.00
50		Dibenzofuran	1.806	1.724	4.5	125	-0.02
51		2,4-Dinitrotoluene	0.489	0.538	-10.0	138	0.00
52	P	4-Nitrophenol	0.211	0.234	-10.9	137	0.00
53		2,3,4,6-Tetrachlorophenol	0.432	0.432	0.0	129	-0.02
54		Fluorene	1.197	1.128	5.8	125	-0.01
55		4-Chlorophenyl-phenylether	0.621	0.565	9.0	123	-0.02
56		Diethylphthalate	1.451	1.497	-3.2	133	-0.02
57		4-Nitroaniline	0.416	0.415	0.2	129	0.00
58	I	Phenanthrene-d10	1.000	1.000	0.0	129	-0.02
59		4,6-Dinitro-2-methylphenol	0.198	0.220	-11.1	135	0.00
60	C	n-Nitrosodiphenylamine	0.542	0.530	2.2	126	-0.01
61		1,2-Diphenylhydrazine	0.952	1.095	-15.0	150	-0.01
62	S	2,4,6-Tribromophenol	0.150	0.131	12.7	113	-0.02
63		4-Bromophenyl-phenylether	0.247	0.229	7.3	123	-0.02
64		Hexachlorobenzene	0.317	0.282	11.0	119	-0.02
65	C	Pentachlorophenol	0.199	0.199	0.0	126	-0.02
66		Phenanthrene	1.152	1.101	4.4	126	-0.01
67		Anthracene	1.113	1.072	3.7	125	-0.01
68		Carbazole	1.111	1.084	2.4	126	-0.02
69		Di-n-butylphthalate	1.451	1.458	-0.5	129	-0.02
70	C	Fluoranthene	1.146	1.083	5.5	122	-0.02
71	I	Chrysene-d12	1.000	1.000	0.0	113	-0.02
72		Benzidine	0.699	0.677	3.1	111	-0.01
73		Pyrene	1.478	1.565	-5.9	119	-0.02
74	S	Terphenyl-d14	0.925	0.938	-1.4	114	-0.02
75		Butylbenzylphthalate	0.792	0.869	-9.7	120	-0.02
76		3,3'-Dichlorobenzidine	0.545	0.509	6.6	103	-0.03
77		Benzo[a]anthracene	1.254	1.209	3.6	109	-0.02
78		Chrysene	1.219	1.219	0.0	115	-0.02
79		bis(2-Ethylhexyl)phthalate	1.087	1.177	-8.3	120	-0.03
80	I	Perylene-d12	1.000	1.000	0.0	107	-0.04
81	C	Di-n-octylphthalate	2.014	2.073	-2.9	113	-0.03
82		Benzo[b]fluoranthene	1.326	1.340	-1.1	105	-0.03
83		Benzo[k]fluoranthene	1.320	1.149	13.0	99	-0.03
84	C	Benzo[a]pyrene	1.188	1.204	-1.3	108	-0.03
85		Indeno[1,2,3-cd]pyrene	1.057	1.394	[redacted]	142	-0.03
86		Dibenz[a,h]anthracene	1.027	1.271	-23.8	139	-0.02
87		Benzo[g,h,i]perylene	1.043	1.263	-21.1	138	-0.02

Non target

(#) = Out of Range SPCC's out = 0 CCC's out = 0

H004513.D 8270C.M Tue Jun 15 09:45:23 1999 RPT1

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP846-MB	H004583.D	1	06/15/99	ME	06/14/99	OP846	SH227

The QC reported here applies to the following samples: **Method:** SW846 3510C/8270C

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	ug/l	
105-67-9	2,4-Dimethylphenol	ND	25	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	ug/l	
95-48-7	2-Methylphenol	ND	5.0	ug/l	
	3&4-Methylphenol	ND	5.0	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	ug/l	
100-02-7	4-Nitrophenol	ND	25	ug/l	
108-95-2	Phenol	ND	5.0	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	5.0	ug/l	
85-68-7	Butyl benzyl phthalate	ND	5.0	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	ug/l	
86-74-8	Carbazole	ND	5.0	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	ug/l	
108-60-1	bis(2-Chloroisopropyl)ether	ND	5.0	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	10	ug/l	
132-64-9	Dibenzofuran	ND	5.0	ug/l	
84-74-2	Di-n-butyl phthalate	ND	5.0	ug/l	
117-84-0	Di-n-octyl phthalate	ND	5.0	ug/l	
84-66-2	Diethyl phthalate	ND	5.0	ug/l	
131-11-3	Dimethyl phthalate	ND	5.0	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	ug/l	
67-72-1	Hexachloroethane	ND	5.0	ug/l	
78-59-1	Isophorone	ND	5.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	5.0	ug/l	

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Bat.
OP846-MB	H004583.D	1	06/15/99	ME	06/14/99	OP846	SH227

The QC reported here applies to the following samples: **Method:** SW846 3510C/8270C

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
91-57-6	2-Methylnaphthalene	ND	5.0	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	ug/l	
98-95-3	Nitrobenzene	ND	5.0	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	5.0	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/l	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	54%	21-100%
4165-62-2	Phenol-d5	38%	10-94%
118-79-6	2,4,6-Tribromophenol	90%	10-123%
4165-60-0	Nitrobenzene-d5	107%	35-114%
321-60-8	2-Fluorobiphenyl	92%	43-116%
1718-51-0	Terphenyl-d14	109%	33-141%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP847-MB	L001862.D	1	06/14/99	ME	06/14/99	OP847	SL117

The QC reported here applies to the following samples: **Method:** SW846 3510C/8270C

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
87-86-5	Pentachlorophenol	ND	1.0	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	1.5	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	0.20	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	0.20	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	ug/l	

Instrument Performance Check (DFTPP)

Laboratory DRAFT - Not for Release

Sample:	SL121-DFTPP	Injection Date:	06/18/99
Lab File ID:	L001935.D	Injection Time:	10:33
Instrument ID:	GCMSL	THIS TUNE HAS NOT YET BEEN APPROVED. DO NOT REPORT.	

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	80748	39.9		Pass
68	Less than 2.0% of mass 69	0	0.0	(0.0) [a]	Pass
69	Mass 69 relative abundance	76504	37.8		Pass
70	Less than 2.0% of mass 69	402	0.2	(0.53) [a]	Pass
127	40.0 - 60.0% of mass 198	106392	52.6		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	202417	100.0		Pass
199	5.0 - 9.0% of mass 198	14068	7.0		Pass
275	10.0 - 30.0% of mass 198	39133	19.3		Pass
365	1.0 - 100.0% of mass 198	3373	1.7		Pass
441	Present, but less than mass 443	21751	10.7	(72.4) [b]	Pass
442	40.0 - 100.0% of mass 198	150317	74.3		Pass
443	17.0 - 23.0% of mass 442	30040	14.8	(20.0) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SL121-CC111	L001936.D	06/18/99	10:52	00:19	Continuing cal 75
OP853-BS	L001938.D	06/18/99	11:54	01:21	Blank Spike
OP853-MB	L001939.D	06/18/99	12:24	01:51	Method Blank
F4255-13	L001940.D	06/18/99	12:54	02:21	CEF-P49-SS-046
F4281-19	L001941.D	06/18/99	13:24	02:51	CEF-P39-SD-028
F4281-17	L001942.D	06/18/99	13:56	03:23	CEF-P39-SD-026
F4273-5	L001943.D	06/18/99	14:26	03:53	CEF-P48-SD-004
F4273-6	L001944.D	06/18/99	14:58	04:25	CEF-P48-SD-003
F4273-10	L001948.D	06/18/99	17:02	06:29	CEF-P48-SD-002
F4281-2	L001951.D	06/18/99	18:33	08:00	CEF-P39-SD-002
F4281-24	L001958.D	06/18/99	22:05	11:32	CEF-P39-SD-014

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP853-MB	L001939.D	1	06/18/99	ME	06/17/99	OP853	SL121

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	330	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	330	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	330	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	830	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	830	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	670	ug/kg	
95-48-7	2-Methylphenol	ND	330	ug/kg	
	3&4-Methylphenol	ND	330	ug/kg	
88-75-5	2-Nitrophenol	ND	330	ug/kg	
100-02-7	4-Nitrophenol	ND	830	ug/kg	
87-86-5	Pentachlorophenol	ND	830	ug/kg	
108-95-2	Phenol	ND	330	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	330	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	330	ug/kg	
83-32-9	Acenaphthene	ND	330	ug/kg	
208-96-8	Acenaphthylene	ND	330	ug/kg	
120-12-7	Anthracene	ND	330	ug/kg	
56-55-3	Benzo(a)anthracene	ND	330	ug/kg	
50-32-8	Benzo(a)pyrene	ND	330	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	330	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	330	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	330	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	330	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	330	ug/kg	
91-58-7	2-Chloronaphthalene	ND	330	ug/kg	
106-47-8	4-Chloroaniline	ND	330	ug/kg	
86-74-8	Carbazole	ND	330	ug/kg	
218-01-9	Chrysene	ND	330	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	330	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	330	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	330	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	330	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	330	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	330	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	330	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	330	ug/kg	

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP853-MB	L001939.D	1	06/18/99	ME	06/17/99	OP853	SL121

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	330	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	670	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	330	ug/kg	
132-64-9	Dibenzofuran	ND	330	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	330	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	330	ug/kg	
84-66-2	Diethyl phthalate	ND	330	ug/kg	
131-11-3	Dimethyl phthalate	ND	330	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	330	ug/kg	
206-44-0	Fluoranthene	ND	330	ug/kg	
86-73-7	Fluorene	ND	330	ug/kg	
118-74-1	Hexachlorobenzene	ND	330	ug/kg	
87-68-3	Hexachlorobutadiene	ND	330	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	330	ug/kg	
67-72-1	Hexachloroethane	ND	330	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	
78-59-1	Isophorone	ND	330	ug/kg	
90-12-0	1-Methylnaphthalene	ND	330	ug/kg	
91-57-6	2-Methylnaphthalene	ND	330	ug/kg	
88-74-4	2-Nitroaniline	ND	330	ug/kg	
99-09-2	3-Nitroaniline	ND	330	ug/kg	
100-01-6	4-Nitroaniline	ND	330	ug/kg	
91-20-3	Naphthalene	ND	330	ug/kg	
98-95-3	Nitrobenzene	ND	330	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	330	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	330	ug/kg	
85-01-8	Phenanthrene	ND	330	ug/kg	
129-00-0	Pyrene	ND	330	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	330	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	88%	25-121%
4165-62-2	Phenol-d5	95%	24-113%
118-79-6	2,4,6-Tribromophenol	100%	19-122%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP853-MB	L001939.D	1	06/18/99	ME	06/17/99	OP853	SL121

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	93%	23-120%
321-60-8	2-Fluorobiphenyl	94%	30-115%
1718-51-0	Terphenyl-d14	88%	18-137%

Instrument Performance Check (DFTPP)

Laboratory DRAFT - Not for Release

Sample:	SL122-DFTPP	Injection Date:	06/19/99
Lab File ID:	L001962.D	Injection Time:	13:51
Instrument ID:	GCMSL	THIS TUNE HAS NOT YET BEEN APPROVED. DO NOT REPORT.	

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	52616	43.6		Pass
68	Less than 2.0% of mass 69	405	0.34	(0.85) [a]	Pass
69	Mass 69 relative abundance	47877	39.7		Pass
70	Less than 2.0% of mass 69	163	0.14	(0.34) [a]	Pass
127	40.0 - 60.0% of mass 198	64000	53.1		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	120573	100.0		Pass
199	5.0 - 9.0% of mass 198	7983	6.6		Pass
275	10.0 - 30.0% of mass 198	21052	17.5		Pass
365	1.0 - 100.0% of mass 198	2145	1.8		Pass
441	Present, but less than mass 443	11068	9.2	(73.2) [b]	Pass
442	40.0 - 100.0% of mass 198	75952	63.0		Pass
443	17.0 - 23.0% of mass 442	15126	12.5	(19.9) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SL122-CC111	L001963.D	06/19/99	14:43	00:52	Continuing cal 75
OP853-MB	L001965.D	06/19/99	15:44	01:53	Method Blank
F4273-8	L001966.D	06/19/99	16:15	02:24	CEF-P48-SD-DU01
OP853-MS	L001967.D	06/19/99	16:45	02:54	Matrix Spike
OP853-MSD	L001968.D	06/19/99	17:15	03:24	Matrix Spike Duplicate
F4273-12	L001969.D	06/19/99	17:45	03:54	CEF-P48-SD-001
F4273-14	L001970.D	06/19/99	18:15	04:24	CEF-P48-SD-005
F4281-6	L001971.D	06/19/99	18:45	04:54	CEF-P39-SD-005
F4281-9	L001972.D	06/19/99	19:16	05:25	CEF-P39-SD-008
F4281-13	L001973.D	06/19/99	19:46	05:55	CEF-P39-SD-011
F4281-14	L001974.D	06/19/99	20:17	06:26	CEF-P39-SD-023
F4281-16	L001975.D	06/19/99	20:47	06:56	CEF-P39-SD-024
F4281-22	L001976.D	06/19/99	21:17	07:26	CEF-P39-SD-012
F4281-28	L001977.D	06/19/99	21:47	07:56	CEF-P39-SD-017
F4281-32	L001978.D	06/19/99	22:18	08:27	CEF-P39-SD-DU01
F4282-1	L001979.D	06/19/99	22:48	08:57	CEF-P48-SD-006

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\061999\L001963.D
Acq On : 19 Jun 1999 2:43 pm
Sample : cc111-75
Misc : op853,sl122,soil,,,1,
MS Integration Params: RTEINT.P

Vial: 2
Operator: marke
Inst : MSBNA02
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8270C.M (RTE Integrator)
Title : SW846 8270C OR EPA 625
Last Update : Tue Jun 15 12:59:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	72	-0.04
2		1,4-Dioxane	0.422	0.363	14.0	62	-0.05
3		N-nitrosodimethylamine	0.655	0.594	9.3	65	-0.05
4		Pyridine	1.264	1.100	13.0	61	-0.05
5		Aniline	1.928	1.815	5.9	70	-0.04
6	S	2-Fluorophenol	1.233	1.192	3.3	71	-0.04
7		bis(2-Chloroethyl)ether	1.217	1.149	5.6	69	-0.04
8	S	Phenol-d5	1.419	1.352	4.7	71	-0.04
9	C	Phenol	1.654	1.607	2.8	72	-0.04
10		2-Chlorophenol	1.390	1.362	2.0	71	-0.04
11		1,3-Dichlorobenzene	1.528	1.522	0.4	72	-0.04
12	C	1,4-Dichlorobenzene	1.518	1.517	0.1	73	-0.04
13		1,2-Dichlorobenzene	1.446	1.425	1.5	71	-0.04
14		Benzyl alcohol	0.895	0.845	5.6	69	-0.04
15		bis(2-chloroisopropyl)ether	2.018	1.908	5.5	70	-0.04
16		2-Methylphenol	1.231	1.187	3.6	70	-0.05
17		Hexachloroethane	0.498	0.501	-0.6	72	-0.04
18	P	N-Nitroso-di-n-propylamine	0.832	0.770	7.5	67	-0.05
19		3&4-Methylphenol	1.253	1.190	5.0	68	-0.04
20	I	Naphthalene-d8	1.000	1.000	0.0	71	-0.05
21	S	Nitrobenzene-d5	0.348	0.346	0.6	70	-0.04
22		Nitrobenzene	0.354	0.349	1.4	70	-0.04
23		Isophorone	0.656	0.625	4.7	67	-0.05
24	C	2-Nitrophenol	0.208	0.224	-7.7	73	-0.04
25		2,4-Dimethylphenol	0.363	0.358	1.4	70	-0.05
26		bis(2-Chloroethoxy)methane	0.386	0.370	4.1	68	-0.05
27		Benzoic Acid	0.247	0.269	-8.9	74	-0.07
28	C	2,4-Dichlorophenol	0.304	0.315	-3.6	72	-0.05
29		1,2,4-Trichlorobenzene	0.305	0.311	-2.0	72	-0.05
30		Naphthalene	1.040	1.038	0.2	72	-0.05
31		4-Chloroaniline	0.462	0.443	4.1	68	-0.05
32		2,6-Dichlorophenol	0.297	0.303	-2.0	71	-0.05
33	C	Hexachlorobutadiene	0.146	0.156	-6.8	75	-0.05
34	C	4-Chloro-3-methylphenol	0.300	0.290	3.3	68	-0.07
35		2-Methylnaphthalene	0.736	0.738	-0.3	72	-0.06
36		1-Methylnaphthalene	0.703	0.707	-0.6	72	-0.05
37	I	Acenaphthene-d10	1.000	1.000	0.0	72	-0.07
38	P	Hexachlorocyclopentadiene	0.242	0.259	-7.0	69	-0.05
39	C	2,4,6-Trichlorophenol	0.361	0.385	-6.6	74	-0.07
40		2,4,5-Trichlorophenol	0.389	0.404	-3.9	73	-0.07
41	S	2-Fluorobiphenyl	1.372	1.400	-2.0	73	-0.06
42		2-Chloronaphthalene	1.170	1.181	-0.9	72	-0.06
43		2-Nitroaniline	0.339	0.334	1.5	69	-0.07

14		Acenaphthylene	1.672	1.707	-2.1	74	-0.07
15		Dimethylphthalate	1.272	1.248	1.9	71	-0.06
16		2,6-Dinitrotoluene	0.275	0.293	-6.5	73	-0.07
17	C	Acenaphthene	1.121	1.142	-1.9	74	-0.07
18		3-Nitroaniline	0.357	0.361	-1.1	71	-0.07
19	P	2,4-Dinitrophenol	0.156	0.180	-15.4	79	-0.07
50		Dibenzofuran	1.656	1.705	-3.0	74	-0.07
51		2,4-Dinitrotoluene	0.368	0.386	-4.9	72	-0.07
52	P	4-Nitrophenol	0.157	0.168	-7.0	74	-0.08
53		2,3,4,6-Tetrachlorophenol	0.223	0.256	-14.8	78	-0.07
54		Fluorene	1.209	1.252	-3.6	75	-0.07
55		4-Chlorophenyl-phenylether	0.503	0.526	-4.6	76	-0.07
56		Diethylphthalate	1.236	1.259	-1.9	74	-0.07
57		4-Nitroaniline	0.334	0.343	-2.7	73	-0.08
58	I	Phenanthrene-d10	1.000	1.000	0.0	75	-0.07
59		4,6-Dinitro-2-methylphenol	0.142	0.156	-9.9	77	-0.08
60	C	n-Nitrosodiphenylamine	0.617	0.610	1.1	74	-0.07
61		1,2-Diphenylhydrazine	0.839	0.800	4.6	70	-0.07
62	S	2,4,6-Tribromophenol	0.060	0.066	-10.0	80	-0.07
63		4-Bromophenyl-phenylether	0.170	0.173	-1.8	75	-0.07
64		Hexachlorobenzene	0.156	0.158	-1.3	76	-0.07
65	C	Pentachlorophenol	0.102	0.113	-10.8	79	-0.08
66		Phenanthrene	1.128	1.155	-2.4	78	-0.07
67		Anthracene	1.072	1.079	-0.7	76	-0.08
68		Carbazole	1.089	1.105	-1.5	77	-0.07
69		Di-n-butylphthalate	1.287	1.355	-5.3	77	-0.07
70	C	Fluoranthene	0.921	0.959	-4.1	78	-0.08
71	I	Chrysene-d12	1.000	1.000	0.0	88	-0.08
72		Benzidine	1.042	0.827	20.6	67	-0.08
73		Pyrene	2.139	2.004	6.3	80	-0.08
74	S	Terphenyl-d14	1.253	1.211	3.4	82	-0.07
75		Butylbenzylphthalate	1.017	1.045	-2.8	84	-0.07
76		3,3'-Dichlorobenzidine	0.423	0.473	-11.8	93	-0.07
77		Benzo[a]anthracene	1.383	1.400	-1.2	87	-0.08
78		Chrysene	1.309	1.288	1.6	87	-0.08
79		bis(2-Ethylhexyl)phthalate	1.207	1.320	-9.4	88	-0.07
80	I	Perylene-d12	1.000	1.000	0.0	102	-0.08
81	C	Di-n-octylphthalate	3.420	3.465	-1.3	98	-0.07
82		Benzo[b]fluoranthene	1.546	1.596	-3.2	102	-0.08
83		Benzo[k]fluoranthene	1.634	1.519	7.0	93	-0.08
84	C	Benzo[a]pyrene	1.298	1.363	-5.0	103	-0.07
85		Indeno[1,2,3-cd]pyrene	0.801	1.122	[redacted]	126	-0.08
86		Dibenz[a,h]anthracene	0.840	1.165	[redacted] #	130	-0.08
87		Benzo[g,h,i]perylene	0.845	1.151	[redacted]	129	-0.08

(#) = Out of Range SPCC's out = 0 CCC's out = 0

L001789.D 8270C.M Mon Jun 21 08:03:05 1999 RPT1

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP853-MB	L001965.D	1	06/19/99	ME	06/17/99	OP853	SL122

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	330	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	330	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	330	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	830	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	830	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	670	ug/kg	
95-48-7	2-Methylphenol	ND	330	ug/kg	
	3&4-Methylphenol	ND	330	ug/kg	
88-75-5	2-Nitrophenol	ND	330	ug/kg	
100-02-7	4-Nitrophenol	ND	830	ug/kg	
87-86-5	Pentachlorophenol	ND	830	ug/kg	
108-95-2	Phenol	ND	330	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	330	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	330	ug/kg	
83-32-9	Acenaphthene	ND	330	ug/kg	
208-96-8	Acenaphthylene	ND	330	ug/kg	
120-12-7	Anthracene	ND	330	ug/kg	
56-55-3	Benzo(a)anthracene	ND	330	ug/kg	
50-32-8	Benzo(a)pyrene	ND	330	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	330	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	330	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	330	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	330	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	330	ug/kg	
91-58-7	2-Chloronaphthalene	ND	330	ug/kg	
106-47-8	4-Chloroaniline	ND	330	ug/kg	
86-74-8	Carbazole	ND	330	ug/kg	
218-01-9	Chrysene	ND	330	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	330	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	330	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	330	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	330	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	330	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	330	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	330	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	330	ug/kg	

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batc.
OP853-MB	L001965.D	1	06/19/99	ME	06/17/99	OP853	SL122

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	330	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	670	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	330	ug/kg	
132-64-9	Dibenzofuran	ND	330	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	330	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	330	ug/kg	
84-66-2	Diethyl phthalate	ND	330	ug/kg	
131-11-3	Dimethyl phthalate	ND	330	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	330	ug/kg	
206-44-0	Fluoranthene	ND	330	ug/kg	
86-73-7	Fluorene	ND	330	ug/kg	
118-74-1	Hexachlorobenzene	ND	330	ug/kg	
87-68-3	Hexachlorobutadiene	ND	330	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	330	ug/kg	
67-72-1	Hexachloroethane	ND	330	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	330	ug/kg	
78-59-1	Isophorone	ND	330	ug/kg	
90-12-0	1-Methylnaphthalene	ND	330	ug/kg	
91-57-6	2-Methylnaphthalene	ND	330	ug/kg	
88-74-4	2-Nitroaniline	ND	330	ug/kg	
99-09-2	3-Nitroaniline	ND	330	ug/kg	
100-01-6	4-Nitroaniline	ND	330	ug/kg	
91-20-3	Naphthalene	ND	330	ug/kg	
98-95-3	Nitrobenzene	ND	330	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	330	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	330	ug/kg	
85-01-8	Phenanthrene	ND	330	ug/kg	
129-00-0	Pyrene	ND	330	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	330	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	85%	25-121%
4165-62-2	Phenol-d5	92%	24-113%
118-79-6	2,4,6-Tribromophenol	101%	19-122%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP853-MB	L001965.D	1	06/19/99	ME	06/17/99	OP853	SL122

The QC reported here applies to the following samples: **Method:** SW846 3550B/8270C

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	91%	23-120%
321-60-8	2-Fluorobiphenyl	96%	30-115%
1718-51-0	Terphenyl-d14	91%	18-137%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP844-MB	MN03943.D	1	06/17/99	SKW	06/11/99	OP844	GMN164

The QC reported here applies to the following samples: **Method:** SW846 3510C/8081A

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	85%	30-160%
2051-24-3	Decachlorobiphenyl	77%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP844-MB	MN03823.D	1	06/12/99	SKW	06/11/99	OP844	GMN160

The QC reported here applies to the following samples: **Method:** SW846 3510C/8081A

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	0.050	ug/l	
319-84-6	alpha-BHC	ND	0.050	ug/l	
319-85-7	beta-BHC	ND	0.050	ug/l	
319-86-8	delta-BHC	ND	0.050	ug/l	
58-89-9	gamma-BHC (Lindane)	ND	0.050	ug/l	
5103-71-9	alpha-Chlordane	ND	0.10	ug/l	
5103-74-2	gamma-Chlordane	ND	0.10	ug/l	
60-57-1	Dieldrin	ND	0.050	ug/l	
72-54-8	4,4'-DDD	ND	0.10	ug/l	
72-55-9	4,4'-DDE	ND	0.10	ug/l	
50-29-3	4,4'-DDT	ND	0.10	ug/l	
72-20-8	Endrin	ND	0.10	ug/l	
1031-07-8	Endosulfan sulfate	ND	0.10	ug/l	
7421-93-4	Endrin aldehyde	ND	0.10	ug/l	
53494-70-5	Endrin ketone	ND	0.10	ug/l	
959-98-8	Endosulfan-I	ND	0.050	ug/l	
33213-65-9	Endosulfan-II	ND	0.10	ug/l	
76-44-8	Heptachlor	ND	0.050	ug/l	
1024-57-3	Heptachlor epoxide	ND	0.050	ug/l	
72-43-5	Methoxychlor	ND	0.20	ug/l	
8001-35-2	Toxaphene	ND	2.5	ug/l	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	85%	30-160%
2051-24-3	Decachlorobiphenyl	74%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Bat...
OP852-MB	MN03969.D	1	06/18/99	SKW	06/16/99	OP852	GMN165

The QC reported here applies to the following samples: **Method:** SW846 3550B/8081A

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	1.7	ug/kg	
319-84-6	alpha-BHC	ND	1.7	ug/kg	
319-85-7	beta-BHC	ND	1.7	ug/kg	
319-86-8	delta-BHC	ND	1.7	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	ug/kg	
5103-71-9	alpha-Chlordane	ND	3.3	ug/kg	
5103-74-2	gamma-Chlordane	ND	3.3	ug/kg	
60-57-1	Dieldrin	ND	1.7	ug/kg	
72-54-8	4,4'-DDD	ND	3.3	ug/kg	
72-55-9	4,4'-DDE	ND	3.3	ug/kg	
50-29-3	4,4'-DDT	ND	3.3	ug/kg	
72-20-8	Endrin	ND	3.3	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.3	ug/kg	
53494-70-5	Endrin ketone	ND	3.3	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	ug/kg	
33213-65-9	Endosulfan-II	ND	3.3	ug/kg	
76-44-8	Heptachlor	ND	1.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	ug/kg	
72-43-5	Methoxychlor	ND	6.7	ug/kg	
8001-35-2	Toxaphene	ND	170	ug/kg	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	92%	40-150%
2051-24-3	Decachlorobiphenyl	104%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP852-MB	MN04008.D	1	06/21/99	SKW	06/16/99	OP852	GMN166

The QC reported here applies to the following samples: **Method:** SW846 3550B/8081A

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	1.7	ug/kg	
319-84-6	alpha-BHC	ND	1.7	ug/kg	
319-85-7	beta-BHC	ND	1.7	ug/kg	
319-86-8	delta-BHC	ND	1.7	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	ug/kg	
5103-71-9	alpha-Chlordane	ND	3.3	ug/kg	
5103-74-2	gamma-Chlordane	ND	3.3	ug/kg	
60-57-1	Dieldrin	ND	1.7	ug/kg	
72-54-8	4,4'-DDD	ND	3.3	ug/kg	
72-55-9	4,4'-DDE	ND	3.3	ug/kg	
50-29-3	4,4'-DDT	ND	3.3	ug/kg	
72-20-8	Endrin	ND	3.3	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.3	ug/kg	
53494-70-5	Endrin ketone	ND	3.3	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	ug/kg	
33213-65-9	Endosulfan-II	ND	3.3	ug/kg	
76-44-8	Heptachlor	ND	1.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	ug/kg	
72-43-5	Methoxychlor	ND	6.7	ug/kg	
8001-35-2	Toxaphene	ND	170	ug/kg	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	92%	40-150%
2051-24-3	Decachlorobiphenyl	83%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batc.
OP852-MB	MN04041.D	1	06/22/99	SKW	06/16/99	OP852	GMN167

The QC reported here applies to the following samples: **Method:** SW846 3550B/8081A

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	1.7	ug/kg	
319-84-6	alpha-BHC	ND	1.7	ug/kg	
319-85-7	beta-BHC	ND	1.7	ug/kg	
319-86-8	delta-BHC	ND	1.7	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	1.7	ug/kg	
5103-71-9	alpha-Chlordane	ND	3.3	ug/kg	
5103-74-2	gamma-Chlordane	ND	3.3	ug/kg	
60-57-1	Dieldrin	ND	1.7	ug/kg	
72-54-8	4,4'-DDD	ND	3.3	ug/kg	
72-55-9	4,4'-DDE	ND	3.3	ug/kg	
50-29-3	4,4'-DDT	ND	3.3	ug/kg	
72-20-8	Endrin	ND	3.3	ug/kg	
1031-07-8	Endosulfan sulfate	ND	3.3	ug/kg	
7421-93-4	Endrin aldehyde	ND	3.3	ug/kg	
53494-70-5	Endrin ketone	ND	3.3	ug/kg	
959-98-8	Endosulfan-I	ND	1.7	ug/kg	
33213-65-9	Endosulfan-II	ND	3.3	ug/kg	
76-44-8	Heptachlor	ND	1.7	ug/kg	
1024-57-3	Heptachlor epoxide	ND	1.7	ug/kg	
72-43-5	Methoxychlor	ND	6.7	ug/kg	
8001-35-2	Toxaphene	ND	170	ug/kg	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	87%	40-150%
2051-24-3	Decachlorobiphenyl	126%	30-160%

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 3510C/8081A **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S2 [a]
F4273-1	MN03825.D	75.0	74.0
F4273-2	MN03828.D	84.0	85.0
F4273-3	MN03829.D	73.0	71.0
OP844-BS	MN03824.D	80.0	76.0
OP844-MB	MN03943.D	85.0	77.0
OP844-MB	MN03823.D	85.0	74.0
OP844-MS	MN03826.D	71.0	72.0
OP844-MSD	MN03827.D	76.0	80.0

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	30-160%
S2 = Decachlorobiphenyl	30-160%

(a) Recovery from GC signal #1

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 3550B/8081A **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S2 [a]
F4273-5	MN04029.D	92.0	60.0
F4273-5	MN03972.D	83.0	111.0
F4273-6	MN04030.D	87.0	62.0
F4273-6	MN03973.D	77.0	86.0
F4273-8	MN04031.D	90.0	56.0
F4273-8	MN03974.D	81.0	88.0
F4273-10	MN04032.D	93.0	69.0
F4273-10	MN03977.D	79.0	84.0
F4273-12	MN04033.D	87.0	71.0
F4273-12	MN03978.D	74.0	80.0
F4273-14	MN04034.D	79.0	59.0
F4273-14	MN03979.D	67.0	75.0
OP852-BS	MN03970.D	98.0	109.0
OP852-BS	MN04009.D	96.0	86.0
OP852-MB	MN03969.D	92.0	104.0
OP852-MB	MN04008.D	92.0	83.0
OP852-MB	MN04041.D	87.0	126.0
OP852-MS	MN04013.D	96.0	71.0
OP852-MSD	MN04014.D	75.0	58.0

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	40-150%
S2 = Decachlorobiphenyl	30-160%

(a) Recovery from GC signal #1

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03996.D\ECD1B.CH Vial: 37
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03996.D\ECD2A.CH
Acq On : 19 Jun 99 12:27 am
Sample : 40ppb ccv
Misc : op852,gmn165,soil,,,10,
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Operator: stephw
Inst : ECD 2
Multiplr: 1.00

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.119	3.588 E3	12.9	91	0.00
2		alpha-BHC	7.233	6.676 E3	7.7	90	0.00
3		gamma-BHC (Lindane)	6.407	4.772 E3	25.5#	74	0.00
4		beta-BHC	2.851	2.134 E3	25.1#	77	0.00
5		Heptachlor	5.032	2.210 E3	56.1#	45#	0.00
6		delta-BHC	5.396	4.582 E3	15.1#	81	0.00
7		Aldrin	4.497	3.800 E3	15.5#	84	0.00
8		Heptachlor Epoxide	4.444	3.668 E3	17.5#	84	0.00
9		gamma-Chlordane	4.200	3.321 E3	20.9#	80	0.00
.0		alpha-Chlordane	4.237	3.359 E3	20.7#	81	0.00
.1		Endosulfan I	4.199	3.476 E3	17.2#	82	0.00
.2		4,4'-DDE	2.957	2.629 E3	11.1	84	0.00
.3		Dieldrin	3.658	3.067 E3	16.2#	83	0.00
.4		Endrin	2.809	1.986 E3	29.3#	69	0.00
5		4,4'-DDD	2.416	2.262 E3	6.4	89	0.00
6		Endosulfan II	3.046	2.092 E3	31.3#	70	0.00
8		Endrin Aldehyde	1.911	1.434 E3	25.0#	75	0.00
9		Endosulfan Sulfate	2.463	1.635 E3	33.6#	68	0.00
1		Endrin Ketone	2.176	0.656 E3	69.9#	30#	0.00
9	S	Decachlorobiphenyl	917.967	391.534	57.3#	43#	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.254	4.163 E3	2.1	102	0.00
2		alpha-BHC	8.317	8.401 E3	-1.0	101	0.00
3		gamma-BHC (Lindane)	7.248	6.180 E3	14.7	86	0.00
4		beta-BHC	3.058	2.484 E3	18.8#	84	0.00
5		Heptachlor	5.861	2.946 E3	49.7#	51	0.00
6		delta-BHC	5.885	5.582 E3	5.1	92	0.00
7		Aldrin	5.278	5.243 E3	0.7	99	0.00
8		Heptachlor Epoxide	4.920	4.524 E3	8.0	93	0.00
9		gamma-Chlordane	4.916	4.480 E3	8.9	91	0.00
		alpha-Chlordane	4.631	4.249 E3	8.2	93	0.00
		Endosulfan I	3.984	3.771 E3	5.3	94	0.00
		4,4'-DDE	3.227	3.232 E3	-0.2	102	0.00
		Dieldrin	4.085	3.832 E3	6.2	92	0.00
		Endrin	3.139	2.409 E3	23.3#	76	0.00
		4,4'-DDD	2.364	2.692 E3	-13.9	109	0.00
		Endosulfan II	3.219	2.588 E3	19.6#	81	0.00

#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03996.D\ECD1B.CH Vial: 37
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03996.D\ECD2A.CH
Acq On : 19 Jun 99 12:27 am
Sample : 40ppb ccv
Misc : op852,gmn165,soil,,,10,
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Operator: stephw
Inst : ECD 2
Multiplr: 1.00

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
8		Endrin Aldehyde	1.486	1.241 E3	16.5#	84	0.00
9		Endosulfan Sulfate	2.458	1.869 E3	24.0#	76	0.00
1		Endrin Ketone	2.191	0.788 E3	64.0#	36#	0.00
9	S	Decachlorobiphenyl	1.019	0.540 E3	47.0#	54	0.00

) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03995.D\ECD1B.CH Vial: 37
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03995.D\ECD2A.CH
Acq On : 19 Jun 99 12:05 am
Sample : 40ppb ccv
Misc : op852,gmn165,soil,,,10,
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Operator: stephw
Inst : ECD 2
Multiplr: 1.00

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.119	3.482 E3	15.5#	88	0.00
2		alpha-BHC	7.233	6.488 E3	10.3	88	0.00
3		gamma-BHC (Lindane)	6.407	4.576 E3	28.6#	71	0.00
4		beta-BHC	2.851	2.060 E3	27.7#	74	0.00
5		Heptachlor	5.032	1.953 E3	61.2#	40#	0.00
6		delta-BHC	5.396	4.414 E3	18.2#	78	0.00
7		Aldrin	4.497	3.728 E3	17.1#	82	0.00
8		Heptachlor Epoxide	4.444	3.414 E3	23.2#	78	0.00
9		gamma-Chlordane	4.200	3.089 E3	26.5#	74	0.00
10		alpha-Chlordane	4.237	3.097 E3	26.9#	75	0.00
11		Endosulfan I	4.199	3.189 E3	24.1#	76	0.00
12		4,4'-DDE	2.957	2.388 E3	19.2#	76	0.00
13		Dieldrin	3.658	2.773 E3	24.2#	75	0.00
14		Endrin	2.809	1.740 E3	38.1#	60	0.00
15		4,4'-DDD	2.416	1.973 E3	18.3#	78	0.00
16		Endosulfan II	3.046	1.852 E3	39.2#	62	0.00
18		Endrin Aldehyde	1.911	1.260 E3	34.1#	66	0.00
19		Endosulfan Sulfate	2.463	1.402 E3	43.1#	58	0.00
21		Endrin Ketone	2.176	0.541 E3	75.1#	25#	0.00
19	S	Decachlorobiphenyl	917.967	335.149	63.5#	37#	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.254	4.118 E3	3.2	101	0.00
2		alpha-BHC	8.317	8.185 E3	1.6	98	0.00
3		gamma-BHC (Lindane)	7.248	5.844 E3	19.4#	81	0.00
4		beta-BHC	3.058	2.345 E3	23.3#	80	0.00
5		Heptachlor	5.861	2.541 E3	56.6#	44#	0.00
6		delta-BHC	5.885	5.027 E3	14.6	83	0.00
7		Aldrin	5.278	5.065 E3	4.0	96	0.00
8		Heptachlor Epoxide	4.920	4.290 E3	12.8	88	0.00
9		gamma-Chlordane	4.916	4.151 E3	15.6#	84	0.00
10		alpha-Chlordane	4.631	3.899 E3	15.8#	85	0.00
11		Endosulfan I	3.984	3.456 E3	13.3	86	0.00
12		4,4'-DDE	3.227	2.911 E3	9.8	92	0.00
13		Dieldrin	4.085	3.528 E3	13.6	85	0.00
14		Endrin	3.139	2.252 E3	28.3#	71	0.00
15		4,4'-DDD	2.364	2.373 E3	-0.4	96	0.00
16		Endosulfan II	3.219	2.324 E3	27.8#	73	0.00

#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03995.D\ECD1B.CH Vial: 37
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03995.D\ECD2A.CH
Acq On : 19 Jun 99 12:05 am Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn165,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
18		Endrin Aldehyde	1.486	1.137 E3	23.5#	77	0.00
19		Endosulfan Sulfate	2.458	1.637 E3	33.4#	66	0.00
21		Endrin Ketone	2.191	0.637 E3	70.9#	29#	0.00
29	S	Decachlorobiphenyl	1.019	0.461 E3	54.8#	46#	0.00

#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03982.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03982.D\ECD2A.CH
Acq On : 18 Jun 99 7:23 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn165,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF		%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.119	3.821	E3	7.2	97	0.00
2		alpha-BHC	7.233	6.987	E3	3.4	95	0.00
3		gamma-BHC (Lindane)	6.407	5.504	E3	14.1	85	0.00
4		beta-BHC	2.851	2.356	E3	17.4#	85	0.00
5		Heptachlor	5.032	3.791	E3	24.7#	77	0.00
6		delta-BHC	5.396	5.026	E3	6.9	89	0.00
7		Aldrin	4.497	4.102	E3	8.8	90	0.00
8		Heptachlor Epoxide	4.444	3.935	E3	11.5	90	0.00
9		gamma-Chlordane	4.200	3.646	E3	13.2	87	0.00
10		alpha-Chlordane	4.237	3.637	E3	14.2	88	0.00
11		Endosulfan I	4.199	3.725	E3	11.3	88	0.00
12		4,4'-DDE	2.957	2.875	E3	2.8	92	0.00
13		Dieldrin	3.658	3.375	E3	7.7	91	0.00
14		Endrin	2.809	2.529	E3	10.0	87	0.00
15		4,4'-DDD	2.416	2.723	E3	-12.7	107	0.00
16		Endosulfan II	3.046	2.555	E3	16.1#	85	0.00
17		4,4'-DDT	1.697	0.324	E3	80.9#	19#	0.00
18		Endrin Aldehyde	1.911	1.779	E3	6.9	93	0.00
19		Endosulfan Sulfate	2.463	2.166	E3	12.1	90	0.00
20		Methoxychlor	813.970	190.954		76.5#	24#	0.00
21		Endrin Ketone	2.176	1.480	E3	32.0#	68	0.00
29	S	Decachlorobiphenyl	917.967	849.953		7.4	93	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.254	4.265	E3	-0.3	105	0.00
2		alpha-BHC	8.317	8.649	E3	-4.0	103	0.00
3		gamma-BHC (Lindane)	7.248	6.760	E3	6.7	94	0.00
4		beta-BHC	3.058	2.684	E3	12.2	91	0.00
5		Heptachlor	5.861	4.687	E3	20.0#	81	0.00
6		delta-BHC	5.885	5.783	E3	1.7	96	0.00
7		Aldrin	5.278	5.375	E3	-1.8	102	0.00
8		Heptachlor Epoxide	4.920	4.712	E3	4.2	97	0.00
9		gamma-Chlordane	4.916	4.741	E3	3.6	96	0.00
10		alpha-Chlordane	4.631	4.403	E3	4.9	97	0.00
11		Endosulfan I	3.984	3.891	E3	2.3	97	0.00
12		4,4'-DDE	3.227	3.267	E3	-1.2	103	0.00
13		Dieldrin	4.085	3.933	E3	3.7	95	0.00
14		Endrin	3.139	2.913	E3	7.2	91	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03982.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03982.D\ECD2A.CH
Acq On : 18 Jun 99 7:23 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn165,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF		%Dev	Area%	Dev(min)
15	4,4'-DDD	2.364	2.936	E3	-24.2#	119	0.00
16	Endosulfan II	3.219	3.003	E3	6.7	94	0.00
17	4,4'-DDT	1.733	0.343	E3	80.2#	21#	0.00
18	Endrin Aldehyde	1.486	1.459	E3	1.8	99	0.00
19	Endosulfan Sulfate	2.458	2.245	E3	8.7	91	0.00
20	Methoxychlor	778.049	187.787		75.9#	24#	0.00
21	Endrin Ketone	2.191	1.598	E3	27.1#	73	0.00
29 S	Decachlorobiphenyl	1.019	1.033	E3	-1.4	103	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03981.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03981.D\ECD2A.CH
Acq On : 18 Jun 99 7:02 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn165,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF		%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.119	3.767	E3	8.5	96	0.00
2		alpha-BHC	7.233	7.061	E3	2.4	96	0.00
3		gamma-BHC (Lindane)	6.407	5.557	E3	13.3	86	0.00
4		beta-BHC	2.851	2.397	E3	15.9#	86	0.00
5		Heptachlor	5.032	3.848	E3	23.5#	78	0.00
6		delta-BHC	5.396	4.974	E3	7.8	88	0.00
7		Aldrin	4.497	4.168	E3	7.3	92	0.00
8		Heptachlor Epoxide	4.444	4.051	E3	8.8	92	0.00
9		gamma-Chlordane	4.200	3.729	E3	11.2	89	0.00
10		alpha-Chlordane	4.237	3.789	E3	10.6	91	0.00
11		Endosulfan I	4.199	3.880	E3	7.6	92	0.00
12		4,4'-DDE	2.957	2.978	E3	-0.7	95	0.00
13		Dieldrin	3.658	3.469	E3	5.2	94	0.00
14		Endrin	2.809	2.605	E3	7.3	90	0.00
15		4,4'-DDD	2.416	2.757	E3	-14.1	109	0.00
16		Endosulfan II	3.046	2.599	E3	14.7	87	0.00
17		4,4'-DDT	1.697	0.294	E3	82.7#	17#	0.00
18		Endrin Aldehyde	1.911	1.797	E3	6.0	94	0.00
19		Endosulfan Sulfate	2.463	2.155	E3	12.5	89	0.00
20		Methoxychlor	813.970	173.550		78.7#	22#	0.00
21		Endrin Ketone	2.176	1.546	E3	29.0#	71	0.00
29	S	Decachlorobiphenyl	917.967	835.767		9.0	91	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.254	4.346	E3	-2.2	107	0.00
2		alpha-BHC	8.317	8.766	E3	-5.4	105	0.00
3		gamma-BHC (Lindane)	7.248	7.058	E3	2.6	98	0.00
4		beta-BHC	3.058	2.741	E3	10.4	93	0.00
5		Heptachlor	5.861	4.909	E3	16.2#	85	0.00
6		delta-BHC	5.885	5.789	E3	1.6	96	0.00
7		Aldrin	5.278	5.549	E3	-5.1	105	0.00
8		Heptachlor Epoxide	4.920	4.889	E3	0.6	100	0.00
9		gamma-Chlordane	4.916	4.854	E3	1.3	98	0.00
10		alpha-Chlordane	4.631	4.584	E3	1.0	100	0.00
11		Endosulfan I	3.984	4.002	E3	-0.5	100	0.00
12		4,4'-DDE	3.227	3.372	E3	-4.5	106	0.00
13		Dieldrin	4.085	4.155	E3	-1.7	100	0.00
14		Endrin	3.139	3.167	E3	-0.9	99	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0618PEST\MN03981.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0618PEST\MN03981.D\ECD2A.CH
Acq On : 18 Jun 99 7:02 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn165,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15	4,4'-DDD	2.364	3.155 E3	-33.5#	128	0.00
16	Endosulfan II	3.219	3.161 E3	1.8	99	0.00
17	4,4'-DDT	1.733	0.326 E3	81.2#	20#	0.00
18	Endrin Aldehyde	1.486	1.542 E3	-3.8	104	0.00
19	Endosulfan Sulfate	2.458	2.346 E3	4.6	95	0.00
20	Methoxychlor	778.049	180.086	76.9#	23#	0.00
21	Endrin Ketone	2.191	1.651 E3	24.6#	75	0.00
29 S	Decachlorobiphenyl	1.019	1.038 E3	-1.9	104	0.00

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04028.D\ECD1B.CH Vial: 32
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04028.D\ECD2A.CH
Acq On : 21 Jun 99 8:56 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.367	3.852 E3	11.8	92	0.00
2		alpha-BHC	7.596	7.034 E3	7.4	91	0.00
3		gamma-BHC (Lindane)	6.959	6.049 E3	13.1	87	0.00
4		beta-BHC	3.143	2.484 E3	21.0#	81	0.00
5		Heptachlor	6.076	5.058 E3	16.8#	85	0.00
6		delta-BHC	6.178	4.993 E3	19.2#	76	0.00
7		Aldrin	5.278	4.415 E3	16.4#	82	0.00
8		Heptachlor Epoxide	5.329	4.299 E3	19.3#	81	0.00
9		gamma-Chlordane	5.229	3.964 E3	24.2#	75	0.00
10		alpha-Chlordane	5.334	4.020 E3	24.6#	75	0.00
11		Endosulfan I	5.240	4.116 E3	21.5#	76	0.00
12		4,4'-DDE	4.012	3.104 E3	22.6#	72	0.00
13		Dieldrin	4.740	3.694 E3	22.1#	75	0.00
14		Endrin	3.783	2.948 E3	22.1#	77	0.00
15		4,4'-DDD	3.278	2.457 E3	25.0#	72	0.00
16		Endosulfan II	3.884	2.715 E3	30.1#	69	0.00
17		4,4'-DDT	2.845	1.586 E3	44.3#	51	0.00
18		Endrin Aldehyde	2.712	1.805 E3	33.4#	66	0.00
19		Endosulfan Sulfate	3.329	2.189 E3	34.2#	65	0.00
20		Methoxychlor	1.264	0.830 E3	34.3#	64	0.00
21		Endrin Ketone	3.168	2.085 E3	34.2#	64	0.00
29	S	Decachlorobiphenyl	1.176	0.690 E3	41.3#	62	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.614	4.351 E3	5.7	97	0.00
2		alpha-BHC	8.751	8.558 E3	2.2	96	0.00
3		gamma-BHC (Lindane)	7.992	7.527 E3	5.8	94	0.00
4		beta-BHC	3.301	2.792 E3	15.4#	87	0.00
5		Heptachlor	7.186	6.377 E3	11.3	89	0.00
6		delta-BHC	6.660	5.844 E3	12.3	84	0.00
7		Aldrin	6.308	5.794 E3	8.1	91	0.00
8		Heptachlor Epoxide	6.037	5.223 E3	13.5	86	0.00
9		gamma-Chlordane	6.213	5.232 E3	15.8#	83	0.00
10		alpha-Chlordane	5.914	4.907 E3	17.0#	81	0.00
11		Endosulfan I	5.120	4.332 E3	15.4#	83	0.00
12		4,4'-DDE	4.484	3.680 E3	17.9#	82	0.00
13		Dieldrin	5.316	4.531 E3	14.8	82	0.00
14		Endrin	4.380	3.653 E3	16.6#	82	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04028.D\ECD1B.CH Vial: 32
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04028.D\ECD2A.CH
Acq On : 21 Jun 99 8:56 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15		4,4'-DDD	3.382	2.739 E3	19.0#	78	0.00
16		Endosulfan II	4.304	3.335 E3	22.5#	76	0.00
17		4,4'-DDT	3.016	1.726 E3	42.8#	56	0.00
18		Endrin Aldehyde	2.159	1.581 E3	26.8#	73	0.00
19		Endosulfan Sulfate	3.450	2.521 E3	26.9#	72	0.00
20		Methoxychlor	1.305	0.913 E3	30.0#	68	0.00
21		Endrin Ketone	3.252	2.312 E3	28.9#	69	0.00
29	S	Decachlorobiphenyl	1.405	0.880 E3	37.4#	67	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD1B.CH Vial: 27
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD2A.CH
Acq On : 21 Jun 99 7:08 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.367	4.185 E3	4.2	99	0.00
2		alpha-BHC	7.596	7.571 E3	0.3	98	0.00
3		gamma-BHC (Lindane)	6.959	6.597 E3	5.2	95	0.00
4		beta-BHC	3.143	2.658 E3	15.4#	87	0.00
5		Heptachlor	6.076	5.465 E3	10.1	92	0.00
6		delta-BHC	6.178	5.552 E3	10.1	85	0.00
7		Aldrin	5.278	4.961 E3	6.0	92	0.00
8		Heptachlor Epoxide	5.329	4.900 E3	8.1	92	0.00
9		gamma-Chlordane	5.229	4.538 E3	13.2	86	0.00
10		alpha-Chlordane	5.334	4.528 E3	15.1#	85	0.00
11		Endosulfan I	5.240	4.674 E3	10.8	87	0.00
12		4,4'-DDE	4.012	3.516 E3	12.4	82	0.00
13		Dieldrin	4.740	4.194 E3	11.5	85	0.00
14		Endrin	3.783	3.303 E3	12.7	86	0.00
15		4,4'-DDD	3.278	2.725 E3	16.9#	80	0.00
16		Endosulfan II	3.884	3.073 E3	20.9#	79	0.00
17		4,4'-DDT	2.845	1.769 E3	37.8#	57	0.00
18		Endrin Aldehyde	2.712	1.991 E3	26.6#	73	0.00
19		Endosulfan Sulfate	3.329	2.453 E3	26.3#	73	0.00
20		Methoxychlor	1.264	0.851 E3	32.7#	65	0.00
21		Endrin Ketone	3.168	2.298 E3	27.5#	70	0.00
29	S	Decachlorobiphenyl	1.176	0.786 E3	33.2#	71	0.00
		Signal #2					
1	S	Tetrachloro-m-xylene	4.614	4.705 E3	-2.0	105	0.00
2		alpha-BHC	8.751	9.203 E3	-5.2	104	0.00
3		gamma-BHC (Lindane)	7.992	8.106 E3	-1.4	101	0.00
4		beta-BHC	3.301	3.043 E3	7.8	94	0.00
5		Heptachlor	7.186	6.798 E3	5.4	95	0.00
6		delta-BHC	6.660	6.446 E3	3.2	93	0.00
7		Aldrin	6.308	6.325 E3	-0.3	100	0.00
8		Heptachlor Epoxide	6.037	5.753 E3	4.7	95	0.00
9		gamma-Chlordane	6.213	5.811 E3	6.5	92	0.00
10		alpha-Chlordane	5.914	5.555 E3	6.1	92	0.00
11		Endosulfan I	5.120	4.791 E3	6.4	92	0.00
12		4,4'-DDE	4.484	4.010 E3	10.6	89	0.00
13		Dieldrin	5.316	5.015 E3	5.7	91	0.00
14		Endrin	4.380	3.956 E3	9.7	88	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD1B.CH Vial: 27
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD2A.CH
Acq On : 21 Jun 99 7:08 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15	4,4'-DDD	3.382	2.914 E3	13.8	83	0.00
16	Endosulfan II	4.304	3.624 E3	15.8#	83	0.00
17	4,4'-DDT	3.016	1.842 E3	38.9#	59	0.00
18	Endrin Aldehyde	2.159	1.682 E3	22.1#	78	0.00
19	Endosulfan Sulfate	3.450	2.684 E3	22.2#	76	0.00
20	Methoxychlor	1.305	0.890 E3	31.8#	66	0.00
21	Endrin Ketone	3.252	2.410 E3	25.9#	72	0.00
29 S	Decachlorobiphenyl	1.405	0.962 E3	31.5#	73	0.00

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04012.D\ECD1B.CH Vial: 16
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04012.D\ECD2A.CH
Acq On : 21 Jun 99 3:00 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.367	4.272 E3	2.2	101	0.00
2		alpha-BHC	7.596	7.984 E3	-5.1	103	0.00
3		gamma-BHC (Lindane)	6.959	7.231 E3	-3.9	104	0.00
4		beta-BHC	3.143	3.066 E3	2.4	100	0.00
5		Heptachlor	6.076	6.165 E3	-1.5	103	0.00
6		delta-BHC	6.178	6.388 E3	-3.4	98	0.00
7		Aldrin	5.278	5.226 E3	1.0	97	0.00
8		Heptachlor Epoxide	5.329	5.266 E3	1.2	99	0.00
9		gamma-Chlordane	5.229	5.174 E3	1.1	98	0.00
10		alpha-Chlordane	5.334	5.202 E3	2.5	97	0.00
11		Endosulfan I	5.240	5.279 E3	-0.7	98	0.00
12		4,4'-DDE	4.012	4.113 E3	-2.5	96	0.00
13		Dieldrin	4.740	4.767 E3	-0.6	97	0.00
14		Endrin	3.783	3.683 E3	2.6	96	0.00
15		4,4'-DDD	3.278	3.247 E3	0.9	95	0.00
16		Endosulfan II	3.884	3.716 E3	4.3	95	0.00
17		4,4'-DDT	2.845	2.865 E3	-0.7	93	0.00
18		Endrin Aldehyde	2.712	2.526 E3	6.9	93	0.00
19		Endosulfan Sulfate	3.329	3.158 E3	5.1	94	0.00
20		Methoxychlor	1.264	1.206 E3	4.6	92	0.00
21		Endrin Ketone	3.168	3.070 E3	3.1	94	0.00
29	S	Decachlorobiphenyl	1.176	0.938 E3	20.2#	85	0.00
		Signal #2					
1	S	Tetrachloro-m-xylene	4.614	4.760 E3	-3.2	106	0.00
2		alpha-BHC	8.751	9.392 E3	-7.3	106	0.00
3		gamma-BHC (Lindane)	7.992	8.694 E3	-8.8	108	0.00
4		beta-BHC	3.301	3.353 E3	-1.6	104	0.00
5		Heptachlor	7.186	7.446 E3	-3.6	104	0.00
6		delta-BHC	6.660	7.229 E3	-8.5	104	0.00
7		Aldrin	6.308	6.670 E3	-5.7	105	0.00
8		Heptachlor Epoxide	6.037	6.189 E3	-2.5	102	0.00
9		gamma-Chlordane	6.213	6.553 E3	-5.5	103	0.00
10		alpha-Chlordane	5.914	6.104 E3	-3.2	101	0.00
11		Endosulfan I	5.120	5.214 E3	-1.8	100	0.00
12		4,4'-DDE	4.484	4.632 E3	-3.3	103	0.00
13		Dieldrin	5.316	5.637 E3	-6.0	102	0.00
14		Endrin	4.380	4.470 E3	-2.1	100	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04012.D\ECD1B.CH Vial: 16
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04012.D\ECD2A.CH
Acq On : 21 Jun 99 3:00 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15	4,4'-DDD	3.382	3.508 E3	-3.7	100	0.00
16	Endosulfan II	4.304	4.375 E3	-1.6	100	0.00
17	4,4'-DDT	3.016	3.005 E3	0.4	97	0.00
18	Endrin Aldehyde	2.159	2.084 E3	3.5	96	0.00
19	Endosulfan Sulfate	3.450	3.365 E3	2.5	96	0.00
20	Methoxychlor	1.305	1.260 E3	3.4	93	0.00
21	Endrin Ketone	3.252	3.260 E3	-0.2	97	0.00
29 S	Decachlorobiphenyl	1.405	1.134 E3	19.3#	86	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04035.D\ECD1B.CH Vial: 39
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04035.D\ECD2A.CH
Acq On : 21 Jun 99 11:29 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.367	3.986 E3	8.7	95	0.00
2		alpha-BHC	7.596	7.325 E3	3.6	95	0.00
3		gamma-BHC (Lindane)	6.959	6.198 E3	10.9	89	0.00
4		beta-BHC	3.143	2.416 E3	23.1#	79	0.00
5		Heptachlor	6.076	4.780 E3	21.3#	80	0.00
6		delta-BHC	6.178	4.919 E3	20.4#	75	0.00
7		Aldrin	5.278	4.535 E3	14.1	84	0.00
8		Heptachlor Epoxide	5.329	4.362 E3	18.1#	82	0.00
9		gamma-Chlordane	5.229	3.989 E3	23.7#	76	0.00
10		alpha-Chlordane	5.334	4.085 E3	23.4#	77	0.00
11		Endosulfan I	5.240	4.105 E3	21.7#	76	0.00
12		4,4'-DDE	4.012	3.053 E3	23.9#	71	0.00
13		Dieldrin	4.740	3.693 E3	22.1#	75	0.00
14		Endrin	3.783	2.866 E3	24.2#	74	0.00
15		4,4'-DDD	3.278	2.477 E3	24.4#	73	0.00
16		Endosulfan II	3.884	2.625 E3	32.4#	67	0.00
17		4,4'-DDT	2.845	1.153 E3	59.5#	37#	0.00
18		Endrin Aldehyde	2.712	1.735 E3	36.0#	64	0.00
19		Endosulfan Sulfate	3.329	2.069 E3	37.8#	62	0.00
20		Methoxychlor	1.264	0.605 E3	52.1#	46#	0.00
21		Endrin Ketone	3.168	1.810 E3	42.9#	55	0.00
29	S	Decachlorobiphenyl	1.176	0.626 E3	46.8#	56	0.00
		Signal #2					
1	S	Tetrachloro-m-xylene	4.614	4.474 E3	3.0	100	0.00
2		alpha-BHC	8.751	8.971 E3	-2.5	101	0.00
3		gamma-BHC (Lindane)	7.992	7.524 E3	5.9	94	0.00
4		beta-BHC	3.301	2.791 E3	15.4#	86	0.00
5		Heptachlor	7.186	5.977 E3	16.8#	84	0.00
6		delta-BHC	6.660	5.767 E3	13.4	83	0.00
7		Aldrin	6.308	5.835 E3	7.5	92	0.00
8		Heptachlor Epoxide	6.037	5.208 E3	13.7	86	0.00
9		gamma-Chlordane	6.213	5.196 E3	16.4#	82	0.00
10		alpha-Chlordane	5.914	4.870 E3	17.7#	81	0.00
11		Endosulfan I	5.120	4.239 E3	17.2#	81	0.00
12		4,4'-DDE	4.484	3.502 E3	21.9#	78	0.00
13		Dieldrin	5.316	4.437 E3	16.5#	81	0.00
14		Endrin	4.380	3.456 E3	21.1#	77	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04035.D\ECD1B.CH Vial: 39
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04035.D\ECD2A.CH
Acq On : 21 Jun 99 11:29 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF		%Dev	Area%	Dev(min)
15	4,4'-DDD	3.382	2.754	E3	18.6#	78	0.00
16	Endosulfan II	4.304	3.133	E3	27.2#	71	0.00
17	4,4'-DDT	3.016	1.208	E3	59.9#	39#	0.00
18	Endrin Aldehyde	2.159	1.447	E3	33.0#	67	0.00
19	Endosulfan Sulfate	3.450	2.241	E3	35.0#	64	0.00
20	Methoxychlor	1.305	0.647	E3	50.4#	48#	0.00
21	Endrin Ketone	3.252	1.928	E3	40.7#	57	0.00
29 S	Decachlorobiphenyl	1.405	0.791	E3	43.7#	60	0.00

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0614PEST\MN03878.D\ECD1B.CH Vial: 33
Signal #2 : C:\HPCHEM\2\DATA\0614PEST\MN03878.D\ECD2A.CH
Acq On : 15 Jun 99 12:34 am Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn161,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Mon Jun 14 17:18:27 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF		%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.199	3.933	E3	6.3	95	0.00
2		alpha-BHC	7.396	7.436	E3	-0.5	96	0.00
3		gamma-BHC (Lindane)	6.767	5.983	E3	11.6	87	0.00
4		beta-BHC	3.098	2.598	E3	16.1#	84	0.00
5		Heptachlor	5.769	3.775	E3	34.6#	65	0.00
6		delta-BHC	6.078	5.605	E3	7.8	86	0.00
7		Aldrin	5.067	4.788	E3	5.5	91	0.00
8		Heptachlor Epoxide	5.230	4.704	E3	10.1	88	0.00
9		gamma-Chlordane	5.129	4.610	E3	10.1	87	0.00
0		alpha-Chlordane	5.228	4.594	E3	12.1	86	0.00
1		Endosulfan I	5.171	4.742	E3	8.3	88	0.00
2		4,4'-DDE	3.956	3.693	E3	6.6	86	0.00
3		Dieldrin	4.675	4.306	E3	7.9	86	0.00
4		Endrin	3.749	2.675	E3	28.6#	69	0.00
5		4,4'-DDD	3.327	3.190	E3	4.1	89	0.00
6		Endosulfan II	4.157	3.497	E3	15.9#	82	0.00
7		4,4'-DDT	3.166	0.480	E3	84.8#	14#	0.00
8		Endrin Aldehyde	2.927	2.181	E3	25.5#	72	0.00
9		Endosulfan Sulfate	3.626	2.779	E3	23.4#	74	0.00
0		Methoxychlor	1.507	0.298	E3	80.2#	19#	0.00
1		Endrin Ketone	3.578	1.508	E3	57.9#	40#	0.00
2	S	Decachlorobiphenyl	1.646	0.926	E3	43.7#	61	0.00

Signal #2

	S	Tetrachloro-m-xylene	4.224	4.210	E3	0.3	101	0.00
		alpha-BHC	8.375	8.686	E3	-3.7	100	0.00
		gamma-BHC (Lindane)	7.576	6.816	E3	10.0	88	0.00
		beta-BHC	3.201	2.820	E3	11.9	90	0.00
		Heptachlor	6.592	4.412	E3	33.1#	66	0.00
		delta-BHC	6.321	6.217	E3	1.6	93	0.00
		Aldrin	5.759	5.786	E3	-0.5	97	0.00
		Heptachlor Epoxide	5.671	5.449	E3	3.9	94	0.00
		gamma-Chlordane	6.035	5.795	E3	4.0	92	0.00
		alpha-Chlordane	5.739	5.361	E3	6.6	90	0.00
		Endosulfan I	4.891	4.626	E3	5.4	91	0.00
		4,4'-DDE	4.276	4.024	E3	5.9	91	0.00
		Dieldrin	5.187	4.990	E3	3.8	91	0.00
		Endrin	4.194	2.884	E3	31.2#	65	0.00

#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0614PEST\MN03878.D\ECD1B.CH Vial: 33
Signal #2 : C:\HPCHEM\2\DATA\0614PEST\MN03878.D\ECD2A.CH
Acq On : 15 Jun 99 12:34 am Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn161,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Mon Jun 14 17:18:27 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15		4,4'-DDD	3.256	3.396 E3	-4.3	96	0.00
16		Endosulfan II	4.420	3.895 E3	11.9	85	0.00
17		4,4'-DDT	3.048	0.545 E3	82.1#	16#	0.00
18		Endrin Aldehyde	2.251	1.771 E3	21.3#	76	0.00
19		Endosulfan Sulfate	3.602	2.871 E3	20.3#	75	0.00
20		Methoxychlor	1.467	0.272 E3	81.5#	17#	0.00
21		Endrin Ketone	3.581	1.643 E3	54.1#	42#	0.00
29	S	Decachlorobiphenyl	1.704	1.079 E3	36.7#	64	0.00

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0614PEST\MN03869.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0614PEST\MN03869.D\ECD2A.CH
Acq On : 14 Jun 99 9:18 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn161,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Mon Jun 14 17:18:27 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.199	3.916 E3	6.7	95	0.00
2		alpha-BHC	7.396	7.273 E3	1.7	94	0.00
3		gamma-BHC (Lindane)	6.767	5.807 E3	14.2	84	0.00
4		beta-BHC	3.098	2.611 E3	15.7#	85	0.00
5		Heptachlor	5.769	3.728 E3	35.4#	64	0.00
6		delta-BHC	6.078	5.692 E3	6.4	88	0.00
7		Aldrin	5.067	4.759 E3	6.1	90	0.00
8		Heptachlor Epoxide	5.230	4.635 E3	11.4	87	0.00
9		gamma-Chlordane	5.129	4.571 E3	10.9	86	0.00
10		alpha-Chlordane	5.228	4.497 E3	14.0	84	0.00
11		Endosulfan I	5.171	4.580 E3	11.4	85	0.00
12		4,4'-DDE	3.956	3.628 E3	8.3	85	0.00
13		Dieldrin	4.675	4.200 E3	10.2	84	0.00
14		Endrin	3.749	2.829 E3	24.5#	72	0.00
15		4,4'-DDD	3.327	3.156 E3	5.1	88	0.00
16		Endosulfan II	4.157	3.405 E3	18.1#	80	0.00
17		4,4'-DDT	3.166	0.521 E3	83.5#	15#	0.00
18		Endrin Aldehyde	2.927	2.112 E3	27.8#	70	0.00
19		Endosulfan Sulfate	3.626	2.780 E3	23.3#	74	0.00
20		Methoxychlor	1.507	0.331 E3	78.0#	21#	0.00
21		Endrin Ketone	3.578	1.585 E3	55.7#	42#	0.00
29	S	Decachlorobiphenyl	1.646	1.076 E3	34.6#	71	0.00
		Signal #2					
1	S	Tetrachloro-m-xylene	4.224	4.127 E3	2.3	99	0.00
2		alpha-BHC	8.375	8.559 E3	-2.2	99	0.00
3		gamma-BHC (Lindane)	7.576	6.810 E3	10.1	88	0.00
4		beta-BHC	3.201	2.795 E3	12.7	89	0.00
5		Heptachlor	6.592	4.357 E3	33.9#	65	0.00
6		delta-BHC	6.321	6.189 E3	2.1	92	0.00
7		Aldrin	5.759	5.658 E3	1.8	95	0.00
8		Heptachlor Epoxide	5.671	5.277 E3	6.9	91	0.00
9		gamma-Chlordane	6.035	5.579 E3	7.6	88	0.00
.0		alpha-Chlordane	5.739	5.156 E3	10.2	87	0.00
.1		Endosulfan I	4.891	4.534 E3	7.3	90	0.00
.2		4,4'-DDE	4.276	3.825 E3	10.5	86	0.00
.3		Dieldrin	5.187	4.799 E3	7.5	87	0.00
.4		Endrin	4.194	3.117 E3	25.7#	70	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0614PEST\MN03869.D\ECD1B.CH Vial: 24
Signal #2 : C:\HPCHEM\2\DATA\0614PEST\MN03869.D\ECD2A.CH
Acq On : 14 Jun 99 9:18 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn161,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Mon Jun 14 17:18:27 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15		4,4'-DDD	3.256	3.241 E3	0.5	92	0.00
16		Endosulfan II	4.420	3.692 E3	16.5#	80	0.00
17		4,4'-DDT	3.048	0.562 E3	81.6#	17#	0.00
18		Endrin Aldehyde	2.251	1.669 E3	25.9#	71	0.00
19		Endosulfan Sulfate	3.602	2.834 E3	21.3#	74	0.00
20		Methoxychlor	1.467	0.335 E3	77.2#	21#	0.00
21		Endrin Ketone	3.581	1.691 E3	52.8#	44#	0.00
29	S	Decachlorobiphenyl	1.704	1.215 E3	28.7#	72	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03834.D\ECD1B.CH Vial: 17
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03834.D\ECD2A.CH
Acq On : 12 Jun 99 9:39 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn160,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.149	4.187 E3	-0.9	101	0.00
2		alpha-BHC	7.246	7.871 E3	-8.6	102	0.00
3		gamma-BHC (Lindane)	6.629	6.990 E3	-5.4	100	0.00
4		beta-BHC	3.020	3.095 E3	-2.5	102	0.00
5		Heptachlor	5.215	5.245 E3	-0.6	98	0.00
6		delta-BHC	5.792	6.451 E3	-11.4	103	0.00
7		Aldrin	4.945	5.119 E3	-3.5	98	0.00
8		Heptachlor Epoxide	5.082	5.263 E3	-3.6	101	0.00
9		gamma-Chlordane	4.988	5.109 E3	-2.4	100	0.00
.0		alpha-Chlordane	5.100	5.131 E3	-0.6	99	0.00
.1		Endosulfan I	4.947	5.157 E3	-4.2	100	0.00
.2		4,4'-DDE	3.749	4.127 E3	-10.1	103	0.00
.3		Dieldrin	4.467	4.702 E3	-5.3	101	0.00
.4		Endrin	3.634	3.659 E3	-0.7	97	0.00
.5		4,4'-DDD	3.036	3.933 E3	-29.5#	127	0.00
.6		Endosulfan II	3.793	3.803 E3	-0.3	101	0.00
7		4,4'-DDT	2.718	1.224 E3	55.0#	45#	0.00
8		Endrin Aldehyde	2.555	2.672 E3	-4.6	108	0.00
9		Endosulfan Sulfate	3.216	3.279 E3	-2.0	105	0.00
0		Methoxychlor	1.171	0.688 E3	41.2#	61	0.00
1		Endrin Ketone	3.072	2.880 E3	6.3	95	0.00
9	S	Decachlorobiphenyl	1.229	1.045 E3	15.0	96	0.00

Signal #2

1	S	Tetrachloro-m-xylene	3.996	4.161 E3	-4.1	103	0.00
2		alpha-BHC	7.748	8.902 E3	-14.9	109	0.00
3		gamma-BHC (Lindane)	7.036	7.847 E3	-11.5	106	0.00
4		beta-BHC	2.923	3.257 E3	-11.4	110	0.00
5		Heptachlor	6.000	6.008 E3	-0.1	97	0.00
6		delta-BHC	5.714	6.850 E3	-19.9#	112	0.00
7		Aldrin	5.443	6.009 E3	-10.4	106	0.00
8		Heptachlor Epoxide	5.259	5.762 E3	-9.6	106	0.00
9		gamma-Chlordane	5.487	6.150 E3	-12.1	107	0.00
)		alpha-Chlordane	5.292	5.798 E3	-9.6	107	0.00
.		Endosulfan I	4.452	4.893 E3	-9.9	106	0.00
:		4,4'-DDE	3.837	4.378 E3	-14.1	114	0.00
:		Dieldrin	4.804	5.322 E3	-10.8	105	0.00
:		Endrin	3.936	3.878 E3	1.5	95	0.00

#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03834.D\ECD1B.CH Vial: 17
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03834.D\ECD2A.CH
Acq On : 12 Jun 99 9:39 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn160,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15		4,4'-DDD	2.832	3.973 E3	-40.3#	137	0.00
16		Endosulfan II	3.899	4.073 E3	-4.5	103	0.00
17		4,4'-DDT	2.548	1.223 E3	52.0#	46#	0.00
18		Endrin Aldehyde	1.877	2.105 E3	-12.1	113	0.00
19		Endosulfan Sulfate	3.074	3.298 E3	-7.3	110	0.00
20		Methoxychlor	1.177	0.679 E3	42.3#	60	0.00
21		Endrin Ketone	2.953	2.990 E3	-1.3	103	0.00
29	S	Decachlorobiphenyl	1.257	1.161 E3	7.6	105	0.00

MD250

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03820.D\ECD1B.CH Vial: 3
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03820.D\ECD2A.CH
Acq On : 12 Jun 99 4:26 pm Operator: stephw
Sample : 40ppb ccv p439 Inst : ECD 2
Misc : op,gmn160,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.149	4.321 E3	-4.1	104	0.01
2		alpha-BHC	7.246	8.218 E3	-13.4	106	0.00
3		gamma-BHC (Lindane)	6.629	7.371 E3	-11.2	105	0.00
4		beta-BHC	3.020	3.216 E3	-6.5	106	0.01
5		Heptachlor	5.215	5.491 E3	-5.3	103	0.01
6		delta-BHC	5.792	6.624 E3	-14.4	105	0.01
7		Aldrin	4.945	5.382 E3	-8.8	103	0.01
8		Heptachlor Epoxide	5.082	5.312 E3	-4.5	101	0.01
9		gamma-Chlordane	4.988	5.198 E3	-4.2	101	0.01
10		alpha-Chlordane	5.100	5.237 E3	-2.7	101	0.01
11		Endosulfan I	4.947	5.147 E3	-4.0	100	0.01
12		4,4'-DDE	3.749	4.094 E3	-9.2	103	0.01
13		Dieldrin	4.467	4.586 E3	-2.7	98	0.01
14		Endrin	3.634	3.642 E3	-0.2	97	0.01
15		4,4'-DDD	3.036	3.413 E3	-12.4	110	0.01
16		Endosulfan II	3.793	3.782 E3	0.3	100	0.01
17		4,4'-DDT	2.718	2.421 E3	10.9	88	0.01
18		Endrin Aldehyde	2.555	2.653 E3	-3.8	107	0.01
19		Endosulfan Sulfate	3.216	3.319 E3	-3.2	106	0.01
20		Methoxychlor	1.171	1.033 E3	11.8	92	0.01
21		Endrin Ketone	3.072	3.184 E3	-3.6	105	0.02
29	S	Decachlorobiphenyl	1.229	1.023 E3	16.8#	94	0.03

Signal #2

1	S	Tetrachloro-m-xylene	3.996	4.081 E3	-2.1	101	0.01
2		alpha-BHC	7.748	8.467 E3	-9.3	104	0.01
3		gamma-BHC (Lindane)	7.036	7.766 E3	-10.4	105	0.01
4		beta-BHC	2.923	3.150 E3	-7.8	106	0.01
5		Heptachlor	6.000	6.417 E3	-6.9	103	0.01
6		delta-BHC	5.714	6.454 E3	-13.0	105	0.01
7		Aldrin	5.443	5.770 E3	-6.0	101	0.01
8		Heptachlor Epoxide	5.259	5.425 E3	-3.2	100	0.01
9		gamma-Chlordane	5.487	5.787 E3	-5.5	101	0.01
10		alpha-Chlordane	5.292	5.478 E3	-3.5	101	0.01
11		Endosulfan I	4.452	4.603 E3	-3.4	100	0.01
12		4,4'-DDE	3.837	3.987 E3	-3.9	104	0.01
13		Dieldrin	4.804	4.991 E3	-3.9	99	0.01
14		Endrin	3.936	3.971 E3	-0.9	97	0.01

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03820.D\ECD1B.CH Vial: 3
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03820.D\ECD2A.CH
Acq On : 12 Jun 99 4:26 pm Operator: stephw
Sample : 40ppb ccv p439 Inst : ECD 2
Misc : op,gmn160,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
15	4,4'-DDD	2.832	3.208 E3	-13.3	110	0.01
16	Endosulfan II	3.899	3.885 E3	0.4	98	0.01
17	4,4'-DDT	2.548	2.323 E3	8.8	88	0.01
18	Endrin Aldehyde	1.877	2.026 E3	-7.9	109	0.01
19	Endosulfan Sulfate	3.074	3.198 E3	-4.0	106	0.01
20	Methoxychlor	1.177	1.086 E3	7.7	95	0.01
21	Endrin Ketone	2.953	3.029 E3	-2.6	104	0.01
29 S	Decachlorobiphenyl	1.257	1.055 E3	16.1#	95	0.02

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03845.D\ECD1B.CH Vial: 28
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03845.D\ECD2A.CH
Acq On : 13 Jun 99 1:38 am
Sample : 40ppb ccv
Misc : op844,gmn160,water,,,10,
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Operator: stephw
Inst : ECD 2
Multiplr: 1.00

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	S	Tetrachloro-m-xylene	4.149	4.217 E3	-1.6	101	0.00
2		alpha-BHC	7.246	8.128 E3	-12.2	105	0.00
3		gamma-BHC (Lindane)	6.629	6.054 E3	8.7	86	0.00
4		beta-BHC	3.020	2.880 E3	4.6	95	0.00
5		Heptachlor	5.215	2.912 E3	44.2#	54	0.00
6		delta-BHC	5.792	6.362 E3	-9.8	101	0.00
7		Aldrin	4.945	5.055 E3	-2.2	97	0.00
8		Heptachlor Epoxide	5.082	5.178 E3	-1.9	99	0.00
9		gamma-Chlordane	4.988	5.103 E3	-2.3	100	0.00
10		alpha-Chlordane	5.100	5.078 E3	0.4	98	0.00
11		Endosulfan I	4.947	5.183 E3	-4.8	101	0.00
12		4,4'-DDE	3.749	4.129 E3	-10.1	104	0.00
13		Dieldrin	4.467	4.822 E3	-7.9	104	0.00
14		Endrin	3.634	2.822 E3	22.3#	75	0.00
15		4,4'-DDD	3.036	3.844 E3	-26.6#	124	0.00
16		Endosulfan II	3.793	3.663 E3	3.4	97	0.00
17		4,4'-DDT	2.718	0.124 E3	95.4#	5#	0.00
18		Endrin Aldehyde	2.555	2.432 E3	4.8	98	0.00
19		Endosulfan Sulfate	3.216	3.054 E3	5.0	98	0.00
20		Methoxychlor	1.171	0.098 E3	91.6#	9#	0.00
21		Endrin Ketone	3.072	1.349 E3	56.1#	44#	0.00
	S	Decachlorobiphenyl	1.229	1.005 E3	18.2#	93	0.00

Signal #2

	S	Tetrachloro-m-xylene	3.996	4.385 E3	-9.7	108	0.00
		alpha-BHC	7.748	9.305 E3	-20.1#	114	0.00
		gamma-BHC (Lindane)	7.036	6.872 E3	2.3	93	0.00
		beta-BHC	2.923	3.070 E3	-5.0	103	0.00
		Heptachlor	6.000	3.266 E3	45.6#	53	0.00
		delta-BHC	5.714	6.916 E3	-21.0#	113	0.00
		Aldrin	5.443	6.289 E3	-15.5#	111	0.00
		Heptachlor Epoxide	5.259	5.793 E3	-10.2	107	0.00
		gamma-Chlordane	5.487	6.270 E3	-14.3	109	0.00
		alpha-Chlordane	5.292	5.837 E3	-10.3	108	0.00
		Endosulfan I	4.452	5.021 E3	-12.8	109	0.00
		4,4'-DDE	3.837	4.523 E3	-17.9#	118	0.00
		Dieldrin	4.804	5.352 E3	-11.4	106	0.00
		Endrin	3.936	2.896 E3	26.4#	71	0.00

= Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0612PEST\MN03845.D\ECD1B.CH Vial: 28
Signal #2 : C:\HPCHEM\2\DATA\0612PEST\MN03845.D\ECD2A.CH
Acq On : 13 Jun 99 1:38 am Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op844,gmn160,water,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Thu Jun 03 16:16:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
.5		4,4'-DDD	2.832	4.006 E3	-41.5#	138	0.00
.6		Endosulfan II	3.899	4.034 E3	-3.5	102	0.00
.7		4,4'-DDT	2.548	0.214 E3	91.6#	8#	-0.02
.8		Endrin Aldehyde	1.877	1.924 E3	-2.5	104	0.00
.9		Endosulfan Sulfate	3.074	3.132 E3	-1.9	104	0.00
0		Methoxychlor	1.177	0.096 E3	91.8#	8#	0.00
1		Endrin Ketone	2.953	1.362 E3	53.9#	47#	0.00
9	S	Decachlorobiphenyl	1.257	1.155 E3	8.1	104	0.00

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 8082 **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S2 [a]
F4273-1	AB09148.D	94.0	99.0
F4273-2	AB09149.D	108.0	117.0
F4273-3	AB09150.D	90.0	90.0
OP843-BS	AB09147.D	97.0	101.0
OP843-MB	AB09146.D	104.0	113.0
OP843-MS	AB09165.D	89.0	96.0
OP843-MSD	AB09166.D	95.0	102.0

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	30-160%
S2 = Decachlorobiphenyl	30-160%

(a) Recovery from GC signal #1

Semivolatile Surrogate Recovery Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Method: SW846 8082 **Matrix:** SO

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1 [a]	S2 [a]
F4273-5	AB09208.D	103.0	110.0
F4273-6	AB09209.D	100.0	101.0
F4273-8	AB09210.D	107.0	108.0
F4273-10	AB09211.D	110.0	108.0
F4273-12	AB09212.D	107.0	108.0
F4273-14	AB09213.D	105.0	99.0
OP851-BS	AB09206.D	103.0	101.0
OP851-MB	AB09205.D	97.0	88.0
OP851-MB	AB09236.D	99.0	86.0
OP851-MS	AB09216.D	123.0	89.0
OP851-MSD	AB09217.D	98.0	76.0

Surrogate Compounds	Recovery Limits
S1 = Tetrachloro-m-xylene	40-150%
S2 = Decachlorobiphenyl	30-160%

(a) Recovery from GC signal #1

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP843-MB	AB09146.D	1	06/14/99	SKW	06/11/99	OP843	GAB345

The QC reported here applies to the following samples: **Method:** SW846 8082

F4273-1, F4273-2, F4273-3

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.50	ug/l	
11104-28-2	Aroclor 1221	ND	0.50	ug/l	
11141-16-5	Aroclor 1232	ND	0.50	ug/l	
53469-21-9	Aroclor 1242	ND	0.50	ug/l	
12672-29-6	Aroclor 1248	ND	0.50	ug/l	
11097-69-1	Aroclor 1254	ND	0.50	ug/l	
11096-82-5	Aroclor 1260	ND	0.50	ug/l	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	104%	30-160%
2051-24-3	Decachlorobiphenyl	113%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Ba
OP851-MB	AB09205.D	1	06/16/99	SKW	06/16/99	OP851	GAB347

The QC reported here applies to the following samples: **Method:** SW846 8082

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	33	ug/kg	
11104-28-2	Aroclor 1221	ND	33	ug/kg	
11141-16-5	Aroclor 1232	ND	33	ug/kg	
53469-21-9	Aroclor 1242	ND	33	ug/kg	
12672-29-6	Aroclor 1248	ND	33	ug/kg	
11097-69-1	Aroclor 1254	ND	33	ug/kg	
11096-82-5	Aroclor 1260	ND	33	ug/kg	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	97%	40-150%
2051-24-3	Decachlorobiphenyl	88%	30-160%

Method Blank Summary

Job Number: F4273
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP851-MB	AB09236.D	1	06/17/99	SKW	06/16/99	OP851	GAB348

The QC reported here applies to the following samples: **Method:** SW846 8082

F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	33	ug/kg	
11104-28-2	Aroclor 1221	ND	33	ug/kg	
11141-16-5	Aroclor 1232	ND	33	ug/kg	
53469-21-9	Aroclor 1242	ND	33	ug/kg	
12672-29-6	Aroclor 1248	ND	33	ug/kg	
11097-69-1	Aroclor 1254	ND	33	ug/kg	
11096-82-5	Aroclor 1260	ND	33	ug/kg	

CAS No.	Surrogate Recoveries		Limits
877-09-8	Tetrachloro-m-xylene	99%	40-150%
2051-24-3	Decachlorobiphenyl	86%	30-160%

005699

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-092

TO:	**M. SPERANZA**	**DATE:**	**JULY 14, 1999**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS**
CTO 078 - CECIL FIELD
SDG – F4273

SAMPLES: 3/Aqueous/

CEF-P48-SW-008	CEF-P48-SW-009	CEF-P48-SW-DU01

6/Sediments/

CEF-P48-SD-001	CEF-P48-SD-002	CEF-P48-SD-003
CEF-P48-SD-004	CEF-P48-SD-005	CEF-P48-SD-DU01

Overview

The sample set for CTO 078, Cecil Field, SDG F4273, consists of three (3) aqueous and six (6) soil environmental samples. Two (2) field duplicate pairs (CEF-P48-SW-009 / CEF-P48-SW-DU01 and CEF-P48-SD-002 / CEF-P48-SD-DU01) were included within this SDG.

The samples were analyzed for target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on June 7, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA / QC) criteria. Metals analyses, with the exception of mercury, were conducted using SW 846 method 6010B. Mercury analyses were conducted using SW 846 method 7470A.

The data was evaluated based on the following parameters:

- * Data Completeness
- * Holding Times
- Calibration Verifications
- Laboratory Blank Analyses
- Field Duplicate Imprecision

* - All quality control criteria were met for this parameter.

Laboratory Blank Analyses

The following contaminant was present in a laboratory method / preparation blanks at the following maximum concentration:

APPENIDX A
QUALIFIED ANALYTICAL RESULTS

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-008			CEF-P48-SW-009			CEF-P48-SW-DU01					
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			/ /		
LABORATORY ID:	F4273-2			F4273-1			F4273-3					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	0.0 %			0.0 %			0.0 %			100.0 %		
UNITS:	UG/L			UG/L			UG/L					
FIELD DUPLICATE OF:							CEF-P48-SW-009					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	253			253			292					
ANTIMONY	2.4	U		2.4	U		2.4	U				
ARSENIC	3.4	U		3.4	U		3.4	U				
BARIUM	36.4			27.1			27.2					
BERYLLIUM	0.61	U	A	0.42	U	A	0.63	U	A			
CADMIUM	0.33	U		0.33	U		0.33	U				
CALCIUM	15100			15000			15100					
CHROMIUM	1.0	U	A	8.3	U	A	1.0	U	A			
COBALT	0.80	U		0.80	U		0.80	U				
COPPER	0.75	U		0.75	U		0.75	U				
IRON	1320			1270			1310					
LEAD	1.6	U		2.7	U	A	3.6	U	A			
MAGNESIUM	3170			3300			3340					
MANGANESE	10.3			13.5			14.1					
MERCURY	0.25	U		0.25	U		0.25	U				
NICKEL	1.0	U		1.0	U		1.0	U				
POTASSIUM	1070			1030			1030					
SELENIUM	2.0	U		2.0	U		2.0	U				
SILVER	0.96	U		0.96	U		0.96	U				
SODIUM	6180			6090			6350					
THALLIUM	2.7	U		2.7	U		2.7	U				
VANADIUM	1.7	U	A	2.8	U	A	2.7	U	A			
ZINC	4.8	U	A	8.6			9.3					

CTO78 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-001			CEF-P48-SD-002			CEF-P48-SD-003			CEF-P48-SD-004		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-12			F4273-10			F4273-6			F4273-5		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	19.6 %			49.8 %			57.0 %			23.2 %		
UNITS:	MG/KG			MG/KG			MG/KG			MG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	10300	J	Y	2580			1950			2630	J	Y
ANTIMONY	1.3	U	A	0.48	U		0.42	U		1.0	U	
ARSENIC	1.8	U		0.69	U		0.61	U		1.5	U	
BARIUM	69.2	J	Y	14.8			14.2			16.8	J	Y
BERYLLIUM	1.6	U	A	0.57	U	A	0.51	U	A	0.94	U	A
CADMIUM	1.6	U	A	0.42	U	A	0.32	U	A	0.45	U	A
CALCIUM	11700	J	Y	1360			1350			1510	J	Y
CHROMIUM	14.7	J	G	3.5	J	G	2.9	J	G	3.7	J	G
COBALT	2.7	J	G	0.77			0.43			0.68	J	Y
COPPER	42.2	J	G	8.9			6.5			12.8	J	Y
IRON	7460	J	G	1550			1310			1480	J	Y
LEAD	52.5	J	G	13.4			9.6			16.5	J	Y
MAGNESIUM	2690	J	G	202			182			232	J	Y
MANGANESE	38.8	J	G	7.4			9.2			11.9	J	Y
MERCURY	0.21	U		0.08	U		0.07	U		0.18	U	
NICKEL	7.3	J	GY	1.9	J	G	1.6	J	G	2.9	J	GY
POTASSIUM	244	U	A	68.2	U	A	61.7	U	A	121	U	A
SELENIUM	1.0	U	A	0.41	U		0.36	U		0.88	U	
SILVER	0.55	U	A	0.22	U	A	0.25	U	A	0.42	U	
SODIUM	152	J	Y	42.5			54.1			170	J	Y
THALLIUM	1.4	U		0.54	U		0.47	U		2.0	U	A
VANADIUM	15.5	J	Y	4.3			3.2			4.9	J	Y
ZINC	162	J	Y	39.3			28.3			47.7	J	Y

CTO78 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-005			CEF-P48-SD-DU01			/ /			/ /		
SAMPLE DATE:	06/07/99			06/07/99								
LABORATORY ID:	F4273-14			F4273-8								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	49.7 %			52.8 %			100.0 %			100.0 %		
UNITS:	MG/KG			MG/KG								
FIELD DUPLICATE OF:				CEF-P48-SD-002								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	3670			3160								
ANTIMONY	0.48	U		0.45	U							
ARSENIC	0.69	U		0.65	U							
BARIUM	19.7			16.5								
BERYLLIUM	0.61	U	A	0.56	U	A						
CADMIUM	0.12	U	A	0.51	U	A						
CALCIUM	1540			1490								
CHROMIUM	4.5	J	G	22.9	J	G						
COBALT	0.60			1.1								
COPPER	9.3			10.7								
IRON	1670			1910								
LEAD	11.6			16.4								
MAGNESIUM	201			217								
MANGANESE	9.8			10.4								
MERCURY	0.08	U		0.08	U							
NICKEL	1.5	J	G	13.8	J	G						
POTASSIUM	86.6	U	A	86.4	U	A						
SELENIUM	0.41	U		0.39	U							
SILVER	0.19	U		0.21	U	A						
SODIUM	30.8	U		51.2								
THALLIUM	0.54	U		0.51	U							
VANADIUM	4.9			5.2								
ZINC	30.1			44.3								

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	253	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Barium	36.4 B	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Beryllium	0.61 B	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Calcium	15100	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Chromium	1.0 B	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Iron	1320	100	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Lead	1.6 U	3.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Magnesium	3170 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Manganese	10.3 B	15.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/17/99	06/18/99	JK	SW846 7470A
Nickel	1.0 U	40.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Potassium	1070 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Sodium	6180	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Vanadium	1.7 B	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Zinc	4.8 B	20.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	253	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Barium	27.1 B	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Beryllium	0.42 B	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Calcium	15000	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Chromium	8.3 B	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Iron	1270	100	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Lead	2.7 B	3.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Magnesium	3300 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Manganese	13.5 B	15.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/17/99	06/18/99	JK	SW846 7470A
Nickel	1.0 U	40.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Potassium	1030 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Sodium	6090	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Vanadium	2.8 B	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Zinc	8.6 B	20.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	292	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Antimony	2.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Arsenic	3.4 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Barium	27.2 B	200	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Beryllium	0.63 B	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cadmium	0.33 U	4.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Calcium	15100	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Chromium	1.0 B	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Cobalt	0.80 U	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Copper	0.75 U	25.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Iron	1310	100	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Lead	3.6	3.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Magnesium	3340 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Manganese	14.1 B	15.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Mercury	0.25 U	1.0	ug/l	1	06/17/99	06/18/99	JK	SW846 7470A
Nickel	1.0 U	40.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Potassium	1030 B	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Selenium	2.0 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Silver	0.96 U	10.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Sodium	6350	5000	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Thallium	2.7 U	5.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Vanadium	2.7 B	50.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A
Zinc	9.3 B	20.0	ug/l	1	06/14/99	06/16/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	19.6
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	10300	102	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	1.3 B	30.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	1.8 U	5.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	69.2 B	102	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	1.6 B	2.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	1.6 B	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	11700	2550	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	14.7	5.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	2.7 B	25.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	42.2	12.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	7460	51.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	52.5	51.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	2690	2550	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	38.8	7.7	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.21 U	0.85	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	7.3 B	20.4	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	244 B	2550	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	1.0 B	51.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.55 B	5.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	152 B	2550	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	1.4 U	5.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	15.5 B	25.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	162	10.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID: CEF-P48-SD-002
Lab Sample ID: F4273-10
Matrix: SO - Soil
Project: NAS Cecil Field

Date Sampled: 06/07/99
Date Received: 06/08/99
Percent Solids: 49.8

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2580	40.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	0.48 U	12.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	0.69 U	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	14.8 B	40.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.57 B	1.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.42 B	0.80	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1360	1000	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	3.5	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	0.77 B	10.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	8.9	5.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1550	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	13.4 B	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	202 B	1000	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	7.4	3.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.08 U	0.33	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	1.9 B	8.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	68.2 B	1000	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.41 U	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.22 B	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	42.5 B	1000	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	0.54 U	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	4.3 B	10.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	39.3	4.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	57.0
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1950	35.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	0.42 U	10.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	0.61 U	1.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	14.2 B	35.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.51 B	0.88	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.32 B	0.70	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1350	877	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	2.9	1.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	0.43 B	8.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	6.5	4.4	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1310	17.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	9.6 B	17.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	182 B	877	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	9.2	2.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.07 U	0.29	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	1.6 B	7.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	61.7 B	877	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.36 U	17.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.25 B	1.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	54.1 B	877	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	0.47 U	1.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	3.2 B	8.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	28.3	3.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID: CEF-P48-SD-004
Lab Sample ID: F4273-5
Matrix: SO - Soil
Project: NAS Cecil Field

Date Sampled: 06/07/99
Date Received: 06/08/99
Percent Solids: 23.2

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	2630	86.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	1.0 U	25.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	1.5 U	4.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	16.8 B	86.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.94 B	2.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.45 B	1.7	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1510 B	2160	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	3.7 B	4.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	0.68 B	21.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	12.8	10.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1480	43.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	16.5 B	43.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	232 B	2160	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	11.9	6.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.18 U	0.72	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	2.9 B	17.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	121 B	2160	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.88 U	43.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.42 U	4.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	170 B	2160	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	2.0 B	4.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	4.9 B	21.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	47.7	8.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	49.7
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	3670	40.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	0.48 U	12.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	0.69 U	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	19.7 B	40.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.61 B	1.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.12 B	0.80	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1540	1010	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	4.5	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	0.60 B	10.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	9.3	5.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1670	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	11.6 B	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	201 B	1010	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	9.8	3.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.08 U	0.34	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	1.5 B	8.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	86.6 B	1010	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.41 U	20.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.19 U	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	30.8 U	1010	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	0.54 U	2.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	4.9 B	10.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	30.1	4.0	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	52.8
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	3160	37.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	0.45 U	11.4	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	0.65 U	1.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	16.5 B	37.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.56 B	0.95	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.51 B	0.76	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1490	947	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	22.9	1.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	1.1 B	9.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	10.7	4.7	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1910	18.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	16.4 B	18.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	217 B	947	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	10.4	2.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.08 U	0.32	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	13.8	7.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	86.4 B	947	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.39 U	18.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.21 B	1.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	51.2 B	947	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	0.51 U	1.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	5.2 B	9.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	44.3	3.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

RDL = Reported Detection Limit

07-9-092

APPENDIX C
SUPPORT DOCUMENTATION

F4273
HOLDING TIME
07/07/99

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8

ACCUTEST

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
ADDRESS: Tetra Tech NUS
CITY: 900 Trail Ridge Road
STATE: Aiken
ZIP: SC 29803
SEND REPORT TO: Rob Simcizk
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL - PSC 48
LOCATION: NAS Cecil Field
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD = SEDIMENT
SW - surface water

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	COLLECTION TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals	SVOCs, Pest, PCBs, nitrate, nitrite	TOC, metals, SVOC, grain size, PCBs, PCB	PORE WATER, ammonia, SULFIDE, nitrate, nitrite							LAB USE ONLY
F4273-1	[redacted]	6/7/99	1056	MW	SW	4			1		3	1	3					MS/MSD				
-2	[redacted]	6/7/99	1625	MW	SW	4			1		3	1	3									
-3	[redacted]	6/7/99	000	MW	SW	4			1		3	1	3									←
-4	CEF - P48 - PW - 004		1515	MW	SD	1					1				1							
-5	[redacted]		1515	MW	SD	1					1			1								
-6	[redacted]		1436	MW	SD	1					1			1								
-7	CEF - P48 - PW - 003		1436	MW	SD	1					1				1							
-8	[redacted]		1129	MW	SD	1					1			1				MS/MSD				
8	CEF - P48 - SD - MS/MSD01		1129	MW	SD	1					1			1								
-9	CEF - P48 - PW - 002		1129	MW	SD	1					1				1							
-10	[redacted]	↓	1129	MW	SD	1					1			1								

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

F4273

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1800	1. Rachel 1345	2.		2.
RELINQUISHED BY: 3.	DATE TIME:	RECEIVED BY: 3.	RELINQUISHED BY: 4.	DATE TIME:	RECEIVED BY: 4.
RELINQUISHED BY: 5.	DATE TIME:	RECEIVED BY: 5.	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C

ACCUTEST

CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-707

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
ADDRESS: Tetra Tech NUS
CITY: 900 Trail Ridge Road
STATE: Aiken SC
ZIP: 29803
SEND REPORT TO: Rob Simcik
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL PSC 48
LOCATION: NAS CECIL FIELD
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SD - SOLID
SOL - OTHER SOLID

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals	SVOCs, PEST, PCBs, nitrate, nitrite		TOC, grain size, metals SVOC, PEST, PCBs		PORE WATER, ammonia, sulfide, nitrate, nitrite					LAB USE ONLY
F4228-11	CEF-P48-PW-DU01	6/7/99	1129	MW	SD	1					1						1			MS/	MSD	
-12	CEF-P48-PW-MS/MSD01		1129	MW	SD	1					1						1					
-12	[redacted]		1257	MW	SD	1					1				1							
-13	CEF-P48-PW-001		1257	MW	~~SW~~ SD	1					1						1					*Hg
-14	CEF-P48-SW-MS/MSD01		1056	MW	SW	8			2		6	2	6									
-14	[redacted]		1705		SD	1					1				1							
-15	CEF-P48-PW-005		1705		SD	1					1						1					
																MKW						

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1600	1. [signature] 1345 6/8/99	2.		2.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
3.		3.	4.		4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C
		5.			

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC Date Analyzed: 06/15/99 Methods: EPA 200.7, SW846 6010A
QC Limits: 70 to 130 % Recovery Run ID: MA1453 Units: ug/l

Metal	CRI True	CRIA True	CRIA Results	% Rec	CRI Results	% Rec	CRIA Results	% Rec	CRI Results	% Rec
Aluminum										
Antimony		10	11.6	116.0			10.5	105.0		
Arsenic	500	10	10.1	101.0	510	102.0	9.9	99.0	504	100.8
Barium	400				395	98.8			398	99.5
Beryllium	10				11.6	116.0			12.7	127.0
Cadmium	10				10.5	105.0			10.2	102.0
Calcium										
Chromium	20				23.0	115.0			22.4	112.0
Cobalt	100				103	103.0			99.6	99.6
Copper	50				47.2	94.4			45.2	90.4
Iron										
Lead	500	10	10.8	108.0	514	102.8	9.6	96.0	500	100.0
Magnesium										
Manganese	30				31.6	105.3			30.9	103.0
Molybdenum	100									
Nickel	80				84.6	105.8			83.4	104.2
Potassium										
Selenium	500	10	9.8	98.0	512	102.4	9.0	90.0	501	100.2
Silver	20				19.7	98.5			19.6	98.0
Sodium										
Thallium		10	15.6	[redacted]			17.1	[redacted]a		
Tin	100									
Vanadium	100				99.6	99.6			97.5	97.5
Zinc	40				41.8	104.5			40.1	100.2

(*) Outside of QC limits
(anr) Analyte not requested
(a) Possible positive bias, but all sample results < the DL.

00650

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC
QC Limits: 70 to 130 % Recovery

Date Analyzed: 06/16/99
Run ID: MA1456

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	CRI True	CRIA True	CRIA Results	% Rec	CRI Results	% Rec	CRIA Results	% Rec	CRI Results	% Rec
Aluminum										
Antimony		10	11.2	112.0			11.0	109.6		
Arsenic	500	10	11.4	114.5	511	102.3	8.7	86.6	502	100.4
Barium	400				393	98.2			391	97.7
Beryllium	10				10.9	109.4			12.2	[redacted]
Cadmium	10				10.5	104.9			10.4	104.3
Calcium										
Chromium	20				22.8	114.1			22.5	112.4
Cobalt	100				102	102.1			99.2	99.2
Copper	50				45.1	90.1			42.7	85.4
Iron										
Lead	500	10	12.2	[redacted]	507	101.4	10.8	107.8	495	99.0
Magnesium										
Manganese	30				30.1	100.4			29.6	98.8
Molybdenum	100									
Nickel	80				84.7	105.9			82.0	102.5
Potassium										
Selenium	500	10	12.1	[redacted]	506	101.2	11.9	118.8	496	99.3
Silver	20				20.0	100.2			19.2	96.2
Sodium										
Thallium		10	10.4	104.5			12.6	[redacted]		
Tin	100									
Vanadium	100				111	110.7			108	108.3
Zinc	40				14.3B	[redacted]			13.1B	[redacted]

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	14.9	<200	16.8	<200	25.0	<200	15.0	<200
Antimony	5.0	2.39	3.6	<5.0	5.2		3.0	<5.0	3.2	<5.0B
Arsenic	5.0	3.4	-0.80	<5.0	1.0	<5.0	-2.8	<5.0	-0.50	<5.0
Barium	200	.39	0.44	<200	0.59	<200	0.40	<200	0.50	<200B
Beryllium	5.0	.36	0.98	<5.0	1.6	<5.0	1.6	<5.0	1.7	<5.0B
Cadmium	4.0	.33	0.45	<4.0	0.77	<4.0	0.58	<4.0	0.40	<4.0B
Calcium	5000	19.5	8.3	<5000	10.9	<5000	22.0	<5000	7.9	<5000
Chromium	10	.637	0.50	<10	0.78	<10	0.45	<10	0.70	<10.0B
Cobalt	50	.797	0.68	<50	0.78	<50	0.47	<50	0.60	<50.0
Copper	25	.747	0.33	<25	0.35	<25	-0.32	<25	-0.30	<25.0
Iron	100	32	14.2	<100	24.5	<100	15.6	<100	16.0	<100
Lead	3.0	1.59	-0.030	<3.0	0.50	<3.0	0.35	<3.0	0.0	<3.0
Magnesium	5000	17.6	10.9	<5000	15.6	<5000	23.0	<5000	11.5	<5000
Manganese	15	.16	0.51	<15	0.63	<15	0.53	<15	0.50	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	0.99	<40	0.93	<40	1.3	<40	0.50	<40.0
Potassium	5000	28.2	111	<5000	119	<5000	102	<5000	98.1	<5000B
Selenium	5.0	2	0.52	<5.0	-0.20	<5.0	-0.97	<5.0	-1.1	<5.0
Silver	10	.96	0.89	<10	1.3	<10	0.78	<10	0.50	<10.0
Sodium	5000	153	96.6	<5000	148	<5000	55.0	<5000	49.6	<5000
Thallium	5.0	2.69	5.4	(a)	6.6	(a)	7.0	(a)	5.4	(a)
Tin	50	2.2	anr							
Vanadium	50	.717	0.53	<50	0.79	<50	0.61	<50	0.50	<50.0
Zinc	20	.83	0.96	<20	1.2	<20	1.1	<20	0.70	<20.0

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable aqueous samples requiring 5ppb DL.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	26.2	<200	19.4	<200	28.2	<200	24.0	<200
Antimony	5.0	2.39	1.9	<5.0	0.90	<5.0	2.0	<5.0	2.3	<5.0
Arsenic	5.0	3.4	-0.55	<5.0	-1.2	<5.0	-2.3	<5.0	-0.90	<5.0
Barium	200	.39	0.53	<200	0.20	<200	0.60	<200B	0.30	<200
Beryllium	5.0	.36	2.1	<5.0	2.2	<5.0B	2.7	<5.0B	2.5	<5.0B
Cadmium	4.0	.33	0.42	<4.0	0.0	<4.0	0.50	<4.0B	0.20	<4.0
Calcium	5000	19.5	13.4	<5000	2.0	<5000	9.4	<5000	4.2	<5000
Chromium	10	.637	1.2	<10	0.60	<10.0	0.90	<10.0B	1.7	<10.0B
Cobalt	50	.797	0.71	<50	0.40	<50.0	0.50	<50.0	0.50	<50.0
Copper	25	.747	-0.65	<25	-1.3	<25.0B	-0.90	<25.0B	-1.3	<25.0B
Iron	100	32	23.1	<100	3.8	<100	13.9	<100	14.6	<100
Lead	3.0	1.59	0.26	<3.0	-0.40	<3.0	0.30	<3.0	0.0	<3.0
Magnesium	5000	17.6	12.6	<5000	6.1	<5000	13.0	<5000	8.7	<5000
Manganese	15	.16	0.80	<15	0.30	<15.0B	0.70	<15.0B	0.50	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	1.2	<40	0.60	<40.0	0.80	<40.0	0.60	<40.0
Potassium	5000	28.2	101	<5000	93.7	<5000B	96.2	<5000B	101	<5000B
Selenium	5.0	2	0.060	<5.0	-2.3	<5.0B	-0.60	<5.0	-1.1	<5.0
Silver	10	.96	0.46	<10	0.40	<10.0	0.80	<10.0	0.70	<10.0
Sodium	5000	153	8.8	<5000	-3.2	<5000	17.4	<5000	36.7	<5000
Thallium	5.0	2.69	7.3	(a)	6.1	(a)	8.0	(a)	9.9	(a)
Tin	50	2.2	anr							
Vanadium	50	.717	0.63	<50	0.10	<50.0	0.50	<50.0	0.40	<50.0
Zinc	20	.83	0.84	<20	0.20	<20.0	0.90	<20.0B	0.40	<20.0

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable aqueous samples requiring 5ppb DL.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final
Aluminum	200	30	22.9	<200
Antimony	5.0	2.39	0.090	<5.0
Arsenic	5.0	3.4	-0.88	<5.0
Barium	200	.39	0.16	<200
Beryllium	5.0	.36	2.5	<5.0
Cadmium	4.0	.33	0.010	<4.0
Calcium	5000	19.5	0.98	<5000
Chromium	10	.637	-0.070	<10
Cobalt	50	.797	0.13	<50
Copper	25	.747	-2.4	<25
Iron	100	32	-1.4	<100
Lead	3.0	1.59	-0.43	<3.0
Magnesium	5000	17.6	11.1	<5000
Manganese	15	.16	0.12	<15
Molybdenum	50	.68	anr	
Nickel	40	1	-0.25	<40
Potassium	5000	28.2	83.8	<5000
Selenium	5.0	2	-1.7	<5.0
Silver	10	.96	0.51	<10
Sodium	5000	153	-100	<5000
Thallium	5.0	2.69	14.6	* (a)
Tin	50	2.2	anr	
Vanadium	50	.717	0.11	<50
Zinc	20	.83	1.1	<20

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable samples

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: HG0616S1.HGD
QC Limits: result < RDL

Date Analyzed: 06/16/99
Run ID: MA1455

Methods: SW846 7471A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Mercury	1.0	.25	0.0	<1.0	0.0	<1.0	0.0	<1.0	0.0	<1.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/16/99
Run ID: MA1456

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	5.8	<200	3.5	<200	23.1	<200	12.4	<200
Antimony	5.0	2.39	4.3	<5.0B	4.0	<5.0B	3.0	<5.0B	2.4	<5.0
Arsenic	5.0	3.4	0.90	<5.0	-0.60	<5.0	-0.80	<5.0	1.2	<5.0
Barium	200	.39	0.50	<200B	0.40	<200	0.30	<200	0.60	<200B
Beryllium	5.0	.36	0.70	<5.0B	0.70	<5.0B	0.90	<5.0B	1.6	<5.0B
Cadmium	4.0	.33	0.70	<4.0B	0.60	<4.0B	0.50	<4.0B	0.60	<4.0B
Calcium	5000	19.5	8.8	<5000	6.1	<5000	25.4	<5000B	9.7	<5000
Chromium	10	.637	0.50	<10.0	0.30	<10.0	0.10	<10.0	0.80	<10.0B
Cobalt	50	.797	0.60	<50.0	0.40	<50.0	0.40	<50.0	0.20	<50.0
Copper	25	.747	0.40	<25.0	0.40	<25.0	0.10	<25.0	-0.30	<25.0
Iron	100	32	12.2	<100	7.6	<100	15.8	<100	9.9	<100
Lead	3.0	1.59	2.0	<3.0B	1.3	<3.0	0.40	<3.0	1.4	<3.0
Magnesium	5000	17.6	10.2	<5000	10.0	<5000	29.0	<5000B	12.3	<5000
Manganese	15	.16	-0.80	<15.0B	-0.80	<15.0B	-0.80	<15.0B	-0.60	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	0.40	<40.0	0.40	<40.0	0.20	<40.0	-0.30	<40.0
Potassium	5000	28.2	97.2	<5000B	101	<5000B	94.1	<5000B	92.7	<5000B
Selenium	5.0	2	3.2	<5.0B	3.4	<5.0B	2.4	<5.0B	2.9	<5.0B
Silver	10	.96	0.0	<10.0	0.10	<10.0	0.50	<10.0	0.10	<10.0
Sodium	5000	153	79.8	<5000	73.0	<5000	60.2	<5000	-2.4	<5000
Thallium	5.0	2.69	-2.1	<5.0	1.8	<5.0	-1.4	<5.0	1.3	<5.0
Tin	50	2.2	anr							
Vanadium	50	.717	0.90	<50.0B	0.70	<50.0B	0.60	<50.0	0.80	<50.0B
Zinc	20	.83	0.70	<20.0	0.50	<20.0	0.60	<20.0	0.40	<20.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/16/99
Run ID: MA1456

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	8.8	<200	11.5	<200	13.5	<200	12.2	<200
Antimony	5.0	2.39	3.4	<5.0	3.4	<5.0B	1.5	<5.0	3.4	<5.0B
Arsenic	5.0	3.4	1.2	<5.0	1.0	<5.0	-0.20	<5.0	1.8	<5.0
Barium	200	.39	0.44	<200	0.40	<200B	0.40	<200B	0.40	<200B
Beryllium	5.0	.36	1.6	<5.0	1.9	<5.0B	2.2	<5.0B	2.4	<5.0B
Cadmium	4.0	.33	0.61	<4.0	0.50	<4.0B	0.40	<4.0B	0.50	<4.0B
Calcium	5000	19.5	5.1	<5000	8.4	<5000	2.8	<5000	2.2	<5000
Chromium	10	.637	0.89	<10	1.2	<10.0B	1.0	<10.0B	0.90	<10.0B
Cobalt	50	.797	0.29	<50	0.40	<50.0	0.30	<50.0	0.10	<50.0
Copper	25	.747	-0.56	<25	-0.80	<25.0B	-1.1	<25.0B	-1.5	<25.0B
Iron	100	32	13.2	<100	11.3	<100	9.5	<100	10.4	<100
Lead	3.0	1.59	2.2	<3.0	1.6	<3.0	0.40	<3.0	1.9	<3.0B
Magnesium	5000	17.6	10.4	<5000	9.3	<5000	10.6	<5000	11.0	<5000
Manganese	15	.16	-0.74	<15	-0.40	<15.0B	-0.50	<15.0B	-0.70	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	0.26	<40	0.20	<40.0	0.10	<40.0	0.20	<40.0
Potassium	5000	28.2	97.1	<5000	99.7	<5000B	94.9	<5000B	96.3	<5000B
Selenium	5.0	2	3.2	<5.0	1.2	<5.0	3.2	<5.0B	2.8	<5.0B
Silver	10	.96	0.56	<10	0.50	<10.0	0.70	<10.0	0.80	<10.0
Sodium	5000	153	91.4	<5000	49.3	<5000	16.6	<5000	74.0	<5000
Thallium	5.0	2.69	2.7	<5.0	0.80	<5.0	2.6	<5.0	2.1	<5.0
Tin	50	2.2	anr							
Vanadium	50	.717	0.52	<50	0.60	<50.0	0.40	<50.0	0.60	<50.0
Zinc	20	.83	0.34	<20	-0.1	<20.0	-0.20	<20.0	-0.10	<20.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/16/99
Run ID: MA1456

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final
Aluminum	200	30	37.7	<200B
Antimony	5.0	2.39	3.3	<5.0B
Arsenic	5.0	3.4	-1.1	<5.0
Barium	200	.39	0.50	<200B
Beryllium	5.0	.36	2.4	<5.0B
Cadmium	4.0	.33	0.60	<4.0B
Calcium	5000	19.5	28.7	<5000B
Chromium	10	.637	0.90	<10.0B
Cobalt	50	.797	0.50	<50.0
Copper	25	.747	-1.2	<25.0B
Iron	100	32	25.9	<100
Lead	3.0	1.59	1.7	<3.0B
Magnesium	5000	17.6	35.3	<5000B
Manganese	15	.16	-0.60	<15.0B
Molybdenum	50	.68	anr	
Nickel	40	1	0.20	<40.0
Potassium	5000	28.2	96.4	<5000B
Selenium	5.0	2	3.1	<5.0B
Silver	10	.96	0.60	<10.0
Sodium	5000	153	38.1	<5000
Thallium	5.0	2.69	1.8	<5.0
Tin	50	2.2	anr	
Vanadium	50	.717	0.60	<50.0
Zinc	20	.83	-0.1	<20.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: HG0618W1.HGD
QC Limits: result < RDL

Date Analyzed: 06/18/99
Run ID: MA1461

Methods: EPA 245.1, SW846 7470A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Mercury	1.0	.25	0.0	<1.0	0.0	<1.0	0.0	<1.0	0.012	<1.0

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

QC Batch ID: MP1889
Matrix Type: AQUEOUS

Methods: EPA 200.7, SW846 6010A
Units: mg/l

Prep Date: 06/14/99

Metal	RDL	IDL	MB raw	final
Aluminum	0.20	.03	-0.48	<200
Antimony	0.0050	.00239	1.9	<5.0
Arsenic	0.0050	.00345	0.0	<5.0
Barium	0.20	.00039	0.06	<200
Beryllium	0.0050	.000363	0.54	<5.0
Cadmium	0.0040	.00033	-0.05	<4.0
Calcium	5.0	.0195	0.0	<5000
Chromium	0.010	.000637	0.95	<10.0
Cobalt	0.050	.000797	-0.18	<50.0
Copper	0.025	.000747	-0.33	<25.0
Iron	0.10	.032	9.8	<100
Lead	0.0030	.00159	1.7	<3.0
Magnesium	5.0	.0176	3.9	<5000
Manganese	0.015	.00016	-0.89	<15.0
Molybdenum	0.050	.00068	anr	
Nickel	0.040	.001	0.99	<40.0
Potassium	5.0	.0282	91.0	<5000
Selenium	0.0050	.00204	1.7	<5.0
Silver	0.010	.000963	0.14	<10.0
Sodium	5.0	.153	39.4	<5000
Thallium	0.0050	.00269	-0.51	<5.0
Tin	0.050	.00223	anr	
Vanadium	0.050	.000717	0.16	<50.0
Zinc	0.020	.00083	-0.44	<20.0

Associated samples MP1889: F4273-1, F4273-2, F4273-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

QC Batch ID: MP1893
Matrix Type: SOLID

Methods: SW846 6010A
Units: mg/kg

Prep Date: 06/15/99

Metal	RDL	IDL	MB raw	final
Aluminum	10.0	1.5	0.88	<10.0
Antimony	3.0	.12	-0.06	<3.0
Arsenic	0.50	.17	-0.06	<0.50
Barium	10.0	.02	0.005	<10.0
Beryllium	0.25	.02	0.1	<0.25
Cadmium	0.20	.02	-0.01	<0.20
Calcium	250	.98	-0.12	<250
Chromium	0.50	.03	-0.004	<0.50
Cobalt	2.5	.04	-0.008	<2.5
Copper	1.2	.04	-0.08	<1.2
Iron	5.0	1.6	-0.34	<5.0
Lead	5.0	.08	-0.03	<5.0
Magnesium	250	.88	-0.07	<250
Manganese	0.75	.008	0.005	<0.75
Molybdenum	2.5	.03	anr	
Nickel	2.0	.05	0.009	<2.0
Potassium	250	1.4	4.1	<250
Selenium	5.0	.1	-0.02	<5.0
Silver	0.50	.05	0.03	<0.50
Sodium	250	7.6	-2.1	<250
Thallium	0.50	.13	0.19	<0.50
Tin	2.5	.11	anr	
Vanadium	2.5	.04	-0.01	<2.5
Zinc	1.0	.04	0.02	<1.0

Associated samples MP1893: F4273-5, F4273-6, F4273-8, F4273-10, F4273-12, F4273-14

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

QC Batch ID: MP1905
Matrix Type: AQUEOUS

Methods: EPA 245.1, SW846 7470A
Units: mg/l

Prep Date: 06/17/99

Metal	RDL	IDL	MB raw	final
Mercury	0.0010	.00025	0.01	<1.0

Associated samples MP1905: F4273-1, F4273-2, F4273-3

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

METALS DIGESTION LOG: WATER

Method of Digestion: Icp **Temp:** 95°c **Thermometer ID#:** 18

Analyst: J

	HNO_3	HCl	H_2O_2
Added:			
Mfg:	Fisher	Fisher	
Lot #:	118100	918070	

Sample #	Initial Vol.	Final Vol.	Date	Comments
F4273-1 DUP	50	50	6/14/99	
F4273-1 -MS				Spiked with Lot Acc 147 + .25 Acc 149 + .50 - 1 copy
1- F4273-1				
2- F4273-2				
3- F4273-3				
4- F4281-1				
5- F4281-3				
6- F4281-5				
7- F4267-3				
8- F4267-4				
9- F4290-5				
10- F4277-10				
11-				
12-				
13-				
14-				
15-				
16-				
17-				
18-				
19-				
20-				
MB/SB	50	50	6/14/99	
MB/SB	6	6		Same as ms

RELINQUISHED BY: _____ **DATE:** 6/14/99

ACCEPTED BY: _____ **DATE:** 6/14/99

1889

METALS DIGESTION LOG: SOIL

Method of Digestion: Icp **Temp:** 94°c **Thermometer ID#:** 18

Analyst: [illegible]

	HNO_3	HCl	H_2O_2
Added:			
Mfg:	Fisher	Fisher	Fisher
Lot #:	118070	118070	983019

Sample #	WT	Final Vol.	% Sol	Digestion Factor	Date	Comments
F4273-8 -DUP	1.09	100ml			6/15/95	
F4273-8 -MS						Spiked wt 2.0-1 Acc 147 + .50 Acc 149 + 1.0-1 Lan 494
1- F4273-8						
2- F4273-5						
3- F4273-10						
4- F4273-12						
5- F4273-14						
6- F4282-1						
7- F4273-6						
8-						
9-						
10-						
11-						
12-						
13-						
14-						
15-						
16-						
17-						
18-						
19-						
20-						
MB/SB	50	50	—	1	6/15/95	
MB/SB			—			Spiked wt 1.0-1 Acc 147 + .25-1 Acc 149 + .50-1 Lan 494

RELINQUISHED BY: [illegible] **DATE:** 6/15/95

Page 1893

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC Date Analyzed: 06/15/99 Methods: EPA 200.7, SW846 6010A
Analyst: JK Run ID: MA1453
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:55	MA1453-HSTD1	1		
07:06	MA1453-ICV1	1		
07:11	MA1453-ICB1	1		
07:27	MA1453-CCV1	1		
07:32	MA1453-CCB1	1		
07:38	MA1453-CRIA1	1		
07:43	MA1453-CRI1	1		
07:49	MA1453-ICSA1	1		
07:54	MA1453-ICSAB1	1		
07:59	MA1453-CCV2	1		
08:05	MA1453-CCB2	1		
08:10	ZZZZZZ	1		
08:16	ZZZZZZ	1		
08:22	ZZZZZZ	2		
08:27	ZZZZZZ	1		
08:33	MP1888-MB1	1		Data not used. Repoured for Tl.
08:38	MP1888-B1	1		
08:43	MP1888-D1	1		
08:49	F4281-6	1		(sample used for QC only; not part of login F4273)
08:54	MA1453-CCV3	1		
09:00	MA1453-CCB3	1		
09:06	MP1888-MB1	1		Reanalyzed for all elements on 6/16/99.
09:12	MP1888-S1	1		
09:17	MP1888-SD1	5		
09:23	ZZZZZZ	1		
09:28	ZZZZZZ	1		
09:33	ZZZZZZ	1		
09:39	ZZZZZZ	1		
09:44	ZZZZZZ	1		
09:50	ZZZZZZ	1		
09:55	ZZZZZZ	1		
10:00	MA1453-CCV4	1		
10:06	MA1453-CCB4	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC Date Analyzed: 06/15/99 Methods: EPA 200.7, SW846 6010A
Analyst: JK Run ID: MA1453
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:13	MP1892-MB1	1		
10:18	MP1892-B1	1		
10:24	MP1892-D1	1		
10:29	F4256-1	1		(sample used for QC only; not part of login F4273)
10:35	MP1892-S1	1		
10:40	MP1892-SD1	5		
10:46	ZZZZZZ	1		
10:51	ZZZZZZ	1		
10:56	ZZZZZZ	1		
11:02	MA1453-CCV5	1		
11:08	MA1453-CCB5	1		
11:14	ZZZZZZ	1		
11:19	ZZZZZZ	1		
11:27	ZZZZZZ	1		
11:33	ZZZZZZ	1		
11:38	ZZZZZZ	1		
11:44	ZZZZZZ	1		
11:53	MP1893-MB1	1		
11:58	MP1893-B1	1		
12:04	MP1893-D1	1		
12:10	MA1453-CCV6	1		
12:16	MA1453-CCB6	1		
12:22	F4273-8	1		
12:27	MP1893-S1	1		
12:33	MP1893-SD1	5		
12:38	F4273-5	1		
12:43	F4273-6	1		
12:49	F4273-10	1		
12:54	F4273-12	1		
13:00	F4273-14	1		
13:05	ZZZZZZ	1		
13:11	MA1453-CCV7	1		
13:16	MA1453-CCB7	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC Date Analyzed: 06/15/99 Methods: EPA 200.7, SW846 6010A
Analyst: JK Run ID: MA1453
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:22	MA1453-CRIA2	1		
13:27	MA1453-CRI2	1		
13:33	MA1453-ICSA2	1		
13:38	MA1453-ICSAB2	1		
13:44	MA1453-CCV8	1		
13:53	MA1453-CCB8	1		

Refer to raw data for calibration curve and standards.

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: HG0616S1.HGD
Analyst: JK
Parameters: Hg

Date Analyzed: 06/16/99
Run ID: MA1455

Methods: SW846 7471A

Time	Sample Description	Dilution Factor	PS Recov	Comments
00:00	MA1455-ICV1	1		
00:00	MA1455-ICB1	1		
00:00	MA1455-CCV1	1		
00:00	MA1455-CCB1	1		
00:00	MA1455-CRI1	1		
00:00	MP1895-MB1	1		
00:00	MP1895-B1	1		
00:00	F4273-8	1		
00:00	MP1895-D1	1		
00:00	MP1895-S1	1		
00:00	F4273-5	1		
00:00	F4273-6	1		
00:00	F4273-10	1		
00:00	MA1455-CCV2	1		
00:00	MA1455-CCB2	1		
00:00	F4273-12	1		
00:00	F4273-14	1		
00:00	ZZZZZZ	1		
00:00	MA1455-CCV3	1		
00:00	MA1455-CCB3	1		

Refer to raw data for calibration curve and standards.

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC Date Analyzed: 06/16/99 Methods: EPA 200.7, SW846 6010A
Analyst: JK Run ID: MA1456
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:40	MA1456-HSTD1	1		
07:46	MA1456-ICV1	1		
07:52	MA1456-ICB1	1		
07:57	MA1456-CCV1	1		
08:03	MA1456-CCB1	1		
08:08	MA1456-CRIA1	1		
08:13	MA1456-CRI1	1		
08:19	MA1456-ICSA1	1		Repoured. See rerun.
08:30	MA1456-ICSA2	1		
08:35	MA1456-ICSAB1	1		
08:40	MA1456-CCV2	1		
08:46	MA1456-CCB2	1		
08:55	MP1889-MB1	1		
09:01	MP1889-B1	1		
09:06	MP1889-D1	1		
09:12	F4273-1	1		
09:17	MP1889-S1	1		
09:23	MP1889-SD1	5		
09:28	F4273-2	1		
09:33	F4273-3	1		
09:39	ZZZZZZ	1		
09:44	MA1456-CCV3	1		
09:50	MA1456-CCB3	1		
09:55	ZZZZZZ	1		
10:00	ZZZZZZ	1		
10:06	MP1894-MB1	1		
10:11	MP1894-B1	1		
10:17	MP1894-D1	1		
10:22	F4252-1	1		(sample used for QC only; not part of login F4273)
10:28	MP1894-S1	1		
10:33	MP1894-SD1	5		
10:38	ZZZZZZ	1		
10:44	MA1456-CCV4	1		
10:49	MA1456-CCB4	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC Date Analyzed: 06/16/99 Methods: EPA 200.7, SW846 6010A
Analyst: JK Run ID: MA1456
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:55	ZZZZZZ	1		
11:00	ZZZZZZ	1		
11:05	ZZZZZZ	1		
11:11	ZZZZZZ	1		
11:16	ZZZZZZ	1		
11:22	ZZZZZZ	1		
11:27	ZZZZZZ	1		
11:33	ZZZZZZ	1		
11:38	MP1897-MB1	1		
11:43	MA1456-CCV5	1		
11:49	MA1456-CCB5	1		
11:58	MP1897-B1	1		
12:04	MP1897-D1	1		
12:09	F4281-7	1		(sample used for QC only; not part of login F4273)
12:15	MP1897-S1	1		
12:20	MP1897-SD1	5		
12:25	ZZZZZZ	1		
12:31	ZZZZZZ	1		
12:36	ZZZZZZ	1		
12:42	ZZZZZZ	1		
12:54	MA1456-CCV6	1		
13:04	MA1456-CCB6	1		
13:09	ZZZZZZ	1		
13:15	ZZZZZZ	1		
13:20	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:35	ZZZZZZ	1		
13:40	ZZZZZZ	1		
13:45	MP1888-MB1	1		
13:51	ZZZZZZ	1		
13:57	MA1456-CCV7	1		
14:02	MA1456-CCB7	1		
14:08	MA1456-CRIA2	1		
14:14	MA1456-CRI2	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0616M1.ASC
Date Analyzed: 06/16/99
Methods: EPA 200.7, SW846 6010A
Analyst: JK
Run ID: MA1456
Parameters: Al,Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Ni,K,Se,Ag,Na,Tl,V,Zn

Time	Sample Description	Dilution Factor	PS Recov	Comments
14:19	MA1456-ICSA3	1		
14:25	MA1456-ICSAB2	1		
14:30	MA1456-CCV8	1		
14:36	MA1456-CCB8	1		

Refer to raw data for calibration curve and standards.

0070

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: HG0618W1.HGD
Analyst: JK
Parameters: Hg

Date Analyzed: 06/18/99
Run ID: MA1461

Methods: EPA 245.1, SW846 7470A

Time	Sample Description	Dilution Factor	PS Recov	Comments
00:00	MA1461-ICV1	1		
00:00	MA1461-ICB1	1		
00:00	MA1461-CCV1	1		
00:00	MA1461-CCB1	1		
00:00	MA1461-CRI1	1		
00:00	MP1905-MB1	1		
00:00	MP1905-B1	1		
00:00	F4256-9	1		(sample used for QC only; not part of login F4273)
00:00	MP1905-D1	1		
00:00	MP1905-S1	1		
00:00	F4273-1	1		
00:00	F4273-2	1		
00:00	F4273-3	1		
00:00	MA1461-CCV2	1		
00:00	MA1461-CCB2	1		
00:00	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:00	ZZZZZZ	1		
00:00	MA1461-CCV3	1		
00:00	MA1461-CCB3	1		

Refer to raw data for calibration curve and standards.

087030

FIELD DUPLICATE PRECISION

COMPOUND	CEF-P48-SW-009	CEF-P48-SW-DU01	RPD
Aluminum	253	292	14.31
Antimony	2.4U	2.4U	
Arsenic	3.4U	3.4U	
Barium	27.1	27.2	0.37
Beryllium	0.42U	0.63U	
Cadmium	0.33U	0.33U	
Calcium	15000	15100	0.66
Chromium	8.3	1.0U	
Cobalt	0.80U	0.80U	
Copper	0.75U	0.75U	
Iron	1270	1310	3.10
Lead	2.7U	3.6U	
Magnesium	3300	3340	1.20
Manganese	13.5	14.1	4.35
Mercury	0.25U	0.25U	
Nickel	1.0U	1.0U	
Potassium	1030	1030	0.00
Selenium	2.0U	2.0U	
Silver	0.96U	0.96U	
Sodium	6090	6350	4.18
Thallium	2.7U	2.7U	
Vanadium	2.8U	2.7U	
Zinc	8.6	9.3	7.82
COMPOUND	CEF-P48-SD-002	CEF-P48-SD-DU01	RPD
Aluminum	2580	3160	20.21
Antimony	0.48U	0.45U	
Arsenic	0.69U	0.65U	
Barium	14.8	16.5	10.86
Beryllium	0.57U	0.56U	
Cadmium	0.42U	0.51U	
Calcium	1360	1490	9.12
Chromium	3.5	22.9	146.97
Cobalt	0.77	1.1	35.29
Copper	8.9	10.7	18.37
Iron	1550	1910	20.81
Lead	13.4	16.4	20.13
Magnesium	202	217	7.16
Manganese	7.4	10.4	33.71
Mercury	0.08U	0.08U	
Nickel	1.9	13.8	[redacted]
Potassium	68.2U	86.4U	
Selenium	0.41U	0.39U	
Silver	0.22U	0.21U	
Sodium	42.5	51.2	18.57
Thallium	0.54U	0.51U	
Vanadium	4.3	5.2	18.95
Zinc	39.3	44.3	11.96

CRDL 2
DIFF >4x

5XCRDL
CTAD
7-13-99

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-087

TO:	**M. SPERANZA**	**DATE:**	**JULY 13, 1999**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – MISCELLANEOUS PARAMETERS**
CTO 078 - CECIL FIELD
SDG – F4273

SAMPLES: 9/Aqueous/

CEF-P48-PW-001	CEF-P48-PW-002	CEF-P48-PW-003
CEF-P48-PW-004	CEF-P48-PW-005	CEF-P48-PW-DU01
CEF-P48-SW-008	CEF-P48-SW-009	CEF-P48-SW-DU01

6/Sediments/

CEF-P48-SD-001	CEF-P48-SD-002	CEF-P48-SD-003
CEF-P48-SD-004	CEF-P48-SD-005	CEF-P48-SD-DU01

Overview

The sample set for CTO 078, Cecil Field, SDG F4273, consists of nine (9) aqueous environmental samples and six (6) soil environmental samples. Three (3) field duplicate pairs (CEF-P48-PW-002 / CEF-P48-PW-DU01, CEF-P48-SW-009 / CEF-P48-SW-DU01 and CEF-P48-SD-002 / CEF-P48-SD-DU01) were included within this SDG.

The samples designated PW were analyzed for ammonia, hydrogen sulfide, nitrate, nitrate/nitrite and nitrite. The sample designated SW were analyzed for nitrate, nitrate/nitrite and nitrite. The soil samples were analyzed for particle size and total organic carbon (TOC) The samples were collected by Tetra Tech NUS on June 7, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA / QC) criteria. Ammonia analyses were conducted using EPA method 350.1. Hydrogen sulfide analyses were conducted using EPA method 376.1. Nitrate, nitrate/nitrite and nitrite analyses were conducted using Standard Method 18 4500. TOC analyses were conducted using the Corp. Engineering method 81 modified. Particle size analyses were conducted using ASTM D422-63.

The data was evaluated based on the following parameters:

- Data Completeness
- Holding Times
- * Calibration Verifications
- * Laboratory Blank Analyses
- * Field Duplicate Results

* - All quality control criteria were met for this parameter.

Holding Times

The forty-eight (48) hour holding time for nitrite analyses was exceeded by two (2) days affecting the aqueous samples designated as PW. The nondetected results reported in the affected samples were qualified as estimated, "UJ".

Notes

The laboratory does not provide Form 1s for sieve (particle size) results.

A comparison of field duplicate pairs (CEF-P48-PW-002 / CEF-P48-PW-DU01, CEF-P48-SW-009 / CEF-P48-SW-DU01 and CEF-P48-SD-002 / CEF-P48-SD-DU01) is included in Appendix C.

The percent solids were <30% in samples CEF-P48-SD-001 and CEF-P48-SD-004. The low percent solids affected the positive results reported for TOC. Therefore, the positive results reported for TOC in the above listed samples were qualified as estimated, "J".

Executive Summary

Laboratory Performance: The holding time for nitrite analyses was exceeded affecting some aqueous samples.

Other Factors Affecting Data Quality: The percent solids were <30% in samples CEF-P48-SD-001 and CEF-P48-SD-004.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENIDX A
QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-PW-001			CEF-P48-PW-002			CEF-P48-PW-003			CEF-P48-PW-004		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-13			F4273-9			F4273-7			F4273-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	MG/L			MG/L			MG/L			MG/L		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
AMMONIA, AS NITROGEN	6.2			2			2.3			8.1		
HYDROGEN SULFIDE	20	U		20	U		20	U		20	U	
NITRATE, AS NITROGEN	1.1	U		1.1	U		1.1	U		1.1	U	
NITRATE/NITRITE, AS N	1	U		1	U		1	U		1	U	
NITRITE, AS NITROGEN	0.1	UJ	H	0.1	UJ	H	0.1	UJ	H	0.1	UJ	H

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-PW-005			CEF-P48-PW-DU01			CEF-P48-SW-008			CEF-P48-SW-009		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-15			F4273-11			F4273-2			F4273-1		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	MG/L			MG/L			MG/L			MG/L		
FIELD DUPLICATE OF:				CEF-P48-PW-002								
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
AMMONIA, AS NITROGEN	1.5			1.6								
HYDROGEN SULFIDE	20	U		20	U							
NITRATE, AS NITROGEN	1.1	U		1.1	U		0.11	U		0.11	U	
NITRATE/NITRITE, AS N	1	U		1	U		0.1	U		0.1	U	
NITRITE, AS NITROGEN	0.1	UJ	H	0.1	UJ	H	0.01	U		0.01	U	

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SW-DU01											
SAMPLE DATE:	06/07/99			/ /			/ /			/ /		
LABORATORY ID:	F4273-3											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	MG/L											
FIELD DUPLICATE OF:	CEF-P48-SW-009											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
NITRATE, AS NITROGEN	0.11	U										
NITRATE/NITRITE, AS N	0.1	U										
NITRITE, AS NITROGEN	0.01	U										

CTO078 - NAS CECIL
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-001			CEF-P48-SD-002			CEF-P48-SD-DU01			CEF-P48-SD-003		
SAMPLE DATE:	06/07/99			06/07/99			06/07/99			06/07/99		
LABORATORY ID:	F4273-12			F4273-10			F4273-8			F4273-6		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	19.6 %			49.8 %			52.8 %			57.0 %		
FIELD DUPLICATE OF:							CEF-P48-SD-002					
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
NO. 10 SIEVE(%)	98.3			98.08			98.64			98.7		
NO. 120 SIEVE(%)	9.13			8.58			11.04			10.72		
NO. 18 SIEVE(%)	92.35			96.06			96.62			95.6		
NO. 230 SIEVE(%)	1.13			1.08			1.08			1.04		
NO. 4 SIEVE(%)	1001			100			99.28			100		
NO. 40 SIEVE(%)	70.62			92.42			92.28			91.38		
NO. 60 SIEVE(%)	16.58			84.36			83.3			83.78		
TOTAL ORGANIC CARBON(MG/KG)	131000	J	Y	18500			19900			50600		

CTO078 - NAS CECIL
SOIL DATA
Accutest, NJ
SDG: F4273

SAMPLE NUMBER:	CEF-P48-SD-004			CEF-P48-SD-005			/ /			/ /		
SAMPLE DATE:	06/07/99			06/07/99								
LABORATORY ID:	F4273-5			F4273-14								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	23.2 %			49.7 %			100.0 %			100.0 %		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
NO. 10 SIEVE(%)	90.1			96.74								
NO. 120 SIEVE(%)	8			12.24								
NO. 18 SIEVE(%)	83.3			94.02								
NO. 230 SIEVE(%)	0.94			1.82								
NO. 4 SIEVE(%)	99.9			99.56								
NO. 40 SIEVE(%)	71.6			90.8								
NO. 60 SIEVE(%)	62.9			85.12								
TOTAL ORGANIC CARBON(MG/KG)	51700	J	Y	21500								

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID:	CEF-P48-PW-001		
Lab Sample ID:	F4273-13	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed	By	Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99	EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	6.2	2.0	mg/l	10	06/15/99	EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99	LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99	LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99	JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-002		
Lab Sample ID:	F4273-9	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99 EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	2.0	2.0	mg/l	10	06/15/99 EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99 JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-003		
Lab Sample ID:	F4273-7	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99	EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	2.3	2.0	mg/l	10	06/15/99	EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99	LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99	LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99	JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-004		
Lab Sample ID:	F4273-4	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99	EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	8.1	2.0	mg/l	10	06/15/99	EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99	LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99	LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99	JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-005		
Lab Sample ID:	F4273-15	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99 EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	1.5	2.0	mg/l	10	06/15/99 EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99 JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-DU01		
Lab Sample ID:	F4273-11	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99 EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	1.6	2.0	mg/l	10	06/15/99 EP	EPA 350.1
Nitrogen, Nitrate [a]	<1.1	1.1	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<1.0	1.0	mg/l	10	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99 JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SW-008		
Lab Sample ID:	F4273-2	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Nitrogen, Nitrate [a]	<0.11	0.11	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<0.10	0.10	mg/l	1	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.010	0.010	mg/l	1	06/09/99 EP	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SW-009		
Lab Sample ID:	F4273-1	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Nitrogen, Nitrate [a]	<0.11	0.11	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<0.10	0.10	mg/l	1	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.010	0.010	mg/l	1	06/09/99 EP	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SW-DU01		
Lab Sample ID:	F4273-3	**Date Sampled:**	06/07/99
Matrix:	AQ - Ground Water	**Date Received:**	06/08/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Nitrogen, Nitrate [a]	<0.11	0.11	mg/l	1	06/21/99 LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<0.10	0.10	mg/l	1	06/21/99 LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.010	0.010	mg/l	1	06/09/99 EP	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-001		
Lab Sample ID:	F4273-12	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	19.6
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Solids, Percent	19.6		%	1	06/14/99 LR	EPA 160.3 M
Total Organic Carbon	131000	5100	mg/kg	1	06/17/99 ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-002	**Date Sampled:**	06/07/99
Lab Sample ID:	F4273-10	**Date Received:**	06/08/99
Matrix:	SO - Soil	**Percent Solids:**	49.8
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Solids, Percent	49.8		%	1	06/14/99 LR	EPA 160.3 M
Total Organic Carbon	18500	2000	mg/kg	1	06/11/99 ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-003		
Lab Sample ID:	F4273-6	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	57.0
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Solids, Percent	57		%	1	06/16/99	LR	EPA 160.3 M
Total Organic Carbon	50600	1800	mg/kg	1	06/11/99	ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-004		
Lab Sample ID:	F4273-5	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	23.2
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By	Method
Solids, Percent	23.2		%	1	06/14/99 LR	EPA 160.3 M
Total Organic Carbon	51700	4300	mg/kg	1	06/11/99 ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-005		
Lab Sample ID:	F4273-14	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	49.7
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Solids, Percent	49.7		%	1	06/14/99	LR	EPA 160.3 M
Total Organic Carbon	21500	2000	mg/kg	1	06/17/99	ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-SD-DU01		
Lab Sample ID:	F4273-8	**Date Sampled:**	06/07/99
Matrix:	SO - Soil	**Date Received:**	06/08/99
		Percent Solids:	52.8
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Solids, Percent	52.8		%	1	06/14/99	LR	EPA 160.3 M
Total Organic Carbon	19900	1900	mg/kg	1	06/11/99	ANJ	CORP ENG 81 M

RDL = Reported Detection Limit

07-9-087

APPENDIX C
SUPPORT DOCUMENTATION

CHAIN OF CUSTODY

ACCUTEST

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
ADDRESS: Tetra Tech NVS
CITY: 900 Trail Ridge Road
STATE: Aiken SC
ZIP: 29803
SEND REPORT TO: Rob Simcizk
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL - PSC 48
LOCATION: NAS Cecil Field
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD = SEDIMENT
SW - surface water

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals	SVOCs, Pest, PCBs, nitrate, nitrite	TOC, grainsize, SVOC, PCB, PCB	PORE WATER, ammonia, sulfide, nitrate, nitrite						LAB USE ONLY
F4273	[redacted]	6/7/99	1056	MW	SW	4			1		3	1	3					MS/MSD			
-2	[redacted]	6/7/99	1625	MW	SW	4			1		3	1	3								
-3	[redacted]	6/7/99	000	MW	SW	4			1		3	1	3								←
-4	[redacted]		1515	MW	SD	1					1				1						xHg
-5	[redacted] SD-004		1515	MW	SD	1					1			1							
-6	[redacted] 003		1436	MW	SD	1					1			1							
-7	[redacted]		1436	MW	SD	1					1				1						
-8	[redacted]		1129	MW	SD	1					1			1				MS/MSD			
-8	CEF-P48-SD-MS/MSD01		1129	MW	SD	1					1			1							
-9	[redacted]		1129	MW	SD	1					1				1						oil
-10	[redacted]	↓	1129	MW	SD	1					1			1							

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

F4273

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1800	1. [illegible] 1345	2.		2.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
3.		3.	4.		4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE °C

CHAIN OF CUSTODY

ACCUTEST

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
ADDRESS: Tetra Tech NUS
900 Trail Ridge Road
CITY, STATE, ZIP: Aiken SC 29803
SEND REPORT TO: ROB SIMCIK
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS CECIL PSC 48
LOCATION: NAS CECIL FIELD
PROJECT NO.:
FAX #:

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD - SEDIMENT

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	TAL metals	SVOCs, PEST, PCBs, nitrate nitrite		TOC, grain size, metals SVOC, PEST, PCBs		PORE WATER, ammonia, sulfide, nitrate, nitrite						LAB USE ONLY
F4228-11	[redacted]	6/7/99	1129	MW	SD	1					1						1			MS/MSD			
-12	CEF-P48-PW-MS/MSD01		1129	MW	SD	1					1						1						
-12	[redacted]		1257	MW	SD	1					1				1								
-13	[redacted]		1257	MW	~~SW~~ SD	1					1						1						*Hg
-14	CEF-P48-SW-MS/MSD01		1056	MW	SW	8			2		6	2	6										
-14	[redacted]		1705		SD	1					1				1								
-15	[redacted]		1705		SD	1					1						1						

MW

DATA TURNAROUND INFORMATION

- ☐ STANDARD
- ☐ 48 HOUR RUSH
- ☐ 24 HOUR EMERGENCY
- ☐ OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- ☐ STANDARD
- ☐ COMMERCIAL "B"
- ☐ DISK DELIVERABLE
- ☐ STATE FORMS
- ☐ OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M.L. Whitten	6/7/99 1600	1. [signature] 1345 6/8/99	2.		2.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
3.		3.	4.		4.

SEAL # PRESERVE WHERE APPLICABLE ON ICE TEMPERATURE °C

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: F4273
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

Analyte	Batch ID	RDL	MB Result	Units	BSP %Recov	QC Limits
Hydrogen Sulfide	GN4018	2.0	<2.0	mg/l		
Nitrogen, Ammonia	GP1049	0.20	<0.20	mg/l	93.9	80-120%
Nitrogen, Nitrate + Nitrite	GN4048	0.10	<0.10	mg/l	102.0	80-120%
Nitrogen, Nitrate + Nitrite	GN4049	0.10	<0.10	mg/l	105.0	80-120%
Nitrogen, Nitrite	GN3998	0.010	<0.010	mg/l	97.0	80-120%
Nitrogen, Nitrite	GN4043	0.010	<0.010	mg/l	100.0	80-120%

Associated Samples:
Batch GN3998: F4273-1, F4273-2, F4273-3
Batch GN4018: F4273-11, F4273-13, F4273-15, F4273-4, F4273-7, F4273-9
Batch GN4043: F4273-11, F4273-13, F4273-15, F4273-4, F4273-7, F4273-9
Batch GN4048: F4273-1, F4273-11, F4273-2, F4273-3, F4273-4, F4273-7, F4273-9
Batch GN4049: F4273-13, F4273-15
Batch GP1049: F4273-11, F4273-13, F4273-15, F4273-4, F4273-7, F4273-9

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	NNTA	06/07/99	/ /	06/21/99	0	0	14
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	NNTI	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
MG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
MG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	NNTI	06/07/99	/ /	06/09/99	0	0	2
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	OS	06/07/99	06/17/99	06/18/99	10	1	11

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	OS	06/07/99	06/17/99	06/19/99	10	2	12
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	OS	06/07/99	06/14/99	06/15/99	7	1	8
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	PCB	06/07/99	06/16/99	06/16/99	9	0	9
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	PCB	06/07/99	06/11/99	06/14/99	4	3	7
UG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	PEST	06/07/99	06/16/99	06/18/99	9	2	11
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	PEST	06/07/99	06/11/99	06/12/99	4	1	5
%	CEF-P48-SD-001	F4273-12	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-002	F4273-10	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-003	F4273-6	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	[illegible]	21
%	CEF-P48-SD-004	F4273-5	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
%	CEF-P48-SD-005	F4273-14	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
%	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	SIEVE	06/07/99	/ /	06/28/99	0	0	21
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	TOC	06/07/99	06/17/99	06/17/99	10	0	10
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	TOC	06/07/99	06/17/99	06/17/99	10	0	10
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	TOC	06/07/99	06/11/99	06/11/99	4	0	4

F4273
HOLDING TIME
07/07/99

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	HG	06/07/99	06/15/99	06/16/99	8	1	9
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	HG	06/07/99	06/17/99	06/18/99	10	1	11
MG/L	CEF-P48-PW-001	F4273-13	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-002	F4273-9	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-003	F4273-7	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-004	F4273-4	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-005	F4273-15	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/L	CEF-P48-PW-DU01	F4273-11	NORMAL	F4273	HS	06/07/99	/ /	06/11/99	0	0	4
MG/KG	CEF-P48-SD-001	F4273-12	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-002	F4273-10	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-003	F4273-6	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-004	F4273-5	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-005	F4273-14	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
MG/KG	CEF-P48-SD-DU01	F4273-8	NORMAL	F4273	M	06/07/99	06/15/99	06/15/99	8	0	8
UG/L	CEF-P48-SW-008	F4273-2	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-009	F4273-1	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	2	9
UG/L	CEF-P48-SW-DU01	F4273-3	NORMAL	F4273	M	06/07/99	06/14/99	06/16/99	7	[illegible]	9
[illegible]	[illegible]	F4273-13	NORMAL	F4273	NAM	06/07/99	06/14/99	06/15/99	7	1	8

FIELD DUPLICATE PRECISION

COMPOUND	CEF-P48-PW-002	CEF-P48-PW-DU01	RPD
Ammonia	2	1.6	22.22
Hydrogen Sulfide	20u	20u	
Nitrate	1.1u	1.1u	
Nitrate/Nitrite	1u	1u	
Nitrite	0.1u	0.1u	

COMPOUND	CEF-P48-SW-009	CEF-P48-SW-DU01	RPD
Nitrate	0.11u	0.11u	
Nitrate/Nitrite	0.1u	0.1u	
Nitrite	0.01u	0.01u	

COMPOUND	CEF-P48-SD-002	CEF-P48-SD-DU01	RPD
Sieve 10	98.08	98.64	0.57
Sieve 120	8.58	11.04	25.08
Sieve 18	96.06	96.62	0.58
Sieve 230	1.08	1.08	0.00
Sieve 4	100	99.28	0.72
Sieve 40	92.42	92.28	0.15
Sieve 60	84.36	83.3	1.26
TOC	18500	19900	7.29

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-07-9-114

TO:	**M. SPERANZA**	**DATE:**	**JULY 19, 1999**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –SVOA / PESTICIDES / PCBs**
CTO 078 –NAS CECIL FIELD, FLORIDA
SDG – F4282

SAMPLES: 1/Soil/

CEF-P48-SD-006

Overview

The sample set for CTO 078, Cecil Field, SDG F4282, consists of one (1) soil environmental sample.

All samples were analyzed for semivolatile organic compounds (SVOAs) and pesticides / PCBs. The sample was collected Tetra Tech NUS on June 8, 1999 and analyzed by Accutest under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 methods 8270C, 8081A and 8082. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
  • Initial and Continuing Calibration Results
* • Laboratory Blank Analyses
* • Surrogate Recoveries
* • Detection Limits

* - All quality control criteria were met for this parameter.

PITT-07-9-114

Semivolatile Analyses

The continuing calibration percent differences (%Ds) for indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene were > 25% quality control limit. The nondetected results reported for the aforementioned compounds were qualified as estimated, "UJ".

Pesticide Analyses

The continuing calibration %Ds for Endosulfan II, 4,4'-DDT, Endrin aldehyde, Endosulfan sulfate, Methychlor and Endrin ketone were > 15% quality control limit on both columns. The nondetected results reported for the aforementioned compounds were qualified as estimated, "UJ".

Executive Summary

Laboratory Performance: The continuing calibration %Ds for indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene were > 25% quality control limit. The continuing calibration %Ds for Endosulfan II, 4,4'-DDT, Endrin aldehyde, Endosulfan sulfate, Methychlor and Endrin ketone were > 15% quality control limit on both columns.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", February 1994 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Terri L. Solomon
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

APPENDIX A
Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO(- NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4282

SAMPLE NUMBER:	CEF-P48-SD-006											
SAMPLE DATE:	06/08/99			/ /			/ /			/ /		
LABORATORY ID:	F4282-1											
QC_TYPE:	NORMAL											
% SOLIDS:	64.4 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/KG											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
SEMIVOLATILES												
1,2,4-TRICHLOROBENZENE	260	U										
1,2-DICHLOROBENZENE	260	U										
1,3-DICHLOROBENZENE	260	U										
1,4-DICHLOROBENZENE	260	U										
2,4,5-TRICHLOROPHENOL	260	U										
2,4,6-TRICHLOROPHENOL	260	U										
2,4-DICHLOROPHENOL	230	U										
2,4-DIMETHYLPHENOL	520	U										
2,4-DINITROPHENOL	1300	U										
2,4-DINITROTOLUENE	260	U										
2,6-DINITROTOLUENE	260	U										
2-CHLORONAPHTHALENE	260	U										
2-CHLOROPHENOL	260	U										
2-METHYLNAPHTHALENE	260	U										
2-METHYLPHENOL	260	U										
2-NITROANILINE	260	U										
2-NITROPHENOL	260	U										
3,3'-DICHLOROBENZIDINE	520	U										
3-NITROANILINE	260	U										
4,6-DINITRO-2-METHYLPHENOL	520	U										
4-BROMOPHENYL PHENYL ETHER	260	U										
4-CHLORO-3-METHYLPHENOL	520	U										
4-CHLOROANILINE	260	U										
4-CHLOROPHENYL PHENYL ETHER	260	U										
4-METHYLPHENOL	260	U										
4-NITROANILINE	260	U										
4-NITROPHENOL	1300	U										
ACENAPHTHENE	260	U										
ACENAPHTHYLENE	260	U										
ANTHRACENE	260	U										
BENZO(A)ANTHRACENE	260	U										
BENZO(A)PYRENE	130	U										
BENZO(B)FLUORANTHENE	260	U										
BENZO(G,H,I)PERYLENE	260	UJ	C									

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4282

SAMPLE NUMBER:	CEF-P48-SD-006			/ /			/ /			/ /		
SAMPLE DATE:	06/08/99											
LABORATORY ID:	F4282-1											
QC_TYPE:	NORMAL											
% SOLIDS:	64.4 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/KG											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	26	U										
4,4'-DDE	26	U										
4,4'-DDT	26	UJ	C									
ALDRIN	13	U										
ALPHA-BHC	13	U										
ALPHA-CHLORDANE	26	U										
AROCLOR-1016	52	U										
AROCLOR-1221	52	U										
AROCLOR-1232	52	U										
AROCLOR-1242	52	U										
AROCLOR-1248	52	U										
AROCLOR-1254	52	U										
AROCLOR-1260	52	U										
BETA-BHC	13	U										
DELTA-BHC	13	U										
DIELDRIN	13	U										
ENDOSULFAN I	13	U										
ENDOSULFAN II	26	UJ	C									
ENDOSULFAN SULFATE	26	UJ	C									
ENDRIN	26	UJ	C									
ENDRIN ALDEHYDE	26	U										
ENDRIN KETONE	26	UJ	C									
GAMMA-BHC (LINDANE)	13	U										
GAMMA-CHLORDANE	26	U										
HEPTACHLOR	13	U										
HEPTACHLOR EPOXIDE	13	U										
METHOXYCHLOR	52	UJ	C									
TOXAPHENE	1300	U										

APPENDIX B

..ults as reported by the Laboratory

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001979.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
95-57-8	2-Chlorophenol	ND	260	ug/kg	
59-50-7	4-Chloro-3-methyl phenol	ND	520	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	230	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	520	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	1300	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	520	ug/kg	
95-48-7	2-Methylphenol	ND	260	ug/kg	
	3&4-Methylphenol	ND	260	ug/kg	
88-75-5	2-Nitrophenol	ND	260	ug/kg	
100-02-7	4-Nitrophenol	ND	1300	ug/kg	
87-86-5	Pentachlorophenol	ND	1300	ug/kg	
108-95-2	Phenol	ND	260	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	260	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	260	ug/kg	
83-32-9	Acenaphthene	ND	260	ug/kg	
208-96-8	Acenaphthylene	ND	260	ug/kg	
120-12-7	Anthracene	ND	260	ug/kg	
56-55-3	Benzo(a)anthracene	ND	260	ug/kg	
50-32-8	Benzo(a)pyrene	ND	130	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	260	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	260	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	260	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	260	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	260	ug/kg	
91-58-7	2-Chloronaphthalene	ND	260	ug/kg	
106-47-8	4-Chloroaniline	ND	260	ug/kg	
86-74-8	Carbazole	ND	260	ug/kg	
218-01-9	Chrysene	ND	260	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	260	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	260	ug/kg	
108-60-1	bis(2-Chloroisopropyl)ether	ND	260	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	260	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	260	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	260	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	260	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	260	ug/kg	

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001979.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Compound	Result	RDL	Units	Q
606-20-2	2,6-Dinitrotoluene	ND	260	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	520	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	130	ug/kg	
132-64-9	Dibenzofuran	ND	260	ug/kg	
84-74-2	Di-n-butyl phthalate	ND	260	ug/kg	
117-84-0	Di-n-octyl phthalate	ND	260	ug/kg	
84-66-2	Diethyl phthalate	ND	260	ug/kg	
131-11-3	Dimethyl phthalate	ND	260	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	260	ug/kg	
206-44-0	Fluoranthene	ND	260	ug/kg	
86-73-7	Fluorene	ND	260	ug/kg	
118-74-1	Hexachlorobenzene	ND	260	ug/kg	
87-68-3	Hexachlorobutadiene	ND	260	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	260	ug/kg	
67-72-1	Hexachloroethane	ND	260	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	260	ug/kg	
78-59-1	Isophorone	ND	260	ug/kg	
90-12-0	1-Methylnaphthalene	ND	260	ug/kg	
91-57-6	2-Methylnaphthalene	ND	260	ug/kg	
88-74-4	2-Nitroaniline	ND	260	ug/kg	
99-09-2	3-Nitroaniline	ND	260	ug/kg	
100-01-6	4-Nitroaniline	ND	260	ug/kg	
91-20-3	Naphthalene	ND	260	ug/kg	
98-95-3	Nitrobenzene	ND	260	ug/kg	
621-64-7	N-Nitroso-di-n-propylamine	ND	93	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	260	ug/kg	
85-01-8	Phenanthrene	ND	260	ug/kg	
129-00-0	Pyrene	ND	260	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	260	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	68%		25-121%
4165-62-2	Phenol-d5	76%		24-113%
118-79-6	2,4,6-Tribromophenol	104%		19-122%
4165-60-0	Nitrobenzene-d5	75%		23-120%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
Method:	SW846 3550B/8270C	**Percent Solids:**	64.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	L001979.D	1	06/19/99	ME	06/17/99	OP853	SL122
Run #2							

ABN TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
321-60-8	2-Fluorobiphenyl	90%		30-115%
1718-51-0	Terphenyl-d14	84%		18-137%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
Method:	SW846 3550B/8081A	**Percent Solids:**	64.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	MN04015.D	5	06/21/99	SKW	06/16/99	OP852	GMN166
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RDL	Units	Q
309-00-2	Aldrin	ND	13	ug/kg	
319-84-6	alpha-BHC	ND	13	ug/kg	
319-85-7	beta-BHC	ND	13	ug/kg	
319-86-8	delta-BHC	ND	13	ug/kg	
58-89-9	gamma-BHC (Lindane)	ND	13	ug/kg	
5103-71-9	alpha-Chlordane	ND	26	ug/kg	
5103-74-2	gamma-Chlordane	ND	26	ug/kg	
60-57-1	Dieldrin	ND	13	ug/kg	
72-54-8	4,4'-DDD	ND	26	ug/kg	
72-55-9	4,4'-DDE	ND	26	ug/kg	
50-29-3	4,4'-DDT	ND	26	ug/kg	
72-20-8	Endrin	ND	26	ug/kg	
1031-07-8	Endosulfan sulfate	ND	26	ug/kg	
7421-93-4	Endrin aldehyde	ND	26	ug/kg	
53494-70-5	Endrin ketone	ND	26	ug/kg	
959-98-8	Endosulfan-I	ND	13	ug/kg	
33213-65-9	Endosulfan-II	ND	26	ug/kg	
76-44-8	Heptachlor	ND	13	ug/kg	
1024-57-3	Heptachlor epoxide	ND	13	ug/kg	
72-43-5	Methoxychlor	ND	52	ug/kg	
8001-35-2	Toxaphene	ND	1300	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	90%		40-150%
2051-24-3	Decachlorobiphenyl	74%		30-160%

(a) Sample matrix caused CCV to fail low, sample was reanalyzed with similar results. All values are considered estimated.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
Method:	SW846 8082	**Percent Solids:**	64.4
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AB09228.D	1	06/17/99	SKW	06/16/99	OP851	GAB347
Run #2							

PCB List

CAS No.	Compound	Result	RDL	Units	Q
12674-11-2	Aroclor 1016	ND	52	ug/kg	
11104-28-2	Aroclor 1221	ND	52	ug/kg	
11141-16-5	Aroclor 1232	ND	52	ug/kg	
53469-21-9	Aroclor 1242	ND	52	ug/kg	
12672-29-6	Aroclor 1248	ND	52	ug/kg	
11097-69-1	Aroclor 1254	ND	52	ug/kg	
11096-82-5	Aroclor 1260	ND	52	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	101%		40-150%
2051-24-3	Decachlorobiphenyl	76%		30-160%

00200

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

07-9-114

APPENDIX C
Support Documentation

ACCUTEST

CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
Tetra Tech NUS
ADDRESS: 900 Trail Ridge Road
CITY: Aiken STATE: SC ZIP: 29803
SEND REPORT TO: Rob Simcik
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS Cecil - PSC 48
LOCATION: NAS Cecil Field
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD - Sediment

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	COLLECTION TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	PRESERVATION HCl	NaOH	HNO3	H2SO4	NONE	Pore Water - ammonia, sulfide, nitrate, nitrite	TOC, grain size, metals, SVOC, pesticide, PCBs								LAB USE ONLY
F4282-1	CEF-P48-SD-006	6/8/99	0900	MLW	SD	1					1		1								
-2	CEF-P48-PW-006	6/8/99	0900	MLW	SD	1					1	1									

M. Whitten

00012

DATA TURNAROUND INFORMATION

- STANDARD
- 48 HOUR RUSH
- 24 HOUR EMERGENCY
- OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- STANDARD
- COMMERCIAL "B"
- DISK DELIVERABLE
- STATE FORMS
- OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. M L Whitten	6/8/99 1800	Addy Wilson	2.		2.
RELINQUISHED BY: 3.	DATE TIME:	RECEIVED BY: 3. 6-9-99 1730	RELINQUISHED BY: 4.	DATE TIME:	RECEIVED BY: 4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY:	SEAL #	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C

F428

HOLDING TIME

07/09/99

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	HG	06/08/99	06/15/99	06/16/99	7	1	8
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	HSUL	06/08/99	/ /	06/11/99	0	0	3
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	M	06/08/99	06/15/99	06/15/99	7	0	7
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NAM	06/08/99	06/14/99	06/15/99	6	1	7
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTA	06/08/99	/ /	06/21/99	0	0	13
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTI	06/08/99	/ /	06/11/99	0	0	3
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTIA	06/08/99	/ /	06/21/99	0	0	13
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	OS	06/08/99	06/17/99	06/19/99	9	2	11
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	PCB	06/08/99	06/16/99	06/17/99	8	1	9
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	PEST	06/08/99	06/16/99	06/21/99	8	5	13
%	CEF-P48-SD-006	F4282-1	NORMAL	F4282	SIEVE	06/08/99	/ /	06/28/99	0	0	20
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	TOC	06/08/99	06/28/99	06/28/99	20	0	20

Sequence Name: C:\HPCHEM\1\SEQUENCE\061999.S
Comment:
Operator: marke
Data Path: C:\HPCHEM\1\DATA\061999\
Pre-Seq Cmd:
Post-Seq Cmd:

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	1	L001962	DFTPP	dftpp
2	Sample	2	L001963	8270C	cc111-75
3	Sample	3	L001964	8270C	2ppm
4	Sample	4	L001965	8270C	op853-mb
5	Sample	5	L001966	8270C	f4273-8
6	Sample	6	L001967	8270C	op853-ms
7	Sample	7	L001968	8270C	op853-msd
8	Sample	8	L001969	8270C	f4273-12
9	Sample	9	L001970	8270C	f4273-14
10	Sample	10	L001971	8270C	f4281-6,4
11	Sample	11	L001972	8270C	f4281-9,10
12	Sample	12	L001973	8270C	f4281-13,4
13	Sample	13	L001974	8270C	f4281-14,4
14	Sample	14	L001975	8270C	f4281-16,4
15	Sample	15	L001976	8270C	f4281-22,4
16	Sample	16	L001977	8270C	f4281-28,4
[illegible]	Sample	17	L001978	8270C	f4281-32
[illegible]	Sample	18	L001979	8270C	f4282-1
9					

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\061999\L001963.D Vial: 2
Acq On : 19 Jun 1999 2:43 pm Operator: marke
Sample : cc111-75 Inst : MSBNA02
Misc : op853,sl122,soil,,,1, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\8270C.M (RTE Integrator)
Title : SW846 8270C OR EPA 625
Last Update : Tue Jun 15 12:59:14 1999
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	72	-0.04
2		1,4-Dioxane	0.422	0.363	14.0	62	-0.05
3		N-nitrosodimethylamine	0.655	0.594	9.3	65	-0.05
4		Pyridine	1.264	1.100	13.0	61	-0.05
5		Aniline	1.928	1.815	5.9	70	-0.04
6	S	2-Fluorophenol	1.233	1.192	3.3	71	-0.04
7		bis(2-Chloroethyl)ether	1.217	1.149	5.6	69	-0.04
8	S	Phenol-d5	1.419	1.352	4.7	71	-0.04
9	C	Phenol	1.654	1.607	2.8	72	-0.04
10		2-Chlorophenol	1.390	1.362	2.0	71	-0.04
11		1,3-Dichlorobenzene	1.528	1.522	0.4	72	-0.04
12	C	1,4-Dichlorobenzene	1.518	1.517	0.1	73	-0.04
13		1,2-Dichlorobenzene	1.446	1.425	1.5	71	-0.04
		Benzyl alcohol	0.895	0.845	5.6	69	-0.04
15		bis(2-chloroisopropyl)ether	2.018	1.908	5.5	70	-0.04
16		2-Methylphenol	1.231	1.187	3.6	70	-0.05
17		Hexachloroethane	0.498	0.501	-0.6	72	-0.04
18	P	N-Nitroso-di-n-propylamine	0.832	0.770	7.5	67	-0.05
19		3&4-Methylphenol	1.253	1.190	5.0	68	-0.04
20	I	Naphthalene-d8	1.000	1.000	0.0	71	-0.05
21	S	Nitrobenzene-d5	0.348	0.346	0.6	70	-0.04
22		Nitrobenzene	0.354	0.349	1.4	70	-0.04
23		Isophorone	0.656	0.625	4.7	67	-0.05
24	C	2-Nitrophenol	0.208	0.224	-7.7	73	-0.04
25		2,4-Dimethylphenol	0.363	0.358	1.4	70	-0.05
26		bis(2-Chloroethoxy)methane	0.386	0.370	4.1	68	-0.05
27		Benzoic Acid	0.247	0.269	-8.9	74	-0.07
28	C	2,4-Dichlorophenol	0.304	0.315	-3.6	72	-0.05
29		1,2,4-Trichlorobenzene	0.305	0.311	-2.0	72	-0.05
30		Naphthalene	1.040	1.038	0.2	72	-0.05
31		4-Chloroaniline	0.462	0.443	4.1	68	-0.05
32		2,6-Dichlorophenol	0.297	0.303	-2.0	71	-0.05
33	C	Hexachlorobutadiene	0.146	0.156	-6.8	75	-0.05
34	C	4-Chloro-3-methylphenol	0.300	0.290	3.3	68	-0.07
35		2-Methylnaphthalene	0.736	0.738	-0.3	72	-0.06
36		1-Methylnaphthalene	0.703	0.707	-0.6	72	-0.05
37	I	Acenaphthene-d10	1.000	1.000	0.0	72	-0.07
38	P	Hexachlorocyclopentadiene	0.242	0.259	-7.0	69	-0.05
39	C	2,4,6-Trichlorophenol	0.361	0.385	-6.6	74	-0.07
40		2,4,5-Trichlorophenol	0.389	0.404	-3.9	73	-0.07
41	S	2-Fluorobiphenyl	1.372	1.400	-2.0	73	-0.06
42		2-Chloronaphthalene	1.170	1.181	-0.9	72	-0.06
43		2-Nitroaniline	0.339	0.334	1.5	69	-0.07

00082

44		Acenaphthylene	1.672	1.707	-2.1	74	-0.07
45		Dimethylphthalate	1.272	1.248	1.9	71	-0.06
46		2,6-Dinitrotoluene	0.275	0.293	-6.5	73	-0.07
47	C	Acenaphthene	1.121	1.142	-1.9	74	-0.07
48		3-Nitroaniline	0.357	0.361	-1.1	71	-0.07
49	P	2,4-Dinitrophenol	0.156	0.180	-15.4	79	-0.07
50		Dibenzofuran	1.656	1.705	-3.0	74	-0.07
51		2,4-Dinitrotoluene	0.368	0.386	-4.9	72	-0.07
52	P	4-Nitrophenol	0.157	0.168	-7.0	74	-0.08
53		2,3,4,6-Tetrachlorophenol	0.223	0.256	-14.8	78	-0.07
54		Fluorene	1.209	1.252	-3.6	75	-0.07
55		4-Chlorophenyl-phenylether	0.503	0.526	-4.6	76	-0.07
56		Diethylphthalate	1.236	1.259	-1.9	74	-0.07
57		4-Nitroaniline	0.334	0.343	-2.7	73	-0.08
58	I	Phenanthrene-d10	1.000	1.000	0.0	75	-0.07
59		4,6-Dinitro-2-methylphenol	0.142	0.156	-9.9	77	-0.08
60	C	n-Nitrosodiphenylamine	0.617	0.610	1.1	74	-0.07
61		1,2-Diphenylhydrazine	0.839	0.800	4.6	70	-0.07
62	S	2,4,6-Tribromophenol	0.060	0.066	-10.0	80	-0.07
63		4-Bromophenyl-phenylether	0.170	0.173	-1.8	75	-0.07
64		Hexachlorobenzene	0.156	0.158	-1.3	76	-0.07
65	C	Pentachlorophenol	0.102	0.113	-10.8	79	-0.08
66		Phenanthrene	1.128	1.155	-2.4	78	-0.07
67		Anthracene	1.072	1.079	-0.7	76	-0.08
68		Carbazole	1.089	1.105	-1.5	77	-0.07
69		Di-n-butylphthalate	1.287	1.355	-5.3	77	-0.07
70	C	Fluoranthene	0.921	0.959	-4.1	78	-0.08
71	I	Chrysene-d12	1.000	1.000	0.0	88	-0.08
72		Benzidine	1.042	0.827	20.6	67	-0.08
73		Pyrene	2.139	2.004	6.3	80	-0.08
74	S	Terphenyl-d14	1.253	1.211	3.4	82	-0.07
75		Butylbenzylphthalate	1.017	1.045	-2.8	84	-0.07
76		3,3'-Dichlorobenzidine	0.423	0.473	-11.8	93	-0.07
77		Benzo[a]anthracene	1.383	1.400	-1.2	87	-0.08
78		Chrysene	1.309	1.288	1.6	87	-0.08
79		bis(2-Ethylhexyl)phthalate	1.207	1.320	-9.4	88	-0.07
80	I	Perylene-d12	1.000	1.000	0.0	102	-0.08
81	C	Di-n-octylphthalate	3.420	3.465	-1.3	98	-0.07
82		Benzo[b]fluoranthene	1.546	1.596	-3.2	102	-0.08
83		Benzo[k]fluoranthene	1.634	1.519	7.0	93	-0.08
84	C	Benzo[a]pyrene	1.298	1.363	-5.0	103	-0.07
85		Indeno[1,2,3-cd]pyrene	0.801	1.122	-40.1#	126	-0.08
86		Dibenz[a,h]anthracene	0.840	1.165	-38.7#	130	-0.08
87		Benzo[g,h,i]perylene	0.845	1.151	-36.2#	129	-0.08

(#) = Out of Range SPCC's out = 0 CCC's out = 0

L001789.D 8270C.M Mon Jun 21 08:03:05 1999 RPT1

00083

Sequence Name: C:\HPCHEM\2\SEQUENCE\0621PEST.S
Comment:
Operator: stephw
Data Path: C:\HPCHEM\2\DATA\0621pest\
Pre-Seq Cmd:
Post-Seq Cmd:

gmn166

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	1	MN03997	ACQ_PEST	cond std
2	Sample	2	MN03998	ACQ_PEST	ddt/endrin breakdown
3	Sample	3	MN03999	ACQ_PEST	5ppb pest p441
4	Sample	4	MN04000	ACQ_PEST	10ppb pest p441
5	Sample	5	MN04001	ACQ_PEST	20ppb pest p441
6	Sample	6	MN04002	ACQ_PEST	40ppb pest p441
7	Sample	7	MN04003	ACQ_PEST	60ppb pest p441
8	Sample	8	MN04004	ACQ_PEST	80ppb pest p441
9	Sample	9	MN04005	ACQ_PEST	500ppb toxpahene p429
10	Sample	10	MN04006	ACQ_PEST	200ppb chlordane p430
11	Sample	11	MN04007	ACQ_PEST	ddt/endrin breakdown p421
12	Sample	12	MN04008	ACQ_PEST	op852-mb
13	Sample	13	MN04009	ACQ_PEST	op852-bs
14	Sample	14	MN04010	ACQ_PEST	F4255-13
15	Sample	15	MN04011	ACQ_PEST	F4281-18
16	Sample	16	MN04012	ACQ_PEST	40ppb ccv -OK
17	Sample	17	MN04013	ACQ_PEST	op852-ms,5x
18	Sample	18	MN04014	ACQ_PEST	op852-msd,5x
19	Sample	19	MN04015	ACQ_PEST	F4282-1,5x
20	Sample	20	MN04016	ACQ_PEST	F4281-17,5x
21	Sample	21	MN04017	ACQ_PEST	F4281-19,5x
22	Sample	22	MN04018	ACQ_PEST	F4281-2,5x
23	Sample	23	MN04019	ACQ_PEST	F4281-32,5x
24	Sample	24	MN04020	ACQ_PEST	F4281-6,5x
25	Sample	25	MN04021	ACQ_PEST	F4281-13,5x
26	Sample	26	MN04022	ACQ_PEST	F4281-14,5x
27	Sample	27	MN04023	ACQ_PEST	40ppb ccv
28	Sample	28	MN04024	ACQ_PEST	F4281-24,10x
29	Sample	29	MN04025	ACQ_PEST	F4281-28,10x
30	Sample	30	MN04026	ACQ_PEST	F4281-9,10x
31	Sample	31	MN04027	ACQ_PEST	F4281-30,20x
32	Sample	32	MN04028	ACQ_PEST	40ppb ccv
33	Sample	33	MN04029	ACQ_PEST	F4273-5,5x
34	Sample	34	MN04030	ACQ_PEST	F4273-6,5x
35	Sample	35	MN04031	ACQ_PEST	F4273-8,5x
36	Sample	36	MN04032	ACQ_PEST	F4273-10,5x
37	Sample	37	MN04033	ACQ_PEST	F4273-12,5x
38	Sample	38	MN04034	ACQ_PEST	F4273-14,5x
39	Sample	39	MN04035	ACQ_PEST	40ppb ccv

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD1B.CH Vial: 27
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD2A.CH
Acq On : 21 Jun 99 7:08 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
	S	Tetrachloro-m-xylene	4.367	4.185 E3	4.2	99	0.00
		alpha-BHC	7.596	7.571 E3	0.3	98	0.00
3		gamma-BHC (Lindane)	6.959	6.597 E3	5.2	95	0.00
4		beta-BHC	3.143	2.658 E3	15.4#	87	0.00
5		Heptachlor	6.076	5.465 E3	10.1	92	0.00
6		delta-BHC	6.178	5.552 E3	10.1	85	0.00
7		Aldrin	5.278	4.961 E3	6.0	92	0.00
8		Heptachlor Epoxide	5.329	4.900 E3	8.1	92	0.00
9		gamma-Chlordane	5.229	4.538 E3	13.2	86	0.00
10		alpha-Chlordane	5.334	4.528 E3	15.1#	85	0.00
11		Endosulfan I	5.240	4.674 E3	10.8	87	0.00
12		4,4'-DDE	4.012	3.516 E3	12.4	82	0.00
13		Dieldrin	4.740	4.194 E3	11.5	85	0.00
14		Endrin	3.783	3.303 E3	12.7	86	0.00
15		4,4'-DDD	3.278	2.725 E3	16.9#	80	0.00
16		Endosulfan II	3.884	3.073 E3	20.9#	79	0.00
17		4,4'-DDT	2.845	1.769 E3	37.8#	57	0.00
18		Endrin Aldehyde	2.712	1.991 E3	26.6#	73	0.00
19		Endosulfan Sulfate	3.329	2.453 E3	26.3#	73	0.00
		Methoxychlor	1.264	0.851 E3	32.7#	65	0.00
		Endrin Ketone	3.168	2.298 E3	27.5#	70	0.00
29	S	Decachlorobiphenyl	1.176	0.786 E3	33.2#	71	0.00

Signal #2

1	S	Tetrachloro-m-xylene	4.614	4.705 E3	-2.0	105	0.00
2		alpha-BHC	8.751	9.203 E3	-5.2	104	0.00
3		gamma-BHC (Lindane)	7.992	8.106 E3	-1.4	101	0.00
4		beta-BHC	3.301	3.043 E3	7.8	94	0.00
5		Heptachlor	7.186	6.798 E3	5.4	95	0.00
6		delta-BHC	6.660	6.446 E3	3.2	93	0.00
7		Aldrin	6.308	6.325 E3	-0.3	100	0.00
8		Heptachlor Epoxide	6.037	5.753 E3	4.7	95	0.00
9		gamma-Chlordane	6.213	5.811 E3	6.5	92	0.00
10		alpha-Chlordane	5.914	5.555 E3	6.1	92	0.00
11		Endosulfan I	5.120	4.791 E3	6.4	92	0.00
12		4,4'-DDE	4.484	4.010 E3	10.6	89	0.00
13		Dieldrin	5.316	5.015 E3	5.7	91	0.00
14		Endrin	4.380	3.956 E3	9.7	88	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Signal #1 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD1B.CH Vial: 27
Signal #2 : C:\HPCHEM\2\DATA\0621PEST\MN04023.D\ECD2A.CH
Acq On : 21 Jun 99 7:08 pm Operator: stephw
Sample : 40ppb ccv Inst : ECD 2
Misc : op852,gmn166,soil,,,10, Multiplr: 1.00
IntFile Signal #1: events.e IntFile Signal #2: events2.e

Method : C:\HPCHEM\2\METHODS\8081A.M
Title : Pesticides by 608 or 8081
Last Update : Fri Jun 18 13:44:18 1999
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.10min
Max. RRF Dev : 15% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
.5		4,4'-DDD	3.382	2.914 E3	13.8	83	0.00
.6		Endosulfan II	4.304	3.624 E3	15.8#	83	0.00
.7		4,4'-DDT	3.016	1.842 E3	38.9#	59	0.00
.8		Endrin Aldehyde	2.159	1.682 E3	22.1#	78	0.00
.9		Endosulfan Sulfate	3.450	2.684 E3	22.2#	76	0.00
0		Methoxychlor	1.305	0.890 E3	31.8#	66	0.00
1		Endrin Ketone	3.252	2.410 E3	25.9#	72	0.00
9	S	Decachlorobiphenyl	1.405	0.962 E3	31.5#	73	0.00

00213

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**M. SPERANZA**	**DATE:**	**JULY 19, 1999**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – TAL METALS, GRAIN SIZE, TOTAL ORGANIC CARBON, AMMONIA, HYDROGEN SULFIDE, NITRATE, NITRITE, NITRATE / NITRITE**
CTO 078 – NAS CECIL FIELD, FLORIDA
SDG – F4282

SAMPLES: 1/Aqueous/

CEF-P48-PW-006

1/ Soil/

CEF-P48-SD-006

Overview

The sample set for CTO 078, NAS Cecil Field, SDG F4282, consists of one (1) aqueous environmental and one(1) environmental sample.

The soil sample was analyzed for Target Analyte List (TAL) metals, grain size and total organic carbon. The aqueous sample was analyzed for ammonia, hydrogen sulfide, nitrate, nitrite and nitrate / nitrite. The samples were collected by Tetra Tech NUS on June 8, 1999 and analyzed by Accutest Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All metals analyses were conducted using SW-846 method 6010B. Grain size analyses were conducted using ASTM method E422-63. Total organic carbon analyses were conducted using Army Corp Eng 81M. Hydrogen sulfide analyses were conducted using Standard Method 18 4500 . EPA method 376.1. Ammonia analyses were conducted using EPA method 350.1. Nitrite analyses were conducted using Standard Method 18 4500N02B. Nitrate / Nitrite analyses were conducted using Standard Method 4500N03E. The nitrate result was obtained by subtracting the nitrite result from the nitrate / nitrite result. These data were evaluated based on the following parameters:

* • Data Completeness
• Holding Times
* • Initial and Continuing Calibration Recoveries
• Laboratory Blank Analyses
* • Field Duplicate Results
* • Detection Limits

* - All quality control criteria were met for this parameter.

Holding Times

The 48 hour hold time for the nitrite analysis was marginally exceeded. The nondetected result reported for aforementioned parameter was qualified as estimated, "UJ". Since the nitrate result was calculated using the nitrite result, the nondetected result reported for the nitrate analysis was also qualified as estimated, "UJ".

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level (soil)
antimony	5.2 ug/L	2.6 mg/kg
barium	0.60 ug/L	0.3 mg/kg
beryllium	2.7 ug/L	1.35 mg/kg
cadmium	0.77 ug/L	0.385 mg/kg
[illegible]cium	22.0 ug/L	11 mg/kg
[illegible]romium	1.7 ug/L	0.85 mg/kg
magnesium	23.0 ug/L	11.5 mg/kg
manganese	0.80 ug/L	0.4 mg/kg
nickel	1.3 ug/L	0.65 mg/kg
potassium	119 ug/L	59.5 mg/kg
silver	1.3 ug/L	0.65 mg/kg
thallium	14.6 ug/L	7.3 mg/kg
vanadium	0.79 ug/L	0.395 mg/kg
zinc	1.2 ug/L	0.6 mg/kg

Samples affected: All

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for antimony, beryllium, cadmium, nickel, potassium and silver have been qualified as nondetected "U". No action was taken for the remaining analytes since the results were either greater than the action level or were nondetects.

Executive Summary

Laboratory Performance: The 48 hour hold time for the nitrite analysis was marginally exceeded. The nitrate result was calculated using the nitrite result, the nondetected result reported for the nitrate analysis was also qualified as estimated. Several analytes were present in the laboratory method blanks.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Terri L. Solomon

Tetra Tech NUS
Terri L. Solomon
Chemist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation.

APPENDIX A
Qualified Analytical Results

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

CTO(- NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4282

SAMPLE NUMBER:	CEF-P48-SD-006			
SAMPLE DATE:	06/08/99	/ /	/ /	/ /
LABORATORY ID:	F4282-1			
QC_TYPE:	NORMAL			
% SOLIDS:	64.4 %	100.0 %	100.0 %	100.0 %
UNITS:	MG/KG			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
ALUMINUM	1690											
ANTIMONY	0.44	U	A									
ARSENIC	0.54	U										
BARIUM	10.3											
BERYLLIUM	0.45	U	A									
CADMIUM	0.12	U	A									
CALCIUM	1250											
CHROMIUM	2.6											
COBALT	0.36											
COPPER	4.7											
IRON	1000											
LEAD	9.2											
MAGNESIUM	131											
MANGANESE	6.0											
MERCURY	0.06	U										
NICKEL	0.95	U	A									
POTASSIUM	51.1	U	A									
SELENIUM	0.32	U										
SILVER	0.15	U	A									
SODIUM	31.6											
THALLIUM	0.42	U										
VANADIUM	3.0											
ZINC	20.3											

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4282

SAMPLE NUMBER:	CEF-P48-PW-006											
SAMPLE DATE:	06/08/99			/ /			/ /			/ /		
LABORATORY ID:	F4282-2											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	MG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
AMMONIA, AS NITROGEN	5.5											
HYDROGEN SULFIDE	20	U										
NITRATE, AS NITROGEN	0.2	UJ	H									
NITRATE/NITRITE, AS N	0.1	U										
NITRITE, AS NITROGEN	0.1	UJ	H									

CTOC - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4282

SAMPLE NUMBER:	CEF-P48-SD-006			
SAMPLE DATE:	06/08/99	/ /	/ /	/ /
LABORATORY ID:	F4282-1			
QC_TYPE:	NORMAL			
% SOLIDS:	64.4 %	100.0 %	100.0 %	100.0 %
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
MISCELLANEOUS PARAMETERS												
NO. 10 SIEVE(%)	100											
NO. 120 SIEVE(%)	8.7											
NO. 18 SIEVE(%)	99.5											
NO. 230 SIEVE(%)	0.82											
NO. 4 SIEVE(%)	100											
NO. 40 SIEVE(%)	98.4											
NO. 60 SIEVE(%)	95.9											
TOTAL ORGANIC CARBON(MG/KG)	13000											

APPENDIX B
Results as reported by the Laboratory

Report of Analysis

Client Sample ID:	CEF-P48-SD-006		
Lab Sample ID:	F4282-1	**Date Sampled:**	06/08/99
Matrix:	SO - Soil	**Date Received:**	06/09/99
		Percent Solids:	64.4
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Aluminum	1690	31.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Antimony	0.44 B	9.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Arsenic	0.54 U	1.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Barium	10.3 B	31.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Beryllium	0.45 B	0.78	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cadmium	0.12 B	0.62	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Calcium	1250	776	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Chromium	2.6	1.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Cobalt	0.36 B	7.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Copper	4.7	3.9	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Iron	1000	15.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Lead	9.2 B	15.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Magnesium	131 B	776	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Manganese	6.0	2.3	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Mercury	0.06 U	0.26	mg/kg	1	06/15/99	06/16/99	JK	SW846 7471A
Nickel	0.95 B	6.2	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Potassium	51.1 B	776	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Selenium	0.32 U	15.5	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Silver	0.15 B	1.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Sodium	31.6 B	776	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Thallium	0.42 U	1.6	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Vanadium	3.0 B	7.8	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A
Zinc	20.3	3.1	mg/kg	1	06/15/99	06/15/99	JK	SW846 6010A

00365

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID: CEF-P48-SD-006
Lab Sample ID: F4282-1
Matrix: SO - Soil

Date Sampled: 06/08/99
Date Received: 06/09/99
Percent Solids: 64.4

Project: NAS Cecil Field

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Sieve Test - Particle Sizing							
No. 4 Sieve	100		%	1	06/28/99	JK	ASTM E422-63
No. 10 Sieve	100		%	1	06/28/99	JK	ASTM E422-63
No. 18 Sieve	99.5		%	1	06/28/99	JK	ASTM E422-63
No. 40 Sieve	98.4		%	1	06/28/99	JK	ASTM E422-63
No. 60 Sieve	95.9		%	1	06/28/99	JK	ASTM E422-63
No. 120 Sieve	8.7		%	1	06/28/99	JK	ASTM E422-63
No. 230 Sieve	0.82		%	1	06/28/99	JK	ASTM E422-63
Solids, Percent	64.4		%	1	06/15/99	LR	EPA 160.3 M
Total Organic Carbon	13000	1600	mg/kg	1	06/28/99	ANJ	CORP ENG 81 M

00458

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-P48-PW-006		
Lab Sample ID:	F4282-2	**Date Sampled:**	06/08/99
Matrix:	AQ - Ground Water	**Date Received:**	06/09/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

General Chemistry

Analyte	Result	RDL	Units	DF	Analyzed By		Method
Hydrogen Sulfide	<20	20	mg/l	10	06/11/99	EP	SM18 4500/EPA 376.1
Nitrogen, Ammonia	5.5	2.0	mg/l	10	06/15/99	EP	EPA 350.1
Nitrogen, Nitrate [a]	<0.20	0.20	mg/l	1	06/21/99	LR	SM18 4500NO3E/NO2B
Nitrogen, Nitrate + Nitrite	<0.10	0.10	mg/l	1	06/21/99	LR	SM18 4500NO3E
Nitrogen, Nitrite	<0.10	0.10	mg/l	10	06/11/99	JK	SM18 4500NO2B

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

00450

RDL = Reported Detection Limit

07-9-116
N: = , Pg 1

APPENDIX C
Support Documentation

F4282

HOLDING TIME

07/09/99

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	HG	06/08/99	06/15/99	06/16/99	7	1	8
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	HSUL	06/08/99	/ /	06/11/99	0	0	3
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	M	06/08/99	06/15/99	06/15/99	7	0	7
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NAM	06/08/99	06/14/99	06/15/99	6	1	7
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTA	06/08/99	/ /	06/21/99	0	0	13
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTI	06/08/99	/ /	06/11/99	0	0	3
MG/L	CEF-P48-PW-006	F4282-2	NORMAL	F4282	NTIA	06/08/99	/ /	06/21/99	0	0	13
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	OS	06/08/99	06/17/99	06/19/99	9	2	11
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	PCB	06/08/99	06/16/99	06/17/99	8	1	9
UG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	PEST	06/08/99	06/16/99	06/21/99	8	5	13
%	CEF-P48-SD-006	F4282-1	NORMAL	F4282	SIEVE	06/08/99	/ /	06/28/99	0	0	20
MG/KG	CEF-P48-SD-006	F4282-1	NORMAL	F4282	TOC	06/08/99	06/28/99	06/28/99	20	0	20

ACCUTEST

CHAIN OF CUSTODY

4405 VINELAND ROAD • SUITE C-15
ORLANDO, FL 32811
TEL: 407-425-6700 • FAX: 407-425-0707

ACCUTEST JOB #:

ACCUTEST QUOTE #:

CLIENT INFORMATION

NAME: Mike Whitten
Tetra Tech NUS
ADDRESS: 900 Trail Ridge Road
CITY, STATE, ZIP: Aiken SC 29803
SEND REPORT TO: Rob Simcik
PHONE #: 1-800-245-2730

FACILITY INFORMATION

PROJECT NAME: NAS Cecil - PSC 48
LOCATION: NAS Cecil Field
PROJECT NO.:
FAX #:

ANALYTICAL INFORMATION

Pore Water - ammonia, sulfide, nitrate, nitrite
TOC, grain size, metals, SVOC, pesticide, PCBs

00017

MATRIX CODES

DW - DRINKING WATER
GW - GROUND WATER
WW - WASTE WATER
SO - SOIL
SL - SLUDGE
OI - OIL
LIQ - OTHER LIQUID
SOL - OTHER SOLID
SD - Sediment

ACCUTEST SAMPLE #	FIELD ID / POINT OF COLLECTION	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	# OF BOTTLES	HCl	NaOH	HNO3	H2SO4	NONE	Pore Water - ammonia, sulfide, nitrate, nitrite	TOC, grain size, metals, SVOC, pesticide, PCBs	LAB USE ONLY
F4282-1	CEF-P48-SD-006	6/8/99	0900	MLW	SD	1					1		1	
-2	CEF-P48-PW-006	6/8/99	0900	MLW	SD	1					1	1		

ML Whitten

DATA TURNAROUND INFORMATION

- [ ] STANDARD
- [ ] 48 HOUR RUSH
- [ ] 24 HOUR EMERGENCY
- [ ] OTHER

APPROVED BY:

EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED

DATA DELIVERABLE INFORMATION

- [ ] STANDARD
- [ ] COMMERCIAL "B"
- [ ] DISK DELIVERABLE
- [ ] STATE FORMS
- [ ] OTHER (SPECIFY)

COMMENTS/REMARKS

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESION, INCLUDING COURIER DELIVERY

RELINQUISHED BY/SAMPLER:	DATE TIME:	RECEIVED BY:	RELINQUISHED BY:	DATE TIME:	RECEIVED BY:
1. ML Whitten	6/8/99 1800	2. Addy Wilson	2.		2.
RELINQUISHED BY: 3.	DATE TIME:	RECEIVED BY: 3. 6-9-99 1730	RELINQUISHED BY: 4.	DATE TIME:	RECEIVED BY: 4.
RELINQUISHED BY:	DATE TIME:	RECEIVED BY: 5.	SEAL	PRESERVE WHERE APPLICABLE ☐	ON ICE ☐ TEMPERATURE ____ C

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4282
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final
Aluminum	200	30	22.9	<200
Antimony	5.0	2.39	0.090	<5.0
Arsenic	5.0	3.4	-0.88	<5.0
Barium	200	.39	0.16	<200
Beryllium	5.0	.36	2.5	<5.0
Cadmium	4.0	.33	0.010	<4.0
Calcium	5000	19.5	0.98	<5000
Chromium	10	.637	-0.070	<10
Cobalt	50	.797	0.13	<50
Copper	25	.747	-2.4	<25
Iron	100	32	-1.4	<100
Lead	3.0	1.59	-0.43	<3.0
Magnesium	5000	17.6	11.1	<5000
Manganese	15	.16	0.12	<15
Molybdenum	50	.68	anr	
Nickel	40	1	-0.25	<40
Potassium	5000	28.2	83.8	<5000
Selenium	5.0	2	-1.7	<5.0
Silver	10	.96	0.51	<10
Sodium	5000	153	-100	<5000
Thallium	5.0	2.69	14.6	* (a)
Tin	50	2.2	anr	
Vanadium	50	.717	0.11	<50
Zinc	20	.83	1.1	<20

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable samples

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4282
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	26.2	<200	19.4	<200	28.2	<200	24.0	<200
Antimony	5.0	2.39	1.9	<5.0	0.90	<5.0	2.0	<5.0	2.3	<5.0
Arsenic	5.0	3.4	-0.55	<5.0	-1.2	<5.0	-2.3	<5.0	-0.90	<5.0
Barium	200	.39	0.53	<200	0.20	<200	0.60	<200B	0.30	<200
Beryllium	5.0	.36	2.1	<5.0	2.2	<5.0B	2.7	<5.0B	2.5	<5.0B
Cadmium	4.0	.33	0.42	<4.0	0.0	<4.0	0.50	<4.0B	0.20	<4.0
Calcium	5000	19.5	13.4	<5000	2.0	<5000	9.4	<5000	4.2	<5000
Chromium	10	.637	1.2	<10	0.60	<10.0	0.90	<10.0B	1.7	<10.0B
Cobalt	50	.797	0.71	<50	0.40	<50.0	0.50	<50.0	0.50	<50.0
Copper	25	.747	-0.65	<25	-1.3	<25.0B	-0.90	<25.0B	-1.3	<25.0B
Iron	100	32	23.1	<100	3.8	<100	13.9	<100	14.6	<100
Lead	3.0	1.59	0.26	<3.0	-0.40	<3.0	0.30	<3.0	0.0	<3.0
Magnesium	5000	17.6	12.6	<5000	6.1	<5000	13.0	<5000	8.7	<5000
Manganese	15	.16	0.80	<15	0.30	<15.0B	0.70	<15.0B	0.50	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	1.2	<40	0.60	<40.0	0.80	<40.0	0.60	<40.0
Potassium	5000	28.2	101	<5000	93.7	<5000B	96.2	<5000B	101	<5000B
Selenium	5.0	2	0.060	<5.0	-2.3	<5.0B	-0.60	<5.0	-1.1	<5.0
Silver	10	.96	0.46	<10	0.40	<10.0	0.80	<10.0	0.70	<10.0
Sodium	5000	153	8.8	<5000	-3.2	<5000	17.4	<5000	36.7	<5000
Thallium	5.0	2.69	7.3	(a)	6.1	(a)	8.0	(a)	9.9	(a)
Tin	50	2.2	anr							
Vanadium	50	.717	0.63	<50	0.10	<50.0	0.50	<50.0	0.40	<50.0
Zinc	20	.83	0.84	<20	0.20	<20.0	0.90	<20.0B	0.40	<20.0

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable aqueous samples requiring 5ppb DL.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4282
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0615M1.ASC
QC Limits: result < RDL

Date Analyzed: 06/15/99
Run ID: MA1453

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	14.9	<200	16.8	<200	25.0	<200	15.0	<200
Antimony	5.0	2.39	3.6	<5.0	5.2		3.0	<5.0	3.2	<5.0B
Arsenic	5.0	3.4	-0.80	<5.0	1.0	<5.0	-2.8	<5.0	-0.50	<5.0
Barium	200	.39	0.44	<200	0.59	<200	0.40	<200	0.50	<200B
Beryllium	5.0	.36	0.98	<5.0	1.6	<5.0	1.6	<5.0	1.7	<5.0B
Cadmium	4.0	.33	0.45	<4.0	0.77	<4.0	0.58	<4.0	0.40	<4.0B
Calcium	5000	19.5	8.3	<5000	10.9	<5000	22.0	<5000	7.9	<5000
Chromium	10	.637	0.50	<10	0.78	<10	0.45	<10	0.70	<10.0B
Cobalt	50	.797	0.68	<50	0.78	<50	0.47	<50	0.60	<50.0
Copper	25	.747	0.33	<25	0.35	<25	-0.32	<25	-0.30	<25.0
Iron	100	32	14.2	<100	24.5	<100	15.6	<100	16.0	<100
Lead	3.0	1.59	-0.030	<3.0	0.50	<3.0	0.35	<3.0	0.0	<3.0
Magnesium	5000	17.6	10.9	<5000	15.6	<5000	23.0	<5000	11.5	<5000
Manganese	15	.16	0.51	<15	0.63	<15	0.53	<15	0.50	<15.0B
Molybdenum	50	.68	anr							
Nickel	40	1	0.99	<40	0.93	<40	1.3	<40	0.50	<40.0
Potassium	5000	28.2	111	<5000	119	<5000	102	<5000	98.1	<5000B
Selenium	5.0	2	0.52	<5.0	-0.20	<5.0	-0.97	<5.0	-1.1	<5.0
Silver	10	.96	0.89	<10	1.3	<10	0.78	<10	0.50	<10.0
Sodium	5000	153	96.6	<5000	148	<5000	55.0	<5000	49.6	<5000
Thallium	5.0	2.69	5.4	(a)	6.6	(a)	7.0	(a)	5.4	(a)
Tin	50	2.2	anr							
Vanadium	50	.717	0.53	<50	0.79	<50	0.61	<50	0.50	<50.0
Zinc	20	.83	0.96	<20	1.2	<20	1.1	<20	0.70	<20.0

(*) Outside of QC limits
(anr) Analyte not requested
(a) Not bracketing any reportable aqueous samples requiring 5ppb DL.

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-05-9-229

TO: MR. M. SPERANZA **DATE:** JUNE 25, 1999

FROM: JUSTIN ORBICH **CC:** DV FILE

SUBJECT: ORGANIC DATA VALIDATION – PAH/TPH
CTO 078 – NAS CECIL FIELD
SDG F4091

SAMPLES: 44/Solid

CEF-P06-SD-001-01	CEF-P06-SD-004-01
CEF-P06-SD-005-01	CEF-P06-SD-006-01
CEF-P06-SD-007-01	CEF-P06-SD-06A-01
CEF-P06-SD-06B-01	CEF-P06-SD-06C-01
CEF-P06-SD-DUP01	CEF-P06-SS-001-01
CEF-P06-SS-002-01	CEF-P06-SS-003-01
CEF-P06-SS-004-01	CEF-P06-SS-005-01
CEF-P06-SS-006-01	CEF-P06-SS-007-01
CEF-P06-SS-008-01	CEF-P06-SS-009-01
CEF-P06-SS-010-01	CEF-P06-SS-010-02
CEF-P06-SS-013-01	CEF-P06-SS-014-01
CEF-P06-SS-015-01	CEF-P06-SS-016-01
CEF-P06-SS-016A-01	CEF-P06-SS-017-01
CEF-P06-SS-018-01	CEF-P06-SS-019-01
CEF-P06-SS-020-01	CEF-P06-SS-021-01
CEF-P06-SS-03A-01	CEF-P06-SS-03B-01
CEF-P06-SS-03C-01	CEF-P06-SS-05A-01
CEF-P06-SS-05B-01	CEF-P06-SS-05C-01
CEF-P06-SS-DUP01	CEF-P06-SS-DUP03
CEF-P06-SS-DUP04	CEF-P06-SS-011-01*
CEF-P06-SS-012-01*	CEF-P06-SS-DUP02*

OVERVIEW

The sample set for CTO 078, SDG F4091, Naval Air Station (NAS) Cecil Field; Florida consists of forty-four (44) solid environmental samples. The environmental samples were analyzed for Polynuclear Aromatic Hydrocarbon (PAH) plus 1-methylnaphthalene and 2-methylnaphthalene and Total Petroleum Hydrocarbons (TPH) organic compounds. The compounds designated (*) were analyzed for TPH organic compounds only. Four (4) field duplicate pairs (CEF-P06-SS-002-01/CEF-P06-SS-DUP01, CEF-P06-019-01\CEF-P06-SS-DUP03, CEF-P06-SS-010-01\CEF-P06-SS-DUP04, and CEF-P06-SS-011-01/CEF-P06-SS-DUP02) were included within this SDG.

The samples were collected by Tetra Tech, NUS on May 1st, 1999 and analyzed by Accutest Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria and analyzed according to SW 846 Method 8310 and FLORIDA-PRO analytical and reporting protocols. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
* • Initial/continuing calibrations
* • Laboratory method/field quality control blank results
* • Detection Limits
• Field Duplicate Precision

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

PAH FRACTION

Several field duplicate Relative Percent Differences (RPDs) exceeded the 50% quality control limits. The positive and nondetected results were qualified as estimated (J) and (UJ), respectively.

In samples CEF-P06-SD-004-01, CEF-P06-SD-006-01, CEF-P06-SD-007-01, CEF-P06-SD-DUP01, and CEF-P06-SD-006A-01, the percent solids were below 30%. The positive results were qualified as estimated (J), in the aforementioned samples. It should be noted elevated detection limits were reported for the nondetected compounds, also.

It should be noted in samples CEF-P06-SD-006-01, CEF-P06-SD-007-01, CEF-P06-SD-DUP01, and CEF-P06-SD-006A-01, the laboratory reported the nondetected values incorrectly.

Several inconsistencies were noted between the Form Is and the electronic data. For the purpose of maintaining consistency, the electronic data was amended to reflect the Form Is.

It should be noted in the reporting results, the laboratory failed to account for the percent solids on the Form Is and the electronic data. The laboratory was notified and in return, amended the Form Is and the electronic data to account for the percent solids in the reporting results.

TPH FRACTION

All quality control parameters were met for this fraction.

EXECUTIVE SUMMARY

Laboratory performance: The laboratory failed to account for the percent solids in the reporting limits.

Other Factors Affecting Data Quality: Several inconsistencies were noted between the Form Is and the electronic data.

MEMO TO: MR. M. SPERANZA
DATE: JUNE 22, 1999 – PAGE 3

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to address only those problems affecting data quality.

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich

Chemist/Data Validator
Tetra Tech, NUS

for
Joseph A. Samchuck

Data Validation Quality Assurance Officer
Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

DATA QUALIFIER DEFINITIONS:

U	-	Value is a nondetected result as reported by the laboratory and should not be considered present.
J	-	Positive result is estimated as a result of a value below the CRQL or a technical noncompliance.
UJ	-	Nondetected result is considered to be estimated as a result of technical noncompliances.

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCB D% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = % Solid content is less than 30%

APPENDIX A

Qualified Analytical Results

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4091

SAMPLE NUMBER:	CEF-P06-SD-001-01			CEF-P06-SD-004-01			CEF-P06-SD-005-01			CEF-P06-SD-006-01		
SAMPLE DATE:	05/01/99			05/01/99			05/01/99			05/01/99		
LABORATORY ID:	F4091-1			F4091-2			F4091-3			F4091-4		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	72.7 %			28.6 %			70.4 %			10.6 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	140	U		340	U		140	U		940	U	
2-METHYLNAPHTHALENE	140	U		340	U		140	U		940	U	
ACENAPHTHENE	140	U		340	U		140	U		940	U	
ACENAPHTHYLENE	140	U		340	U		140	U		940	U	
ANTHRACENE	140	U		340	U		140	U		940	U	
BENZO(A)ANTHRACENE	21	U		23	U		21	U		223	J	GY
BENZO(A)PYRENE	21	U		23	U		21	U		150	J	GY
BENZO(B)FLUORANTHENE	264			135	J	Y	337			3180	J	Y
BENZO(G,H,I)PERYLENE	21	U		186	J	Y	21	U		19000	J	GY
BENZO(K)FLUORANTHENE	131			23	U		368			3700	J	GY
CHRYSENE	21	U		177	J	Y	908			299	J	GY
DIBENZO(A,H)ANTHRACENE	21	U		23	U		21	U		288	J	GY
FLUORANTHENE	21	U		23	U		21	U		140	U	
FLUORENE	140	U		340	U		140	U		940	U	
INDENO(1,2,3-CD)PYRENE	21	U		23	U		21	U		140	U	
NAPHTHALENE	140	U		340	U		140	U		940	U	
PHENANTHRENE	140	U		340	U		140	U		940	U	
PYRENE	21	U		23	U		21	U		140	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4091

SAMPLE NUMBER:	CEF-P06-SD-007-01			CEF-P06-SD-06A-01			CEF-P06-SD-06B-01			CEF-P06-SD-06C-01		
SAMPLE DATE:	05/01/99			05/01/99			05/01/99			05/01/99		
LABORATORY ID:	F4091-8			F4091-5			F4091-6			F4091-7		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	14.3 %			12.4 %			74.1 %			35.5 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	700	U		810	U		135	U		280	U	
2-METHYLNAPHTHALENE	700	U		810	U		135	U		280	U	
ACENAPHTHENE	700	U		810	U		135	U		280	U	
ACENAPHTHYLENE	700	U		810	U		135	U		280	U	
ANTHRACENE	700	U		810	U		135	U		280	U	
BENZO(A)ANTHRACENE	105	U		810	U		20	U		42	U	
BENZO(A)PYRENE	133	J	Y	323	J	Y	20	U		144		
BENZO(B)FLUORANTHENE	343	J	Y	1790	J	Y	20	U		1150		
BENZO(G,H,I)PERYLENE	9500	J	Y	55900	J	Y	20	U		42	U	
BENZO(K)FLUORANTHENE	831	J	Y	4024	J	Y	20	U		1060		
CHRYSENE	106	J	Y	120	U		20	U		42	U	
DIBENZO(A,H)ANTHRACENE	100	U		140	J	Y	20	U		42	U	
FLUORANTHENE	100	U		120	U		20	U		42	U	
FLUORENE	291	J	Y	810	U		135	U		280	U	
INDENO(1,2,3-CD)PYRENE	100	U		120	U		20	U		42	U	
NAPHTHALENE	700	U		810	U		135	U		280	U	
PHENANTHRENE	700	U		810	U		135	U		280	U	
PYRENE	100	U		120	U		20	U		42	U	

CTO078 - NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4091

SAMPLE NUMBER:	CEF-P06-SD-DUP01			CEF-P06-SS-001-01			CEF-P06-SS-002-01			CEF-P06-SS-003-01		
SAMPLE DATE:	05/01/99			05/01/99			05/01/99			05/01/99		
LABORATORY ID:	F4091-36			F4091-9			F4091-10			F4091-11		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	10.2 %			97.5 %			92.6 %			88.6 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:	CEF-P06-SD-006-01											
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	980	U		100	U		110	U		110	U	
2-METHYLNAPHTHALENE	980	U		100	U		110	UJ	G	110	U	
ACENAPHTHENE	980	U		100	U		110	UJ	G	110	U	
ACENAPHTHYLENE	980	U		100	U		110	UJ	G	110	U	
ANTHRACENE	980	U		100	U		110	UJ	G	110	U	
BENZO(A)ANTHRACENE	150	UJ	G	15	U		16	UJ	G	17	U	
BENZO(A)PYRENE	1070	J	GY	15	U		16	U		106		
BENZO(B)FLUORANTHENE	2660	J	GY	15	U		141			17	U	
BENZO(G,H,I)PERYLENE	6220	J	GY	15	U		16	UJ	G	104		
BENZO(K)FLUORANTHENE	2030	J	GY	15	U		16	U		17	U	
CHRYSENE	150	UJ	G	15	U		16	UJ	G	144		
DIBENZO(A,H)ANTHRACENE	150	UJ	G	15	U		16	U		17	U	
FLUORANTHENE	150	U		15	U		148			17	U	
FLUORENE	980	U		100	U		110	U		110	U	
INDENO(1,2,3-CD)PYRENE	150	U		15	U		16	UJ	G	17	U	
NAPHTHALENE	980	U		100	U		110	U		110	U	
PHENANTHRENE	980	U		100	U		110	UJ	G	110	U	
PYRENE	150	U		15	U		16	UJ	G	17	U	

APPENDIX B

Results as Reported by the Laboratory

Report of Analysis

Client Sample ID:	CEF-P06-SD-001-01		
Lab Sample ID:	F4091-1	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	72.7
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	05/15/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	140	ug/kg	
208-96-8	Acenaphthylene	ND	140	ug/kg	
120-12-7	Anthracene	ND	140	ug/kg	
56-55-3	Benzo (a) anthracene	ND	21	ug/kg	
50-32-8	Benzo (a) pyrene	ND	21	ug/kg	
205-99-2	Benzo (b) fluoranthene	264	21	ug/kg	
191-24-2	Benzo (g,h,i) perylene	ND	21	ug/kg	
207-08-9	Benzo (k) fluoranthene	131	21	ug/kg	
218-01-9	Chrysene	ND	21	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	21	ug/kg	
206-44-0	Fluoranthene	ND	21	ug/kg	
86-73-7	Fluorene	ND	140	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	21	ug/kg	
90-12-0	1-Methylnaphthalene	ND	140	ug/kg	
91-57-6	2-Methylnaphthalene	ND	140	ug/kg	
91-20-3	Naphthalene	ND	140	ug/kg	
85-01-8	Phenanthrene	ND	140	ug/kg	
129-00-0	Pyrene	ND	21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	50%		20-130%

(a) Analyzed by Accutest NE HRS I.D.# E87579

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-004-01		
Lab Sample ID:	F4091-2	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	28.6
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	05/15/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	340	ug/kg	
208-96-8	Acenaphthylene	ND	340	ug/kg	
120-12-7	Anthracene	ND	340	ug/kg	
56-55-3	Benzo (a) anthracene	ND	23	ug/kg	
50-32-8	Benzo (a) pyrene	ND	23	ug/kg	
205-99-2	Benzo (b) fluoranthene	135	23	ug/kg	
191-24-2	Benzo (g,h,i) perylene	186	23	ug/kg	
207-08-9	Benzo (k) fluoranthene	ND	23	ug/kg	
218-01-9	Chrysene	177	23	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	23	ug/kg	
206-44-0	Fluoranthene	ND	23	ug/kg	
86-73-7	Fluorene	ND	340	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	23	ug/kg	
90-12-0	1-Methylnaphthalene	ND	340	ug/kg	
91-57-6	2-Methylnaphthalene	ND	340	ug/kg	
91-20-3	Naphthalene	ND	340	ug/kg	
85-01-8	Phenanthrene	ND	340	ug/kg	
129-00-0	Pyrene	ND	23	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	43%		20-130%

(a) Analyzed by Accutest NE HRS I.D.# E87579

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-005-01		
Lab Sample ID:	F4091-3	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	70.4
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	06/06/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	140	ug/kg	
208-96-8	Acenaphthylene	ND	140	ug/kg	
120-12-7	Anthracene	ND	140	ug/kg	
56-55-3	Benzo (a) anthracene	ND	21	ug/kg	
50-32-8	Benzo (a) pyrene	ND	21	ug/kg	
205-99-2	Benzo (b) fluoranthene	337	21	ug/kg	
191-24-2	Benzo (g,h,i) perylene	ND	21	ug/kg	
207-08-9	Benzo (k) fluoranthene	368	21	ug/kg	
218-01-9	Chrysene	908	21	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	21	ug/kg	
206-44-0	Fluoranthene	ND	21	ug/kg	
86-73-7	Fluorene	ND	140	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	21	ug/kg	
90-12-0	1-Methylnaphthalene	ND	140	ug/kg	
91-57-6	2-Methylnaphthalene	ND	140	ug/kg	
91-20-3	Naphthalene	ND	140	ug/kg	
85-01-8	Phenanthrene	ND	140	ug/kg	
129-00-0	Pyrene	ND	21	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	51%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blanl
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-006-01		
Lab Sample ID:	F4091-4	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	10.6
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	06/06/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	140	ug/kg	
208-96-8	Acenaphthylene	ND	140	ug/kg	
120-12-7	Anthracene	ND	140	ug/kg	
56-55-3	Benzo (a) anthracene	223	140	ug/kg	
50-32-8	Benzo (a) pyrene	150	140	ug/kg	
205-99-2	Benzo (b) fluoranthene	3180	140	ug/kg	
191-24-2	Benzo (g,h,i) perylene	19000	140	ug/kg	
207-08-9	Benzo (k) fluoranthene	3700	140	ug/kg	
218-01-9	Chrysene	299	140	ug/kg	
53-70-3	Dibenz(a,h)anthracene	288	140	ug/kg	
206-44-0	Fluoranthene	ND	140	ug/kg	
86-73-7	Fluorene	ND	140	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	140	ug/kg	
90-12-0	1-Methylnaphthalene	ND	140	ug/kg	
91-57-6	2-Methylnaphthalene	ND	140	ug/kg	
91-20-3	Naphthalene	ND	140	ug/kg	
85-01-8	Phenanthrene	ND	140	ug/kg	
129-00-0	Pyrene	ND	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	60%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blanl
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-06A-01		
Lab Sample ID:	F4091-5	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	12.4
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	06/06/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	120	ug/kg	
208-96-8	Acenaphthylene	ND	120	ug/kg	
120-12-7	Anthracene	ND	120	ug/kg	
56-55-3	Benzo (a) anthracene	ND	120	ug/kg	
50-32-8	Benzo (a) pyrene	323	120	ug/kg	
205-99-2	Benzo (b) fluoranthene	1790	120	ug/kg	
191-24-2	Benzo (g,h,i) perylene	55900	120	ug/kg	
207-08-9	Benzo (k) fluoranthene	4020	120	ug/kg	
218-01-9	Chrysene	ND	120	ug/kg	
53-70-3	Dibenz(a,h)anthracene	141	120	ug/kg	
206-44-0	Fluoranthene	ND	120	ug/kg	
86-73-7	Fluorene	ND	120	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	120	ug/kg	
90-12-0	1-Methylnaphthalene	ND	120	ug/kg	
91-57-6	2-Methylnaphthalene	ND	120	ug/kg	
91-20-3	Naphthalene	ND	120	ug/kg	
85-01-8	Phenanthrene	ND	120	ug/kg	
129-00-0	Pyrene	ND	120	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	55%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blan
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-06B-01		
Lab Sample ID:	F4091-6	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	74.1
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	05/16/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	140	ug/kg	
208-96-8	Acenaphthylene	ND	140	ug/kg	
120-12-7	Anthracene	ND	140	ug/kg	
56-55-3	Benzo (a) anthracene	ND	20	ug/kg	
50-32-8	Benzo (a) pyrene	ND	20	ug/kg	
205-99-2	Benzo (b) fluoranthene	ND	20	ug/kg	
191-24-2	Benzo (g,h,i) perylene	ND	20	ug/kg	
207-08-9	Benzo (k) fluoranthene	ND	20	ug/kg	
218-01-9	Chrysene	ND	20	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	20	ug/kg	
206-44-0	Fluoranthene	ND	20	ug/kg	
86-73-7	Fluorene	ND	140	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	20	ug/kg	
90-12-0	1-Methylnaphthalene	ND	140	ug/kg	
91-57-6	2-Methylnaphthalene	ND	140	ug/kg	
91-20-3	Naphthalene	ND	140	ug/kg	
85-01-8	Phenanthrene	ND	140	ug/kg	
129-00-0	Pyrene	ND	20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	52%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-06C-01		
Lab Sample ID:	F4091-7	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	35.5
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	06/06/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	280	ug/kg	
208-96-8	Acenaphthylene	ND	280	ug/kg	
120-12-7	Anthracene	ND	280	ug/kg	
56-55-3	Benzo (a) anthracene	ND	42	ug/kg	
50-32-8	Benzo (a) pyrene	144	42	ug/kg	
205-99-2	Benzo (b) fluoranthene	1150	42	ug/kg	
191-24-2	Benzo (g,h,i) perylene	ND	42	ug/kg	
207-08-9	Benzo (k) fluoranthene	1060	42	ug/kg	
218-01-9	Chrysene	ND	42	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	42	ug/kg	
206-44-0	Fluoranthene	ND	42	ug/kg	
86-73-7	Fluorene	ND	280	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	42	ug/kg	
90-12-0	1-Methylnaphthalene	ND	280	ug/kg	
91-57-6	2-Methylnaphthalene	ND	280	ug/kg	
91-20-3	Naphthalene	ND	280	ug/kg	
85-01-8	Phenanthrene	ND	280	ug/kg	
129-00-0	Pyrene	ND	42	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	48%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-007-01		
Lab Sample ID:	F4091-8	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	14.3
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	06/06/99	AMA	05/10/99	M:OP1217	M:GC1113
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	100	ug/kg	
208-96-8	Acenaphthylene	ND	100	ug/kg	
120-12-7	Anthracene	ND	100	ug/kg	
56-55-3	Benzo (a) anthracene	ND	100	ug/kg	
50-32-8	Benzo (a) pyrene	133	100	ug/kg	
205-99-2	Benzo (b) fluoranthene	343	100	ug/kg	
191-24-2	Benzo (g,h,i) perylene	9500	100	ug/kg	
207-08-9	Benzo (k) fluoranthene	831	100	ug/kg	
218-01-9	Chrysene	106	100	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	100	ug/kg	
206-44-0	Fluoranthene	ND	100	ug/kg	
86-73-7	Fluorene	291	100	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	100	ug/kg	
90-12-0	1-Methylnaphthalene	ND	100	ug/kg	
91-57-6	2-Methylnaphthalene	ND	100	ug/kg	
91-20-3	Naphthalene	ND	100	ug/kg	
85-01-8	Phenanthrene	ND	100	ug/kg	
129-00-0	Pyrene	ND	100	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	31%		20-130%

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blanl
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CEF-P06-SD-DUP01		
Lab Sample ID:	F4091-36	**Date Sampled:**	05/01/99
Matrix:	SO - Soil	**Date Received:**	05/04/99
Method:	SW846 8310	**Percent Solids:**	10.2
Project:	NAS Cecil Field-PSC 06		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]		1	06/06/99	AMA	05/11/99	M:OP1218	M:GC1112
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	1000	ug/kg	
208-96-8	Acenaphthylene	ND	1000	ug/kg	
120-12-7	Anthracene	ND	1000	ug/kg	
56-55-3	Benzo (a) anthracene	ND	150	ug/kg	
50-32-8	Benzo (a) pyrene	1070	150	ug/kg	
205-99-2	Benzo (b) fluoranthene	2660	150	ug/kg	
191-24-2	Benzo (g,h,i) perylene	6220	150	ug/kg	
207-08-9	Benzo (k) fluoranthene	2030	150	ug/kg	
218-01-9	Chrysene	ND	150	ug/kg	
53-70-3	Dibenz(a,h)anthracene	ND	150	ug/kg	
206-44-0	Fluoranthene	ND	150	ug/kg	
86-73-7	Fluorene	ND	1000	ug/kg	
193-39-5	Indeno (1,2,3-cd) pyrene	ND	150	ug/kg	
90-12-0	1-Methylnaphthalene	ND	1000	ug/kg	
91-57-6	2-Methylnaphthalene	ND	1000	ug/kg	
91-20-3	Naphthalene	ND	1000	ug/kg	
85-01-8	Phenanthrene	ND	1000	ug/kg	
129-00-0	Pyrene	ND	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		20-130%

(a) Elevated MDL due to low percent solids.

ND = Not detected
RDL = Reported Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

APPENDIX B

LAKE FRETWELL ECOLOGICAL RISK ASSESSMENT AND SUPPORTING INFORMATION FROM BASEWIDE ECOLOGICAL ASSESSMENT REPORT

7.0 ECOLOGICAL RISK ASSESSMENT FOR LAKE FRETWELL

The information below describes the results of the ERA for Lake Fretwell and Rowell Creek upstream of Lake Fretwell. The ERA was completed according to the methodology described in Chapter 3.0. The ERA includes problem formulation (Section 7.1), selection of ECPCs (Section 7.2), exposure assessment (Section 7.3), ecological effects assessment (Section 7.4), risk characterization (Section 7.5), and uncertainty analyses (Section 7.6).

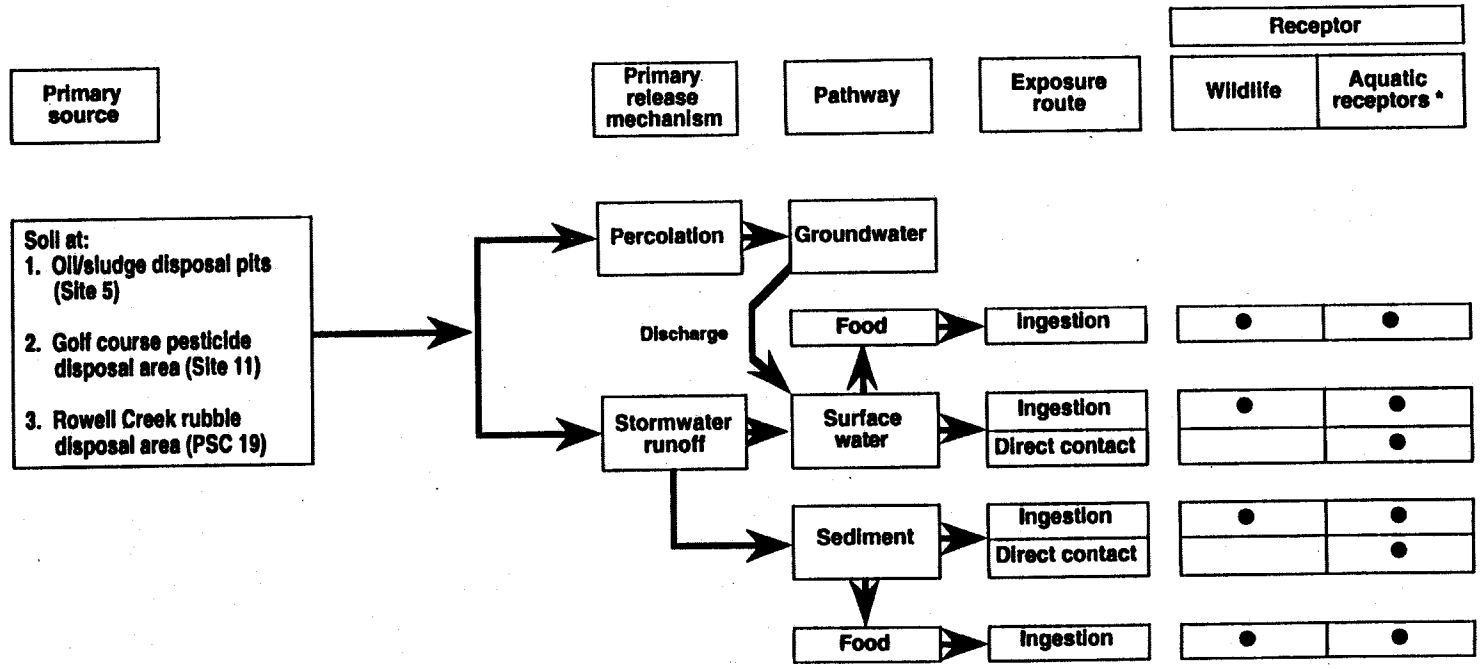
7.1 PROBLEM FORMULATION. Problem formulation is the initial step of the ERA process. In this section, the ecological receptors and exposure pathways are identified. In addition, the assessment and measurement endpoints used to evaluate and measure risks to ecological receptors are also selected.

7.1.1 Identification of Receptors Terrestrial and aquatic flora and fauna potentially occurring at NAS Cecil Field are presented in Appendix A. Terrestrial wildlife and aquatic receptors are expected to be found in the aquatic and riparian (stream bank) habitats associated with Lake Fretwell and Rowell Creek. Wildlife receptors, including omnivorous small mammals, opportunistic mammals, and piscivorous avian species, would likely use the wetland and aquatic habitats present at the site for forage and shelter. Aquatic receptors present at the site and adjacent shallow wetlands would include invertebrates, fish, mollusks, amphibians, algae, and aquatic plants.

7.1.2 Exposure Pathways Exposure pathways for ecological receptors evaluated in the assessment are summarized in the Site Conceptual Model (Figure 7-1). Although Lake Fretwell is not designated as an OU at NAS Cecil Field, the lake is surrounded by several OUs and sources of potential contamination. Site 11, the Golf Course Pesticide Area, is located to the north of Lake Fretwell; contaminants from Site 11 and the golf course may be transported to Lake Fretwell via Rowell Creek. PSC 19, the Rowell Creek Rubble Disposal Area, is also located to the west of Rowell Creek, just north of Lake Fretwell. An extensive palustrine freshwater wetland system associated with Lake Fretwell is located immediately to the east of Site 5, the Oil/Sludge Disposal Pits. A drainage ditch south of Site 5 carries surface water in an easterly direction, through the freshwater wetland, towards Lake Fretwell. Other sites that may contribute to contamination in Lake Fretwell via surficial run off, drainage ditch discharge, or groundwater discharge include the unnamed wash rack west of Building 860, PSC 6 (along the southeastern Shore of Lake Fretwell), the Yellow Water Weapons Area, the fight line apron, and area of interest (AOI) 33. An ERA for Lake Fretwell is being completed as part of the BEAR to evaluate potential risks for Lake Fretwell ecological receptors exposed to contaminants from these various sources.

The pathways include exposures to contamination in surface water and sediment. The identified pathways are associated with two areas: Lake Fretwell and Rowell Creek upstream of Lake Fretwell. The surface water and sediment data from both Rowell Creek and Lake Fretwell represent contamination potentially received from both the discharge of groundwater, overland transport from the sites, and drainage ditch discharge.

Potential exposures to groundwater contamination are not evaluated as part of the ERA for Lake Fretwell and Rowell Creek upstream of Lake Fretwell. It is believed



NOTES:
PSC = Potential source of contamination
* Aquatic receptors = Invertebrates, plants, amphibians, and fish

FIGURE 7-1
CONTAMINANT PATHWAY MODEL FOR ECOLOGICAL RECEPTORS, LAKE FRETWELL AND ROWELL CREEK UPSTREAM OF LAKE FRETWELL

BASEWIDE ECOLOGICAL ASSESSMENT REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

8500-19-RPT FIG 7-1 090298MAWhes

that the surface water samples from Lake Fretwell provide an accurate representation of the contribution of groundwater contamination from the surrounding upgradient sites. In addition, exposure from groundwater at Site 5 to aquatic and wetland receptors was evaluated as part of the BRA for OU 2 (ABB-ES, 1995a).

7.1.3 Evaluation of Potential Ecological Effects A preliminary review of the analytes detected in surface water and sediment was conducted to focus the ERA for Lake Fretwell. The following sections identify the types of contaminants that are most likely to pose risks to ecological receptors at the site.

All of the analytes detected in surface water and sediment media were reviewed and screened for toxicological benchmarks, known toxicological properties, background concentrations, and bioaccumulation potential. The frequency of detection and types of media in which an analyte was detected were also considered. This review identified a subset of probable risk drivers, which are presented in the following subsections.

Surface Water. Several VOCs that are often associated with laboratory contamination were detected in surface water from Rowell Creek and Lake Fretwell. These VOCs were detected at a low frequency and concentration; therefore, they are not anticipated to present a risk for aquatic receptors or semiaquatic wildlife.

Many inorganic analytes were also detected in surface water from Rowell Creek and Lake Fretwell. In general, the essential nutrients (calcium, magnesium, sodium, and potassium) and aluminum, barium, and iron were detected at a high frequency (i.e., in most or all of the samples). Of these, aluminum was detected at concentrations that are often associated with mortality in salmonid fish. However, these fish are coldwater species that do not inhabit the water bodies at NAS Cecil Field. Other metals (including beryllium, cadmium, copper, lead, manganese, mercury, nickel, vanadium, and zinc) were detected in some of the surface water samples. Most of these metals were detected at fairly low concentrations that are generally not associated with toxic effects for either aquatic receptors or semiaquatic wildlife. Mercury, however, may cause adverse reproductive effects in piscivorous mammals or birds that ingest fish that have bioaccumulated mercury in their tissue.

Sediment. Sediment samples from Rowell Creek and Lake Fretwell were analyzed for SVOCs, pesticides, PCBs, and metals. Di-*n*-butylphthalate was detection at relatively high concentrations and at a high frequency of detection in sediment; however, toxic effects to aquatic receptors from exposure to di-*n*-butylphthalate are unknown because sediment toxicity data are not readily available for this compound.

Several pesticides and the PCB, Aroclor-1260 were detected at low to moderate frequencies in sediment (i.e., in up to one-half the samples). Pesticides, which can bioaccumulate via the food chain and cause eggshell thinning for birds, were generally detected at low concentrations (i.e., less than 3 μg/kg). Aroclor-1260 was detected in nearly half the sediment samples at a maximum concentration of 14 μg/kg; this analyte also has potential for bioaccumulating via the food chain and is most often associated with adverse reproductive effects in minks (and possibly other mammals).

Many inorganic analytes were also detected in Rowell Creek and Lake Fretwell sediment, including the essential nutrients and several heavy metals. Arsenic,

cadmium, cobalt, and zinc were detected in only a few samples and at low concentrations. Other metals (including aluminum, barium, chromium, copper, lead, manganese, nickel, and vanadium) were detected in most or all of the sediment samples at fairly low concentrations. The exceptions may be copper (32.7 mg/kg) and lead (75.8 mg/kg), which may be associated with lethal effects for aquatic life, or lethal and adverse reproductive effects for semiaquatic wildlife receptors.

7.1.4 Identification of Endpoints The assessment and measurement endpoints and ECPCs selected for the Lake Fretwell 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. The specific assessment endpoints for the receptor groups most likely to be at risk at Lake Fretwell are discussed below.

Wildlife Receptors. Wildlife receptors could be exposed to contamination in surface water and sediment via direct (e.g., direct contact and incidental ingestion) and indirect (e.g. ingestion of contaminated prey items) exposure pathways. As discussed in Subsection 7.1.3, the contaminates of greatest concern in these media for wildlife include PCBs, mercury, and possibly pesticides, lead, and copper. Reproductive effects are the primary adverse effects associated with wildlife exposure to PCBs, copper, and mercury. Therefore, the assessment endpoints selected for wildlife receptors at Lake Fretwell are the survival and maintenance of mammal and bird subpopulations. The measurement endpoints selected for this assessment endpoint are based on oral contaminant doses measuring adverse effects on the survival and reproduction of mammalian or avian laboratory test organisms.

Aquatic Receptors. Aquatic organisms could be exposed to contamination in surface water and sediment via direct contact. As discussed in Subsection 7.1.3, the contaminants of greatest concern in surface water are aluminum and mercury. The contaminants of greatest concern in sediment are PCBs, pesticides, and metals. The assessment endpoint selected for surface water and sediment is survival and maintenance of fish, invertebrates, and amphibian subpopulations. The measurement endpoints selected to evaluate the assessment endpoint are effects concentrations in surface water and sediment associated with adverse effects to growth, reproduction, and survival of aquatic organisms. Other measurement endpoints used to gauge the assessment endpoints are measures of macroinvertebrate community structure and function as compared to a reference location.

7.1.5 Fate and Transport This subsection discusses the possible pathways for contaminants at Cecil Field to migrate to Lake Fretwell. The primary mechanisms for contaminant transport are surface water runoff, drainage ditch conveyance, and groundwater migration following precipitation infiltration.

Overland transport of contaminants at Cecil Field is less likely due to the relatively flat and vegetated topography; however, the extensive drainage ditch system could be a major mechanism for contaminant migration into Lake Fretwell. Storm water and surface water runoff ultimately end up in Lake Fretwell because many drainage ditches flow to either Rowell Creek (which discharges to Lake Fretwell) or Lake Fretwell itself. Surface water runoff can result in contaminant migration via physical transport of contaminated soils (i.e., soil erosion). During the period of active disposal at Site 5 in the early 1970s, heavy precipitation could have carried contaminants (e.g., PCBs) in the soil from Site 5

Table 7-1
Endpoints for Ecological Assessment

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Medium	Possible ECPCs	Receptor	Assessment Endpoint	Measurement Endpoint
Sediment and Surface Water	PCBs, copper, and mercury	Wildlife	Survival and maintenance of wildlife receptor subpopulations from exposure to PCBs and metals.	Oral contaminant doses (mg/kg BW-day) based on measured adverse effects on survival (e.g., LD_{50} studies, LOAELS, and NOAELs) of mammalian or avian laboratory test populations.
			Survival and maintenance of wildlife receptor populations from exposure to aluminum, lead, and mercury.	Oral contaminant doses (mg/kg BW-day) based on measured adverse effects on reproduction (e.g., LD_{50} studies, LOAELS, and NOAELs) of mammalian or avian laboratory test populations.
Surface Water	Aluminum, lead, and mercury	Aquatic organisms	Survival and maintenance of aquatic receptor populations from exposure to aluminum, lead, and mercury.	Contaminant concentrations in surface water (μg/ℓ) associated with adverse effects to growth, reproduction, and survival of aquatic organisms.
Sediment	PCBs, pesticides, and metals	Aquatic organisms	Macroinvertebrate community structure and function.	Measurement of the macroinvertebrate community structure and function at the site and comparison it to a reference location.
		Aquatic organisms	Survival and maintenance of aquatic receptor populations from exposure to PCBs, pesticides, and metals.	Contaminant concentrations in sediment (μg/kg and mg/kg) associated with adverse effects to growth, reproduction, and survival of aquatic organisms.
		Aquatic organisms	Survival and maintenance of invertebrate populations from exposure to PCBs, pesticides, and metals.	Direct measurement of survival and growth of the midge (*Chironomus tentans*) and amphipod (*Hyalella azteca*) in laboratory toxicity tests.

Notes: ECPC = ecological chemical of potential concern.
PCB = polychlorinated biphenyl.
mg/kg/BW/day = milligram per kilogram of body weight per day.
LD_{50} = lethal dose to 50 percent of a test population.
LOAEL = lowest observed adverse effect concentration.
NOAEL = no observed adverse effect concentration.
μg/ℓ = micrograms per liter.
μg/kg = micrograms per kilogram.
mg/kg = milligrams per kilogram.

to the Site 5 drainage ditch via surface water runoff. In addition, it is possible that the Site 5 disposal pits could have overflowed into the drainage ditch during major storm events.

Rainwater from UNF 6, the unnamed wash rack west of Building 860, has been diverted into the storm water drainage system in the past rather than to the oil/water separator associated with the 864 Lift Station. It is likely that contaminants (e.g., solvents and jet fuels) associated with washing aircraft were discharged into the drainage system that ultimately leads to Lake Fretwell during these times of diversion. It is also possible that contaminants from PSC 6, PSC 19, the Yellow Water Weapons Area, the flight line apron, AOI 33, and the golf course (e.g., pesticides from AOI 21, 22, and general application) may have reached Lake Fretwell via drainage ditches.

Contaminants may also have reached Lake Fretwell via precipitation infiltration and groundwater migration. Groundwater flow direction at Site 5 is primarily to the southeast. The Site 5 drainage ditch acts as the primary point of groundwater discharge. Groundwater transport is also the likeliest route of contaminant transport from Site 11, the pesticide disposal area. The groundwater flow direction at Site 11 is towards Rowell Creek. Historic pesticide use on the golf course may also be a contributing factor to surficial aquifer contamination, which ultimately discharges into Rowell Creek. Other possible sources of contaminant migration through precipitation infiltration and groundwater migration include metals from the sludge drying beds at the WWTP, and contaminants at PSC 6, PSC 19, and AOI 22.

7.1.6 Contaminant Modes of Toxicities This section discusses the specific toxicological effects and modes of toxicity of the contaminants most likely to be of concern in Lake Fretwell. These contaminants of concern include PCBs, mercury, lead, and copper.

PCBs are acutely toxic to newly hatched fish, and are readily bioaccumulated by aquatic organisms (USEPA, 1980). PCBs also bind to sediment particles and are highly lipophilic. Acute exposures to small mammals produced mild liver damage and some mortality. Chronic exposures typically generate serious health effects, including liver, stomach, and thyroid gland injuries, anemia, skin irritation, and reproductive effects. These effects have also been noted in offspring of adults exposed to PCBs.

Mercury is typically found in three states in the natural environment elemental (Hg^0), inorganic (Hg^{-2}), and methylated (CH_3Hg^+). In an aquatic environment elemental and inorganic mercury are typically converted to methylmercury by aerobic and anaerobic bacteria. Methylmercury, which is a neurotoxin, is readily accumulated by aquatic organisms from water and food items. The highest concentrations are typically measured in predatory fish. Omnivorous fish typically have intermediate detected tissue concentrations and planktivorous fish typically have the lowest detected concentrations. Methylmercury is also known to adversely affect developing neural tissue in mammals and birds (Watras, C.J., and H.W. Huckabee, 1994).

Lead is a ubiquitous environmental metal. Like mercury, lead is found in the environment most often in its inorganic state; however, it is known to form organic complexes. Chronic exposure to lead is likely to cause reproductive and developmental effects in small mammals. Avian species exposed to lead are likely

to have hematological effects such as anemia, blood changes, and kidney pathology. Acute exposures to lead result in mortality to both avian and mammalian species. Lead toxicity in the aquatic environment is highly dependent on water hardness. The toxicity of lead increases as water hardness decreases.

Chronic exposure to copper is likely to produce toxicological effects to the liver and kidney of mammals. Other toxicological effects noted in mammals include reproductive effects, such as reduced litter size. In the aquatic environment, copper ions form complexes with inorganic and organic constituents, which are typically less toxic than free cupric ions (USEPA, 1984). The alkalinity and pH of water greatly influences the state of copper in water; therefore, its toxicity. Toxicological effects to aquatic receptors include adverse reproductive effects and mortality for both chronic and acute exposures.

7.2 SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN. Analytes were determined to be ECPCs according to the process described in Subsection 3.3.1 and illustrated on Figure 3-1. The results of the selection of ECPCs in surface water and sediment are described in the following sections. ECPCs for aquatic life and terrestrial wildlife were selected separately for both surface water and sediment.

In July of 1993, eight surface water and sediment samples were collected in Lake Fretwell (LF-SW/SD-1 through LF-SW/SD-8; Plate 2) and three surface water and sediment samples were collected in Rowell Creek upstream of Lake Fretwell (RC-SW/SD-1, RC-SW/SD-2, and GC-SW/SD-2). The eight surface water samples from Lake Fretwell and the three samples from Rowell Creek were included in the surface water summaries. Based on detection of PCBs in the 1993 Lake Fretwell sediment data (Appendix B), sediment was resampled for chemical analyses and toxicity testing and fish tissue was collected in April of 1995. As shown on Figure 7-2, eight sediment samples were collected in Lake Fretwell (LF-SD-9 through LF-SD-16 with a duplicate at LF-SD-9), and three sediment samples were collected in Rowell Creek upstream of Lake Fretwell (LF-SD-17, RC-SD-18, and GC-SD-19) during the April 1995 sampling effort. The 1995 sediment data were summarized to represent the most current exposure conditions in Lake Fretwell and Rowell Creek upstream of Lake Fretwell. The 1993 sediment data are presented in Appendix B. The historical sediment data were qualitatively compared to the 1995 sediment data set. Based on this comparison, detected concentrations of pesticides, PCBs, and inorganics are considerably lower in the 1995 sediment data set. In addition, a number of analytes detected in the 1993 data set (benzo(b)fluoranthene, chrysene, pyrene, 4,4'-DDD, 4,4'-DDT, Aroclor-1254, and mercury) were not detected in sediment collected in 1995. Analytes detected in the 1995 sediment samples that were not detected in 1993 include endosulfan II, endrin aldehyde, gamma-chlordane, and arsenic.

7.2.1 Surface Water In 1993, surface water was sampled from Lake Fretwell and Rowell Creek upstream of Lake Fretwell. Tables 7-2 and 7-3 provide a summary of the analytical results, screening values, and exposure point concentrations for Lake Fretwell and Rowell Creek upstream of Lake Fretwell, respectively. The summary tables include the USEPA Region IV Freshwater Quality Chronic Screening Values (USEPA, 1995a), which were used to screen ECPCs for aquatic receptors. For the analytes selected as ECPCs, maximum and average exposure point concentrations are provided. Calcium, iron, magnesium, potassium, and sodium are excluded from the screening process because they are naturally occurring elements.

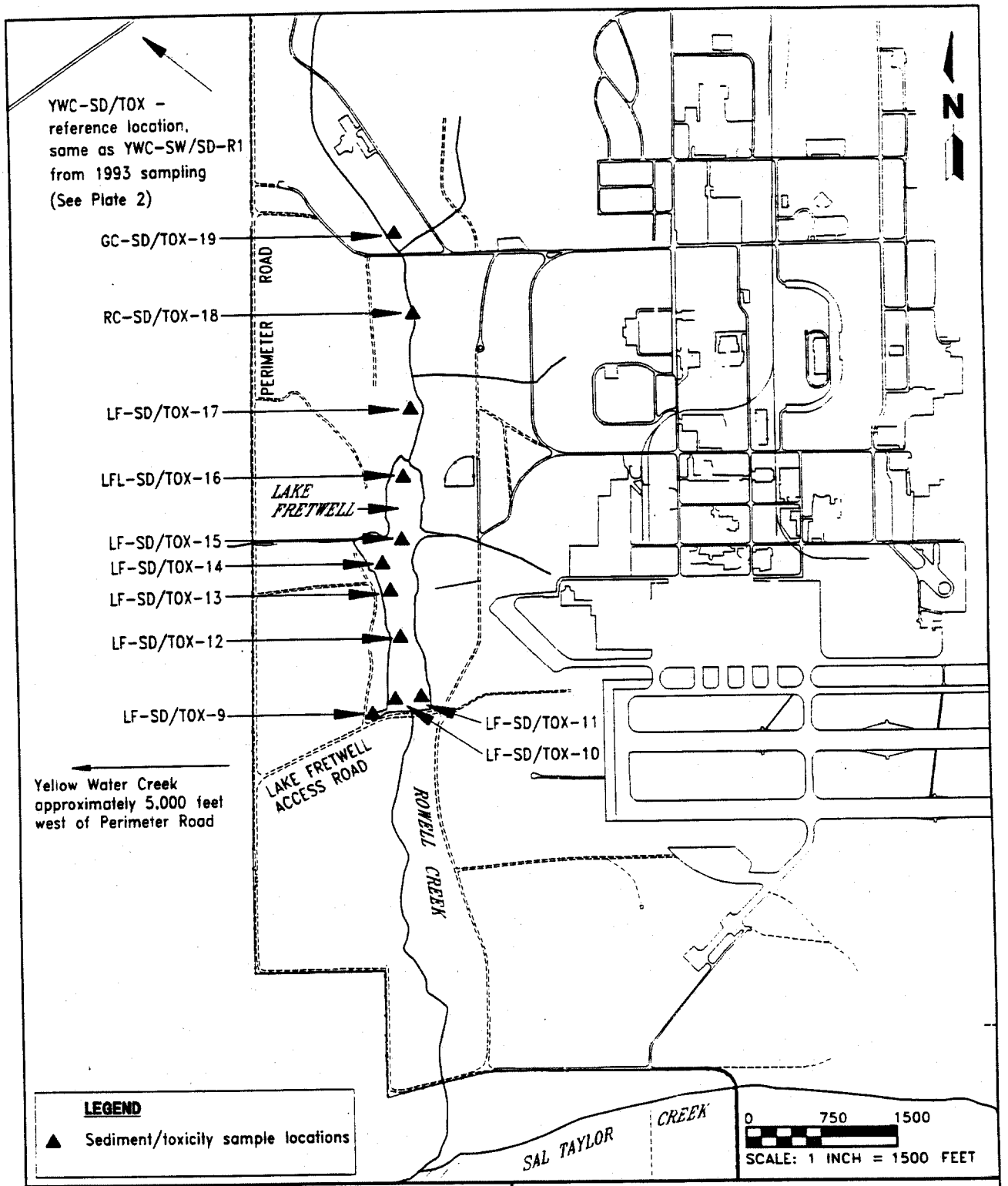


FIGURE 7-2
LOCATIONS OF SEDIMENT AND TOXICOLOGICAL SAMPLING STATIONS AT LAKE FRETWELL AND ROWELL CREEK UPSTREAM OF LAKE FRETWELL

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BASEWIDE ECOLOGICAL ASSESSMENT REPORT

NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

Table 7-2
Selection of Ecological Chemicals of Potential Concern, Surface Water Associated with Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Screening Reference Concentration[4]	Region IV Water Quality Screening Values[5]	Analyte ECPC? (Yes/No)[6]	Wildlife Exposure Concentrations[14]			
							95% UCL[7]	Arithmetic Mean[8]	Exposure Point Concentrations	
									Maximum[9]	Average[10]
Volatile Organic Compounds (µg/ℓ)										
Acetone	1/8	7	7	NA	NA	A/W	6	5	7	7
Chloroform	1/8	[2]3.5	3.5	NA	289	W[12]	5.2	4.8	3.5	3.5
Inorganic Analytes (µg/ℓ)										
Aluminum	8/8	84.4 to 751	181	619	87	A/W	369	181	751	181
Barium	8/8	[2]19.8 to 29.6	23.6	59.9	NA	No[11]				
Beryllium	3/8	0.23 to 0.29	0.26	ND	0.53	W[12]	11.8	1.7	0.29	0.26
Calcium	8/8	[2]12,400 to 14,200	13,700	16,980	NA	No[11]				
Copper	6/8	1.7 to [2]7.1	3.5	7.0	6.05	A/W	13.5	5.8	7.1	3.5
Iron	8/8	790 to 1,270	950	4,940	1,000	No[11]				
Lead	2/8	7.7 to 7.8	7.8	6.2	1.17	A/W	18.7	6.8	7.8	7.8
Magnesium	8/8	[2]2,610 to 2,920	2,810	4,127	NA	No[11,13]				
Manganese	4/8	7.6 to 19.1	14.5	24.8	NA	No[11]				
Mercury	5/8	0.08 to 0.5	0.3	ND	0.012	A/W	0.5	0.21	0.5	0.3
Nickel	1/8	13	13	ND	81.2	W[12]	21	19	13	13
Potassium	6/8	[2]485 to 961	746	1,251	NA	No[11,13]				
Sodium	8/8	6,490 to 7,570	6,880	12,520	NA	No[11,13]				
Zinc	3/8	9.5 to 30.3	21.4	ND	54.5	W[12]	21.5	14.3	30.3	21.4

See notes at end of table.

Table 7-2 (Continued)
Selection of Ecological Chemicals of Potential Concern, Surface Water Associated with Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed. The following samples were analyzed: LF-SW-1 through LF-SW-8 (with a duplicate at LF-SW-8D).
[2] The average of the detected concentration in a sample and its duplicate. For nondetect values, one-half of the contract-required quantitation limit (CRQL) or contract-required detection limit is used as a surrogate.
[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 in which the analyte was not detected.
[4] The screening reference concentration is equal to two times the average background concentration for inorganics and is equal to the average background concentration for organics. Background sample locations include RCGC-SW-R1, RC-SW-R1, and YWC-SW-R1.
[5] U.S. Environmental Protection Agency (USEPA) Region IV, Waste Management Division, *Freshwater Water Quality Chronic Screening Values for Hazardous Waste Sites* (USEPA, 1995a). Values for copper, lead, nickel, and zinc based upon equations using the average hardness for surface water samples from Lake Fretwell of 45.6 $\mu g/\ell$ of $CaCO_3$.
[6] Ecological chemical of potential concern (ECPC) selection process is depicted on Figure 3-1. "A" indicates an ECPC for aquatic receptors. "W" indicates an ECPC for terrestrial receptors.
[7] The 95 percent upper confidence limit (UCL) is calculated on the log-transformed average of all concentrations using the formula provided in the USEPA Region IV supplemental guidance (1991b).
[8] The arithmetic mean of all concentrations assigns a value of one-half of the CRQL for organics and method detection limit for inorganics to all nondetects.
[9] The maximum exposure concentration is equal to the maximum detected concentration.
[10] The average exposure concentration is equal to the mean of detected concentrations.
[11] The maximum detected concentration is less than two times the average background concentration for inorganics.
[12] The maximum analyte concentration is below the USEPA Region IV water quality screening value; therefore, the analyte was not considered an ECPC for aquatic receptors.
[13] Analyte is an essential nutrient and is not present at toxic levels.
[14] Aquatic receptor exposure concentrations are location-specific and are equal to the respective concentrations measured in surface water and sediment samples.

Notes: % = percent.
$\mu g/\ell$ = micrograms per liter.
NA = not available.
ND = not detected in background samples.

Table 7-3
Selection of Ecological Chemicals of Potential Concern, Surface Water Associated with Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Detected Concentrations[2]	Mean of Detected Concentrations[3]	Screening Reference Concentration[4]	Region IV Water Quality Screening Values[5]	Analyte ECPC? (Yes/No)[6]	Wildlife Exposure Concentrations[14]			
							95% UCL[7]	Arithmetic Mean[8]	Exposure Point Concentrations	
									Maximum[9]	Average[10]
Volatile Organic Compounds (µg/ℓ)										
Acetone	1/3	12	12	NA	NA	A/W	NC	7	12	12
Methylene chloride	1/3	1	1	NA	1,930	W[12]	NC	0.4	1	1
Inorganic Analytes (µg/ℓ)										
Aluminum	2/3	86.9 to 107	97	619	87	No[11]				
Barium	3/3	23.4 to 25.7	24.7	59.9	NA	No[11]				
Cadmium	1/3	0.26	0.26	ND	0.83	W[12]	NC	1.8	0.26	0.26
Calcium	3/3	13,900 to 14,700	14,300	16,980	NA	No[13]				
Iron	3/3	702 to 996	958	4,940	1,000	No[11,12]				
Lead	1/3	3.4	3.4	6.2	1.93	No[11]				
Magnesium	3/3	2,810 to 2,990	2,910	4,127	NA	No[13]				
Manganese	1/3	7.8	7.8	24.8	NA	No[11]				
Potassium	1/3	866	866	1,251	NA	No[13]				
Sodium	3/3	6,680 to 7,240	6,980	12,520	NA	No[13]				
Vanadium	1/3	3	3	ND	NA	A/W	NC	18	3	3

See notes at end of table.

Table 7-3 (Continued)
Selection of Ecological Chemicals of Potential Concern, Surface Water Associated with Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed. The following samples were analyzed: RC-SW-1, RC-SW-2, and GC-SW-2.
[2] Values where one-half of the contract-required quantitation limit (CRQL) or contract-required detection limit is used as a surrogate.
[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 in which the analyte was not detected.
[4] The screening reference concentration is equal to two times the average background concentration for inorganics and is equal to the average background concentration for organics. Background sample locations include RCGC-SW-R1, RC-SW-R1, and YWC-SW-R1.
[5] U.S. Environmental Protection Agency (USEPA) Region IV, Waste Management Division, *Freshwater Water Quality Chronic Screening Values for Hazardous Waste Sites* (USEPA, 1995a). Values for cadmium and lead based upon equations using the average hardness for surface water samples from Rowell Creek of 67.7 $\mu g/\ell$ of $CaCO_3$.
[6] Ecological chemical of potential concern (ECPC) selection process is depicted on Figure 3-1. "A" indicates an ECPC for aquatic receptors. "W" indicates an ECPC for terrestrial receptors.
[7] The 95 percent upper confidence limit (UCL) is calculated on the log-transformed average of all concentrations using the formula provided in the USEPA Region IV supplemental guidance (1991b).
[8] The arithmetic mean of all concentrations assigns a value of one-half of the for organics and method detection limit for inorganics to all nondetects.
[9] The maximum exposure concentration is equal to the maximum detected concentration.
[10] The average exposure concentration is equal to the mean of detected concentrations.
[11] The maximum detected concentration is less than two times the average background concentration for inorganics.
[12] The maximum analyte concentration is below the USEPA Region IV water quality screening value; therefore, the analyte was not considered as an ECPC for aquatic receptors.
[13] Analyte is an essential nutrient and is not present at toxic levels.
[14] Aquatic receptor exposure concentrations are location-specific and are equal to the respective concentrations measured in surface water and sediment samples.

Notes: % = percent.
$\mu g/\ell$ = micrograms per liter.
NA = not available.
NC = not calculated.
ND = not detected in background samples.

7.2.1.1 **Lake Fretwell** Surface water was collected from eight locations (LF-SW-1 through LF-SW-8 with a duplicate at LF-SW-8D) in Lake Fretwell (Plate 2). Of the 16 analytes detected in surface water, 1 VOC (acetone), and 4 inorganics (aluminum, copper, lead, and mercury) were selected as ECPCs for both terrestrial wildlife and aquatic receptors. One VOC (chloroform) and three inorganics (beryllium, nickel, and zinc) were selected as ECPCs for terrestrial wildlife only.

7.2.1.2 **Rowell Creek Upstream of Lake Fretwell** Surface water was collected from three locations (RC-SW-1, RC-SW-2, and GC-SW-2) in Rowell Creek upstream of Lake Fretwell (Plate 2). Of the 13 analytes detected in surface water, 1 VOC (acetone) and 1 inorganic (vanadium) were selected as ECPCs for both terrestrial wildlife and aquatic receptors. One volatile (methylene chloride) and one inorganic (cadmium) were selected as ECPCs for terrestrial wildlife only.

7.2.2 Sediment Sediment was sampled from Lake Fretwell and Rowell Creek upstream of Lake Fretwell. Tables 7-4 and 7-5 provide a summary of the analytical results, the USEPA Region IV Sediment Screening Values (USEPA, 1995a), and exposure point concentrations for Lake Fretwell and Rowell Creek upstream of Lake Fretwell, respectively.

7.2.2.1 **Lake Fretwell** Sediment was sampled from eight locations (LF-SD-9 through LF-SD-16 with a duplicate at LF-SD-9D; Figure 7-2) in Lake Fretwell. Table 7-4 provides a summary of the analyses of the sediment samples. Nine of 25 analytes detected in sediment samples were selected as ECPCs for both aquatic life and terrestrial wildlife. The selected analytes include one SVOC (di-*n*-butylphthalate), three pesticides (endosulfan II, endrin aldehyde, and alpha-chlordane), and five inorganics (arsenic, cadmium, lead, manganese, and zinc). Three pesticides/PCBs (4,4'-DDE, Aroclor-1260, and gamma-chlordane) and one inorganic (nickel) were selected as ECPCs for terrestrial wildlife only.

7.1.2.2 **Rowell Creek Upstream of Lake Fretwell** Sediment was sampled from three locations (LF-SD-17, RC-SD-18, and GC-SD-19 with a duplicate at LF-SD-17D; Figure 7-2) in Rowell Creek upstream of Lake Fretwell. Table 7-4 provides a summary of the analyses of the sediment samples. One of 19 analytes detected in sediment samples was selected as an ECPC for both aquatic life and terrestrial wildlife.

The selected analyte is di-*n*-butylphthalate. Four pesticides and PCBs (4,4'-DDE, Aroclor-1260, dieldrin, and alpha-chlordane) were selected as ECPCs for terrestrial wildlife only. No organic analytes were retained as ECPCs for either aquatic receptors or terrestrial wildlife.

7.2 EXPOSURE ASSESSMENT. Exposure assessment is the process of estimating or measuring the amount of an ECPC to which an ecological receptor may be exposed. The following subsections discuss how contaminant exposures were estimated or measured for aquatic receptors and terrestrial wildlife at Lake Fretwell and Rowell Creek upstream of Lake Fretwell. The site conceptual model (Figure 7-1) provides a summary of potential exposure pathways that exist at Lake Fretwell for each group of receptors.

7.2.1 Surface Water Exposure concentrations for ECPCs in surface water are determined for both aquatic receptors and terrestrial wildlife. Exposure pathways for aquatic receptors and terrestrial wildlife were identified in the contaminant

Table 7-4
Selection of Ecological Chemicals of Potential Concern, Sediment Associated with Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Detected Concentrations	Mean of Detected Concentrations[3]	Screening Reference Concentration[4]	Region IV Sediment Quality Screening Values[5]	Analyte ECPC? (Yes/No)[6]	Wildlife Exposure Concentrations[16]			
							95% UCL[7]	Arithmetic Mean[8]	Exposure Point Concentrations	
									Maximum[9]	Average[10]
Semivolatile Organic Compounds (µg/kg)										
Di-*n*-butylphthalate	8/8	[2]17.04 to 380	113	NA	NA	A/W	372	113	380	113
Pesticides and PCBs (µg/kg)										
4,4'-DDE	3/8	0.27 to 0.87	0.49	ND	3.3	W[12]	7.6	1.8	0.87	0.49
Aroclor-1260	3/7[11]	3 to 14	7	ND	33	W[12]	508	34	14	7
Endosulfan II	1/8	0.12	[2]0.12	ND	NA	A/W	35.5	3.3	0.12	0.12
Endrin aldehyde	1/8	0.31	0.31	ND	NA	A/W	12.4	3.2	0.31	0.31
alpha-Chlordane	3/8	[2]0.19 to 2.4	0.94	ND	1.7	A/W	10.5	1.6	2.4	0.9
gamma-Chlordane	1/8	0.13	0.13	ND	1.7	W[12]	7.2	1.6	0.13	0.13
Inorganic Analytes (mg/kg)										
Aluminum	8/8	912 to 10,700	2,900	15,980	NA	No[13]				
Arsenic	1/8	7.7	7.7	ND	7.24	A/W	10.5	9.7	7.7	7.7
Barium	8/8	4.6 to 101	20	195.2	NA	No[13]				
Cadmium	2/8	0.46 to 1.4	0.9	ND	1.0	A/W	0.8	0.6	1.4	0.93
Calcium	8/8	523 to 8,300	2,630	5,860	NA	No				
Chromium	8/8	2.9 to [2]18.9	7.6	14.6	52.3	W[12]	15.8	7.6	18.9	7.6
Cobalt	1/8	0.8	0.8	3.4	NA	No[13]				
Copper	8/8	1.4 to 32.7	7.4	50.4	18.7	No[13]				
Cyanide	4/4[15]	0.18 to 0.71	0.34	1.66	NA	No[13]				
Iron	8/8	415 to 4,110	1,160	6,280	NA	No[13,14]				
Lead	8/8	3.4 to 75.8	16.6	47	30.2	A/W	49.9	16.6	75.8	16.6
Magnesium	8/8	55.8 to 2,980	540	1,160	NA	No[14]				

See notes at end of table.

Table 7-4 (Continued)
Selection of Ecological Chemicals of Potential Concern, Sediment Associated with Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Detected Concentrations	Mean of Detected Concentrations[3]	Screening Reference Concentration[4]	Region IV Sediment Quality Screening Values[5]	Analyte ECPC? (Yes/No)[6]	Wildlife Exposure Concentrations[16]			
							95% UCL[7]	Arithmetic Mean[8]	Exposure Point Concentrations	
									Maximum[9]	Average[10]
Manganese	8/8	3.1 to 19.7	8.5	17.4	NA	A/W	15.3	8.5	19.7	8.5
Nickel	8/8	1.5 to [2]10	4.1	6.4	15.9	W[12]	9	4	10	4
Potassium	6/8	18.5 to 110	42	135	NA	No[13,14]				
Sodium	8/8	196 to 1,060	330	1,154	NA	No[13,14]				
Vanadium	8/8	1.6 to 17.6	5	29.8	NA	No[13]				
Zinc	1/8	132	132	ND	124	A/W	147	18	132	132

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed. The following samples were analyzed: LF-SD-9 through LF-SD-16

[2] The average of the detected concentration in a sample and its duplicate. For nondetect values, one-half of the contract-required quantitation limit (CRQL) or contract-require detection limit is used as a surrogate.

[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 in which the analyte was not detected.

[4] The screening reference concentration is equal to two times the average background concentration for inorganics and is equal to the average background concentration for organics. The background sample location is YWC-SD-20.

[5] U.S. Environmental Protection Agency (USEPA) Region IV Waste Management Division, *Sediment Screening Values for Hazardous Waste Sites* (USEPA, 1995a).

[6] Ecological chemical of potential concern (ECPC) selection process is depicted on Figure 3-1. "A" indicates an ECPC for aquatic receptors. "W" indicates an ECPC for terrestrial receptors.

[7] The 95 percent upper confidence limit (UCL) is calculated on the log-transformed average of all concentrations using the formula provided in the USEPA Region IV supplemental guidance (1991).

[8] The arithmetic mean of all concentrations assigns a value of one-half of the CRQL for organics and method detection limit for inorganics to all nondetects.

Table continued on next page.

Table 7-4 (Continued)
Selection of Ecological Chemicals of Potential Concern, Sediment Associated with Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[9] The maximum exposure concentration is equal to the maximum detected concentration.
[10] The average exposure concentration is equal to the mean of detected concentration.
[11] The validated analytical data for Aroclor-1260 were rejected at sampling station LF-SD-10.
[12] The maximum analyte concentration is below the sediment quality screening value; therefore, the analyte was not considered an ECPC for aquatic receptors.
[13] The maximum detected concentration is less than two times the average background concentration for inorganics.
[14] Analyte is an essential nutrient and is not present at toxic levels.
[15] The validated analytical data for cyanide was rejected at sampling stations LF-SD-10, LF-SD-11, LF-SD-13, and LF-SD-14.
[16] Aquatic receptor exposure concentrations are location-specific and are equal to the respective concentrations measured in surface water and sediment samples.

Notes: % = percent.
µg/kg = micrograms per kilogram.
NA = not available.
UCL = upper confidence limit.
PCB = polychlorinated biphenyl.
DDE = dichlorodiphenyldichloroethene.
ND = not detected in the background samples.
mg/kg = milligram per kilogram.

Table 7-5
Selection of Ecological Chemicals of Potential Concern, Sediment Associated with Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Frequency of Detection[1]	Range of Detected Concentrations	Mean of Detected Concentrations[3]	Screening Reference Concentration[4]	Region IV Sediment Quality Screening Values[5]	Analyte ECPC? (Yes/No)[6]	Wildlife Exposure Concentrations[16]			
							95% UCL[7]	Arithmetic Mean[8]	Exposure Point Concentrations	
									Maximum[9]	Average[10]
Semivolatile Organic Compounds (µg/kg)										
Di-*n*-butylphthalate	3/3	94 to [2]185	153	NA	NA	A/W	NC	153	185	153
Pesticides and PCBs (µg/kg)										
4,4'-DDE	1/2[11]	[2]0.195	0.2	ND	3.3	W[12]	NC	1.3	0.2	0.2
Aroclor-1260	1/2[11]	6.6	6.6	ND	33	W[12]	NC	16.2	6.6	6.6
Dieldrin	1/2[11]	[2]1.53	1.5	ND	3.3	W[12]	NC	0.87	1.5	1.5
alpha-Chlordane	2/2[11]	[2]0.19 to 0.19	0.19	ND	1.7	W[12]	NC	0.19	0.19	0.19
Inorganic Analytes (mg/kg)										
Aluminum	3/3	1,720 to [2]2,820	2,290	15,980	NA	No[13]				
Barium	3/3	9.4 to 14.5	12.3	195.2	NA	No[13]				
Calcium	3/3	[2]930.5 to 1,360	1,090	5,860	NA	No[13,14]				
Chromium	3/3	2.6 to [2]5.45	4.4	14.6	52.3	No[12,13]				
Copper	3/3	3.7 to [2]5.5	4.7	50.4	18.7	No[12,13]				
Cyanide	2/2[15]	0.4 to [2]0.41	0.4	1.66	NA	No[13]				
Iron	3/3	631 to 986	795	6,280	NA	No[13]				
Lead	3/3	8.5 to 17	13	47	30.2	No[12,13]				
Magnesium	3/3	76.4 to [2]124.35	97.3	1,160	NA	No[13,14]				
Manganese	3/3	3.6 to [2]5.95	4.7	17.4	NA	No[13]				
Nickel	3/3	1.5 to [2]2.5	1.8	6.4	15.9	No[12,13]				
Potassium	1/3	[2]36	36	135	NA	No[13,14]				
Sodium	3/3	[2]260 to 266	264	1,154	NA	No[13,14]				
Vanadium	3/3	3 to [2]5.4	4	29.8	NA	No[13]				

See notes at end of table.

Table 7-5 (Continued)
Selection of Ecological Chemicals of Potential Concern, Sediment Associated with Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[1] Frequency of detection is the number of samples in which the analyte was detected divided by the total number of samples analyzed. The following samples were analyzed: LF-SD-17, RC-SD-18 and GC-SD-19.
[2] The average of the detected concentration in a sample and its duplicate. For nondetect values, one-half of the contract-required quantitation limit (CRQL) or contract-required detection limit is used as a surrogate.
[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 in which the analyte was not detected.
[4] The screening reference concentration is equal to two times the average background concentration for inorganics and is equal to the average background concentration for organics. The background sample location is YWC-SD-20.
[5] U.S. Environmental Protection Agency (USEPA) Region IV, Waste Management Division, *Sediment Screening Values for Hazardous Waste Sites* (USEPA, 1995a).
[6] Ecological chemical of potential concern (ECPC) selection process is depicted on Figure 3-1. "A" indicates an ECPC for aquatic receptors. "W" indicates an ECPC for terrestrial receptors.
[7] The 95 percent upper confidence limit (UCL) is calculated on the log-transformed average of all concentrations using the formula provided in the USEPA Region IV supplemental guidance (1991).
[8] The arithmetic mean of all concentrations assigns a value of one-half of the CRQL for organics and method detection limit for inorganics to all nondetects.
[9] The maximum exposure concentration is equal to the maximum detected concentration.
[10] The average exposure concentration is equal to the mean of detected concentrations.
[11] The validated analytical data were rejected at sampling station GC-SD-19.
[12] The maximum analyte concentration is below the sediment quality screening value; therefore, the analyte was not considered an ECPC for aquatic receptors.
[13] The maximum detected concentration is less than two times the average background concentration for inorganics.
[14] Analyte is an essential nutrient and is not present at toxic levels.
[15] The validated data for cyanide were rejected at sampling station GC-SD-19.
[16] Aquatic receptor exposure concentrations are location-specific and are equal to the respective concentrations measured in surface water and sediment samples.

Notes: % = percent.
μg/kg = micrograms per kilogram.
NA = not available.
NC = not calculated.
PCB = polychlorinated biphenyl.
DDE = dichlorodiphenyldichloroethene.
ND = not detected in the background samples.
mg/kg = milligrams per kilogram.

pathway model on Figure 7-1. Exposures for terrestrial wildlife to ECPCs in surface water and sediment are evaluated concurrently.

7.2.1.1 **Terrestrial Wildlife** Four species were selected as representative wildlife species for the purpose of evaluating risks associated with exposures to surface water and sediment contamination in Lake Fretwell and Rowell Creek upstream of Lake Fretwell. Life history information used to estimate exposures for each of the representative wildlife species is summarized in Table 7-6. The four representative wildlife species used for exposure modeling are described below.

- Florida water rat (*Neofiber alleni*). This small mammalian omnivore may be exposed to contamination in surface water and sediment as a result of direct ingestion and ingestion of aquatic prey. Aquatic prey (plants and invertebrates) may become contaminated as a result of accumulation of contaminants from the surface water and sediment. The Florida water rat was selected to represent mammalian species that would receive higher doses as a result of their small body size.

- Raccoon (*Procyon lotor*). This species represents an opportunistic omnivorous species that may be exposed to contamination in surface water and sediment both as a result of direct ingestion and ingestion of aquatic prey. Aquatic prey includes plants, invertebrates and fish.

- Kingfisher (*Ceryle alcyon*). This species represents a piscivorous avian species that may be exposed to contamination in surface water both as a result of direct ingestion and ingestion of aquatic prey.

- Great blue heron (*Ardea herodias*). This species represents a higher trophic level avian receptor that may be exposed to surface water and sediment contamination from Lake Fretwell. Great blue herons feed primarily on aquatic prey items including fish, frogs, and invertebrates. The great blue heron has been observed at Lake Fretwell and was selected to represent the wading bird guild (group) of ecological receptors (i.e., other herons and egrets).

Contaminant exposures for each of the representative wildlife species related to the surface water and sediment ECPCs are estimated based on the equations in Table 3-2. Exposures evaluated for the representative wildlife species include ingestion of surface water and sediment and ingestion of aquatic life (which may bioconcentrate ECPCs in the surface water or accumulate ECPCs from sediment). Maximum and average exposure concentrations are equal to the respective maximum and mean of the detected concentrations.

PDEs for each of the representative wildlife species for each of the surface water and sediment ECPCs are estimated using a model discussed in Paragraph 3.3.2.2. In the model, exposure doses for each ECPC for each representative wildlife species are calculated based on the exposure concentrations in surface water (and sediment) and life history factors for the species. The equations are provided in Table 3-2. Piscivorous exposures are estimated using the maximum analyte concentration detected in any fish species from the corresponding lake or stream sampling stations. In addition, the site-derived fish tissue data were used to estimate exposures to all aquatic prey, including benthic macroinvertebrates. The model for the Lake Fretwell ERA uses the maximum site-specific measurements of

Table 7-6
Exposure Parameters for Representative Wildlife Species

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Representative Wildlife Species	Body Weight (kg)	Reported Diet	Soil and Sediment Ingestion (% of diet)	Assumed Diet for Exposure Assessment (% of diet)	Food Ingestion Rate (kg/day)	Water Intake Rate (ℓ/day)	Home Range (acres)
Florida water rat (*Neofiber alleni*)	0.33 [a]	Primarily aquatic plants and crayfish [b].	<2% sed. [c]	90% Aquatic plants, 8% Aquatic organisms	0.027 [d]	0.037 [e]	0.42 [f]
Raccoon (Procyon lotor)	3.99 [g]	Mostly fleshy fruits, nuts acorns, corn; also frogs, crayfish, and insects [b].	7% sed. [c]	93% Aquatic organisms	0.214 [d]	0.344 [e]	385 [h]
Kingfisher (*Ceryle alcyon*)	0.15 [i]	Mostly small fish; some crayfish, frogs, crabs, snakes, and insects [i].	7% sed. [c]	93% Aquatic organisms	0.014 [j]	0.0165 [k]	35 [l]
Great blue heron (*Ardea herodias*)	2.23 [b]	Mostly fish; some amphibians, crustaceans, and birds [b].	<2% sed. [c]	>98% Aquatic organisms	0.401 [m]	0.101 [k]	1.5 [n]

References:
[a] Burt and Grossenheider, 1980.
[b] Wildlife Exposure Factors Handbook, (U.S. Environmental Protection Agency [USEPA] 1993a).
[c] Sediment ingestion assumed to be 7% for the raccoon and the heron and 2% for the Florida water rat and heron.
[d] Calculated using the mammal equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0687 \times Wt^{0.822}$ (USEPA, 1993a).
[e] Calculated using the mammal equation based on body (Wt.) in kg. Water ingestion (l/day) = $0.099 \times Wt^{0.90}$ (USEPA, 1993a).
[f] Value for the muskrat was used for the Florida water rat (USEPA, 1993a).
[g] Median of mean weights for male and female raccoons in Alabama (USEPA, 1993a).
[h] Average of adult male and female raccoons from May to December (USEPA, 1993a).
[i] Terres, 1991.
[j] Calculated using the bird equation based on body weight (Wt.) in kg. Food ingestion (kg/day) = $0.0582 \times Wt^{0.651}$ (USEPA, 1993a).
[k] Calculated using the bird equation based on body weight (Wt.) in kg. Water ingestion (ℓ/day) = $0.059 \times Wt^{0.67}$ (USEPA, 1993a).
[l] Sayler and Lagler, 1949.
[m] As reported estimating from Kushlan's (1978) allometric equation for wading birds, assuming a body weight of 2,230 g (USEPA, 1993a).
[n] Size of heron feeding territory in summer (USEPA, 1993a).

Notes: kg = kilograms.
% = percent.
kg/day = kilograms per day.
ℓ/day = liters per day.
< = lesser than.
g = grams.

pesticide, PCB, and inorganic concentrations in whole fish in place of estimates based on BCFs. The fish data were collected to provide accurate measurements of exposure and to reduce uncertainty in the exposure and risk assessments. The collection and analyses of fish tissue is described in Section 5.5.

The contaminant exposures calculated for each of the representative wildlife species for each of the ECPCs in surface water and sediment are presented in Appendices D-1 and D-2 (for Lake Fretwell and Rowell Creek upstream of Lake Fretwell, respectively).

7.2.1.2 **Aquatic Receptors** Contaminant exposures related to direct contact with surface water are evaluated for aquatic receptors in Lake Fretwell and Rowell Creek upstream of Lake Fretwell. Exposures are evaluated for each of the geographic sampling locations in Lake Fretwell and Rowell Creek with the exposure concentrations assumed to be equal to the amount of an analyte detected in the surface water sample from the respective location. The concentrations of ECPCs detected in surface water from Lake Fretwell and Rowell Creek upstream of Lake Fretwell are provided in Tables 7-2 and 7-3, respectively.

7.2.2 Sediment Both aquatic receptors and wildlife may be exposed to ECPCs in sediment. Exposure pathways for ECPCs in sediment are depicted on Figure 7-1.

7.2.2.1 **Terrestrial Wildlife** Routes of exposure to contaminated sediment evaluated for each of the representative wildlife species include indirect ingestion of sediment (during foraging activities) and ingestion of contaminated food (aquatic organisms that have accumulated contamination from the surface water and sediment). Site-specific measurements of whole fish were used to measure the contaminant concentrations in aquatic prey. The collection and analysis of fish tissue is described in Section 5.5. Contaminant exposures for each of the representative wildlife species for each of the ECPCs are calculated based on the equations in Table 3-2. The exposure concentrations calculated are reported in Appendices D-1 and D-2 (for Lake Fretwell and Rowell Creek upstream of Lake Fretwell, respectively).

7.2.2.2 **Aquatic Receptors** Contaminant exposures via direct contact were evaluated by the use of sediment toxicity tests. Exposures are evaluated for each of the sampling stations in Lake Fretwell and Rowell Creek upstream of Lake Fretwell with the exposure concentrations assumed to be equal to the amount of an analyte detected in the sediment sample from the respective location.

7.3 ECOLOGICAL EFFECTS ASSESSMENT. The ecological effects assessment describes the potential adverse effects associated with the identified ECPCs to ecological receptors.

7.3.1 **Surface Water and Sediment** Potential or adverse ecological effects for ECPCs in surface water and sediment are described in the paragraphs below.

7.3.1.1 **Terrestrial Receptors** The ecological effects assessment for ECPCs in surface water and sediment includes identification of RTVs for avian and mammalian receptors. The RTV relates the dose of a respective ECPC in an oral exposure with an adverse effect. For each ECPC identified and each representative wildlife species selected, lethal and sublethal RTVs are identified. A lethal RTV represents the threshold for lethal effects and is based on oral LD_{50} values (oral

dose lethal to 50 percent of a test population). The lethal RTV is one-fifth of the lowest reported LD_{50} for the closest related test species. One-fifth of an oral LD_{50} is considered to be protective of 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 at Lake Fretwell and Rowell Creek upstream of Lake Fretwell, and represents a level of acceptable risk. A sublethal RTV is also identified that represents a threshold dose for effects that impair or prevent reproduction, growth, or survival.

Toxicity data for avian species are limited; in cases where toxicity information is unavailable, RTVs are not identified and risks associated with the predicted exposure for the respective ECPC are not evaluated. The absence of specific data for a taxonomic group does not imply that there is no anticipated toxicological effect associated with contaminant exposure by these receptors.

The RTVs derived for each of the representative wildlife species for each of the ECPCs in surface water and sediment at Lake Fretwell and Rowell Creek upstream of Lake Fretwell are summarized in Appendix D-3. The dose-response information used to derive RTVs is included as Appendix D-4.

7.3.1.2 **Aquatic Receptors** The results of the quantitative sampling and analyses of the benthic macroinvertebrate community at Lake Fretwell (LF-Bio-1 through LF-Bio-8) and Rowell Creek upstream of Lake Fretwell (RC-Bio-1, RC-Bio-2, and GC-Bio-2) are provided in Subsection 5.2.2. The biological sampling locations are depicted on Plate 2. Although the habitat assessment procedure (described in Section 5.2) is designed for stream habitat, information that was applicable to the Lake Fretwell sampling stations was tabulated and scores were assigned (Table 5-24). Due to the lack of a suitable reference station for the Lake Fretwell sampling stations, the Lake Fretwell habitat assessment scores were only comparable to each other. The scores for Lake Fretwell ranged from 26 at LF-Bio-1 to 46 at LF-Bio-7. Habitat assessment scores for sampling stations in Rowell Creek upstream of Lake Fretwell were consistent ranging from 49 at GC-Bio-2 to 55 at RC-Bio-2. For the Rowell Creek sampling stations, the habitat scores were divided by the Five Mile Creek reference station score for a percent comparability value (Table 5-24). These values ranged from 73.1 percent at station GC-Bio-2 to 82.1 percent at RC-Bio-2.

Metrics used to characterize the benthic macroinvertebrate community are described in Table 5-10 and discussed for Lake Fretwell and the upstream stations in Rowell Creek in Subsection 5.2.2. The trends in metric values indicate that station LF-Bio-6 ranked lower for many of the key metrics as compared to the other Lake Fretwell sampling stations. Station LF-Bio-6, the deepest station sampled in Lake Fretwell, had very low DO at the bottom, which may have contributed to its low metric values. A review of the macroinvertebrate habitat quality parameter data at the other Lake Fretwell and Rowell Creek sampling stations suggests that these stations lie within normal conditions.

Table 7-7 summarizes the results (percent survival and growth) from the 14-day toxicity tests with the amphipod, *H. azteca*, and the midge larvae, *C. tentans*. After 14 days of exposure, survival of *H. azteca* in the reference (YWC-SD/TOX-20), was significantly different (p less than or equal to 0.05) from the laboratory control sediment; however, this significance is the result of no mortality in the laboratory control. Survival of *H. azteca* in samples from stations LF-SD/TOX-11

Table 7-7
Results of Sediment Toxicity Testing

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Sample Location	Amphipod (*Hyalella azteca*)			Midge larvae (*Chironomus tentans*)	
	Survival (%)	Growth (weight in mg/organism)	Growth (length in mm)	Survival (%)	Growth (weight in g/organism)
Control 1[1]	100	0.28	3.3	85	1.06
LF-SD/TOX-11	[3,4,5]0	NA	NA	82	1.74
LF-SD/TOX-12	[3,4,5]0	NA	NA	80	1.47
LF-SD/TOX-13	100	0.29	3.4	[3,5]65	1.72
LF-SD/TOX-14	[3]93	0.29	3.4	[3,5]6	1.91
LF-SD/TOX-15	100	0.39	3.6	[3,5]63	1.37
LF-SD/TOX-16	98	0.42	3.6	77	1.87
LF-SD/TOX-17	100	0.37	3.5	67	0.88
YWC-SD/TOX-20	[3]95	0.32	3.4	75	1.05
Control 2[2]	88	0.4	3.4	75	1.45
LF-SD/TOX-9	94	0.46	3.7	[3,4,5]42	1.5
LF-SD/TOX-10	99	0.47	3.7	87	1.47
RC-SD/TOX-18	98	0.41	3.5	[3,4,5]18	1.17
GC-SD/TOX-19	88	0.43	3.6	75	1.24

[1] Laboratory control for sediment samples LF-SD/TOX-11 through LF-SD/TOX-17 and YWC-SD/TOX-20.
[2] Laboratory control for sediment samples LF-SD/TOX-9, LF-SD/TOX-10, RC-SD/TOX-18, and GC-SD/TOX-19.
[3] Significantly different from the laboratory control sediment.
[4] Significantly different from the reference sediment (YWC-SD/TOX-20).
[5] Considered to be substantially different from the reference or control sediment (i.e., biologically significant).

Notes: % = percent
mg = milligram
mm = millimeter
g = gram
NA = not available.

and LF-SD/TOX-12 were significantly different from the reference sediment. Growth, reported as weight and length, of *H. azteca* in the sediment from all sample stations was not significantly different from the laboratory control and reference sample. Growth of *H. azteca* in sediment from stations LF-SD/TOX-11 and LF-SD/TOX-12 could not be determined due to 100 percent mortality. Survival of *C. tentans* exposed to sediment from stations LF-SD/TOX-9, LF-SD/TOX-13, LF-SD/TOX-14, LF-SD/TOX-15, and RC-SD/TOX-18 were significantly different from the laboratory control sediment. Survival of *C. tentans* exposed to sediment from stations LF-SD/TOX-9 and RC-SD/TOX-18 were significantly different from the reference sediment. Growth of *C. tentans* exposed to the sediment samples was not significantly different from the control or reference sediments. Complete information on the sediment toxicity testing from Lake Fretwell and Rowell Creek upstream of Lake Fretwell is presented in Appendix D-5.

Ecological effects associated with surface water ECPCs are also estimated based on aquatic toxicity benchmarks. Aquatic toxicity benchmarks include the Florida Surface Water Quality Standards for Class III freshwater (Florida Legislature, 1995b) and aquatic toxicity information from the USEPA AQUIRE database (Appendix D-6). Information from the AQUIRE database on the aquatic toxicity of surface water ECPCs to freshwater life is summarized in Table 7-8.

The toxicity of ECPCs in sediment to aquatic receptors is also estimated by comparing maximum and average exposure concentrations of ECPCs in sediment to available sediment toxicity benchmarks. Sediment toxicity benchmarks are the concentrations reported in the literature as a "safe" no-effect concentration, a "threshold" concentration above which adverse effects are observed, and various adverse effects concentrations. Benchmarks are available from *Approach to the Assessment of Sediment Quality in Florida Coastal Waters* (SQAG) (MacDonald and others, 1994) and the updated NOAA database (Long and others, 1995). These benchmarks are listed as part of the risk characterization for sediment in Lake Fretwell and in Rowell Creek upstream of Lake Fretwell, respectively.

7.4 RISK CHARACTERIZATION

Risks are characterized for contamination in surface water and sediment of Lake Fretwell and Rowell Creek upstream of Lake Fretwell for both terrestrial wildlife and aquatic receptors. Risks are characterized based upon the methodology provided in Chapter 3.0. The methodology represents an integrated approach using both field and theoretical methods to provide a measure of actual or potential risks.

7.4.1 Surface Water

Potential risks associated with ECPCs in the surface water of Lake Fretwell and Rowell Creek upstream of Lake Fretwell are characterized for both wildlife and aquatic receptors. Risks for terrestrial wildlife are characterized by comparing PDE concentrations for surface water ECPCs with a respective RTV (estimated threshold for toxicity). Risks for aquatic life are characterized based on field measurements and comparison of exposure concentrations of the ECPCs in surface water samples with respective toxicity benchmark values or standards.

7.4.1.1 Terrestrial Wildlife Risks for representative wildlife species associated with ingestion of surface water, potentially contaminated aquatic life, and sediment are quantitatively evaluated using HQs, which are calculated for each ECPC for lethal and sublethal effects by dividing the estimated contaminant exposure concentration by the lethal and sublethal RTV. Lethal and sublethal HIs

Table 7-8
Toxicity of Surface Water Ecological Chemicals of Potential Concern to Aquatic Receptors

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte[1]	Fish[2]		Invertebrates[2]		Mollusks[2]		Amphibians[2]		Algae and Aquatic Plants[2]
	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal	Sublethal
Volatile Organic Compounds ($\mu g/\ell$)									
Acetone	$30/1.0 \times 10^5$ - 1.5×10^7	--	$62/1 \times 10^4$ - 1.5×10^7	$14/1.1 \times 10^6$ - 6.9×10^6	$7/7 \times 10^6$ - 4.8×10^7	--	$2/2 \times 10^7$ - 2.4×10^7	--	$9/5.3 \times 10^5$ - 1×10^7
Inorganic Analytes ($\mu g/\ell$)									
Aluminum[3]	$6/3.28 \times 10^3$ - 3.5×10^4	--	$7/7.4 \times 10^2$ - 3.82×10^4	--	$2/3.06 \times 10^4$ - 5.55×10^4	--	--	--	--
Mercury	$32/1.5 \times 10^2$ - 1×10^5	--	$50/4.7$ - 3.2×10^4	--	$2/5 \times 10^3$ - 1×10^4	$3/500$ - 5.9×10^3	--	--	$5/1.2 \times 10^3$ - 1.2×10^4
Vanadium	$4/128$ - 6×10^3	--	--	--	--	--	--	--	--

[1] With the exception of aluminum, copper, and lead, toxicity information for surface water ecological contaminant of potential concerns was retrieved from the U.S. Environmental Protection Agency (USEPA) Aquatic Information Retrieval System. All aquatic toxicity information is included as Appendix D-6. Aquatic toxicity data for aluminum, copper, and lead were gathered from corresponding ambient water quality criteria documents (USEPA, 1991c).
[2] Number of studies/range of concentrations.
[3] Information for aluminum is from USEPA, 1988.

Notes: $\mu g/\ell$ = micrograms per liter.
-- = not measured.

are determined for each representative wildlife species by summing the HQs for all ECPCs.

Lake Fretwell. The lethal and sublethal HIs and HQs calculated for each of the representative wildlife species from exposure to Lake Fretwell surface water and sediment ECPCs are provided in Appendix D-1. A summary of the HIs for representative wildlife species in Lake Fretwell is presented in Table 7-9.

Table 7-9
Summary of Hazard Indices for Representative Wildlife Species Exposed to Ecological Chemicals of Potential Concern in Surface Water and Sediment from Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Receptors[1]	Maximum Exposure/ Lethal RTVs	Average Exposure/ Lethal RTVs	Maximum Exposure/ Sublethal RTVs	Average Exposure/ Sublethal RTVs
Florida water rat	0.019	0.016	0.11	0.073
Raccoon	0.74	0.73	5.3	5.2
Kingfisher	1.0	1.0	2.1	2.0
Great blue heron	2.1	2.1	4.0	3.9

[1] A model of the potential exposures to surface water and sediment at Lake Fretwell for terrestrial wildlife is presented in Appendix D-1.

Note: RTV = reference toxicity value.

A low probability for lethal effects is predicted for the kingfisher and great blue heron suggesting that population-level effects for piscivorous birds are unlikely. The HIs for the kingfisher (1.0) and the great blue Heron (2.1) are equal or slightly above 1 for the exposures based on both the maximum and average detected concentrations of ECPCs. The primary contributor to the lethal HI for the avian representative wildlife species is copper exposures associated with the ingestion of contaminated fish. These risk estimates are not likely associated with adverse effects for terrestrial wildlife populations. If copper exposures associated with ingestion of contaminated fish are removed from the food-web model, the lethal HIs for the kingfisher and great blue heron are reduced to 0.078 and 0.15, respectively. Copper was not a significant ECPC for any of the OUs or PSCs draining into Lake Fretwell. Lethal risks are not predicted for terrestrial wildlife ingesting surface water and sediment because ingestion of surface water and sediment ECPCs is not an important contributor to the HI for avian receptors.

Sublethal effects (adverse effects to growth and reproduction) are predicted for the raccoon, kingfisher, and great blue heron. The HIs for the raccoon (5.3), kingfisher (2.1), and great blue heron (3.9) exceed 1 for exposures based on the maximum detected concentrations of ECPCs. The HIs for these representative wildlife species also exceed one for exposures based on the average detected concentration of ECPCs. The primary contributor to the sublethal HI for the raccoon is Aroclor-1260 which is associated with ingestion of contaminated fish. For the two avian representative wildlife species, sublethal risks are associated with ingestion of mercury in fish. If mercury exposures associated with ingestion of contaminated fish are removed from the food-web model, the sublethal HIs for the kingfisher and great blue heron are reduced to 0.25 and 0.34, respectively. Because ingestion of surface water and sediment ECPCs are not important

contributors to the HI for any of the representative wildlife species, risks are not predicted for terrestrial wildlife exposed through ingestion of surface water or sediment in Lake Fretwell.

Aroclor-1260, copper, and mercury were detected in fish tissue collected from Lake Fretwell. Aroclor-1260, copper, and mercury were detected in largemouth bass at maximum concentrations of 640 μg/kg, and 7.9 mg/kg, and 1.3 mg/kg, respectively. The magnitude of these HIs suggest that population level effects are not likely. Sublethal effects to the representative wildlife species assume ingestion of the maximum concentration of analytes detected in fish tissue from Lake Fretwell. Section 5.5 provides further information on the collection and analysis of fish tissue in Lake Fretwell.

Although surface water samples from Lake Fretwell were collected approximately 2 years earlier (June 1993) than collection of fish tissue (April 1995), aluminum, copper, and mercury were detected in the 1993 surface water samples (Table 7-2). Aroclor-1260 was detected in sediment from Lake Fretwell (which was collected at the same time as the fish tissue) at concentrations ranging from 3 to 14 μg/kg. It is assumed that aquatic life in Lake Fretwell may bioconcentrate ECPCs in surface water (copper and mercury) or accumulate ECPCs from sediment (Aroclor-1260).

Rowell Creek Upstream of Lake Fretwell. The lethal and sublethal HIs and HQs calculated for each of the representative wildlife species from exposure to surface water and sediment ECPCs in Rowell Creek upstream of Lake Fretwell are provided in Appendix D-2. A summary of the HIs for representative wildlife species in Rowell Creek upstream of Lake Fretwell is presented in Table 7-10. Lethal effects are not expected for the representative wildlife species at Rowell Creek resulting from exposure to ECPCs in the surface water or sediment because the lethal HIs and HQs are all less than 1.

Table 7-10
Summary of Hazard Indices for Representative Wildlife Species Exposed to Ecological Chemicals of Potential Concern in Surface Water and Sediment from Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Receptors[1]	Maximum and Average Exposure/Lethal RTVs[2]	Maximum and Average Exposure/Sublethal RTVs
Florida water rat	2.3×10^{-5}	0.01
Raccoon	2.2×10^{-4}	1.7
Kingfisher	1.5×10^{-3}	0.038
Great blue heron	2.8×10^{-3}	0.033

[1] A model of the potential exposures to surface water and sediment at Rowell Creek upstream of Lake Fretwell for terrestrial wildlife is presented in Appendix D-2.
[2] Maximum and average concentrations of ECPCs were identified for surface water (Table 7-2).

Note: RTV = reference toxicity value.

A low probability for sublethal effects are predicted for the raccoon, suggesting that population-level effects for omnivorous mammals are unlikely. The HI for the raccoon is above 1 for exposures based on the maximum and average detected

concentrations of the ECPCs (HI of 1.7). The primary contributor to the sublethal HI for the raccoon is Aroclor-1260. The HQ for Aroclor-1260 is 1.67. If Aroclor-1260 exposures associated with ingestion of contaminated fish are removed from the calculation, the sublethal HI for the raccoon falls below 1 at 0.0034. This indicates that exposures to Aroclor-1260 in contaminated fish tissue are the primary contributor to predicted risks for the raccoon. Because ingestion of the surface water and sediment are not important contributors to the HI, risks are not predicted for terrestrial wildlife ingesting surface water or sediment in Rowell Creek upstream of Lake Fretwell.

Aroclor-1260 was detected in both largemouth bass and golden shiner whole fish tissue at concentrations of 0.25 μg/kg and 0.056 μg/kg, respectively. Sublethal effects to the raccoon assume ingestion of the maximum concentration of Aroclor-1260 detected in fish tissue from Rowell Creek upstream of Lake Fretwell. Section 5.5 provides further information on the collection and analysis of fish tissue in Rowell Creek upstream of Lake Fretwell.

Aroclor-1260 was detected in sediment from Rowell Creek upstream of Lake Fretwell at a concentration of 6.6 μg/kg. It is assumed that aquatic life in Rowell Creek upstream of Lake Fretwell may accumulate Aroclor-1260 from sediment.

7.4.1.2 **Aquatic Receptors** Risks for aquatic receptors resulting from exposure to the ECPCs in surface water are characterized based on field measurements of the structure and function of the benthic macroinvertebrate communities. Risks are also characterized based upon comparison of the exposure concentrations of the ECPCs in surface water samples with respective aquatic toxicity benchmarks or standards. Tables 7-11 and 7-12 present the concentrations of the ECPCs detected in respective surface water samples from Lake Fretwell and Rowell Creek upstream of Lake Fretwell. The risk characterization for aquatic receptors for both surface water and sediment contamination in Lake Fretwell and upstream of Lake Fretwell is summarized in Table 7-13. The 1993 surface water and biological samples and 1995 sediment and toxicological samples were collected from the same locations. Corresponding data from the 1993 and 1995 sampling stations are provided in Table 7-13 as part of the risk characterization for aquatic receptors.

There are no apparent trends in the status of the benthic macroinvertebrate community in Lake Fretwell and Rowell Creek upstream of Lake Fretwell. Due to the lack of a suitable reference location for the Lake Fretwell sampling stations, the Lake Fretwell habitat assessment scores are comparable only to each other. The macroinvertebrate habitat quality parameter data at the Lake Fretwell and Rowell Creek sampling stations suggest that these stations lie within normal conditions.

<u>Lake Fretwell</u>. Table 7-11 provides a comparison of the concentrations of the ECPCs detected in surface water samples from Lake Fretwell with available toxicity benchmarks. Concentrations of aluminum, lead, and mercury exceed the aquatic toxicity benchmarks. The concentrations of aluminum and lead measured in the water samples from the reference locations also exceed available benchmarks.

The AWQC value of 87 μg/ℓ for aluminum may not be appropriate as a screening value because it is based on the protection of brook trout and striped bass. Neither of these sensitive species are present in Lake Fretwell. The final chronic AWQC value of 748 μg/ℓ is a more appropriate screening value for aluminum because this value does not consider the brook trout or striped bass toxicity data. Based on

Table 7-11
Comparison of Concentrations of Ecological Chemicals of Potential Concern in Surface Water of Lake Fretwell with Aquatic Toxicity Benchmarks

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Range of Detected Reference Concentrations[1]	LFSW1	LFSW2	LFSW3	LFSW4	LFSW5	LFSW6	LFSW7	LFSW8	LFSW8D
Volatile Organic Compounds (µg/ℓ)										
Acetone	10	ND	ND	ND	ND	ND	ND	7 J	ND	ND
Inorganic Analytes (µg/ℓ)										
Aluminum	287 to 332	84.9	112	84.4	93.4	87.2	751	94	84.1	192
Copper	1.9 to 5.1	ND	ND	2.5 J	2.5 J	1.7 J	3.9 J	3.4 J	1.7 J	ND
Lead	3.1	ND	ND	ND	ND	ND	7.8	7.7	ND	ND
Mercury	ND	ND	ND	0.08 J	0.14 J	0.5	0.33	0.34	ND	ND

Analyte	AWQC[2]	Florida Surface Water Quality Standard (µg/ℓ)[3]	Lowest Reported Adverse Effect Concentration (µg/ℓ)[4]
Volatile Organic Compounds (µg/ℓ)			
Acetone	NA	NA	10,000
Inorganic Analytes (µg/ℓ)			
Aluminum	87	NA	740
Copper	12	6.05	NS
Lead	3.2	1.17	NS
Mercury	0.012	0.012	4.7

[1] The reference locations include RCGC-SW-R1, RC-SW-R1, and YWC-SW-R1.
[2] Federal Ambient Water Quality Criteria (U.S. Environmental Protection Agency [USEPA], 1991c).
[3] Chapter 62-302, Florida Administrative Code (Florida Legislature, 1997), Surface Water Quality Standards for Class III Freshwater.
[4] From Table 7-7.

Notes: LFSW = Lake Fretwell surface water.
µg/ℓ = micrograms per liter.
ND = not detected.
J = estimated value.The value indicated by an asterisk is the average of a sample and its duplicate.
AWQC = ambient water quality criteria (guidance established under the Clean Water Act).
NA = not available.
NS = not searched.

Table 7-12
Comparison of Concentrations of Ecological Chemicals of Potential Concern in Surface Water of Rowell Creek Upstream of Lake Fretwell with Aquatic Toxicity Benchmarks

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Range of Detected Reference Concentrations[1]	RC-SW-1	RC-SW-2	GC-SW-2	AWQC[2]	Florida Surface Water Quality Standard (µg/ℓ)[3]	Lowest Reported Adverse Effect Concentration (µg/ℓ)[4]
Volatile Organic Compounds (µg/ℓ)							
Acetone	10	12	ND	ND	NA	NA	10,000
Inorganic Analytes (µg/ℓ)							
Vanadium	ND	3 J	ND	ND	NA	NA	128

[1] The reference locations include RCGC-SW-R1, RC-SW-R1, and YWC-SW-R1.
[2] Federal Ambient Water Quality Criteria (U.S. Environmental Protection Agency [USEPA], 1991c).
[3] Chapter 62-302, Florida Administrative Code (Florida Legislature, 1997), Surface Water Quality Standards for Class III Freshwater.
[4] From Table 7-7.

Notes: AWQC = Ambient Water Quality Criteria (guidance established under the Clean Water Act).
µg/ℓ = micrograms per liter.
ND = not detected.
NA = not available.
J = estimated value.

Table 7-13
Aquatic Receptor Risk Characterization

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Sampling Locations		Biological Parameters		Contaminants Associated with Risk		Interpretation of Weight-of-Evidence
1993 Surface Water/Biological Sampling Station[1]	1995 Sediment/ Toxicological Sampling Station[2]	Sediment Laboratory Toxicity Testing	Benthic Community Composition	Surface Water[3]	Sediment[4]	
LF-SW/BIO-1	LF-SD/TOX-16	No toxicity	Inconclusive	--	--	No significant risks estimated.
LF-SW/BIO-2	LF-SD/TOX-15	37 percent midge larvae mortality[5]	Inconclusive	--	alpha-Chlordane (TEL)	No significant risks estimated.
LF-SW/BIO-3	LF-SD/TOX-13	35 percent midge larvae mortality[5]	Inconclusive	--	--	No significant risks estimated.
LF-SW/BIO-4	LF-SD/TOX-12	100 percent amphipod mortality[5,6]	Inconclusive	--	--	Risks for aquatic receptors are possible due to sediment toxicity of amphipods.
LF-SW/BIO-5	LF-SD/TOX-11	100 percent amphipod mortality[5,6]	Inconclusive	--	--	Risks for aquatic receptors are possible due to sediment toxicity of amphipods.
LF-SW/BIO-6	LF-SD/TOX-10	No toxicity	Inconclusive	Al and Pb	--	No significant risks estimated.
LF-SW/BIO-7	LF-SD/TOX-9	58 percent midge larvae mortality[5,6]	Inconclusive	Pb	--	Risks for aquatic receptors are possible due to sediment toxicity of midge larvae.
LF-SW/BIO-8	LF-SD/TOX-14	7 percent amphipod mortality[5] and 38 percent midge larvae mortality[5]	Inconclusive	--	As (TEL), Cd (TEL, ER-L), Pb (TEL, ER-L), and Zn (TEL)	Risks for aquatic receptors are possible due to elevated concentrations of Ar, Cd, Pb, and Zn in sediment
RC-SW/BIO-2	LF-SD/TOX-17	No toxicity	Normal condition	--	--	No significant risks estimated.
RC-SW/BIO-1	RC-SD/TOX-18	82 percent midge larvae mortality[5,6]	Normal condition	--	--	Risks for aquatic receptors are possible due to sediment toxicity of midge larvae.
GC-SW/BIO-2	GC-SD/TOX-19	No toxicity	Normal condition	--	--	No significant risks estimated.

See notes at end of table.

Table 7-13 (Continued)
Aquatic Receptor Risk Characterization

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[1] 1993 surface water and biological sampling stations are depicted on Plate 2.
[2] 1995 sediment and toxicological sampling stations are depicted on Figure 7-2.
[3] ECPCs in surface water that exceeded the screening reference concentration and also exceeded benchmarks. Benchmarks for surface water ECPCs are listed in Tables 7-10 and 7-11.
[4] ECPCs in sediment that exceeded at least one benchmark. Benchmarks for sediment ECPCs are listed in Tables 7-13 and 7-14.
[5] Results are statistically significant as compared to the laboratory control.
[6] Results are statistically and biologically significant as compared to the reference location YWC-SD/TOX-20.

Notes: -- = not measured.
TEL = threshold effects level from Florida SQAG.
Al = aluminum.
Pb = lead.
As = arsenic.
Cd = cadmium.
ER-L = effects range-low concentration.
Zn = zinc.
ECPC = ecological chemical of potential concern.
SQAG = Sediment Quality Assessment Guidelines.

the screening value of 748 $\mu g/\ell$, detected concentrations of aluminum in Lake Fretwell surface water are not likely to present a risk to aquatic receptors.

Detected concentrations of lead and mercury in surface water exceed available benchmarks at sampling stations LF-SW-6 and LF-SW-7. In addition, concentrations of mercury also exceed screening benchmarks at sampling stations LF-SW-3, LF-SW-4, and LF-SW-5. It should be noted, however, that the AWQC value for mercury (0.012 $\mu g/\ell$) is based on a tissue residue level established for the FDA action level; therefore, the value is overly protective of toxicological effects to aquatic life. All detected concentrations of mercury in the surface water of Lake Fretwell are well below the lowest adverse effect concentration reported in the AQUIRE at 4.7 $\mu g/\ell$. Lead was detected in fish tissue collected from Lake Fretwell at a concentration of 2.5 mg/kg in lake chubsucker tissue and 2.9 mg/kg in golden shiner tissue. The presence of lead in surface water of Lake Fretwell may cause a risk to aquatic receptors.

Rowell Creek Upstream of Lake Fretwell. Table 7-12 provides a comparison of the concentrations of the ECPCs detected in surface water samples from Rowell Creek upstream of Lake Fretwell with available toxicity benchmarks. Detected concentrations of acetone and vanadium are well below their respective aquatic toxicity benchmarks; therefore, risks associated with exposure to surface water in Rowell Creek upstream of Lake Fretwell are not predicted for aquatic receptors.

7.4.2 Sediment Potential risks are characterized for contamination in sediment in Lake Fretwell and in Rowell Creek upstream of Lake Fretwell for both terrestrial wildlife and aquatic receptors. The risk characterization methodology is described in Section 3.5.

7.4.2.1 **Terrestrial Wildlife** The lethal and sublethal HIs and HQs calculated for each of the representative wildlife species for exposures related to both surface water and sediment ECPCs have been discussed in the previous section (paragraph 7.4.1.1).

7.4.2.2 **Aquatic Receptors** Risks for aquatic receptors associated with ECPCs in sediment at Lake Fretwell and Rowell Creek upstream of Lake Fretwell are characterized for each sampling station based on the approach outlined in Section 3.5. The sediment samples for toxicity testing and chemical analyses were gathered from a split sample of sediment. These samples were collected in April of 1995. Sampling of the macroinvertebrate community and collection of surface water samples for chemical analyses were completed at roughly the same locations in the summer of 1993. Although the results of the benthic macroinvertebrate sampling are not directly comparable with the chemical and toxicity testing analyses (due to variation in the time and location of sample collection), they are discussed in Subsection 5.2.2 and Paragraph 7.3.1.2. The 1993 benthic macroinvertebrate habitat quality parameter data at the Lake Fretwell and Rowell Creek sampling stations suggests that these stations lie within normal conditions. s Concurrent sampling of the sediment for chemical analyses and toxicity testing allows for comparison of adverse responses in aquatic receptors with measured concentrations of analytes in the sediment samples.

Lake Fretwell. Risks for aquatic receptors in Lake Fretwell associated with ECPCs in sediment are characterized for each sampling station (LF-SD/Tox-9 through LF-SD/TOX-16). Table 7-14 presents the distribution of ECPCs detected in sediment from Lake Fretwell. Nine analytes detected in sediment samples from Lake Fretwell

Table 7-14
Comparison of Lake Fretwell Sediment with Toxicity Benchmarks

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	LF-SD-9	LF-SD-10	LF-SD-11	LF-SD-12	LF-SD-13	LF-SD-14	LF-SD-15	LF-SD-16
Semivolatile Organic Compounds (µg/kg)								
Di-n-butylphthalate	34 J	60 J	140 J	110 J	83 J	380 J	38 J	73 J
Pesticides and PCBs (µg/kg)								
Endosulfan II	0.23 J	ND	ND	ND	ND	ND	ND	ND
Endrin aldehyde	ND	ND	ND	ND	ND	ND	0.31 J	ND
alpha-Chlordane	0.38 J	ND	0.22 J	ND	ND	ND	2.4 J	ND
Inorganic Analytes (mg/kg)								
Arsenic	ND	ND	ND	ND	ND	7.7	ND	ND
Cadmium	ND	ND	ND	ND	ND	1.4	0.46	ND
Lead	6.3	3.4	14.8	4.7	6.4	75.8	11.4	10
Manganese	8.3	4.8	7	13.1	3.1	19.7	5.8	5
Zinc	ND	ND	ND	ND	ND	132	ND	ND

Analyte	Reference Concentrations[1]	NOAA ER-L/ER-M[2]	State of Florida TEL/PEL[3]
Semivolatile Organic Compounds (µg/kg)			
Di-*n*-butylphthalate	110 J	NA/NA	NA/NA
Pesticides and PCBs (µg/kg)			
Endosulfan II	ND	NA/NA	NA/NA
Endrin aldehyde	ND	NA/NA	NA/NA
alpha-Chlordane	ND	NA/NA	2.26/4.79
Inorganic Analytes (mg/kg)			
Arsenic	ND	8.2/70	7.24/41.6
Cadmium	ND	1.2/9.6	0.676/4.21
Lead	23.5	46.7/218	30.2/112
Manganese	8.7	NA/NA	NA/NA
Zinc	ND	150/410	124/271

See notes at end of table.

Table 7-14 (Continued)
Comparison of Lake Fretwell Sediment with Toxicity Benchmarks

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

[1] The reference location is YWC-SD-20 (Plate 2).
[2] National Oceanic and Atmospheric Administration ER-L and ER-M sediment values (Long and others, 1995). ER-L (10th percentile) represents a lower threshold value above which adverse effects on sensitive life stages and/or species have been documented. ER-M (50th percentile) represents a second threshold value above which adverse effects on most species are frequently or always observed.
[3] Florida Department of Environmental Protection Sediment Quality Assessment Guidelines (MacDonald and others, 1994). PEL defines the lower limit of the range of contaminant concentrations associated with adverse biological effects. TEL defines the upper limit of the range of contaminant concentrations not considered to represent significant hazards to aquatic organisms.

Notes: µg/kg = micrograms per kilogram.
J = estimated value.
PCB = polychlorinated biphenyl.
ND = not detected.
mg/kg = milligrams per kilogram.
NOAA = National Oceanic and Atmospheric Administration
ER-L = effects range-low.
ER-M = effects range-medium.
TEL = threshold effect level.
PEL = probable effect level.
NA = not available.

were selected as ECPCs for aquatic life. These ECPCs included one SVOC three pesticides, and five inorganics. The ER-L and ER-M sediment values (Long and others, 1995) and the State of Florida Sediment Quality Assessment Guidelines (MacDonald, 1994) are provided as a point of reference. An evaluation of the weight-of-evidence from the toxicological and chemical data is summarized in Table 7-12 and discussed below.

Sediment collected from three of the eight sampling stations in Lake Fretwell was toxic to one of the test organisms in the laboratory bioassays, as compared to the reference sediment sample collected upstream. Mortality of 100 percent was observed in the amphipod test at sampling stations LF-SD/TOX-11 and LF-SD/TOX-12, which are located at the southeastern and southwestern portions of the lake, respectively. In addition, 58 percent mortality was observed in the midge larvae test at sampling station LF-SD/TOX-9, which is located in the southwestern edge of Lake Fretwell. Based on the results of the laboratory sediment bioassays, impacts to survival of certain invertebrate receptors may be occurring in the southern portion of Lake Fretwell.

To determine which contaminants measured in the Lake Fretwell sediment may be possible causative agents for the observed toxicity, simple linear regressions were completed for selected analytes. The regressions compared the observed responses in the bioassays (amphipod and midge larvae mortality) to the concentrations of di-*n*-butylphthalate, alpha-chlordane, lead, and manganese in sediment (Appendix D-7). There were several contaminants detected at only one or two stations for which regressions were not possible. The linear regressions reveal no positive association between the concentration of detected ECPCs in sediment and adverse responses observed in the sediment toxicity tests. This suggests that toxicological effects may be associated with simultaneous exposures to multiple contaminants or conditions not related to the OUs or PSCs.

A comparison of sediment guidelines with site chemical data (Table 7-13) reveals that alpha-chlordane, arsenic, cadmium, lead, and zinc exceed available sediment guidelines. Sediment toxicity benchmarks are not available for d n-butylphthalate, endosulfan II, and endrin aldehyde.

Detected concentrations of di-*n*-butylphthalate in sediment from Lake Fretwell are not associated with the observed mortality in the sediment toxicity tests. Although di-*n*-butylphthalate was detected at all eight sampling stations at concentrations ranging from 34 to 380 μg/kg, this analyte is likely to be a laboratory contaminant rather than a site-related contaminant.

Alpha-chlordane was detected in three of the eight sediment sampling locations at concentrations ranging from 0.22 μg/kg to 2.4 μg/kg. Detected concentrations of alpha-chlordane at sampling station LF-SD/TOX-15 (2.4 μg/kg) exceeded the State of Florida TEL. Within this range of concentrations (i.e., between the lower limit TEL and upper limit permissible exposure limit [PEL]), adverse biological effects are possible; however, it is difficult to predict the occurrence, nature, and/or severity of these effects. The results of the sediment toxicity testing from sampling station LF-SD/TOX-15 show 35 percent mortality in the midge larvae as compared to the laboratory control. However, this result is not statistically significant when compared to the reference sediment from NAS Cecil Field.

Although several inorganics are elevated above upgradient concentrations, based on the results of the correlation analysis (Appendix D-7), none of these analytes

appear to be a substantial contributor to the observed mortality in the sediment laboratory bioassays. Low correlation coefficients (i.e., R^2 less than 0.1) were observed for all inorganics when regressed against amphipod and midge larvae mortality. Concentrations of these inorganics were all highest at sampling station LF-SD/TOX-14. Detected concentrations of arsenic, cadmium, lead, and zinc at LF-SD/TOX-14 exceed their respective Florida TEL (but not the PEL) values, and concentrations of cadmium and lead also exceed their respective NOAA ER-L (but not ER-M values) at this sampling station. Sediment quality screening values are not available for manganese. The results of the sediment toxicity testing from sampling station LF-SD/TOX-14 show 7 percent mortality in the amphipod test and 38 percent mortality in the midge larvae test as compared to the laboratory control. These results, however, are not statistically significant when compared to the reference sediment from NAS Cecil Field.

Based on the weight-of-evidence for each of the sampling locations (toxicity testing results, benthic community, and chemical analyses), the statements below concerning risks for aquatic life associated with sediment contamination in Lake Fretwell can be made.

- Risks may be present to certain macroinvertebrate receptors at four of the eight sampling stations (LF-SD/TOX-7, LF-SD/TOX-9, LF-SD/TOX-11, and LF-SD/TOX-12). For stations LF-SD/TOX-11 and LF-SD/TOX-12, risks are based on mortality of amphipods in sediment toxicity testing. At sampling station LF-SD/TOX-9, risks are based on mortality of midge larvae in sediment toxicity testing. At sampling station LF-SD/TOX-7, detected concentrations of arsenic, cadmium, lead, and zinc exceeded threshold, but not probable, effects benchmarks and observed toxicity in both test organisms was statistically significant as compared to the laboratory control.

- Based on the results of simple linear regressions (Appendix D-7), the observed mortality in the sediment toxicity tests is not associated with concentrations of individual ECPCs in bulk sediment from Lake Fretwell. Although not evaluated, it is possible that the toxicological results are correlated with exposure to multiple ECPCs and other factors that influence the bioavailability of sediment toxicants.

- Analysis of the benthic community metrics relative to contaminant concentrations in surface water are inconclusive.

<u>Rowell Creek Upstream of Lake Fretwell</u>. Risks for aquatic receptors in Rowell Creek upstream of Lake Fretwell associated with ECPCs in sediment are characterized for each sampling station (LF-SD/Tox-17, RC-SD/TOX-18, and GC-SD/TOX-19). Table 7-15 presents the distribution of ECPCs detected in sediment from Lake Fretwell. Only one analyte (di-*n*-butylphthalate) detected in sediment samples from Rowell Creek upstream of Lake Fretwell was selected as an ECPC for aquatic life. An evaluation of the weight-of-evidence from the toxicological and chemical data is summarized in Table 7-15 and discussed below.

Sediment collected from one of the three sampling stations in Rowell Creek upstream of Lake Fretwell was toxic to the midge larvae in the laboratory bioassays as compared to the reference sediment sample collected upstream in Yellow Water Creek. Mortality of 82 percent was observed in the midge larvae at sampling station RC-SD/TOX-18. Based on the results of the laboratory sediment

Table 7-15
Comparison of Rowell Creek (Upstream of Lake Fretwell) Sediment with Toxicity Benchmarks

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Analyte	Reference Concentration[1]	LF-SD-17	LF-SD-17D	RC-SD-18	GC-SD-19	NOAA ER-L/ER-M[2]	State of Florida TEL/PEL[3]
Semivolatile Organic Compounds (µg/kg)							
Di-*n*-butylphthalate	110 J	200 J	170 J	94 J	180 J	NA/NA	NA/NA

[1] The reference location is YWC-SD-20 (Figure 7-1).
[2] National Oceanic and Atmospheric Administration ER-L and ER-M sediment values (Long and others, 1995). ER-L (10th percentile) represents a lower threshold value above which adverse effects on sensitive life stages and/or species have been documented. ER-M (50th percentile) represents a second threshold value above which adverse effects on most species are frequently or always observed.
[3] Florida Department of Environmental Protection Sediment Quality Assessment Guidelines (MacDonald and others, 1994). PEL defines the lower limit of the range of contaminant concentrations associated with adverse biological effects. TEL defines the upper limit of the range of contaminant concentrations not considered to represent significant hazards to aquatic organisms.

Notes: This table shows ecological chemicals of potential concern for aquatic receptors from Table 7-4.

NOAA = National Oceanic and Atmospheric Administration.
ER-L = effects range-low.
ER-M = effects range-medium.
TEL = threshold effect level.
PEL = probable effect level.
µg/kg = micrograms per kilogram.
J = estimated value.
NA = not available.

bioassays, impacts to survival of certain invertebrate receptors may be occurring in portions of Rowell Creek upstream of Lake Fretwell. Linear regressions reveal no positive association between the concentrations of detected ECPCs in sediment and adverse responses observed in the sediment conditions toxicity tests. This suggests that the mixture of contamination from the OUs and PSCs and other sediment conditions may be toxic to aquatic life at sampling station RC-SD/TOX-18.

Table 7-14 provides a comparison of the ECPC concentrations with sediment benchmarks. Based on this evaluation, risks are not anticipated for aquatic exposures to ECPCs in sediment in Rowell Creek upstream of Lake Fretwell. Benchmarks do not exist for di-*n*-butylphthalate; however, this analyte is likely the result of laboratory contamination.

In summary, the results of the sediment toxicity testing indicate that aquatic receptors may be at risk at sampling station RC-SD/TOX-18. Observed toxicity may be due to a mixture of contamination in the sediment or other physical disturbances at sampling station RC-SD/TOX-18.

7.5 UNCERTAINTY ANALYSES. A number of uncertainties and assumptions are inherent in the ecological risk assessment process. Table 3-3 summarizes general ERA uncertainties. Specific uncertainties associated with the evaluation of risks associated with contamination at Lake Fretwell and Rowell Creek upstream of Lake Fretwell are described below.

- Due to the presence of several PSCs surrounding Lake Fretwell and Rowell Creek upstream of Lake Fretwell, it is difficult to attribute predicted risks to a particular site or PSC.

- The surface water and biological samples were collected in June 1993, while the sediment and toxicological samples and fish tissue were collected in April 1995. Although the 1993 surface water and 1995 sediment sampling stations are located in roughly the same vicinity, collection of the samples on different dates increases uncertainty in the data comparison.

- An assumption has been made that organisms evaluated in the laboratory bioassays are representative of organisms in Lake Fretwell and Rowell Creek.

- The lack of information concerning the toxicity of surface water and sediment ECPCs to avian species may result in an underestimation of risks.

- The lack of aquatic toxicity benchmarks for some of the surface water and sediment ECPCs may result in an underestimation of risks for aquatic life.

- The food-web model for representative wildlife species assumes ingestion of the maximum concentration of detected analytes in whole fish tissue collected form golden shiner, lake chubsucker, or largemouth bass. PDEs related to ingestion of contaminated aquatic life may be overestimated, depending on the feeding habits of the representative wildlife species.

- The simple linear regression model does not account for the influence of bioavailability (e.g., TOC, sediment grain size) or the potential toxicity of sediment to aquatic life.

- The site-derived fish tissue data were used to estimate exposures to all aquatic prey including benthic macroinvertebrates. Depending on the feeding habits of the representative wildlife species and/or concentrations of ECPCs present in aquatic prey other than fish, this assumption may either overestimate or underestimate potential risks associated with ingestion of contaminated aquatic prey.

- Lake Fretwell is periodically drained, which could have two effects. Draining the lake may physically mobilize sediment, which would displace contaminants associated with lake sediment, causing them to be deposited downgradient in Lake Fretwell or Rowell Creek. Draining the lake may also change or alter the bioavailability of metals, based on a change in the oxidation state. Metals may be oxidized and reduced when the water level is lowered and raised.

- The FDEP, which manages the STORET database, was contacted to provide regional background concentrations for potential risk contributors identified in this ERA (FDEP, 1997). The FDEP conducted a search of the database on chemical data for selected ECPCs: for all lakes in the State of Florida north of 26 degrees latitude, copper, mercury, lead, and Aroclor-1260 in surface water, and Aroclor-1260 in sediment. The database search provided a number of concentrations for copper and lead (number of detects was 100 and 75, respectively). The average detected concentrations of copper and lead in surface water were 8.05 $\mu g/\ell$ and 3.23 $\mu g/\ell$, respectively. The maximum detected concentrations of copper and lead in Lake Fretwell surface water are 7.1 $\mu g/\ell$ and 7.8 $\mu g/\ell$, respectively. These concentrations are generally consistent with average regional background levels. Mercury was detected in surface water in only one lake at a concentration of 0.1 $\mu g/\ell$, and Aroclor-1260 was not detected. The maximum detected concentration of mercury in Lake Fretwell was 0.5 $\mu g/\ell$. As discussed in Paragraph 7.4.1.2, the AWQC for mercury is based on residues in fish for human consumption; the maximum detected concentration of mercury in surface water is lower than effects concentrations for aquatic life. Aroclor-1260 was not detected in sediment; however, the method detection limits ranged between 12 and 60 $\mu g/kg$. The average detected concentration of Aroclor-1260 in Lake Fretwell sediment, 7 $\mu g/kg$, is most likely comparable to concentrations detected in lakes throughout northern Florida.

APPENDIX D

SUPPORTING ECOLOGICAL INFORMATION FOR LAKE FRETWELL RISK ASSESSMENT

APPENDIX D-1

SURFACE WATER/SEDIMENT SPREADSHEETS FOR LAKE FRETWELL

Appendix D-1
Exposure Parameters and Assumptions for Representative Wildlife Species at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

Representative Wildlife Species		Percent Prey in Diet [a] Aquatic Organisms	Percent Prey in Diet [a] Plants	Sediment	Home Range [a] (acres)	ED [b]	Site Foraging Frequency [c]	Food Ingestion Rate [a] (kg/day)	Water Ingestion Rate [a] (l/day)	Body Weight [a] (kg)
Florida water rat	(Small Omniv. Mammal)	8%	90%	2%	0.42	1.0	1.00E+00	0.027	0.037	0.33
Kingfisher	(Piscivorous bird)	93%	0%	7%	35	1.0	1.00E+00	0.014	0.0165	0.15
Great blue heron	(Piscivorous bird)	98%	0%	2%	1.5	1.0	1.00E+00	0.401	0.10	2.23
Raccoon	(Piscivorous Mammal)	93%	0%	7%	385	1.0	1.00E+00	0.214	0.34	3.99

NOTES:
[a] From 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 and multiplying by exposure duration (cannot exceed 1.0)).

Appendix D-1

Estimation of ECPC Exposure Concentrations for Representative Wildlife Species at Lake Fretwell
Maximum Surface Water and Sediment Concentrations
Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

EXPOSURE CONCENTRATION DATA			ESTIMATED TISSUE LEVELS IN PRIMARY FOOD ITEMS	
ECPC	MAXIMUM SEDIMENT CONCENTRATION [a] (mg/kg)	MAX. SURFACE WATER CONCENTRATION [b] [mg/l]	Aquatic BCF	Aquatic Organism Tissue Concent. [c] (mg/kg)
Acetone		0.007		0.0E+00
Chloroform		0.0035		0.0E+00
Di-n-butylphthalate	0.38			0.0E+00
4,4-DDE	0.00087			2.4E-02
Aroclor-1260	0.014			6.4E-01
Endosulfan II	0.00012			0.0E+00
Endrin aldehyde	0.00031			0.0E+00
alpha-Chlordane	0.0024			1.5E-02
gamma-Chlordane	0.00013			4.2E-03
Aluminum		0.751		2.7E+02
Arsenic	7.7			0.0E+00
Beryllium		0.00029		0.0E+00
Cadmium	1.4			0.0E+00
Chromium	18.9			0.0E+00
Copper		0.0071		2.3E+01
Lead	75.8	0.0078		2.9E+00
Manganese	19.7			2.2E+01
Mercury		0.0005		1.3E+00
Nickel	10	0.013		3.3E+00
Zinc	132	0.0303		1.6E+02

[a] From Table 7-3.
[b] From Table 7-1.
[c] Aquatic organism tissue concentrations for pesticides, PCBs, and metals based on the maximum detected concentration in fish tissue collected from the Lake Fretwell area.
The fish data are presented in Section 5.5.
ECPC = Ecological Chemical of Potential Concern

Appendix D-1
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Florida water rat			Raccoon		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.8E-04	6.00E+02	1.31E-06	6.0E-04	6.00E+02	1.01E-06
Chloroform	3.9E-04	1.64E+02	2.39E-06	3.0E-04	1.64E+02	1.84E-06
Di-n-butylphthalate	6.2E-04	1.30E+03	4.77E-07	1.4E-03	1.30E+03	1.09E-06
4,4-DDE	1.6E-04	1.40E+02	1.13E-06	1.2E-03	1.20E+01	1.00E-04
Aroclor-1260	4.2E-03	1.00E+02	4.21E-05	3.2E-02	1.50E+02	2.13E-04
Endosulfan II	2.0E-07	5.00E+00	3.93E-08	4.5E-07	5.00E+00	9.01E-08
Endrin aldehyde	5.1E-07	6.00E-01	8.45E-07	1.2E-06	6.00E-01	1.94E-06
alpha-Chlordane	1.0E-04	4.00E+01	2.55E-06	7.6E-04	4.00E+01	1.89E-05
gamma-Chlordane	2.8E-05	4.00E+01	6.93E-07	2.1E-04	4.00E+01	5.25E-06
Aluminum	1.9E+00	7.40E+02	2.50E-03	1.4E+01	7.40E+02	1.83E-02
Arsenic	1.3E-02	1.53E+02	8.24E-05	2.9E-02	2.90E+01	9.97E-04
Beryllium	3.3E-05	2.00E+00	1.63E-05	2.5E-05	2.00E+00	1.25E-05
Cadmium	2.3E-03	3.00E+01	7.64E-05	5.3E-03	3.00E+01	1.75E-04
Chromium	3.1E-02	4.00E+01	7.73E-04	7.1E-02	4.00E+01	1.77E-03
Copper	1.5E-01	1.88E+02	8.08E-04	1.2E+00	1.88E+02	6.13E-03
Lead	1.4E-01	6.00E+01	2.40E-03	4.3E-01	6.00E+01	7.17E-03
Manganese	1.8E-01	4.50E+01	3.90E-03	1.2E+00	8.00E+01	1.46E-02
Mercury	8.6E-03	3.60E+00	2.38E-03	6.5E-02	1.00E-01	6.49E-01
Nickel	3.9E-02	1.34E+01	2.94E-03	2.0E-01	1.34E+01	1.52E-02
Zinc	1.3E+00	3.90E+02	3.32E-03	8.7E+00	3.90E+02	2.23E-02
SUMMARY HAZARD INDEX			1.9E-02			7.4E-01

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	*Kingfisher*			*Great blue heron*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.7E-04			3.17E-04		
Chloroform	3.9E-04			1.59E-04		
Di-n-butylphthalate	2.5E-03			1.37E-03		
4,4-DDE	2.1E-03	4.48E+02	4.66E-06	4.23E-03	4.48E+02	9.45E-06
Aroclor-1260	5.6E-02	1.60E+01	3.48E-03	1.13E-01	1.60E+01	7.05E-03
Endosulfan II	7.8E-07	6.20E+00	1.26E-07	4.32E-07	6.20E+00	6.96E-08
Endrin aldehyde	2.0E-06	3.60E-01	5.63E-06	1.11E-06	3.60E-01	3.10E-06
alpha-Chlordane	1.3E-03	4.80E+00	2.75E-04	2.65E-03	4.80E+00	5.52E-04
gamma-Chlordane	3.7E-04	4.80E+00	7.61E-05	7.41E-04	4.80E+00	
Aluminum	2.4E+01			4.76E+01		
Arsenic	5.0E-02	6.46E+01	7.79E-04	2.77E-02	6.46E+01	4.29E-04
Beryllium	3.2E-05			1.31E-05		
Cadmium	9.1E-03			5.03E-03		
Chromium	1.2E-01	2.52E+01	4.90E-03	6.80E-02	2.52E+01	2.70E-03
Copper	2.0E+00	2.10E+00	9.55E-01	4.07E+00	2.10E+00	1.94E+00
Lead	7.5E-01	7.50E+01	9.97E-03	7.84E-01	7.50E+01	1.05E-02
Manganese	2.0E+00			3.93E+00		
Mercury	1.1E-01	2.20E+00	5.13E-02	2.29E-01	2.20E+00	1.04E-01
Nickel	3.5E-01	6.08E+01	5.81E-03	6.18E-01	6.08E+01	1.02E-02
Zinc	1.5E+01	1.29E+03	1.17E-02	2.94E+01	1.29E+03	2.27E-02
SUMMARY HAZARD INDEX			1.0E+00			2.1E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Florida water rat			Raccoon		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.8E-04	2.73E+05	2.87E-09	6.0E-04	2.73E+05	2.21E-09
Chloroform	3.9E-04	2.60E+02	1.51E-06	3.0E-04	2.60E+02	1.16E-06
Di-n-butylphthalate	6.2E-04	1.25E+02	4.97E-06	1.4E-03	1.25E+02	1.14E-05
4,4-DDE	1.6E-04	2.00E-02	7.93E-03	1.2E-03	3.54E+03	3.39E-07
Aroclor-1260	4.2E-03	6.40E+00	6.58E-04	3.2E-02	7.50E-03	4.26E+00
Endosulfan II	2.0E-07	2.60E-01	7.55E-07	4.5E-07	2.60E-01	1.73E-06
Endrin aldehyde	5.1E-07	1.00E-01	5.07E-06	1.2E-06	1.00E-01	1.16E-05
alpha-Chlordane	1.0E-04	3.04E+00	3.36E-05	7.6E-04	3.04E+00	2.49E-04
gamma-Chlordane	2.8E-05	3.04E+00	9.11E-06	2.1E-04	3.04E+00	6.91E-05
Aluminum	1.9E+00	1.00E+02	1.85E-02	1.4E+01	1.00E+02	1.35E-01
Arsenic	1.3E-02	1.40E+01	9.00E-04	2.9E-02	1.40E+01	2.06E-03
Beryllium	3.3E-05			2.5E-05		
Cadmium	2.3E-03	2.15E+01	1.07E-04	5.3E-03	2.15E+01	2.44E-04
Chromium	3.1E-02	1.40E+03	2.21E-05	7.1E-02	1.40E+03	5.07E-05
Copper	1.5E-01	1.00E+02	1.52E-03	1.2E+00	1.00E+02	1.15E-02
Lead	1.4E-01	2.50E+00	5.76E-02	4.3E-01	2.50E+00	1.72E-01
Manganese	1.8E-01	1.40E+02	1.25E-03	1.2E+00	1.40E+02	8.33E-03
Mercury	8.6E-03	5.00E-01	1.71E-02	6.5E-02	1.00E-01	6.49E-01
Nickel	3.9E-02	5.00E+01	7.88E-04	2.0E-01	5.00E+01	4.07E-03
Zinc	1.3E+00	2.00E+02	6.46E-03	8.7E+00	2.00E+02	4.34E-02
SUMMARY HAZARD INDEX			1.1E-01			5.3E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	*Kingfisher*			*Great blue heron*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.7E-04			3.2E-04		
Chloroform	3.9E-04			1.6E-04		
Di-n-butylphthalate	2.5E-03			1.4E-03		
4,4-DDE	2.1E-03	5.80E-01	3.60E-03	4.2E-03	5.80E-01	7.30E-03
Aroclor-1260	5.6E-02	9.00E-01	6.18E-02	1.1E-01	9.00E+00	1.25E-02
Endosulfan II	7.8E-07			4.3E-07		
Endrin aldehyde	2.0E-06			1.1E-06		
alpha-Chlordane	1.3E-03	3.10E-02	4.25E-02	2.7E-03	3.10E-02	8.55E-02
gamma-Chlordane	3.7E-04	3.10E-02	1.18E-02	7.4E-04	3.10E-02	2.39E-02
Aluminum	2.4E+01			4.8E+01		
Arsenic	5.0E-02			2.8E-02		
Beryllium	3.2E-05			1.3E-05		
Cadmium	9.1E-03	1.00E+01	9.15E-04	5.0E-03	1.00E+01	5.03E-04
Chromium	1.2E-01	2.00E+02	6.17E-04	6.8E-02	2.00E+02	3.40E-04
Copper	2.0E+00	2.90E+01	6.92E-02	4.1E+00	2.90E+01	1.40E-01
Lead	7.5E-01	6.25E+00	1.20E-01	7.8E-01	6.25E+00	1.25E-01
Manganese	2.0E+00			3.9E+00		
Mercury	1.1E-01	6.40E-02	1.76E+00	2.3E-01	6.40E-02	3.58E+00
Nickel	3.5E-01			6.2E-01		
Zinc	1.5E+01			2.9E+01		
SUMMARY HAZARD INDEX			2.1E+00			4.0E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1

Estimation of ECPC Exposure Concentrations for Representative Wildlife Species at Lake Fretwell
Average Surface Water and Sediment Concentrations
Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

EXPOSURE CONCENTRATION DATA			ESTIMATED TISSUE LEVELS IN PRIMARY FOOD ITEMS	
ECPC	AVERAGE SEDIMENT CONCENTRATION [a] (mg/kg)	AVG. SURFACE WATER CONCENTRATION [b] [mg/l]	Aquatic BCF	Aquatic Organism Tissue Concent. [c] (mg/kg)
Acetone		0.007		0.0E+00
Chloroform		0.0035		0.0E+00
Di-n-butylphthalate	0.113			0.0E+00
4,4-DDE	0.00049			2.4E-02
Aroclor-1260	0.007			6.4E-01
Endosulfan II	0.00012			0.0E+00
Endrin aldehyde	0.00031			0.0E+00
alpha-Chlordane	0.00094			1.5E-02
gamma-Chlordane	0.00013			4.2E-03
Aluminum		0.181		2.7E+02
Arsenic	7.7			0.0E+00
Beryllium		0.00026		0.0E+00
Cadmium	0.93			0.0E+00
Chromium	7.6			0.0E+00
Copper		0.0035		2.3E+01
Lead	16.6	0.0078		2.9E+00
Manganese	8.5			2.2E+01
Mercury		0.00028		1.3E+00
Nickel	4.1	0.013		3.3E+00
Zinc	132	0.0214		1.6E+02

[a] From Table 7-3.
[b] From Table 7-1.
[c] Aquatic organism tissue concentrations for pesticides, PCBs, and metals based on the maximum detected concentration in fish tissue collected from the Lake Fretwell. The fish data are presented in Section 5.5.
ECPC = Ecological Chemical of Potential Concern

Appendix D-1
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Average Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Florida water rat			Raccoon		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.8E-04	6.00E+02	1.31E-06	6.0E-04	6.00E+02	1.01E-06
Chloroform	3.9E-04	1.64E+02	2.391 06	3.0E-04	1.64E+02	1.84E-06
Di-n-butylphthalate	1.8E-04	1.30E+03	1.42E-07	4.2E-04	1.30E+03	3.26E-07
4,4-DDE	1.6E-04	1.40E+02	1.13E-06	1.2E-03	1.20E+01	9.99E-05
Aroclor-1260	4.2E-03	1.00E+02	4.20E-05	3.2E-02	1.50E+02	2.13E-04
Endosulfan II	2.0E-07	5.00E+00	3.93E-08	4.5E-07	5.00E+00	9.01E-08
Endrin aldehyde	5.1E-07	6.00E-01	8.45E-07	1.2E-06	6.00E-01	1.94E-06
alpha-Chlordane	1.0E-04	4.00E+01	2.49E-06	7.5E-04	4.00E+01	1.88E-05
gamma-Chlordane	2.8E-05	4.00E+01	6.93E-07	2.1E-04	4.00E+01	5.25E-06
Aluminum	1.8E+00	7.40E+02	2.42E-03	1.3E+01	7.40E+02	1.82E-02
Arsenic	1.3E-02	1.53E+02	8.24E-05	2.9E-02	2.90E+01	9.97E-04
Beryllium	2.9E-05	2.00E+00	1.46E-05	2.2E-05	2.00E+00	1.12E-05
Cadmium	1.5E-03	3.00E+01	5.07E-05	3.5E-03	3.00E+01	1.16E-04
Chromium	1.2E-02	4.00E+01	3.11E-04	2.9E-02	4.00E+01	7.13E-04
Copper	1.5E-01	1.88E+02	8.06E-04	1.2E+00	1.88E+02	6.13E-03
Lead	4.7E-02	6.00E+01	7.84E-04	2.1E-01	6.00E+01	3.46E-03
Manganese	1.6E-01	4.50E+01	3.49E-03	1.1E+00	8.00E+01	1.41E-02
Mercury	8.5E-03	3.60E+00	2.37E-03	6.5E-02	1.00E-01	6.49E-01
Nickel	3.0E-02	1.34E+01	2.22E-03	1.8E-01	1.34E+01	1.35E-02
Zinc	1.3E+00	3.90E+02	3.31E-03	8.7E+00	3.90E+02	2.23E-02
SUMMARY HAZARD INDEX			1.6E-02			7.3E-01

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Average Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Kingfisher			Great blue heron		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.7E-04			3.17E-04		
Chloroform	3.9E-04			1.59E-04		
Di-n-butylphthalate	7.4E-04			4.06E-04		
4,4-DDE	2.1E-03	4.48E+02	4.66E-06	4.23E-03	4.48E+02	9.44E-06
Aroclor-1260	5.6E-02	1.60E+01	3.47E-03	1.13E-01	1.60E+01	7.05E-03
Endosulfan II	7.8E-07	6.20E+00	1.26E-07	4.32E-07	6.20E+00	6.96E-08
Endrin aldehyde	2.0E-06	3.60E-01	5.63E-06	1.11E-06	3.60E-01	3.10E-06
alpha-Chlordane	1.3E-03	4.80E+00	2.73E-04	2.65E-03	4.80E+00	5.51E-04
gamma-Chlordane	3.7E-04	4.80E+00	7.61E-05	7.41E-04	4.80E+00	1.54E-04
Aluminum	2.3E+01			4.76E+01		
Arsenic	5.0E-02	6.46E+01	7.79E-04	2.77E-02	6.46E+01	4.29E-04
Beryllium	2.9E-05			1.18E-05		
Cadmium	6.1E-03			3.34E-03		
Chromium	5.0E-02	2.52E+01	1.97E-03	2.73E-02	2.52E+01	1.08E-03
Copper	2.0E+00	2.10E+00	9.55E-01	4.07E+00	2.10E+00	1.94E+00
Lead	3.6E-01	7.50E+01	4.81E-03	5.71E-01	7.50E+01	7.61E-03
Manganese	2.0E+00			3.89E+00		
Mercury	1.1E-01	2.20E+00	5.13E-02	2.29E-01	2.20E+00	1.04E-01
Nickel	3.1E-01	6.08E+01	5.18E-03	5.97E-01	6.08E+01	9.82E-03
Zinc	1.5E+01	1.29E+03	1.17E-02	2.94E+01	1.29E+03	2.27E-02
SUMMARY HAZARD INDEX			1.0E+00			2.1E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Average Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Florida water rat			Raccoon		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.8E-04	2.73E+05	2.87E-09	6.0E-04	2.73E+05	2.21E-09
Chloroform	3.9E-04	2.60E+02	1.51E-06	3.0E-04	2.60E+02	1.16E-06
Di-n-butylphthalate	1.8E-04	1.25E+02	1.48E-06	4.2E-04	1.25E+02	3.39E-06
4,4-DDE	1.6E-04	2.00E-02	7.89E-03	1.2E-03	3.54E+03	3.39E-07
Aroclor-1260	4.2E-03	6.40E+00	6.56E-04	3.2E-02	7.50E-03	4.26E+00
Endosulfan II	2.0E-07	2.60E-01	7.55E-07	4.5E-07	2.60E-01	1.73E-06
Endrin aldehyde	5.1E-07	1.00E-01	5.07E-06	1.2E-06	1.00E-01	1.16E-05
alpha-Chlordane	1.0E-04	3.04E+00	3.28E-05	7.5E-04	3.04E+00	2.47E-04
gamma-Chlordane	2.8E-05	3.04E+00	9.11E-06	2.1E-04	3.04E+00	6.91E-05
Aluminum	1.8E+00	1.00E+02	1.79E-02	1.3E+01	1.00E+02	1.35E-01
Arsenic	1.3E-02	1.40E+01	9.00E-04	2.9E-02	1.40E+01	2.06E-03
Beryllium	2.9E-05			2.2E-05		
Cadmium	1.5E-03	2.15E+01	7.08E-05	3.5E-03	2.15E+01	1.62E-04
Chromium	1.2E-02	1.40E+03	8.88E-06	2.9E-02	1.40E+03	2.04E-05
Copper	1.5E-01	1.00E+02	1.52E-03	1.2E+00	1.00E+02	1.15E-02
Lead	4.7E-02	2.50E+00	1.88E-02	2.1E-01	2.50E+00	8.31E-02
Manganese	1.6E-01	1.40E+02	1.12E-03	1.1E+00	1.40E+02	8.03E-03
Mercury	8.5E-03	5.00E-01	1.71E-02	6.5E-02	1.00E-01	6.49E-01
Nickel	3.0E-02	5.00E+01	5.95E-04	1.8E-01	5.00E+01	3.62E-03
Zinc	1.3E+00	2.00E+02	6.46E-03	8.7E+00	2.00E+02	4.34E-02
SUMMARY HAZARD INDEX			7.3E-02			5.2E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-1
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Average Exposure Concentrations of ECPCs in Surface Waters and Sediments at Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	*Kingfisher*			*Great blue heron*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	7.7E-04			3.2E-04		
Chloroform	3.9E-04			1.6E-04		
Di-n-butylphthalate	7.4E-04			4.1E-04		
4,4-DDE	2.1E-03	5.80E-01	3.60E-03	4.2E-03	5.80E-01	7.30E-03
Aroclor-1260	5.6E-02	9.00E-01	6.18E-02	1.1E-01	9.00E+00	1.25E-02
Endosulfan II	7.8E-07			4.3E-07		
Endrin aldehyde	2.0E-06			1.1E-06		
alpha-Chlordane	1.3E-03	3.10E-02	4.22E-02	2.6E-03	3.10E-02	8.54E-02
gamma-Chlordane	3.7E-04	3.10E-02	1.18E-02	7.4E-04	3.10E-02	2.39E-02
Aluminum	2.3E+01			4.8E+01		
Arsenic	5.0E-02			2.8E-02		
Beryllium	2.9E-05			1.2E-05		
Cadmium	6.1E-03	1.00E+01	6.08E-04	3.3E-03	1.00E+01	3.34E-04
Chromium	5.0E-02	2.00E+02	2.48E-04	2.7E-02	2.00E+02	1.37E-04
Copper	2.0E+00	2.90E+01	6.92E-02	4.1E+00	2.90E+01	1.40E-01
Lead	3.6E-01	6.25E+00	5.78E-02	5.7E-01	6.25E+00	9.14E-02
Manganese	2.0E+00			3.9E+00		
Mercury	1.1E-01	6.40E-02	1.76E+00	2.3E-01	6.40E-02	3.58E+00
Nickel	3.1E-01			6.0E-01		
Zinc	1.5E+01			2.9E+01		
SUMMARY HAZARD INDEX			2.0E+00			3.9E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

APPENDIX D-2

SURFACE WATER/SEDIMENT SPREADSHEETS FOR ROWELL CREEK UPSTREAM OF LAKE FRETWELL

Appendix D-2

Estimation of ECPC Exposure Concentrations for Representative Wildlife Species at Rowell Creek Upstream of Lake Fretwell
Maximum Surface Water and Sediment Concentrations
Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

EXPOSURE CONCENTRATION DATA			ESTIMATED TISSUE LEVELS IN PRIMARY FOOD ITEMS	
ECPC	MAXIMUM SEDIMENT CONCENTRATION [a] (mg/kg)	MAX. SURFACE WATER CONCENTRATION [b] [mg/l]	Aquatic BCF	Aquatic Organism Tissue Concent. [c] (mg/kg)
Acetone		0.012		0.0E+00
Methylene chloride		0.001		0.0E+00
Di-n-butylphthalate	0.185			0.0E+00
4,4-DDE	0.0002			3.0E-02
Aroclor-1260	0.0066			2.5E-01
Dieldrin	0.0015			0.0E+00
alpha-Chlordane	0.00019			3.4E-03
Cadmium		0.00026		0.0E+00
Vanadium		0.003		0.0E+00

[a] From Table 7-4.
[b] From Table 7-2.
[c] Aquatic organism tissue concentrations for pesticides, PCBs, and metals based on the maximum detected concentration in fish tissue from Rowell Creek upstream of Lake Fretwell. The fish data are presented in Section 5.5.
ECPC = Ecological Chemical of Potential Concern

Appendix D-2
Exposure Parameters and Assumptions for Representative Wildlife Species at Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

Representative Wildlife Species		Percent Prey in Diet [a] Aquatic Organisms	Percent Prey in Diet [a] Plants	Sediment	Home Range [a] (acres)	ED [b]	Site Foraging Frequency [c]	Food Ingestion Rate [a] (kg/day)	Water Ingestion Rate [a] (l/day)	Body Weight [a] (kg)
Florida water rat	(Small Omniv. Mammal)	8%	90%	2%	0.42	1.0	1.00E+00	0.027	0.037	0.33
Kingfisher	(Piscivorous bird)	93%	0%	7%	35	1.0	1.00E+00	0.014	0.0165	0.15
Great blue heron	(Piscivorous bird)	98%	0%	2%	1.5	1.0	1.00E+00	0.401	0.10	2.23
Raccoon	(Piscivorous Mammal)	93%	0%	7%	385	1.0	1.00E+00	0.214	0.34	3.99

NOTES:
[a] From 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 and multiplying by exposure duration (cannot exceed 1.0)).

Appendix D-2
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	*Florida water rat*			*Raccoon*		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	1.3E-03	6.00E+02	2.24E-06	1.0E-03	6.00E+02	1.72E-06
Methylene chloride	1.1E-04	3.20E+02	3.50E-07	8.6E-05	3.20E+02	2.69E-07
Di-n-butylphthalate	3.0E-04	1.30E+03	2.32E-07	6.9E-04	1.30E+03	5.33E-07
4,4-DDE	2.0E-04	1.40E+02	1.40E-06	1.5E-03	1.20E+01	1.25E-04
Aroclor-1260	1.6E-03	1.00E+02	1.65E-05	1.2E-02	1.50E+02	8.33E-05
Dieldrin	2.5E-06	7.60E+00	3.23E-07	5.6E-06	5.00E+00	1.13E-06
alpha-Chlordane	2.3E-05	4.00E+01	5.64E-07	1.7E-04	4.00E+01	4.26E-06
Cadmium	2.9E-05	3.00E+01	9.72E-07	2.2E-05	3.00E+01	7.47E-07
Vanadium	3.4E-04			2.6E-04		
SUMMARY HAZARD INDEX			2.3E-05			2.2E-04

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-2
Hazard Quotients and Indices for Potential Lethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Kingfisher			Great blue heron		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	1.3E-03			5.43E-04		
Methylene chloride	1.1E-04			4.53E-05		
Di-n-butylphthalate	1.2E-03			6.65E-04		
4,4-DDE	2.6E-03	4.48E+02	5.82E-06	5.29E-03	4.48E+02	1.18E-05
Aroclor-1260	2.2E-02	1.60E+01	1.36E-03	4.41E-02	1.60E+01	2.75E-03
Dieldrin	9.8E-06	6.00E-01	1.63E-05	5.39E-06	6.00E-01	8.99E-06
alpha-Chlordane	3.0E-04	4.80E+00	6.17E-05	6.00E-04	4.80E+00	
Cadmium	2.9E-05			1.18E-05		
Vanadium	3.3E-04	1.92E+01	1.72E-05	1.36E-04	1.92E+01	7.08E-06
SUMMARY HAZARD INDEX			1.5E-03			2.8E-03

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = 1/5 of the lowest reported LD50 or lowest reported adverse effect level (LOAEL) for mortality from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV)

Appendix D-2
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Florida water rat			Raccoon		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	1.3E-03	2.73E+05	4.93E-09	1.0E-03	2.73E+05	3.79E-09
Methylene chloride	1.1E-04			8.6E-05		
Di-n-butylphthalate	3.0E-04	1.25E+02	2.42E-06	6.9E-04	1.25E+02	5.56E-06
4,4-DDE	2.0E-04	2.00E-02	9.83E-03	1.5E-03	3.54E+03	4.23E-07
Aroclor-1260	1.6E-03	6.40E+00	2.57E-04	1.2E-02	7.50E-03	1.67E+00
Dieldrin	2.5E-06	1.40E-02	1.75E-04	5.6E-06	2.19E+00	2.57E-06
alpha-Chlordane	2.3E-05	3.04E+00	7.42E-06	1.7E-04	3.04E+00	5.60E-05
Cadmium	2.9E-05	2.15E+01	1.36E-06	2.2E-05	2.15E+01	1.04E-06
Vanadium	3.4E-04	8.40E+00	4.00E-05	2.6E-04	8.40E+00	3.08E-05
SUMMARY HAZARD INDEX			1.0E-02			1.7E+00

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV).

Appendix D-2
Hazard Quotients and Indices for Potential Sublethal Effects for Representative Wildlife Species Associated with Maximum Exposure Concentrations of ECPCs in Surface Waters and Sediments at Rowell Creek Upstream of Lake Fretwell

Basewide Ecological Assessment Report
NAS Cecil Field, Jacksonville, Florida

ANALYTE	Kingfisher			Great blue heron		
	PDE	RTV	HQ	PDE	RTV	HQ
Acetone	1.3E-03			5.4E-04		
Methylene chloride	1.1E-04			4.5E-05		
Di-n-butylphthalate	1.2E-03			6.7E-04		
4,4-DDE	2.6E-03	5.80E-01	4.49E-03	5.3E-03	5.80E-01	9.12E-03
Aroclor-1260	2.2E-02	9.00E-01	2.42E-02	4.4E-02	9.00E+00	4.90E-03
Dieldrin	9.8E-06			5.4E-06		
alpha-Chlordane	3.0E-04	3.10E-02	9.56E-03	6.0E-04	3.10E-02	1.93E-02
Cadmium	2.9E-05	1.00E+01	2.86E-06	1.2E-05	1.00E+01	1.18E-06
Vanadium	3.3E-04	1.10E+01	3.00E-05	1.4E-04	1.10E+01	1.24E-05
SUMMARY HAZARD INDEX			3.8E-02			3.3E-02

PDE = Potential Dietary Exposure (mg/kgBW/day) calculated according to equations in Table 3-2.
RTV = Reference Toxicity Value (mg/kgBW/day) = Lowest reported adverse effect level (LOAEL) for reproduction or growth from Appendix D-4 for closest related species.
HQ = Hazard Quotient (calculated by dividing PDE by RTV).

APPENDIX D-3

SUMMARY OF RTVs

Appendix D-3
Summary of Reference Ingestion Toxicity Values for Wildlife Receptors
(mg/kg/BW/day)

Basewide Ecological Assessment Report
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical Name	Florida Water Rat		Raccoon		Kingfisher		Great Blue Heron	
	Lethal [a]	Sublethal [b]	Lethal	Sublethal	Lethal	Sublethal	Lethal	Sublethal
Acetone	600	273000	600	273000				
Bromodichloromethane	94	50	94	50				
Chloroform	164	260	164	260				
Methylene chloride	320		320					
Di-n-butylphthalate	1303	125	1303	125				
4,4-DDE	140	.02 [c]	12 [d]	3540 [e]	448 [f]	0.58	448 [f]	0.58
Aroclor-1260	100	6.4	150	0.0075	16	0.9	16	9.0
Chlordane	40	3.04	40	3.04	4.8	0.031	4.8	0.031
Dieldrin	7.6	0.014	5.0	2.19	0.6		0.6	
Endosulfan II	5	0.26	5	0.26	6.2		6.2	
Endrin aldehyde	0.60	0.1	0.60	0.1	0.36		0.36	
Aluminum	740	100	740	100				
Arsenic	153	14	29	14	64.6		64.6	
Beryllium	2		2					
Cadmium	30	21.5	30	21.5		10		10
Chromium	40	1400	40	1400	25.2	200	25.2	200
Copper	188	100	188	100	2.1	29	2.1	29
Lead	60	2.5	60	2.5	75	6.25	75	6.25
Manganese	45	140	80	140				
Mercury	3.6	0.5	0.1	0.01	2.2	0.064	2.2	0.064
Nickel	13.4	50	13.4	50	60.8		60.8	
Silver	181.2	18.1	181.2	18.1				
Vanadium		8.4		8.4	19.2	11	19.2	11
Zinc	390	200	390	200	1292		1292	

[a] 1/5th of the LD50 value or lowest reported dose associated with mortality for the closest related species.
[b] The lowest reported dose associated with adverse effects to growth or reproduction for the closest related species.
[c] The 4,4'-DDT sublethal LOAEL rat value was used as a surrogate.
[d] One-fifth of the 4,4'-DDT lethal LD50 dog value was used as a surrogate.
[e] The 4,4'-DDT sublethal LOAEL dog value was used as a surrogate.
[f] One-fifth of the 4,4'-DDT lethal LD50 mallard value was used as a surrogate.

APPENDIX D-4

INGESTION TOXICITY INFORMATION

Appendix D-4
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Volatile Organic Compounds							
Acetone	Rat	Oral	NR	LD_{50}	5,800		RTECS, 1994
	Rat	Single Oral Dose		LD_{50}	9,750		Sax, 1984
	Rat	Oral	NR	LOAEL for reproductive effects		273,000	RTECS, 1994
	Mouse	Oral	NR	LD_{50}	3,000		RTECS, 1994
	Rabbit	Oral	NR	LD_{50}	5,340		RTECS, 1994
Bromodichloromethane	Rat	Oral LD_{50}	1 dose	LD_{50}	470		ATSDR, 1988a
	Rat	Oral LD_{50}	1 dose	LD_{50}	943		ATSDR, 1988a
	Mouse	Oral LD_{50}	1 dose	LD_{50}	675		ATSDR, 1988a
	Rat	Oral (acute)	6-10 days of gestation	LOAEL for phytotoxicity		50	ATSDR, 1988a
Chloroform	Dog (Beagle)	Oral (chronic)	7.5 years	Liver cyst formation		12.9	IRIS, 1991
	Rat	Oral	NR	Mortality	908		RTECS, 1994
	Rat	Oral	NR	Reproductive effects		1,260	RTECS, 1994
	Rat	Oral	NR	Reproductive effects		4,000	RTECS, 1994
	Mouse	Oral	NR	Reproductive effects		2,177	RTECS, 1994
	Mouse	Oral	NR	Reproductive effects		2,115	RTECS, 1994
	Guinea pig	Oral	NR	Mortality	820		RTECS, 1994
	Rabbit	Oral	NR	Reproductive effects		260	RTECS, 1994
Methylene chloride	Rat	Oral (chronic)	2 years	LOAEL for liver toxicity		52.6	IRIS, 1991
	Rat	Oral LD_{50}	NR	Mortality	1,600		RTECS, 1994
	Dog	Oral LD_{50}	NR	Mortality	3,000		RTECS, 1994
	Rat	Oral (subchronic)	3 months	NOAEL for mortality, blood chemistry, histopathology		125	USEPA, 1984a
	Rabbit	Single oral dose	1 dose	LD_{50}	1,900		Sax, 1984
	Mouse	Oral	NR	LOAEL for reproductive effects		15,000	RTECS, 1994

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Semivolatile Organic Compounds							
Di-*n*-butylphthalate	Rat	Oral (subchronic)	48 days	LOAEL for reproductive effects		125	ATSDR, 1989
	Rat	Oral (chronic)	1 year	LOAEL for mortality	600		IRIS, 1991
	Mouse	Single oral dose	1 dose	LD_{50}	6,513		Sax, 1984
Pesticides and PCBs							
4,4'-DDE	Rat	Oral	NR	LD_{50}	800		RTECS, 1994
4,4'-DDE	Mouse	Oral	NR	LD_{50}	700		RTECS, 1994
	Hamster	Oral	NR	LD_{50}	>5,000		RTECS, 1994
	Mallard	Oral	NR	Eggshell thinning		2.91	USEPA, 1993a
	Mallard	Oral	2 years	Embryo mortality, cracked eggs		0.58	USEPA, 1993a
	Kestrel	Oral	NR	Eggshell thinning		0.39	USEPA, 1993a
Aroclor-1260	Rat	Oral dose	NR	LD_{50}	1,315		RTECS, 1993
	Rat	Oral dose	NR	LD_{50}	500		Eisler, 1986
	Rat	Oral dose	NR	LD_{50}	1,300		Eisler, 1986
	Rat	Oral	NR	LOAEL for reproductive effects		1,674	RTECS, 1993
	Rat	Oral (chronic)	2 generations	LOAEL for reduced litter size		7.6	USEPA, 1985b
	Rat	Oral (subchronic)	9 weeks	LOAEL for fetal mortality; maternal toxicity		6.4	ATSDR, 1987a
	Mouse	Oral	NR	LOAEL for reproductive effects		74	RTECS, 1993
	Mink	Oral dose	NR	LD_{50}	4,000		Eisler, 1986
	Mink	Oral dose	NR	LD_{50}	3,000		Eisler, 1986
	Mink	Oral dose	NR	LD_{50}	750		Eisler, 1986

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
	Mink	Oral (subchronic)	4 months	LOAEL for impaired reproduction		0.0075	Newell et al., 1987
	Dog (beagle)	Oral (chronic)	2 years	LOAEL (not described)		0.37	USEPA, 1976
	Chicken	Oral (chronic)	NR	LOAEL for embryonic mortality		0.9	USEPA, 1976
	American kestrel	Oral (chronic)	69 days	LOAEL for reduced sperm concentration		9	Eisler, 1986
	Bobwhite	Oral dose	8 days	LD_{50}	80		Eisler, 1986
	Mallard	Oral dose	8 days	LD_{50}	111		Eisler, 1986
Chlordane	Rat	Oral	NR	LD_{50}	283		RTECS, 1994
	Rat	Single oral dose		LD_{50}	430		Allen et al., 1979
	Rat	Single oral dose		LD_{50}	335		Allen et al., 1979
	Rat	Oral	NR	LD_{50}	200		RTECS, 1994
	Mouse	Oral	NR	LD_{50}	145		RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		3.36	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		152	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		7	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		3.04	RTECS, 1994
	Rabbit	Single oral dose		LD_{50}	300		Allen et al., 1979
	Rabbit	Single oral dose		LD_{50}	100		RTECS, 1994
	Hamster	Oral	NR	LD_{50}	1,720		RTECS, 1994
	Dog	Single oral dose		LD_{50}	200		Allen et al., 1979
	Domestic mammal	Oral	NR	LD_{50}	50		RTECS, 1994
	Goat	Single oral dose		LD_{50}	180		Allen et al., 1979
	Chicken	Oral	NR	LD_{50}	220		RTECS, 1994
	Duck	Oral	NR	LD_{50}	1,200		RTECS, 1994

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
	Mallard	Oral	5 days	LD_{50}	62*		Hill et al., 1975
	Japanese quail	Oral	5 days	LD_{50}	35*		Hill et al., 1975
	Bobwhite	Oral	5 days	LD_{50}	29*		Hill et al., 1975
	Pheasant	Single oral dose	NR	LD_{50}	24		USFWS, 1984
	Young chicken	Chronic	4 week	NOAEL for egg hatchability and growth		0.031	Eisler, 1990 *
Dieldrin	Mouse	Single oral dose	1 dose	LD_{50}	38		Allen et al., 1979
	Mouse	Oral	NR	LD_{50}	38		RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		30.6	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		15	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		2.25	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		12.5	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		4.5	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		6.25	RTECS, 1994
	Rat	Oral	NR	LOAEL for reproductive effects		0.014	RTECS, 1994
	Rat	Oral	NR	LOAEL for reproductive effects		0.336	RTECS, 1994
	Rat	Single oral dose		LD_{50}	46		Allen et al., 1979
	Rat	Oral	NR	LD_{50}	38.3		RTECS, 1994
	Dog	Oral	NR	LOAEL for reproductive effects		2.19	RTECS, 1994
	Hamster	Oral	NR	LOAEL for reproductive effects		30	RTECS, 1994
	Guinea pig	Single oral dose		LD_{50}	25		Allen et al., 1979
	Guinea pig	Oral	NR	LD_{50}	49		RTECS, 1994
	Rabbit	Single oral dose		LD_{50}	45		Allen et al., 1979
	Rabbit	Oral	NR	LD_{50}	45		RTECS, 1994
	Goat	Single oral dose		LD_{50}	100		Allen et al., 1979

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Dieldrin (cont'd)	Sheep	Single oral dose		LD_{50}	50		Allen et al., 1979
	Cattle	Single oral dose		LD_{50}	60		Allen et al., 1979
	Mule deer	Single oral dose		LD_{50}	75		Allen et al., 1979
	Cat	Single oral dose		LD_{50}	300		Allen et al., 1979
	Cat	Oral	NR	LD_{50}	500		RTECS, 1994
	Dog	Single oral dose		LD_{50}	65		Allen et al., 1979
	Dog	Oral	NR	LD_{50}	65		RTECS, 1994
	Hamster	Oral	NR	LD_{50}	60		RTECS, 1994
	Pig	Oral	NR	LD_{50}	38		RTECS, 1994
	Monkey	Oral	NR	LD_{50}	3		RTECS, 1994
	House sparrow	Single oral dose		LD_{50}	48		USFWS, 1984
	Chicken	Single oral dose		LD_{50}	20		Allen et al., 1979
	Chicken	Oral	NR	LD_{50}	20		RTECS, 1994
	Rock dove	Single oral dose		LD_{50}	27		USFWS, 1984
	Gray partridge	Single oral dose		LD_{50}	9		USFWS, 1984
	Chukar	Single oral dose		LD_{50}	25		USFWS, 1984
	Japanese quail	Oral	5 days	LD_{50}	6*		Hill et al., 1975
	Japanese quail	Single oral dose		LD_{50}	70		USFWS, 1984
	California quail	Single oral dose		LD_{50}	9		USFWS, 1984
	Quail	Oral	NR	LD_{50}	10.78		RTECS, 1994
	Bobwhite	Oral	5 days	LD_{50}	3*		Hill et al., 1975
	Pheasant	Single oral dose		LD_{50}	79		USFWS, 1984
	Mallard	Oral	5 days	LD_{50}	12*		Hill et al., 1975
	Mallard	Oral	5 days	LD_{50}	11*		Hill et al., 1975
	Mallard	Oral	NR	LD_{50}	381		RTECS, 1994

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Dieldrin (cont'd)	Mallard	Single oral dose		LD_{50}	381		USFWS, 1984
Endosulfan II	Mouse	Oral (chronic)	78 weeks	Mortality		0.9	ATSDR, 1991e
	Mouse	Oral (chronic)	78 weeks	Ovarian cyst development		0.26	ATSDR, 1991e
	Rat	Single oral dose	1 dose	Mortality	24		ATSDR, 1991e
	Rat	Oral (chronic)	2 years	Reduced testes weight		10	USEPA, 1980b
	Rat	Oral (chronic)	2 years	LOAEL for reduced testes weight		10	USEPA, 1980b
	Rat	Oral (chronic)	2 generations	LOAEL for kidney toxicity		0.15	IRIS, 1991
	Mallard	Single oral dose	1 dose	Mortality	33		USFWS, 1984
	Mallard	Single oral dose	1 dose	Mortality	31.2		USFWS, 1984
	Pheasant	Single oral dose	1 dose	Mortality	80		USFWS, 1984
Endrin (surrogate for endrin aldehyde)	Mouse	Oral (chronic)	80 weeks	LOAEL for mortality	0.53		ATSDR, 1989
	Dog	Oral (chronic)	19 months	LOAEL for decreased weight gain		0.1	USEPA, 1985b
	Rat	Single oral dose	1 dose	LD_{50}	3		Sax, 1984
	Bird	Single oral dose	1 dose	LD_{50}	1.8		Sax, 1984
Inorganic Analytes							
Aluminum	Mouse	Oral (chronic)	2-3 generations	LOAEL for reduced body weight gain of newborns		425	NIOSH, 1985
	Rat	Oral (subchronic)	1-5 days	LOAEL for reduced growth		100	Bernuzzi, et al., 1989
	Rat	Oral LD_{50}	NR	Mortality	3,700		Sax, 1984
Arsenic	Rat	Oral	NR	LD_{50}	763		RTECS, 1994
	Mouse	Oral	NR	LD_{50}	145		RTECS, 1994
	Hamster	Single oral dose	Gestation	7 - 36% fetal mortality		14	ATSDR, 1992a
	Pheasant	Single oral dose		LD_{50}	386		Eisler, 1988a

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
	Mallard	Single oral dose		LD_{50}	323		Eisler, 1988a
Beryllium	Rat	Single oral dose		LD_{50}	10		USEPA, 1985a
Cadmium	Rat	Oral	NR	LOAEL for reproductive effects		155	RTECS, 1993
	Rat	Oral	NR	LOAEL for reproductive effects		220	RTECS, 1993
	Rat	Oral	NR	LOAEL for reproductive effects		21.5	RTECS. 1993
	Rat	Oral	NR	LOAEL for reproductive effects		23	RTECS, 1993
	Rat	Single oral dose		LD_{50}	250		Eisler, 1985
	Rat	Single oral dose	NR	LD_{50}	225		RTECS, 1993
	Mouse	Single oral dose		LD_{50}	890		RTECS, 1993
	Mouse	Oral	NR	LOAEL for reproductive effects		448	RTECS, 1993
	Mouse	Oral	NR	LOAEL for reproductive effects		1,700	RTECS, 1993
	Guinea pig	Single oral dose		LD_{50}	150		Eisler, 1985
	Mallard	Oral (subchronic)	90 days	Egg production suppressed		10	Eisler, 1985
	Mallard	Oral (subchronic)	29 days	NOAEL for survivorship		2.1	Demayo et al., 1982
Chromium	Rat	Oral LD_{50}		Mortality	200		ATSDR, 1991
	Rat	Oral (subchronic)	90 days	NOAEL for histopathologic and reproductive effects		1,400	Invankovic and Preussman, 1975
	Japanese quail	Oral LD_{50}	5 days	Mortality	126		Hill and Camardese, 1986
	Black duck	Oral (subchronic)	5 months	NOAEL for reproductive effects		200	Outridge and Scheu-hammer, 1993
Copper	Rat	Single oral dose		LOAEL for reproductive effects		152	NIOSH, 1985 and RTECS, 1994
	Rat	Oral LD_{50}	NR	Mortality	940		Sax, 1984
	Mouse	Oral	30 days	Decreased litter sizes with teratogenic effects		100	Lecyk, 1980
	Mallard	Oral	NR	LOAEL		29	NRC, 1977

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
	Mallard	Oral (subchronic)	29 days	NOAEL for survivorship	2.1		Demayo et al., 1982
Lead	Guinea pig	Single oral dose		LD_{50}	300		Sax, 1984
	Rat	Oral	3 weeks	50% of progeny dead		200	
	Rat	Oral (subchronic)	12-14 days	Decreased fetal body weight		2.5	McClain and Becker, 1972
	Rat	Oral	NR	LOAEL for reproductive effects		790	RTECS, 1994
	Rat	Oral	NR	LOAEL for reproductive effects		1,140	RTECS, 1994
	Rat	Oral	NR	LOAEL for reproductive effects		520	RTECS, 1994
	Rat	Oral	NR	LOAEL for reproductive effects		1,100	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		1,120	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		6,300	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		300	RTECS, 1994
	Mouse	Oral	NR	LOAEL for reproductive effects		4,800	RTECS, 1994
	Domestic animal	Oral	NR	LOAEL for reproductive effects		662	RTECS, 1994
	Japanese quail	Oral LD_{50}	5 days	Mortality	24,752		Hill and Camerdese, 1986
	Rock dove	Oral (chronic)	NR	Kidney pathology; learning deficiencies		6.25	Anders er al., 1982 and Dietz et al., 1979
	Rock dove	Oral LD_{50}	NR	Mortality	375		Kendall and Scanlon, 1985
Lead acetate	Chicken	Oral	4 weeks	Growth rate suppressed; no mortality or hematological effects		169	Eisler, 1988b
Metallic lead powder	American kestrel nestlings	Oral	10 days	Reduced growth and brain weight; abnormal development		125	Eisler, 1988b
Tetraethyl lead	Rat	Single oral dose		LD_{50}	12		Eisler, 1988b
	Cattle	Oral	105 days	LOAEL for mortality	6		Eisler, 1988b
	Horse	Oral	NR	LOAEL for mortality	2.4		Eisler, 1988b

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Triethyl lead chloride	Starling	Oral	11 days	Reduced food consumption; no mortality		2.8	Eisler, 1988b
Manganese	Mouse	Oral (subchronic)	6 months	NOAEL for mortality		2,300	ATSDR, 1990e
	Mouse	Oral (subchronic)	90 days	LOAEL for delayed growth of testes		140	ATSDR, 1990e
	Mouse	Oral (chronic)	103 weeks	NOAEL for mortality		810	ATSDR, 1990e
	Rat	Single oral dose	1 dose	LD_{50}	410		ATSDR, 1990e
	Rat	Oral (acute)	20 days	LD_{50}	225		ATSDR, 1990e
	Rat	Oral (subchronic)	10 weeks	NOAEL for hepatic effects		12	ATSDR, 1990e
	Rat	Oral (subchronic)	20 days	NOAEL for decreased litter weight during gestation		620	ATSDR, 1990e
	Rat	Oral (subchronic)	103 weeks	LOAEL for mortality	930		ATSDR, 1990e
	Guinea pig	Single oral dose	1 dose	LD_{50}	400		USEPA, 1984d
	Monkey	Oral (chronic)	18 months	LOAEL for weakness, rigidity		25	ATSDR, 1990e
	Rodents/ livestock	Oral (subchronic)	10 days - 2 months	LOAEL for decreased growth rate		250	Cunningham et al., 1966
	Mouse	Oral (subchronic)	180 days	NOAEL for mortality		2,300	Gianutsos and Murray, 1982
Mercury	Mouse	Single oral dose		LD_{50}	22		NIOSH, 1985
	Mouse	Oral	50 days	Embryotoxicity		0.9	Suzuki, 1979
	Mouse	Oral	Day 0-18 (gest)	Embryolethality and teratogenicity		0.7	Suzuki, 1979
	Rat	Single oral dose		LD_{50}	18		NIOSH, 1985
	Rat	Oral	Day 6-14 (gest)	Retarded fetus growth		4	Suzuki, 1979
	Chicken	Single oral dose		LD_{50}	20		Fimreite, 1979
	Bantam chicken	Single oral dose		LD_{50}	190		Fimreite, 1979
	Japanese quail	Oral	NR	LOAEL for reproductive effects		5	Fimreite, 1979
	Bobwhite quail	Oral	5 days	LD_{50}	523		Hill et. al., 1975

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
Inorganic mercury	Mouse	Oral	18 days	LOAEL for mortality	6.3		Suzuki, 1979
	Mouse	Oral	38 days	LOAEL for mortality	5		Suzuki, 1979
	Mouse	Oral	Day 6-17 (gest)	Stillbirths and neonatal death		4	Suzuki, 1979
	Japanese quail	Diet	3 weeks	Depressed gonad weights		0.81*	Eisler, 1987b
	Japanese quail	NR	14d post treatment	LD_{50}	31.1		Eisler, 1987b
	Coturnix	NR	14d post treatment	LD_{50}	26 to 54		Eisler, 1987b
Ethylmercury	Rock dove	Single oral dose		LD_{50}	22.8		Eisler, 1987b
	Prairie chicken	Single oral dose		LD_{50}	11.5		Eisler, 1987b
	Chuckar	Single oral dose		LD_{50}	26.9		Eisler, 1987b
	Gray partridge	Single oral dose		LD_{50}	17.6		Eisler, 1987b
Methylmercury	Mink	Diet	2 months	Fatal to 100%	0.048*		Eisler, 1987b
	House sparrow	NR	14d post treatment	LD_{50}	12.6 to 37.8		Eisler, 1987b
	Coturnix	NR	14d post treatment	LD_{50}	11 to 27		Eisler, 1987b
	Fulvous whistling duck	NR	14d post treatment	LD_{50}	37.8		Eisler, 1987b
	Black duck	Oral	28 weeks	Reproduction inhibited		0.22*	Eisler, 1987b
	Northern bob-white	NR	14d post treatment	LD_{50}	23.8		Eisler, 1987b
Organomercury	Mule deer	Single oral dose		LD_{50}	17.9		Eisler, 1987b
	Japanese quail	NR	14d post treatment	LD_{50}	14.4 to 33.7		Eisler, 1987b
	Ring-necked pheasant	NR	14d post treatment	LD_{50}	11.5 to 26.8		Eisler, 1987b
	River otter	Diet	NR	Fatal	0.14*		Eisler, 1987b

See notes at end of table.

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	
	Rat	Oral	NR	Reduced fertility		0.5	Eisler, 1987b
	Pig	Oral	Pregnancy	High incidence of stillbirths		0.5	Eisler, 1987b
	Monkey	Oral	Day 20-30 (gest)	Maternally toxic and abortient		0.5	Eisler, 1987b
	Cat	Oral	Day 10-58 (gest)	Increased incidence of anomalous fetuses		0.25	Eisler, 1987b
	Dog	Oral	Pregnancy	High incidence of stillbirths		0.1 to 0.25	Eisler, 1987b
	Mallard	Oral	NR	Reproduction, behavior		0.064	USEPA, 1993
	Gray pheasant	Oral	30 days	Reduced reproductive ability		0.64	Eisler, 1987b
Nickel	Rat	Single oral dose	1 dose	LD_{50}	67		ATSDR, 1987d
	Rat	Oral	NR	LOAEL for reproductive effects		158	RTECS, 1994
	Rat	Oral	2 years	Decreased body weight gain		50	ATSDR, 1987d
	Japanese quail	Oral (acute)	5 days	Mortality	304		Hill and Camardese, 1986
Silver	Mouse	Intraperitoneal (acute)		Mortality	34		NIOSH, 1985
	Mouse	Oral (chronic)	125 days	LOAEL for hypoactivity		18.1	ATSDR, 1990f
	Rat	Oral	2 week	NOAEL for mortality		181.2	ATSDR, 1990f
	Rat	Oral (chronic)	37 weeks	LOAEL for lack of weight gain		222.2	ATSDR, 1990f
Vanadium	Rat	Oral (subchronic)	2 months	LOAEL for hypertension		15	Susic and Kentera, 1986
	Rat	Oral (subchronic)	35 days	NOAEL for developmental effects		8.4	Domingo et al., 1986
	Japanese quail	Oral dose	5 days	LD_{50}	96		Hill and Camardese, 1986
	Chicken	Oral (subchronic)	6 weeks	LOAEL for decreased egg-laying		11	Berg et al., 1963
Zinc	Rat	Single oral dose		LD_{50}	2,510		Sax, 1984
	Rat	Oral	Gestation	Fetal resorptions in 4-20% of population		200	Schlicker and Cox, 1968
	Ferret	Oral	3-13 days	LOAEL for mortality	390		Straube et. al., 1980
Zinc phosphide	Mallard	Diet	5 days	LC50	6,458*		Hill et. al., 1975

Appendix D-4 (Continued)
Ingestion Toxicity Information for Wildlife Receptors

Basewide Ecological Risk Assessment
Naval Air Station Cecil Field
Jacksonville, Florida

Chemical	Test Species	Test Type	Duration	Effect	Result (mg/kg BW/day)		Reference
					Lethal	Sublethal	

a) Converted to dose per kilogram body weight by multiplying by food ingestion rate and dividing by body weight.

Notes: mg/kg BW/day = milligrams per kilogram body weight per day.
NR = not reported.
LD_{50} = Dose resulting in 50 percent mortality in test population.
RTECS = Registry of Toxic Effects of Chemical Substances.
LOAEL = lowest observed adverse effect level
NOAEL = no observed adverse effect level.
ATSDR = Agency for Toxic Substance and Disease Registry.
IRIS = Integrated Risk Information System.
NIOSH = National Institute for Occupational Safety and Health.
DDD = dichlorodiphenyldichloroethane.
DDE = dichlorodiphenyldichloroethene.
DDT = dichlorodiphenyltrichloroethane.
USEPA = U.S. Environmental Protection Agency.
% = percent.
14d = 14 days
USFWS = U.S. Fish and Wildlife Service.

Appendix D-4 Reference List

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APPENDIX D-5

TOXICITY ANALYSES OF SEDIMENT SAMPLES FROM NAS CECIL FIELD, JACKSONVILLE, FLORIDA, LAKE FRETWELL

FINAL REPORT

TOXICITY ANALYSIS OF SEDIMENT SAMPLES FROM NAS CECIL FIELD, JACKSONVILLE, FLORIDA LAKE FRETWELL

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EXECUTIVE SUMMARY

Whole sediment toxicity tests were conducted at Environmental Science & Engineering, Inc. (ESE) with the freshwater invertebrates, *Hyalella azteca* and *Chironomus tentans*, on samples collected from the Lake Fretwell site of NAS Cecil Field, Jacksonville, Florida. The effect criteria for the tests were survival and growth. A total of 13 sediments including a control and a reference were used in the toxicity tests.

After 14 days of exposure, survival of *Hyalella azteca* in the reference (YWCSDTOX20), was significantly different ($P \leq 0.05$) from the control sediment. Survival of *Hyalella azteca* in samples from sample stations LFSDTOX11 and LFSDTOX12 were significantly different from the reference sediment. Growth, as weight and length, of *Hyalella azteca* in the sediment from all the sample stations was not significantly different from the control and reference. Growth of *Hyalella azteca* in sediments from sample stations LFSDTOX11 and LFSDTOX12 could not be determined due to 100 percent mortality. Survival of *Chironomus tentans* exposed to sediment from sample stations LFSDTOX9, LFSDTOX13, LFSDTOX14, LFSDTOX15, and RCSDTOX18 were significantly different from the control sediment. Survival of *Chironomus tentans* exposed to sediment from sample stations LFSDTOX9 and RCSDTOX18 were significantly different from the reference sediment. Growth of *Chironomus tentans* exposed to the sediment samples was not significantly different from the control or reference sediments.

TABLE OF CONTENTS

Section	Page
EXECUTIVE SUMMARY	2
TABLE OF CONTENTS	3
1.0 INTRODUCTION	5
2.0 SAMPLE RECEIPT	5
3.0 WHOLE SEDIMENT BIOASSAY PROCEDURES	5
3.1 TEST ORGANISMS	
3.2 TEST DESIGN	
4.0 STATISTICAL ANALYSIS	8
5.0 RESULTS AND DISCUSSION	8
6.0 CONCLUSION	10
7.0 REFERENCES	10

LIST OF TABLES

		Page
Table 1	Summary of Whole Sediment Bioassays Conducted with Samples From Lake Fretwell, NAS Cecil Field, Jacksonville, Florida	11
Table 2	Water Quality Measurement Ranges of Overlying Water During a 14-Day Toxicity Test Using Whole Sediment From NAS Cecil Field, Jacksonville, Florida, with *Hyalella azteca*	12
Table 3	Water Quality Measurement Ranges of Overlying Water During a 14-Day Toxicity Test Using Whole Sediment From NAS Cecil Field, Jacksonville, Florida, with *Chironomus tentans*	13
Table 4	Survival and Growth of *Hyalella azteca* After 14 Days of Exposure to Whole Sediments From Lake Fretwell, NAS Cecil Field, Jacksonville, Florida	14
Table 5	Survival and Growth of *Chironomus tentans* After 14 Days of Exposure to Whole Sediments From Lake Fretwell, NAS Cecil Field, Jacksonville, Florida	16

LIST OF APPENDICES

Appendix A: Chain-of-custody

Appendix B: *Hyalella azteca* Sediment Test Raw Data

Appendix C: *Chironomus tentans* Sediment Test Raw Data

1.0 INTRODUCTION

Whole sediment bioassays were conducted at Environmental Science & Engineering, Inc. (ESE) on samples collected from Lake Fretwell, NAS Cecil Field, Jacksonville, Florida, to determine the potential toxicity of the test samples. Test organisms used for sediment toxicity tests were the freshwater invertebrates, *Hyalella azteca* and *Chironomus tentans*. The effect criteria for both species were survival and growth.

Sediment bioassays were conducted following ASTM E 1383-94 guidelines entitled *Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates* and ESE in-house protocols. All raw data related to this study are maintained at ESE, 14220 West Newberry Road, Gainesville, Florida.

2.0 SAMPLE RECEIPT

Test sediments, collected between April 25 and 28, 1995, were received on ice at the ESE Gainesville office between April 26 and 29, 1995. Test samples were received in quantities of ~ 10-11 kilograms each. Upon receipt, the coolers were opened and the contents checked against the chain-of-custody to ensure that all the recorded samples were present. The temperature of the coolers was then measured using the temperature blanks provided in the coolers. Any observations were recorded in the sample receipt logbook. Approximately 25 L of control sediment were collected by ESE personnel for the whole sediment bioassays. The site from which the control sediment was collected, Marineland, Florida, has proven to be uncontaminated in previous tests. Chain-of-custody and other documentation are presented in Appendix A. All sediment samples were stored in a refrigerator at 4 ± 2 °C during the testing period.

3.0 WHOLE SEDIMENT BIOASSAY PROCEDURES

3.1 TEST ORGANISMS

Whole sediment bioassays were conducted using juvenile (second or third instar) *H. azteca* and second instar *C. tentans*. *H. azteca* (2-3 mm in length) were obtained from Chesapeake Cultures

(Hayes, VA) and *C. tentans* (second instar) were obtained from Environmental Consulting & Testing (Superior, WI). The suppliers' breeding and holding conditions, such as temperature and water hardness, were similar to those of the testing conditions, therefore, organisms were held <24 hours prior to test initiation. Test organisms were acclimated to any differences in water chemistry by diluting the receiving water with test dilution water to 50 percent of receiving water.

3.2 TEST DESIGN

Initiation of the whole sediment tests was staggered due to the schedule of sample receipt. Tests with sediment samples LFSDTOX11, LFSDTOX12, LFSDTOX13, LFSDTOX14, LFSDTOX15, LFSDTOX16, LFSDTOX17, and YWCSDTOX20 (reference) were initiated on April 29, 1995, while tests with samples LFSDTOX9, LFSDTOX10, RCSDTOX18, and GCSDTOX19 were initiated on April 30, 1995. Separate controls were used for each series of tests for *C. tentans* and *H. azteca*.

Prior to use in the tests, sediment samples were individually sieved using a 1 mm Nytex screen to homogenize the samples and remove any large debris or indigenous organisms. No water was added to aid in sieving. Approximately 200 grams of test or control sediment were introduced to the test chambers and uniformly leveled. Test chambers were 2 L glass jars (23 cm height and 13 cm diameter). Approximately 400 mL of overlying reconstituted freshwater were added to each test chamber and allowed to settle overnight with aeration provided at a rate of 60 bubbles per minute (bpm). The overlying water was siphoned out the following day and 800 mL of reconstituted water was added to achieve a ratio of 1 part sediment to 4 parts overlying water. The test system was then allowed to settle for 2 hours. Water quality measurements were taken and the test organisms were indiscriminately added to the test chambers. Whole sediment tests were conducted using four replicates of twenty *H. azteca* and four replicates of fifteen *C. tentans*, for a total of 80 *H. azteca* and 60 *C. tentans* per sample.

The whole sediment tests were 14-day static renewal tests, with the *H. azteca* test being renewed twice weekly and the *C. tentans* test being renewed once weekly. During renewals, approximately 50 percent of the overlying water was siphoned through a 0.5 mm mesh sieve. Any test organisms trapped on the sieve were pipetted back into the appropriate test chamber. New dilution water was then slowly siphoned into the test chamber while diverting the flow onto the side of the test chamber to minimize resuspension of the sediments. Dilution water for *H. azteca* was hard reconstituted water with a hardness of approximately 134 mg/L as $CaCO_3$; and dilution water for *C. tentans* was moderately hard reconstituted water with a hardness of approximately 85 mg/L as $CaCO_3$. *H. azteca* were fed 0.2 mL of a rabbit chow (Alachua County Feed and Seed Store, Gainesville, FL) solution twice a week following renewal of overlying water. *C. tentans* were fed a 1:6 ratio (5 mg: 30 mg) of Tetramin (That Fish Place, Lancaster, PA) and ground cereal leaves (Sigma Chemical Company, St. Louis, MO) weekly following renewal of overlying water.

The tests were conducted in a waterbath adjusted to maintain a temperature of 20 $\pm$ 2 °C under fluorescent lighting with a daily photoperiod of 16 hours light (600 Lux) and 8 hours dark. All test chambers were aerated at approximately 60 bpm. Temperature, pH, and dissolved oxygen concentrations (DO), were measured daily. On renewal days, water quality parameters (temperature, pH, DO, and conductivity) were measured prior to and immediately following renewal of overlying water. Water quality measurements were taken with the following instruments: temperature--Fisher Scientific digital thermocouple; pH--SA 290 Orion pH meter with an Orion 91-57 triode; dissolved oxygen--YSI, Model 57 DO meter; and conductivity--YSI, Model 33 SCT conductivity meter. Instruments were calibrated daily during the test period.

The test chambers were observed daily for organism entrapment at surface of overlying water, sediment avoidance, reproductive behavior, and organism emergence. The effect criteria for the tests were mortality and growth (measured as dry weight and/or length). At test termination, the overlying water was swirled and then poured through a 0.5 mm Nytex screen to collect and

count the test organisms. If all organisms were not immediately found, the remaining sediment was poured into a 0.50 mm nytex screen sieve or a glass pan for further observation. Individual lengths of *H. azteca* were measured at test termination using a Nikon dissecting microscope equipped with a micrometer. Growth, as group dry weight, was measured for both species by placing the organisms in pre-weighed aluminum pans and drying the organisms in a Blue-M oven at 60 °C for 24 hours. After 24 hours, the weigh pans were removed from the oven and placed in a desiccator to cool. When cooled, the weight of the pans were measured on a American Scientific S/P 180 analytical balance and the group weight of the organisms was determined.

4.0 STATISTICAL ANALYSIS

All bioassay data were evaluated by a statistical comparison of mean survival or growth in the test samples with the control samples using appropriate statistical procedures. Analysis of variance followed by the Duncan's Multiple Range Test (Snedecor and Cochran, 1980) and Dunnett's t-test (EPA/600/4-89/001) were used to determine statistical significance. Data were first checked for normality and homogeneity of variance using Shapiro-Wilk's and Bartlett's tests, respectively. If either of these assumptions were not met, data was transformed using a square-root arcsine transformation and checked for normality and homogeneity of variance prior to statistical analysis. Survival and growth in sediments from sample stations LFSDTOX9, LFSDTOX11, LFSDTOX12, LFSDTOX13, LFSDTOX14, LFSDTOX15, LFSDTOX16, LFSDTOX17, and the reference, YWCSDTOX20, were statistically compared to control 1. Survival and growth in sediments from sample stations LFSDTOX9, LFSDTOX10 RCSDTOX18, and GCSDTOX19 were statistically compared to control 2.

5.0 RESULTS AND DISCUSSION

A summary of all the biological endpoint data for samples from the Lake Fretwell of NAS Cecil Field, Jacksonville, Florida, is presented in Table 1.

Test conditions, including lighting, hardness, alkalinity, conductivity, temperature, and pH levels remained at acceptable levels throughout the testing period. Exposure water quality parameters are presented in Table 2 and 3 for *H. azteca* and *C. tentans*, respectively. Survival and growth data of the whole sediment bioassays with *H. azteca* and *C.tentans*, are presented in Tables 4 and 5, respectively. Control survivals were within acceptable limits for both organisms. Control survival of *H. azteca* was 100 percent in the first test series and 88 percent in the second test series. Control survival for *C. tentans* was 85 percent in the first test series and 75 percent in the second test series. Complete laboratory raw data are provided in Appendix B and C for *H. azteca* and *C. tentans*, respectively.

Survival of *H. azteca* in the laboratory control was significantly ($p \leq 0.05$) different from the sediments from sample stations LFSDTOX11, LFSDTOX12, LFSDTOX14, and YWCSDTOX20 (Table 4). Survival of *H. azteca* in the reference sample, YWCSDTOX20, was significantly ($p \leq 0.05$) different from sediments from sample stations LFSDTOX11 and LFSDTOX12. Growth of *H. azteca*, measured as length and dry weight, was not significantly ($p \leq 0.05$) different from the control and reference, and all other sediments tested. Growth of *H. azteca* in samples from sample stations LFSDTOX11 and LFSDTOX12 could not be determined due to 100 percent mortality (Table 4). Survival of *C. tentans* was significantly ($p \leq 0.05$) different from the control in sediment from stations LFSDTOX9, LFSDTOX13, LFSDTOX14, LFSDTOX15, and RCSDTOX18 (Table 5). Survival of *C. tentans* in the reference sediment was significantly ($p \leq 0.05$) different from sediments from only 2 stations: LFSDTOX9 and RCSDTOX18. Growth of *C. tentans* was not significantly ($p \leq 0.05$) different in any of the test sediments from the control and the reference sediments.

Behavioral observations recorded included organism emergence from the sediments and at the surface of the overlying water possibly due to toxicity, and amplexus (reproductive behavior of *H. azteca* noted at test termination).

6.0 CONCLUSION

The whole-sediment bioassay results indicate that survival of *H. azteca* was significantly ($p \leq 0.05$) different from the control in sediment from sample stations LFSDTOX11, LFSDTOX12, LFSDTOX14, and YWCSDTOX20 (reference). Survival of *H. azteca* in the reference sediment was significantly different from sediments from sample stations LFSDTOX11 and LFSDTOX12. Growth of *H. azteca*, measured as length and group dry weight, could not be determined in sediments from stations LFSDTOX11 and LFSDTOX12 due to 100 percent mortality. The whole-sediment bioassay results also indicate that survival of *C. tentans* was significantly ($p \leq 0.05$) different from the control in sediments from stations LFSDTOX9, LFSDTOX13, LFSDTOX14, LFSDTOX15, and RCSDTOX18. Survival of *C. tentans* in the reference was significantly different from sediments from sample stations LFSDTOX9 and RCSDTOX18. Growth of *C. tentans* was not significantly different in the control or reference, and any of the test sediments.

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Table 1. Summary of Whole Sediment Bioassays Conducted with Samples From Lake Fretwell (LF), NAS Cecil Field, Jacksonville, Florida.

CECIL FIELD (SITE LF): SEDIMENT BIOASSAY RESULTS					
STATION NUMBER	*CHIRONOMUS* SURVIVAL	*CHIRONOMUS* MEAN GROWTH:WT	*HYALELLA* SURVIVAL	*HYALELLA* MEAN GROWTH:WT	*HYALELLA* MEAN GROWTH:LN
CONTROL 1	85%	1.06 g	100%	0.28	3.3 mm
LFSDTOX11	82%	1.74 g	0%*[a]	–	–
LFSDTOX12	80%	1.47 g	0%*[a]	–	–
LFSDTOX13	65%*	1.72 g	100%	0.29	3.4 mm
LFSDTOX14	62%*	1.91 g	93%*	0.29	3.4 mm
LFSDTOX15	63%*	1.37 g	100%	0.39	3.6 mm
LFSDTOX16	77%	1.87 g	98%	0.42	3.6 mm
LFSDTOX17	67%	0.88 g	100%	0.37	3.5 mm
YWCSDTOX20 (REF)	75%	1.05 g	95%*	0.32	3.4 mm

CECIL FIELD (SITE LF): SEDIMENT BIOASSAY RESULTS					
STATION NUMBER	CHIRONOMUS SURVIVAL	CHIRONOMUS MEAN GROWTH:WT	HYALELLA SURVIVAL	HYALELLA MEAN GROWTH:WT	HYALELLA MEAN GROWTH:LN
CONTROL 2	75%	1.45 g	88%	0.40	3.4 mm
LFSDTOX9	42%*[a]	1.50 g	94%	0.46	3.7 mm
LFSDTOX10	87%	1.47 g	99%	0.47	3.7 mm
RCSDTOX18	18%*[a]	1.17 g	98%	0.41	3.5 mm
GCSDTOX19	75%	1.24 g	88%	0.43	3.6 mm

Note: Growth of *H. azteca*, as group dry weight, is expressed as milligrams per organism.
WT = Weight
LN = Length
*significantly different from the control sediment
[a]significantly different from the reference sediment

Source: ESE, 1995

Table 2. Water Quality Measurement Ranges of Overlying Water During a 14-Day Toxicity Test Using Whole Sediment from NAS Cecil Field, Jacksonville, Florida, with *Hyalella azteca*

	Hyalella azteca			
Sample	Temp (°C)	pH (s.u.)	DO (mg/L)	Cond. (μmhos/cm)
Controls	19.9 - 21.1	7.9 - 8.4	7.7 - 8.8	230 - 275
LFSDTOX9	20.0 - 21.0	7.9 - 8.2	8.0 - 8.7	210 - 278
LFSDTOX10	20.0 - 21.1	8.1 - 8.3	7.9 - 8.6	180 - 250
LFSDTOX11	20.5 - 21.1	7.8 - 8.3	7.8 - 8.6	245 - 275
LFSDTOX12	19.8 - 21.1	7.6 - 8.4	7.7 - 8.6	230 - 270
LFSDTOX13	19.8 - 21.1	8.0 - 8.3	7.6 - 8.5	175 - 245
LFSDTOX14	19.8 - 21.1	7.5 - 8.2	7.7 - 8.6	110 - 220
LFSDTOX15	19.8 - 21.1	7.8 - 8.2	7.5 - 8.6	165 - 245
LFSDTOX16	19.9 - 21.0	7.8 - 8.3	7.5 - 8.6	185 - 250
LFSDTOX17	20.0 - 21.1	7.7 - 8.2	7.6 - 8.6	120 - 220
RCSDTOX18	19.9 - 21.9	7.6 - 8.2	7.6 - 8.7	130 - 235
GCSDTOX19	20.0 - 21.1	7.9 - 8.3	7.6 - 8.7	145 - 235
YWCSDTOX20(REF)	20.0 - 21.1	7.7 - 8.3	7.5 - 8.5	180 - 235

Source: ESE, 1995

Table 3. Water Quality Measurement Ranges of Overlying Water During a 14-Day Toxicity Test Using Whole Sediment from NAS Cecil Field, Jacksonville, Florida, with *Chironomus tentans*

	Chironomus tentans			
Sample	Temp (°C)	pH (s.u.)	DO (mg/L)	Cond. (μmhos/cm)
Controls	19.9 - 21.2	7.8 - 8.3	7.8 - 9.0	245 - 295
LFSDTOX9	19.9 - 21.0	7.5 - 8.2	7.5 - 9.0	250 - 285
LFSDTOX10	20.0 - 21.0	7.5 - 8.2	7.5 - 8.8	220 - 275
LFSDTOX11	20.0 - 21.2	7.7 - 8.2	7.9 - 8.8	268 - 300
LFSDTOX12	20.0 - 21.2	7.9 - 8.2	7.9 - 8.8	260 - 295
LFSDTOX13	20.1 - 21.2	7.4 - 8.2	7.9 - 8.7	210 - 260
LFSDTOX14	20.1 - 21.2	7.0 - 8.1	8.0 - 8.7	170 - 225
LFSDTOX15	20.1 - 21.2	6.9 - 7.9	7.9 - 8.6	200 - 255
LFSDTOX16	20.1 - 21.2	7.4 - 7.9	7.8 - 8.5	210 - 260
LFSDTOX17	20.0 - 21.2	7.0 - 8.0	7.8 - 8.6	185 - 250
RCSDTOX18	19.9 - 21.0	7.0 - 8.1	8.0 - 8.7	200 - 275
GCSDTOX19	20.0 - 21.1	7.2 - 7.9	7.9 - 8.7	200 - 260
YWCSDTOX20(REF)	20.0 - 21.2	7.3 - 7.8	7.8 - 8.7	200 - 260

Source: ESE, 1995.

Table 4. Survival and Growth of *Hyalella azteca* After 14 Days of Exposure to Whole Sediments Collected From NAS Cecil Field, Jacksonville, Florida (Page 1 of 2)

Sample	Replicate[a]	No. Alive (% Survival)	Growth/weight (mg/organism)	Growth/length (mm)
Control 1	A	20	0.26	3.3
	B	20	0.32	3.4
	C	20	0.28	3.4
	D	20	0.25	3.1
		80 (100%)	0.28[b]	3.3[b]
Control 2	A	18	0.38	3.2
	B	18	0.40	3.4
	C	19	0.43	3.5
	D	15	0.39	3.3
		70 (88%)	0.40[b]	3.4[b]
LFSDTOX9	A	19	0.54	3.8
	B	20	0.43	3.6
	C	18	0.48	3.7
	D	18	0.40	3.5
		75 (94%)	0.46[b]	3.7[b]
LFSDTOX10	A	19	0.46	3.7
	B	20	0.48	3.6
	C	20	0.50	3.6
	D	20	0.45	3.7
		79 (99%)	0.47[b]	3.7[b]
LFSDTOX11	A	0	–	–
	B	0	–	–
	C	0	–	–
	D	0	–	–
		0 (0%)[cd]	–	–
LFSDTOX12	A	0	–	–
	B	0	–	–
	C	0	–	–
	D	0	–	–
		0 (0%)[cd]	–	–
LFSDTOX13	A	20	0.25	3.2
	B	20	0.30	3.4
	C	20	0.31	3.4
	D	20	0.29	3.4
		80 (100%)	0.29[b]	3.4[b]
LFSDTOX14	A	17	0.31	3.5
	B	19	0.25	3.3
	C	18	0.32	3.5
	D	20	0.29	3.4
		74 (93%)[c]	0.29[b]	3.4[b]

Table 4. Survival and Growth of *Hyalella azteca* After 14 Days of Exposure to Whole Sediments Collected From NAS Cecil Field, Jacksonville, Florida (Page 2 of 2)

Sample	Replicate[a]	No. Alive (% Survival)	Growth/weight (mg/organism)	Growth/length (mm)
LFSDTOX15	A	20	0.40	3.5
	B	20	0.38	3.6
	C	20	0.41	3.7
	D	20	0.35	3.4
		80 (100%)	0.39[b]	3.6[b]
LFSDTOX16	A	20	0.42	3.5
	B	18	0.44	3.5
	C	19	0.41	3.6
	D	20	0.42	3.6
		77 (96%)	0.42[b]	3.6[b]
LFSDTOX17	A	20	0.28	3.2
	B	20	0.38	3.6
	C	20	0.39	3.6
	D	20	0.41	3.6
		80 (100%)	0.37[b]	3.5[b]
RCSDTOX18	A	18	0.42	3.4
	B	19	0.46	3.7
	C	20	0.36	3.3
	D	20	0.38	3.5
		77 (96%)	0.41[b]	3.5[b]
GCSDTOX19	A	16	0.40	3.5
	B	16	0.45	3.6
	C	18	0.43	3.6
	D	20	0.43	3.7
		70 (88%)[c]	0.43[b]	3.6[b]
YWCSDTOX20 (REF)	A	18	0.30	3.3
	B	20	0.34	3.5
	C	19	0.31	3.4
	D	19	0.33	3.4
		76 (95%)[c]	0.32[b]	3.4[b]

[a]Twenty organisms exposed per replicate
[b]Total mean growth of *H. azteca* (A+B+C+D/4)
[c] = Significantly different from control 1
[d] = Significantly different from the reference

Source: ESE 1995.

Table 5. Survival and Growth of *Chironomus tentans* After 14 Days of Exposure to Whole Sediments Collected From NAS Cecil Field, Jacksonville, Florida (Page 1 of 2)

Sample	Replicate[a]	No. Alive (% Survival)	Growth/weight (mg/organism)
Control 1	A	14	0.99
	B	13	0.96
	C	14	1.03
	D	10	1.27
		51 (85%)	1.06[b]
Control 2	A	10	1.11
	B	13	1.55
	C	11	1.60
	D	11	1.55
		45 (75%)	1.45[b]
LFSDTOX9	A	5	1.94
	B	8	1.26
	C	5	0.96
	D	7	1.84
		25 (42%)[de]	1.50[b]
LFSDTOX10	A	15	1.33
	B	13	1.42
	C	13	1.60
	D	11	1.54
		52 (87%)	1.47[b]
LFSDTOX11	A	13	2.01
	B	13	1.75
	C	11	1.98
	D	13	1.22
		50 (83%)	1.74[b]
LFSDTOX12	A	12	1.65
	B	13	1.22
	C	11	1.87
	D	12	1.13
		48 (80%)	1.47[b]
LFSDTOX13	A	10	1.60
	B	11	1.59
	C	8	1.83
	D	10	1.84
		39 (65%)[c]	1.72[b]
LFSDTOX14	A	11	2.01
	B	8	1.63
	C	9	2.20
	D	9	1.80
		37 (62%)[c]	1.91[b]

Table 5. Survival and Growth of *Chironomus tentans* After 14 Days of Exposure to Whole Sediments Collected From NAS Cecil Field, Jacksonville, Florida (Page 2 of 2)

Sample	Replicate[a]	No. Alive (% Survival)	Growth/weight (mg/organism)
LFSDTOX15	A	10	1.26
	B	8	2.06
	C	11	1.40
	D	9	0.76
		38 (63%)[c]	1.37[b]
LFSDTOX16	A	9	2.20
	B	11	1.55
	C	12	2.08
	D	14	1.66
		46 (77%)	1.87[b]
LFSDTOX17	A	12	1.26
	B	11	0.94
	C	9	0.50
	D	8	0.80
		40 (67%)	0.88[b]
RCSDTOX18	A	5	1.68
	B	1	0.60
	C	4	1.58
	D	1	0.80
		11 (18%)[de]	1.17[b]
GCSDTOX19	A	12	1.19
	B	10	1.07
	C	13	1.42
	D	10	1.27
		45 (75%)	1.24[b]
YWCSDTOX20 (REF)	A	9	0.93
	B	11	1.16
	C	15	0.93
	D	10	1.19
		45 (75%)	1.05[b]

[a]Fifteen organisms exposed per replicate
[b]Total mean growth of *C. tentans* (A+B+C+D/4)
[c] = Significantly different from control 1
[d] = Significantly different from control 2
[e] = Significantly different from the reference

Source: ESE 1995.

Appendix C: *Chironomus tentans* Sediment Test Raw Data

C. Fenters
#1-2-96
SURVIVAL

Cecil Field (Site LF): Sediment Bioassay Results
File: CECIL Transform: NO TRANSFORMATION

Bartlett's test for homogeneity of variance
Calculated B1 statistic = 5.66

Table Chi-square value = 18.48 (alpha = 0.01, df = 7)
Table Chi-square value = 14.07 (alpha = 0.05, df = 7)

Data PASS B1 homogeneity test at 0.01 level. Continue analysis.

Cecil Field (Site LF): Sediment Bioassay Results
File: CECIL Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	7	43.219	6.174	2.343
Within (Error)	24	63.250	2.635	
tal	31	106.469		

Critical F value = 2.42 (0.05,7,24)
Since F < Critical F FAIL TO REJECT Ho: All equal

Cecil Field (Site LF): Sediment Bioassay Results
File: CECIL Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	YWCSDTOX20	11.250	11.250		
2	LFSDTOX11	12.500	12.500	-1.089	
3	LFSDTOX12	12.000	12.000	-0.653	
4	LFSDTOX13	9.750	9.750	1.307	
5	LFSDTOX14	9.250	9.250	1.742	
6	LFSDTOX15	9.500	9.500	1.525	
7	LFSDTOX16	11.500	11.500	-0.218	
8	LFSDTOX17	10.000	10.000	1.089	

nett table value = 2.48 (1 Tailed Value, P=0.05, df=24,7)

Cecil Field (Site LF): Sediment Bioassay Results
File: CECIL Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	YWCSDTOX20	4			
2	LFSDTOX11	4	2.847	25.3	-1.250
3	LFSDTOX12	4	2.847	25.3	-0.750
4	LFSDTOX13	4	2.847	25.3	1.500
5	LFSDTOX14	4	2.847	25.3	2.000
6	LFSDTOX15	4	2.847	25.3	1.750
7	LFSDTOX16	4	2.847	25.3	-0.250
8	LFSDTOX17	4	2.847	25.3	1.250

H. Azteca
CR 1-2-96
SURVIVAL

CECIL
File: B:\DRY. Transform: NO TRANSFORMATION

STEEL'S MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	YWC	19.000				
2	11	0.000	10.00	None	4.00	
3	12	0.000	10.00	None	4.00	
4	13	20.000	24.00	None	4.00	
5	14	18.500	16.00	None	4.00	
6	15	20.000	24.00	None	4.00	
7	16	19.250	19.50	None	4.00	
8	17	20.000	24.00	None	4.00	

Critical values use k = 7, are 1 tailed, and alpha = 0.05

WARNING - There are no critical values for this combination of groups and replicates.

CECIL
File: B:\DRY. Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	7	2279.969	325.710	801.747
Within (Error)	24	9.750	0.406	
Total	31	2289.719		

Critical F value = 2.42 (0.05,7,24)

Since F > Critical F REJECT Ho: All equal

CIL
File: B:\DRY. Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	YWC	19.000	19.000		
2	11	0.000	0.000	42.157	*
3	12	0.000	0.000	42.157	*
4	13	20.000	20.000	-2.219	
5	14	18.500	18.500	1.109	
6	15	20.000	20.000	-2.219	
7	16	19.250	19.250	-0.555	
8	17	20.000	20.000	-2.219	

Dunnett table value = 2.48 (1 Tailed Value, P=0.05, df=24,7)

CECIL
File: B:\DRY. Transform: NO TRANSFORMATION

DUNNETT'S TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	YWC	4			
2	11	4	1.118	5.9	19.000
3	12	4	1.118	5.9	19.000
4	13	4	1.118	5.9	-1.000
5	14	4	1.118	5.9	0.500
6	15	4	1.118	5.9	-1.000
7	16	4	1.118	5.9	-0.250
8	17	4	1.118	5.9	-1.000

APPENDIX D-6

AQUIRE DATA

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Cladocera*; Crustacean	< 24 H	FW; LAB	ST	18 H	(NR)	LC50	1220000	UG/L	200211	81
Acetone	*Palaemonetes kadiakensis*; Grass shrimp, freshwater prawn	JUVENILE	FW; LAB	ST	18 H	(NR)	LC50	2610000	UG/L	200212	81
Acetone	*Culex restuans*; White dotted mosquito	3RD INSTAR	FW; LAB	ST	18 H	(NR)	LC50	6190000	UG/L	200373	81
Acetone	*Centrarchidae*; Fish	5.3-7.2 CM, 3.5-3.9 G	FW; LAB	ST	96 H	(NR)	LC50	8300000	UG/L	202219	68
Acetone	*Amphipoda*; Crustacean	JUVENILE, 14-16 ANTENNA SEGMENTS	LAB	ST	18 H	(NR)	LC50	2780000	UG/L	202456	81
Acetone	*Corbicula manilensis*; Asiatic clam	1.0-2.7 G	FW; LAB	ST	96 H	(NR)	LC50	>20000000	UG/L	203161	79
Acetone	*Poeciliidae*; Fish	2-3 MO	FW; LAB	RN	14 D	(NR)	LC50	637000	UG/L	209503	81
Acetone	*Centrarchidae*; Fish	NR	FW; LAB	ST	96 H	(NR)	LC50	8300000	UG/L	213424	68
Acetone	*Cladocera*; Crustacean	1ST INSTAR, < 24 H	FW; LAB	ST	48 H	7.0 to 8.2 (Mean 7.7)	EC50IM	13500000	UG/L	213812	80
Acetone	*Gambusia affinis*; Mosquitofish	ADULT, FEMALE	FW; LAB	ST	24 H	8.0 to 8.5	LC50	13500000	UG/L	215458	57
Acetone	*Gambusia affinis*; MosquitofishS	ADULT, FEMALE	FW; LAB	ST	48 H	8.0 to 8.5	LC50	13000000	UG/L	215459	57
Acetone	*Gambusia affinis*; Mosquitofish	ADULT, FEMALE	FW; LAB	ST	96 H	8.0 to 8.5	LC50	13000000	UG/L	215460	57
Acetone	*Lepomis humilis*; Orangespotted sunfish	4-6 G	FW; LAB	ST	1 H	(NR)	LET	14250000 to 15050000	UG/L	215469	17
Acetone	*Scenedesmus quadricauda*; Green algae	NR	LAB	ST	NR	7.0	PGR	7500000	UG/L	217549	77
Acetone	*Cladocera*; Crustacean	NR	FW; LAB	ST	24 H	(NR)	LC50	10000	UG/L	218332	65
Acetone	*Cladocera*; Crustacean	NR	FW; LAB	ST	48 H	(NR)	LC50	10000	UG/L	218333	65

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Rasbora heteromorpha*; Harlequinfish, red rasbora	1.3-3 CM	FW; LAB	RN	24 H	7.2	LC50	5700000	UG/L	219277	69
Acetone	*Rasbora heteromorpha*; Harlequinfish, red rasbora	1.3-3 CM	FW; LAB	RN	48 H	7.2	LC50	4000000	UG/L	219278	69
Acetone	*Scenedesmus quadricauda*; Green algae	INITIAL CULTURE TURBIDITY REPORTED	LAB	ST	7 D	(NR)	PGR	7500000	UG/L	223927	80
Acetone	*Entosiphon sulcatum*; Flagellate euglenoid	INITIAL CULTURE TURBIDITY REPORTED	LAB	ST	72 H	(NR)	PGR	28000	UG/L	223928	80
Acetone	*Chlorella pyrenoidosa*; Green algae	INITIAL CONC:1.0 MG CLR/L	LAB	ST	76 H	(NR)	GRO	330	UG/L	223929	78
Acetone	*Chlorella pyrenoidosa*; Green algae	INITIAL CONC:1.0 MG CLR/L	LAB	ST	76 H	(NR)	CEL	3330	UG/L	223930	78
Acetone	*Chlamydomonas eugametos*; Green algae	INITIAL CONC: 100000 CELLS/ML	LAB	ST	48 H	6.7	PGR	10000000	UG/L	223931	80
Acetone	*Cladocera*; Crustacean	< 24 H	FW; LAB	ST	48 H	(NR)	LC50	12600000	UG/L	225554	78
Acetone	*Cladocera*; Crustacean	< 24 H	FW; LAB	ST	48 H	(NR)	LC50	13300000	UG/L	225555	78
Acetone	*Cladocera*; Crustacean	< 24 H	FW; LAB	ST	48 H	(NR)	LC50	12100000	UG/L	225556	78
Acetone	*Cladocera*; Crustacean	< 24 H	FW; LAB	ST	48 H	(NR)	LC50	8800000	UG/L	225557	78
Acetone	*Cladocera*; Crustacean	11 D	FW; LAB	ST	48 H	(NR)	LC50	7460000	UG/L	225558	78
Acetone	*Cladocera*; Crustacean	11 D	FW; LAB	ST	48 H	(NR)	LC50	7810000	UG/L	225559	78
Acetone	*Selenastrum capricornutum*; Green algae	NR	LAB	ST	1 to 16 D	(NR)	PGR	40000000	UG/L	226760	75
Acetone	*Chlamydomonas reinhardtii*; Green algae	NR	LAB	ST	1 to 17 D	(NR)	PGR	79000	UG/L	226761	75
Acetone	*Chlorophyta*; ALGAE	NR	LAB	ST	1 to 20 D	(NR)	PGR	79000	UG/L	226762	75
Acetone	*Chrysophyta*; ALGAE	NR	LAB	ST	1 to 18 D	(NR)	PGR	79000	UG/L	226763	75

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Chlorophyta*; ALGAE	NR	LAB	ST	1 to 14 D	(NR)	PGR	79000	UG/L	226764	75
Acetone	*Algae*, phytoplankton, algal mat	NITZSCHIA, SCENEDESMUS SP	LAB	ST	1 to 14 D	(NR)	PGR	79000	UG/L	226765	75
Acetone	*Gastropoda*; Mollusk	NR	FW; LAB	NR	48 H	(NR)	LC50	35000000	UG/L	229285	72
Acetone	*Semisulcospira libertina*; Marsh snail	NR	FW; LAB	NR	48 H	(NR)	LC50	35000000	UG/L	229286	72
Acetone	*Cipangopaludina malleata*; Mud snail	NR	FW; LAB	NR	48 H	(NR)	LC50	48000000	UG/L	229287	72
Acetone	*Gastropoda*; Mollusk	NR	FW; LAB	NR	48 H	(NR)	LC50	35000000	UG/L	229288	72
Acetone	*Chlorella pyrenoidosa*; Green algae	NR	LAB	ST	6.8 D	(NR)	PGR	10000000	UG/L	229289	75
Acetone	*Chlorella pyrenoidosa*; Green algae	INIT CONC 1000000 CELLS	LAB	ST	70 H	(NR)	PSE	10000000	UG/L	229290	75
Acetone	*Ambystoma mexicanum*; Salamander	3-4 WK	FW; LAB	ST	48 H	(NR)	LC50	20000000	UG/L	234302	80
Acetone	*Pipidae*; Amphibian	3-4 WK	FW; LAB	ST	48 H	(NR)	LC50	24000000	UG/L	234303	80
Acetone	*Cladocera*; Crustacean	24 H	FW; LAB	ST	24 H	7.6 to 7.7	LC50	>10000000	UG/L	253088	77
Acetone	*Leuciscus idus*; Ide, silver or golden orfe	NR	FW; LAB	ST	NR	(NR)	LC50	7505000	UG/L	255185	78
Acetone	*Scenedesmus quadricauda*; Green algae	NR	LAB	ST	8 D	(NR)	PGR	7500000	UG/L	257059	78
Acetone	*Anacystis aeruginosa*; Blue-green algae	NR	LAB	ST	8 D	(NR)	PGR	530000	UG/L	257060	78
Acetone	*Anacystis aeruginosa*; Blue-green algae	NR	LAB	ST	NR	7.0	MOR	530000	UG/L	261408	78
Acetone	*Scenedesmus quadricauda*; Green algae	NR	LAB	ST	NR	7.0	MOR	7500000	UG/L	261409	78

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Pimephales promelas*; Fathead minnow	NR	FW; LAB	FT	96 H	(NR)	MOR	9100000	ug/L	261999	78
Acetone	*Salvelinus fontinalis*; Brook trout	NR	FW; LAB	FT	96 H	(NR)	MOR	6070000	ug/L	262000	78
Acetone	*Lepomis macrochirus*; Bluegill	NR	FW; LAB	FT	96 H	(NR)	MOR	7300000	ug/L	262001	78
Acetone	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	FINGERLING, 9.4 CM, 10.8 G	FW; LAB	FT	24 H	8.0	LC50	6100000	UG/L	267444	78
Acetone	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	FINGERLING, 10.0 CM, 10.2 G	FW; LAB	ST	6 H	8.0	LET	12500000	UG/L	267445	78
Acetone	*Chironomus tentans*; Midge	2ND INSTAR, 10-14 D, MIXED SPECIES	FW; LAB	ST	48 H	(NR)	MOR	46900000	ug/L	268145	86
Acetone	*Daphnia magna*; Water flea	< 24 H, MIXED SPECIES	FW; LAB	ST	48 H	(NR)	MOR	23500000	ug/L	268147	86
Acetone	*Pimephales promelas*; Fathead minnow	0.12 G	FW; LAB	FT	96 H	7.5	LC50	8140000	UG/L	274731	83
Acetone	*Pimephales promelas*; Fathead minnow	0.12 G	FW; LAB	FT	96 H	7.5	LC50	7310000	UG/L	274732	83
Acetone	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1.0 G	FW; LAB	ST	96 H	7.2 to 7.5	LC50	5540000	UG/L	276007	80
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	7 D	7.8 to 7.9	MOR	550000	UG/L	276274	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	14 D	7.8 to 7.9	MOR	550000	UG/L	276275	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	21 D	7.8 to 7.9	MOR	550000	UG/L	276276	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	MOR	550000	UG/L	276277	83

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	7 D	7.8 to 7.9	MOR	1100000	UG/L	276278	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	14 D	7.8 to 7.9	MOR	1100000	UG/L	276279	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	21 D	7.8 to 7.9	MOR	1100000	UG/L	276280	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	MOR	1100000	UG/L	276281	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	7 D	7.8 to 7.9	MOR	2200000	UG/L	276282	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	14 D	7.8 to 7.9	MOR	2200000	UG/L	276283	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	21 D	7.8 to 7.9	MOR	2200000	UG/L	276284	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	MOR	2200000	UG/L	276285	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	7 D	7.8 to 7.9	MOR	4300000	UG/L	276286	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	14 D	7.8 to 7.9	MOR	4300000	UG/L	276288	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	21 D	7.8 to 7.9	MOR	4300000	UG/L	276290	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	MOR	4300000	UG/L	276292	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	7 D	7.8 to 7.9	LET	8700000	UG/L	276296	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	ST	24 H	7.9 to 8.3	LC50	35000000	UG/L	276301	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	ST	48 H	7.9 to 8.3	LC50	31000000	UG/L	276305	83

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	REP	1100000	UG/L	276309	83
Acetone	*Cladocera*; Crustacean	<= 24 H	FW; LAB	FT	28 D	7.8 to 7.9	REP	4300000	UG/L	276311	83
Acetone	*Selenastrum capricornutum*; Green algae	LOG PHASE	FW; LAB	NR	96 H	(NR)	GRO	7000000	UG/L	276591	83
Acetone	*Chlorella pyrenoidosa*; Green algae	LOG PHASE	FW; LAB	NR	48 H	(NR)	GRO	3400000	UG/L	276592	83
Acetone	*Scenedesmus pannonicus*; Green algae	LOG PHASE	FW; LAB	NR	48 H	(NR)	GRO	4740000	UG/L	276593	83
Acetone	*Diptera*; Insect	3RD INSTAR	FW; LAB	NR	48 H	(NR)	LC50	15000000	UG/L	276594	83
Acetone	*Diptera*; Insect	3RD INSTAR	FW; LAB	NR	48 H	(NR)	LC50	17000000	UG/L	276595	83
Acetone	*Cnidarians*; CNIDARIA	BUDLESS	FW; LAB	NR	48 H	(NR)	LC50	13500000	UG/L	276596	83
Acetone	*Lymnaea stagnalis*; Great pond snail	3-4 WK	FW; LAB	NR	48 H	(NR)	LC50	7000000	UG/L	276597	83
Acetone	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	5-8 WK	FW; LAB	NR	48 H	7 to 8	LC50	7400000	UG/L	276598	83
Acetone	*Oryzias latipes*; Medaka, high-eyes	4-5 WK	FW; LAB	NR	48 H	(NR)	LC50	14300000	UG/L	276599	83
Acetone	*Pimephales promelas*; Fathead minnow	3-4 WK	FW; LAB	NR	48 H	(NR)	LC50	15000000	UG/L	276600	83
Acetone	*Tubificidae*; Oligoca	NR	FW; LAB	ST	48 H	(NR)	LC50	15000000	UG/L	296306	83
Acetone	*Diptera*; Insect	NR	FW; LAB	ST	48 H	(NR)	LC50	13000000	UG/L	296307	83
Acetone	*Hirudinea*; ANNELIDA	NR	FW; LAB	ST	48 H	(NR)	LC50	7000000	UG/L	296308	83
Acetone	*Asellus aquaticus*; Aquatic sowbug	NR	FW; LAB	ST	48 H	(NR)	LC50	7550000	UG/L	296309	83

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Lymnaea stagnalis*; Great pond snail	NR	FW; LAB	ST	48 H	(NR)	LC50	7000000	UG/L	296310	83
Acetone	*Dugesia lugubris*; Turbellarian, planarian	NR	FW; LAB	ST	48 H	(NR)	LC50	7500000	UG/L	296311	83
Acetone	*Cnidarians*; CNIDARIA	NR	FW; LAB	ST	48 H	(NR)	LC50	13500000	UG/L	296312	83
Acetone	*Corixa punctata*; Water boatman	NR	FW; LAB	ST	48 H	(NR)	LC50	5000000	UG/L	296313	83
Acetone	*Amphipoda*; Crustacean	NR	FW; LAB	ST	48 H	(NR)	LC50	6000000	UG/L	296314	83
Acetone	*Odonata*; Insect	NR	FW; LAB	ST	48 H	(NR)	LC50	6400000	UG/L	296315	83
Acetone	*Plecoptera*; Insect	NR	FW; LAB	ST	48 H	(NR)	LC50	10300000	UG/L	296316	83
Acetone	*Ephemeroptera*; Insect	NR	FW; LAB	ST	48 H	(NR)	LC50	7600000	UG/L	296317	83
Acetone	*Cladocera*; Crustacean	1ST AND 2ND INSTAR LARVAE	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298027	86
Acetone	*Dugesia tigrina*; Turbellarian, flatworm	JUVENILE, 0.006 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298028	86
Acetone	*Helisoma trivolvis*; Ramshorn snail	JUVENILE, 0.180 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298029	86
Acetone	*Pimephales promelas*; Fathead minnow	JUVENILE, 0.2-0.5 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298030	86
Acetone	*Amphipoda*; Crustacean	JUVENILE, 0.007 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298031	86
Acetone	*Asellus intermedius*; Aquatic sowbug	JUVENILE, 0.012 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298032	86
Acetone	*Lumbriculus variegatus*; Oligochaete	JUVENILE, 0.006 G	FW; LAB	ST	96 H	6.5 to 8.5	LC50	> 100000	UG/L	298033	86
Acetone	*Pimephales promelas*; Fathead minnow	28 D, 19.2 MM, 0.076 G	FW; LAB	FT	96 H	6.9	LC50	7280000	UG/L	302606	84

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Pimephales promelas*; Fathead minnow	33 D, 22.6 MM, 0.159 G	FW; LAB	FT	96 H	7.6	LC50	8120000	UG/L	302608	84
Acetone	*Pimephales promelas*; Fathead minnow	32 D, 18.0 MM, 0.087 G	FW; LAB	FT	96 H	7.6	LC50	6210000	UG/L	302624	84
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	24 H	(NR)	MOR	>10000000	ug/L	308253	86
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	48 H	(NR)	MOR	>10000000	ug/L	308254	86
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	24 H	(NR)	MOR	>10000000	ug/L	308255	86
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	48 H	(NR)	MOR	>10000000	ug/L	308256	86
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	24 H	(NR)	MOR	8300000	ug/L	308257	86
Acetone	*Oryzias latipes*; Medaka, high-eyes	NR	FW; LAB	ST	48 H	(NR)	MOR	8300000	ug/L	308258	86
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	ST	48 H	8.2	MOR	8098000	ug/L	313505	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	240 H	8.2	MOR	6693000	ug/L	313506	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP EC50	6469000	ug/L	313507	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP EC50	5908000	ug/L	313508	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP EC50	6928000	ug/L	313509	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 10 D	8.2	MOR	1866000	ug/L	313510	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP	5184000	ug/L	313511	91

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP	5184000	ug/L	313512	91
Acetone	*Ceriodaphnia dubia*; Water flea	NEONATE, <12 H	FW; LAB	RN	to 10 D	8.2	REP	5184000	ug/L	313513	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP	3110000	ug/L	313515	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP	5184000	ug/L	313516	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP	3110000	ug/L	313517	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	48 H	8.2	MOR	9218000	ug/L	313518	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	240 H	8.2	MOR	4068000	ug/L	313519	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP EC50	6389000	ug/L	313520	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP EC50	6406000	ug/L	313521	91
Acetone	*Daphnia magna*; Water flea	NEONATE, <12 H	FW; LAB	ST	to 11 D	8.2	REP EC50	6714000	ug/L	313522	91
Acetone	*Brachionus calyciflorus*; Rotifer	NEONATE	FW; LAB	ST	24 H	(NR)	MOR	51000	ug/L	313866	91
Mercury	*Caridina rajadhari*; Freshwater prawn	NR	FW; LAB	ST	48 H	(NR)	LC50	6.918	UG/L	202828	85
Mercury	*Caridina rajadhari*; Freshwater prawn	NR	FW; LAB	ST	72 H	(NR)	LC50	5.784	UG/L	202830	85
Mercury	*Caridina rajadhari*; Freshwater prawn	NR	FW; LAB	ST	96 H	(NR)	LC50	4.786	UG/L	202831	85
Mercury	*Lamellidens marginalis*; Mussel	NR	FW; LAB	RN	96 H	(NR)	LC50	10000	UG/L	219525	89

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Mercury	*Myriophyllum spicatum*; Water-milfoil	4 CM APEX	FW; LAB	ST	32 D	(NR)	EC50BM	3400	UG/L	231768	74
Mercury	*Myriophyllum spicatum*; Water-milfoil	4 CM APEX	FW; LAB	ST	32 D	(NR)	EC50BM	4400	UG/L	231769	74
Mercury	*Myriophyllum spicatum*; Water-milfoil	4 CM APEX	FW; LAB	ST	32 D	(NR)	EC50GR	12000	UG/L	231770	74
Mercury	*Myriophyllum spicatum*; Water-milfoil	4 CM APEX	FW; LAB	ST	32 D	(NR)	EC50GR	1200	UG/L	231771	74
Mercury	*Dugesia tigrina*; Turbellarian, flatworm	NR	FW; LAB	ST	96 H	7.3 to 7.9	LC50	270	UG/L	240762	74
Mercury	*Potamogeton crispus*; Curled pondweed	NR	FW; LAB	NR	NR	(NR)	PSE	5000	UG/L	257788	77
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	60 H	(NR)	LET	1000	UG/L	270876	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	700	UG/L	270877	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	500	UG/L	270878	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	300	UG/L	270879	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	290	UG/L	270880	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	1.25 H	(NR)	LET	100000	UG/L	270881	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	2.5 H	(NR)	LET	75000	UG/L	270882	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	4.5 H	(NR)	LET	50000	UG/L	270883	57
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	8.5 H	(NR)	LET	5000	UG/L	270884	57

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	24.25 H	(NR)	LET	1500	UG/L	270885	57
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	4.5 H	(NR)	LET	50000	UG/L	270886	57
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	12.58 H	(NR)	LET	5000	UG/L	270887	57
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	72 H	(NR)	LET	1500	UG/L	270888	57
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	4.25 D	(NR)	LET	1300	UG/L	270889	57
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	1000	UG/L	270890	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1 SUMMER	FW; LAB	ST	8.17 H	(NR)	LET	800	UG/L	270891	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1 SUMMER	FW; LAB	ST	11 H	(NR)	LET	500	UG/L	270892	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1 SUMMER	FW; LAB	ST	13.67 H	(NR)	LET	350	UG/L	270893	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	150	UG/L	270894	57
Mercury	*Salvelinus fontinalis*; Brook trout	1 SUMMER	FW; LAB	ST	7 D	(NR)	MOR	250	UG/L	270895	57
Mercury	*Salvelinus fontinalis*; Brook trout	1 SUMMER	FW; LAB	ST	16.33 H	(NR)	LET	800	UG/L	270896	57
Mercury	*Salvelinus fontinalis*; Brook trout	1 SUMMER	FW; LAB	ST	18 H	(NR)	LET	500	UG/L	270897	57
Mercury	*Salvelinus fontinalis*; Brook trout	1 SUMMER	FW; LAB	ST	21 H	(NR)	LET	350	UG/L	2708	
Mercury	*Cyprinidae*; Minnow, carp family	1 SUMMER	FW; LAB	ST	84 H	(NR)	LET	800	UG/L	271406	57

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Mercury	*Cyprinidae*; Fish	1 SUMMER	FW; LAB	ST	7.17 D	(NR)	LET	1100	UG/L	271407	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	1 SUMMER	FW; LAB	ST	5.33 D	(NR)	LET	250	UG/L	271408	57
Mercury	*Salvelinus fontinalis*; Brook trout	1 SUMMER	FW; LAB	ST	4.25 D	(NR)	LET	300	UG/L	271409	57
Mercury	*Cyprinidae*; Minnow, carp family	2 SUMMERS	FW; LAB	ST	58 H	(NR)	LET	4500	UG/L	271410	57
Mercury	*Cyprinidae*; Fish	2 SUMMERS	FW; LAB	ST	4.3 D	(NR)	LET	1500	UG/L	271411	57
Mercury	*Oncorhynchus mykiss*; Rainbow trout, donaldson trout	2 SUMMERS	FW; LAB	ST	24 H	(NR)	LET	500	UG/L	271412	57
Mercury	*Salvelinus fontinalis*; Brook trout	2 SUMMERS	FW; LAB	ST	88 H	(NR)	LET	500	UG/L	271413	57
Mercury	*Amphipoda*; Crustacean	NR	FW; LAB	ST	7 D	(NR)	LET	100	UG/L	271414	57
Mercury	*Tubifex tubifex*; Tubificid worm	NR	FW; LAB	ST	7 D	(NR)	LET	300	UG/L	271415	57
Mercury	*Diptera*; Insect	LARVAE	FW; LAB	ST	7 D	(NR)	LET	3500	UG/L	271416	57
Mercury	*Trichoptera*; Insect	LARVAE	FW; LAB	ST	7 D	(NR)	LET	2000	UG/L	271417	57
Mercury	*Copepoda*; Crustacean	ADULT	FW; LAB	ST	48 H	(NR)	LC50	600	UG/L	279705	88
Mercury	*Diptera*; Insect	LARVAE	FW; LAB	ST	48 H	(NR)	LC50	290	UG/L	279711	88
Mercury	*Diptera*; Insect	LARVA-STATE L1	FW; LAB	ST	24 H	7 to 8.5	LC50	2280	UG/L	284329	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	24 H	7 to 8.5	LC50	23400	UG/L	284330	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	48 H	7 to 8.5	LC50	8040	UG/L	284331	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	72 H	7 to 8.5	LC50	570	UG/L	284332	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	96 H	7 to 8.5	LC50	240	UG/L	284333	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	24 H	7 to 8.5	LC50	29600	UG/L	284334	89

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	48 H	7 to 8.5	LC50	6700	UG/L	284335	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	72 H	7 to 8.5	LC50	580	UG/L	284336	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	96 H	7 to 8.5	LC50	280	UG/L	284337	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	24 H	7 to 8.5	LC50	32300	UG/L	284338	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	48 H	7 to 8.5	LC50	6860	UG/L	284339	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	72 H	7 to 8.5	LC50	3040	UG/L	284340	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	96 H	7 to 8.5	LC50	570	UG/L	284341	89
Mercury	*Diptera*; Insect	LARVA-STATE L1	FW; LAB	ST	24 H	7 to 8.5	LC50	1690	UG/L	284342	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	24 H	7 to 8.5	LC50	1960	UG/L	284343	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	48 H	7 to 8.5	LC50	820	UG/L	284344	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	72 H	7 to 8.5	LC50	260	UG/L	284345	89
Mercury	*Diptera*; Insect	LARVA-STATE L2	FW; LAB	ST	96 H	7 to 8.5	LC50	220	UG/L	284346	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	24 H	7 to 8.5	LC50	750	UG/L	284347	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	48 H	7 to 8.5	LC50	240	UG/L	284348	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	72 H	7 to 8.5	LC50	230	UG/L	284349	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	96 H	7 to 8.5	LC50	230	UG/L	284350	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	24 H	7 to 8.5	LC50	4800	UG/L	284351	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	48 H	7 to 8.5	LC50	790	UG/L	284352	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	72 H	7 to 8.5	LC50	710	UG/L	284439	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	96 H	7 to 8.5	LC50	480	UG/L	284440	89
Mercury	*Diptera*; Insect	LARVA-STATE L1	FW; LAB	ST	24 H	7 to 8.5	LC50	3180	UG/L	284442	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	24 H	7 to 8.5	LC50	2430	UG/L	284445	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	48 H	7 to 8.5	LC50	1760	UG/L	284450	89

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	72 H	7 to 8.5	LC50	1360	UG/L	284453	89
Mercury	*Diptera*; Insect	LARVA-STATE L3	FW; LAB	ST	96 H	7 to 8.5	LC50	600	UG/L	284454	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	24 H	7 to 8.5	LC50	3230	UG/L	284456	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	48 H	7 to 8.5	LC50	1280	UG/L	284459	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	72 H	7 to 8.5	LC50	880	UG/L	284464	89
Mercury	*Diptera*; Insect	LARVA-STATE L4	FW; LAB	ST	96 H	7 to 8.5	LC50	880	UG/L	284467	89
Mercury	*Diptera*; Insect	EGGS	FW; LAB	ST	<=24 H	7 to 8.5	MOR	>10000	UG/L	284468	89
Mercury	*Diptera*; Insect	EGGS	FW; LAB	ST	7 to 96 H	7 to 8.5	MOR	>=320	UG/L	284470	89
Mercury	*Diptera*; Insect	EGGS	FW; LAB	ST	<=24 H	7 to 8.5	MOR	>=3200	UG/L	284572	89
Mercury	*Diptera*; Insect	EGGS	FW; LAB	ST	7 to 96 H	7 to 8.5	MOR	>=320	UG/L	284605	89
Mercury	*Caridina rajadhari*; Freshwater prawn	NR	FW; LAB	ST	24 H	(NR)	LC50	9.120	UG/L	288530	85
Mercury	*Lamellidens marginalis*; Mussel	32 G	FW; LAB	ST	48 H	(NR)	OC	5910	UG/L	292756	84
Mercury	*Lamellidens marginalis*; Mussel	5.0-6.0 CM	FW; LAB	RN	96 H	(NR)	LC50	5000	UG/L	311739	91
Mercury	*Lamellidens marginalis*; Mussel	5.0-6.0 CM	FW; LAB	RN	1 to 30 D	(NR)	GRO	500 to 2000	UG/L	311740	91
Mercury	*Lamellidens marginalis*; Mussel	5.0-6.0 CM	FW; LAB	RN	1 to 30 D	(NR)	OC	500 to 2000	UG/L	311741	91
Mercury	*Brachionus calyciflorus*; Rotifer	NEONATE	FW; LAB	ST	24 H	(NR)	LC50	60	UG/L	313882	91
Vanadium oxide sulfate	*Carassius auratus*; Goldfish	3-5 CM, 0.3-2.9 G	FW; LAB	ST - LAB	6 D	6.0 to 6.5	LC50	1,020	UG/L	228999	79
Vanadium oxide sulfate	*Poecilia reticulata*; Guppy	1.5-2.5 CM, 0.1-0.5 G	FW; LAB	ST - LAB	6 D	6.0 to 6.5	LC50	128	UG/L	229000	79

APPENDIX D-6
AQUIRE Toxicity Information

Chemical Name	Species Identification	Age/Life Stage	Test Condition	Route/ Method	Duration	pH	Endpoint	Effect Conc.	Units	Aquire Ref. #	Yr
Vanadium oxide sulfate	*Lepomis macrochirus*; Bluegill	NR	FW; LAB	ST - LAB	96 H	7.4	LC50	6,000	UG/L	287133	60
Vanadium oxide sulfate	*Pimephales promelas*; Fathead minnow	NR	FW; LAB	ST - LAB	96 H	7.4	LC50	4,800	UG/L	287131	60

APPENDIX D-7

STATISTICAL ANALYSES OF SEDIMENT TOXICOLOGICAL AND CHEMICAL DATA

APPENDIX D-7

STATISTICAL ANALYSES OF SEDIMENT TOXICOLOGICAL AND CHEMICAL DATA

Simple linear regressions were completed to determine if a relationship is present between ECPCs in sediment and mortality observed in the sediment toxicity testing. The regressions were completed by use of the Lotus 1,2,3 Version 4 for Windows computer software. An orcsine transformation was applied to all percentage mortality data prior to the regression analysis. Simple regression models assume that both the dependent and independent factors are continuous variables. The orcsine transformation helps to normalize the dependent response distribution.

Appendix D-7
Di-n-butylphthalate
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

Di-n-butylphthalate in Sediment versus Amphipod Mortality

	Di-n-butyl. Sediment (ug/kg) (x)	Amphipod Mortality (y)
LF-SD-9	34	94
LF-SD-10	60	99
LF-SD-11	140	0
LF-SD-12	110	0
LF-SD-13	83	100
LF-SD-14	380	93
LF-SD-15	38	100
LF-SD-16	73	98
LF-SD-17	200	100
RC-SD-18	94	98
GC-SD-19	180	88
YWC-SD-2	110	95

Regression Output:

Constant		42.56391
Std Err of Y Est		37.98497
R Squared		0.000918
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	0.01152	
Std Err of Coef.	0.120207	

Di-n-butylphthalate in Sediment versus Midge Larvae Mortality

	Di-n-butyl. Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	34	42
LF-SD-10	60	87
LF-SD-11	140	82
LF-SD-12	110	80
LF-SD-13	83	65
LF-SD-14	380	62
LF-SD-15	38	63
LF-SD-16	73	77
LF-SD-17	200	67
RC-SD-18	94	18
GC-SD-19	180	75
YWC-SD-2	110	75

Regression Output:

Constant		41.88128
Std Err of Y Est		14.50514
R Squared		0.001628
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	0.005862	
Std Err of Coef.	0.045903	

Appendix D-7
4,4-DDE
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

4,4-DDE in Sediment versus Amphipod Mortality

	4,4-DDE Sediment (ug/kg) (x)	Amphipod Mortality (y)
LF-SD-9	0.66	94
LF-SD-11	0.27	0
LF-SD-14	0.87	93
LF-SD-17	0.21	100

Regression Output:

Constant		47.58821
Std Err of Y Est		46.17903
R Squared		0.035669
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	-22.9517	
Std Err of Coef.	84.38486	

4,4-DDE in Sediment versus Midge Larvae Mortality

	4,4-DDE Sediment (ug/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	0.66	42
LF-SD-11	0.27	82
LF-SD-14	0.87	62
LF-SD-17	0.21	67

Regression Output:

Constant		47.86608
Std Err of Y Est		14.01121
R Squared		0.154948
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	-15.5046	
Std Err of Coef.	25.60327	

Appendix D-7
Aroclor-1260
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

Aroclor-1260 in Sediment versus Amphipod Mortality

	Aroclor Sediment (ug/kg) (x)	Amphipod Mortality (y)
LF-SD-11	4.1	0
LF-SD-15	14	100
LF-SD-16	3	98
RC-SD-18	6.6	98

Regression Output:

Constant		68.29232
Std Err of Y Est		47.8087
R Squared		0.203515
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	-3.98517	
Std Err of Coef.	5.574719	

Aroclor-1260 in Sediment versus Midge Larvae Mortality

	Aroclor Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-11	4.1	82
LF-SD-15	14	63
LF-SD-16	3	77
RC-SD-18	6.6	18

Regression Output:

Constant		46.27482
Std Err of Y Est		23.65407
R Squared		0.072682
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	-1.09203	
Std Err of Coef.	2.758175	

Appendix D-7
alpha-Chlordane
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

alpha-Chlordane in Sediment versus Amphipod Mortality

	a-Chlordane Sediment (ug/kg) (x)	Amphipod Mortality (y)
LF-SD-9	0.38	94
LF-SD-11	0.22	0
LF-SD-15	2.4	100
LF-SD-17	0.2	100
RC-SD-18	0.19	98

Regression Output:

Constant		59.45443
Std Err of Y Est		36.7974
R Squared		0.307437
No. of Observations		5
Degrees of Freedom		3
X Coefficient(s)	-21.9859	
Std Err of Coef.	19.05175	

alpha-Chlordane in Sediment versus Midge Larvae Mortality

	a-Chlordan Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	0.38	42
LF-SD-11	0.22	82
LF-SD-15	2.4	63
LF-SD-17	0.2	67
RC-SD-18	0.19	18

Regression Output:

Constant		31.48707
Std Err of Y Est		19.11389
R Squared		0.029976
No. of Observations		5
Degrees of Freedom		3
X Coefficient(s)	3.013178	
Std Err of Coef.	9.896162	

Appendix D-7
Lead
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

Lead in Sediment versus Amphipod Mortality

	Sediment (mg/kg) (x)	Amphipod Mortality (y)
LF-SD-9	6.3	94
LF-SD-10	3.4	99
LF-SD-11	14.8	0
LF-SD-12	4.7	0
LF-SD-13	6.4	100
LF-SD-14	75.8	93
LF-SD-15	11.4	100
LF-SD-16	10	98
LF-SD-17	14.7	100
RC-SD-18	8.5	98
GC-SD-19	17	88
YWC-SD-2	23.5	95

Regression Output:

Constant		52.52697
Std Err of Y Est		36.46762
R Squared		0.079142
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	-0.52037	
Std Err of Coef.	0.561316	

Lead in Sediment versus Midge Larvae Mortality

	Lead Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	6.3	42
LF-SD-10	3.4	87
LF-SD-11	14.8	82
LF-SD-12	4.7	80
LF-SD-13	6.4	65
LF-SD-14	75.8	62
LF-SD-15	11.4	63
LF-SD-16	10	77
LF-SD-17	14.7	67
RC-SD-18	8.5	18
GC-SD-19	17	75
YWC-SD-2	23.5	75

Regression Output:

Constant		42.34569
Std Err of Y Est		14.51303
R Squared		0.000542
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	0.016446	
Std Err of Coef.	0.223387	

Appendix D-7
Manganese
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

Manganese in Sediment versus Amphipod Mortality

	Manganese Sediment (mg/kg) (x)	Amphipod Mortality (y)
LF-SD-9	8.3	94
LF-SD-10	4.8	99
LF-SD-11	7	0
LF-SD-12	13.1	0
LF-SD-13	3.1	100
LF-SD-14	19.7	93
LF-SD-15	5.8	100
LF-SD-16	5	98
LF-SD-17	8.2	100
RC-SD-18	3.6	98
GC-SD-19	4.7	88
YWC-SD-2	8.7	95

Regression Output:

Constant		68.10221
Std Err of Y Est		34.72163
R Squared		0.165209
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	-3.14301	
Std Err of Coef.	2.234177	

Manganesel in Sediment versus Midge Larvae Mortality

	Manganese Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	8.3	42
LF-SD-10	4.8	87
LF-SD-11	7	82
LF-SD-12	13.1	80
LF-SD-13	3.1	65
LF-SD-14	19.7	62
LF-SD-15	5.8	63
LF-SD-16	5	77
LF-SD-17	8.2	67
RC-SD-18	3.6	18
GC-SD-19	4.7	75
YWC-SD-2	8.7	75

Regression Output:

Constant		39.67453
Std Err of Y Est		14.39407
R Squared		0.016859
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	0.383539	
Std Err of Coef.	0.926192	

Appendix D-7
Nickel
Lake Fretwell and Rowell Creek Upstream of Lake Fretwell
Simple Linear Regressions

Statistical Analysis of Sediment Toxicological and Chemical Data

Nickel in Sediment versus Amphipod Mortality

	Nickel Sediment (mg/kg) (x)	Amphipod Mortality (y)
LF-SD-9	1.9	94
LF-SD-10	1.5	99
LF-SD-11	1.9	0
LF-SD-12	3.2	0
LF-SD-13	1.5	100
LF-SD-14	7.9	93
LF-SD-15	2.1	100
LF-SD-16	4.4	98
LF-SD-17	2.9	100
RC-SD-18	1.5	98
GC-SD-19	1.5	88
YWC-SD-2	3.2	95

Regression Output:

Constant		56.44705
Std Err of Y Est		37.0023
R Squared		0.051941
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	-4.45656	
Std Err of Coef.	6.020881	

Nickel in Sediment versus Midge Larvae Mortality

	Nickel Sediment (mg/kg) (x)	Midge Larvae Mortality (y)
LF-SD-9	1.9	42
LF-SD-10	1.5	87
LF-SD-11	1.9	82
LF-SD-12	3.2	80
LF-SD-13	1.5	65
LF-SD-14	7.9	62
LF-SD-15	2.1	63
LF-SD-16	4.4	77
LF-SD-17	2.9	67
RC-SD-18	1.5	18
GC-SD-19	1.5	75
YWC-SD-2	3.2	75

Regression Output:

Constant		39.90262
Std Err of Y Est		14.39364
R Squared		0.016918
No. of Observations		12
Degrees of Freedom		10
X Coefficient(s)	0.971599	
Std Err of Coef.	2.342081	

APPENDIX C

SEDIMENT TOXICITY TESTING REPORT

Results of 10 day Sediment Toxicity Tests with *Chironomus tentans* and *Hyalella azteca* for Lake Fretwell, NAS Cecil Field, Florida

Submitted to:
Mr. Mike Whitten
Tetra Tech NUS
900 Trail Ridge Road
Aiken, SC 29803
Phone: 904-281-0400

Prepared by:
Tetra Tech, Inc.
10045 Red Run Boulevard
Owings Mills, Maryland 21117

July 9, 1999

SUMMARY

CLIENT: Tetra Tech NUS

TEST FACILITY: Lake Fretwell, NAS Cecil Field, Florida

TEST MATERIAL: Sediment from 6 sites, plus control site

DATE(S) COLLECTED: 7 -8 June 1999

DATE(S) RECEIVED: 8 June 1999

COLLECTED BY: Client

CONTROL/OVERLYING WATER: Dilute mineral water (20% Perrier in distilled, deionized water)

TYPE OF TEST(S): 10-Day Sediment Toxicity using *Chironomus tentans*
10-Day Sediment Toxicity using *Hyalella azteca*

TEST DATE(S): 18 - 28 June 1999 for *C. tentans*
22 June - 2 July 1999 for *H. azteca*

TEST RESULTS:

TABLE 1. SUMMARY OF TEST RESULTS *Chironomus tentans*

Site	Mean % Survival	Mean Weight of Survivors (mg)	Mean Individual Weight based on 10 Organisms per Chamber (mg)
Control	82.5	2.21	1.82
SD-001	78.75	2.12	1.71
SD-002	83.75	3.10	2.62
SD-003	82.5	2.38	2.01
SD-004	86.25	1.79	1.56
SD-005	90.0	1.85	1.64
SD-006	80.0	2.17	1.76

TABLE 2. SUMMARY OF TEST RESULTS *Hyalella azteca*

Site	Mean % Survival	Mean Weight of Survivors (mg)	Mean Individual Weight based on 10 Organisms per Chamber (mg)
Control	81.25	0.205	0.160
SD-001	73.75	0.228	0.144
SD-002	90.0	0.133	0.118
SD-003	88.75	0.203	0.186
SD-004	75.0	0.271	0.226
SD-005	87.5	0.309	0.245
SD-006	90.0	0.189	0.171

MATERIALS AND METHODS

TEST MATERIAL

One gallon of sediment for sites SD-001, SD-002, SD-003 was collected and two gallons for sites SD-004, SD-005, SD-006 were collected by Tetra Tech NUS personnel. Samples were transported on ice to Tetra Tech's Biological Research Facility via overnight courier. Upon arrival, the sample identification, collection date and time were recorded on the sample chain-of-custody sheet (see "Chain-of-Custody" section of this report). Temperature of sediment was recorded upon arrival by measuring the temperature blank (water) packed with sediment. Temperature in all blanks was < 4° C and were recorded on the chain-of-custody sheet.

CONTROL/DILUTION WATER

The control/overlying water used for all 10-day sediment toxicity test was dilute mineral water (20% Perrier in deionized water) with a hardness between 146 and 156 mg/L as $CaCO_3$ and an alkalinity between 88 and 90 mg/L as $CaCO_3$. This is Tetra Tech's standard culture and testing water.

TEST ORGANISMS/AGE

Chironomus tentans, second and third instar, were obtained from ABS (Aquatic BioSystems Inc.). *Hyalella azteca*, 7 to 14 days old, were received from ABS, also. All organisms were healthy and disease-free.

TEST METHODS

U.S. Environmental Protection Agency. 1994. "Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates." 2nd edition. EPA/600/R-94/024. U.S. EPA, ORD, Duluth, MN.

ASTM. 1998a. Standard test methods for measuring the toxicity of sediment-associated contaminants with freshwater invertebrates. E1706-95b. In Annual Book of ASTM Standards, Vol. 11.05, Philadelphia, PA.

Tetra Tech Protocol. 10-day *Chironomus tentans* Sediment Toxicity Test. Revised January, 1997. (Internal document prepared by Tetra Tech, Inc.)

Tetra Tech Protocol. 10-day *Hyalella azteca* Sediment Toxicity Test. Revised January, 1997. (Internal document prepared by Tetra Tech, Inc.)

TEST CONDITIONS

A summary of the test conditions for the *C. tentans* 10-day sediment toxicity test is on page 5. A summary of the test conditions for the *H. azteca* 10-day sediment toxicity test is on page 6.

MODIFICATIONS TO PROTOCOLS

None

COMMENTS CONCERNING TEST

None

TABLE 3. Summary of Test Conditions for *Chironomus tentans* 10-day Whole Sediment Toxicity Test.

PARAMETER		CONDITIONS
1.	Test type:	Whole-sediment toxicity test with renewal of overlying water
2.	Test duration:	10-D
3.	Temperature:	23°C ± 1°C
4.	Light quality:	Wide-spectrum fluorescent lights
5.	Light intensity:	~ 500-1000 lux
6.	Photoperiod:	16h light, 8h darkness
7.	Test chamber size:	400 mL high-form lipless beaker
8.	Sediment volume:	100 mL
9.	Overlying water volume:	175 mL
10.	Renewal of overlying water	2 volume additions/d (i.e., one volume addition every 12 h)
11.	Age of test organisms:	3rd-instar larvae (at least 50% of the larvae were 3rd instar at the start of the test)
12.	No. organisms per test chamber	10
13.	No. replicate chambers per concentration	8
14.	No. organisms per concentration:	80
15.	Feeding regime:	Tetrafin goldfish food, fed 1.5 mL daily to each test chamber (1.5mL contains 6.0mg of dry solids)
16.	Test chamber cleaning	If screens become clogged during a test, gently brush the outside of the screen
17.	Overlying water:	20% dilute mineral water
18.	Overlying water quality	Hardness, alkalinity, conductivity, pH, and ammonia at the beginning and end of a test. Temperature and dissolved oxygen daily.
19.	Endpoint:	Survival and growth (dry weight)
20.	Sampling and sample holding requirements	Samples used within 7 days of sampling. Samples are stored in the dark at 4°C in sealed containers with no air space.
21.	Sample volume required:	one gallon
22.	Test acceptability	Minimum mean control survival of 80% and mean weight per surviving control organism of 0.6mg. Performance-based criteria specifications outlined in the following Test Acceptability outline.

TABLE 4. Summary of Test Conditions for *Hyalella azteca* 10-day Whole Sediment Toxicity Test.

PARAMETER		CONDITIONS
1.	Test type:	Whole-sediment toxicity test with renewal of overlying water
2.	Test duration:	10-D
3.	Temperature:	23°C ± 1°C
4.	Light quality:	Wide-spectrum fluorescent lights
5.	Light intensity:	~ 500-1000 lux
6.	Photoperiod:	16h light, 8h darkness
7.	Test chamber size:	400 mL high-form lipless beaker
8.	Sediment volume:	100 mL
9.	Overlying water volume:	175 mL
10.	Renewal of overlying water	2 volume additions/d (i.e., one volume addition every 12 h)
11.	Age of test organisms:	7 to 14 days old
12.	No. organisms per test chamber	10
13.	No. replicate chambers per concentration	8
14.	No. organisms per concentration:	80
15.	Feeding regime:	YTC, fed 1.5 mL daily to each test chamber.
16.	Test chamber cleaning	If screens become clogged during a test, gently brush the outside of the screen
17.	Overlying water:	20% dilute mineral water
19.	Overlying water quality	Hardness, alkalinity, conductivity, pH, and ammonia at the beginning and end of a test. Temperature and dissolved oxygen daily.
19.	Endpoint:	Survival and growth (dry weight)
20.	Sampling and sample holding requirements	Samples used within 7 days of sampling. Samples are stored in the dark at 4°C in sealed containers with no air space.
21.	Sample volume required:	one gallon
22.	Test acceptability	Minimum mean control survival of 80%. Performance-based criteria specifications outlined in the following Test Acceptability outline.

RESULTS

OVERLYING WATER PHYSICAL/CHEMICAL RESULTS

Physical/chemical results of the overlying water (including alkalinity and hardness as mg $CaCO_3$, ammonia, dissolved oxygen, pH, temperature, and conductivity) are listed in Table 5 and 6 for the *Chironomus* and *Hyalella* tests, respectively. Changes in alkalinity and hardness were similar among sites. See "Laboratory Bench Sheets" section of this report for all physicochemical data.

CHIRONOMUS TENTANS RESULTS

Chironomus survival was not significantly different among the reference site (SD-006), the control, and the other sites (Anova, $p>0.05$). Site SD-002 had a significant higher individual weight in comparison to all of the other sites, including the control and reference site (SD-006) (Anova, $p<0.05$). Thus the sediment samples tested were not toxic to *Chironomus tentans* Copies of all statistical analysis are contained in the "Statistical Analysis" section of this report.

HYALELLA AZTECA RESULTS

Hyallela survival was similar among all sites including the reference and control sites (Anova, $p>0.05$). The only difference observed in mean individual weight was site SD-005 which had greater weight than the reference site (Anova, $p<0.05$). Sites SD-004 and SD-005 both had greater weights than site SD-002 (Anova, $p <0.05$), but still similar to the control and reference sites. Thus, the sediment samples tested were not toxic to *Hyalella azteca*. Copies of all statistical analysis are contained in the "Statistical Analysis" section of this report.

COMMENTS CONCERNING TEST RESULTS

Test acceptability criteria were met for *C. tentans* for this test as evidenced by survival in the control greater than 80% and mean weight greater than 0.6 mg/organism. Test acceptability criteria were met for *H. azteca* for this test as evidenced by survival in the control greater the 80%.

TABLE 5. SUMMARY OF WATER QUALITY AND TEST DATA FOR *Chironomus tentans* 10-DAY SEDIMENT TOXICITY TEST

Client: Tetra Tech NUS	NPDES Permit #:	
Experiment ID: Tt NUS 6/18/99 *C. tentans*	Start Test	6-18-99
Sample Tested: Lake Fretwell, NAS Cecil Field, FL	End Test	6-28-99

RESULTS

WATER CHEMISTRY ANALYSIS (RANGE)							
Site	Cond. (µmhos)	D.O. (mg/L)	pH	Temp. (°C) Instantaneous	Alkalinity (mg/L as $CaCO_3$)	Hardness (mg/L as $CaCO_3$)	Ammonia (mg/L)
Control	348-359	5.1-7.5	7.5-8.2	22.1-24.5	102-118	120-144	0.096-0.34
SD-001	256-356	3.5-7.5	6.5-6.6	22.1-24.5	62-76	98-114	0.055-1.34
SD-002	320-324	5.2-7.9	6.8	22.1-24.5	68-80	112-116	0.053-0.12
SD-003	297-312	5.5-7.8	6.9-7.3	22.1-24.5	56-70	104-120	0.049-0.19
SD-004	263-266	5.1-7.7	7.2-7.5	22.1-24.5	52-56	92-96	0.053-0.25
SD-005	301-315	4.5-7.8	7.2-7.5	22.1-24.5	60-80	100-120	0.051-0.095
SD-006	328-348	4.6-.8	7.2-7.5	22.1-24.5	72-94	124-134	0.074-0.075

TABLE 5. SUMMARY OF WATER QUALITY AND TEST DATA FOR *Hyalella azteca* 10-DAY SEDIMENT TOXICITY TEST

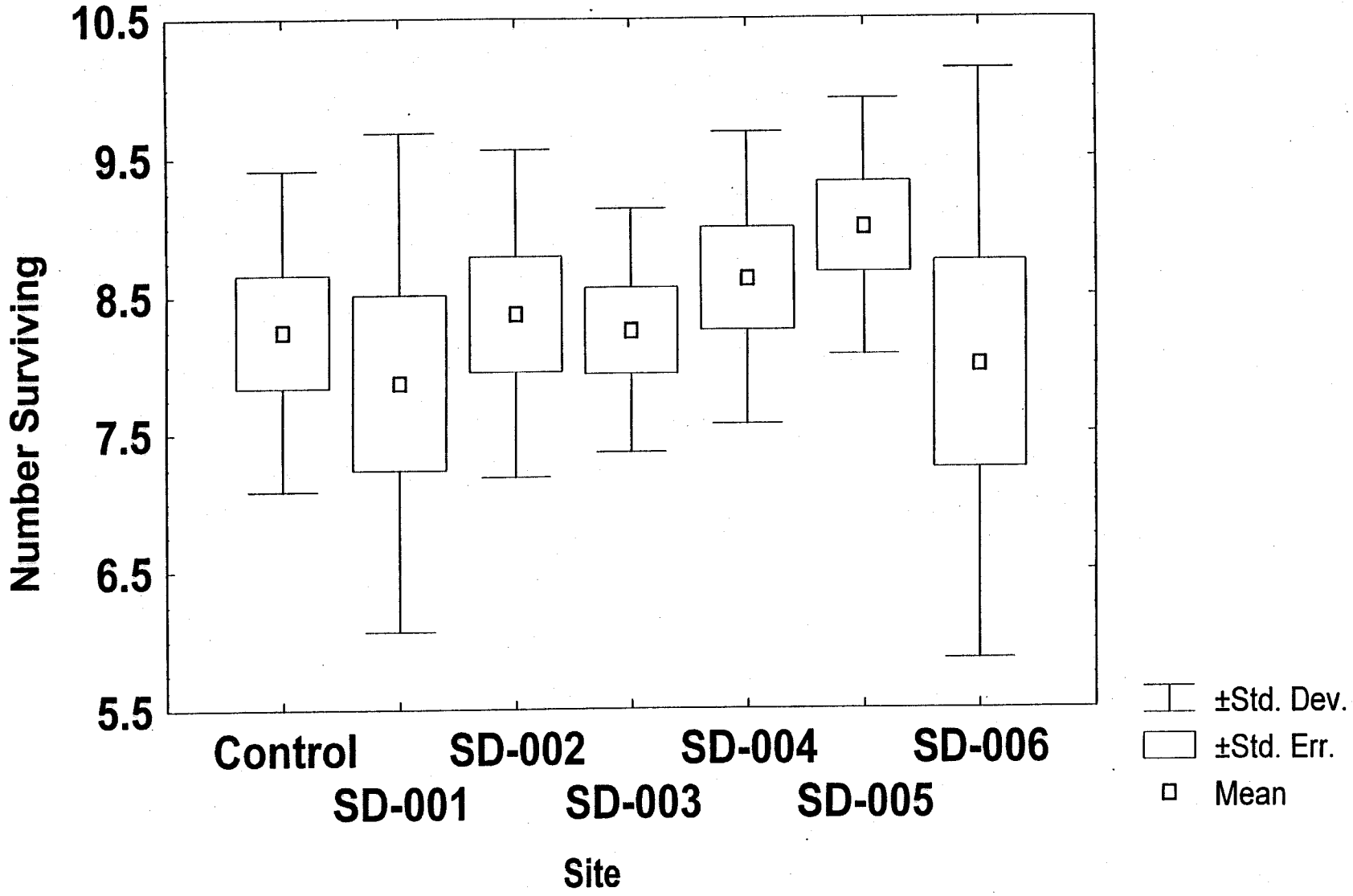
Client: Tetra Tech NUS	NPDES Permit #:	
Experiment ID: Tt NUS 6/22/99 *H. azteca*	Start Test	6-22-99
Sample Tested: Lake Fretwell, NAS Cecil Field, FL	End Test	7-2-99

RESULTS

WATER CHEMISTRY ANALYSIS (RANGE)							
Site	Cond. (µmhos)	D.O. (mg/L)	pH	Temp. (°C) Instantaneous	Alkalinity (mg/L as $CaCO_3$)	Hardness (mg/L as $CaCO_3$)	Ammonia (mg/L)
Control	349-410	6.0-8.0	7.1-7.3	21.5-24.5	88-100	136-146	0.055-0.77
SD-001	315-370	6.1-7.4	6.6	21.5-24.5	68-74	108-154	0.14-1.68
SD-002	322-373	5.6-7.1	6.7-6.9	21.5-24.5	76-80	120-166	0.094-0.46
SD-003	300-377	6.1-8.2	6.8-7.0	21.5-24.5	66-76	106-156	0.071-0.66
SD-004	261-371	5.0-7.9	6.9-7.0	21.5-24.5	54-68	104-152	0.060-0.44
SD-005	317-356	5.9-7.3	6.9-7.2	21.5-24.5	70-84	118-160	0.084-0.25
SD-006	335-382	5.6-8.0	7.0-7.3	21.5-24.5	76	134-160	0.064-0.25

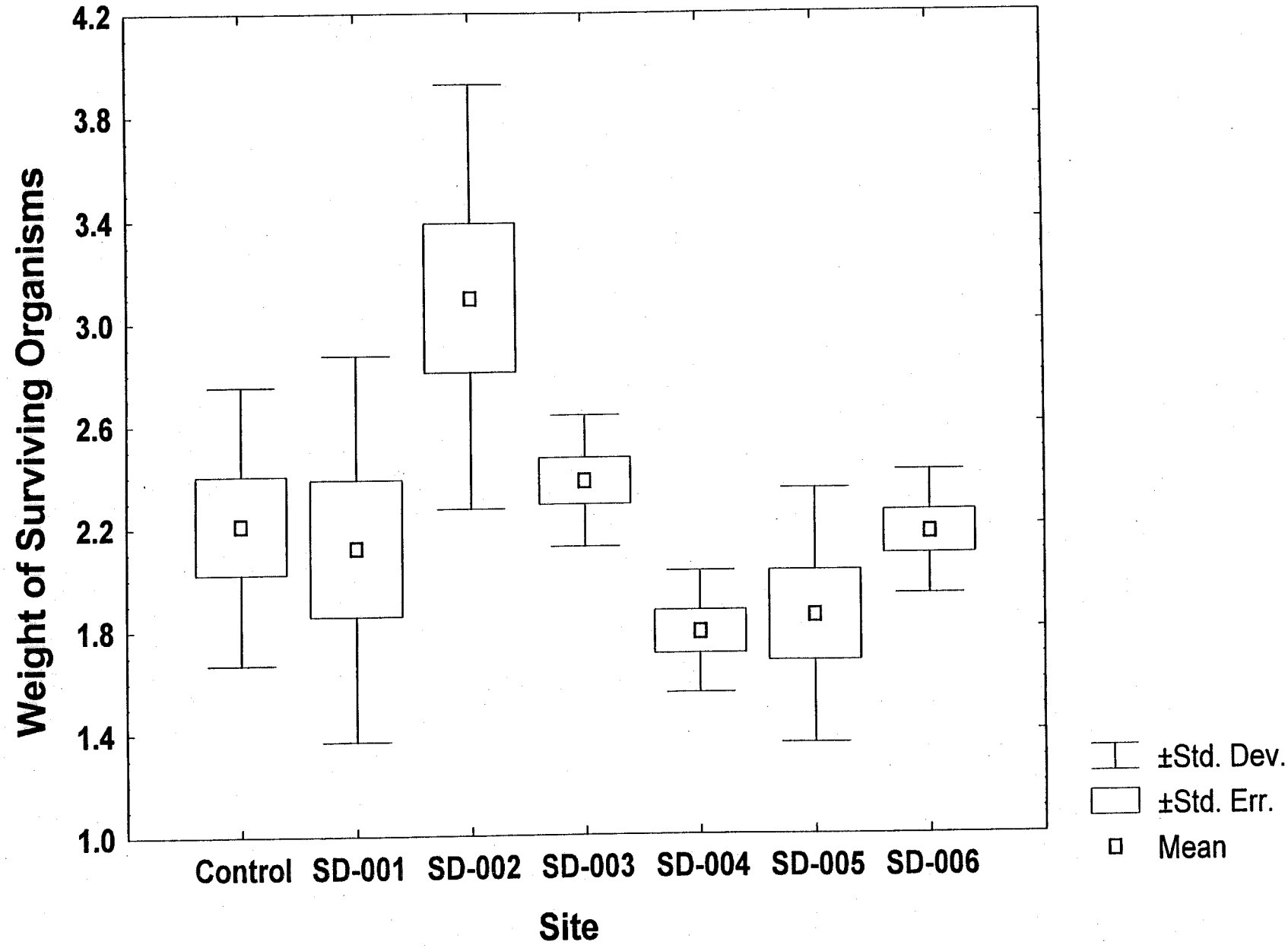
Survival of *Chironomus tentans* in 10 Day Sediment Toxicity Test

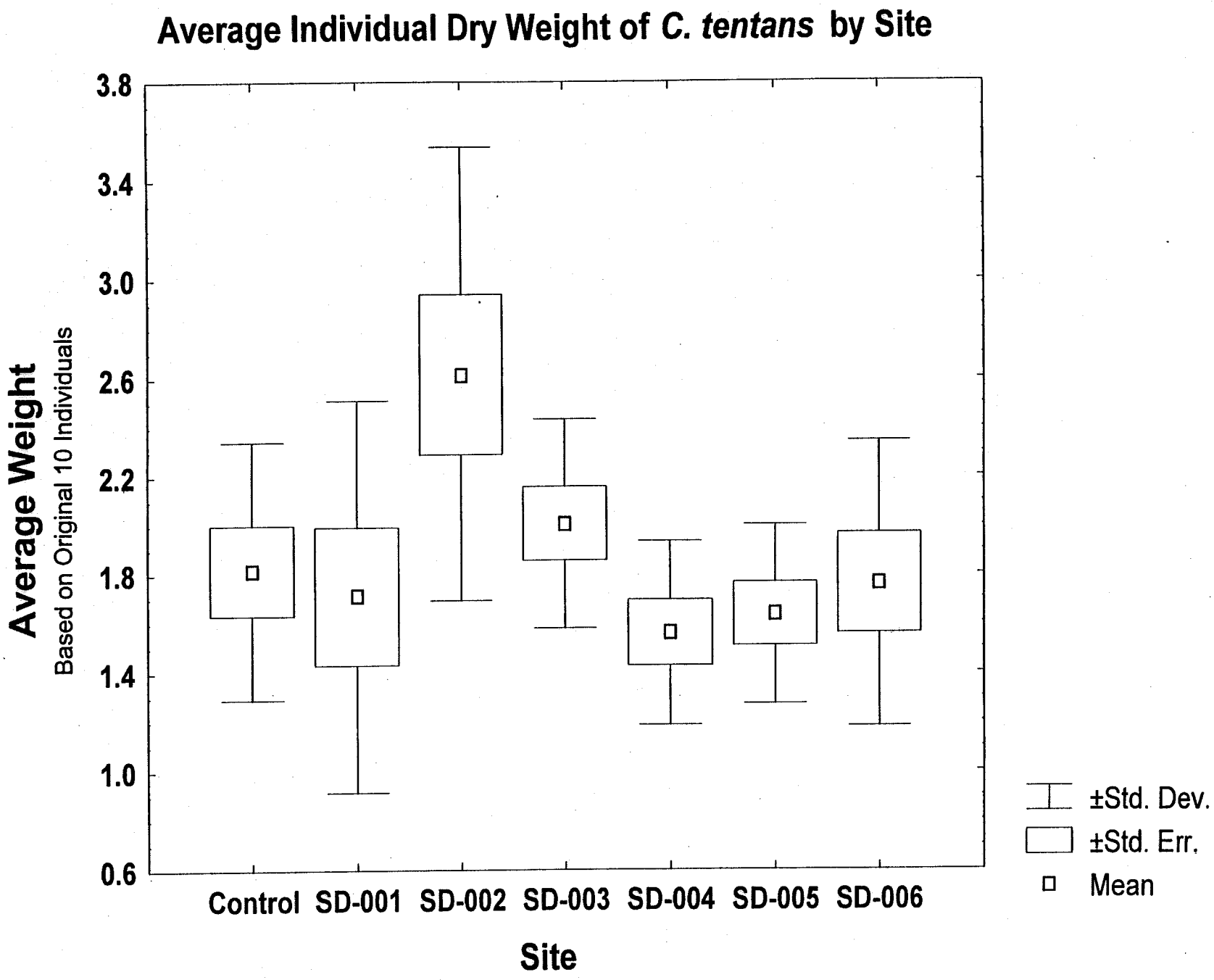
Lake Fretwell, NAS Cecil Field, Florida - Tetra Tech NUS



All chambers began with 10 individuals.

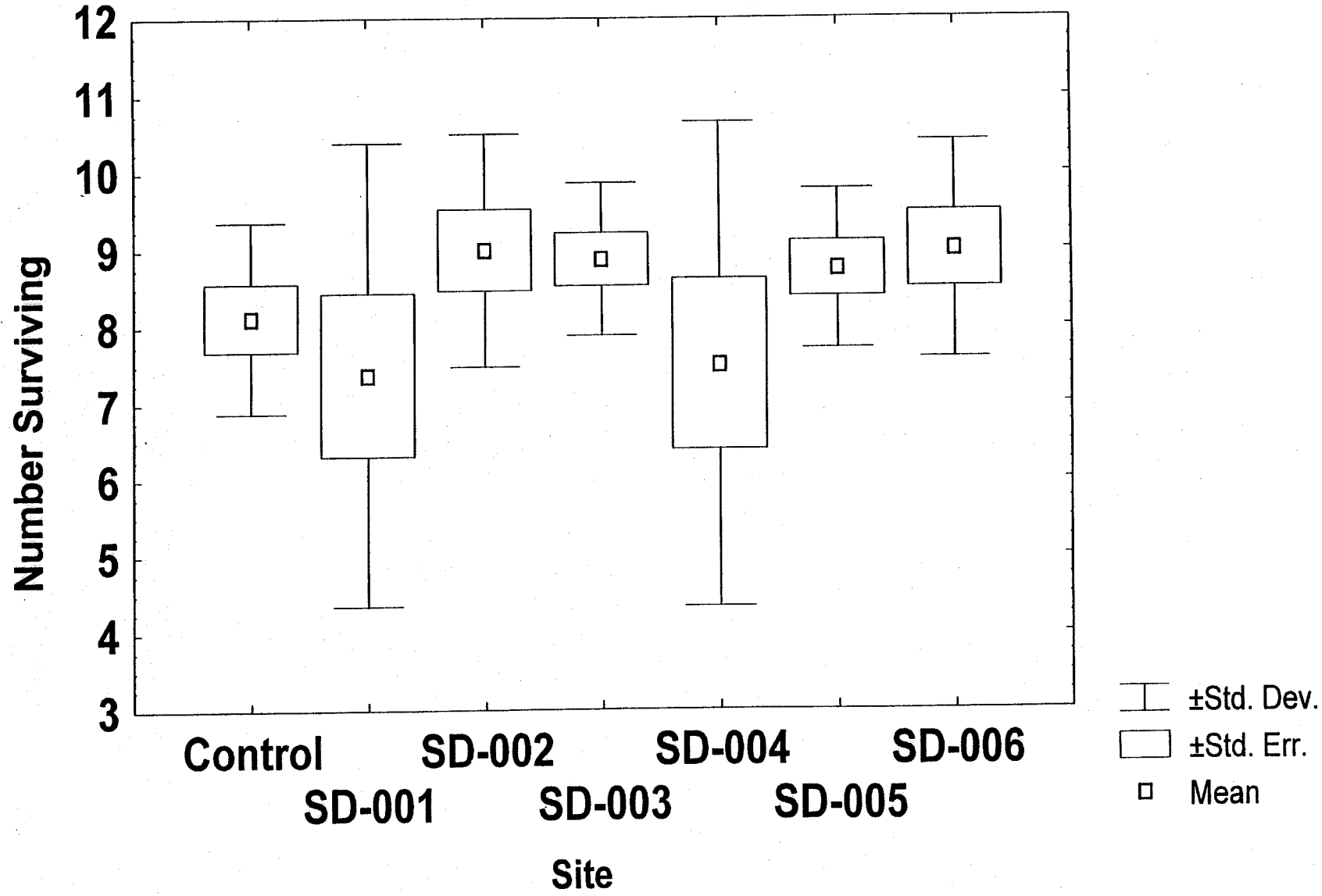
Mean Weight of Surviving *C. tentans* Larvae in Each Site



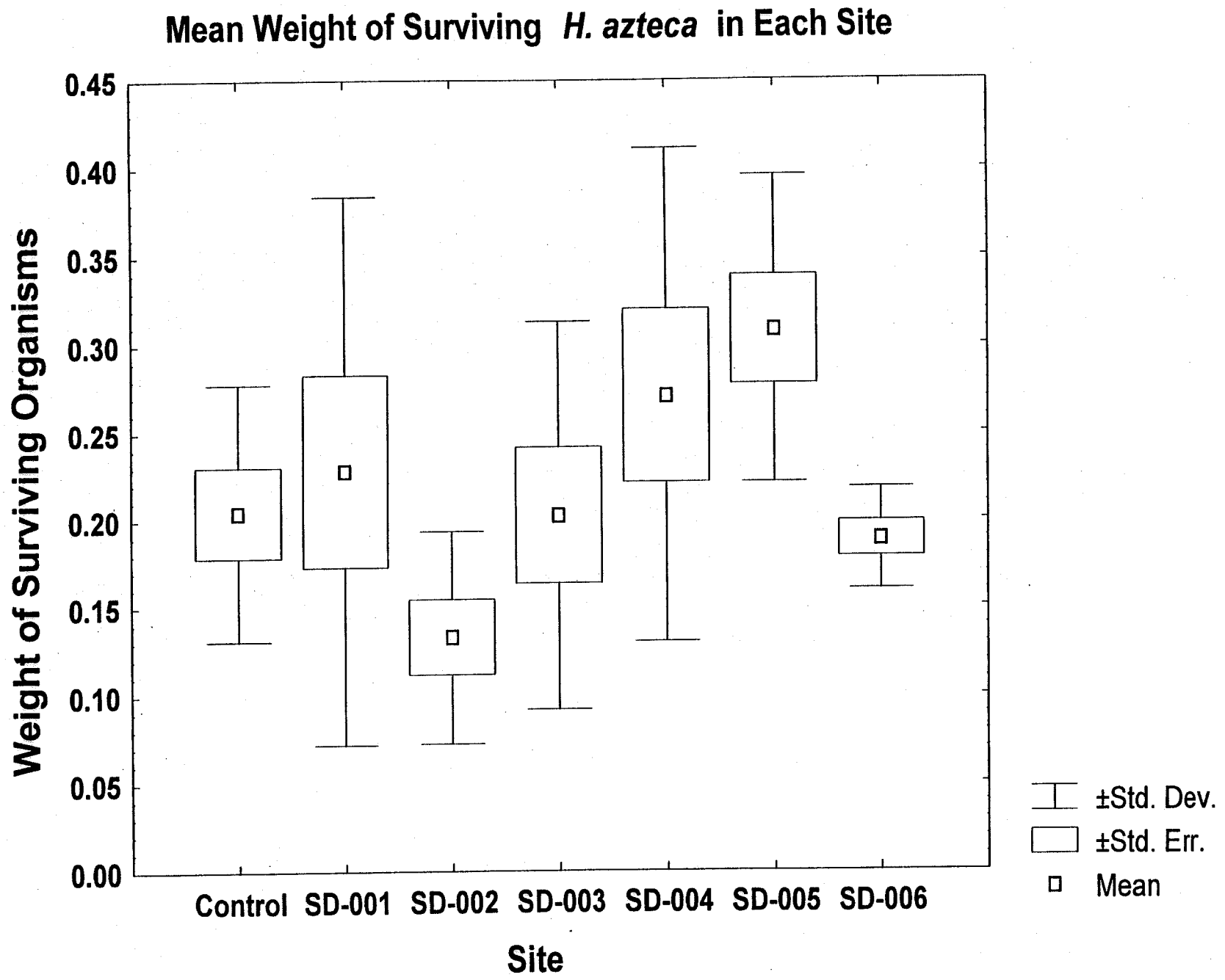

Average Individual Dry Weight of C. tentans by Site
Average Weight
Based on Original 10 Individuals
3.8
3.4
3.0
2.6
2.2
1.8
1.4
1.0
0.6
Control
SD-001
SD-002
SD-003
SD-004
SD-005
SD-006
Site
±Std. Dev.
±Std. Err.
Mean

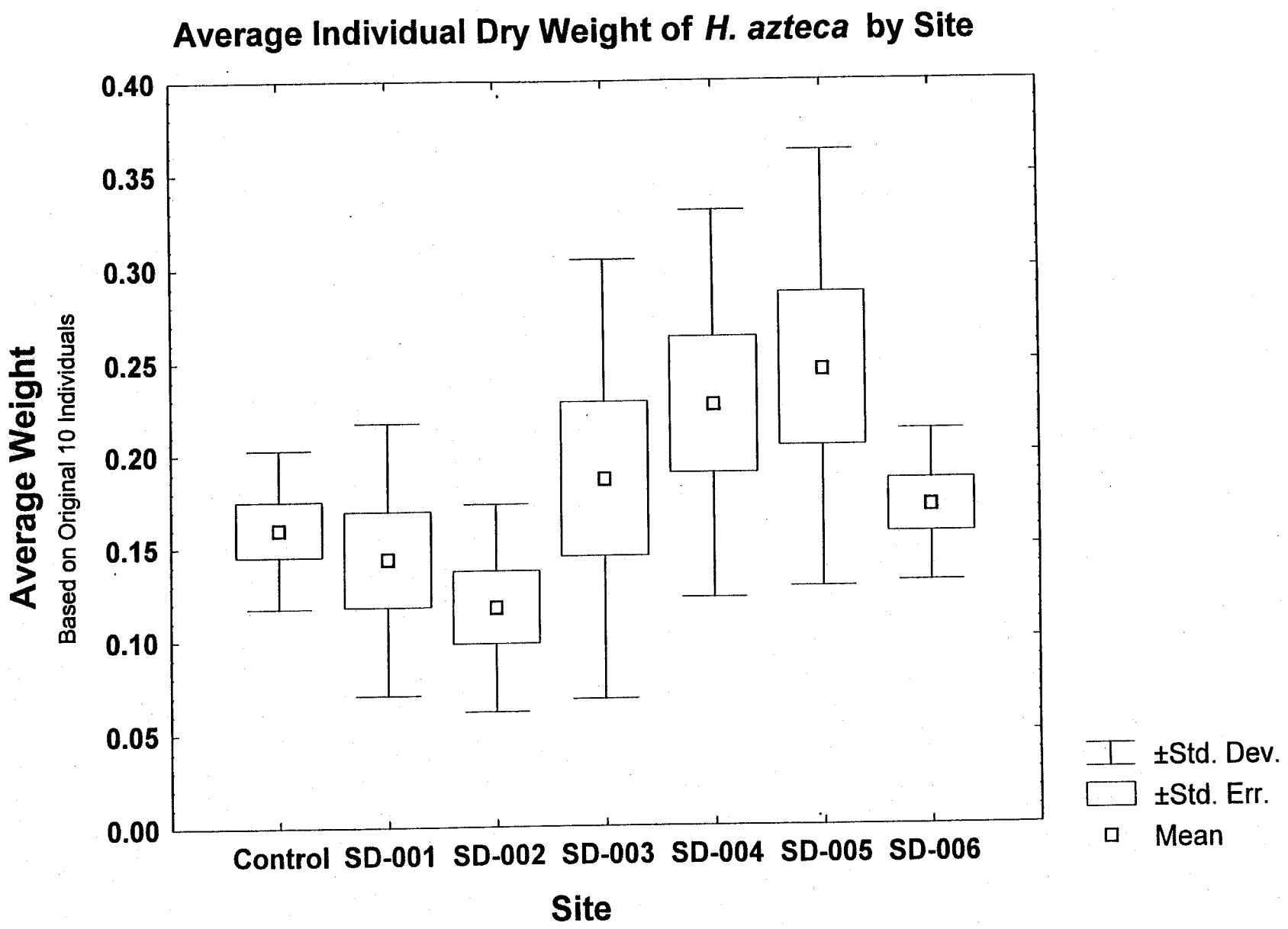
Survival of *Hyalella azteca* in 10 Day Sediment Toxicity Test

Lake Fretwell, NAS Cecil Field, Florida - Tetra Tech NUS



All chambers began with 10 individuals.


Mean Weight of Surviving H. azteca in Each Site
Weight of Surviving Organisms
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Control
SD-001
SD-002
SD-003
SD-004
SD-005
SD-006
Site
±Std. Dev.
±Std. Err.
Mean


Average Individual Dry Weight of *H. azteca* by Site
Average Weight
Based on Original 10 Individuals
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Control
SD-001
SD-002
SD-003
SD-004
SD-005
SD-006
Site
±Std. Dev.
±Std. Err.
Mean

STATISTICAL ANALYSIS

Duncan test; Variable: SURVCHIR (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=8.2500	{2} M=7.8750	{3} M=8.3750	{4} M=8.2500	{5} M=8.6250	{6} M=9.0000	{7} M=8.0000
Control	{1}		0.627169	0.857331	1	0.613726	0.330741	0.736587
SD-001	{2}	0.627169		0.527416	0.613726	0.351157	0.166844	0.857331
SD-002	{3}	0.857331	0.527416		0.866659	0.719247	0.400224	0.627169
SD-003	{4}	1	0.613726	0.866659		0.627169	0.342684	0.719247
SD-004	{5}	0.613726	0.351157	0.719247	0.627169		0.589993	0.429324
SD-005	{6}	0.330741	0.166844	0.400224	0.342684	0.589993		0.213317
SD-006	{7}	0.736587	0.857331	0.627169	0.719247	0.429324	0.213317	

Duncan test; Variable: MWSCHIR (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=2.2100	{2} M=2.1200	{3} M=3.0975	{4} M=2.3775	{5} M=1.7875	{6} M=1.8487	{7} M=2.1713
Control	{1}		0.752152	0.002251	0.530421	0.162568	0.221486	0.884435
SD-001	{2	0.752152		0.001262	0.383917	0.243317	0.31119	0.847563
SD-002	{3	0.002251	0.001262		0.009202	5.2E-05	8.2E-05	0.00185
SD-003	{4	0.530421	0.383917	0.009202		0.054592	0.080011	0.469051
SD-004	{5	0.162568	0.243317	5.2E-05	0.054592		0.8183	0.193952
SD-005	{6	0.221486	0.31119	8.2E-05	0.080011	0.8183		0.257756
SD-006	{7	0.884435	0.847563	0.00185	0.469051	0.193952	0.257756	

Duncan test; Variable: DWOCHIR (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=1.8175	{2} M=1.7138	{3} M=2.6150	{4} M=2.0062	{5} M=1.5600	{6} M=1.6363	{7} M=1.7613
Control	{1}		0.749719	0.014944	0.535574	0.456861	0.591563	0.853327
SD-001	{2	0.749719		0.008789	0.386119	0.636257	0.79894	0.875935
SD-002	{3	0.014944	0.008789		0.049726	0.002831	0.005066	0.011342
SD-003	{4	0.535574	0.386119	0.049726		0.204336	0.284516	0.451068
SD-004	{5	0.456861	0.636257	0.002831	0.204336		0.802113	0.551237
SD-005	{6	0.591563	0.79894	0.005066	0.284516	0.802113		0.700614
SD-006	{7	0.853327	0.875935	0.011342	0.451068	0.551237	0.700614	

Duncan test; Variable: SURVHYAL (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=8.1250	{2} M=7.3750	{3} M=9.0000	{4} M=8.8750	{5} M=7.5000	{6} M=8.7500	{7} M=9.0000
Control	{1}		0.477518	0.43629	0.477518	0.527698	0.527698	0.424821
SD-001	{2	0.477518		0.159996	0.181151	0.899364	0.209289	0.154429
SD-002	{3	0.43629	0.159996		0.906156	0.188911	0.82041	1
SD-003	{4	0.477518	0.181151	0.906156		0.209289	0.899364	0.899364
SD-004	{5	0.527698	0.899364	0.188911	0.209289		0.236691	0.181151
SD-005	{6	0.527698	0.209289	0.82041	0.899364	0.236691		0.812998
SD-006	{7	0.424821	0.154429	1	0.899364	0.181151	0.812998	

Duncan test; Variable: MWSHYAL (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=.20450	{2} M=.22813	{3} M=.13313	{4} M=.20250	{5} M=.27075	{6} M=.30850	{7} M=.18875
Control	{1}		0.647665	0.212578	0.969213	0.230343	0.068984	0.775552
SD-001	{2	0.647665		0.104816	0.642535	0.41074	0.145847	0.492276
SD-002	{3	0.212578	0.104816		0.209151	0.020411	0.003468	0.284173
SD-003	{4	0.969213	0.642535	0.209151		0.233361	0.070072	0.790155
SD-004	{5	0.230343	0.41074	0.020411	0.233361		0.46596	0.161946
SD-005	{6	0.068984	0.145847	0.003468	0.070072	0.46596		0.043993
SD-006	{7	0.775552	0.492276	0.284173	0.790155	0.161946	0.043993	

Duncan test; Variable: DWOHYAL (2nusdata.sta)
Marked differences are significant at p < .05000

		{1} M=.16000	{2} M=.14375	{3} M=.11750	{4} M=.18625	{5} M=.22625	{6} M=.24500	{7} M=.17125
Control	{1}		0.703893	0.352132	0.565446	0.161768	0.079186	0.792402
SD-001	{2	0.703893		0.539667	0.370024	0.088498	0.039482	0.547086
SD-002	{3	0.352132	0.539667		0.156325	0.026849	0.010248	0.25664
SD-003	{4	0.565446	0.370024	0.156325		0.351214	0.198593	0.72569
SD-004	{5	0.161768	0.088498	0.026849	0.351214		0.661052	0.228699
SD-005	{6	0.079186	0.039482	0.010248	0.198593	0.661052		0.119206
SD-006	{7	0.792402	0.547086	0.25664	0.72569	0.228699	0.119206	

LABORATORY BENCH SHEETS

Site	Replicate	Orig. Num. Loaded	Surv. Chir.	Mean Weight of Surv. Chir.	Dry Weight of Orig. Chir.	Surv. Hyal.	Mean Weight of Surv. Hyal.	Dry Weight of Orig. Hyal.
Control	3	10	7	2.2	1.54	6	0.317	0.19
Control	4	10	9	1.76	1.58	9	0.189	0.17
Control	5	10	8	1.76	1.41	7	0.26	0.18
Control	6	10	10	1.54	1.54	10	0.08	0.08
Control	7	10	7	2.07	1.45	8	0.16	0.13
Control	8	10	9	2.81	2.53	8	0.16	0.13
SD-001	1	10	5	0.92	0.46	5	0.58	0.29
SD-001	2	10	9	3.02	2.72	8	0.125	0.1
SD-001	3	10	10	1.79	1.79	10	0.08	0.08
SD-001	4	10	10	2.52	2.52	10	0.15	0.15
SD-001	5	10	6	1.37	0.82	2	0.25	0.05
SD-001	6	10	7	1.84	1.29	10	0.17	0.17
SD-001	7	10	8	2.81	1.96	9	0.19	0.17
SD-001	8	10	8	2.69	2.15	5	0.28	0.14
SD-002	1	10	9	4.34	3.91	10	0.07	0.07
SD-002	2	10	10	4.14	4.14	10	0.09	0.09
SD-002	3	10	8	3.2	2.56	10	0.12	0.12
SD-002	4	10	8	2.64	2.11	8	0.125	0.1
SD-002	5	10	9	2.73	2.46	6	0.15	0.09
SD-002	6	10	9	1.8	1.62	10	0.07	0.07
SD-002	7	10	6	3.15	1.89	8	0.21	0.17
SD-002	8	10	8	2.78	2.23	10	0.23	0.23
SD-003	1	10	7	2.26	1.58	8	0.19	0.15
SD-003	2	10	9	2.67	2.4	10	0.23	0.23
SD-003	3	10	8	2.5	2	10	0.15	0.15
SD-003	4	10	7	2.1	1.47	10	0.45	0.45

SD-003	5	10	9	2.23	2.01	8	0.15	0.12
SD-003	6	10	9	2.08	1.87	8	0.12	0.1
SD-003	7	10	9	2.78	2.8	9	0.23	0.21
SD-003	8	10	8	2.4	1.92	8	0.1	0.08
SD-004	1	10	10	2.11	2.11	9	0.278	0.25
SD-004	2	10	10	1.91	1.91	9	0.178	0.16
SD-004	3	10	8	1.78	1.42	8	0.35	0.28
SD-004	4	10	8	1.56	1.25	10	0.27	0.27
SD-004	5	10	7	1.61	1.13	9	0.3	0.27
SD-004	6	10	9	1.85	1.67	8	0.3	0.24
SD-004	7	10	8	1.44	1.15	7	0.49	0.34
SD-004	8	10	9	2.04	1.84	0	0	0
SD-005	1	10	10	2	2	7	0.286	0.02
SD-005	2	10	8	2.36	1.89	10	0.4	0.4
SD-005	3	10	9	1.38	1.24	10	0.15	0.15
SD-005	4	10	8	2.32	1.86	8	0.325	0.26
SD-005	5	10	9	2.06	1.85	9	0.278	0.25
SD-005	6	10	10	0.94	0.94	9	0.278	0.25
SD-005	7	10	10	1.62	1.62	9	0.311	0.28
SD-005	8	10	8	2.11	1.69	8	0.44	0.35
SD-006	1	10	10	2.32	2.32	9	0.23	0.21
SD-006	2	10	10	2.45	2.45	8	0.14	0.11
SD-006	3	10	5	1.96	0.98	10	0.21	0.21
SD-006	4	10	5	2.08	1.04	6	0.18	0.11
SD-006	5	10	8	2.34	1.87	10	0.17	0.17
SD-006	6	10	10	1.95	1.95	10	0.17	0.17
SD-006	7	10	9	2.43	2.19	9	0.21	0.19
SD-006	8	10	7	1.84	1.29	10	0.2	0.2

Chironomus tentans Survival and Growth Test

Test No CEF-P48-SD-001 Start Date 6/18/99 End Date 6/28/99 Client: TtNUS

Organism C. tentans Batch No ABS 6/18/99 C. tentans Age 3rd Instar Scientists: MD, CD

Water Type/Location Lake Frotwall, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ MU	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-001	0	10	10	10	10	10	10	10	10	22.6	6.8	336	-6.7	6.5	76	114		✓	✓	MB
	1									23	3.9						✓	✓	✓	MB
	2									22.5	7.0						✓	✓	✓	MB
	3									22.0	5.4						✓	✓	✓	MB
	4									22.5	6.6						✓	✓	✓	MB
	5									22.7	6.1						✓	✓	✓	JD
	6									22.9	7.5						✓	✓	✓	JD
	7									22.8	6.6						✓	✓	✓	JD
	8									24.5	6.1						✓	✓	✓	MB
	9									24.0	3.5	256	71.5	6.6	62	98	✓	✓	✓	MB
	10	5	9	10	10	6	7	8	8	22.1	5.9						✓	✓	✓	MB

Test No. CEF-P48-SD-002 Start Date 6/18/99 End Date 6/28/99 Client: TtNUS

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: MB, CD

Water Type/Location Lake Frotwall, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ MU	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-002	0	10	10	10	10	10	10	10	10	22.6	7.5	324	48.9	6.8	68	112		✓	✓	MB
	1									23	7.5						✓	✓	✓	MB
	2									22.5	6.5						✓	✓	✓	MB
	3									22.0	7.2						✓	✓	✓	MB
	4									22.5	7.4						✓	✓	✓	MB
	5									22.7	6.6						✓	✓	✓	JD
	6									22.9	7.9						✓	✓	✓	JD
	7									22.8	6.7						✓	✓	✓	JD
	8									24.5	5.9						✓	✓	✓	MB
	9									24.0	5.2	320	72.4	6.8	80	116	✓	✓	✓	MB
	10	9	10	8	8	~~8~~ 9	9	6	8	22.1	6.1						✓	✓	✓	MB

Chironomus tentans Survival and Growth Test

Test No. CEF-P48-SD-003 Start Date 6/18/99 End Date 6/28/99 Client: TtNUS

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: MB, CD

Water Type/Location Lake Frohwill, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mU	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-003	0	10	10	10	10	10	10	10	10	22.6	7.4	297	37.9	6.9	70	104	✓	✓	✓	MB
	1									23	7.8						✓	✓	✓	MB
	2									22.5	7.2						✓	✓	✓	MB
	3									22.0	7.3						✓	✓	✓	MB
	4									22.5	7.6						✓	✓	✓	MB
	5									22.7	6.3						✓	✓	✓	JP
	6									22.9	7.6						✓	✓	✓	JP
	7									22.8	6.8						✓	✓	✓	JP
	8									24.5	6.3						✓	✓	✓	MB
	9									24.0	5.5	312	73.9	7.3	56	120	✓	✓	✓	MB
	10	7	9	8	7	9	9	9	8	22.1	5.9						✓	✓	✓	MB

Test No. CEF-P48-SD-004 Start Date 6/18/99 End Date 6/28/99 Client: TtNUS

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: CD, MB

Water Type/Location Lake Frohwill, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mU	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-004	0	10	10	10	10	10	10	10	10	22.6	7.4	266	31.8	7.2	52	92		✓	✓	MB
	1									23	7.4						✓	✓	✓	MB
	2									22.5	6.9						✓	✓	✓	MB
	3									22.0	7.3						✓	✓	✓	MB
	4									22.5	7.3						✓	✓	✓	MB
	5									22.7	6.0						✓	✓	✓	JP
	6									22.9	7.7						✓	✓	✓	CD
	7									22.8	6.8						✓	✓	✓	JP
	8									24.5	6.0						✓	✓	✓	MB
	9									24.0	5.1	263	72.2	7.5	56	96	✓	✓	✓	MB
	10	10	10	8	8	7	9	8	9	22.1	6.0						✓	✓	✓	MB

Test No. CEF-P48-SD-005 Start Date 6/18/99 End Date 6/28/99 Client: TE NAS

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: CD, MB

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Cone.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ MV	pH SU	Alkalinity	Hardness	Renewed	Fed	Initial
	0	10	10	10	10	10	10	10	10	22.6	6.9	301	53.9	7.2	60	100	✓	✓	MB
	1									23	7.2						✓	✓	MB
	2									22.5	7.5						✓	✓	MB
	3									22.0	7.6						✓	✓	MB
	4									22.5	7.7						✓	✓	MB
	5									22.7	6.5						✓	✓	JP
	6									22.9	7.8						✓	✓	CD
	7									22.8	6.2						✓	✓	JP
	8									24.5	5.5						✓	✓	MB
	9									24.0	4.5	315	73.3	7.5	80	120	✓	✓	MB
	10	10	8	9	8	9	10	10	8	22.1	6.2						✓	✓	MB

Test No. CEF-P48-SD-006 Start Date 6/18/99 End Date 6/28/99 Client: TE NAS

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: CD, MB

Water Type/Location Lake Frotwell, Cecil Field NAS, Jacksonville FL No. Organisms/~~Cone.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ MV	pH SU	Alkalinity	Hardness	Renewed	Fed	Initial
CEF-P48-SD-006	0	10	10	10	10	10	10	10	10	22.6	7.1	328	59.3	7.2	72	124	✓	✓	MB
	1									23	4.7						✓	✓	MB
	2									22.5	7.4						✓	✓	MB
	3									22.0	7.8						✓	✓	MB
	4									22.5	7.6						✓	✓	MB
	5									22.7	6.4						✓	✓	JP
	6									22.9	7.7						✓	✓	CD
	7									22.8	6.4						✓	✓	JP
	8									24.5	5.6						✓	✓	MB
	9									24.0	4.6	348	64.2	7.5	94	134	✓	✓	MB
	10	10	10	5	5	8	10	9	7	22.1	6.6						✓	✓	MB

Chironomus tentans **Survival and Growth Test**

Test No. Control Start Date 6/18/99 End Date 6/25/99 Client: Tt Nus

Organism C. tentans Batch No. ABS 6/18/99 C. tentans Age 3rd Instar Scientists: CD, MB

Water Type/Location No. Organisms/~~Conc.~~ 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ MV	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
	0	10	10	10	10	10	10	10	10	22.6	7.2	359	24.5	7.5	102	120				
	1									23	6.0									
	2									22.5	6.0									
	3									22.0	7.5									
	4									22.5	7.7									
	5									22.7	5.5									
	6									22.9	7.5									
	7									22.8	7.1									
	8									24.5	6.7									
	9									24.0	5.2	348	57.7	8.2	118	144				
	10	9	7	7	9	8	10	7	9	22.1	5.1									

Test No. Start Date End Date Client:

Organism Batch No. Age Scientists:

Water Type/Location No. Organisms/Conc.

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia mg/L	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
	0																			
	1																			
	2																			
	3																			
	4																			
	5																			
	6																			
	7																			
	8																			
	9																			
	10																			

Weight Data for *Chironomus tentans* Survival and Growth Test

Test ID: TtNus 6/18/99 C. tentans | Start Date: 6/18/99 | End Date: 6/28/99

Drying Temp: 80°C | Drying Time: 48hrs | Weighing Date: 6/30/99

Analyst: WB | Client: TtNus

Site	Replicate	A Wgt. Of boat ~~(mg)~~ g	B Dry Wgt. foil and larvae (g)	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
SD-001	1	1.0846	1.0892	4.6	5	0.92	10	0.46	
	2	1.0727	1.0999	27.2	9	3.02	10	2.72	
	3	1.0938	1.1117	17.9	10	1.79	10	1.79	
	4	1.0951	1.1203	25.2	10	2.52	10	2.52	
	5	1.0800	1.0882	8.2	6	1.37	10	0.82	
	6	1.089	1.1218	12.9	7	1.84	10	1.29	
	7	1.0910	1.1106	19.6	8	2.81	10	1.96	
	8	1.0816	1.1031	21.5	8	2.69	10	2.15	
SD-002	1	1.1068	1.1459	39.1	9	4.34	10	3.91	
	2	1.0709	1.1123	41.4	10	4.14	10	4.14	
	3	1.0820	1.1076	25.6	8	3.2	10	2.56	
	4	1.0717	1.0928	21.1	8	2.64	10	2.11	
	5	1.0722	1.0968	24.6	9	2.73	10	2.46	
	6	1.0901	1.1063	16.2	9	1.8	10	1.62	
	7	1.0776	1.0965	18.9	6	3.15	10	1.89	
	8	1.0697	1.0920	22.3	8	2.78	10	2.23	
SD-003	1	1.1012	1.1170	15.8	7	2.26	10	1.58	
	2	1.0855	1.1095	24.0	9	2.67	10	2.40	
	3	1.0926	1.1126	20.0	8	2.5	10	2.00	
	4	1.0868	1.1015	14.7	7	2.1	10	1.47	
	5	1.0908	1.1109	20.1	9	2.23	10	2.01	
	6	1.0748	1.0935	18.7	9	2.08	10	1.87	
	7	1.0729	1.1009	28.0	9	2.78	10	2.80	
	8	1.0875	1.1067	19.2	8	2.4	10	1.92	

Test ID: TtNUS 6/18/99 C. tentans | Start Date: 6/18/99 | End Date: 6/28/99

Drying Temp: 80°C | Drying Time: 48 hrs. | Weighing Date: 6/30/99

Analyst: MB | Client: Tt NUS

Site	Replicate	A Wgt. Of boat (mg)	B Dry Wgt. foil and larvae	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
SD-004	1	1.0974	1.1185	21.1	10	2.11	10	2.11	
	2	1.1009	1.1200	19.1	10	1.91	10	1.91	
	3	1.1004	1.1146	14.2	8	1.78	10	1.42	
	4	1.0937	1.1062	12.5	8	1.56	10	1.25	
	5	1.0860	1.0973	11.3	7	1.61	10	1.13	
	6	1.1070	1.1237	16.7	9	1.85	10	1.67	
	7	1.0878	1.0993	11.5	8	1.44	10	1.15	
	8	1.0936	1.1120	18.4	9	2.04	10	1.84	
SD-005	1	1.0842	1.1042	20.0	10	2.00	10	2.00	
	2	1.0924	1.1113	18.9	8	2.36	10	1.89	
	3	1.0799	1.0923	12.4	9	1.38	10	1.24	
	4	1.0742	1.0928	18.6	8	2.32	10	1.86	
	5	1.0884	1.1069	18.5	9	2.06	10	1.85	
	6	1.0962	1.1056	9.4	10	0.94	10	0.94	
	7	1.0790	1.0952	16.2	10	1.62	10	1.62	
	8	1.0795	1.0964	16.9	8	2.11	10	1.69	
SD-006	1	1.0931	1.1163	23.2	10	2.32	10	2.32	
	2	1.0827	1.1072	24.5	10	2.45	10	2.45	
	3	1.0901	1.1072	9.8	5	1.96	10	0.98	
	4	1.0711	1.0999	10.4	5	2.08	10	1.04	
	5	1.0709	1.0815	18.7	8	2.34	10	1.87	
	6	1.0799	1.0896	19.5	10	1.95	10	1.95	
	7	1.0780	1.0994	21.9	9	2.43	10	2.19	
	8	1.0962	1.0991	12.9	7	1.84	10	1.29	

Weight Data for Chironomus tentans Survival and Growth Test

Test ID: Tt NUS 6/18/99 C. tentans | Start Date: 6/18/99 | End Date: 6/28/99

Drying Temp: 80°C | Drying Time: 48 hrs. | Weighing Date: 6/30/99

Analyst: MB | Client: Tt NUS

Site	Replicate	A Wgt. Of boat (mg)	B Dry Wgt. foil and larvae	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
Control	1	1.0856	1.1133	27.7	9	3.08	10	2.77	
	2	1.0891	1.1063	17.2	7	2.46	10	1.72	
	3	1.0907	1.1061	15.4	7	2.20	10	1.54	
	4	1.1037	1.1195	15.8	9	1.76	10	1.58	
	5	1.0690	1.0831	14.1	8	1.76	10	1.41	
	6	1.0731	1.0885	15.4	10	1.54	10	1.54	
	7	1.0997	1.1142	14.5	7	2.07	10	1.45	
	8	1.0880	1.1133	25.3	9	2.81	10	2.53	
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								

Hyallela azteca Survival and Growth Test

Test No. CEF-P48-SD-001 Start Date 6/22/99 End Date 7/2/99 Client: Tt NUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: MB, CD

Water Type/Location LAKE Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-001	0	10	10	10	10	10	10	10	10	22.5	7.4	315	-13.0	6.6	68	108	✓	✓	✓	MB
	1									22.7	6.4						✓	✓	✓	~~MB~~
	2									22.9	7.4						✓	✓	✓	CD
	3									22.8	7.1						✓	✓	✓	JP
	4									24.5	6.5						✓	✓	✓	MB
	5									24.0	6.0						✓	✓	✓	MB
	6									23.5	6.1						✓	✓	✓	MB
	7									23.7	5.4						✓	✓	✓	MB
	8									21.5	6.6						✓	✓	✓	~~MB~~ CD
	9									22.1	6.1	370	48.0	6.6	74	154	✓	✓	✓	MB
	10	5	8	10	10	2	10	9	5	22.5	6.4						✓	✓	✓	MB

Test No. CEF-P48-SD-002 Start Date 6/22/99 End Date 7/2/99 Client: Tt NUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: CD, MB

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD-002	0	10	10	10	10	10	10	10	10	22.5	7.1	322	19.3	6.7	76	120	✓	✓	✓	MB
	1									22.7	5.6						✓	✓	✓	JP
	2									22.9	7.9						✓	✓	✓	CD
	3									22.8	7.1						✓	✓	✓	JP
	4									24.5	6.8						✓	✓	✓	MB
	5									24.0	6.4						✓	✓	✓	MB
	6									23.5	6.1						✓	✓	✓	MB
	7									23.7	6.4						✓	✓	✓	MB
	8									21.5	6.7						✓	✓	✓	CD
	9									22.1	6.7	373	57.9	6.9	80	166	✓	✓	✓	MB
	10	10	10	10	8	6	10	8	10	22.5	6.4						✓	✓	✓	MB

Test No. CEF-P48-SD-003 Start Date 6/22/99 End Date 7/22/99 Client: TE NUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: MB, CD

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed	Fed		Initial
CEF-P48-SD003	0	10	10	10	10	10	10	10	10	22.5	7.2	300	10.2	6.8	66	106	✓	✓	✓	MB
	1									22.7	7.0						✓	✓	✓	MB
	2									22.9	8.2						✓	✓	✓	CD
	3									22.8	7.6						✓	✓	✓	CD
	4									24.5	6.9						✓	✓	✓	MB
	5									24.0	6.2						✓	✓	✓	MB
	6									23.5	6.3						✓	✓	✓	MB
	7									23.7	6.2						✓	✓	✓	MB
	8									21.5	7.1						✓	✓	✓	MB
	9									22.1	6.1	377	64.9	7.0	76	156	✓	✓	✓	MB
	10	8	10	10	10	8	8	9	8	22.5	7.0						✓	✓	✓	MB

Test No. CEF-P48-SD-004 Start Date 6/22/99 End Date 7/22/99 Client: TE NUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: CD, MB

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed	Fed		Initial
CEF-P48-SD004	0	10	10	10	10	10	10	10	10	22.5	6.5	261	7.3	6.9	54	104	✓	✓	✓	MB
	1									22.7	5.8						✓	✓	✓	CD
	2									22.9	7.9						✓	✓	✓	CD
	3									22.8	7.2						✓	✓	✓	CD
	4									24.5	6.4						✓	✓	✓	MB
	5									24.0	6.0						✓	✓	✓	MB
	6									23.5	5.8						✓	✓	✓	MB
	7									23.7	6.3						✓	✓	✓	MB
	8									21.5	7.2						✓	✓	✓	MB
	9									22.1	5.0	371	69.0	7.0	68	152	✓	✓	✓	MB
	10	9	9	8	10	9	8	7	0	22.5	7.1						✓	✓	✓	MB

Test No. CEF-P48-SD-005 Start Date 6/22/99 End Date 7/2/99 Client: TtNUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: CD, MB

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD005	0	10	10	10	10	10	10	10	10	22.5	6.7	317	20.5	6.9	70	118	✓	✓	✓	MB
	1									22.7	7.0						✓	✓	✓	JP
	2									22.9	7.3						✓	✓	✓	JP
	3									22.8	7.1						✓	✓	✓	JP
	4									24.5	6.7						✓	✓	✓	MB
	5									24.0	5.3						✓	✓	✓	MB
	6									23.5	5.6						✓	✓	✓	MB
	7									23.7	6.5						✓	✓	✓	MB
	8									21.5	6.7						✓	✓	✓	CD
	9									22.1	5.9	356	60.8	7.2	84	160	✓	✓	✓	MB
	10	7	10	10	8	9	9	9	8	22.5	6.2						✓	✓	✓	MB

Test No. CEF-P48-SD006 Start Date 6/22/99 End Date 7/2/99 Client: TtNUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: CD, MB

Water Type/Location Lake Frotwell, NAS Cecil Field, Jacksonville FL No. Organisms/~~Conc.~~ Site 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed		Fed	Initial
CEF-P48-SD006	0	10	10	10	10	10	10	10	10	22.5	6.9	335	34.3	7.0	76	134	✓	✓	✓	MB
	1									22.7	5.6						✓	✓	✓	JP
	2									22.9	8.0						✓	✓	✓	CD
	3									22.8	6.9						✓	✓	✓	JP
	4									24.5	6.2						✓	✓	✓	MB
	5									24.0	6.0						✓	✓	✓	MB
	6									23.5	6.2						✓	✓	✓	MB
	7									23.7	6.1						✓	✓	✓	MB
	8									21.5	6.9						✓	✓	✓	CD
	9									22.1	5.9	382	67.5	7.3	76	160	✓	✓	✓	MB
	10	9	8	10	6	10	10	9	10	22.5	6.5						✓	✓	✓	MB

Hyallela azteca Survival and Growth Test

Test No. Control Start Date 6/22/99 End Date 7/2/99 Client: TtNUS

Organism H. azteca Batch No. ABS 6/22/99 H. azteca Age 7-14 days Scientists: CD, MB

Water Type/Location No. Organisms/~~Conc.~~ Std 80

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia ~~mg/L~~ mN	pH SU	Alkalinity	Hardness	Renewed	Fed	Initial
Control	0	10	10	10	10	10	10	10	10	22.5	6.6	349	6.5	7.1	100	136	✓	✓	✓	MB
	1									22.7	7.0						✓	✓	✓	JP
	2									22.9	8.0						✓	✓	✓	CD
	3									22.8	7.0						✓	✓	✓	JP
	4									24.5	6.6						✓	✓	✓	MB
	5									24.0	6.2						✓	✓	✓	MB
	6									23.5	6.0						✓	✓	✓	MB
	7									23.7	6.3						✓	✓	✓	MB
	8									21.5	6.6						✓	✓	✓	CD
	9									22.1	6.4	410	71.0	7.3	88	146	✓	✓	✓	MB
	10	9	8	6	9	7	10	8	8	22.5	6.2						✓	✓	✓	MB

Test No. Start Date End Date Client:

Organism Batch No. Age Scientists:

Water Type/Location No. Organisms/Conc.

Site	Day	Replicate 1	2	3	4	5	6	7	8	Temp. °C	DO mg/L	Cond umhos	Ammonia mg/L	pH SU	Alkalinity	Hardness	Renewed	Fed	Initial
	0																		
	1																		
	2																		
	3																		
	4																		
	5																		
	6																		
	7																		
	8																		
	9																		
	10																		

Test ID: TENUS 10DAY SEDTOX H. Aztaca Start Date: 6/22/99 End Date: 7/2/99

Drying Temp: 80°C Drying Time: 96 hrs. Weighing Date: 7/6/99

Analyst: MB Client: TENUS

Site	Replicate	A Wgt. Of boat (~~mg~~ g)	B Dry Wgt. foil and larvae (g)	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
SD-001	1	1.0825	1.0854	2.9	5	0.58	10	0.29	
	2	1.0738	1.0748	1.0	8	0.125	10	0.10	
	3	1.0945	1.0953	0.8	10	0.08	10	0.08	
	4	1.0963	1.0978	1.5	10	0.15	10	0.15	
	5	1.0806	1.0881	0.5	2	0.25	10	0.05	
	6	1.1103	1.1120	1.7	10	0.17	10	0.17	
	7	1.0919	1.0936	1.7	9	0.19	10	0.17	
	8	1.0820	1.0834	1.4	5	0.28	10	0.14	
SD-002	1	1.1115	1.1122	0.7	10	0.07	10	0.07	
	2	1.0767	1.0776	0.9	10	0.09	10	0.09	
	3	1.0848	1.0860	1.2	10	0.12	10	0.12	
	4	1.0735	1.0745	1.0	8	0.125	10	0.10	
	5	1.0730	1.0739	0.9	6	0.15	10	0.09	
	6	1.0940	1.0947	0.7	10	0.07	10	0.07	
	7	1.0796	1.0813	1.7	8	0.21	10	0.17	
	8	1.0715	1.0738	2.3	10	0.23	10	0.23	
SD-003	1	1.1023	1.1038	1.5	8	0.19	10	0.15	
	2	1.0862	1.0885	MB ~~1.5~~ 2.3	10	0.23	10	0.23	
	3	1.0930	1.0945	1.5	10	0.15	10	0.15	
	4	1.0868	1.0913	4.5	10	0.45	10	0.45	
	5	1.0918	1.0930	1.2	8	0.15	10	0.12	
	6	1.0758	1.0768	1.0	8	0.13	10	0.10	
	7	1.0755	1.0776	2.1	9	0.23	10	0.21	
	8	1.0900	1.0908	0.8	8	0.1	10	0.08	

Weight Data for *Hyallela azteca* Survival and Growth Test

Page 2 of 2

Test ID: TtNUS ~~MOXAY~~ Sed. for H. azteca Start Date: 6/2/99 End Date: 7/2/99

Drying Temp: 80°C Drying Time: 96 hrs. Weighing Date: 7/6/99

Analyst: MB Client: Tt NUS

Site	Replicate	A Wgt. Of boat (~~mg~~ g)	B Dry Wgt. foil and larvae(g)	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
SD-004	1	1.0975	1.1000	2.5	9	0.278	10	0.25	
	2	1.1012	1.1028	1.6	9	0.178	10	0.16	
	3	1.1006	1.1034	2.8	8	0.35	10	0.28	
	4	1.0940	~~1.109~~ 1.0967	2.7	10	0.27	10	0.27	
	5	1.0862	1.0889	2.7	9	0.30	10	0.27	
	6	1.1078	1.1102	2.4	8	0.30	10	0.24	
	7	1.0875	1.0909	3.4	7	0.49	10	0.34	
	8	1.0932	1.0932	0	0	0	10	0	
SD-004	1	1.0844	1.0864	2.0	7	0.286	10	0.20	
	2	1.0933	1.0973	4.0	10	0.40	10	0.40	
	3	1.0813	1.0828	1.5	10	0.15	10	0.15	
	4	1.0749	1.0775	2.6	8	0.325	10	0.26	
	5	1.0888	1.0913	2.5	9	0.278	10	0.25	
	6	1.0965	1.0990	2.5	9	0.278	10	0.25	
	7	1.0789	1.0817	2.8	9	0.311	10	0.28	
	8	1.0794	1.0829	3.5	8	0.44	10	0.35	
SD-004	1	1.0944	1.0965	2.1	9	0.23	10	0.21	
	2	1.0832	1.0843	1.1	8	0.14	10	0.11	
	3	1.0904	1.0925	2.1	10	0.21	10	0.21	
	4	1.0714	1.0725	1.1	6	0.18	10	0.11	
	5	1.0714	1.0731	1.7	10	0.17	10	0.17	
	6	1.0803	1.0820	1.7	10	0.17	10	0.17	
	7	1.0775	1.0794	1.9	9	0.21	10	0.19	
	8	1.0857	1.0877	2.0	10	0.20	10	0.20	

Test ID: TtNUS 10 Day Seed Tox M. beta Start Date: 6/22/ End Date: 7/2/99

Drying Temp: 80°C Drying Time: 96 hrs. Weighing Date: 7/6/99

Analyst: MB Client: Tt NUS

Site	Replicate	A Wgt. Of boat (~~mg~~ g)	B Dry Wgt. foil and larvae (g)	B-A Total dry wgt. of larvae (mg)	C No. Of surviving larvae	(B-A)/C Mean Dry Wgt. of Surviving	D No. of original larvae	(B-A)/D Average individ. dry wgt.	Remarks
Control	1	1.0870	1.0890	2.0	9	0.22	10	0.20	
	2	1.0905	1.0925	2.0	8	0.25	10	0.20	
	3	1.0914	1.0933	1.9	6	0.317	10	0.19	
	4	1.1039	1.1056	1.7	9	0.189	10	0.17	
	5	1.0694	1.0712	1.8	7	0.26	10	0.18	
	6	1.0751	1.0759	0.8	10	0.08	10	0.08	
	7	1.1006	1.1019	1.3	8	0.16	10	0.13	
	8	1.0884	1.0897	1.3	8	0.16	10	0.13	
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								

CHAIN-OF-CUSTODY

Tetra Tech, Inc. | Biological Research Facility

CHAIN-OF-CUSTODY RECORD

Project Manager or Client Contact:

Address/Phone:
(410)-356-8993 OFFICE
(410)-455-2628 LAB

Contact Name/Phone:

Tetra Tech
c/o UMBC
TRC Building, Room 210
5200 Westland Blvd.
Catonsville MD 21227

Project Number: 0337-50 Project Name: TE NUS

Page 1 of 1

Sample Location: Lake Fretwell, NAS Cecil Field, Jacksonville, FL

Type of Analyses Requested

Shaded area for Tt use only:

Sample check-in:
DO
T °C 14
pH
Cond/Salinity
Chlorine
Appearance

Date	Time	Sample Identification/Station		Preservative (Y/N) ICE	Number of Containers	Sediment Toxicity Test	+ Chlorophyll	+ Grain Size	Collection Method	Log Number
6/7/99	1515	CEF-P48-SD-004	✓	✓	2	✓	✓			
6/7/99	1436	CEF-P48-SD-003	✓	✓	1	✓	✓			
6/7/99	1129	CEF-P48-SD-002	✓	✓	1	✓	✓			
6/7/99	1705	CEF-P48-SD-005	✓	✓	2	✓	✓			
6/7/99	1257	CEF-P48-SD-001	✓	✓	1	✓	✓			
6/8/99	0900	CEF-P48-SD-006	✓	✓	2	✓	✓			

ML Whitten

Sampled by: M.L. Whitten (signature) ML Whitten	Date/Time: June 7-8, 1999	Relinquished by: (signature) ML Whitten	Date/Time: 6/8/99 1730	Received by: Delivered to FEDEX (signature) by ML Whitten	Date/Time: 6/8/99 1730
Received by: (signature) Oakley	Date/Time: 9JUN99 0950	Received by: (signature)	Date/Time:	Received by: (signature)	Date/Time:

BRF\FORMS\CHAIN\1/23/94

FORM DISTRIBUTION: White - Tt BRF Yellow - Report Pink - Sampler

APPENDIX D

ECOLOGICAL EFFECTS EVALUATION – FOOD CHAIN MODELING; SEDIMENT SAMPLES ASSOCIATED WITH PSC 6

APPENDIX D

ECOLOGICAL EFFECTS EVALUATION – FOOD CHAIN MODELING
PSC 48, LAKE FRETWELL SEDIMENTS
SEDIMENT SAMPLES ASSOCIATED WITH PSC 6

Contaminant exposure via the food chain was modeled to investigate potential risks to representative receptors. Toxicity reference values (TRVs), which are contaminant doses associated with adverse effects on growth, survival, and reproduction, were obtained for comparison to doses that the receptors may receive in the environment. TRVs were preferentially selected that represent a threshold for sublethal effects, such as impairment of reproduction or growth. Since toxicity data for the specific receptors chosen herein were usually not available, toxicity data from laboratory species were extrapolated to receptor species. The TRVs were preferentially obtained from ORNL wildlife toxicity data (Sample et al., 1996).

TRVs used in this ecological risk assessment and their sources are presented in Table D-1 for the raccoon (representative mammal). TRVs for birds were obtained from a study by Trust et al (1993) in which adult and nestling European starlings (*Sturnus vulgaris*) were dosed with various concentrations of a PAH compound [7,12-dimethylbenz(a)anthracene]. A NOAEL of 10/mg/kg/day and LOAEL of 100 mg/kg/day from the Trust et (1993) study were used to evaluate risks to birds that are exposed to PAH compounds. TRVs for the bullfrog were based on a NOAEL value of 0.3 mg/kg/day for PAHs, and were obtained from a spreadsheet provided by the EPA Environmental Response Team (ERT, 1997). The NOAEL was multiplied by 10 to derive an estimated LOAEL of 3 mg/kg/day.

Representative Receptors

Representative ecological receptors used in the food chain model for PSC 6 consisted of the Raccoon (*Procyon lotor*), belted kingfisher (*Ceryle alcyon*), and bullfrog (*Rana catesbeiana*), all of which are found at NAS Cecil Field and are expected to forage at PSC 6. Information regarding these representative receptors is presented below.

Raccoon (*Procyon lotor*)

The raccoon was selected as a representative mammalian that preys on aquatic organisms. The raccoon is found in a variety of habitats, and particularly in swamps, floodplain forests, and marshes. The raccoon is an opportunistic feeder that will consume terrestrial and aquatic plants and animals. Crustaceans are common forage items for raccoons while fish usually comprise less than 3 percent of the diet [United States Environmental Protection Agency (U.S. EPA), 1993]. The size of a raccoon's home range depends on factors such as age, sex, habitat, food sources, and season. A literature review of several studies reported home ranges of up to 6,000 acres, although values of 200 to 600 acres were most common (U.S. EPA, 1993). Raccoon home ranges on a Georgia coastal island were 160 acres for males and 96 acres for females (Lotze, 1979).

Belted kingfisher (*Ceryle alcyon*)

The kingfisher was selected as a representative avian piscivore. The species is common in Florida and its range includes most of North America. Kingfishers are typically found along rivers, streams, seacoasts, estuaries, and along the edges of lakes and ponds. Fish are the preferred prey, commonly comprising about 90 to 95 percent of the diet, and are usually less than 18 cm in length. Kingfishers will also consume crustaceans and other aquatic organisms when fish are sparse. Breeding populations in Florida are non-migratory. Territory size is variable but usually ranges from 0.4 to 2.2 km of shoreline (U.S. EPA, 1993).

Bullfrog (*Rana catesbeiana*)

The bullfrog was selected as a representative amphibian. It is common in Florida and the eastern United States. The bullfrog is an indiscriminate and aggressive predator, feeding on crayfish, insects, small fish, snails, and occasionally small birds, small mammals, and young snakes (U.S. EPA, 1993). Frogs are also quite sensitive to contaminants and thus, provide a conservative measure of potential risks.

Exposure Estimate And Risk Calculation

Chemicals whose maximum concentrations did not exceed ecological screening values (ESVs) were dropped from further consideration, while those that equaled or exceeded ESVs were retained as ecological chemicals of potential concern (COPCs). The following equation was then used to estimate contaminant intake from ingestion for representative wildlife species:

$$PD\ ingestion = [(C_{sediment} * FI * SA * F) + (C_{food} * F * FA * FI)]/WR$$

where:

PD	=	predicted dose from the ingestion food items and the incidental ingestion of sediment (mg/kg/day)
$C_{sediment}$	=	concentration in sediment (mg/kg)
FI	=	fractional intake (portion of home range that overlaps affected area; assumed to be 100%)
SA	=	portion of diet consisting of sediment
F	=	food consumed (kg/day)
FA	=	portion of diet consisting of prey
C_{food}	=	contaminant concentration in food (mg/kg)
WR	=	weight of receptor (kg)

Exposure parameters (e.g., body weight, ingestion rate) for the representative receptors are shown in Table D-2. Most exposure parameters were obtained from the *Wildlife Exposure Factors Handbook: Volumes I and II* (U.S. EPA, 1993). Wet weight food ingestion rates shown in Table D-2 were calculated as follows:

- raccoon: 856 grams of food/gram body weight/day (g/g bw/day) calculated using mammal equation for food ingestion (g/day): $0.235 \times bw^{0.822}$ (U.S. EPA, 1993); converted to wet weight assuming 75 percent water content in food items (aquatic organisms)
- kingfisher: 0.5 g/g/bw/day (U.S. EPA, 1993)
- bullfrog: 0.04 g/g bw/day (U.S. EPA, 1993)

Contaminant concentrations in food items of the raccoon, kingfisher, and bullfrog (C_{food} in the equation shown above) were calculated using sediment concentrations and biota sediment accumulation factors (BSAFs). The BSAFs were preferentially obtained from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States* (U.S. EPA, 1997). If BSAFs were not available from U.S. EPA (1997), values were obtained from ERED (1998). Values of 1.0 were assumed where BSAFs were not available.

The following equation (U.S. EPA, 1997) was used to estimate tissue concentrations (i.e., the theoretical bioaccumulation potential) in food items of the raccoon, kingfisher, and bullfrog:

$$TBP = BSAF(C_s/f_{oc})f_l$$

Where TBP = theoretical bioaccumulation potential (mg/kg)

C_s = chemical concentration in sediment (mg/kg)

BSAF = biota-sediment accumulation factor (ratio of the concentration of a chemical in tissue, normalized to lipid, to the concentration of the chemical in surface sediment, normalized to organic carbon)

f_{oc} = total organic carbon (TOC) content of sediment expressed as a decimal fraction

f_l = organism lipid content expressed as a decimal fraction

Site-specific tissue data were not available, so lipid values in food items of the raccoon, kingfisher, and bullfrog were assumed as follows. A lipid value of 1.3 percent was used for food items of the kingfisher, and was based on largemouth bass (*Micropterus salmoides*) (Sullivan and Otwell, 1992). This was the highest value from among three fish species [largemouth bass, bluegill (*Lepomis macrochirus*), and pumpkinseed (*Lepomis macrochirus*)] that are known to occur in creeks at NAS Cecil Field. Although adult largemouth bass would be too large to be preyed upon by the kingfisher, minnows and juvenile bass could be prey items. A lipid value of 2.2 percent was used for food items of the raccoon and bullfrog. This was the highest value available from among 12 crustacean species (Sullivan and Otwell, 1992).

The use of sediment data rather than surface water to calculate doses for semi-aquatic receptors provided a conservative assessment of exposure since PAHs are generally greater in sediments than in surface water samples. Surface water samples at PSC 6 were not analyzed for PAHs.

Hazard quotients (HQs) are presented for each PAH compound at PSC 6 (Tables D-4 through D-6) and are defined as the ratio of the modeled dose to the TRV.

TABLE D-1

TOXICITY REFERENCE VALUES (TRVs) FOR THE RACCOON
PSC 48, LAKE FRETWELL SEDIMENTS
SEDIMENT SAMPLES ASSOCIATED WITH PSC 6
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Chemical	Test Species	Endpoint	NOAEL Derived TRV (mg/kg/day)	LOAEL Derived TRV (mg/kg/day)	NOAEL Source	LOAEL Source
1-Methylnaphthalene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
2-Methylnaphthalene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Acenaphthene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Acenaphthylene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Anthracene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Benzo(a)anthracene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Benzo(a)pyrene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Benzo(b)fluoranthene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Benzo(g,h,i)perylene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Benzo(k)fluoranthene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Chrysene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Dibenzo(a,h)anthracene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Fluoranthene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Fluorene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Indeno(1,2-cd)pyrene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996
Naphthalene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Phenanthrene	Mouse	Tumors	1.3	2.6	ERT, 1997	ERT, 1997
Pyrene [a]	Mouse	Reproduction	1	10	Sample et al., 1996	Sample et al., 1996

a = Benzo(a)pyrene value used as a surrogate.

TABLE D-2

EXPOSURE PARAMETERS FOR REPRESENTATIVE ECOLOGICAL RECEPTORS
PSC 48, LAKE FRETWELL SEDIMENTS
SEDIMENT SAMPLES ASSOCIATED WITH PSC 6
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIA

Receptor	Representative Group	Body Weight[1] (grams)	Water Ingestion[1] (grams/day)	Food Ingestion[1,2] (grams/day)	Assumed Diet for Exposure Assessment[1]	Home Range[1] (acres)
Raccoon (*Procyon lotor*)	Omnivorous Mammal	3990	344	856	90.6% aquatic invertebrates 9.4% sediment	96 to 160
Belted kingfisher (*Ceryle alcyon*)	Piscivorous Bird	136	15	68	100% fish soil, sdiment: none[3]	0.4 to 2.2 km[4]
Bullfrog (*Rana catesbeiana*)	Amphibian	249[5]	none	9.96	94.1% aquatic invertebrates 5.9% sediment[6]	23 square meters

Note: Although water ingestion rates are shown above, surface water samples were not collected during the recent sampling event. Thus, surface water was not incorporated into the doses for representatives at PSC 6.

1 Exposure parameters are from U.S. EPA (1993).

2 Food ingestion includes intended food items and incidentally ingested sediment. For example, a raccoon would be expected to consume 776 g invertebrates plus 80 g sediment per day.

3 Sample and Suter (1994).

4 Kilometers of shoreline (home range acreage not available).

5 Based on body weights in an Arkansas population.

6 Based on Eastern painted turtle (sediment ingestion not available for bullfrog).

TABLE D-3

BIOTA SEDIMENT ACCUMULATION FACTORS
PSC 48, LAKE FRETWELL SEDIMENTS
SEDIMENT SAMPLES ASSOCIATED WITH PSC 6
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Chemical	BSAF	Source
1-Methylnapthalene	1.0	*
2-Methylnapthalene	1.0	*
Acenaphthene	0.29m	Hansen, 1995
Acenaphthylene	0.0111	ERED, 1998
Anthracene	0.29	Hansen, 1995
Benzo(a)anthracene	0.29	Hansen, 1995
Benzo(a)pyrene	0.29	Hansen, 1995
Benzo(b)fluoranthene	0.29	Hansen, 1995
Benzo(k)fluoranthene	0.29	Hansen, 1995
Benzo(g,h,i)perylene	0.0152	ERED, 1998
Chrysene	0.29	Hansen, 1995
Dibenzo(a,h)anthracene	0.29	Hansen, 1995
Fluoranthene	0.29	Hansen, 1995
Fluorene	0.29	Hansen, 1995
Indeno(1,2,3-cd)pyrene	0.29	Hansen, 1995
Naphthalene	0.29	Hansen, 1995
Phenanthrene	0.6493	ERED, 1998
Pyrene	0.29	Hansen, 1995

* When a BSAF was unavailable, 1.0 was used.

Table D-4

Raccoon

Body Weight	3.99 kg		
Food Ingestion Rate	0.856 kg/day	% prey	0.906
Water Ingestion Rate	0.344 kg/day		
Sed Ingestion Rate	0.856 kg/day	% sed	0.094

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Crustacean Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
1-METHYLNAPHTHALENE	0.96	0	2.112	0.429869041	1	10	0.429869	0.042987
2-METHYLNAPHTHALENE	0.96	0	2.112	0.429869041	1	10	0.429869	0.042987
ACENAPHTHENE	0.96	0	0.61248	0.138407451	1.3	2.6	0.106467	0.053234
ACENAPHTHYLENE	0.96	0	0.0234432	0.023916412	1.3	2.6	0.018397	0.009199
ANTHRACENE	0.96	0	0.61248	0.138407451	1.3	2.6	0.106467	0.053234
BENZO(A)ANTHRACENE	0.1865	0	0.118987	0.026888531	1	10	0.026889	0.002689
BENZO(A)PYRENE	0.61	0	0.38918	0.087946401	1	10	0.087946	0.008795
BENZO(B)FLUORANTHENE	2.92	0	1.86296	0.42098933	1	10	0.420989	0.042099
BENZO(G,H,I)PERYLENE	55.9	0	1.869296	1.49063758	1	10	1.490638	0.149064
BENZO(K)FLUORANTHENE	4.024	0	2.567312	0.580157899	1	10	0.580158	0.058016
CHRYSENE	0.908	0	0.579304	0.130910381	1	10	0.13091	0.013091
DIBENZO(A,H)ANTHRACENE	0.219	0	0.139722	0.0315742	1.3	2.6	0.024288	0.012144
FLUORANTHENE	0.145	0	0.09251	0.020905292	1	10	0.020905	0.002091
FLUORENE	0.96	0	0.61248	0.138407451	1.3	2.6	0.106467	0.053234
INDENO(1,2,3-CD)PYRENE	0.145	0	0.09251	0.020905292	1	10	0.020905	0.002091
NAPHTHALENE	0.96	0	0.61248	0.138407451	1.3	2.6	0.106467	0.053234
PHENANTHRENE	0.96	0	1.3713216	0.285903436	1.3	2.6	0.219926	0.109963
PYRENE	0.145	0	0.09251	0.020905292	1	10	0.020905	0.002091

Table D-5

Kingfisher

Body Weight	0.136 kg	
Food Ingestion Rate	0.068 kg/day	100% fish
Water Ingestion Rate	0.015 kg/day	
Sediment Ingestion Rate	0 kg/day	

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Fish Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
1-METHYLNAPHTHALENE	0.96	0	1.248	0.624	10	100	0.0624	0.00624
2-METHYLNAPHTHALENE	0.96	0	1.248	0.624	10	100	0.0624	0.00624
ACENAPHTHENE	0.96	0	0.36192	0.18096	10	100	0.018096	0.0018096
ACENAPHTHYLENE	0.96	0	0.0138528	0.0069264	10	100	0.00069264	0.000069264
ANTHRACENE	0.96	0	0.36192	0.18096	10	100	0.018096	0.0018096
BENZO(A)ANTHRACENE	0.1865	0	0.0703105	0.03515525	10	100	0.003515525	0.000351553
BENZO(A)PYRENE	0.61	0	0.22997	0.114985	10	100	0.0114985	0.00114985
BENZO(B)FLUORANTHENE	2.92	0	1.10084	0.55042	10	100	0.055042	0.0055042
BENZO(G,H,I)PERYLENE	55.9	0	1.104584	0.552292	10	100	0.0552292	0.00552292
BENZO(K)FLUORANTHENE	4.024	0	1.517048	0.758524	10	100	0.0758524	0.00758524
CHRYSENE	0.908	0	0.342316	0.171158	10	100	0.0171158	0.00171158
DIBENZO(A,H)ANTHRACENE	0.219	0	0.082563	0.0412815	10	100	0.00412815	0.000412815
FLUORANTHENE	0.145	0	0.054665	0.0273325	10	100	0.00273325	0.000273325
FLUORENE	0.96	0	0.36192	0.18096	10	100	0.018096	0.0018096
INDENO(1,2,3-CD)PYRENE	0.145	0	0.054665	0.0273325	10	100	0.00273325	0.000273325
NAPHTHALENE	0.96	0	0.36192	0.18096	10	100	0.018096	0.0018096
PHENANTHRENE	0.96	0	0.8103264	0.4051632	10	100	0.04051632	0.004051632
PYRENE	0.145	0	0.054665	0.0273325	10	100	0.00273325	0.000273325

Table D-6

Bullfrog

Body Weight	0.249 kg		
Food Ingestion Rate	0.00996 kg/day	% prey	0.941
Water Ingestion Rate	0 kg/day		
Sed Ingestion Rate	0.00996 kg/day	% sed	0.059

Maximum Concentrations

Chemical	Sediment Concentration (mg/kg)	Water Concentration (mg/L)	Crustacean Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
Semivolatile Organic Compounds								
1-METHYLNAPHTHALENE	0.96	0	2.112	0.08176128	0.3	3	0.2725376	0.02725376
2-METHYLNAPHTHALENE	0.96	0	2.112	0.08176128	0.3	3	0.2725376	0.02725376
ACENAPHTHENE	0.96	0	0.61248	0.025319347	0.3	3	0.084397824	0.008439782
ACENAPHTHYLENE	0.96	0	0.0234432	0.003148002	0.3	3	0.01049334	0.001049334
ANTHRACENE	0.96	0	0.61248	0.025319347	0.3	3	0.084397824	0.008439782
BENZO(A)ANTHRACENE	0.1865	0	0.118987	0.004918811	0.3	3	0.016396036	0.001639604
BENZO(A)PYRENE	0.61	0	0.38918	0.016088335	0.3	3	0.053627784	0.005362778
BENZO(B)FLUORANTHENE	2.92	0	1.86296	0.077013014	0.3	3	0.256710048	0.025671005
BENZO(G,H,I)PERYLENE	55.9	0	1.869296	0.202284301	0.3	3	0.674281005	0.0674281
BENZO(K)FLUORANTHENE	4.024	0	2.567312	0.106130264	0.3	3	0.353767546	0.035376755
CHRYSENE	0.908	0	0.579304	0.023947883	0.3	3	0.079826275	0.007982628
DIBENZO(A,H)ANTHRACENE	0.219	0	0.139722	0.005775976	0.3	3	0.019253254	0.001925325
FLUORANTHENE	0.145	0	0.09251	0.003824276	0.3	3	0.012747588	0.001274759
FLUORENE	0.96	0	0.61248	0.025319347	0.3	3	0.084397824	0.008439782
INDENO(1,2,3-CD)PYRENE	0.145	0	0.09251	0.003824276	0.3	3	0.012747588	0.001274759
NAPHTHALENE	0.96	0	0.61248	0.025319347	0.3	3	0.084397824	0.008439782
PHENANTHRENE	0.96	0	1.3713216	0.053882145	0.3	3	0.17960715	0.017960715
PYRENE	0.145	0	0.09251	0.003824276	0.3	3	0.012747588	0.001274759

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