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SAMPLING AND ANALYSIS REPORT FOR ABANDONED RAILROAD BED SOUTH OF
NORMANDY BOULEVARD BASE REALIGNMENT AND CLOSURE NAS CECIL FIELD FL
10/1/2004
TETRA TECH NUS INC

Sampling and Analysis Report
for
Abandoned Railroad Bed
South of Normandy Boulevard
Base Realignment and Closure

Naval Air Station Cecil Field
Jacksonville, Florida



Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0078

October 2004

**SAMPLING AND ANALYSIS REPORT
FOR
ABANDONED RAILROAD BED
SOUTH OF NORMANDY BOULEVARD
BASE REALIGNMENT AND CLOSURE**

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

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

**Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406**

**Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220**

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

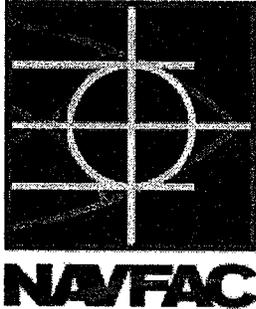
OCTOBER 2004

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The professional opinions rendered in this decision document identified as Sampling and Analysis Report for the Abandoned Railroad Bed South of Normandy Boulevard, 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 the project described in this report.

Mark Speranza

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

Mark Speranza



CERTIFICATION OF TECHNICAL
DATA CONFORMITY

The Contractor, Tetra Tech NUS, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete and accurate and comply with all requirements of this contract.

DATE: October 7, 2004

COMPANY CERTIFICATION AUTHORIZATION NUMBER: 7988
Tetra Tech NUS, Inc.
661 Andersen Drive
Pittsburgh, PA 15220

NAME AND TITLE OF CERTIFYING OFFICIAL: Mark Speranza, P.E.
Task Order Manager

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LIST OF ACRONYMS AND ABBREVIATIONS

µg/kg	Microgram(s) per kilogram
ABB-ES	ABB Environmental Services
AVORD	Aviation ordnance
BaP	benzo(a)pyrene
bgs	below ground surface
CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Chemical of concern
COPC	Chemical of potential concern
CTO	Contract Task Order
DON	Department of the Navy
EBS	Environmental Baseline Survey
ESV	Ecological screening values
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
HLA	Harding Lawson Associates
HQ	Hazard Quotient
JEDC	Jacksonville Economic Development Commission
JPA	Jacksonville Port Authority
MHSP&E	Ministry of Housing, Spatial Planning, and the Environment (Holland)
NAS	Naval Air Station
NAVFAC EFD SOUTH	Naval Facilities Engineering Field Division South
PAH	Polynuclear aromatic hydrocarbon
PSC	Potential Source of Contamination
PRE	Preliminary Risk Evaluation
SAR	Sampling and Analysis Report
SERA	Screening-level ecological risk assessment
SCTL	Soil cleanup target level
TRPH	Total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
UCL	Upper confidence limit
U.S. EPA	United States Environmental Protection Agency
YWWA	Yellow Water Weapons Area

1.0 INTRODUCTION

This Sampling and Analysis Report (SAR) for the Abandoned Railroad Bed South of Normandy Boulevard at Naval Air Station (NAS) Cecil Field in Jacksonville, Florida has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Department of the Navy, Naval Facilities Engineering Field Division South (NAVFAC EFD SOUTH). Only the portion of the abandoned railroad bed south of Normandy Boulevard that is within the Jacksonville Economic Development Commission (JEDC) parcel is included in this SAR. The work was conducted under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62467-94-D-0888, Contract Task Order (CTO) 0078.

1.1 SITE DESCRIPTION

The Navy operated a system of railroad tracks at NAS Cecil Field, including spurs and sidings, from the 1940s to 1983. The railroad cars distributed supplies and materials throughout the Facility. When the system was closed in 1984, the railroad ties and tracks were removed.

In general, railroad tracks may have elevated concentrations of certain contaminants as a result of routine operational activities. These contaminants may include polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPH) and metals from the fossil fuels used to power the engines and from ballast materials/ties used along the tracks. These elevated concentrations of contaminants do not constitute a release because they are a result of normal operating practices of the railroad.

As shown on Figures 1-1 and 1-2, the mainline of the Abandoned Railroad Bed runs north to south about 280 feet east of Authority Avenue (formerly C Avenue). The terminal end was located near the former South Fuel Farm, about 150 feet south of the intersection of Aviation Avenue (formerly A Avenue) and Crossover Street (formerly 2nd Street). The Abandoned Railroad Bed South of Normandy Boulevard parcel excludes the portion of the tracks between Building 11 and the South Fuel Farm because the tracks in this area were removed prior to the removal of the majority of the tracks, and this section appears to have been subsequently significantly reworked. Further, much of this section is outside the JEDC parcel.

There were four spurs from the mainline south of Normandy Boulevard. The first spur branched off to the east just south of 103rd Street and traveled about 10,400 feet to Building 535 [Aviation Ordnance (AVORD) Loading Dock]. The portion of this spur that was in the parcel transferred to the Jacksonville Airport Authority [formerly the Jacksonville Port Authority (JPA)] is not included in this SAR. Only about 1,100 feet of this spur is in the JEDC parcel. The second spur branched off the western side of the mainline about 900 feet north of Building 98 (Storage Building) and ran adjacent to the mainline until it

reached Building 98. The third spur branched off to the west about 900 feet north of Lake Fretwell Street (formerly 4th Street) and traveled west and then south for about 2,800 feet, further branching into two spurs just west of Buildings 68, 68A, and 68B (Supply Warehouses and Office). The fourth spur branched off to the south for about 300 feet at Building 11 (Steam Generating Plant) near the point where the mainline turned east to the South Fuel Farm and the Former Fuel Depot site. Most of this spur and a small part of the mainline are included in Site 45.

The Abandoned Railroad Bed South of Normandy Boulevard consists of two separate parcels within the JEDC parcel. The largest parcel is south of 103rd Street and consists of about 14,200 feet of abandoned railroad bed. The second parcel is located in the Jacksonville Heights section between Normandy Boulevard and 103rd Street and is about 660 feet long.

The Abandoned Railroad Bed includes the Building 98 railroad bed site that was investigated separately and has a final SAR (TtNUS, 2002a). An investigation was performed at this site due to the increased potential for releases based on the historic operations.

Recently, there has been significant construction activity on the Abandoned Railroad Bed for the installation of new buried utilities and construction of a road. The original ballast composed of large-sized gravel and cobbles has been either removed or mixed in with the backfill after construction. The railroad was constructed in the 1940s and was owned and operated by the Navy. The railroad was demolished in the mid-1980s. The tracks and ties were removed and, according to the demolition drawings, the remaining ballast was reworked only as required to make areas disturbed by track demolition neat and uniform (DON, 1986). Tracks and ties were removed at all crossings and the roadways were restored. High-voltage power lines and poles now occupy the mainline of the abandoned railroad bed from 103rd Street to Building 11. The current physical evidence of the railroad includes the ballast, some elevated portions of the ballast, some contouring of the ground, and drainage swales and culverts associated with tracks. Because of inspection and maintenance activities associated with the power lines along the mainline, a dirt path has been worn in the otherwise grassy and vegetated areas adjacent to the former tracks.

Most of the Abandoned Railroad Bed passed through areas that would be considered industrial or commercial, but about 3,500 feet of the mainline and the spur to Building 535 passed through undeveloped areas. The Abandoned Railroad Bed passes through areas identified in the reuse plan for use as roads, office, aviation support, industrial, flightline, and military purposes.

The Abandoned Railroad Bed was not specifically identified during the Environmental Baseline Survey (EBS) (ABB-ES, 1994), although individual buildings served by the railroad, such as Building 68 and Building 98, were evaluated.

1.2 PREVIOUS INVESTIGATIONS

In 2000 and 2001, soil samples were collected at the Building 98 abandoned railroad bed site because of the increased potential for releases based on the railroad-related activities conducted there including loading, unloading, fueling and maintenance. Soil samples were analyzed for PAHs, pesticides, TRPH, and metals, and PAHs and TRPH were determined to be contaminants of concern (COCs). The soil contamination was delineated, and contaminated soil was removed such that Florida Department of Environmental Protection (FDEP) residential soil cleanup target levels (SCTLs) were met (TtNUS, 2002a).

These sample locations are shown on Figure 1-3. A summary of the PAH results from these sampling events for PAHs detected in at least one sample is presented in Table 1-1.

Following these investigations, the Jacksonville Economic Development Commission (JEDC) collected a series of soil samples along the mainline in both the Main Base area and the Yellow Water Weapons Area (YWWA) in October 2001. These samples were analyzed for PAHs based on the results at other railroad sites. This investigation is further described in Section 2.0 of this SAR.

TABLE 1-1

**SOIL PAH DATA - PREVIOUS INVESTIGATIONS
ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 4**

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-098-			
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-101-02	SS-101-02	SS-002-01	SS-102-01
				Sample	Duplicate		
Polynuclear Aromatic Hydrocarbons (ug/kg)							
Anthracene	18,000.00	260,000,000	2,500,000	3.0 J	2.6 J	350 U	1.2 J
Benzo(a)anthracene	1,400	5,000	3,200	86.8	81.2	186	123
Benzo(a)pyrene	100	500	8,000	67.7	51.2	230	29.8
Benzo(b)fluoranthene	1,400	4,800	10,000	151	106	393	118
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	86.3	54.2	220	17.7 J
Benzo(k)fluoranthene	15,000	52,000	25,000	85.5	118	208	99.6
Chrysene	140,000	450,000	77,000	89.4	56.3	319 J	70.9
Dibenzo(a,h)anthracene	100	500	30,000	27 U J	54.6 J	70 U	73.3
Fluoranthene	2,900,000	48,000,000	1,200,000	146 J	72.6 J	353	112
Fluorene	2,200,000	28,000,000	160,000	180 U	180 U	350 U	200 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	89	63.8	260	29.4
Naphthalene	40,000	270,000	17,000	180 U	180 U	350 U	200 U
Phenanthrene	2,000,000	30,000,000	250,000	80 J	23.8 J	350 U	200 U
Pyrene	2,200,000	37,000,000	880,000	172	95.1	454	88.1

TABLE 1-1

**SOIL PAH DATA - PREVIOUS INVESTIGATIONS
ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
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PARAMETER	FDEP SCTL ⁽¹⁾			CEF-098-			
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-104-01	SS-105-01	SS-301-02	SS-303-02
Polynuclear Aromatic Hydrocarbons (ug/kg)							
Anthracene	18,000.00	260,000,000	2,500,000	10.8 J	20.6 J	370 U	360 U
Benzo(a)anthracene	1,400	5,000	3,200	293	484	370 U	360 U
Benzo(a)pyrene	100	500	8,000	222	400	75 U	72 U
Benzo(b)fluoranthene	1,400	4,800	10,000	353	1060	75 U	72 U
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	248	582	75 U	72 U
Benzo(k)fluoranthene	15,000	52,000	25,000	224	461	75 U	72 U
Chrysene	140,000	450,000	77,000	242	574	370 U	360 U
Dibenzo(a,h)anthracene	100	500	30,000	37.5	70.7	75 U	72 U
Fluoranthene	2,900,000	48,000,000	1,200,000	446	865	370 U	360 U
Fluorene	2,200,000	28,000,000	160,000	180 U	190 U	370 U	360 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	213	485	75 U	72 U
Naphthalene	40,000	270,000	17,000	180 U	190 U	370 U	360 U
Phenanthrene	2,000,000	30,000,000	250,000	70.7 J	72.6 J	370 U	360 U
Pyrene	2,200,000	37,000,000	880,000	457	934	370 U	360 U

TABLE 1-1

**SOIL PAH DATA - PREVIOUS INVESTIGATIONS
ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 3 OF 4**

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-P50-			
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-002-01	SS-005-01	SS-005-01	SS-006-01
					Sample	Duplicate	
Polynuclear Aromatic Hydrocarbons (ug/kg)							
Anthracene	18,000.00	260,000,000	2,500,000	100 U	120 U	120 U	100 U
Benzo(a)anthracene	1,400	5,000	3,200	15 U	19 UJ	38.9 J	30.8
Benzo(a)pyrene	100	500	8,000	70	90.9	132	43.8
Benzo(b)fluoranthene	1,400	4,800	10,000	194	146	190	94
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	88.5	122	127	57.3
Benzo(k)fluoranthene	15,000	52,000	25,000	120	93.9	105	42.4
Chrysene	140,000	450,000	77,000	15 U	150 J	226 J	56.1 J
Dibenzo(a,h)anthracene	100	500	30,000	15 U	19 U	18 U	16 U
Fluoranthene	2,900,000	48,000,000	1,200,000	90.5	352	364	84.7
Fluorene	2,200,000	28,000,000	160,000	100 U	120 U	120 U	100 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	15 U	19 U	158	65.8
Naphthalene	40,000	270,000	17,000	100 U	120 U	120 U	100 U
Phenanthrene	2,000,000	30,000,000	250,000	100 U	120 U	120 U	100 U
Pyrene	2,200,000	37,000,000	880,000	160	396	348	137

TABLE 1-1

**SOIL PAH DATA - PREVIOUS INVESTIGATIONS
ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 4 OF 4**

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-P50-		
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-101-01	SS-103-01	SS-103-01
					Sample	Duplicate
Polynuclear Aromatic Hydrocarbons (ug/kg)						
Anthracene	18,000.00	260,000,000	2,500,000	5.5 U	5.3 U	5.3 U
Benzo(a)anthracene	1,400	5,000	3,200	10	8.8	9.9
Benzo(a)pyrene	100	500	8,000	15	14	22
Benzo(b)fluoranthene	1,400	4,800	10,000	31	30	48
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	17	33	36
Benzo(k)fluoranthene	15,000	52,000	25,000	12	12	20
Chrysene	140,000	450,000	77,000	6.6	11	9.1
Dibenzo(a,h)anthracene	100	500	30,000	9.7 U	8.8 U	8.7 U
Fluoranthene	2,900,000	48,000,000	1,200,000	16	23	25
Fluorene	2,200,000	28,000,000	160,000	7.8	7 U	7.1 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	8.8	16	29
Naphthalene	40,000	270,000	17,000	40	35 U	35 U
Phenanthrene	2,000,000	30,000,000	250,000	5.5 U	5.3 U	5.3 U
Pyrene	2,200,000	37,000,000	880,000	25	27	37

Notes:

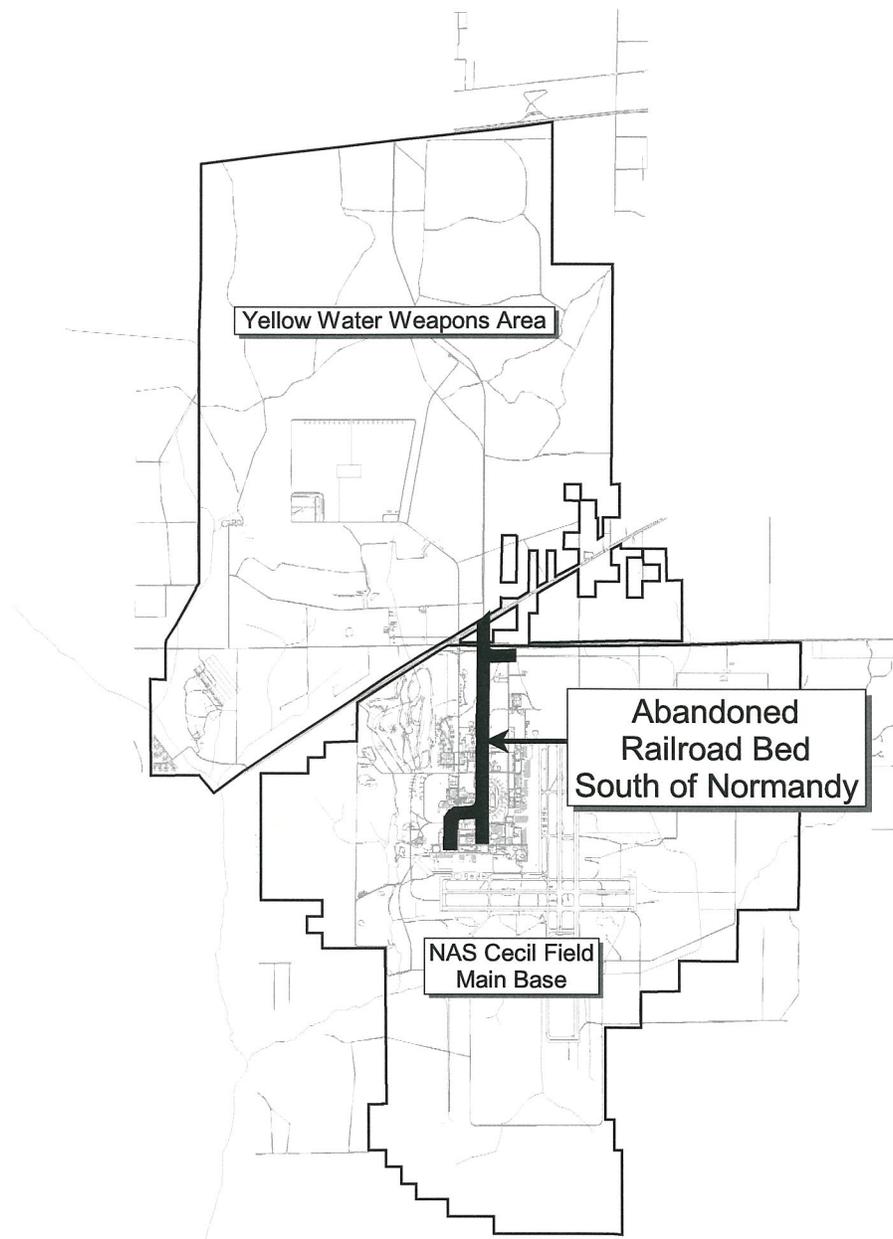
1 - Soil Cleanup Target Levels, FAC 62-777 (FDEP, 1999).

U - Not detected at or above detection limit (associated value).

J - Estimated value.

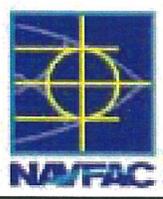
Bolded values exceed detection limit.

Shaded values exceed residential or leachability criteria.



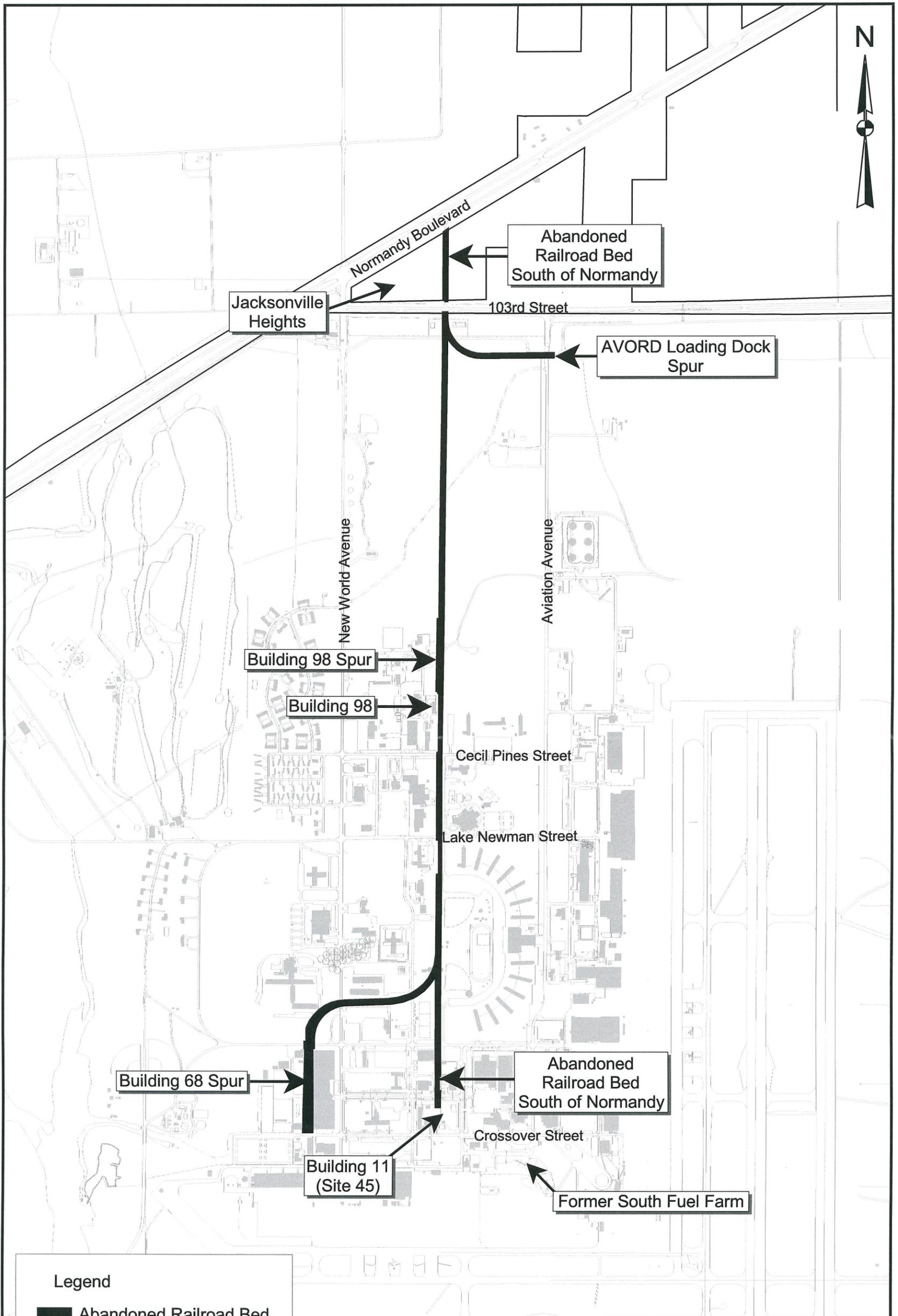
8000 0 8000 Feet

DRAWN BY MJJ	DATE 27Sept02
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

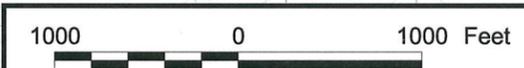


GENERAL LOCATION MAP
ABANDONED RAILROAD BED
SOUTH OF NORMANDY BOULEVARD
SAMPLING AND ANALYSIS REPORT
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>Jmh</i>	DATE 10/5/02
APPROVED BY	DATE
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Legend
 Abandoned Railroad Bed

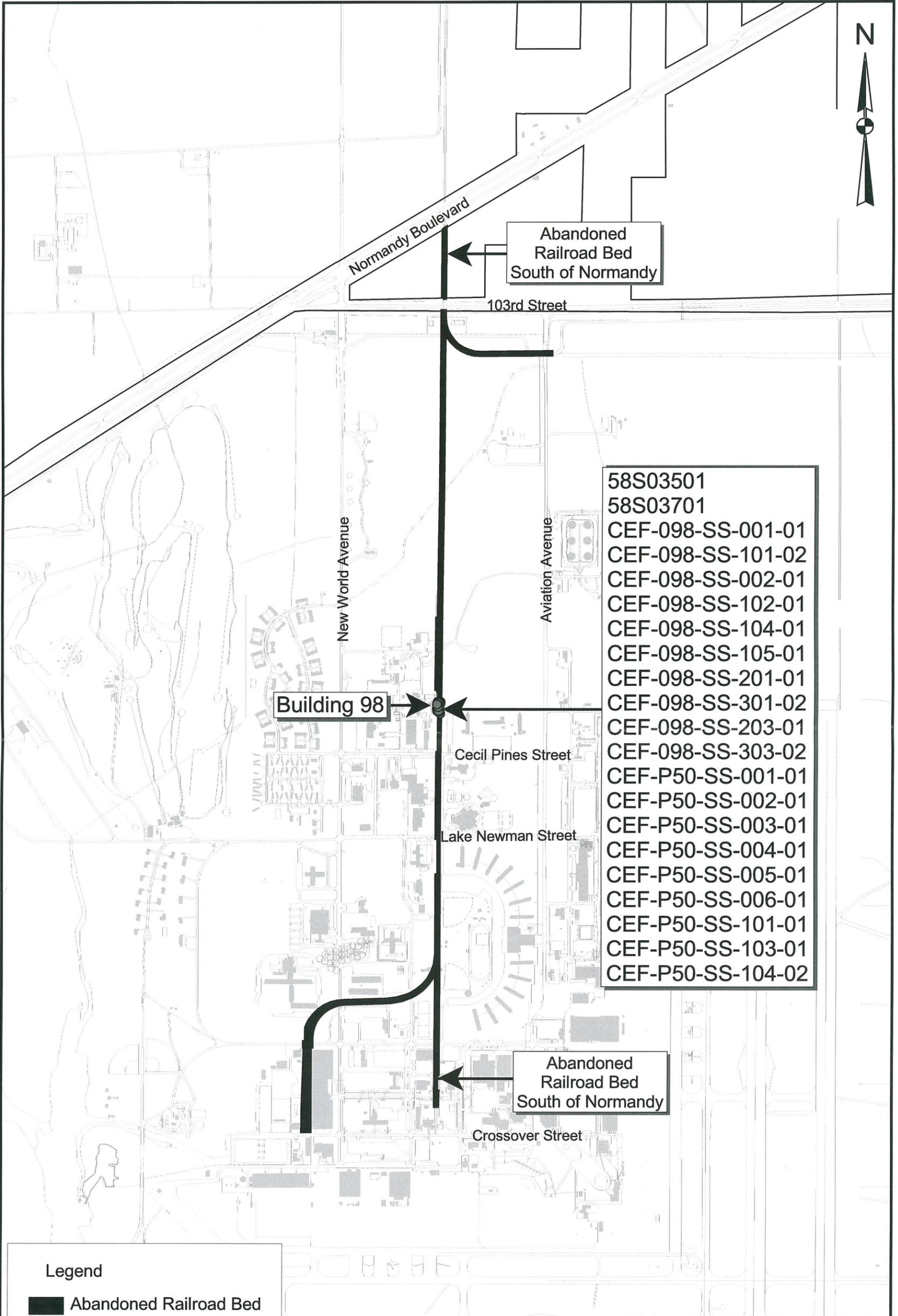


DRAWN BY MJJ	DATE 27Sept02
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



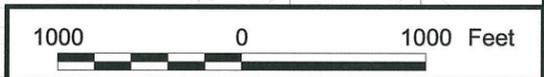
SITE LOCATION MAP
 ABANDONED RAILROAD BED
 SOUTH OF NORMANDY BOULEVARD
 SAMPLING AND ANALYSIS REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>[Signature]</i>	DATE 10/5/04
APPROVED BY	DATE
DRAWING NO. FIGURE 1-2	REV 0



Legend

- Abandoned Railroad Bed
- Soil Sample Location



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CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL SAMPLE LOCATIONS - PREVIOUS INVESTIGATIONS
 ABANDONED RAILROAD BED
 SOUTH OF NORMANDY BOULEVARD
 SAMPLING AND ANALYSIS REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>[Signature]</i>	DATE 10/5/02
APPROVED BY	DATE
DRAWING NO. FIGURE 1-3	REV 0

2.0 FIELD INVESTIGATIONS

TtNUS was contracted by JA Jones Global Services on behalf of the JEDC to collect soil samples along the mainline of the Abandoned Railroad Bed. Samples were collected both north and south of Normandy Boulevard, but only those samples collected south of Normandy Boulevard are discussed in this SAR.

These samples (also referred to as Phase I samples) were collected in June 2001 beginning at a point about 50 feet north of Cecil Pines Street (formerly 9th Street) and then proceeding north at intervals of 1,000 feet. Seven soil samples were collected beneath the ballast (CEF-RB-SS-001-02 through CEF-RB-SS-007-02) from about 1 to 2 feet below ground surface (bgs) at locations shown on Figure 2-1. Based on the absence of other contaminants at other railroad sites, these samples were analyzed for PAHs only. In addition, one duplicate sample and one rinsate blank were collected.

Based on the results of the first round of sampling, three locations (CEF-RB-SS-001, CEF-RB-SS-005, and CEF-RB-SS-007) were resampled in Phase II in January 2004. CEF-RB-SS-001 and CEF-RB-SS-007 were sampled again in Phase III in July 2004 and May 2004, respectively. These post-construction activity samples were collected from depth intervals of 0 to 1 foot bgs because the ballast was either removed or mixed in the backfill. The rationale for the Phase II and III events is discussed further in Section 3.0.

All surface soil samples were collected as grab samples using plastic, disposable trowels. Sampling activities were performed in accordance with the procedures described in the Comprehensive Quality Assurance Plan Number 980038, Revision 1 (TtNUS, 1999).

Soil and groundwater samples were analyzed for PAHs using U.S. Environmental Protection Agency (U. S. EPA) Method SW-846 8310. ACCUTEST SouthEast, in Orlando, Florida performed the analyses. The laboratory reports are included in Appendix A.



CEF-RB-SS-007-02
 CEF-RB-SS-007-01
 CEF-RB-SS-007A-01

Abandoned
 Railroad Bed
 South of Normandy

Normandy Boulevard

103rd Street

CEF-RB-SS-006-02

CEF-RB-SS-005-02
 CEF-RB-SS-005-01

CEF-RB-SS-004-02

CEF-RB-SS-003-02

Building 98

CEF-RB-SS-002-02

Cecil Pines Street

CEF-RB-SS-001-02
 CEF-RB-SS-001-01
 CEF-RB-SS-001-01A

Lake Newman Street

58S03501
 58S03701
 CEF-098-SS-001-01
 CEF-098-SS-101-02
 CEF-098-SS-002-01
 CEF-098-SS-102-01
 CEF-098-SS-104-01
 CEF-098-SS-105-01
 CEF-098-SS-201-01
 CEF-098-SS-301-02
 CEF-098-SS-203-01
 CEF-098-SS-303-02
 CEF-P50-SS-001-01
 CEF-P50-SS-002-01
 CEF-P50-SS-003-01
 CEF-P50-SS-004-01
 CEF-P50-SS-005-01
 CEF-P50-SS-006-01
 CEF-P50-SS-101-01
 CEF-P50-SS-103-01
 CEF-P50-SS-104-02

Abandoned
 Railroad Bed
 South of Normandy

Crossover Street

Legend

- Abandoned Railroad Bed
- Soil Sample Location

1000 0 1000 Feet

DRAWN BY MJJ	DATE 27Sept02
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



SOIL SAMPLE LOCATIONS - PREVIOUS AND SAR INVESTIGATIONS
 ABANDONED RAILROAD BED
 SOUTH OF NORMANDY BOULEVARD
 SAMPLING AND ANALYSIS REPORT
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>JMJ</i>	DATE 10/5/04
APPROVED BY	DATE
DRAWING NO. FIGURE 2-1	REV 0

3.0 DATA EVALUATION

3.1 DATA EVALUATION

PAHs were detected in soil samples from the Abandoned Railroad Bed collected for the JEDC. Table 3-1 presents analytical data from the investigation for the PAHs that were detected in at least one sample. Complete laboratory analytical data for the samples are provided in Appendix A. Because of the presence of the PAHs, a human health preliminary risk evaluation and a screening-level ecological risk assessment (SERA) were considered.

3.2 HUMAN HEALTH PRELIMINARY RISK EVALUATION

Contaminant concentrations in individual soil samples were compared to the FDEP criteria in the Florida Administrative Code (FAC) Chapter 62-777 (FDEP, 1999). Organic analytical results were compared to the more stringent of the FDEP residential SCTLs for direct exposure or the leachability to groundwater criterion. Screening criteria were presented on Table 1-1.

In Phase I, PAHs were detected in three soil samples (CEF-RB-SS-001, CEF-RB-SS-005, and CEF-RB-SS-007). Only benzo(a)pyrene (BaP) was present at concentrations greater than the FDEP residential SCTL, but the concentrations were less than the FDEP industrial SCTL.

Initially, the Phase I data along with existing data from Building 98/PSC 50 was used to calculate the 95-percent upper confidence limit (UCL) concentration. However, FDEP did not concur with the UCL calculation method. FDEP also did not concur with the statistical analysis because the long and narrow shape of the railroad bed was not a typical exposure area. To meet the requirements for the statistical analysis, a significant number of samples collected off the railroad bed would have been required to evaluate the site exposure.

The FDEP and BCT agreed that because of the buried utility and roadway construction work to be performed by the City on the railroad bed, post-construction samples could be collected at the locations where BaP concentrations exceeded the residential SCTL and the new results could be used in the site evaluation. These construction activities removed ballast and mixed existing surface soil and residual ballast with backfill and deep soil.

In Phase II, the BaP concentration in the sample from CEF-RB-SS-005 was less than the residential SCTL. In Phase III, the BaP concentration in the sample from CEF-RB-SS-007 was less than the

residential SCTL. However, the BaP concentration in the Phase II and Phase III samples from CEF-RB-SS-001 were still greater than the residential SCTL.

The construction activities at CEF-RB-SS-001 were further considered by the FDEP. At this location, asphalt was present and was mixed with the backfill after the construction. Because BaP and other PAHs are components of asphalt, the PAHs found at CEF-RB-SS-001 were believed to have originated from the asphalt. The presence of the PAHs in the soil is the result of the normal activities, and therefore, FDEP determined that no further delineation or remedial action is required for the PAHs at CEF-RB-SS-001.

Because the PAH concentrations are less than the residential SCTLs and because the PAHs at CEF-RB-SS-001 are most likely attributable to existing asphalt, a human health Preliminary Risk Evaluation (PRE) is not required.

Table 3-1 presents analytical data from Phases I through III for the PAHs that were detected in at least one sample.

3.3 ECOLOGICAL RISK EVALUATION

A SERA was conducted to evaluate potential site-related risks to ecological receptors on the Abandoned Railroad Bed. Steps 1 through 3A of the ecological risk assessment were conducted in accordance with the following documents: U.S. EPA Ecological Risk Assessment Guidance for Superfund (U.S. EPA, 1997), Region 4 Ecological Risk Assessment Bulletins – Supplement to RAGs (U.S. EPA, 2000a), Amended Guidance on Ecological Risk Assessment at Military Bases (U.S. EPA, 2000b), and the Navy Policy for Conducting Ecological Risk Assessments (DON, 1999). Steps 1 through 3A consist of the following:

- Step 1 Screening-Level Problem Formulation and Ecological Effects Evaluation
- Step 2 Screening-Level Exposure Estimate and Risk Calculation
- Step 3A Refinement of Preliminary Chemicals of Potential Concern (COPCs)

3.3.1 Step 1: Screening-Level Problem Formulation and Ecological Effects Evaluation

The preliminary assessment endpoints for this ecological risk assessment were adverse effects of chemicals on growth, survival, and reproduction of ecological receptors. The preliminary measurement endpoints were chemical concentrations in surface soil associated with adverse effects on growth, survival, and reproduction of soil-dwelling organisms.

3.3.2 Step 2: Screening-Level Exposure Estimate and Risk Calculation

Maximum concentrations of analytes detected in non-excavated surface soil samples were compared to ecological screening values (ESVs) established by U.S. EPA Region 4 (U.S. EPA, 2000a; U.S. EPA, 2000b). Surface soil samples were defined as those collected from depths of 0 to 1 foot. Surface soil analytes with maximum concentrations that did not exceed screening values were dropped from further consideration, and analytes with concentrations that exceeded screening values or did not have screening values were retained as ecological COPCs.

The samples used for the SERA included four surface soil samples from the Building 98/PSC 50 area (CEF-098-SS-002-01, CEF-098-SS-102-01, CEF-098-SS-105-01, and CEF-P50-SS-101-01) that were not excavated. The analytical results for these four samples, excavated surface soil samples, and excavated and non-excavated subsurface soil samples are presented in Tables 1-1 and 3-1.

Maximum concentrations of benzo(a)pyrene, fluoranthene, and pyrene exceeded ESVs and ESVs were not available for eight PAHs detected in surface soils. Maximum concentrations of total PAHs (defined as the sum of detected individual PAHs) in two surface soil samples exceeded the ESV for total PAHs (Table 3-2).

3.3.3 Step 3A: Refinement of Preliminary Contaminants of Potential Concern

Subsequent to the initial screening, other factors are typically considered to further refine COPCs. Such factors include food chain modeling, habitat quality, area use factors, toxicological evaluation of COPCs, frequency of detection, background concentrations, and comparisons of COPCs to alternate guidelines (U.S. EPA, 1997; U.S. EPA, 2000b; DON, 1999).

3.3.3.1 Step 3A Discussion

Food chain modeling was not conducted to investigate potential risks to representative receptors from ingested PAHs because PAH compounds would not be expected to significantly bioaccumulate in higher organisms at the concentrations observed here. Food chain modeling is typically not performed for PAHs unless present at extremely high concentrations.

Ecologically based toxicity values are sparse for PAHs in soil. U.S. EPA Region 4 has established screening values for only six of the 14 PAHs detected at the site. The Region 4 screening values are based on values established in the Netherlands during the 1980s. FDEP has no ecologically-based soil criteria. In 1994, the Dutch modified their screening values for total PAHs, establishing a "target" value of 1,000 µg/kg and an "intervention" value of 40,000 µg/kg (MHSP&E, 1994). The Dutch target values

represent clean soil, and intervention values represent seriously contaminated soil. Furthermore, the Dutch guidelines specify that concentrations greater than the target value but less than the midpoint (intermediate) value require no further investigation (but minor restrictions may be applied on soil use), while concentrations greater than the intermediate value and less than the intervention value indicate that further investigation is required (Swartjes, 1999). The intermediate value for total PAHs in soil is 20,500 µg/kg.

Concentrations of benzo(a)pyrene, fluoranthene, pyrene, and total PAHs exceeded U.S. EPA Region 4 ESVs in surface soil samples CEF-098-SS-002-01 and CEF-098-SS-102-01. Therefore, PAHs might pose risk to soil invertebrates or plants in the vicinity of these two samples. However, the hazard quotients (HQs) are moderately low (less than 10) based on the Region 4 screening values, and concentrations of total PAHs in both samples were well below than the Dutch intermediate value of 20,500 µg/kg.

Because data are available from only four surface soil samples, and all of these were in a relatively small area (i.e., the vicinity of Building 98) an examination of non-excavated soil samples collected from depths of 1 to 2 feet is appropriate. Data from seven subsurface soil samples collected in Phase I are available that represent the mainline from Normandy Boulevard southward to a point approximately 1,000 feet south of Building 98 (Figure 2-1). PAHs were detected in only three of these seven samples, and detected values were relatively low (Table 3-1). Total detected PAH concentrations in these samples are well below the 1,000 µg/kg Region 4 ESV.

As mentioned in Section 1.0, the upper 1 to 2 feet of “soil” along the abandoned railroad bed is comprised of large size gravel and cobbles. The high stone content soil results in a poor habitat for soil invertebrates.

In summary, potential ecological risk from PAHs are expected to be negligible at this site due to the soil conditions and relatively low concentrations of PAHs.

3.3.3.2 Uncertainty Analysis

Uncertainties are associated with several aspects of ecological risk assessments. A summary of the specific uncertainties associated with the ecological risk assessment that was conducted for the Abandoned Railroad Bed follows.

The reporting limits of some non-detected PAHs exceeded their respective Region 4 ESVs. Where this occurred in the four surface soil samples, the reporting limits ranged from 190 to 350 µg/kg, compared to Region 4 screening values of 100 µg/kg. Where this occurred in subsurface samples, most reporting

limits ranged from 190 to 350 µg/kg, but a few were as high as 780 µg/kg. This issue is not considered to be a significant flaw in the risk assessment however, as several non-detect subsurface samples had reporting limits of 72 to 76 µg/kg, which are less than the Region 4 screening values. Some non-detect surface samples had reporting limits as low as 5.5 µg/kg.

The issue of non-detected concentrations also results in some uncertainty regarding the method of calculating *total* PAH concentrations. As mentioned in Section 3.3.2, maximum concentrations of total PAHs were defined as the sum of detected individual PAHs (i.e., non-detects were not included). Because numerous PAHs were not detected, there is no ideal approach for calculating total PAH concentrations. Uncertainty will exist if non-detected PAHs are assigned concentrations of 0, one-half the reporting limit, or any other commonly used value.

The data set for surface soil samples was small (n=4 samples), and these samples were collected from a rather small area (i.e., the vicinity of Building 98). Therefore, there is uncertainty regarding whether the data from these four samples adequately represents the entire abandoned railroad bed. The inclusion of data from samples collected slightly below the surface (1 to 2 feet deep) reduces this uncertainty.

3.3.4 Ecological Risk Summary and Conclusions

A SERA was performed for the Abandoned Railroad Bed South of Normandy Boulevard. PAH compounds were detected in surface soil at concentrations that exceeded conservative screening values, and some PAHs without screening values were detected. These COPCs were assessed in Step 3A of the risk assessment.

PAH compounds do not significantly bioaccumulate or biomagnify in higher organisms at the concentrations observed here. Therefore, PAH concentrations at the site pose negligible risk to upper level receptors such as mammals, birds, reptiles, and amphibians. Any potential PAH-related risks are limited to soil invertebrates and plants. However, the results of the Step 3A evaluation indicate that potential risk to these organisms is negligible or minor at worst. Overall, PAHs detected in surface soil at the Abandoned Railroad Bed pose negligible potential risk to ecological receptors.

TABLE 3-1

SOIL PAH DATA - SAR INVESTIGATION
 ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA
 PAGE 1 OF 3

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-RB-				
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-001-02	SS-001-01 (Phase II)	SS-001-01A (Phase III)	SS-002-02	SS-003-02
Polynuclear Aromatic Hydrocarbons (µg/kg)								
Benzo(a)anthracene	1,400	5,000	3,200	360 U	2,180	786	390 U	380 U
Benzo(a)pyrene	100	500	8,000	120	2,790	1,250	78 U	76 U
Benzo(b)fluoranthene	1,400	4,800	10,000	130	4,440	1,800	78 U	76 U
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	125	3,260	1,370	78 U	76 U
Benzo(k)fluoranthene	15,000	52,000	25,000	101	2,520	590	78 U	76 U
Chrysene	140,000	450,000	77,000	360 U	3,260	1,030	390 U	380 U
Dibenzo(a,h)anthracene	100	500	30,000	71 U	917	207	78 U	76 U
Fluoranthene	2,900,000	48,000,000	1,200,000	360 U	4,290	1,040	390 U	380 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	97.4	2,670	980	78 U	76 U
Pyrene	2,200,000	37,000,000	880,000	221 J	4,810	1,250	390 U	380 U

TABLE 3-1

SOIL PAH DATA - SAR INVESTIGATION
 ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA
 PAGE 2 OF 3

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-RB-				
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-004-02		SS-005-02	SS-005-01 (Phase II)	SS-006-02
				Sample	Duplicate			
Polynuclear Aromatic Hydrocarbons (µg/kg)								
Benzo(a)anthracene	1,400	5,000	3,200	370 U	390 U	440 U	370 U	380 U
Benzo(a)pyrene	100	500	8,000	74 U	78 U	244	74 U	76 U
Benzo(b)fluoranthene	1,400	4,800	10,000	74 U	78 U	223	74 U	76 U
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	74 U	78 U	252	74 U	76 U
Benzo(k)fluoranthene	15,000	52,000	25,000	74 U	78 U	173	74 U	76 U
Chrysene	140,000	450,000	77,000	370 U	390 U	440 U	370 U	380 U
Dibenzo(a,h)anthracene	100	500	30,000	74 U	78 U	89 U	74 U	76 U
Fluoranthene	2,900,000	48,000,000	1,200,000	370 U	390 U	440 U	370 U	380 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	74 U	78 U	186	74 U	76 U
Pyrene	2,200,000	37,000,000	880,000	370 U	390 U	297 J	370 U	380 U

TABLE 3-1

**SOIL PAH DATA - SAR INVESTIGATION
ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 3 OF 3**

PARAMETER	FDEP SCTL ⁽¹⁾			CEF-RB-		
	Residential Direct Exposure	Industrial Direct Exposure	Leachability to Groundwater	SS-007-02	SS-007-01 (Phase II)	SS-007A-01 (Phase III)
Polynuclear Aromatic Hydrocarbons (µg/kg)						
Benzo(a)anthracene	1,400	5,000	3,200	420 U	527	380 U
Benzo(a)pyrene	100	500	8,000	248	1,190	75 U
Benzo(b)fluoranthene	1,400	4,800	10,000	214	1,130	75 U
Benzo(g,h,i)perylene	2,300,000	41,000,000	32,000,000	200	1,240	75 U
Benzo(k)fluoranthene	15,000	52,000	25,000	189	668	75 U
Chrysene	140,000	450,000	77,000	420 U	658	380 U
Dibenzo(a,h)anthracene	100	500	30,000	83 U	322	75 U
Fluoranthene	2,900,000	48,000,000	1,200,000	420 U	831	380 U
Indeno(1,2,3-cd)pyrene	1,500	5,300	28,000	171	898	75 U
Pyrene	2,200,000	37,000,000	880,000	220 J	808	380 U

Notes

U = Not detected at or above detection limit (associated value).

J = Estimated concentration.

Only compounds shown are those that were detected in at least one sample.

Bolded values exceed detection limit.

Shaded values exceed residential or leachability regulatory criteria.

1 - Florida Department of Environmental Protection Soil Cleanup Target Levels, FAC Chapter 62-777 (FDEP, 1999).

TABLE 3-2

ECOLOGICAL CONTAMINANTS OF POTENTIAL CONCERN IN SURFACE SOIL
 ABANDONED RAILROAD BED SOUTH OF NORMANDY BOULEVARD
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

Parameter	Frequency of Detection	Range of Detected Concentrations (ug/kg)		Location of Maximum	Ecological Screening Value (ug/kg) ⁽¹⁾	Maximum Hazard Quotient ⁽²⁾
		Minimum	Maximum			
Anthracene	2/4	1.2	20.6	CEF-098-SS-105	100	0.2
Benzo(a)anthracene	4/4	10	484	CEF-098-SS-105	NA	NA
Benzo(a)pyrene	4/4	15	400	CEF-098-SS-105	100	4.0
Benzo(b)fluoranthene	4/4	31	1060	CEF-098-SS-105	NA	NA
Benzo(g,h,i)perylene	4/4	17	582	CEF-098-SS-105	NA	NA
Benzo(k)fluoranthene	4/4	12	461	CEF-098-SS-105	NA	NA
Chrysene	4/4	6.6	574	CEF-098-SS-105	NA	NA
Dibenzo(a,h)anthracene	2/4	70.7	73.3	CEF-098-SS-102	NA	NA
Fluoranthene	4/4	16	865	CEF-098-SS-105	100	8.7
Fluorene	1/4	7.8	7.8	CEF-P50-SS-101	NA	NA
Indeno(1,2,3-cd)pyrene	4/4	8.8	485	CEF-098-SS-105	NA	NA
Naphthalene	1/4	40	40	CEF-P50-SS-101	100	0.4
Phenanthrene	1/4	72.6	72.6	CEF-098-SS-105	100	0.7
Pyrene	4/4	25	934	CEF-098-SS-105	100	9.3
Total PAHs	4/4	120.4	3420.9	CEF-098-SS-105	1000	3.4

Notes

NA - Ecological Screening Value not available.

Total PAHs - Sum of detected individual PAHs.

1 - ESVs from U. S. EPA 2000a, and U. S. EPA 2000b.

2 - ESV divided by maximum detected concentration.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Field investigations determined that PAH contamination was present in soil on the Abandoned Railroad Bed South of Normandy Boulevard. Based on these concentrations, the soil on the Abandoned Railroad Bed South of Normandy Boulevard does not represent an unacceptable risk to human health under residential use conditions or to the environment.

Based upon these conclusions, the recommendation for the Abandoned Railroad Bed is no further action. It is also recommended that the color code for the Abandoned Railroad Bed South of Normandy Boulevard be Light Green to denote that releases of hazardous substances have occurred but at concentrations that do not require a removal or a remedial action. Residual concentrations of PAHs in surface soil do not represent a hazard to human health or the environment.

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APPENDIX A

LABORATORY ANALYTICAL DATA

PHASE I DATA

Report of Analysis

Client Sample ID:	CEF-RB-SS-001-02	Date Sampled:	10/15/01
Lab Sample ID:	F11218-1	Date Received:	10/17/01
Matrix:	SO - Soil	Percent Solids:	93.4
Method:	EPA 8310 SW846 3550B		
Project:	NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE006019.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	710	ug/kg	
208-96-8	Acenaphthylene	ND	710	ug/kg	
120-12-7	Anthracene	ND	360	ug/kg	
56-55-3	Benzo(a)anthracene	ND	360	ug/kg	
50-32-8	Benzo(a)pyrene	120	71	ug/kg	
205-99-2	Benzo(b)fluoranthene	130	71	ug/kg	
191-24-2	Benzo(g,h,i)perylene	125	71	ug/kg	
207-08-9	Benzo(k)fluoranthene	101	71	ug/kg	
218-01-9	Chrysene	ND	360	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	71	ug/kg	
206-44-0	Fluoranthene	ND	360	ug/kg	
86-73-7	Fluorene	ND	360	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	97.4	71	ug/kg	
91-20-3	Naphthalene	ND	360	ug/kg	
90-12-0	1-Methylnaphthalene	ND	360	ug/kg	
91-57-6	2-Methylnaphthalene	ND	360	ug/kg	
85-01-8	Phenanthrene	ND	360	ug/kg	
129-00-0	Pyrene	221	360	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		37-158%
92-94-4	p-Terphenyl	97%		59-149%

(a) All hits confirmed by spectral match using a diode array detector.

ND = Not detected

RL = Reporting 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-RB-SS-002-02		
Lab Sample ID: F11218-2		Date Sampled: 10/15/01
Matrix: SO - Soil		Date Received: 10/17/01
Method: EPA 8310 SW846 3550B		Percent Solids: 82.7
Project: NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE006020.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	780	ug/kg	
208-96-8	Acenaphthylene	ND	780	ug/kg	
120-12-7	Anthracene	ND	390	ug/kg	
56-55-3	Benzo(a)anthracene	ND	390	ug/kg	
50-32-8	Benzo(a)pyrene	ND	78	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	78	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	78	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	78	ug/kg	
218-01-9	Chrysene	ND	390	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	78	ug/kg	
206-44-0	Fluoranthene	ND	390	ug/kg	
86-73-7	Fluorene	ND	390	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	78	ug/kg	
91-20-3	Naphthalene	ND	390	ug/kg	
90-12-0	1-Methylnaphthalene	ND	390	ug/kg	
91-57-6	2-Methylnaphthalene	ND	390	ug/kg	
85-01-8	Phenanthrene	ND	390	ug/kg	
129-00-0	Pyrene	ND	390	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		37-158%
92-94-4	p-Terphenyl	92%		59-149%

ND = Not detected
 RL = Reporting 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-RB-SS-003-02		
Lab Sample ID: F11218-3		Date Sampled: 10/15/01
Matrix: SO - Soil		Date Received: 10/17/01
Method: EPA 8310 SW846 3550B		Percent Solids: 87.0
Project: NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE006021.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	760	ug/kg	
208-96-8	Acenaphthylene	ND	760	ug/kg	
120-12-7	Anthracene	ND	380	ug/kg	
56-55-3	Benzo(a)anthracene	ND	380	ug/kg	
50-32-8	Benzo(a)pyrene	ND	76	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	76	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	76	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	76	ug/kg	
218-01-9	Chrysene	ND	380	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	76	ug/kg	
206-44-0	Fluoranthene	ND	380	ug/kg	
86-73-7	Fluorene	ND	380	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	76	ug/kg	
91-20-3	Naphthalene	ND	380	ug/kg	
90-12-0	1-Methylnaphthalene	ND	380	ug/kg	
91-57-6	2-Methylnaphthalene	ND	380	ug/kg	
85-01-8	Phenanthrene	ND	380	ug/kg	
129-00-0	Pyrene	ND	380	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	78%		37-158%
92-94-4	p-Terphenyl	95%		59-149%

ND = Not detected
 RL = Reporting 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-RB-SS-004-02		
Lab Sample ID:	F11218-4	Date Sampled:	10/15/01
Matrix:	SO - Soil	Date Received:	10/17/01
Method:	EPA 8310 SW846 3550B	Percent Solids:	91.1
Project:	NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE006022.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	740	ug/kg	
208-96-8	Acenaphthylene	ND	740	ug/kg	
120-12-7	Anthracene	ND	370	ug/kg	
56-55-3	Benzo(a)anthracene	ND	370	ug/kg	
50-32-8	Benzo(a)pyrene	ND	74	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	74	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	74	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	74	ug/kg	
218-01-9	Chrysene	ND	370	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	74	ug/kg	
206-44-0	Fluoranthene	ND	370	ug/kg	
86-73-7	Fluorene	ND	370	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	74	ug/kg	
91-20-3	Naphthalene	ND	370	ug/kg	
90-12-0	1-Methylnaphthalene	ND	370	ug/kg	
91-57-6	2-Methylnaphthalene	ND	370	ug/kg	
85-01-8	Phenanthrene	ND	370	ug/kg	
129-00-0	Pyrene	ND	370	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	79%		37-158%
92-94-4	p-Terphenyl	93%		59-149%

ND = Not detected
 RL = Reporting 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-RB-DUP01-02		Date Sampled:	10/15/01	
Lab Sample ID:	F11218-18		Date Received:	10/17/01	
Matrix:	SO - Soil		Percent Solids:	83.1	
Method:	EPA 8310 SW846 3550B				
Project:	NAS Cecil Field-Railroad Bed-N4163				

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE006050.D	1	11/04/01	MRE	10/29/01	OP4082	GEE272
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	780	ug/kg	
208-96-8	Acenaphthylene	ND	780	ug/kg	
120-12-7	Anthracene	ND	390	ug/kg	
56-55-3	Benzo(a)anthracene	ND	390	ug/kg	
50-32-8	Benzo(a)pyrene	ND	78	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	78	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	78	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	78	ug/kg	
218-01-9	Chrysene	ND	390	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	78	ug/kg	
206-44-0	Fluoranthene	ND	390	ug/kg	
86-73-7	Fluorene	ND	390	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	78	ug/kg	
91-20-3	Naphthalene	ND	390	ug/kg	
90-12-0	1-Methylnaphthalene	ND	390	ug/kg	
91-57-6	2-Methylnaphthalene	ND	390	ug/kg	
85-01-8	Phenanthrene	ND	390	ug/kg	
129-00-0	Pyrene	ND	390	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	90%		37-158%
92-94-4	p-Terphenyl	91%		59-149%

ND = Not detected
 RL = Reporting 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-RB-SS-005-02	Date Sampled:	10/15/01
Lab Sample ID:	F11218-5	Date Received:	10/17/01
Matrix:	SO - Soil	Percent Solids:	75.9
Method:	EPA 8310 SW846 3550B		
Project:	NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE006023.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	890	ug/kg	
208-96-8	Acenaphthylene	ND	890	ug/kg	
120-12-7	Anthracene	ND	440	ug/kg	
56-55-3	Benzo(a)anthracene	ND	440	ug/kg	
50-32-8	Benzo(a)pyrene	244	89	ug/kg	
205-99-2	Benzo(b)fluoranthene	223	89	ug/kg	
191-24-2	Benzo(g,h,i)perylene	252	89	ug/kg	
207-08-9	Benzo(k)fluoranthene	173	89	ug/kg	
218-01-9	Chrysene	ND	440	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	89	ug/kg	
206-44-0	Fluoranthene	ND	440	ug/kg	
86-73-7	Fluorene	ND	440	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	186	89	ug/kg	
91-20-3	Naphthalene	ND	440	ug/kg	
90-12-0	1-Methylnaphthalene	ND	440	ug/kg	
91-57-6	2-Methylnaphthalene	ND	440	ug/kg	
85-01-8	Phenanthrene	ND	440	ug/kg	
129-00-0	Pyrene	297	440	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		37-158%
92-94-4	p-Terphenyl	91%		59-149%

(a) All hits confirmed by spectral match using a diode array detector.

ND = Not detected
 RL = Reporting 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-RB-SS-006-02	Date Sampled: 10/15/01
Lab Sample ID: F11218-6	Date Received: 10/17/01
Matrix: SO - Soil	Percent Solids: 87.4
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-Railroad Bed-N4163	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE006024.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	760	ug/kg	
208-96-8	Acenaphthylene	ND	760	ug/kg	
120-12-7	Anthracene	ND	380	ug/kg	
56-55-3	Benzo(a)anthracene	ND	380	ug/kg	
50-32-8	Benzo(a)pyrene	ND	76	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	76	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	76	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	76	ug/kg	
218-01-9	Chrysene	ND	380	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	76	ug/kg	
206-44-0	Fluoranthene	ND	380	ug/kg	
86-73-7	Fluorene	ND	380	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	76	ug/kg	
91-20-3	Naphthalene	ND	380	ug/kg	
90-12-0	1-Methylnaphthalene	ND	380	ug/kg	
91-57-6	2-Methylnaphthalene	ND	380	ug/kg	
85-01-8	Phenanthrene	ND	380	ug/kg	
129-00-0	Pyrene	ND	380	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	71%		37-158%
92-94-4	p-Terphenyl	90%		59-149%

ND = Not detected
 RL = Reporting 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-RB-SS-007-02	Date Sampled:	10/15/01
Lab Sample ID:	F11218-7	Date Received:	10/17/01
Matrix:	SO - Soil	Percent Solids:	80.8
Method:	EPA 8310 SW846 3550B		
Project:	NAS Cecil Field-Railroad Bed-N4163		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE006025.D	1	11/03/01	MRE	10/29/01	OP4082	GEE271
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	830	ug/kg	
208-96-8	Acenaphthylene	ND	830	ug/kg	
120-12-7	Anthracene	ND	420	ug/kg	
56-55-3	Benzo(a)anthracene	ND	420	ug/kg	
50-32-8	Benzo(a)pyrene	248	83	ug/kg	
205-99-2	Benzo(b)fluoranthene	214	83	ug/kg	
191-24-2	Benzo(g,h,i)perylene	200	83	ug/kg	
207-08-9	Benzo(k)fluoranthene	189	83	ug/kg	
218-01-9	Chrysene	ND	420	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	83	ug/kg	
206-44-0	Fluoranthene	ND	420	ug/kg	
86-73-7	Fluorene	ND	420	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	171	83	ug/kg	
91-20-3	Naphthalene	ND	420	ug/kg	
90-12-0	1-Methylnaphthalene	ND	420	ug/kg	
91-57-6	2-Methylnaphthalene	ND	420	ug/kg	
85-01-8	Phenanthrene	ND	420	ug/kg	
129-00-0	Pyrene	220	420	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	77%		37-158%
92-94-4	p-Terphenyl	98%		59-149%

(a) All hits confirmed by spectral match using a diode array detector.

ND = Not detected
 RL = Reporting 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

PHASE II DATA

dilution to quantify benzo(k)fluoranthene. No undiluted analysis was performed. The laboratory cites matrix interference as the reason for dilution.

Benzo(k)fluoranthene in sample CEF-RB-SS-DU01 was reported from a 4 fold dilution.

The continuing calibration analyzed on March 8, 2004 at 11:54 contained Percent Differences (%Ds) greater than 15% for benzo(k)fluoranthene and dibenzo(a,h)anthracene. The %Ds were not present on both detectors. No validation action was taken.

Positive results for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, and pyrene were qualified as estimated, "J", in the field duplicate pair CEF-RB-SS-DU01 / CEF-RB-SS-012-01 as a result of field duplicate imprecision (i.e. Relative Percent Differences (RPDs) greater than 50%).

Positive results reported at concentrations below the reporting limit were qualified as estimated, "J".

EXECUTIVE SUMMARY

Laboratory Performance Issues: Continuing calibration %Ds for dibenzo(a,h)anthracene and Benzo(k)fluoranthene were greater than 15% but were limited to one detector for each compound.

Other Factors Affecting Data Quality: The laboratory noted matrix interference as the reason for sample dilutions. The field duplicate pair displayed poor precision.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), and the NFESC guidelines IRCDQM (Sept., 1999). 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

Kelly Carper
Chemist/Data Validator



TetraTech-NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 0039

SDG: F22457 MEDIA: SOIL DATA FRACTION: PAH

nsample CEF-RB-SS-001-01
 samp_date 2/27/2004
 lab_id F22457-7
 qc_type NM
 units UG/KG
 Pct_Solids 87.4
 DUP_OF:

nsample CEF-RB-SS-005-01
 samp_date 2/27/2004
 lab_id F22457-6
 qc_type NM
 units UG/KG
 Pct_Solids 88.8
 DUP_OF:

nsample CEF-RB-SS-007-01
 samp_date 2/27/2004
 lab_id F22457-5
 qc_type NM
 units UG/KG
 Pct_Solids 84.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	380	U	
2-METHYLNAPHTHALENE	380	U	
ACENAPHTHENE	760	U	
ACENAPHTHYLENE	760	U	
ANTHRACENE	760	U	
BENZO(A)ANTHRACENE	2180		
BENZO(A)PYRENE	2790		
BENZO(B)FLUORANTHENE	4440		
BENZO(G,H,I)PERYLENE	3260		
BENZO(K)FLUORANTHENE	2520		
CHRYSENE	3260		
DIBENZO(A,H)ANTHRACENE	917		
FLUORANTHENE	4290		
FLUORENE	760	U	
INDENO(1,2,3-CD)PYRENE	2670		
NAPHTHALENE	380	U	
PHENANTHRENE	760	U	
PYRENE	4810		

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	93	U	
2-METHYLNAPHTHALENE	93	U	
ACENAPHTHENE	190	U	
ACENAPHTHYLENE	190	U	
ANTHRACENE	190	U	
BENZO(A)ANTHRACENE	93	U	
BENZO(A)PYRENE	19	U	
BENZO(B)FLUORANTHENE	19	U	
BENZO(G,H,I)PERYLENE	19	U	
BENZO(K)FLUORANTHENE	19	U	
CHRYSENE	93	U	
DIBENZO(A,H)ANTHRACENE	19	U	
FLUORANTHENE	93	U	
FLUORENE	190	U	
INDENO(1,2,3-CD)PYRENE	19	U	
NAPHTHALENE	93	U	
PHENANTHRENE	190	U	
PYRENE	93	U	

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	97	U	
2-METHYLNAPHTHALENE	97	U	
ACENAPHTHENE	190	U	
ACENAPHTHYLENE	190	U	
ANTHRACENE	190	U	
BENZO(A)ANTHRACENE	527		
BENZO(A)PYRENE	1190		
BENZO(B)FLUORANTHENE	1130		
BENZO(G,H,I)PERYLENE	1240		
BENZO(K)FLUORANTHENE	668		
CHRYSENE	658		
DIBENZO(A,H)ANTHRACENE	322		
FLUORANTHENE	831		
FLUORENE	190	U	
INDENO(1,2,3-CD)PYRENE	898		
NAPHTHALENE	97	U	
PHENANTHRENE	190	U	
PYRENE	808		

PROJ_NO: 0039

SDG: F22457 MEDIA: SOIL DATA FRACTION: PAH

nsample CEF-RB-SS-008-01
 samp_date 2/27/2004
 lab_id F22457-4
 qc_type NM
 units UG/KG
 Pct_Solids 79.8
 DUP_OF:

nsample CEF-RB-SS-011-01
 samp_date 2/27/2004
 lab_id F22457-3
 qc_type NM
 units UG/KG
 Pct_Solids 91.2
 DUP_OF:

nsample CEF-RB-SS-012-01
 samp_date 2/27/2004
 lab_id F22457-2
 qc_type NM
 units UG/KG
 Pct_Solids 88.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	410	U	
2-METHYLNAPHTHALENE	410	U	
ACENAPHTHENE	830	U	
ACENAPHTHYLENE	830	U	
ANTHRACENE	830	U	
BENZO(A)ANTHRACENE	2460		
BENZO(A)PYRENE	3300		
BENZO(B)FLUORANTHENE	3840		
BENZO(G,H,I)PERYLENE	2570		
BENZO(K)FLUORANTHENE	2230		
CHRYSENE	3400		
DIBENZO(A,H)ANTHRACENE	676		
FLUORANTHENE	6400		
FLUORENE	830	U	
INDENO(1,2,3-CD)PYRENE	2230		
NAPHTHALENE	410	U	
PHENANTHRENE	832	J	P
PYRENE	6150		

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	180	U	
2-METHYLNAPHTHALENE	180	U	
ACENAPHTHENE	360	U	
ACENAPHTHYLENE	360	U	
ANTHRACENE	360	U	
BENZO(A)ANTHRACENE	1470		
BENZO(A)PYRENE	1950		
BENZO(B)FLUORANTHENE	2050		
BENZO(G,H,I)PERYLENE	1480		
BENZO(K)FLUORANTHENE	1230		
CHRYSENE	1280		
DIBENZO(A,H)ANTHRACENE	438		
FLUORANTHENE	2670		
FLUORENE	360	U	
INDENO(1,2,3-CD)PYRENE	1170		
NAPHTHALENE	180	U	
PHENANTHRENE	360	U	
PYRENE	2850		

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	370	U	
2-METHYLNAPHTHALENE	370	U	
ACENAPHTHENE	740	U	
ACENAPHTHYLENE	740	U	
ANTHRACENE	740	U	
BENZO(A)ANTHRACENE	2980	J	G
BENZO(A)PYRENE	1990	J	G
BENZO(B)FLUORANTHENE	2050	J	G
BENZO(G,H,I)PERYLENE	1300	J	G
BENZO(K)FLUORANTHENE	1190	J	G
CHRYSENE	3160	J	G
DIBENZO(A,H)ANTHRACENE	306	J	G
FLUORANTHENE	6670	J	G
FLUORENE	740	U	
INDENO(1,2,3-CD)PYRENE	1020	J	G
NAPHTHALENE	370	U	
PHENANTHRENE	740	U	
PYRENE	5020	J	G

PROJ_NO: 0039

SDG: F22457 MEDIA: SOIL DATA FRACTION: PAH

nsample CEF-RB-SS-017-01
 samp_date 2/27/2004
 lab_id F22457-1
 qc_type NM
 units UG/KG
 Pct_Solids 91.0
 DUP_OF:

nsample CEF-RB-SS-DU01
 samp_date 2/27/2004
 lab_id F22457-8
 qc_type NM
 units UG/KG
 Pct_Solids 85.7
 DUP_OF: CEF-RB-SS-012-01

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	91	U	
2-METHYLNAPHTHALENE	91	U	
ACENAPHTHENE	180	U	
ACENAPHTHYLENE	180	U	
ANTHRACENE	180	U	
BENZO(A)ANTHRACENE	91	U	
BENZO(A)PYRENE	30.9	J P	
BENZO(B)FLUORANTHENE	41.1	J P	
BENZO(G,H,I)PERYLENE	34.9	J P	
BENZO(K)FLUORANTHENE	24.8	J P	
CHRYSENE	91	U	
DIBENZO(A,H)ANTHRACENE	18	U	
FLUORANTHENE	91	U	
FLUORENE	180	U	
INDENO(1,2,3-CD)PYRENE	26.9	J P	
NAPHTHALENE	91	U	
PHENANTHRENE	180	U	
PYRENE	91	U	

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	95	U	
2-METHYLNAPHTHALENE	95	U	
ACENAPHTHENE	190	U	
ACENAPHTHYLENE	190	U	
ANTHRACENE	190	U	
BENZO(A)ANTHRACENE	418	J G	
BENZO(A)PYRENE	570	J G	
BENZO(B)FLUORANTHENE	610	J G	
BENZO(G,H,I)PERYLENE	503	J G	
BENZO(K)FLUORANTHENE	309	J G	
CHRYSENE	447	J G	
DIBENZO(A,H)ANTHRACENE	154	J G	
FLUORANTHENE	771	J G	
FLUORENE	190	U	
INDENO(1,2,3-CD)PYRENE	406	J G	
NAPHTHALENE	95	U	
PHENANTHRENE	190	U	
PYRENE	665	J G	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID: CEF-RB-SS-001-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-7	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 87.4
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021792.D	4	03/08/04	MRE	03/02/04	OP9878	GEE887
Run #2 ^a	EE021783.D	8	03/05/04	MRE	03/02/04	OP9878	GEE886

Run #	Initial Weight	Final Volume
Run #1	30.2 g	5.0 ml
Run #2	30.2 g	5.0 ml

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	3000	760	ug/kg	
208-96-8	Acenaphthylene	ND	3000	760	ug/kg	
120-12-7	Anthracene	ND	1500	760	ug/kg	
56-55-3	Benzo(a)anthracene	2180	1500	380	ug/kg	
50-32-8	Benzo(a)pyrene	2790	300	76	ug/kg	
205-99-2	Benzo(b)fluoranthene	4440	300	76	ug/kg	
191-24-2	Benzo(g,h,i)perylene	3260	300	76	ug/kg	
207-08-9	Benzo(k)fluoranthene	2520 ^b	610	150	ug/kg	
218-01-9	Chrysene	3260	1500	380	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	917	300	76	ug/kg	
206-44-0	Fluoranthene	4290	1500	380	ug/kg	
86-73-7	Fluorene	ND	1500	760	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	2670	300	76	ug/kg	
91-20-3	Naphthalene	ND	1500	380	ug/kg	
90-12-0	1-Methylnaphthalene	ND	1500	380	ug/kg	
91-57-6	2-Methylnaphthalene	ND	1500	380	ug/kg	
85-01-8	Phenanthrene	ND	1500	760	ug/kg	
129-00-0	Pyrene	4810	1500	380	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%	100%	49-124%
92-94-4	p-Terphenyl	112%	116%	56-141%

(a) All hits confirmed by spectral match using a diode array detector. Dilution required due to matrix interference.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0017

Report of Analysis

Client Sample ID: CEF-RB-SS-005-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-6	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 88.8
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE021767.D	1	03/05/04	MRE	03/02/04	OP9878	GEE886
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.4 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	740	190	ug/kg	
208-96-8	Acenaphthylene	ND	740	190	ug/kg	
120-12-7	Anthracene	ND	370	190	ug/kg	
56-55-3	Benzo(a)anthracene	ND	370	93	ug/kg	
50-32-8	Benzo(a)pyrene	ND	74	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	74	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	74	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	74	19	ug/kg	
218-01-9	Chrysene	ND	370	93	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	74	19	ug/kg	
206-44-0	Fluoranthene	ND	370	93	ug/kg	
86-73-7	Fluorene	ND	370	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	74	19	ug/kg	
91-20-3	Naphthalene	ND	370	93	ug/kg	
90-12-0	1-Methylnaphthalene	ND	370	93	ug/kg	
91-57-6	2-Methylnaphthalene	ND	370	93	ug/kg	
85-01-8	Phenanthrene	ND	370	190	ug/kg	
129-00-0	Pyrene	ND	370	93	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	98%		49-124%
92-94-4	p-Terphenyl	97%		56-141%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0016

Report of Analysis

Client Sample ID: CEF-RB-SS-007-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-5	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 84.4
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021794.D	1	03/08/04	MRE	03/02/04	OP9878	GEE887
Run #2 ^a	EE021782.D	2	03/05/04	MRE	03/02/04	OP9878	GEE886

Run #	Initial Weight	Final Volume
Run #1	30.6 g	5.0 ml
Run #2	30.6 g	5.0 ml

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	770	190	ug/kg	
208-96-8	Acenaphthylene	ND	770	190	ug/kg	
120-12-7	Anthracene	ND	390	190	ug/kg	
56-55-3	Benzo(a)anthracene	527	390	97	ug/kg	
50-32-8	Benzo(a)pyrene	1190	77	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	1130	77	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1240	77	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	668 ^b	150	39	ug/kg	
218-01-9	Chrysene	658	390	97	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	322	77	19	ug/kg	
206-44-0	Fluoranthene	831	390	97	ug/kg	
86-73-7	Fluorene	ND	390	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	898	77	19	ug/kg	
91-20-3	Naphthalene	ND	390	97	ug/kg	
90-12-0	1-Methylnaphthalene	ND	390	97	ug/kg	
91-57-6	2-Methylnaphthalene	ND	390	97	ug/kg	
85-01-8	Phenanthrene	ND	390	190	ug/kg	
129-00-0	Pyrene	808	390	97	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	91%	89%	49-124%
92-94-4	p-Terphenyl	97%	96%	56-141%

(a) All hits confirmed by spectral match using a diode array detector.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0015

Report of Analysis

Client Sample ID: CEF-RB-SS-008-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-4	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 79.8
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021781.D	4	03/05/04	MRE	03/02/04	OP9878	GEE886
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.2 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	3300	830	ug/kg	
208-96-8	Acenaphthylene	ND	3300	830	ug/kg	
120-12-7	Anthracene	ND	1700	830	ug/kg	
56-55-3	Benzo(a)anthracene	2460	1700	410	ug/kg	
50-32-8	Benzo(a)pyrene	3300	330	83	ug/kg	
205-99-2	Benzo(b)fluoranthene	3840	330	83	ug/kg	
191-24-2	Benzo(g,h,i)perylene	2570	330	83	ug/kg	
207-08-9	Benzo(k)fluoranthene	2230	330	83	ug/kg	
218-01-9	Chrysene	3400	1700	410	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	676	330	83	ug/kg	
206-44-0	Fluoranthene	6400	1700	410	ug/kg	
86-73-7	Fluorene	ND	1700	830	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	2230	330	83	ug/kg	
91-20-3	Naphthalene	ND	1700	410	ug/kg	
90-12-0	1-Methylnaphthalene	ND	1700	410	ug/kg	
91-57-6	2-Methylnaphthalene	ND	1700	410	ug/kg	
85-01-8	Phenanthrene	832	1700	830	ug/kg	J
129-00-0	Pyrene	6150	1700	410	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		49-124 %
92-94-4	p-Terphenyl	95%		56-141 %

(a) All hits confirmed by spectral match using a diode array detector. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0014

Report of Analysis

Client Sample ID: CEF-RB-SS-011-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-3	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 91.2
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021791.D	2	03/08/04	MRE	03/02/04	OP9878	GEE887
Run #2 ^b	EE021780.D	4	03/05/04	MRE	03/02/04	OP9878	GEE886

Run #	Initial Weight	Final Volume
Run #1	30.2 g	5.0 ml
Run #2	30.2 g	5.0 ml

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1500	360	ug/kg	
208-96-8	Acenaphthylene	ND	1500	360	ug/kg	
120-12-7	Anthracene	ND	730	360	ug/kg	
56-55-3	Benzo(a)anthracene	1470	730	180	ug/kg	
50-32-8	Benzo(a)pyrene	1950	150	36	ug/kg	
205-99-2	Benzo(b)fluoranthene	2050	150	36	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1480	150	36	ug/kg	
207-08-9	Benzo(k)fluoranthene	1230 ^c	290	73	ug/kg	
218-01-9	Chrysene	1280	730	180	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	438	150	36	ug/kg	
206-44-0	Fluoranthene	2670	730	180	ug/kg	
86-73-7	Fluorene	ND	730	360	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1170	150	36	ug/kg	
91-20-3	Naphthalene	ND	730	180	ug/kg	
90-12-0	1-Methylnaphthalene	ND	730	180	ug/kg	
91-57-6	2-Methylnaphthalene	ND	730	180	ug/kg	
85-01-8	Phenanthrene	ND	730	360	ug/kg	
129-00-0	Pyrene	2850	730	180	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	89%	97%	49-124%
92-94-4	p-Terphenyl	98%	98%	56-141%

(a) All hits confirmed by spectral match using a diode array detector. Dilution required due to matrix interference.

(b) All hits confirmed by spectral match using a diode array detector.

(c) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0013

Report of Analysis

Client Sample ID:	CEF-RB-SS-012-01	Date Sampled:	02/27/04
Lab Sample ID:	F22457-2	Date Received:	02/28/04
Matrix:	SO - Soil	Percent Solids:	88.0
Method:	EPA 8310 SW846 3550B		
Project:	NAS Cecil Field-CTO 78		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021779.D	4	03/05/04	MRE	03/02/04	OP9878	GEE886
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.9 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	2900	740	ug/kg	
208-96-8	Acenaphthylene	ND	2900	740	ug/kg	
120-12-7	Anthracene	ND	1500	740	ug/kg	
56-55-3	Benzo(a)anthracene	2980	1500	370	ug/kg	
50-32-8	Benzo(a)pyrene	1990	290	74	ug/kg	
205-99-2	Benzo(b)fluoranthene	2050	290	74	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1300	290	74	ug/kg	
207-08-9	Benzo(k)fluoranthene	1190	290	74	ug/kg	
218-01-9	Chrysene	3160	1500	370	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	306	290	74	ug/kg	
206-44-0	Fluoranthene	6670	1500	370	ug/kg	
86-73-7	Fluorene	ND	1500	740	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	1020	290	74	ug/kg	
91-20-3	Naphthalene	ND	1500	370	ug/kg	
90-12-0	1-Methylnaphthalene	ND	1500	370	ug/kg	
91-57-6	2-Methylnaphthalene	ND	1500	370	ug/kg	
85-01-8	Phenanthrene	ND	1500	740	ug/kg	
129-00-0	Pyrene	5020	1500	370	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	105%		49-124%
92-94-4	p-Terphenyl	120%		56-141%

(a) All hits confirmed by spectral match using a diode array detector. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0012

Report of Analysis

Client Sample ID: CEF-RB-SS-017-01	Date Sampled: 02/27/04
Lab Sample ID: F22457-1	Date Received: 02/28/04
Matrix: SO - Soil	Percent Solids: 91.0
Method: EPA 8310 SW846 3550B	
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021759.D	1	03/05/04	MRE	03/02/04	OP9878	GEE886
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	730	180	ug/kg	
208-96-8	Acenaphthylene	ND	730	180	ug/kg	
120-12-7	Anthracene	ND	370	180	ug/kg	
56-55-3	Benzo(a)anthracene	ND	370	91	ug/kg	
50-32-8	Benzo(a)pyrene	30.9	73	18	ug/kg	J
205-99-2	Benzo(b)fluoranthene	41.1	73	18	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	34.9	73	18	ug/kg	J
207-08-9	Benzo(k)fluoranthene	24.8	73	18	ug/kg	J
218-01-9	Chrysene	ND	370	91	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	73	18	ug/kg	
206-44-0	Fluoranthene	ND	370	91	ug/kg	
86-73-7	Fluorene	ND	370	180	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	26.9	73	18	ug/kg	J
91-20-3	Naphthalene	ND	370	91	ug/kg	
90-12-0	1-Methylnaphthalene	ND	370	91	ug/kg	
91-57-6	2-Methylnaphthalene	ND	370	91	ug/kg	
85-01-8	Phenanthrene	ND	370	180	ug/kg	
129-00-0	Pyrene	ND	370	91	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	95%		49-124%
92-94-4	p-Terphenyl	96%		56-141%

(a) All hits confirmed by spectral match using a diode array detector.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0011

Report of Analysis

Client Sample ID: CEF-RB-SS-DUO1	
Lab Sample ID: F22457-8	Date Sampled: 02/27/04
Matrix: SO - Soil	Date Received: 02/28/04
Method: EPA 8310 SW846 3550B	Percent Solids: 85.7
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	EE021793.D	1	03/08/04	MRE	03/02/04	OP9878	GEE887
Run #2 ^a	EE021769.D	4	03/05/04	MRE	03/02/04	OP9878	GEE886

Run #	Initial Weight	Final Volume
Run #1	30.7 g	5.0 ml
Run #2	30.7 g	5.0 ml

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	760	190	ug/kg	
208-96-8	Acenaphthylene	ND	760	190	ug/kg	
120-12-7	Anthracene	ND	380	190	ug/kg	
56-55-3	Benzo(a)anthracene	418	380	95	ug/kg	
50-32-8	Benzo(a)pyrene	570	76	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	610	76	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	503	76	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	309 ^b	300	76	ug/kg	
218-01-9	Chrysene	447	380	95	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	154	76	19	ug/kg	
206-44-0	Fluoranthene	771	380	95	ug/kg	
86-73-7	Fluorene	ND	380	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	406	76	19	ug/kg	
91-20-3	Naphthalene	ND	380	95	ug/kg	
90-12-0	1-Methylnaphthalene	ND	380	95	ug/kg	
91-57-6	2-Methylnaphthalene	ND	380	95	ug/kg	
85-01-8	Phenanthrene	ND	380	190	ug/kg	
129-00-0	Pyrene	665	380	95	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	94%	89%	49-124%
92-94-4	p-Terphenyl	101%	98%	56-141%

(a) All hits confirmed by spectral match using a diode array detector.

(b) Result is from Run# 2

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0018



TETRA TECH NUS, INC.

CHAIN OF CUSTODY NUMBER

RR BED-1

PAGE 1 OF 1

F22457

PROJECT NO: N0039, CT078	FACILITY: FORMER RAILROAD	PROJECT MANAGER MARK SPERANZA	PHONE NUMBER 412 921 8916	LABORATORY NAME AND CONTACT: ACCUTEST Sue Bell
SAMPLERS (SIGNATURE) Maurin H. Dale	FIELD OPERATIONS LEADER Merv Dale	PHONE NUMBER 904 636 6125	ADDRESS 4405 Vineyard Rd. C-15	
CARRIER/WAYBILL NUMBER Fedex 8402 7227 1844			CITY, STATE ORLANDO, FL 32811	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS	COMMENTS
2/27	1416	CEF-RB-SS-017-01	17	0	1	SO	G	1	G	None	DATA-8310	← use extra volume for MSMS/Cool to 4°C
2/27	1448	CEF-RB-SS-012-01	12	0	1	SO	G	1	G			
2/27	1510	CEF-RB-SS-011-01	11	0	1	SO	G	1	G			N0039 WR 419
2/27	1530	CEF-RB-SS-008-01	08	0	1	SO	G	1	G			
2/27	1557	CEF-RB-SS-007-01	07	0	1	SO	G	1	G			
2/27	1643	CEF-RB-SS-005-01	05	0	1	SO	G	1	G			
2/27	1702	CEF-RB-SS-001-01	01	0	1	SO	G	1	G			
2/27	0000	CEF-RB-SS-DU01	—	0	1	SO	G	1	G			

1. RELINQUISHED BY Maurin H. Dale	DATE 2/27/04	TIME 1530	1. RECEIVED BY Fedex	DATE 2/27/04	TIME
2. RELINQUISHED BY FED-EX	DATE	TIME	2. RECEIVED BY E. [Signature]	DATE 2/28/04	TIME 9:30
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

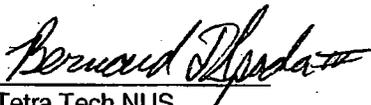
DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) 3.6 PINK (FILE COPY) 4/02R

PHASE III DATA

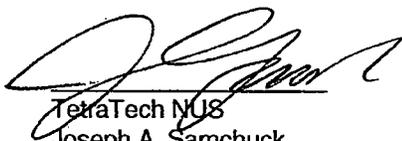
TO: M. SPERANZA – PAGE 2

DATE: JULY 1, 2004

"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
Bernard F Spada III
Chemist/Data Validator



TetraTech NUS
Joseph A. Samchuck
Data Validation 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 Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery 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 - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = % Difference between columns/detectors $>25\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 0039

SDG: F24675 MEDIA: SOIL DATA FRACTION: PAH

nsample CEF-RB-SS-007A-01
samp_date 6/8/2004
lab_id F24675-1
qc_type NM
units UG/KG
Pct_Solids 88.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	94	U	
2-METHYLNAPHTHALENE	94	U	
ACENAPHTHENE	190	U	
ACENAPHTHYLENE	190	U	
ANTHRACENE	190	U	
BENZO(A)ANTHRACENE	94	U	
BENZO(A)PYRENE	19	U	
BENZO(B)FLUORANTHENE	19	U	
BENZO(G,H,I)PERYLENE	19	U	
BENZO(K)FLUORANTHENE	19	U	
CHRYSENE	94	U	
DIBENZO(A,H)ANTHRACENE	19	U	
FLUORANTHENE	94	U	
FLUORENE	190	U	
INDENO(1,2,3-CD)PYRENE	19	U	
NAPHTHALENE	94	U	
PHENANTHRENE	190	U	
PYRENE	94	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID: CEF-RB-SS-007A-01	
Lab Sample ID: F24675-1	Date Sampled: 06/08/04
Matrix: SO - Soil	Date Received: 06/09/04
Method: EPA 8310 SW846 3550B	Percent Solids: 88.5
Project: NAS Cecil Field-CTO 78	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	AA022503.D	1	06/15/04	MRE	06/14/04	OP10671	GAA1060
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.1 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	750	190	ug/kg	
208-96-8	Acenaphthylene	ND	750	190	ug/kg	
120-12-7	Anthracene	ND	380	190	ug/kg	
56-55-3	Benzo(a)anthracene	ND	380	94	ug/kg	
50-32-8	Benzo(a)pyrene	ND	75	19	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	75	19	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	75	19	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	75	19	ug/kg	
218-01-9	Chrysene	ND	380	94	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	75	19	ug/kg	
206-44-0	Fluoranthene	ND	380	94	ug/kg	
86-73-7	Fluorene	ND	380	190	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	75	19	ug/kg	
91-20-3	Naphthalene	ND	380	94	ug/kg	
90-12-0	1-Methylnaphthalene	ND	380	94	ug/kg	
91-57-6	2-Methylnaphthalene	ND	380	94	ug/kg	
85-01-8	Phenanthrene	ND	380	190	ug/kg	
129-00-0	Pyrene	ND	380	94	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	85%		49-124%
92-94-4	p-Terphenyl	89%		56-141%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

0015



TETRA TECH NUS, INC.

CHAIN OF CUSTODY

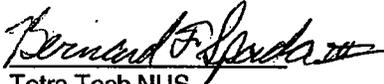
NUMBER

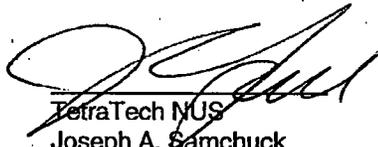
RR BED-2 **F24675** 1 OF 1

PROJECT NO: N0039, C7078		FACILITY: RR Bed, NASCF		PROJECT MANAGER Mark Speranza		PHONE NUMBER 412 921 8916		LABORATORY NAME AND CONTACT: Accutest See Ball			
SAMPLERS (SIGNATURE) Merrin W. Dale				FIELD OPERATIONS LEADER Merrin Dale		PHONE NUMBER 904 636 6125		ADDRESS 4405 Vineland Rd. SC-15			
				CARRIER/WAYBILL NUMBER Fedex 8427		1834 7370		CITY, STATE ORLANDO, FL			
STANDARD TAT <input type="checkbox"/> RUSH TAT <input checked="" type="checkbox"/>								CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED	
<input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input checked="" type="checkbox"/> 7 day <input type="checkbox"/> 14 day								None G			
DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	Nb. OF CONTAINERS	TYPE OF ANALYSIS PAHs BOD		COMMENTS
6/8	1003	CEF-RB-5'S-007A-01		0	1	So	G	1	PAHs BOD		Cool to 4°C
											N0039-428
1. RELINQUISHED BY Merrin W. Dale				DATE 6/8/04	TIME 1600	1. RECEIVED BY Fedex				DATE	TIME
2. RELINQUISHED BY [Signature]				DATE 06/07/04	TIME 0700	2. RECEIVED BY [Signature]				DATE 06/07/04	TIME 0900
3. RELINQUISHED BY				DATE	TIME	3. RECEIVED BY				DATE	TIME
COMMENTS											

TO: M. SPERANZA – PAGE 2
DATE: AUGUST 4, 2004

"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
Bernard F Spada III
Chemist/Data Validator


TetraTech NUS
Joseph A. Samchuck
Data Validation 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 Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery 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 - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = % Difference between columns/detectors $>25\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 0039

SDG: F25219 MEDIA: SOIL DATA FRACTION: PAH

nsample CEF-RR-SS-001-01A
samp_date 7/2/2004
lab_id F25219-1
qc_type NM
units UG/KG
Pct_Solids 93.1
DUP_OF:

Parameter	Result	Val Qual	Qual Code
1-METHYLNAPHTHALENE	170	U	
2-METHYLNAPHTHALENE	170	U	
ACENAPHTHENE	350	U	
ACENAPHTHYLENE	350	U	
ANTHRACENE	350	U	
BENZO(A)ANTHRACENE	786		
BENZO(A)PYRENE	1250		
BENZO(B)FLUORANTHENE	1800		
BENZO(G,H,I)PERYLENE	1370		
BENZO(K)FLUORANTHENE	590		
CHRYSENE	1030		
DIBENZO(A,H)ANTHRACENE	207		
FLUORANTHENE	1040		
FLUORENE	350	U	
INDENO(1,2,3-CD)PYRENE	980		
NAPHTHALENE	170	U	
PHENANTHRENE	350	U	
PYRENE	1250		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID: CEF-RR-SS-001-01A	Date Sampled: 07/02/04
Lab Sample ID: F25219-1	Date Received: 07/03/04
Matrix: SO - Soil	Percent Solids: 93.1
Method: EPA 8310 SW846 3550B	
Project: RR Bed, NASCF	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	AA023024.D	2	07/09/04	MRE	07/07/04	OP10841	GAA1082
Run #2							

Run #	Initial Weight	Final Volume
Run #1	30.8 g	5.0 ml
Run #2		

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1400	350	ug/kg	
208-96-8	Acenaphthylene	ND	1400	350	ug/kg	
120-12-7	Anthracene	ND	700	350	ug/kg	
56-55-3	Benzo(a)anthracene	786	700	170	ug/kg	
50-32-8	Benzo(a)pyrene	1250	140	35	ug/kg	
205-99-2	Benzo(b)fluoranthene	1800	140	35	ug/kg	
191-24-2	Benzo(g,h,i)perylene	1370	140	35	ug/kg	
207-08-9	Benzo(k)fluoranthene	590	140	35	ug/kg	
218-01-9	Chrysene	1030	700	170	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	207	140	35	ug/kg	
206-44-0	Fluoranthene	1040	700	170	ug/kg	
86-73-7	Fluorene	ND	700	350	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	980	140	35	ug/kg	
91-20-3	Naphthalene	ND	700	170	ug/kg	
90-12-0	1-Methylnaphthalene	ND	700	170	ug/kg	
91-57-6	2-Methylnaphthalene	ND	700	170	ug/kg	
85-01-8	Phenanthrene	ND	700	350	ug/kg	
129-00-0	Pyrene	1250	700	170	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		49-124%
92-94-4	p-Terphenyl	97%		56-141%

(a) All hits confirmed by spectral match using a diode array detector. Dilution required due to matrix interference.

ND = Not detected MDL - Method Detection Limit
 RL = Reporting 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

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