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TECHNICAL MEMORANDUM FOR NO FURTHER ACTION AT POTENTIAL SOURCE OF
CONTAMINATION 52 FACILITY 314 NAS CECIL FIELD FL
11/1/2001
TETRA TECH NUS INC

**Technical Memorandum
for
No Further Action**

**Potential Source of Contamination 52
Facility 314**

Naval Air Station Cecil Field
Jacksonville, Florida



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

Revised Final
November 2001

**TECHNICAL MEMORANDUM
FOR NO FURTHER ACTION**

**POTENTIAL SOURCE OF CONTAMINATION 52
FACILITY 314**

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

**REVISED FINAL
NOVEMBER 2001**

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The professional opinions rendered in this decision document identified as Technical Memorandum for No Further Action, Potential Source of Contamination 52, 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 Speranza
Mark Speranza, P.E.
Professional Engineer No. PE0050304

Date: 11/9/01

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: _____ November 6, 2001 _____

NAME AND TITLE OF CERTIFYING OFFICIAL:

Mark Speranza, P.E.
Task Order Manager

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ACRONYMS

µg/kg	Microgram per kilogram
ABB-ES	ABB Environmental Services, Inc.
BaP	Benzo(a)pyrene
BCT	BRAC Cleanup Team
BRAC	Base Realignment and Closure
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	Contract Task Order
EBS	Environmental Baseline Survey
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
ft/ft	Foot/feet
GCTL	Groundwater Cleanup Target Level
HLA	Harding Lawson Associates
IRA	Interim remedial action
mg/kg	Milligram per kilogram
mg/L	milligram per liter
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	Operable unit
PAH	Polynuclear aromatic hydrocarbons
PRE	Preliminary risk evaluation
PSC	Potential source of contamination
PVC	polyvinyl chloride
QA/QC	Quality assurance/quality control
RAC	Remedial action contractor
SAO	Sampling and Analysis Outline
SAR	Sampling and Analysis Report
SCTL	Soil Cleanup Target Level
SOUTHNAVFACENGCOM	Southern Division Naval Facilities Engineering Command
TRPH	Total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency

UCL
USFWS

Upper confidence level
United States Fish and Wildlife Service

1.0 INTRODUCTION

This revised Technical Memorandum for Potential Source of Contamination (PSC) 52, Facility 314, at Naval Air Station (NAS) Cecil Field, has been prepared by Tetra Tech NUS, Inc. (TtNUS) for the Department of the Navy Southern Division Naval Facilities Engineering Command (SOUTHNAVFACENGCOM). 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. The Base Realignment and Closure (BRAC) Cleanup Team (BCT) agreed to delineate, excavate, and dispose of soil at PSC 52 contaminated with polynuclear aromatic hydrocarbons (PAHs) and total recoverable petroleum hydrocarbons (TRPH).

TtNUS performed a field investigation at PSC 52 in June 1999 to supplement the results of previous investigations and to delineate the extent of PAH- and TRPH-contaminated soil. The results of the field investigation were used to develop a Dig and Haul Package (remedial design plan) for a removal action consisting of soil excavation and off-site disposal of the PAH- and TRPH-contaminated surface soil. In addition, a monitoring well was installed and sampled in September 2001 after the excavation was completed.

This technical memorandum presents information from the previous investigations and summarizes the related field operations, results, conclusions, and recommendations of the PSC 52 field investigations conducted by TtNUS in June 1999 and September 2001. It also summarizes the activities related to the soil removal action, as described in the Source Removal Report for PSC 52 (CH2M Hill, 2000). The results of the investigations and the subsequent removal action indicate that no further action is needed at this site.

2.0 SITE DESCRIPTION

2.1 PHYSICAL SETTING

PSC 52 represents an area that was used as a temporary accumulation point for petroleum, oils, and lubricants. This area of concern is on the southern and eastern sides of a storage shed (Facility 314) that is located at the eastern edge of a concrete apron along the east-west flightline (Figures 2-1 and 2-2). Building (Facility) 314 was referred to as the Flightline Ordnance Building in the BRAC NAS Cecil Field Environmental Baseline Survey (EBS) Report (ABB-ES, 1994).

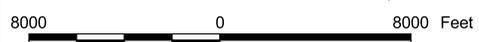
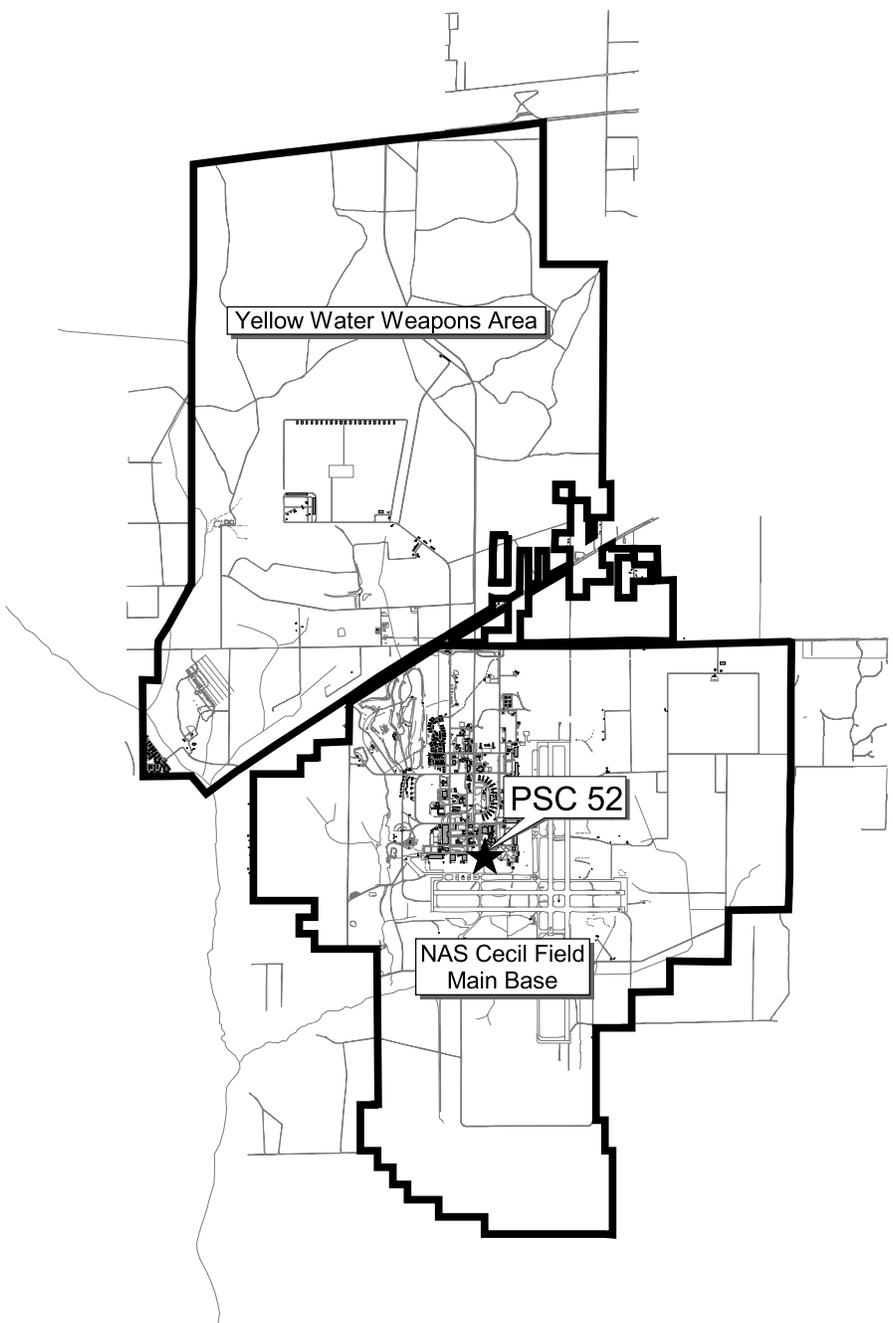
2.2 SITE HISTORY

Building 314 was identified in the EBS report as an environmental concern related to potential releases of hazardous substances caused by improperly sealed waste storage drums at the accumulation point. Because of two areas of stressed vegetation east of Building 314 and stained tarmac on the southern side of the building, the site was color-coded Gray to indicate that additional evaluation was required.

Stressed vegetation and oil stains around waste drums in the accumulation point were originally observed during a January 1995 site walkover (HLA, 1999). A field investigation was conducted between 1995 and 1999 to evaluate the potential for surface soil contamination and to delineate the extent of PAH and TRPH contamination. A preliminary risk evaluation (PRE) was also conducted to assess the potential risks to human receptors. The results were reported in the Sampling and Analysis Report (SAR), Facility 314 (HLA, 1999).

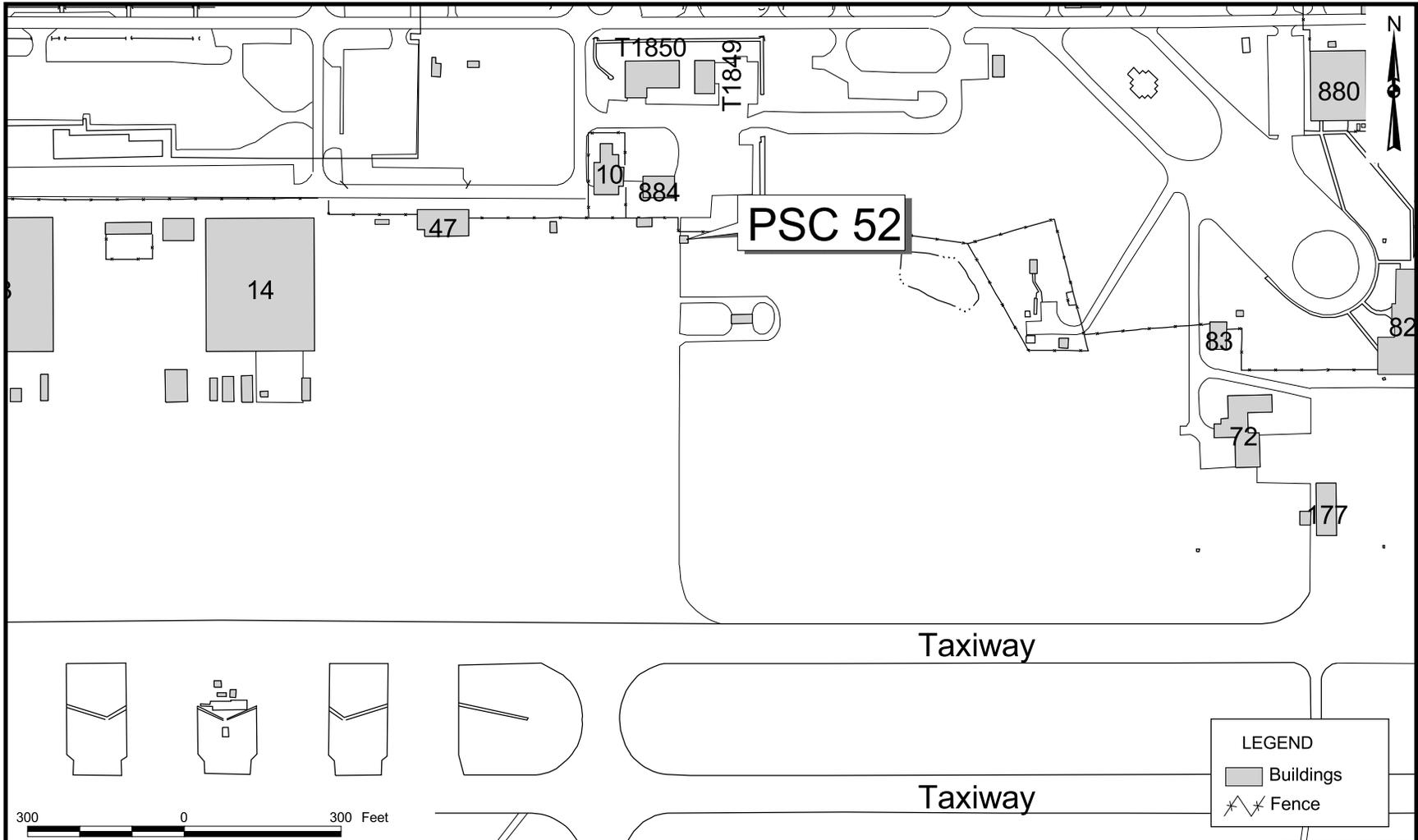
2.3 SITE GEOLOGY AND HYDROGEOLOGY

No site-specific geological investigation was performed at PSC 52. The geological and hydrogeological characteristics of the site are assumed to be similar to those described in the Remedial Investigation Report for Operable Unit (OU) 9, Sites 36 and 37 (TtNUS, 1999), which is located in the same general area as PSC 52.



DRAWN BY MJJ	DATE 08Oct99		<p>GENERAL LOCATION MAP PSC 52, FACILITY 314 TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA</p>	CONTRACT NUMBER 0039	
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SITE LOCATION MAP
PSC 52, FACILITY 314
TECHNICAL MEMORANDUM
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
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FIGURE 2-2	0

3.0 PREVIOUS INVESTIGATIONS

Environmental investigations at PSC 52 began in 1993. The following reports describe the results of investigations conducted prior to the TtNUS investigation at the site:

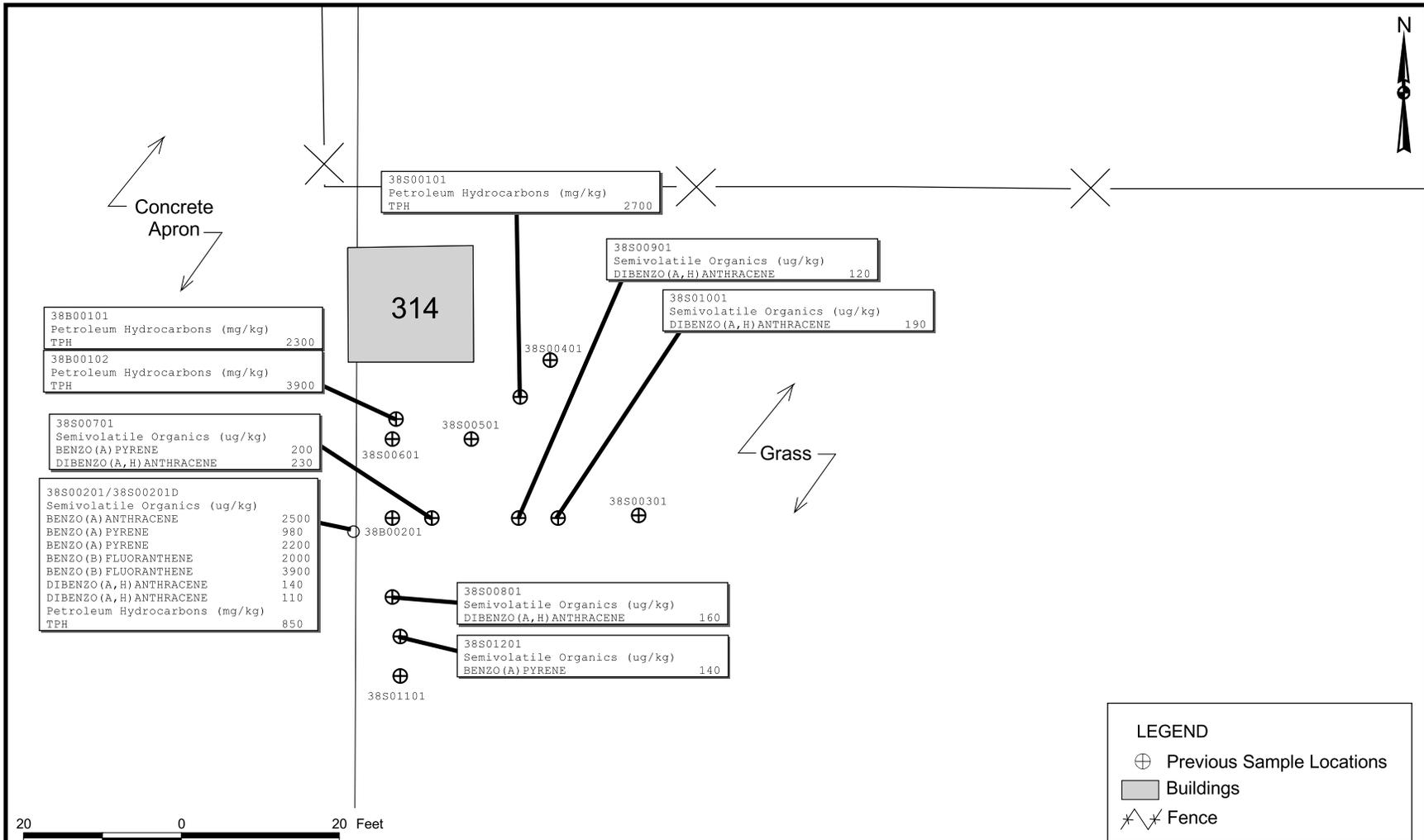
- EBS report (ABB-ES, 1994)
- Sampling and Analysis Outline (SAO), Facility 314 (ABB-ES, 1995)
- SAR, Facility 314 (HLA, 1999)

A summary of sampling locations and analytical data from the previous investigations is shown on Figure 3-1. The SAR (HLA, 1999) indicated the following:

- Surface soil contamination was detected south of Facility 314 in the area of the accumulation point. The contaminants of concern were PAHs and TRPH. The TRPH contamination appeared to be less widespread than the PAH contamination; however, an elevated concentration of TRPH extended beyond 1 foot below ground surface (bgs) in at least one location.
- Additional evaluation of the surface soil contamination is required to determine the extent of contamination and the appropriate response actions for the contaminated soil.
- The human health PRE calculated an excess lifetime cancer risk of 3.6×10^{-5} for the PAH compounds based on the residential risk-based concentrations for surface soil.

Based on these findings, the SAR recommended that Facility 314 should be reclassified to Yellow to indicate that it was an area where release, disposal, and/or migration of hazardous substances had occurred and that removal or remedial actions were underway but not all required remedial actions had been taken.

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PREVIOUS INVESTIGATIONS
SUMMARY OF DETECTED CONTAMINANTS EXCEEDING SCREENING CRITERIA
PSC 52, FACILITY 314
TECHNICAL MEMORANDUM
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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4.0 FIELD INVESTIGATION

Tetra Tech NUS, Inc. (TtNUS) conducted a soil sampling and analysis event at PSC 52 in June 1999 to delineate the extent of PAH- and TRPH-contaminated surface soil. A monitoring well was installed and sampled in September 2001 in response to comments by the FDEP relating to the potential for groundwater contamination. The field investigations were performed in accordance with the PSC 52 Sampling and Analysis Work Plans (TtNUS, 1999; TtNUS, 2001).

A total of five soil samples and one groundwater sample were collected as follows:

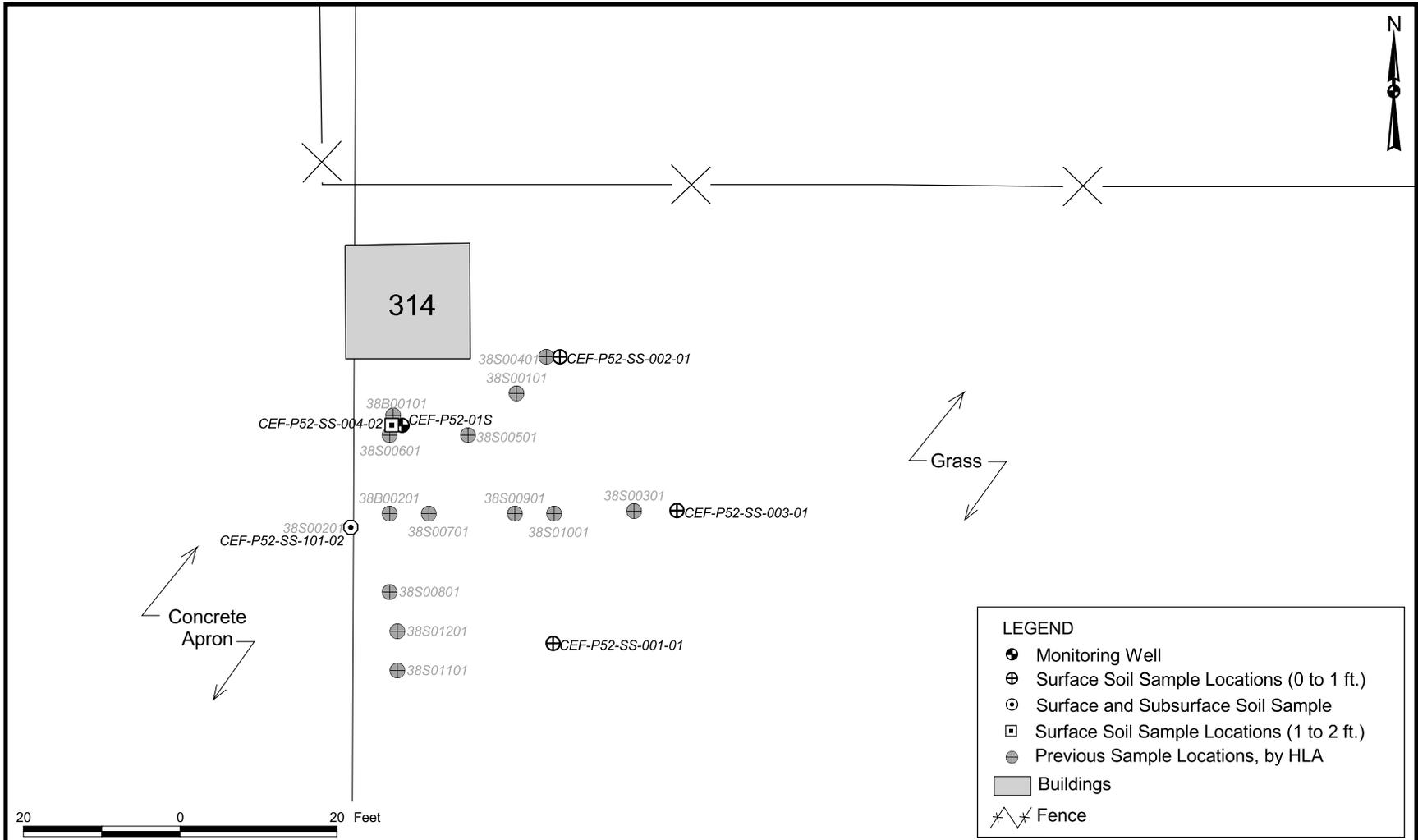
- Two surface soil samples (CEF-P52-SS-001-01 and CEF-P52-SS-003-01) were collected at a depth of 0 to 1 foot bgs, 15 feet south and 15 feet east, respectively, of the previous soil sample 38S01001, and analyzed for PAHs.
- One surface soil sample (CEF-P52-SS-002-01) was collected at a depth of 0 to 1 foot bgs near the previous soil sample 38S00401 and analyzed for PAHs and TRPH.
- One surface soil sample (CEF-P52-SS-004-02) was collected at a depth of 1 to 2 feet bgs near the previous soil sample 38B00101 and analyzed for TRPH.
- One surface soil sample (CEF-P52-SS-101-02) was collected at a depth of 1 to 2 feet bgs near the previous soil sample 38S00201 and analyzed for cadmium.
- One groundwater sample (CEF-P52-GW-01S) was collected from monitoring well CEF-P52-01S that was installed near the location of the highest soil contaminant concentration. Monitoring well CEF-P52-01S was screened from 4.5 to 14.5 feet bgs with a 10 foot long 0.010-inch slotted screen. Well construction material consisted of 2-inch flush threaded polyvinyl chloride (PVC) screen and riser.

One duplicate surface soil sample and one duplicate groundwater sample were collected for quality assurance/quality control (QA/QC) purposes. The soil duplicate was collected at sample location CEF-P52-SS-002.

Sampling locations from the PSC field investigation are shown on Figure 4-1. Analytical results are discussed in Section 5.0 and are included in Appendix A. The boring log and monitoring well construction information are included in Appendix B.

Soil samples were collected as grab samples using plastic, disposable trowels. Groundwater samples were collected using low flow methods. Sampling activities were performed in accordance with the procedures described in the U.S. Environmental Protection Agency (U.S. EPA) Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) (U.S. EPA Region IV, 1996) and the NAS Cecil Field Base-Wide Generic Work Plan (TtNUS, 1998). As agreed by the BCT, no rinsate and trip blanks were collected. In addition, field blanks were not collected because the sampling equipment was disposable.

The soil samples were analyzed for PAHs by U.S. EPA Method SW-846 8310 and TRPH by the Florida PRO method. The groundwater samples were analyzed for PAHs by U.S. EPA Method SW-846 8310, TRPH by Florida PRO method, dieldrin (low detection limit) by U.S. EPA Method SW-846 8081A, and cadmium by U.S. EPA method 6010B. ACCUTEST Southeast in Orlando, Florida performed the analyses.



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SOIL SAMPLE AND MONITORING WELL LOCATIONS
 PSC 52, FACILITY 314
 TECHNICAL MEMORANDUM
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

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5.0 NATURE AND EXTENT OF CONTAMINATION

Analytical results for the soil samples collected during the field investigation are shown on Table 5-1, and complete laboratory data are included in Appendix A. Table 5-1 also compares the results to the FDEP Soil Cleanup Target Level (SCTL) for the most restrictive of the residential direct exposure or the leachability to groundwater criteria (FDEP, 1999).

Based on the results of the sampling and analysis and the statistical analysis discussed in Section 6.0, a remedial design (dig and haul package) was prepared for excavation of the delineated area of benzo(a)pyrene (BaP) contamination greater than 200 µg/kg.

A single excavation area of approximately 1,230 square feet was delineated based on sample locations where the analytical results were less than the BaP statistical criterion or the FDEP SCTLs for the remaining PAHs and TRPH. The estimated excavation volume for an excavation 1 foot deep was approximately 46 cubic yards. The excavation limits are shown on Figure 5-1.

Analytical results for groundwater samples are included in Appendix A. The only detection was TRPH at a concentration of 0.264 mg/L, which is less than the Groundwater Cleanup Target Level (GCTL) of 5 mg/L.

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TABLE 5-1

**SURFACE SOIL ANALYTICAL RESULTS
PSC 52, FACILITY 314
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

PARAMETER	FDEP SCTLs ⁽¹⁾		6/1/99					12/20/00
			CEF-P52-					
	Residential Direct Exposure	Leachability to Groundwater	SS-001 0 - 1 ft	SS-002 0 - 1 ft	SS-002-D 0 - 1 ft	SS-003 0 - 1 ft	SS-004 1 - 2 ft	SS-101 1 - 2 ft
POLYCYCLIC AROMATIC HYDROCARBONS (ug/kg)								
Benzo(a)anthracene	1,400	3,200	46	10 U	15 U	13 U	NA	NA
Benzo(a)pyrene	100 *	8,000	150	10 U	15 U	13 U	NA	NA
Benzo(b)fluoranthene	1,400	10,000	180	10 U	15 U	13 U	NA	NA
Benzo(g,h,i)perylene	2,300,000	32,000,000	290	14 U	20 U	17 U	NA	NA
Benzo(k)fluoranthene	15,000	25,000	100	10 U	15 U	13 U	NA	NA
Chrysene	140,000	77,000	71	10 U	15 U	13 U	NA	NA
Dibenzo(a,h)anthracene	100	30,000	34	16 U	25 U	21 U	NA	NA
Fluoranthene	2,900,000	1,200,000	170	14 U	20 U	17 U	NA	NA
Indeno(1,2,3-cd)pyrene	1,500	28,000	260	86 U	130 U	110 U	NA	NA
Pyrene	2,200,000	880,000	99	9,100 U	20 U	17 U	NA	NA
PETROLEUM HYDROCARBONS (mg/kg)								
TRPH	340	340	NA	89 U	88 U	NA	86 U	NA
METALS (mg/kg)								
Cadmium	75	8	NA	NA	NA	NA	NA	0.07

FDEP = Florida Department of Environmental Protection

1 SCTLs = Soil Target Cleanup Levels, Florida Administrative Code (FAC) 62-777 (FDEP, 1999)

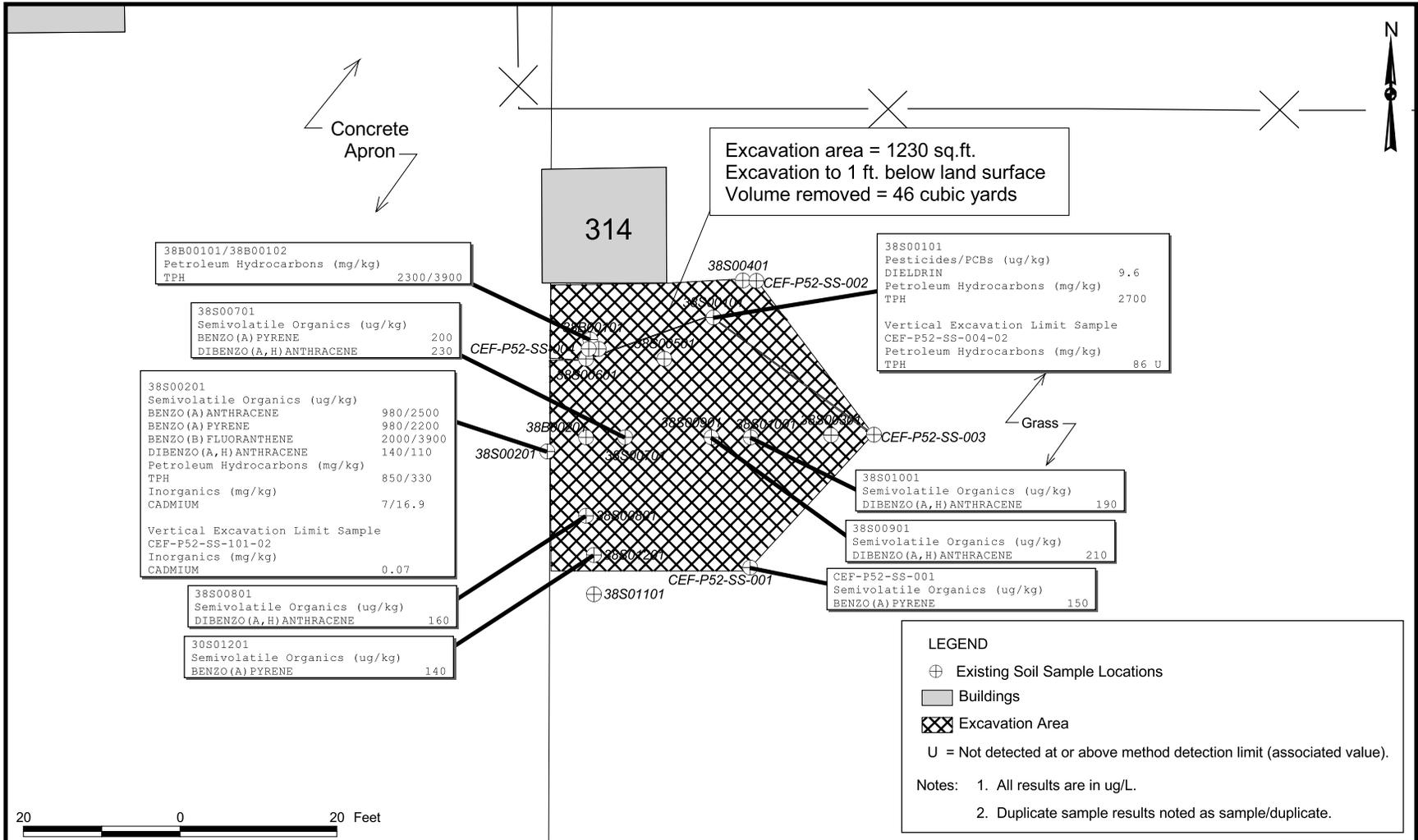
* = Excavation limits were determined using a benzo(a)pyrene concentration of greater than 200 ug/kg, based on statistical analysis.

NA = Not Analyzed

U = Not detected at detection limit value shown.

Shaded values exceed STCLs.

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DRAWN BY MJJ CHECKED BY JWL COST/SCHEDULE-AREA SCALE AS NOTED	DATE 08August199 DATE 8/18/99		CONTAMINANTS GREATER THAN CRITERIA AND LIMITS OF SOIL EXCAVATION PSC 52, FACILITY 314 TECHNICAL MEMORANDUM NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
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6.0 PRELIMINARY RISK EVALUATION

6.1 HUMAN HEALTH RISKS

The results of the soil sampling at PSC 52 identified the extent of BaP contamination in excess of the FDEP residential SCTL of 100 µg/kg. A statistically based approach was used to determine how much excavation would be required. It was determined that not all samples with BaP concentrations greater than the FDEP SCTL would need to be removed. The exceedance of a criterion by an individual sample does not necessarily indicate a significant exceedance of a target risk level. Exposure to the BaP in the soil is a result of exposure to an area, not an individual sampling location. Therefore, the entire data set was used to determine a post-excavation exposure concentration that would be less than the FDEP SCTL for BaP.

The first step of this statistical approach determined the distribution of the BaP data. Performance of a Shapiro-Wilk test indicated that the BaP data at PSC 52 were lognormally distributed. Therefore, the exposure concentration for BaP at PSC 52 would be represented best by the lesser of the 95% upper confidence level (UCL) of the geometric mean or the maximum detected concentration. With a geometric mean concentration of 46 µg/kg and a geometric standard deviation of 9.3 ug/kg (14 samples), the UCL is greater than the maximum detected concentration. Therefore, the exposure concentration (UCL), represented by the maximum of 2,200 µg/kg, is greater than the FDEP SCTL for BaP.

The second step of this statistically based approach used an iterative process to determine above which BaP concentration the soil must be removed to achieve a UCL less than or equal to the FDEP SCTL. In theory, the sampling locations with the highest BaP concentrations would be excavated and replaced with clean fill. The excavated sample points were assumed to be replaced with clean fill having a BaP concentration of 50 µg/kg, a value equal to one-half the detection limit. The data set was evaluated in a stepwise manner by replacing the highest concentration with the clean fill concentration, then recalculating the UCL. When the UCL was less than the FDEP SCTL, the calculations were stopped.

This iterative process indicated that soil with BaP concentrations greater than 200 µg/kg would require removal to achieve a UCL less than 100 µg/kg. This value of 200 µg/kg was based on the assumption that the post-remediation data are normally distributed, as indicated by results of Shapiro-Wilk test conducted on the post-remediation data. The area with BaP concentrations greater than 200 µg/kg are shown on Figure 5-1. Some samples within the shaded area have concentrations less than 200 µg/kg; these were included to facilitate definition of the excavation area. The calculations are provided in Table 6-1.

TABLE 6-1

**BaP DELINEATION
PSC 52 – FACILITY 314
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Sample	Results	ALL DATA		POST-REMEDIATION RESULTS	
		Normal	In	Normal	In
38S00201D	2200	2200	7.696	50	3.912
38S00201	980	980	6.888	50	3.912
38S00701	200	200	5.298	200	5.298
CEF-P52-SS-001	152.7	152.7	5.028	152.7	5.028
38S01201	140	140	4.942	140	4.942
38S01001	100	100	4.605	100	4.605
38S00801	66	66	4.190	66	4.190
38S00101	60 J	60	4.094	60	4.094
38S00901	21	21	3.045	21	3.045
CEF-P52-SS-003	15.2	15.2	2.721	15.2	2.721
38S01101	15	15	2.708	15	2.708
CEF-P52-SS-002	10.1	10.1	2.313	10.1	2.313
38S00601	2 U	1	0.000	1	0.000
38B00201	2 U	1	0.000	1	0.000
	Average	283.00	3.82	63.00	3.34
	STD	606.44	2.23	62.82	1.69
	Count	14	14	14	14
	t/H	1.771	4.32	1.771	3.9
	UCL	570.0	7966.6	92.7	728.2

The area encompassing the sample locations with BaP concentrations in excess of the UCL was excavated and disposed at a permitted solid waste disposal facility. BaP in the soil samples collected outside the excavation area was not detected at a concentration in excess of the UCL. Therefore, a human health preliminary risk evaluation (PRE) is not required.

Because no contaminants were detected at concentrations greater than GCTLs, there is no risk associated with groundwater at this site.

6.2 ECOLOGICAL RISKS

The excavated area is bounded by samples 38S00401, CEF-P52-SS-002, CEF-P52-SS-003, CEF-P52-SS-001, and the eastern edge of the concrete apron (Figure 5-1). Sample CEF-P52-SS-001 is the only one of these four samples where PAH concentrations exceeded U. S. EPA Region IV surface soil screening values (100 µg/kg). PAH concentrations in this sample are shown in Table 5-1. (Note: The ecological screening value for benzo(a)pyrene (100 µg/kg) was used as a surrogate for PAHs that had no established screening values). The exceedances were relatively low, however, with a maximum hazard quotient of 2.9 for benzo(g,h,i)perylene. In addition, the value for total PAHs in this sample (1,400 µg/kg) only slightly exceeded the U.S. EPA Region IV surface soil screening value for total PAHs (1,000 µg/kg). Only one soil sample (38S00111) was collected outside the excavated area (Figure 5-1), and PAH concentrations in this sample were less than the U.S. EPA Region IV surface soil screening values.

PAHs do not bioaccumulate at the concentrations measured at PSC 52, and thus, toxicity via the food chain is negligible. Potential toxicity to ecological receptors would be limited primarily to direct contact.

Ecologically based toxicity values are sparse for PAHs in soil. During the 1980's the Netherlands established criteria for evaluating PAH contamination in soil (Beyer, 1990). The Dutch values indicative of "background concentrations in soil or detection limits" have been adopted as ecological screening values by U.S. EPA Region IV (Table 6-2). All PAH concentrations in sample CEF-P52-SS-001 were well below the Dutch "B" values indicative of "moderate soil contamination that requires additional study" (Beyer, 1990).

Ecological habitat at PSC 52 consists of regularly mowed grass. The site is located adjacent to a building and concrete apron, while other buildings and structures are nearby. There is no natural habitat (other than mowed grass) in the vicinity of the site. Soil invertebrates such as earthworms probably inhabit the grassy portion of the site. Vertebrates that could utilize the site consist of terrestrial species that are tolerant of human activity (e.g., birds, lizards).

TABLE 6-2

SOIL CRITERIA FOR EVALUATING PAH COMPOUNDS UNDER THE
 DUTCH SOIL CLEANUP ACT (BEYER, 1990)
 PSC 52, FACILITY 314
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

PAH Compound	"A" value (µg/kg)	"B" value(µg/kg)	"C" value (µg/kg)
Anthracene	100	10,000	100,000
Benzo(a)pyrene	100	1,000	10,000
Fluoranthene	100	10,000	100,000
Naphthalene	100	5,000	50,000
Phenanthrene	100	5,000	50,000
Pyrene	100	10,000	100,000
Total PAHs	1,000	20,000	200,000

"A" values refer to background concentrations in soil or detection limits
 "B" values refer to moderate soil contamination that requires additional study
 "C" values refer to threshold values that require immediate cleanup

In conclusion, most of the contaminant source (petroleum-contaminated soil) has been excavated and removed. PAH concentrations in one soil sample at the edge of the excavated area only slightly exceeded conservative ecological screening values. All concentrations in this sample were well below concentrations indicative of “moderate soil contamination that requires additional study” (Beyer, 1990).

Minimal contamination in this single sample, which is located in an area of marginal ecological habitat, pose negligible potential risks to ecological receptors from direct contact as well as negligible risks to upper level receptors via the food chain.

7.0 REMEDIAL ACTIVITIES

The Navy's Remedial Action Contractor (RAC), CH2M Hill Contractors, Inc., conducted the source removal activities for PSC 52 from February 11 through February 15, 2000. The RAC excavated, characterized, transported, and disposed of 69.81 tons of petroleum- and PAH-contaminated soil and restored the site to pre-excavation conditions. The excavated soil was transported and disposed off site on February 22 and 23, 2000.

The soil was excavated using a mini-excavator and then stockpiled, bermed, and covered before it was loaded into trucks, provided by Pritchett Trucking, for transportation and disposal. Soils were excavated to the horizontal excavation limits shown on Figure 5-1 and the vertical excavation limit of 1 foot bgs as specified in the Dig and Haul Package for PSC 52 (TtNUS, 1999). The excavated soil was transported to the Chesser Island Road Landfill in Folkston, Georgia.

The material used to backfill the excavation was clean fill obtained from the Dallas Harts Borrow Pit in Jacksonville, Florida. The site was then graded and seeded with a mixture of rye and bahia grass. No confirmatory sampling and analyses were required, based on the specifications outlined in the Dig and Haul Package for PSC 52. A final inspection was conducted on March 1, 2000. The site has been returned to the pre-remedial action condition.

Detailed information on the remedial activities, including photographs, copies of the soil manifests, certificates of disposal, and certificate of clean fill, are provided in the Source Removal Report (CH2M Hill, 2000).

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

Conclusions pertaining to PSC 52, Facility 314 are as follows:

- Areas of soil where BaP was detected at concentrations in excess of the statistical analysis and TRPH concentrations in excess of the FDEP SCTL have been excavated and disposed at a permitted solid waste disposal facility.
- The excavated area was restored to pre-excavation conditions with uncontaminated backfill materials.
- PAHs in the soil samples collected outside the excavation area were not detected in excess of the FDEP SCTL or statistical analysis and TRPH in the soil samples collected outside the excavation area were not detected in excess of the FDEP SCTL.
- No contaminants were detected in the groundwater at concentrations greater than GCTLs, so there is no risk associated with the groundwater.
- Since the removal action has been conducted, no contaminants or pathways pose a threat to the public health, welfare, or the environment.

8.2 RECOMMENDATIONS

The soil removal action conducted at PSC 52 is protective of human health and the environment and utilized permanent solutions for the site. Because the removal action is complete, the final recommendation for PSC 52 is no further action.

It is also recommended that the color classification of PSC 52 be changed from Yellow to Dark Green to denote that releases of hazardous substances have occurred and remedial actions to protect human health and the environment have been taken.

REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1994. Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station (NAS) Cecil Field, November.

Beyer, N., 1990. Evaluating Soil Contamination. USFWS Biological Report 90(2).

ABB-ES, 1995. Sampling and Analysis Outline, Facility 314, Base Realignment and Closure, Zone D, Industrial and Flight Line Area, Group IV. NAS Cecil Field, Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, April.

CH2M Hill, 2000. Source Removal Report, Excavation of Petroleum Contaminated Soil at PSC 52, Facility 314. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, July.

FDEP (Florida Department of Environmental Protection), 1999. Contaminant Target Levels Rule, Soil, Groundwater, and Surface Water Target Cleanup Levels, Florida Administrative Code (FAC) Chapter 62-777, August.

HLA (Harding Lawson Associates), 1999. Sampling and Analysis Report, Facility 314, Base Realignment and Closure, Zone D, Industrial and Flight Line Area. NAS Cecil Field, Jacksonville, Florida. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, February.

TtNUS (Tetra Tech NUS, Inc.), 1998. Base-Wide Generic Work Plan at NAS Cecil Field, Jacksonville, Florida. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, October.

TtNUS, 1999a. Sampling and Analysis Work Plan, PSC 52, Facility 314, NAS Cecil Field. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, May.

TtNUS, 1999b. Dig and Haul Package for PSC 52 - Facility 314, NAS Cecil Field. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, August.

TtNUS, 1999c. Remedial Investigation for Site 36 – Control Tower TCE Plume and Site 37 – Hangars 13 and 14 DCE Plume. NAS Cecil Field, Jacksonville, Florida. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina, August.

TtNUS, 2001. Sampling and Analysis Work Plan, PSC 52, Facility 314, NAS Cecil Field. Prepared for SOUTHNAVFACENGCOC, North Charleston, South Carolina. July.

U.S. EPA Region IV (U.S. Environmental Protection Agency, Region IV), 1996. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), Athens, Georgia.

APPENDIX A

ANALYTICAL LABORATORY RESULTS



Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-07-9-132

TO: MR. M. SPERANZA
DATE: JULY 20, 1999

FROM: JUSTIN ORBICH
CC: DV FILE

SUBJECT: ORGANIC DATA VALIDATION -PAH/TPH
CTO 078 - NAS CECIL FIELD
SDG F4226

SAMPLES: 4/Solid
CEF-P52-SS-001-01
CEF-P52-SS-002-01
CEF-P52-SS-003-01
CEF-P52-SS-DU01

OVERVIEW

The sample set for CTO 078, SDG F4226, Naval Air Station (NAS) Cecil Field, Florida consists of four (4) solid environmental samples. The environmental samples were analyzed for Target Compound List (TCL) Polynuclear Aromatic Hydrocarbon (PAH) and Total Petroleum Hydrocarbon (TPH) organic compounds. One (1) field duplicate pair (CEF-P52-SS-001-02/CEF-P52-SS-DU01) was included within this SDG.

The samples were collected by Tetra Tech, NUS on June 1st, 1999 and analyzed by Accutest Laboratories. The PAH samples were analyzed by Accutest Southeast subcontracted Lab. 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 inconsistencies were noted for the reporting limits between the Form Is and the electronic data.

TPH FRACTION

All quality control parameters were met for this fraction.

MEMO TO: MR. M. SPERANZA
DATE: JULY 20, 1999 - PAGE 2

EXECUTIVE SUMMARY

Laboratory performance: None.

Other Factors Affecting Data Quality: Several inconsistencies were noted between the Form Is and the electronic data.

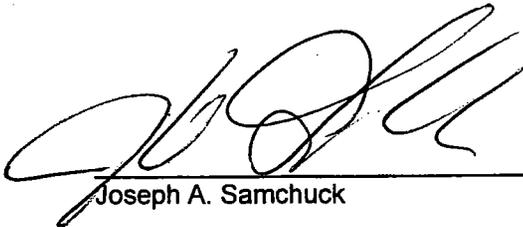
The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (February, 1994), and the NFESC guidelines "Navy Installation Restoration Program Laboratory Quality Assurance Guide" (February, 1996). The text of this report has been formulated to 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



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

Report of Analysis

Client Sample ID: CEF-P52-SS-001-01	Date Sampled: 06/01/99
Lab Sample ID: F4226-1	Date Received: 06/02/99
Matrix: SO - Soil	Percent Solids: 99.3
Method: EPA 8310	
Project: NAS Cecil Field	

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2		1	07/02/99	SUB	n/a	n/a	R6896

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	56	ug/kg	
208-96-8	Acenaphthylene	ND	110	ug/kg	
120-12-7	Anthracene	ND	8.5	ug/kg	
56-55-3	Benzo(a)anthracene	46	8.5	ug/kg	
50-32-8	Benzo(a)pyrene	150	8.5	ug/kg	
205-99-2	Benzo(b)fluoranthene	180	8.5	ug/kg	
191-24-2	Benzo(g,h,i)perylene	290	11	ug/kg	
207-08-9	Benzo(k)fluoranthene	100	8.5	ug/kg	
218-01-9	Chrysene	71	8.5	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	34	14	ug/kg	
206-44-0	Fluoranthene	170	11	ug/kg	
86-73-7	Fluorene	ND	11	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	260	72	ug/kg	
91-20-3	Naphthalene	ND	56	ug/kg	
90-12-0	1-Methylnaphthalene	ND	56	ug/kg	
91-57-6	2-Methylnaphthalene	ND	56	ug/kg	
85-01-8	Phenanthrene	ND	8.5	ug/kg	
129-00-0	Pyrene	99	11	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

00014

Report of Analysis

Client Sample ID: CEF-P52-SS-002-01	
Lab Sample ID: F4226-2	Date Sampled: 06/01/99
Matrix: SO - Soil	Date Received: 06/02/99
Method: EPA 8310	Percent Solids: 93.4
Project: NAS Cecil Field	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a		1	07/02/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	66	ug/kg	
208-96-8	Acenaphthylene	ND	140	ug/kg	
120-12-7	Anthracene	ND	10	ug/kg	
56-55-3	Benzo(a)anthracene	ND	10	ug/kg	
50-32-8	Benzo(a)pyrene	ND	10	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	10	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	14	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	10	ug/kg	
218-01-9	Chrysene	ND	10	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	16	ug/kg	
206-44-0	Fluoranthene	ND	14	ug/kg	
86-73-7	Fluorene	ND	14	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	86	ug/kg	
91-20-3	Naphthalene	ND	66	ug/kg	
90-12-0	1-Methylnaphthalene	ND	66	ug/kg	
91-57-6	2-Methylnaphthalene	ND	66	ug/kg	
85-01-8	Phenanthrene	ND	10	ug/kg	
129-00-0	Pyrene	ND	9100	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

00017

Report of Analysis

Client Sample ID: CEF-P52-SS-DU01		Date Sampled: 06/01/99
Lab Sample ID: F4226-5		Date Received: 06/02/99
Matrix: SO - Soil		Percent Solids: 94.4
Method: EPA 8310		
Project: NAS Cecil Field		

Run #1 ^a	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2		1	07/02/99	SUB	n/a	n/a	R6896

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	100	ug/kg	
208-96-8	Acenaphthylene	ND	200	ug/kg	
120-12-7	Anthracene	ND	15	ug/kg	
56-55-3	Benzo(a)anthracene	ND	15	ug/kg	
50-32-8	Benzo(a)pyrene	ND	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	15	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	20	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	15	ug/kg	
218-01-9	Chrysene	ND	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	25	ug/kg	
206-44-0	Fluoranthene	ND	20	ug/kg	
86-73-7	Fluorene	ND	20	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	130	ug/kg	
91-20-3	Naphthalene	ND	100	ug/kg	
90-12-0	1-Methylnaphthalene	ND	100	ug/kg	
91-57-6	2-Methylnaphthalene	ND	100	ug/kg	
85-01-8	Phenanthrene	ND	15	ug/kg	
129-00-0	Pyrene	ND	20	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

00023

Report of Analysis

Client Sample ID: CEF-P52-SS-003-01		Date Sampled: 06/01/99
Lab Sample ID: F4226-3		Date Received: 06/02/99
Matrix: SO - Soil		Percent Solids: 99.2
Method: EPA 8310		
Project: NAS Cecil Field		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a		1	07/02/99	SUB	n/a	n/a	R6896
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
83-32-9	Acenaphthene	ND	83	ug/kg	
208-96-8	Acenaphthylene	ND	170	ug/kg	
120-12-7	Anthracene	ND	13	ug/kg	
56-55-3	Benzo(a)anthracene	ND	13	ug/kg	
50-32-8	Benzo(a)pyrene	ND	13	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	13	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	17	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	13	ug/kg	
218-01-9	Chrysene	ND	13	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	21	ug/kg	
206-44-0	Fluoranthene	ND	17	ug/kg	
86-73-7	Fluorene	ND	17	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	110	ug/kg	
91-20-3	Naphthalene	ND	83	ug/kg	
90-12-0	1-Methylnaphthalene	ND	83	ug/kg	
91-57-6	2-Methylnaphthalene	ND	83	ug/kg	
85-01-8	Phenanthrene	ND	13	ug/kg	
129-00-0	Pyrene	ND	17	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1718-51-0	p-Terphenyl-d14	%		-%

(a) Analyzed By Accutest Southeast Subcontract Lab.

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

00020



Report of Analysis

Client Sample ID: CEF-P52-SS-002-01	
Lab Sample ID: F4226-2	Date Sampled: 06/01/99
Matrix: SO - Soil	Date Received: 06/02/99
Method: FLORIDA-PRO	Percent Solids: 93.4
Project: NAS Cecil Field	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04138.D	1	06/10/99	SKW	06/07/99	OP829	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	89	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	107%		40-140%

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

0002



Report of Analysis

Client Sample ID: CEF-P52-SS-DU01	
Lab Sample ID: F4226-5	Date Sampled: 06/01/99
Matrix: SO - Soil	Date Received: 06/02/99
Method: FLORIDA-PRO	Percent Solids: 94.4
Project: NAS Cecil Field	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04140.D	1	06/10/99	SKW	06/07/99	OP829	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	88	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	106%		40-140%	

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

90004



Report of Analysis

Client Sample ID: CEF-P52-SS-004-02	Date Sampled: 06/01/99
Lab Sample ID: F4226-4	Date Received: 06/02/99
Matrix: SO - Soil	Percent Solids: 97.0
Method: FLORIDA-PRO	
Project: NAS Cecil Field	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP04139.D	1	06/10/99	SKW	06/07/99	OP829	GOP200
Run #2							

CAS No.	Compound	Result	RDL	Units	Q
	TPH (C8-C40)	ND	86	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	100%		40-140%

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

00003

CTO078 - NAS CECIL
SOIL DATA
Accutest, NJ
SDG: F4226

SAMPLE NUMBER:	CEF-P52-SS-001-01	CEF-P52-SS-002-01	CEF-P52-SS-003-01	CEF-P52-SS-DU01
SAMPLE DATE:	06/01/99	06/01/99	06/01/99	06/01/99
LABORATORY ID:	F4226-1	F4226-2	F4226-3	F4226-5
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	99.3 %	93.4 %	99.2 %	94.4 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				CEF-P52-SS-002

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	56	U		66	U		83	U		100	U	
2-METHYLNAPHTHALENE	56	U		66	U		83	U		100	U	
ACENAPHTHENE	56	U		66	U		83	U		100	U	
ACENAPHTHYLENE	110	U		140	U		170	U		200	U	
ANTHRACENE	8.5	U		10	U		13	U		15	U	
BENZO(A)ANTHRACENE	46			10	U		13	U		15	U	
BENZO(A)PYRENE	150			10	U		13	U		15	U	
BENZO(B)FLUORANTHENE	180			10	U		13	U		15	U	
BENZO(G,H,I)PERYLENE	290			14	U		17	U		20	U	
BENZO(K)FLUORANTHENE	100			10	U		13	U		15	U	
CHRYSENE	71			10	U		13	U		15	U	
DIBENZO(A,H)ANTHRACENE	34			16	U		21	U		25	U	
FLUORANTHENE	170			14	U		17	U		20	U	
FLUORENE	11	U		14	U		17	U		20	U	
INDENO(1,2,3-CD)PYRENE	260			86	U		110	U		130	U	
NAPHTHALENE	56	U		66	U		83	U		100	U	
PHENANTHRENE	8.5	U		10	U		13	U		15	U	
PYRENE	99			9100	U		17	U		20	U	

NAS CECIL FIELD
SOIL DATA
Accutest, NJ
SDG: F4226

SAMPLE NUMBER:	CEF-P52-SS-002-01	CEF-P52-SS-004-02	CEF-P52-SS-DU01	
SAMPLE DATE:	06/01/99	06/01/99	06/01/99	//
LABORATORY ID:	F4226-2	F4226-4	F4226-5	
QC_TYPE:	NORMAL	NORMAL	NORMAL	
% SOLIDS:	93.4 %	97.0 %	94.4 %	100.0 %
UNITS:	MG/KG	MG/KG	MG/KG	
FIELD DUPLICATE OF:			CEF-P52-SS-002	

	RESULT	QUAL	CODE									
PETROLEUM HYDROCARBONS												
TPH (C8-C40)	89	U		86	U		88	U				

TO: M. SPERANZA – PAGE 2
DATE: JANUARY 26, 2001

An action level of 5X the maximum concentration were used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors, if applicable, were taken into consideration when evaluation for blank contamination. No qualification of results was necessary since the result reported for arsenic was nondetected and the result reported for cadmium was greater than the action level.

Executive Summary

Laboratory Performance: Arsenic and cadmium were present in the laboratory method blanks, however, no qualification of results was necessary.

Other Factors Affecting Data Quality: None.

TO: M. SPERANZA – PAGE 3
DATE: JANUARY 26, 2001

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 IRCDQM" (September 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
Erin M. Faust
Environmental Scientist


TetraTech 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

The text of this report is formulated to address only gross noncompliances resulting in the rejection of data and the elimination of false positives.

VOA

All data were reported without qualification.

PAH

Samples CEF-635-SU-806-03 and CEF-635-SU-813-04 were extracted 24 days out of hold time. Positive and nondetected results for benzo(a)pyrene were qualified as estimated (J) and (UJ), respectively.

PEST

Recovery of the pesticide surrogate tetrachloro-m-xylene (TMX) fell below the 57% (but was >10%) quality control limit on one analytical column for the analysis of sample CEF-P52-GW-DUP1-01. No action was taken based on this noncompliance.

Matrix Spike / Matrix Spike Duplicate (MS/MSD) recoveries of Dieldrin resulted in a Relative Percent Difference (RPD) that exceeded the 20% quality control limit. No action was taken based on this noncompliance.

Additional Comments

Positive results below the Reporting Limit (RL) were qualified as estimated (J), due to uncertainty near the detection limit.

Pesticide surrogate recoveries were reported from one analytical column. However, this surrogate reporting convention may be standard laboratory protocol if only nondetected results are reported in environmental samples. Therefore, no action was taken based on this noncompliance.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Environmental soil samples were extracted 24 days out of hold time resulting in the qualification (estimation) of analytical data.

Other Factors Affecting Data Quality: None

MEMO TO: M. Speranza
PAGE: 3

DATE: 10/25/01
SDGs: F10677R, F10950 and F10990

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99) and the NFESC guidelines "Navy 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

Douglas Schloer
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

CTO078-NAS CECIL FIELD

WATER DATA

Accutest, NJ

SDG: F10950

SAMPLE NUMBER:	CEF-P52-GW-01S	CEF-P52-GW-DUP1		
SAMPLE DATE:	09/19/01	09/19/01	//	//
LABORATORY ID:	F10950-1	F10950-2		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	UG/L	UG/L		
FIELD DUPLICATE OF:		CEF-P52-GW-01		

	RESULT	QUAL	CODE									
POLYNUCLEAR AROMATIC HYDROCARBONS												
1-METHYLNAPHTHALENE	2	U		2	U							
2-METHYLNAPHTHALENE	2	U		2	U							
ACENAPHTHENE	4	U		4	U							
ACENAPHTHYLENE	4	U		4	U							
ANTHRACENE	2	U		2	U							
BENZO(A)ANTHRACENE	0.2	U		0.2	U							
BENZO(A)PYRENE	0.2	U		0.2	U							
BENZO(B)FLUORANTHENE	0.2	U		0.2	U							
BENZO(G,H,I)PERYLENE	0.2	U		0.2	U							
BENZO(K)FLUORANTHENE	0.2	U		0.2	U							
CHRYSENE	2	U		2	U							
DIBENZO(A,H)ANTHRACENE	0.2	U		0.2	U							
FLUORANTHENE	2	U		2	U							
FLUORENE	2	U		2	U							
INDENO(1,2,3-CD)PYRENE	0.2	U		0.2	U							
NAPHTHALENE	2	U		2	U							
PHENANTHRENE	2	U		2	U							
PYRENE	2	U		2	U							

CTO078-NAS CECIL FIELD

WATER DATA

Accutest, NJ

SDG: F10950

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

CEF-P52-GW-01S
 09/19/01
 F10950-1
 NORMAL
 0.0 %
 UG/L

CEF-P52-GW-DUP1
 09/19/01
 F10950-2
 NORMAL
 0.0 %
 UG/L
 CEF-P52-GW-01

//
 100.0 %

//
 100.0 %

	RESULT	QUAL	CODE									
PESTICIDES/PCBs												
DIELDRIN	0.002	U		0.002	U							

CTO078-NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F10950

SAMPLE NUMBER:	CEF-P52-GW-01S	CEF-P52-GW-DUP1		
SAMPLE DATE:	09/19/01	09/19/01	//	//
LABORATORY ID:	F10950-1	F10950-2		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	0.0 %	0.0 %	100.0 %	100.0 %
UNITS:	MG/L	MG/L		
FIELD DUPLICATE OF:		CEF-P52-GW-01		

	RESULT	QUAL	CODE									
PETROLEUM HYDROCARBONS												
TOTAL PETROLEUM HYDROCARBONS	0.264			0.282								

Report of Analysis

Client Sample ID: CEF-P52-GW-01S	Date Sampled: 09/19/01
Lab Sample ID: F10950-1	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: EPA 8310 SW846 3510C	
Project: NAS Cecil Field 0039	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE005153.D	1	09/25/01	MRE	09/21/01	OP3876	GEE238
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	4.0	ug/l	
208-96-8	Acenaphthylene	ND	4.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	ND	2.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	ND	2.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	2.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	70%		33-141%
92-94-4	p-Terphenyl	74%		31-122%

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-P52-GW-DUP1	Date Sampled: 09/19/01
Lab Sample ID: F10950-2	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: EPA 8310 SW846 3510C	
Project: NAS Cecil Field 0039	

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	EE005156.D	1	09/25/01	MRE	09/21/01	OP3876	GEE238
Run #2							

Polynuclear Aromatic Hydrocarbons

CAS No.	Compound	Result	RL	Units	Q
83-32-9	Acenaphthene	ND	4.0	ug/l	
208-96-8	Acenaphthylene	ND	4.0	ug/l	
120-12-7	Anthracene	ND	2.0	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	ug/l	
218-01-9	Chrysene	ND	2.0	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	ug/l	
206-44-0	Fluoranthene	ND	2.0	ug/l	
86-73-7	Fluorene	ND	2.0	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	ug/l	
91-20-3	Naphthalene	ND	2.0	ug/l	
90-12-0	1-Methylnaphthalene	ND	2.0	ug/l	
91-57-6	2-Methylnaphthalene	ND	2.0	ug/l	
85-01-8	Phenanthrene	ND	2.0	ug/l	
129-00-0	Pyrene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	74%		33-141%
92-94-4	p-Terphenyl	75%		31-122%

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-P52-GW-01S	Date Sampled: 09/19/01
Lab Sample ID: F10950-1	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8081A SW846 3510C	
Project: NAS Cecil Field 0039	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	DD03179.D	1	10/01/01	SKW	09/25/01	OP3896	GDD117
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
60-57-1	Dieldrin	ND	0.0020	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	69%		57-125%
2051-24-3	Decachlorobiphenyl	94%		15-140%

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

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Report of Analysis

Client Sample ID: CEF-P52-GW-DUP1	Date Sampled: 09/19/01
Lab Sample ID: F10950-2	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: SW846 8081A SW846 3510C	
Project: NAS Cecil Field 0039	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	DD03180.D	1	10/01/01	SKW	09/25/01	OP3896	GDD117
Run #2							

Pesticide TCL List

CAS No.	Compound	Result	RL	Units	Q
60-57-1	Dieldrin	ND	0.0020	ug/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
877-09-8	Tetrachloro-m-xylene	50%*		57-125%	
2051-24-3	Decachlorobiphenyl	63%		15-140%	

(a) Outside control limits, insufficient sample for reextraction.

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-P52-GW-01S	Date Sampled: 09/19/01
Lab Sample ID: F10950-1	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: FLORIDA-PRO SW846 3510C	
Project: NAS Cecil Field 0039	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP17160.D	1	09/25/01	ME	09/21/01	OP3878	GOP664
Run #2							

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	0.264	0.25	mg/l	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits	
84-15-1	o-Terphenyl	78%		55-130%	

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-P52-GW-DUP1	Date Sampled: 09/19/01
Lab Sample ID: F10950-2	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Method: FLORIDA-PRO SW846 3510C	
Project: NAS Cecil Field 0039	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	OP17163.D	1	09/25/01	ME	09/21/01	OP3878	GOP664
Run #2							

CAS No.	Compound	Result	RL	Units	Q
	TPH (C8-C40)	0.282	0.28	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	77%		55-130%

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



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: SPERANZA, M. DATE: OCTOBER 25, 2001

FROM: CATHERINE NORONHA COPIES: DV FILE

SUBJECT: INORGANIC DATA VALIDATION – TAL METALS
CTO-078 NAS CECIL FIELD
SAMPLE DELIVERY GROUP (SDG) – F10950

SAMPLES: 2/Aqueous/
CEF-P52-GW-01S CEF-P52-GW-DUP1

Overview

The sample set for CTO 078, NAS CECIL FIELD, SDG F10950, consists of two (2) aqueous environmental samples. One duplicate pair (CEF-P52-GW-DUP1/CEF-P52-GW-01S) is included in this SDG.

All samples were analyzed for target analyte list (TAL) metals. The samples were collected by TetraTech NUS on September 19, 2001 and analyzed by Accutest 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.

These data were evaluated based on the following parameters:

- * • Data Completeness
 - * • Holding Times
 - * • Calibration Recoveries
 - Laboratory Blank Analyses
 - * • Field Duplicate Results
 - * • Detection Limits
- * - All quality control criteria were met for this parameter.

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level</u>
Cadmium	0.62µg/L	3.1µg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent moisture, and dilution factors, if

TO: SPERANZA, M. - PAGE 2
DATE: OCTOBER 25, 2001

applicable, were taken into consideration when evaluating for blank contamination. No action was taken because all sample results were nondetected.

Executive Summary

Laboratory Performance: None
Other Factors Affecting Data Quality: None.

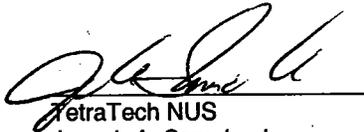
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitled "Navy IRCDQM" (September 1999).

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
Catherine Noronha
Environmental Scientist



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

CTO078-NAS CECIL FIELD

WATER DATA

Accutest, NJ

SDG: F10950

SAMPLE NUMBER:
 SAMPLE DATE:
 LABORATORY ID:
 QC_TYPE:
 % SOLIDS:
 UNITS:
 FIELD DUPLICATE OF:

CEF-P52-GW-01S
 09/19/01
 F10950-1
 NORMAL
 0.0 %
 UG/L

CEF-P52-GW-DUP1
 09/19/01
 F10950-2
 NORMAL
 0.0 %
 UG/L
 CEF-P52-GW-01

//

 100.0 %

//

 100.0 %

	RESULT	QUAL	CODE									
INORGANICS												
CADMIUM	0.27	U		0.27	U							

Report of Analysis

Client Sample ID: CEF-P52-GW-01S	Date Sampled: 09/19/01
Lab Sample ID: F10950-1	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field 0039	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method
Cadmium	0.27 U	5.0	0.27	ug/l	1	09/21/01	09/24/01 JK	SW846 6010B

RL = Reporting Limit
 IDL = Instrument Detection Limit

U = Indicates a result < IDL
 B = Indicates a result >= IDL but < RL

Report of Analysis

Client Sample ID: CEF-P52-GW-DUP1	Date Sampled: 09/19/01
Lab Sample ID: F10950-2	Date Received: 09/20/01
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field 0039	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method
Cadmium	0.27 U	5.0	0.27	ug/l	1	09/21/01	09/24/01 JK	SW846 6010B

RL = Reporting Limit
 IDL = Instrument Detection Limit

U = Indicates a result < IDL
 B = Indicates a result >= IDL but < RL

APPENDIX B

BORING LOG AND WELL CONSTRUCTION REPORT



BORING LOG

PROJECT NAME: PSC 52 (B06 314)

BORING NUMBER: CEF-P52-MW1S

PROJECT NUMBER: N0039

DATE: 9.5.01

DRILLING COMPANY: PRECISION

GEOLOGIST: L. KNIGHT

DRILLING RIG: CME 75

DRILLER: TOMMY LYNCH

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**	
	0	/												
	1.0	/												
	3.0	/												
	4.0	/												
	15.0	/												
<i>[Large handwritten signature and scribbles across the bottom of the table grid]</i>														

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm): 0.0

Converted to Well: Yes No

Well I.D. #: CEF. 752. MW1S



Tetra Tech NUS, Inc.

WELL No.: CEF-P52-MW1S

MONITORING WELL SHEET

PROJECT: PSC 52 DRILLING Co.: PRECISION BORING No.: CEF-P52-MW1S
 PROJECT No.: N0039 DRILLER: Tommy Lynch DATE COMPLETED: 9.5.01
 SITE: BLDG 314 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: L. Knight DEV. METHOD: SUBM. PUMP EASTING: _____

<p>Ground Elevation = Datum: _____</p> <p>Not to Scale</p>	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Steel</u>
	Type of Surface Seal:	_____
	I.D. of Riser:	<u>2" 3/4"</u>
	Type of Riser:	<u>PVC</u>
	Borehole Diameter:	<u>8" 2"</u>
	Elevation / Depth Top of Rock:	<u>N/A</u>
	Type of Backfill:	_____
	Elevation / Depth of Seal:	<u>12.0</u>
	Type of Seal:	<u>30/65 Sand</u>
	Elevation / Depth of Top of Filter Pack:	<u>13.0</u>
	Elevation / Depth of Top of Screen:	<u>14.5</u>
	Type of Screen:	<u>PVC</u>
Slot Size x Length:	_____	
I.D. of Screen:	_____	
Type of Filter Pack:	<u>Prepacked</u>	
Elevation / Depth of Bottom of Screen:	<u>14.5</u>	
Elevation / Depth of Bottom of Filter Pack:	<u>15.0</u>	
Type of Backfill Below Well:	_____	
Elevation / Total Depth of Borehole:	<u>15.0</u>	