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NAS CECIL FIELD, FL
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FINAL ANNUAL GROUNDWATER MONITORING REPORT YEAR 1 FOR OPERABLE UNIT 11
(OU 11) SITE 45 NAS CECIL FIELD FL
2/1/2003
TETRA TECH NUS INC

**Annual Groundwater
Monitoring Report - Year 1
for
Operable Unit 11, Site 45**

**Naval Air Station Cecil Field
Jacksonville, Florida**



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

February 2003

**ANNUAL GROUNDWATER
MONITORING REPORT – YEAR 1**

FOR

**OPERABLE UNIT 11, SITE 45
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**

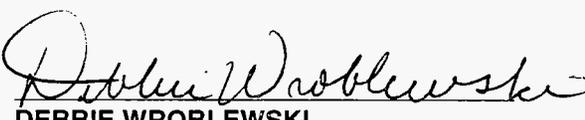
FEBRUARY 2003

PREPARED UNDER THE SUPERVISION OF:

APPROVED FOR SUBMITTAL BY:



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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: February 27, 2003

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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ACRONYMS

CLEAN	Comprehensive Long-Term Environmental Action Navy
COC	Contaminant of concern
CTO	Contract Task Order
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FS	Feasibility Study
GCTL	Groundwater target cleanup level
IRA	Interim removal action
NAS	Naval Air Station
OU	Operable Unit
PAH	Polynuclear aromatic hydrocarbon
RI	Remedial Investigation
T.O.C.	Top of casing
TRPH	Total recoverable petroleum hydrocarbons
TtNUS	Tetra Tech NUS, Inc.

1.0 INTRODUCTION

This Annual Groundwater Monitoring Report presents a summary of the work performed for the first year of groundwater monitoring at Operable Unit (OU) 11, Site 45 at the Naval Air Station (NAS) Cecil Field located in Jacksonville, Florida (see Figures 1-1 and 1-2). This report has been prepared under Contract Task Order (CTO) 0078 as part of the Comprehensive Long-Term Environmental Action Navy (CLEAN) III Contract No. N62467-94-D-0888 for the Southern Division, Naval Facilities Engineering Command.

Site 45, the Steam Generating Plant, is located north of Crossover Street (formerly Second Street) and east of Authority Avenue (formerly "C" Avenue) and includes Buildings 2, 7, 11, and 12 and the surrounding area. The site is primarily unpaved and covers approximately 2 acres. An interim removal action (IRA) conducted at the site in August 2000 based on the results of soil sampling included the excavation and off-site disposal of approximately 363 cubic yards of soil contaminated with polynuclear aromatic hydrocarbons (PAHs), total recoverable petroleum hydrocarbons (TRPH), mercury, and vanadium to support an industrial reuse. The Site 45 Remedial Investigation (RI) delineated a vanadium groundwater plume, defined by the Florida Department of Environmental Protection (FDEP) groundwater cleanup target level (GCTL) of 49 µg/L, that was approximately 260 feet by 110 feet in size and limited to the shallow zone of the surficial aquifer. The selected remedy for Site 45, based on the results of the Feasibility Study (FS), was limited action, which includes institutional controls, natural attenuation, and annual groundwater monitoring. Tetra Tech NUS, Inc. (TtNUS) collected and analyzed seven groundwater samples for vanadium during the Year 1 annual monitoring event at Site 45 in July 2002.

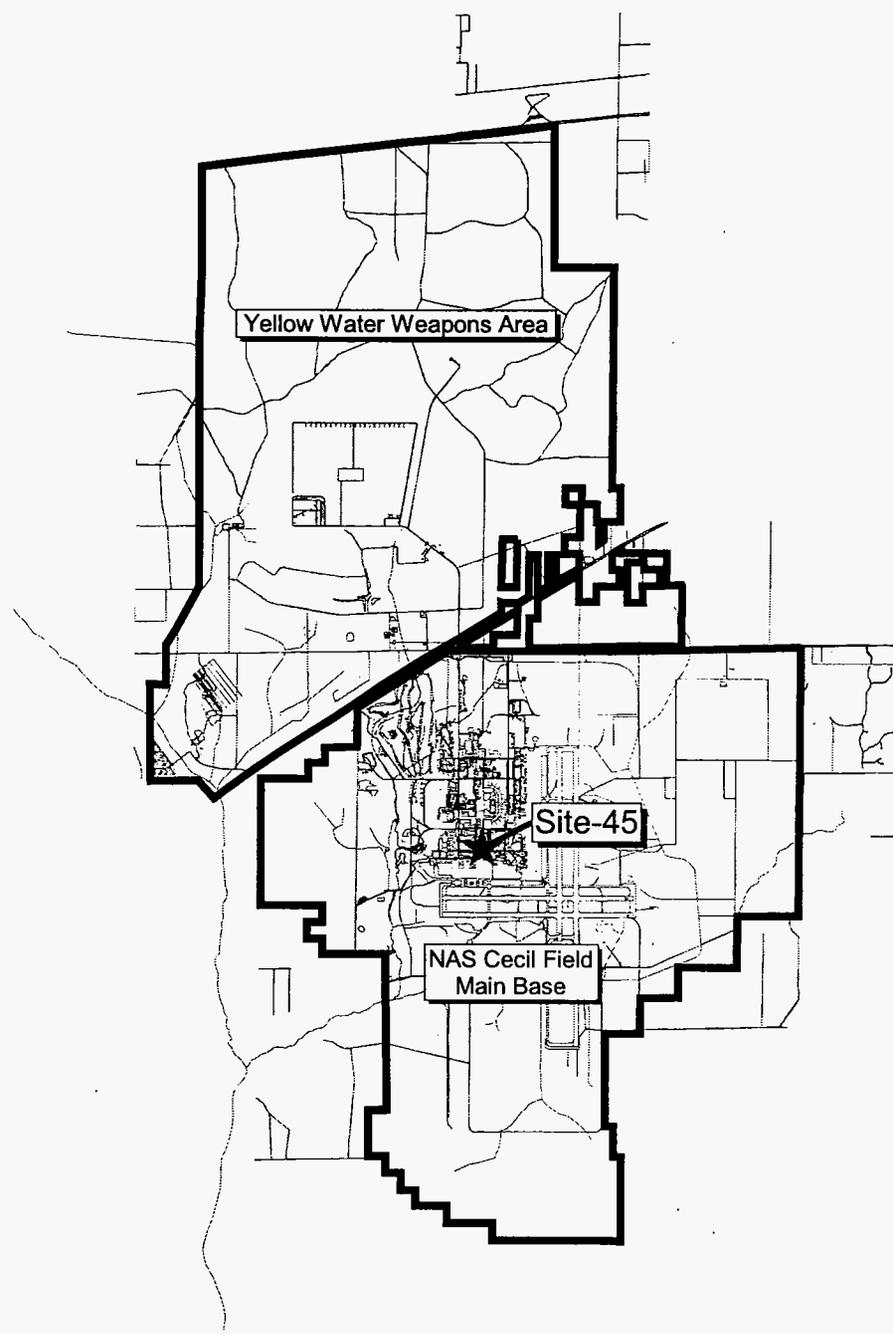
Water-level measurements and potentiometric surface elevations obtained during the annual groundwater sampling event are presented in Table 1-1, and a potentiometric surface elevation map with these data is presented in Figure 1-3. Based on groundwater elevations from the July 2002 sampling event, groundwater flow at Site 45 is to the southeast. Depth to groundwater ranged from 3.82 to 5.97 feet below ground surface (bgs) and potentiometric surface elevations ranged from 70.83 to 72.17 feet above mean sea level during this event. The hydraulic gradient across the site in July 2002 was approximately 0.005, similar to the values reported in the RI (0.003) and for nearby Sites 36 and 37 (0.001 to 0.007).

TABLE 1-1

**WATER LEVEL MEASUREMENTS AND POTENTIOMETRIC SURFACE ELEVATIONS
OPERABLE UNIT 11, SITE 45
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA**

Well Number	Top of Casing (T.O.C.) Elevation	Ground Surface Elevation	July 2002	
			Depth to Groundwater (feet below T.O.C.)	Groundwater Elevation
CEF-007-01Sa	76.12	76.40	4.95	71.17
CEF-F11-01Sb	76.59	76.88	5.50	71.09
CEF-F11-02Sb	76.25	76.38	4.95	71.30
CEF-F11-01Sa	76.37	76.50	5.17	71.20
CEF-P45-01S	75.56	75.86	3.82	71.74
CEF-P45-02S	76.19	76.20	4.52	71.67
CEF-P45-03S	76.73	75.00	5.09	71.64
CEF-P45-04S	76.49	76.50	5.45	71.04
CEF-P45-05S	76.68	76.60	5.02	71.66
CEF-P45-06S	76.27	76.50	4.58	71.69
CEF-P45-07S	77.15	77.40	5.55	71.60
CEF-P45-08S	76.80	77.00	5.97	70.83
CEF-P45-09S	76.42	76.60	4.99	71.43
CEF-P45-12S	76.99	77.10	5.43	71.56
CEF-P45-13S	76.30	76.60	5.07	71.23

All elevations are in feet above mean sea level.



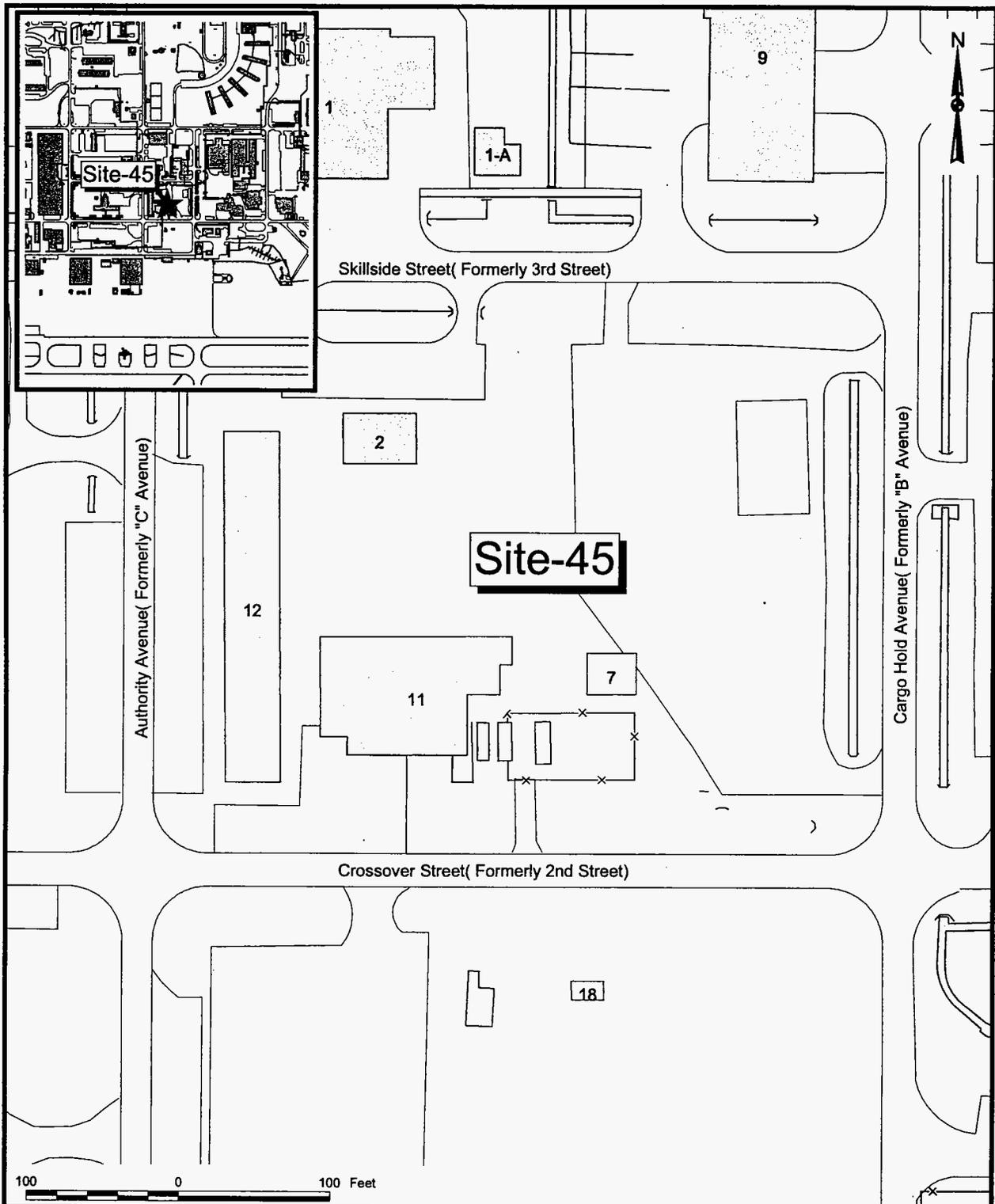
8000 0 8000 Feet

DRAWN BY MJJ	DATE 30Sept02
CHECKED BY <i>LS</i>	DATE <i>2/26/03</i>
COST/SCHEDULE-AREA	
SCALE AS NOTED	

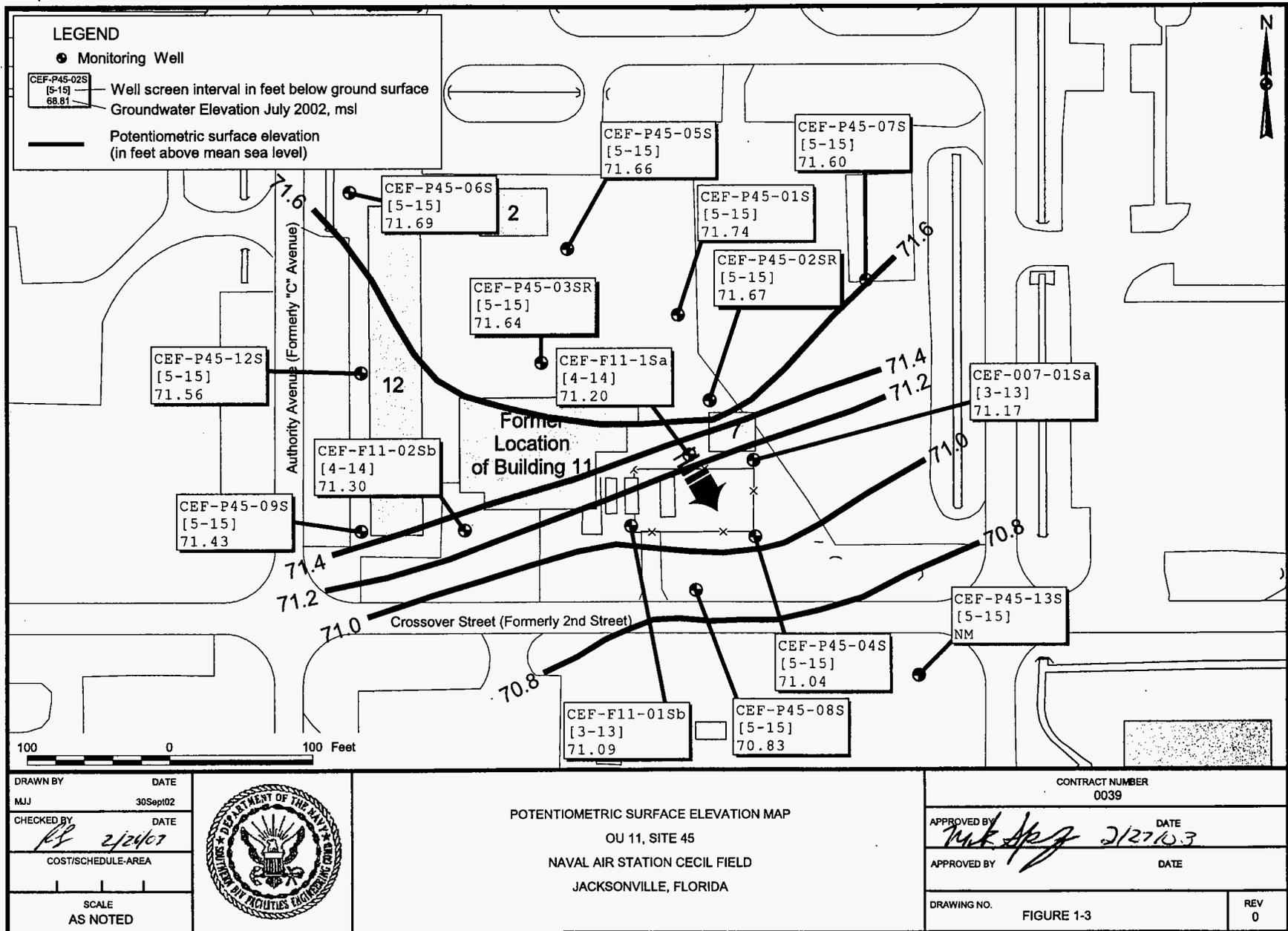


GENERAL LOCATION MAP
OU 11, SITE 45
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>MFL</i>	DATE <i>7/26/03</i>
APPROVED BY	DATE
DRAWING NO. FIGURE 1-1	REV 0



DRAWN BY MJJ	DATE 30Sept02		SITE LOCATION MAP OU 11, SITE 45 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039	
CHECKED BY <i>MJS</i>	DATE 2/26/03			APPROVED BY <i>MJS</i>	DATE 2/27/03
COST/SCHEDULE-AREA	SCALE AS NOTED			APPROVED BY	DATE
			DRAWING NO. FIGURE 1-2	REV 0	



DRAWN BY MJJ	DATE 30Sept02
CHECKED BY <i>RJ</i>	DATE 2/24/07
COST/SCHEDULE-AREA	
SCALE AS NOTED	



POTENTIOMETRIC SURFACE ELEVATION MAP
 OU 11, SITE 45
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0039	
APPROVED BY <i>M. K. Arja</i>	DATE 2/27/07
APPROVED BY	DATE
DRAWING NO. FIGURE 1-3	REV 0

2.0 SITE CONTAMINANT OF CONCERN

Vanadium was identified as the only groundwater contaminant of concern (COC) in the OU 11, Site 45 RI (TtNUS, 2001).

Vanadium concentrations in groundwater as detected during the RI are presented in Figure 2-1. Figure 2-1 also shows the approximate extent of vanadium plume based on exceedances of the FDEP GCTL of 49 µg/L during the RI.

3.0 ANALYTICAL RESULTS

Long-term groundwater monitoring at Site 45 was performed in accordance with the Long-Term Monitoring Plan for Sites 21, 25, and 45 (TtNUS, 2002). Table 3-1 provides a summary of analytical results for the OU 11, Site 45 monitoring wells sampled as part of the long-term groundwater monitoring program. Figure 3-1 presents filtered and unfiltered vanadium data from the RI and the Year 1 sampling event. Complete analytical data for Year 1 are provided in Appendix A.

Filtered and unfiltered vanadium concentrations in wells in the northern portion of the site (CEF-P45-03S, CEF-P45-02S, and CEF-F11-01Sa) increased from levels detected during the RI. Concentrations decreased in CEF-007-01Sa and CEF-P45-04S, located in the southern portion of the source area, from the RI to the first annual sampling event. The CEF-P45-04S concentration decreased to less than the FDEP GCTL; concentrations in other wells within the plume remained greater than the GCTL. Vanadium concentrations in sidegradient well CEF-P45-08S during Year 1 sampling were consistent with RI concentrations. CEF-P45-13S, which did not have detectable concentrations of vanadium when initially sampled in February 2001, had filtered and unfiltered vanadium at 16.0 and 17.0 µg/L, respectively during the Year 1 sampling event. Year 1 filtered and unfiltered results were similar for all wells sampled, indicating that vanadium is in dissolved form.

TABLE 3-1

SUMMARY OF VANADIUM CONCENTRATIONS IN GROUNDWATER
 OPERABLE UNIT 11, SITE 45
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

WELL ID	SAMPLING DATE	UNFILTERED VANADIUM (ug/L)	FILTERED VANADIUM (ug/L)	
TARGET CLEANUP GOAL*		49	49	
CEF-007-01Sa	Feb-96	147	87.2	
	Jul-99	695	744	
	Apr-00	240	233	
	Jul-02	199	198	
CEF-F11-01Sa	Feb-96	195	184	
	Oct-98	740	720	
	Mar-01	281	259	
	Jul-02	759	728	
CEF-P45-02S	Jul-99	Sample	290	
		Duplicate	271	
	Apr-00	74.9	85	
	Mar-01	Sample	211	221
		Duplicate	204	212
	Jul-02	207	168	
CEF-P45-03S	Jul-99	33	250	
	Apr-00	49	40.4	
	Mar-01	66	60.9	
	Jul-02	Sample	101	95.4
		Duplicate	99.8	95.8
CEF-P45-04S	Sep-99	54.2	NA	
	Apr-00	68.2	53.6	
	Mar-01	85	78.3	
	Jul-02	42	41.4	
CEF-P45-08S	Apr-00	5.4	3.7	
	Jul-02	4.7	5.9	
CEF-P45-13S	Feb-01	2.9 U	3.0 U	
	Jul-02	16	17	

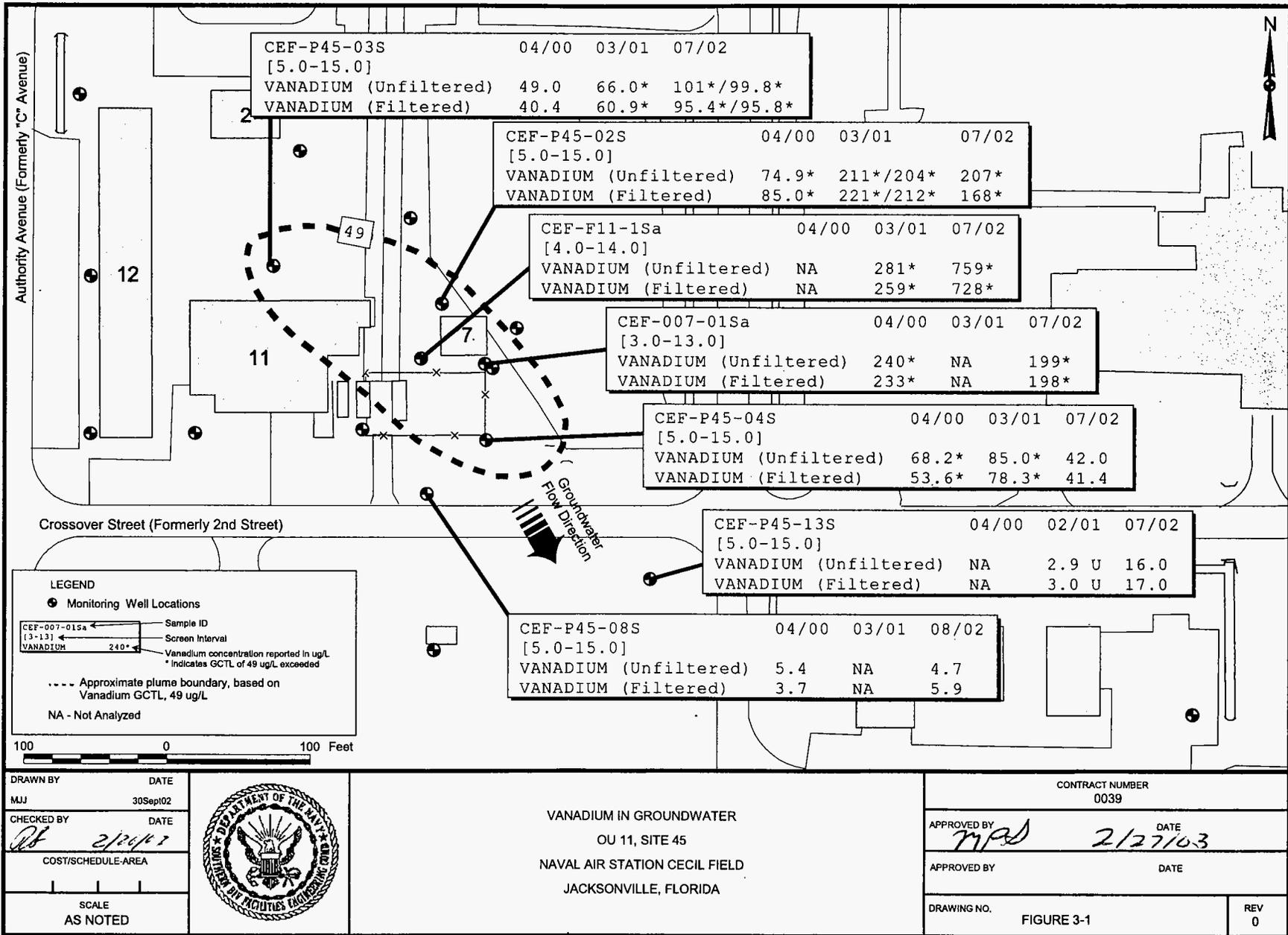
NA = Not analyzed.

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

J = Estimated concentration.

Bolded values exceed detection limit. Shaded values exceed target cleanup goal.

* Florida Administrative Code (FAC) 62-777. (FDEP, 1999).



4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

The RI at OU 11, Site 45 indicated the presence of vanadium in groundwater at concentrations that could pose an unacceptable human health risk if groundwater is used as a potable water source. The ROD identified the following Remedial Action Objectives (RAOs) for groundwater at OU 11, Site 45:

- Prevent unacceptable risk from ingestion of groundwater with concentrations of vanadium greater than the FDEP Groundwater Cleanup Target Level (GCTL).
- Return the surficial aquifer to future beneficial use.

The groundwater remedy selected to achieve these RAOs, as detailed in the ROD, was natural attenuation, institutional controls, and monitoring. Based on the results of year 1 sampling at the site, this remedy continues to be protective of human health and achieves the site RAOs.

Based on the evaluation of groundwater elevation and contaminant concentration data, the current well network adequately monitors the contaminant plume and well CEF-P45-12S is properly placed as a downgradient compliance well within the monitoring network.

4.2 RECOMMENDATIONS

Based on the similar results obtained from the filtered and unfiltered analyses, it is recommended that future monitoring include only unfiltered samples from the seven wells currently in the monitoring program and that samples for filtered analysis be eliminated.

REFERENCES

Florida Department of Environmental Protection (FDEP), 1999. Contaminant Target Levels Rule, Groundwater Target Cleanup Levels, Division of Water Facilities, Bureau of Drinking Water and Groundwater Resources, Florida Administrative Code (FAC) Chapter 62-777.

Tetra Tech NUS, Inc. (TtNUS), 2001. Remedial Investigation Report for Operable Unit 11, Site 45 – Steam Generating Plant, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for the Southern Division, Naval Facilities Engineering Command, North Charleston, South Carolina, June.

TtNUS, 2002. Long-Term Monitoring Plan for Operable Unit 10, Sites 21 and 25 and Operable Unit 11, Site 45, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for the Southern Division, Naval Facilities Engineering Command, North Charleston, South Carolina, June.

APPENDIX A

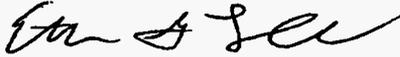
YEAR 1 ANALYTICAL LABORATORY RESULTS

TO: SPERANZA, M. – PAGE 2
DATE: SEPTEMBER 18, 2002

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 IRCDDM" (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
Ethan G. Lee
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

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
- D = MS/MSD Noncompliance
- E = LCS/LCSD Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = GFAA PDS - GFAA MSA's $r < 0.995$
- K = ICP Interference - include ICSAB % R's
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation
- N = Internal Standard Noncompliance
- N01 = Internal Standard 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)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = Pest/PCD% between columns for positive results
- V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $< 30\%$
- Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: M

nsample CEF-007-01SA-L01
samp_date 8/2/2002
lab_id F14108-1
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	199		

nsample CEF-F11-01SA-L01
samp_date 8/2/2002
lab_id F14108-7
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	759		

nsample CEF-P45-02S-L01
samp_date 8/2/2002
lab_id F14108-5
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	207		

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: M

nsample CEF-P45-03S-L01
samp_date 8/2/2002
lab_id F14108-6
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	101		

nsample CEF-P45-04S-L01
samp_date 8/2/2002
lab_id F14108-3
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	42.0		

nsample CEF-P45-08S-L01
samp_date 8/2/2002
lab_id F14108-2
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	4.7		

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: M

nsample CEF-P45-13S-L01
samp_date 8/2/2002
lab_id F14108-4
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	16.0		

nsample CEF-P45-DU01-L01
samp_date 8/2/2002
lab_id F14108-8
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF: CEF-P45-03S-L01

Parameter	Result	ValQual	QualCode
VANADIUM	99.8		

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: MF

nsample CEF-007-01SA-L01-F
samp_date 8/2/2002
lab_id F14108-1A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	198		

nsample CEF-F11-01SA-L01-F
samp_date 8/2/2002
lab_id F14108-7A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	728		

nsample CEF-P45-02S-L01-F
samp_date 8/2/2002
lab_id F14108-5A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	168		

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: MF

nsample CEF-P45-03S-L01-F
samp_date 8/2/2002
lab_id F14108-6A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	95.4		

nsample CEF-P45-04S-L01-F
samp_date 8/2/2002
lab_id F14108-3A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	41.4		

nsample CEF-P45-08S-L01-F
samp_date 8/2/2002
lab_id F14108-2A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	5.9		

PROJ_NO: 0039

SDG: F14108 MEDIA: WATER DATA FRACTION: MF

nsample CEF-P45-13S-L01-F
samp_date 8/2/2002
lab_id F14108-4A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF:

Parameter	Result	ValQual	QualCode
VANADIUM	17.0		

nsample CEF-P45-DU01-L01-F
samp_date 8/2/2002
lab_id F14108-8A
qc_type NM
units UG/L
Pct_Solids 0
DUP_OF: CEF-P45-03S-L01-F

Parameter	Result	ValQual	QualCode
VANADIUM	95.8		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Report of Analysis

Client Sample ID: CEF-007-01SA-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-1	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	199	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
 IDL = Instrument Detection Limit

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

0030

Report of Analysis

Client Sample ID: CEF-F11-01SA-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-7	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	759	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

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-P45-02S-L01 Lab Sample ID: F14108-5 Matrix: AQ - Ground Water Project: NAS Cecil Field-CTO-161	Date Sampled: 08/02/02 Date Received: 08/03/02 Percent Solids: n/a
---	---

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	207	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

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-P45-03S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-6	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	101	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
 IDL = Instrument Detection Limit

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

0040

Report of Analysis

Client Sample ID: CEF-P45-04S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-3	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	42.0 B	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

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-P45-08S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-2	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	4.7 B	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

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-P45-13S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-4	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	16.0 B	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

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-P45-DU01-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-8	Date Received: 08/03/02
Matrix: AQ - Ground Water	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	99.8	50	0.47	ug/l	1	08/06/02	08/07/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
IDL = Instrument Detection Limit

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

0044

Report of Analysis

Client Sample ID: CEF-007-01SA-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-1A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	198	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

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-F11-01SA-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-7A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	728	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

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-P45-02S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-5A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	168	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

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-P45-03S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-6A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	95.4	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

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-P45-04S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-3A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	41.4 B	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

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-P45-08S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-2A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	5.9 B	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
 IDL = Instrument Detection Limit

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

0033

Report of Analysis

Client Sample ID: CEF-P45-13S-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-4A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	17.0 B	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
 IDL = Instrument Detection Limit

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

0037

Report of Analysis

Client Sample ID: CEF-P45-DU01-L01	Date Sampled: 08/02/02
Lab Sample ID: F14108-8A	Date Received: 08/03/02
Matrix: AQ - Groundwater Filtered	Percent Solids: n/a
Project: NAS Cecil Field-CTO-161	

Metals Analysis

Analyte	Result	RL	IDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Vanadium	95.8	50	0.47	ug/l	1	08/07/02	08/08/02 DM	SW846 6010B	SW846 3010A

RL = Reporting Limit
 IDL = Instrument Detection Limit

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

0045