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NAS CECIL FIELD, FL  
5090.3a

FOURTH QUARTER 2004 OPERATIONS AND MAINTENANCE STATUS REPORT FOR DAY  
TANK 1 SITE NAS CECIL FIELD FL  
3/1/2005  
TERRAINE INC ENVIRONMENTAL SERVICES

**FOURTH QUARTER 2004  
Operations and Maintenance  
Status Report  
October 1, 2004 – December 31, 2004**

**DAY TANK 1 SITE**

**Contract No. N62467-02-G-0352  
Contract Task Order No. 0001**

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

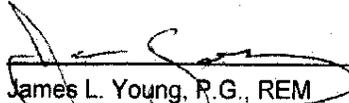
**Submitted to:**

**U.S. Naval Facilities  
Engineering Command  
Southern Division**

**Prepared by:**

**SIGNATURE PAGE**

We, James L. Young and Karen L. Baer, do hereby affirm that the information contained in this report is accurate and correct to the best of our knowledge and belief.

  
James L. Young, R.G., REM  
President/CEO  
TERRAINE, Inc.

3/29/05

Date

PG-FL2090, REM-6089

Registration Nos.





3/29/05

Date

Karen L. Baer  
Field Superintendent  
TERRAINE, Inc.

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**ACRONYMS**

BOA	Basic Ordering Agreement
°C	Degrees Celsius
CTO	Contract Task Order
DO	Dissolved Oxygen
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
Ft.	Feet
Gal.	Gallon
Gal/min	Gallon per minute
GCTL	Groundwater Cleanup Target Levels
LNAPL	Light Non-Aqueous Phase Liquids
mg/L	Milligrams per liter
mL/min	Milliliters per minute
µs/cm	Microsiemens per centimeter
mS/cm	Millisiemens per centimeter
mV	millivolts
NA	Not Analyzed / Not Available
NADSC	Natural Attenuation Default Source Criteria
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
ND	Non Detect
NGVD	National Geodetic Vertical Datum
NS	Not sampled
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
S.U.	Standard Unit
SVOA	Semi-Volatile Organic Aromatics
SVOC	Semi-Volatile Organic Compounds
TERRAINE	Terraine Environmental Services, Inc.
VEW	Vapor Extraction Well
VOA	Volatile Organic Aromatics
VOC	Volatile Organic Compounds

## EXECUTIVE SUMMARY

### SCOPE

The objective of the remedial action at the site of Day Tank 1 was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by Chapter 62-777 Florida Administrative Code (FAC). Biosparging/vapor collection was the technology utilized to achieve this objective.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the biosparge and soil vapor extraction system, the Florida Department of Environmental Protection (FDEP) approved deactivating the remediation system on approximately August 15, 2003. Post-active remediation monitoring in accordance with Chapter 62-770.750, FAC began at that time.

As a part of the post-active remediation monitoring, the following wells were to be sampled quarterly for volatile organic aromatics (VOAs) and semi-volatile organic aromatics (SVOAs) for a period of one year to evaluate rebound: CEF-293-9, VEW-7, VEW-2, VEW-3, VEW-4, VEW-5, and CEF-293-22.

On September 30, 2004, the FDEP recommended to begin sampling groundwater from vapor extraction well VEW-1. Groundwater sampling at this location began during the 4<sup>th</sup> quarter of 2004.

The purpose of this quarterly Groundwater Monitoring Report is to provide a summary of activities performed at the site during the period of October 1, 2004 to December 31, 2004.

### CONCLUSIONS AND RECOMMENDATIONS

In general, contaminant concentrations have increased slightly at the site. These increases, first noted in the December 2003 sampling event, could be a result of excavation activities which commenced between September and December 2003 and continued through September 2004.

As a result of increasing contaminant concentrations, it is recommended to continue quarterly groundwater monitoring for VOAs and SVOAs from monitoring wells CEF-293-9 and CEF-293-22 and vapor extraction wells VEW1, VEW-2, VEW-3, VEW-4, VEW-5, and VEW-7.

**OPERATIONS AND MAINTENANCE STATUS REPORT**

**DAY TANK 1 SITE**

**NAVAL AIR STATION, CECIL FIELD**

**JACKSONVILLE, FLORIDA**

**DECEMBER 2004**

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<i>PREPARED FOR:</i>	Mr. Gabe Magwood - SOUTH DIV
<i>PREPARED BY:</i>	TERRAINE, Inc.
<i>PERIOD OF PERFORMANCE:</i>	October 1, 2004 – December 31, 2004
<i>FIELD TEAM:</i>	Karen Baer, Larry Wolski
<i>CONTRACT NUMBER:</i>	N62467-02-G-0352
<i>TASK ORDER NUMBER:</i>	0001
<i>TASK ORDER MANAGER:</i>	James L. Young, P.G.; REM
<i>SUBMITTAL DATE:</i>	March 2005

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**1.0 INTRODUCTION**

Terraine, Inc. (TERRAINE) has been contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (NAVFAC), to provide Operation and Maintenance (O&M) services at Day Tank 1, Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, under **Basic Ordering Agreement (BOA) Contract No. N62467-02-G-0352, Contract Task Order (CTO) No. 0001**. The purpose of this O&M Report is to provide a summary of activities performed at the site during the period of October 1, 2004 to December 31, 2004.

**1.1 Purpose**

The objective of the remedial action at the Day Tank 1 site was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by Chapter 62-777 Florida Administrative Code (FAC). Biosparging/vapor collection was the technology utilized to achieve this objective.

A system description and a site background and history summary are included in the First Quarter 2004 Operations and Maintenance Status Report submitted by TERRAINE.

**1.2 Site Location and Description**

The Day Tank 1 site is located at the former NAS Cecil Field, approximately 1/8 mile south of the "A" Avenue gate on Jet Road. A base map illustrating the site location is included in **Figure 1, Appendix A**. A site map is included in **Figure 2, Appendix A**.

## 2.0 INVESTIGATION AND METHODOLOGY SUMMARY

### 2.1 System Performance Monitoring

No system performance monitoring was performed during the 4<sup>th</sup> Quarter 2004.

### 2.2 Summary of Maintenance

No maintenance was performed during the Fourth Quarter, 2004. However, on January 5, 2005, a technician changed the air compressor oil, oil filter, dirt trap filter, and oil separator element. The technician also cleaned the motor filter mat, checked the belt tension, and reset the controller maintenance times. Upon completion of these maintenance activities, the system was fully operational.

### 2.3 Water Level Measurements

Depth-to-groundwater/Light Non-Aqueous Phase Liquid (LNAPL) measurements were recorded on December 2, 2004 at monitoring wells CEF-293-9 and CEF-293-22 and vapor extraction wells VEW-1, VEW-2, VEW-3, VEW-4, VEW-5, and VEW-7. The top-of-casing elevation, depth-to-LNAPL measurements, depth-to-water measurements, calculated LNAPL thickness and calculated water level elevations are provided in **Table 1, Appendix B**. A groundwater elevation map, using data collected on December 2, 2004 indicated a groundwater flow pattern to the southeast, and is included in **Figure 3, Appendix A**.

No LNAPL was discovered in any of the monitoring wells or vapor extraction wells during the Fourth Quarter 2004.

### 2.4 Groundwater Sampling

#### 2.4.2 Methodology

Groundwater sampling was conducted at Day Tank 1 on December 2, 2004. Two (2) monitoring wells (CEF-293-9 and CEF-293-22) and six (6) vapor extraction wells (VEW-1, VEW-2, VEW-3, VEW-4, VEW-5, and VEW-7) were purged and sampled using the low-flow methodology. Purging of wells consisted of removing groundwater with a Nomad<sup>®</sup> submersible pump at a flow rate equal to or less than the groundwater recharge rate in the well until field parameters (temperature, pH, conductivity, turbidity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) had stabilized. Water levels in the wells were continuously monitored to maintain drawdown at less than 0.3 feet.

The results from the field measurements are summarized on **Table 2, Appendix B**. Copies of the groundwater purging/sampling logs including all field parameter measurements are provided in **Appendix C**.

#### 2.4.2 Chemical Analysis Suite

Groundwater samples from the monitoring wells were laboratory analyzed for the following analyte suite:

- Volatile Organic Compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B
- Semi Volatile Organic Compounds (SVOCs) by EPA Method 8270C

### 2.5 Investigative Derived Waste

Purge water collected from the monitoring wells was collected, containerized, and stored on site. The purge water was transported to Industrial Water Services in Jacksonville, Florida by Environmental Remediation Services during the 1<sup>st</sup> Quarter 2005 sampling event.

### 3.0 SUMMARY OF SAMPLING AND LABORATORY ANALYTICAL RESULTS

#### 3.1 Data Validation

A cursory review of quality control data was performed. This review evaluated data completeness, holding time compliance, laboratory blank contamination, and detection limits. The validation process resulted in qualifiers that are shown with the analyte concentrations in **Table 2, Appendix B**.

#### 3.2 Groundwater Monitoring

##### 3.2.1 VOCs

- Groundwater sampled from monitoring well CEF-293-09 and vapor extraction wells VEW-2, VEW-4, and VEW-7 exhibited 1,2,4-trimethylbenzene concentrations greater than the GCTL. Vapor extraction wells VEW-4 and VEW-7 exhibited 1,3,5-trimethylbenzene concentrations greater than the GCTL.
- Groundwater sampled from monitoring well CEF-293-22 and vapor extraction wells VEW-4 and VEW-7 exhibited benzene concentrations greater than the GCTL.
- Groundwater sampled from vapor extraction well VEW-1 exhibited xylene concentrations greater than the GCTL.

##### 3.2.2 PAHs

- Groundwater sampled from CEF-293-09, VEW-4, and VEW-7 exhibited naphthalene concentrations greater than the Groundwater Cleanup Target Levels (GCTL) (**Table 3, Appendix B**).
- Groundwater sampled from monitoring well CEF-293-09 exhibited 2-methylnaphthalene concentrations greater than the GCTL.

#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

In general, VOC concentrations have increased since the September 2003 sampling event. Excavation activities on site to the north of the treatment facility and offsite to the north of the Day Tank 1 site began between the September 2003 and December 2003 sampling event and continued through September 2004. Possible rebound could be a result of once adsorbed contaminants being released into groundwater during the beginning of excavation activities.

Increases in benzene and naphthalene concentrations were first noted in monitoring well CEF-293-9, which is closest to the excavation areas, in December 2003.

In March 2004, increased benzene and naphthalene concentrations were noted down gradient of CEF-293-9 in groundwater collected from vapor extraction well VEW-7. Benzene levels remained relatively consistent and naphthalene levels increased in groundwater collected from CEF-293-9.

In September 2004, increased benzene concentrations were noted in VEW-4 and increased naphthalene concentrations were noted in VEW-3 and VEW-4. Both wells are located down gradient of VEW-7. Benzene concentrations decreased and naphthalene concentrations increased in groundwater collected from VEW-7.

Although contaminant concentrations have increased slightly over time, all contaminant concentrations are less than their respective NADSC. As a result, reactivating the remediation system is not recommended at this time.

Based on analytical data obtained to date, the following is recommended for the site:

- Continue groundwater sampling from monitoring wells and vapor extraction wells to monitor for possible rebound as a result of excavation activities.
- Monitor benzene and naphthalene concentrations in vapor extraction well VEW-5 and CEF-293-22 to determine whether the contamination is migrating further southeast of the suspected release area.

## **5.0 REFERENCES**

Terraine, Inc. First Quarter 2004 Operation and Maintenance Status Report, Biosparging and Soil Vapor Extraction System, Day Tank 1 Site, Naval Air Station, Cecil Field, Jacksonville, Florida.

## APPENDIX A

### FIGURES

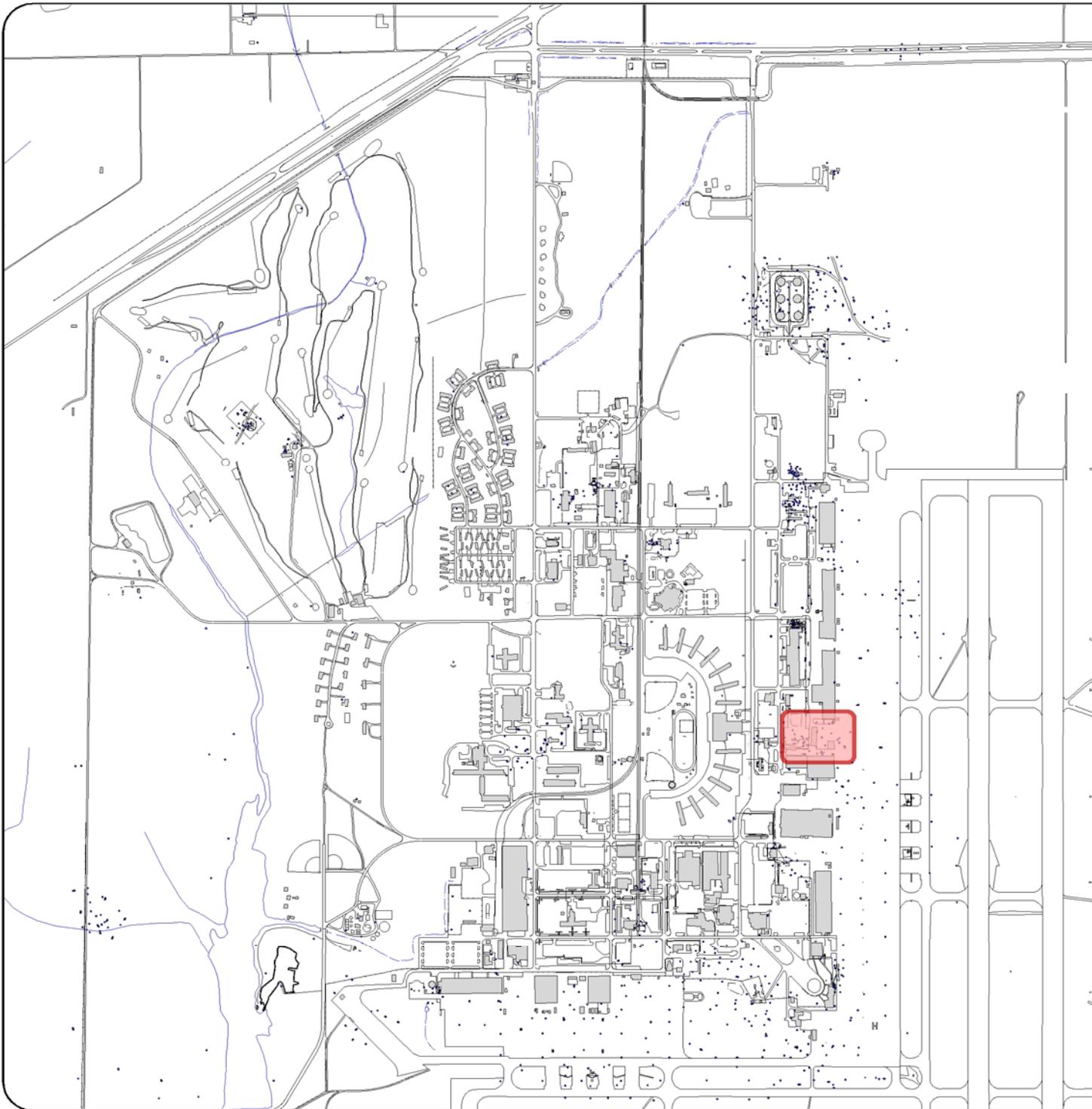
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**Figure 1**    *Site Location Map, Day Tank 1*

**Figure 2**    *Site Map, Day Tank 1*

**Figure 3**    *Groundwater Elevation Map, December 2004*

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**NOTES**

Sources: Environmental IR Gateway ([www.sdirport.com](http://www.sdirport.com))

**LEGEND**

 APPROXIMATE SITE BOUNDARY

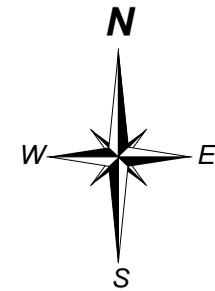
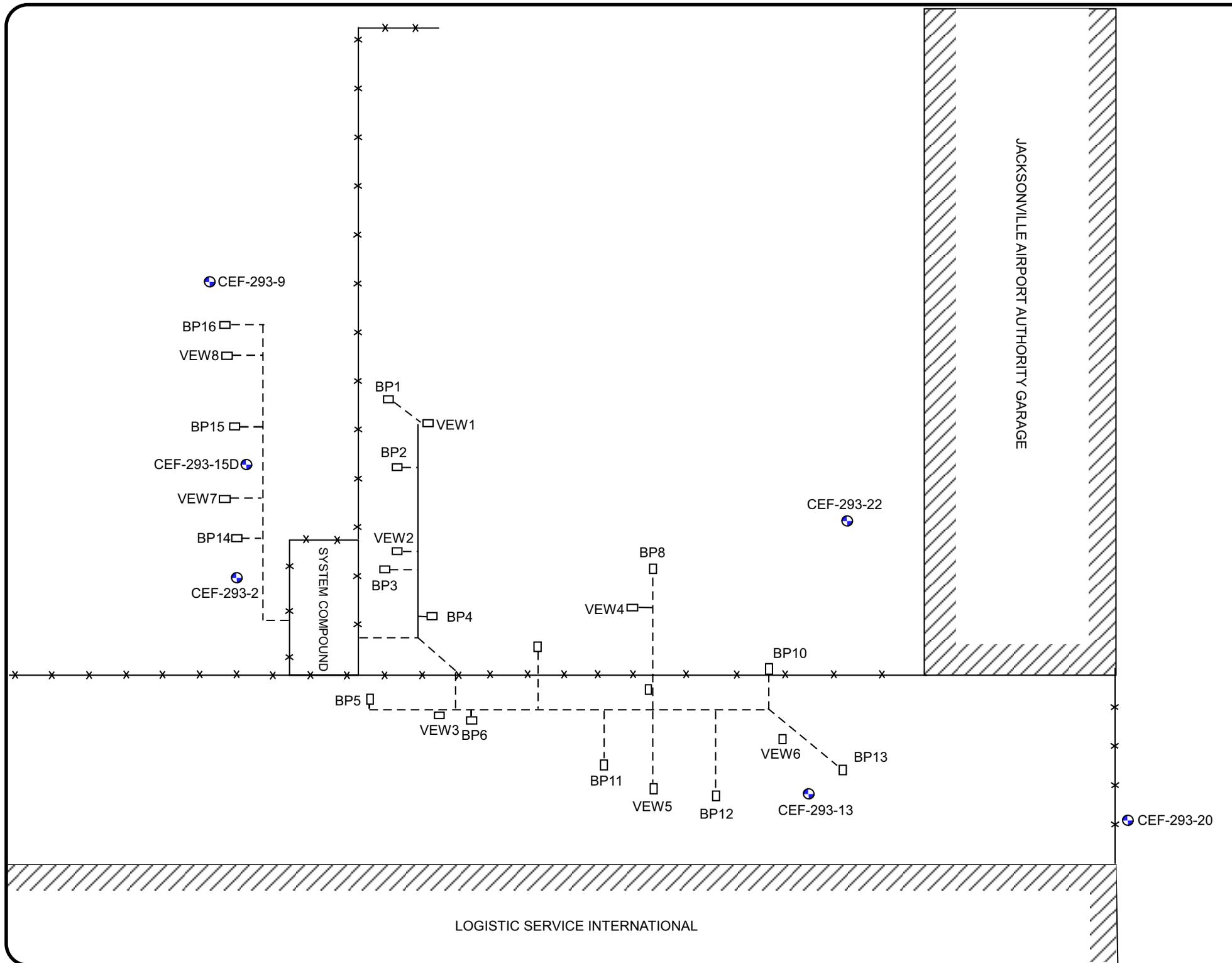
0 0.25 0.5  
APPROXIMATE SCALE IN MILES



**NAS CECIL FIELD  
FIGURE 1: SITE LOCATION MAP  
DAY TANK 1**

Prepared For:  
U.S. Naval Facilities Engineering  
Command, Southern Division

DWN BY: LFW	CHK BY: KBG
SCALE: SEE LEGEND	APR BY: JLY
DATE: 10/12/04	FILE: N/A

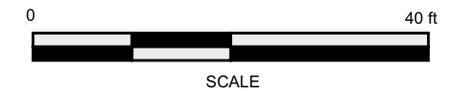


**NOTES**

DASHED LINES INDICATE SUBSURFACE FEATURES

**LEGEND**

- x — x — FENCE
- - - - UNDERGROUND LINES
- VAULT COVER
- MONITORING WELL



**NAS CECIL FIELD  
FIGURE 2: SITE MAP  
DAY TANK 1**

Prepared For:  
U.S. Naval Facilities Engineering  
Command, Southern Division

DWN BY: JLY

CHK BY:  
MJP

SCALE: SEE LEGEND

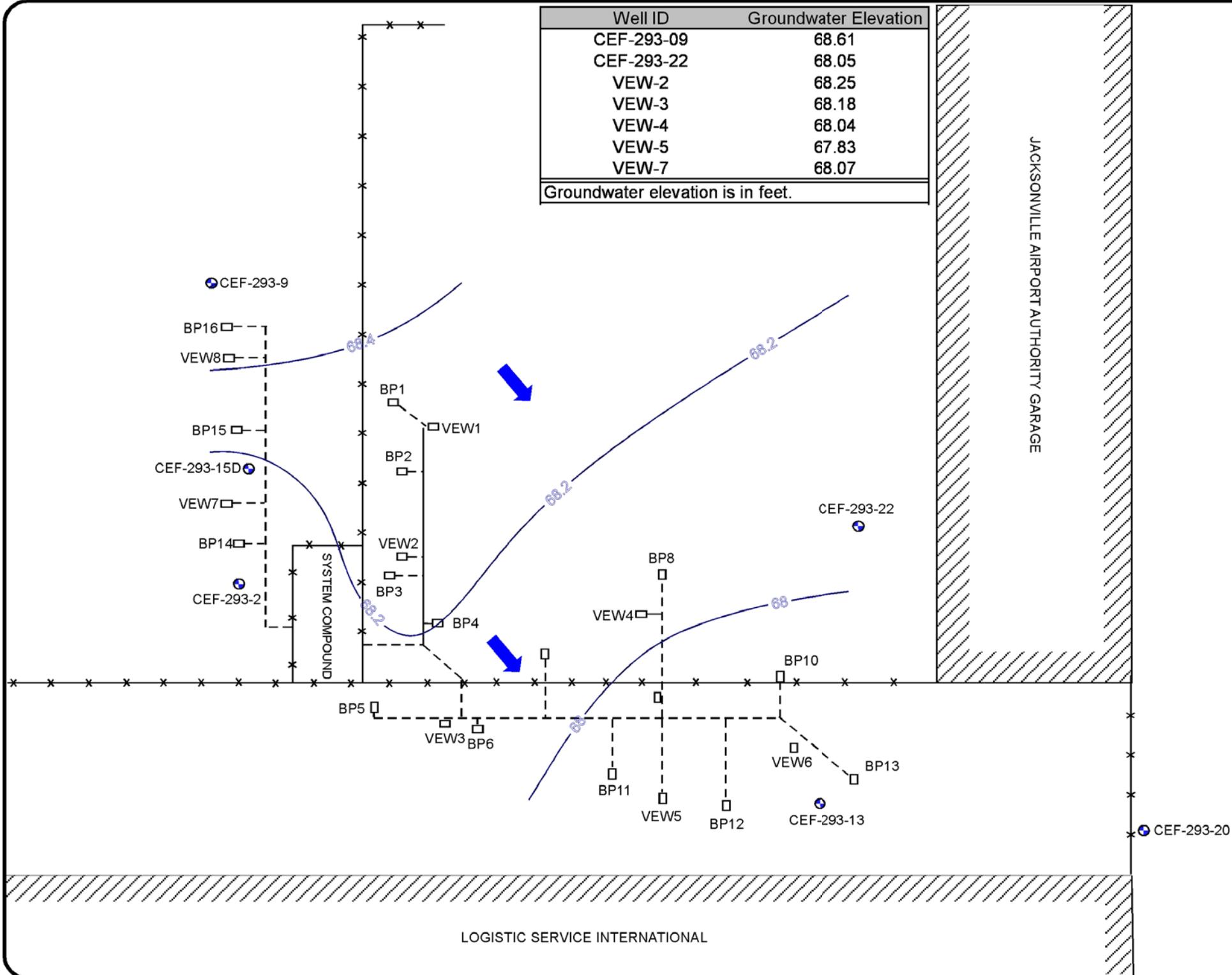
APR BY: JLY

DATE: 8-26-04

FILE: 04-41001

Well ID	Groundwater Elevation
CEF-293-09	68.61
CEF-293-22	68.05
VEW-2	68.25
VEW-3	68.18
VEW-4	68.04
VEW-5	67.83
VEW-7	68.07

Groundwater elevation is in feet.



### NOTES

DASHED LINES INDICATE SUBSURFACE FEATURES  
 CONTOUR PLOT GENERATED USING KRIGING ALGORITHM WITH LINEAR VARIOGRAM MODEL.  
 WELLS IN TABLE USED IN CONTOUR PLOT GENERATION

### LEGEND

- x — x — FENCE
  - - - - UNDERGROUND LINES
  - VAULT COVER
  - MONITORING WELL
  - ➔ INDICATES GROUNDWATER FLOW DIRECTION
- 0 40 ft  
SCALE



### NAS CECIL FIELD FIGURE 3: GROUNDWATER ELEVATION MAP DECEMBER 2004

Prepared For:  
 U.S. Naval Facilities Engineering  
 Command, Southern Division

DWN BY: JLY

CHK BY:  
 MJP

SCALE: SEE LEGEND

APR BY: JLY

DATE: 8-26-04

FILE: 04-41001

## APPENDIX B

### TABLES

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**Table 1**      *Groundwater Monitoring Well – Water and Free Product Data*

**Table 2**      *Monitoring Well Field Measurements*

**Table 3**      *Groundwater Analytical Results*

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**TABLE 1**  
**DEPTH TO GROUNDWATER/LNAPL MEASUREMENTS**  
**DAY TANK 1 BIOSPARGE/VAPOR COLLECTION SYSTEM**  
**NAS CECIL FIELD**  
**JACKSONVILLE, FLORIDA**

Well Identification	Date	Top of Casing Elevation (Feet)	Depth to LNAPL (Feet)	Depth to Water (Feet)	LNAPL Thickness (Feet)	Water Level Elevation (Feet)
CEF-293-09	06/13/00	77.36	none present	9.93	0.00	67.43
	03/11/03		none present	6.09	0.00	71.27
	06/06/03		none present	7.85	0.00	69.51
	09/02/03		none present	7.29	0.00	70.07
	12/12/03		none present	9.62	0.00	67.74
	03/17/04		none present	9.84	0.00	67.52
	06/09/04		none present	9.83	0.00	67.53
	09/20/04		none present	6.30	0.00	71.06
	12/02/04		none present	8.75	0.00	68.61
CEF-293-22	06/13/00	75.95	none present	8.88	0.00	67.07
	03/11/03		none present	8.33	0.00	67.62
	06/07/03		none present	7.00	0.00	68.95
	09/02/03		none present	6.34	0.00	69.61
	12/12/03		none present	8.65	0.00	67.30
	03/17/04		none present	8.80	0.00	67.15
	06/09/04		none present	8.56	0.00	67.39
	09/20/04		none present	5.60	0.00	70.35
	12/02/04		none present	7.90	0.00	68.05
VEW-01	06/13/00	76.32	8.60	10.89	2.29	67.03
	03/11/03		5.08	5.80	0.72	71.02
	06/07/03		6.90	7.40	0.50	69.27
	09/02/03		4.40	4.90	0.50	71.77
	12/12/03		none present	NM	0.00	NM
	03/17/04		none present	NM	0.00	NM
	06/09/04		none present	8.40	0.00	67.92
	09/20/04		none present	4.90	0.00	71.42
	12/02/04		none present	7.44	0.00	68.88
VEW-02	06/13/00	75.86	7.50	13.02	5.52	62.84
	03/11/03		none present	4.71	0.00	71.15
	06/07/03		none present	6.50	0.00	69.36
	09/02/03		none present	5.96	0.00	69.90
	12/12/03		none present	11.04	0.00	64.82
	03/17/04		none present	8.40	0.00	67.46
	06/09/04		none present	8.54	0.00	67.32
	09/20/04		none present	5.01	0.00	70.85
	12/02/04		none present	7.61	0.00	68.25
VEW-03	06/13/00	75.28	none present	8.05	0.00	67.23
	12/11/02		none present	6.23	0.00	69.05
	03/11/03		none present	4.07	0.00	71.21
	06/06/03		none present	6.10	0.00	69.18
	09/02/03		none present	5.35	0.00	69.93
	12/12/03		none present	7.80	0.00	67.48
	03/17/04		none present	8.02	0.00	67.26
	06/09/04		none present	8.01	0.00	67.27
	09/20/04		none present	4.30	0.00	70.98
	12/02/04		none present	7.10	0.00	68.18

**TABLE 1**  
DEPTH TO GROUNDWATER/LNAPL MEASUREMENTS

DAY TANK 1 BIOSPARGE/VAPOR COLLECTION SYSTEM  
NAS CECIL FIELD  
JACKSONVILLE, FLORIDA

Well Identification	Date	Top of Casing Elevation (Feet)	Depth to LNAPL (Feet)	Depth to Water (Feet)	LNAPL Thickness (Feet)	Water Level Elevation (Feet)
VEW-04	06/13/00	75.54	none present	8.38	0.00	67.16
	03/11/03		none present	4.66	0.00	70.88
	06/07/03		none present	6.50	0.00	69.04
	09/02/03		none present	5.80	0.00	69.74
	12/12/03		none present	8.12	0.00	67.42
	03/17/04		none present	8.30	0.00	67.24
	06/09/04		none present	8.37	0.00	67.17
	09/20/04		none present	4.95	0.00	70.59
	12/02/04		none present	7.50	0.00	68.04
VEW-05	06/13/00	74.63	none present	7.53	0.00	67.10
	03/11/03		none present	3.80	0.00	70.83
	06/06/06		none present	6.75	0.00	67.88
	09/02/03		none present	4.95	0.00	69.68
	12/12/03		none present	7.40	0.00	67.23
	03/17/04		none present	7.50	0.00	67.13
	06/09/04		none present	7.55	0.00	67.08
	09/20/04		none present	4.10	0.00	70.53
	12/02/04		none present	6.80	0.00	67.83
VEW-07	06/13/00	76.44	none present	9.06	0.00	67.38
	03/11/03		none present	5.01	0.00	71.43
	06/07/03		none present	6.97	0.00	69.47
	09/04/03		none present	6.45	0.00	69.99
	12/12/03		none present	8.90	0.00	67.54
	03/17/04		none present	9.00	0.00	67.44
	06/09/04		none present	8.99	0.00	67.45
	09/20/04		none present	5.39	0.00	71.05
	12/02/04		none present	8.37	0.00	68.07

LNAPL = Light Non-Aqueous Phase Liquid

NA = Not Available

NM = Not Measured

Elevation is referenced to National Geodetic Vertical Datum 1929 (NGVD 1929)

Depth to LNAPL is measured from top of casing

Depth to water is measured from top of casing

**TABLE 2**  
GROUNDWATER FIELD ANALYTICAL RESULTS

DAY TANK 1 BIOSPARGE/VAPOR COLLECTION SYSTEM  
NAS CECIL FIELD  
JACKSONVILLE, FLORIDA

	Date	ph (s. u.)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Temperature (°C)
CEF-293-9	1/25/2000	5.99	0.088	NM	NM	21.40
	3/11/2003	5.90	0.29	4.29	177.00	20.85
	6/6/2003	6.00	0.472	0.00	-26.00	23.26
	9/2/2003	5.84	0.730	0.93	-90.00	26.10
	12/12/2003	5.86	0.998	0.01	-41.00	23.22
	3/17/2004	5.40	0.279	1.00	NM	21.10
	6/9/2004	5.61	0.280	0.26	-109.60	24.03
	9/20/2004	5.66	0.283	0.15	-148.80	25.79
	12/2/2004	5.82	0.342	0.19	-196.90	24.97
	CEF-293-22	1/25/2000	6.44	0.126	NM	NM
3/11/2003		3.95	0.508	3.13	193.00	21.50
6/7/2003		5.72	0.428	0.12	-20.00	25.90
9/2/2003		5.57	0.929	0.72	52.00	28.75
12/12/2003		5.63	0.626	4.24	99.00	24.35
3/17/2004		5.71	0.480	NM	74.00	23.01
6/9/2004		4.96	0.172	0.90	15.00	25.32
9/20/2004		4.97	0.478	0.35	70.00	27.10
12/2/2004		5.68	0.716	0.33	6	26.08
VEW-1		12/2/2004	5.92	0.302	0.10	-216.5
VEW-2	1/25/2000	5.63	0.085	NM	NM	22.70
	3/11/2003	5.90	0.110	2.51	-53.00	21.10
	6/7/2003	6.09	0.132	0.00	-86.00	22.90
	9/4/2003	5.60	0.342	1.34	-163.00	26.85
	12/12/2003	5.82	0.563	4.01	23.00	22.78
	3/17/2004	5.48	0.172	0.80	NM	21.30
	6/9/2004	5.57	0.172	0.16	-75.90	23.45
	9/20/2004	6.49	0.777	0.10	-141.60	25.98
	12/2/2004	5.91	0.404	0.05	-225.70	24.79
	VEW-3	1/25/2000	5.90	0.070	NM	NM
3/11/2003		4.84	0.166	6.06	202.00	21.30
6/7/2003		5.61	0.159	0.34	30.00	25.10
9/2/2003		5.06	0.306	0.51	NM	27.40
12/12/2003		5.10	0.354	0.66	-223.00	24.60
3/17/2004		5.40	0.398	NM	176.00	21.80
6/9/2004		4.70	0.145	0.42	70.00	25.63
9/20/2004		5.62	0.137	0.00	-42.00	27.32
12/2/2004		5.39	0.341	0.45	32.00	25.51
VEW-4		1/25/2000	5.59	0.078	NM	NM
	3/11/2003	4.35	0.126	5.85	190.00	22.40
	6/7/2003	5.60	0.109	0.00	-41.00	25.10
	9/2/2003	5.35	0.277	0.00	106.00	27.53
	12/12/2003	5.37	0.358	0.28	182.00	24.34
	3/17/2004	5.17	0.316	NM	200.00	22.73
	6/9/2004	4.63	0.128	0.57	210.00	25.43
	9/20/2004	5.15	0.282	0.07	-46.10	27.60
	12/2/2004	4.83	0.683	0.27	103.20	26.27
	VEW-5	1/25/2000	6.28	0.113	NM	NM
3/11/2003		4.35	0.104	5.25	227.00	20.70
6/6/2003		5.10	0.122	0.02	40.00	24.70
9/2/2003		4.84	0.319	0.08	158.00	27.69
12/12/2003		4.68	0.278	0.36	-214.00	23.62
3/17/2004		5.00	0.245	NM	232.00	21.51
6/9/2004		4.47	0.106	0.11	238.00	25.83
9/20/2004		3.94	0.110	0.04	144.00	26.88
12/2/2004		5.11	0.227	0.62	159.2	24.44
VEW-7		1/25/2000	5.63	0.074	NM	NM
	3/11/2003	4.98	0.111	2.69	86.00	18.50
	6/7/2003	5.70	0.134	0.00	-36.00	22.00
	9/4/2003	5.01	0.318	2.26	-42.00	25.31
	12/12/2003	5.07	0.469	0.17	-307.00	23.18
	3/17/2004	5.44	0.186	1.20	NM	21.40
	6/9/2004	5.36	0.214	0.18	-65.60	24.23
	9/20/2004	5.41	0.220	0.24	-137.90	25.36
	12/2/2004	5.71	0.295	0.18	-145.9	24.95

s. u. = standard units  
mS/cm = milli siemens per centimeter  
mg/L = Milligrams per liter  
°C = degrees Centigrade  
NM = not measured

**TABLE 3**  
Groundwater Analytical Results  
NAS Cecil Field, Jacksonville, Florida

Sample I.D.	Date	Benzene	Ethylbenzene	Toluene	Xylenes (total)	Acenaphthylene	Acenaphthene	Fluoranthene	Pyrene	Chrysene	Benzo (a) anthracene	Benzo(b) Fluoranthene	Benzo(k) Fluoranthene	Benzo(a) Pyrene	Benzo(g,h,i) Perylene	Indeno (1,2,3-cd) Pyrene	Naphthalene by Method 8270C SIM	Naphthalene by Method 8260	1-Methylnaphthalene	2-Methylnaphthalene	Phenanthrene	Fluorene	Isopropylbenzene	Chloroform	n-Propylbenzene	sec-Butylbenzene	n-Butylbenzene	T-butylbenzene	1,2,4 Trimethylbenzene	1,3,5 Trimethylbenzene	p-Isopropyltoluene					
CEF 293-09	01/25/00	43.1	592	826	2150	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	378	--	128	182	ND	--	--	--	--	--	--	--	--	--	--	--				
	12/09/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--				
	06/06/03	3.8	4.3	ND	20.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.9	--	ND	ND	ND	5.8	ND	--	--	ND	--	ND	--	ND	--	ND			
	09/02/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.36	--	0.20	ND	ND	ND	ND	--	--	ND	--	ND	--	ND	--	ND			
	12/12/03	2.9	5.8	ND	3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	47.5	98	19.4	18.4	ND	11.8	ND	12.5	3.3	1.9	--	2.3	ND	--	ND				
	03/17/04	2.3	5.7	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	136	144	47.1	50.4	ND	7.9	ND	13.1	4.1	2.4	--	ND	--	ND	--	ND			
	06/09/04	ND	6.96	ND	1.54	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	63.8	81.6	24.6	22.4	ND	12.2	ND	15.9	6.63	ND	ND	6.93	2.98	3.47	ND	1.2			
	09/20/04	ND	1.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12.4	24.1	3.8	4.5	ND	3.6	ND	4.48	1.04	ND	ND	3.75	3.06	ND	ND	ND			
12/02/04	ND	7.180	ND	3.25	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33.64	72.84	16.1 J3	22.7 J3	ND	12.51	ND	15.37	6.20	ND	ND	26.34	7.77	ND	ND	5.53				
CEF 293-22	01/25/00	24.2	19.4	0.88	47.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	142	--	59.6	67	ND	--	--	--	--	--	--	--	--	--	--	--				
	03/11/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	2.4	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--			
	06/06/03	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	0.64	--	4.97	3.76	0.21	0.13	ND	ND	--	--	ND	--	ND	--	ND	--	ND		
	09/02/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	1.34	0.96	0.12	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	
	12/12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	1.07	0.88	0.23	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
	03/17/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	1.35	1.20	0.16	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
	06/09/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	0.7801	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
	09/20/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
12/02/04	3.67	ND	ND	1.801	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND	
VEW-01	01/25/00	18.5	257	59.4	728	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	350	--	220	307	ND	--	--	--	--	--	--	--	--	--	--	--	--			
	06/13/00	FREE PRODUCT																																		
	03/11/03	FREE PRODUCT																																		
	06/07/03	FREE PRODUCT																																		
	09/04/03	FREE PRODUCT																																		
	12/12/03	NOT SAMPLED																																		
	03/17/04	NOT SAMPLED																																		
	06/09/04	NOT SAMPLED																																		
09/20/04	NOT SAMPLED																																			
12/02/04	ND	18.17	0.97001	39.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.590	--	ND J3	ND J3	ND	ND	4.7	ND	4.280	2.20	ND	ND	32.06	5.13	4.080					
VEW-02	01/25/00	91.6	149	29.2	573	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	293	--	118	139	ND	--	--	--	--	--	--	--	--	--	--	--	--			
	03/11/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--		
	06/07/03	ND	ND	ND	ND	ND	ND	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	--	1.06	0.42	ND	ND	ND	ND	--	--	3.2	--	2.3	6.00	--	--	--	--		
	09/04/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	1.4	0.54	ND	ND	ND	--	--	ND	--	ND	3.90	--	--	--	--	--		
	12/12/03	ND	ND	ND	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	0.18	ND	ND	3.2	ND	ND	ND	ND	ND	2.2	1.60	--	--	--	--	--		
	03/17/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.58	ND	1.27	1.09	ND	ND	ND	ND	ND	ND	2.0	ND	ND	ND	ND	ND	ND	ND	
	06/09/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2841	ND	ND	0.3961	ND	ND	ND	ND	ND	ND	2.23	1.33	ND	ND	ND	ND	ND		
	09/20/04	ND	ND	ND	2.45	ND, J3	ND, J3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND, J3	ND, J3	ND, J3	ND, J3	ND	ND, J3	ND	ND	ND	ND	5.95	1.63	ND	ND	ND	ND	ND	ND	
12/02/04	ND	1.3101	ND	3.85	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.161	10.03	3.18 J31	2.05 J31	ND	ND	1.6901	ND	2.14	1.931	ND	ND	16.56	1.701	3.52	ND	ND			
VEW-03	01/25/00	24.4	85.6	11.5	128	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	220	--	78	102	ND	--	--	--	--	--	--	--	--	--	--	--	--			
	03/11/03	ND	ND	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	06/06/03	ND	ND	ND	4.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	1.8	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND
	09/02/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND
	12/12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	3.2	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
	03/17/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.87	ND	2.27	1.46	ND	3.8	ND	4.2	ND	ND	ND	--	ND	--	ND	--	ND	--	ND
	06/09/04	ND	ND	ND	2.32	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.021	ND	3.01	1.18 1	ND	17.5	ND	17.2	3.21	ND	1.11	ND	ND	6.02	ND	ND	ND	ND	
	09/20/04	ND	ND	ND	ND, J3	ND, J3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.29, J3	30.6	2.86, J3	2.88 J3	ND	ND, J3	19	ND	24.2	11.6	ND	ND	12	13	12.8	ND	ND	ND	
12/02/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.091	7.340	7.88 J3	7.05 J3	ND	ND	1.5801	ND	2.32	4.73	3.32	ND	2.1301	0.49001	6.44	ND	ND	ND		
VEW-04	01/25/00	81	138	7.8	298	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	232	--	88.7	108	ND	--	--	--	--	--	--	--	--	--	--	--	--			
	03/11/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	06/07/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	
	09/02/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	--	ND	--	ND	--	ND	--	ND	--	ND	
	12/12/03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	ND	--	ND	--	ND	--	ND	--	ND	
	03/17/04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	--	ND	--	ND	--	ND

## **APPENDIX C**

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*December 2004 Groundwater Sampling Logs*

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# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: Sunny
Sampling ID: 04-41001/5:CEF-293-09:12/2/04		

Notes:

## Well Information

Well ID: <b>CEF-293-09</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 14.00	Well Screen Interval (ft):
TOC Elevation (ft msl): 77.36	Northing: 0	Easting: 0
Static Depth to Water (ft): 8.75	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 12.00
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 13:55	Purge End: 14:18	Total Volume Purged (gal): 1.80

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
14:06	9.03	0.90	0.08	0.26	24.99	345.0	5.93	-176.9	94.70	turbid	none
14:09	9.09	1.30	0.13	0.15	24.92	340.0	5.85	-186.8	53.70		
14:12	8.96	1.60	0.10	0.13	24.91	342.0	5.83	-192.0	39.40		
14:16	8.97	1.80	0.05	0.19	24.92	342.0	5.83	-194.0	36.20		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.19	DO:		DO High Range:	
Sample Start Time:	14:18	Temp (°C):	24.97	CO2:		DO High Range:	
Sample End Time:	14:25	SEC (uS/cm):	342	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.82	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-196.9	H2S:			
		Turb (NTU):	36.2	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"PAHs, VOCs"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Sunny
Sampling ID: 04-41001/5:CEF-293-22:12/2/04		

Notes:

## Well Information

Well ID: <b>CEF-293-22</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 14.70	Well Screen Interval (ft):
TOC Elevation (ft msl): 75.95	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.90	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 9.00
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 15:23	Purge End: 15:44	Total Volume Purged (gal): 2.10

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
15:35	8.70	1.10	0.08	0.59	26.03	800.0	5.69	53.3	224.00	turbid	none
15:38	8.70	1.40	0.03	0.46	26.08	762.0	5.71	35.7	178.00		
15:41	8.70	1.70	0.10	0.39	26.09	736.0	5.70	20.2	147.00		
15:43	8.70	2.10	0.20	0.35	26.08	721.0	5.69	9.1	156.00		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.33	DO:		DO High Range:	
Sample Start Time:	15:44	Temp (°C):	26.08	CO2:		DO High Range:	
Sample End Time:	15:53	SEC (uS/cm):	716	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.68	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	6	H2S:			
		Turb (NTU):	167	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"PAHs, VOCs"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: "Cool, Sunny"
Sampling ID: 04-41001/5:VEW-01:12/2/04		

Notes:

## Well Information

Well ID: <b>VEW-01</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 14.50	Well Screen Interval (ft):
TOC Elevation (ft msl): 76.32	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.44	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 12.00
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 15:51	
Purge End: 16:16	Total Volume Purged (gal): 1.70	

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
16:07	7.68	1.30	0.08	0.26	25.35	292.0	5.93	-219.5	1,000.00	brown	sulfuric
16:10	7.66	1.50	0.06	0.10	25.39	296.0	5.94	-222.9	1,000.00		
16:13	7.72	1.70	0.06	0.09	25.40	302.0	5.92	-221.7	1,000.00		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.1	DO:		DO High Range:	
Sample Start Time:	16:16	Temp (°C):	25.4	CO2:		DO High Range:	
Sample End Time:	16:27	SEC (uS/cm):	302	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.92	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-216.5	H2S:			
		Turb (NTU):	1000	Manganese:			
				Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: Sunny
Sampling ID: 04-41001/5:VEW-02:12/2/04		

Notes:

## Well Information

Well ID: <b>VEW-02</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 16.00	Well Screen Interval (ft):
TOC Elevation (ft msl): 75.86	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.61	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 13.50
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 15:18	Purge End: 15:32	Total Volume Purged (gal): 2.00

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
15:23	7.76	1.40	0.28	0.16	24.81	456.0	5.95	-217.8	1,000.00	brown	sulfuric
15:27	7.59	1.90	0.12	0.07	24.78	424.0	5.93	-224.4	1,000.00		
15:30	7.68	2.00	0.03	0.06	24.74	409.0	5.92	-225.8	1,000.00		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.05	DO:		DO High Range:	
Sample Start Time:	15:32	Temp (°C):	24.79	CO2:		DO High Range:	
Sample End Time:	15:41	SEC (uS/cm):	404	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.91	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-225.7	H2S:			
		Turb (NTU):	1000	Manganese:			
				Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO		
Technician 1: Karen Baer	Technician 2:	Weather: Sunny	
Sampling ID: 04-41001/5:VEW-03:12/2/04			

Notes:

## Well Information

Well ID: <b>VEW-03</b>	Sampling Date: <b>12/2/2004</b>		
Well Diam (in): 2.0	Total Well Depth (ft): 0.00	Well Screen Interval (ft):	
TOC Elevation (ft msl): 75.28	Northing: 0	Easting: 0	
Static Depth to Water (ft): 7.10	Well Capacity (gal): 0.00		

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 9.00	
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS	Turb. Meter: Hach 2100P
Purge Start: 14:01	Purge End: 14:15	Total Volume Purged (gal):	2.10

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
14:08	7.15	1.40	0.20	0.57	25.46	354.0	5.42	33.7	40.70	clear	none
14:11	7.15	1.70	0.10	0.49	25.50	348.0	5.41	31.2	35.20		
14:14	7.15	2.10	0.13	0.47	25.51	341.0	5.39	32.2	30.60		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.45	DO:		DO High Range:	
Sample Start Time:	14:15	Temp (°C):	25.51	CO2:		DO High Range:	
Sample End Time:	14:23	SEC (uS/cm):	341	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.39	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	32	H2S:			
		Turb (NTU):	23.1	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"PAHs, VOCs"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Sunny
Sampling ID: 04-41001/5:VEW-04:12/2/04		

Notes:

## Well Information

Well ID: <b>VEW-04</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 15.10	Well Screen Interval (ft):
TOC Elevation (ft msl): 75.54	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.50	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 9.00
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 16:01	Purge End: 16:20	Total Volume Purged (gal): 3.20

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
16:10	7.60	1.40	0.15	0.32	26.21	690.0	4.88	136.8	180.00	turbid	none
16:13	7.60	2.00	0.20	0.29	26.24	694.0	4.86	129.0	95.70		
16:16	7.60	2.60	0.20	0.29	26.26	700.0	4.84	117.4	38.00		
16:19	7.60	3.20	0.20	0.29	26.26	687.0	4.83	105.4	15.20		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.27	DO:		DO High Range:	
Sample Start Time:	16:20	Temp (°C):	26.27	CO2:		DO High Range:	
Sample End Time:	16:26	SEC (uS/cm):	683	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	4.83	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	103.2	H2S:			
		Turb (NTU):	9.28	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"PAHs, VOCs"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO		
Technician 1: Karen Baer	Technician 2:	Weather: Sunny	
Sampling ID: 04-41001/5:VEW-05:12/2/04			

Notes:

## Well Information

Well ID: <b>VEW-05</b>	Sampling Date: <b>12/2/2004</b>		
Well Diam (in): 2.0	Total Well Depth (ft): 16.85	Well Screen Interval (ft):	
TOC Elevation (ft msl): 74.63	Northing: 0	Easting: 0	
Static Depth to Water (ft): 6.80	Well Capacity (gal): 0.00		

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 8.00	
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS	Turb. Meter: Hach 2100P
Purge Start: 14:32	Purge End: 14:41	Total Volume Purged (gal): 1.50	

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
14:34	6.80	1.00	0.50	0.63	24.24	229.0	5.18	136.6	219.00	turbid	none
14:37	6.80	1.30	0.10	0.73	24.26	227.0	5.14	148.5	146.00		
14:40	6.80	1.50	0.06	0.63	24.38	227.0	5.11	156.7	134.00		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.62	DO:		DO High Range:	
Sample Start Time:	14:41	Temp (°C):	24.44	CO2:		DO High Range:	
Sample End Time:	14:48	SEC (uS/cm):	227	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.11	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	159.2	H2S:			
		Turb (NTU):	126	Manganese:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>		Sulfate:		Alkalinity High Range:	
"PAHs, VOCs"				Sulfide:		Alkalinity Low Range:	
				Nitrate:			

# GROUNDWATER PURGING & SAMPLING LOG



## Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: Sunny
Sampling ID: 04-41001/5:VEW-07:12/2/04		

Notes:

## Well Information

Well ID: <b>VEW-07</b>	Sampling Date: <b>12/2/2004</b>	
Well Diam (in): 2.0	Total Well Depth (ft): 16.40	Well Screen Interval (ft):
TOC Elevation (ft msl): 76.44	Northing: 0	Easting: 0
Static Depth to Water (ft): 8.37	Well Capacity (gal): 0.00	

## Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 14.00
pH Meter:	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P		
Purge Start: 14:32	Purge End: 14:58	Total Volume Purged (gal): 1.70

## Purging Data

Time	Water Level (ft)	Vol Purged (gal)	Pump Rate (gal/min)	DO (mg/L)	Temp (°C)	SEC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Color	Odor
14:46	8.19	1.40	0.10	0.33	24.63	295.0	5.73	-120.0	490.00	brown	none
14:50	8.10	1.60	0.06	0.23	24.81	296.0	5.73	-135.5	321.00		
14:54	8.11	1.70	0.03	0.21	24.89	296.0	5.72	-142.5	298.00		

## Sampling Data

<u>Sample Information</u>		<u>Final Purge Readings</u>		<u>Hach Field Data (mg/L)</u>		<u>CHEMetrics Field Data (mg/L)</u>	
Sample Date:	12/2/2004	DO (mg/L):	0.18	DO:		DO High Range:	
Sample Start Time:	14:58	Temp (°C):	24.95	CO2:		DO High Range:	
Sample End Time:	15:04	SEC (uS/cm):	295	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.71	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-145.9	H2S:			
		Turb (NTU):	294	Manganese:			
				Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							