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NAS CECIL FIELD, FL
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SECOND QUARTER 2005 OPERATIONS AND MAINTENANCE STATUS REPORT FOR DAY
TANK 1 SITE NAS CECIL FIELD FL
10/1/2005
TERRAINE INC ENVIRONMENTAL SERVICES

**SECOND QUARTER 2005
Operations and Maintenance
Status Report
April 1, 2005 to June 30, 2005**

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, the undersigned, do hereby affirm that the information contained in this report is accurate and correct to the best of our knowledge and belief.

<hr/>		PG-FL2090, REM-6089
James L. Young, P.G., REM President/CEO TERRAINE, Inc.	Date	Registration Nos.



<hr/>	
Karen L. Baer Field Superintendent TERRAINE, Inc.	Date

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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
IDW	Investigation Derived Waste
LNAPL	Light Non-Aqueous Phase Liquids
mg/L	Milligrams per liter
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
NM	Not Measured
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). A biosparge and vapor extraction system was selected as the remediation system for the site.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the remediation 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: vapor extraction wells VEW-2, VEW-3, VEW-4, VEW-5, and VEW-7; and monitoring wells CEF-293-9, 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 4th 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 April 1, 2005 to June 30, 2005.

CONCLUSIONS AND RECOMMENDATIONS

Excavation activities at and near the site began between the September 2003 and December 2003 sampling events and continued through September 2004. Excavation was performed on site to the north of the remediation system facility and offsite to the north of the Day Tank 1 site. Possible rebound, first noted in December 2003, could be a result of once adsorbed contaminants being released into groundwater during the beginning of excavation activities. Contaminant concentrations have fluctuated at the site in comparison to the December 2003 sampling event, but have remained below Natural Attenuation Default Source Criteria (NADSC) since 2000.

Based on analytical results obtained to date, 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

JUNE 2005

<i>PREPARED FOR:</i>	Mr. Gabe Magwood - SOUTH DIV
<i>PREPARED BY:</i>	<i>TERRAINE, Inc.</i>
<i>PERIOD OF PERFORMANCE:</i>	April 1, 2005 to June 30, 2005
<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>	October 2005

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 April 1, 2005 to June 30, 2005.

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 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

A post-active remediation system check was performed on June 8, 2005. During this check, the system operated for 15 minutes before being manually shut down.

2.2 Summary of Maintenance

No maintenance was performed on the system during the 2nd Quarter 2005.

2.3 Water Level Measurements

Depth-to-groundwater measurements were recorded on June 8, 2005 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. Using data collected on June 8, 2005, a groundwater elevation map indicated a groundwater flow pattern to the east-southeast, away from well VEW-1 and is included in **Figure 3, Appendix A**. The top-of-casing elevations, historical calculated Light Non-Aqueous Phase Liquids (LNAPL) thickness, historical depth-to-LNAPL measurements, depth-to-water measurements, and calculated water level elevations are provided in **Table 1, Appendix B**.

No LNAPL was detected in any of the monitoring wells or vapor extraction wells during the Second Quarter 2005.

2.4 Groundwater Sampling

2.4.2 Methodology

Groundwater sampling was conducted at Day Tank 1 on June 8, 2005. 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[®] submersible pump or peristaltic 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 and containerized. All investigative derived waste (IDW) is stored at the Day Tank 1 remediation compound site in 55-gallon drums and will be transported to Industrial Water Services in Jacksonville, Florida by Environmental Remediation Services within 90 days of the June 8, 2005 sampling event.

3.0 SUMMARY OF SAMPLING AND LABORATORY ANALYTICAL RESULTS

3.1 Data Validation

A 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 CEF-293-22 as well as vapor extraction wells VEW-1, VEW-2, VEW-4, and VEW-7 exhibited 1,2,4-trimethylbenzene concentrations greater than the Groundwater Cleanup Target Level (GCTL). Groundwater sampled from vapor extraction wells VEW-1 and VEW-4 as well as monitoring well CEF-293-9 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. However, the concentration recorded for groundwater at VEW-4 was between the laboratory method detection limit and the laboratory practical quantitation limit.
- Groundwater sampled from vapor extraction well VEW-1 and CEF-293-9 exhibited xylene concentrations greater than the GCTL.
- Groundwater sampled from monitoring well CEF-293-9 and vapor extraction wells VEW-1, VEW-4 and VEW-7 exhibited naphthalene concentrations greater than the GCTL by EPA Method 8260.

3.2.2 PAHs

- Groundwater sampled from vapor extraction well VEW-7 exhibited a naphthalene concentration greater than the GCTL by EPA Method 8270.
- Groundwater sampled from vapor extraction well VEW-7 exhibited a 1-methylnaphthalene concentration greater than the GCTL.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Excavation activities at and near the site began between the September 2003 and December 2003 sampling events and continued through September 2004. Excavation was performed on site to the north of the remediation system facility and offsite to the north of the Day Tank 1 site. Possible rebound, first noted in December 2003, 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. According to June 2005 analytical results, benzene and naphthalene concentrations have decreased in comparison to the December 2003 sampling event.

In March 2004, increased benzene and naphthalene concentrations were noted down gradient of monitoring well CEF-293-9 in groundwater collected from vapor extraction well VEW-7. According to June 2005 analytical data, benzene concentrations have stabilized and naphthalene concentrations have increased in comparison to the March 2004 sampling event.

In September 2004, increased benzene concentrations were noted in vapor extraction well VEW-4 and increased naphthalene concentrations were noted in vapor extraction wells VEW-3 and VEW-4. Both wells are located down gradient of vapor extraction well VEW-7. According to June 2005 analytical data, benzene concentrations in groundwater sampled from vapor extraction well VEW-4 have decreased in comparison to the September 2004 sampling event. Naphthalene concentrations in both wells have decreased in comparison to the September 2004 sampling event.

In December 2004, increased contaminant concentrations were noted in monitoring well CEF-293-22. In June 2005, contaminant concentrations observed in groundwater sampled from monitoring well CEF-293-22 did not demonstrate a notable increase or decrease.

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

Continue groundwater sampling from monitoring wells and vapor extraction wells (CEF-293-9, CEF-293-22, VEW-1, VEW-2, VEW-3, VEW-4, VEW-5, and VEW-7) to monitor for possible rebound as a result of excavation activities.

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.

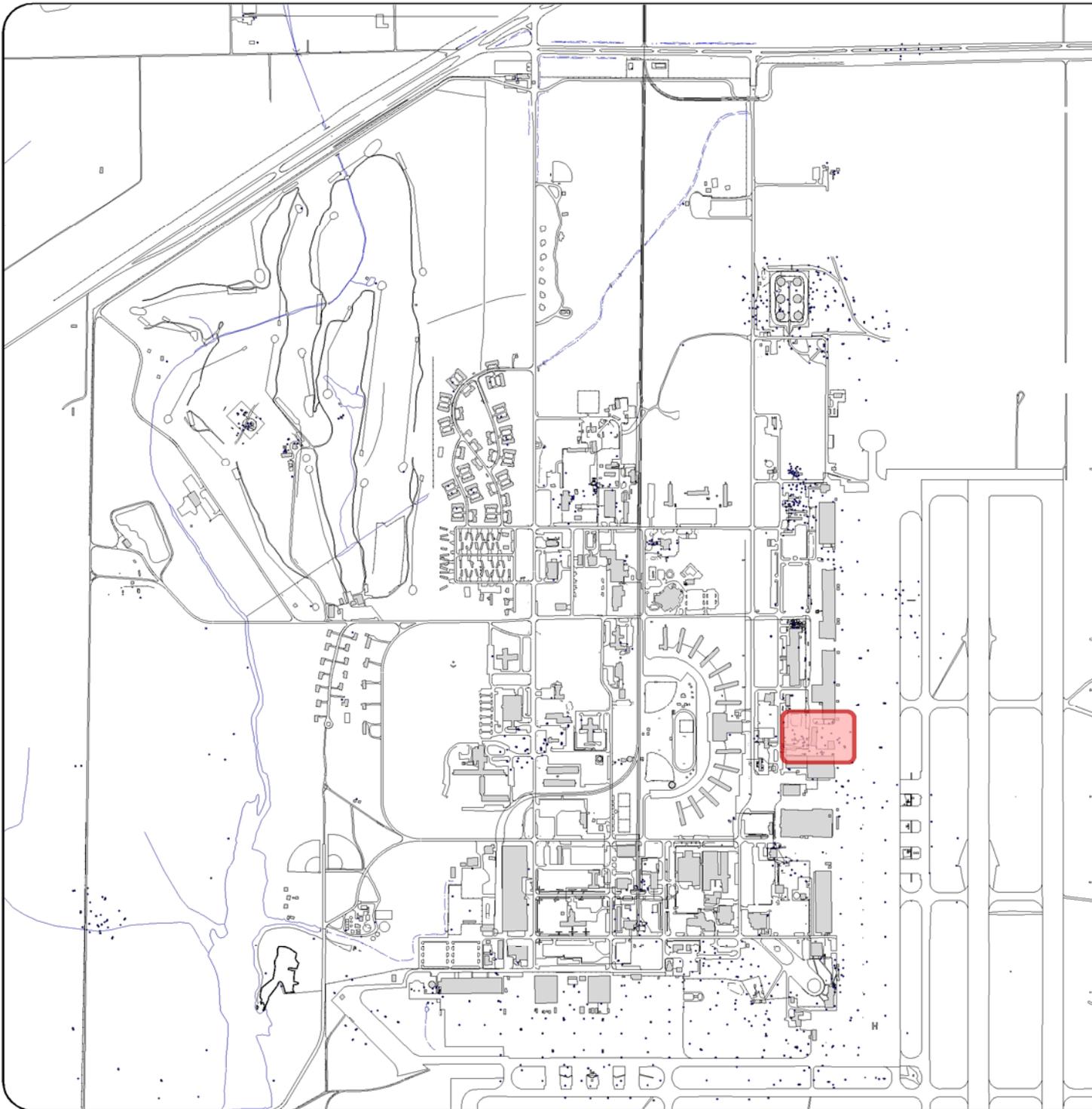
APPENDIX A

FIGURES

Figure 1 *Site Location Map, Day Tank 1*

Figure 2 *Site Map, Day Tank 1*

Figure 3 *Groundwater Elevation Map, June 2005*



NOTES

Sources: Environmental IR Gateway (www.sdirport.com)

LEGEND

 APPROXIMATE SITE BOUNDARY

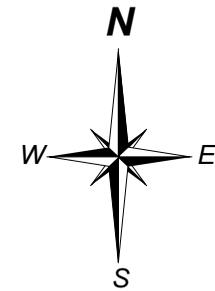
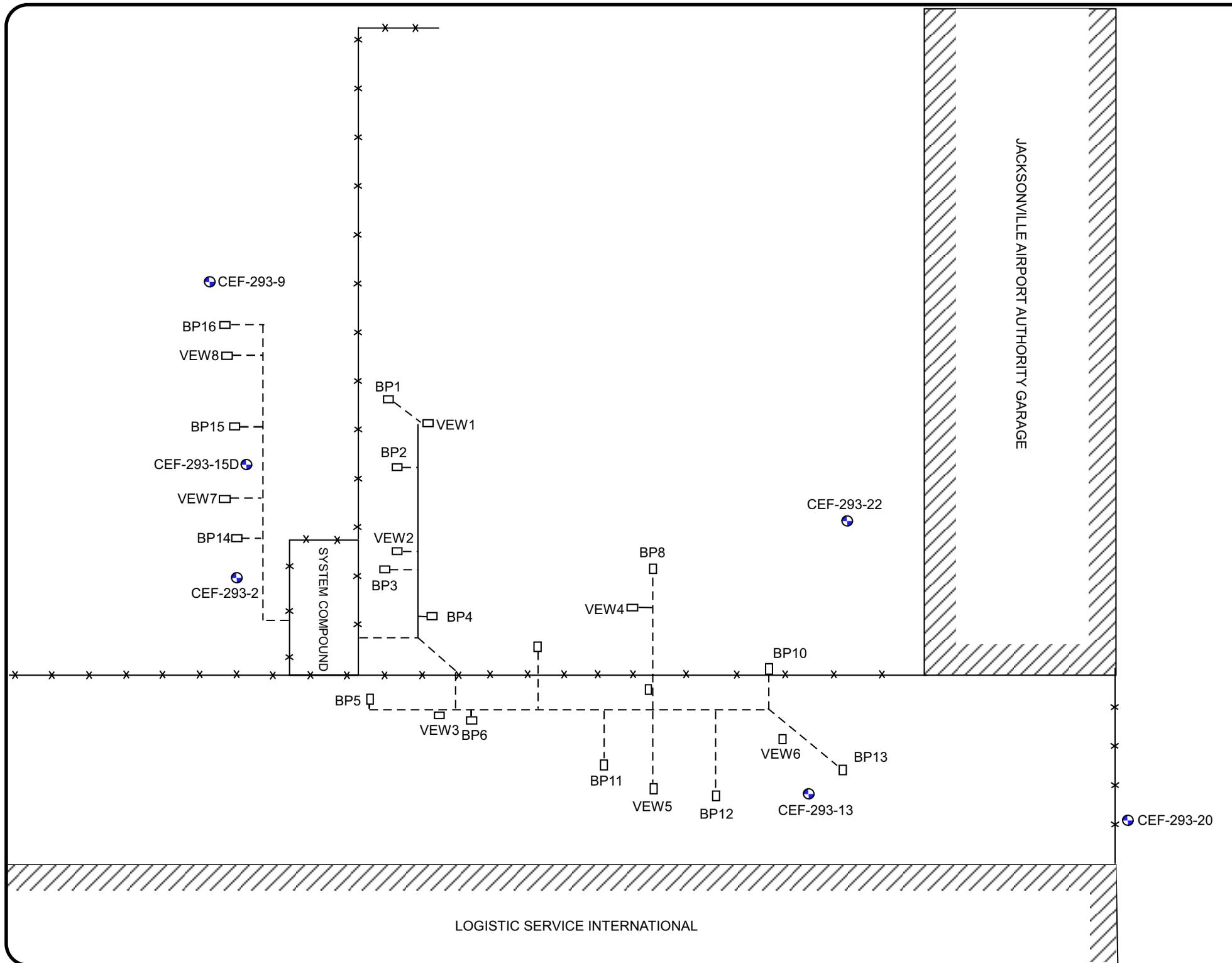
0 0.25 0.5
APPROXIMATE SCALE IN MILES



**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

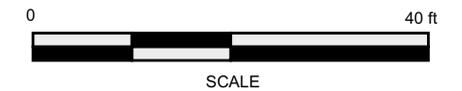


NOTES

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

APPENDIX B
TABLES

Table 1 *Depth to Groundwater/LNAPL Measurements*

Table 2 *Groundwater Field Analytical Results*

Table 3 *Groundwater Analytical Results*

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
	03/11/05		none present	8.79	0.00	68.57
06/08/05	none present	8.65	0.00	68.71		
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
	03/11/05		none present	7.90	0.00	68.05
06/08/05	none present	7.71	0.00	68.24		
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
	03/11/05		none present	7.39	0.00	68.93
06/08/05	none present	7.24	0.00	69.08		
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
	03/11/05		none present	7.52	0.00	68.34
06/08/05	none present	7.39	0.00	68.47		

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-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
	03/11/05		none present	7.05	0.00	68.23
	06/08/05		none present	6.90	0.00	68.38
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
	03/11/05		none present	7.45	0.00	68.09
	06/08/05		none present	7.20	0.00	68.34
	VEW-05		06/13/00	74.63	none present	7.53
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
03/11/05		none present	6.25		0.00	68.38
06/08/05		none present	6.10		0.00	68.53
VEW-07		06/13/00	76.44		none present	9.06
	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
	03/11/05	none present		7.96	0.00	68.48
	06/08/05	none present		7.90	0.00	68.54

LNAPL = Light Non-Aqueous Phase Liquid

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
	3/11/2005	8.34	0.240	1.49	-118.00	22.08
	6/8/2005	5.44	0.263	0.23	-196.50	23.67
	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	6.00	26.08
3/11/2005		5.23	0.518	0.25	-83.30	21.87
6/8/2005		5.41	0.378	0.09	-98.80	25.54
VEW-1		12/2/2004	5.92	0.302	0.10	-216.50
	3/11/2005	7.46	0.120	0.00	-100.00	21.55
	6/8/2005	5.16	0.134	0.08	-198.20	23.18
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
	3/11/2005	8.53	0.310	0.98	-170.00	21.92
	6/8/2005	5.67	0.280	0.06	-209.00	23.53
	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
3/11/2005		5.01	0.275	0.31	-10.30	22.06
6/8/2005		4.91	0.145	0.82	-9.90	26.13
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
	3/11/2005	4.39	0.393	0.24	44.90	22.55
	6/8/2005	4.69	0.203	0.05	64.30	26.93
	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	159.20	24.44
3/11/2005		5.24	0.253	0.23	53.50	20.82
6/8/2005		4.62	0.127	0.25	206.10	25.33
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	-145.90	24.95
	3/11/2005	7.92	0.260	3.32	-107.00	22.00
	6/8/2005	5.26	0.241	0.3	-138.00	23.08

S.U. = standard units
mS/cm = millisiemens per centimeter
mg/L = Milligrams per liter
°C = degrees Centigrade
NM = not measured

APPENDIX C

June 2005 Groundwater Purging and Sampling Logs

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: "Hot, Humid, Windy, Sunny"
Sampling ID: 04-41001/5:CEF-293-09:6/8/05		

Notes:

Well Information

Well ID: CEF-293-09	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 14.00	Well Screen Interval (ft):
TOC Elevation (ft amsl): 77.36	Northing: 0	Easting: 0
Static Depth to Water (ft): 8.65	Well Capacity (gal): 0.87	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 11.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 16:20	
Purge End: 16:38	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)	Salinity	Color	Odor
16:30	8.85	0.90	0.09	0.37	23.54	267.0	5.43	-180.1	10.50			
16:33	8.82	1.10	0.06	0.27	23.64	266.0	5.42	-188.3	9.29			
16:37	8.81	1.30	0.05	0.25	23.68	264.0	5.44	-195.0	9.28			

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:	6/8/2005	DO (mg/L):	0.23	DO:		DO High Range:	
Sample Start Time:	16:38	Temp (°C):	23.67	CO2:		DO High Range:	
Sample End Time:	16:45	SEC (uS/cm):	263	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.44	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-196.5	H2S:			
		Turb (NTU):	9.34	Manganese:			
		Salinity:		Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: "Hot, Muggy, Sunny"
Sampling ID: 04-41001/5:CEF-293-22:6/8/05		

Notes:

Well Information

Well ID: CEF-293-22	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 14.70	Well Screen Interval (ft):
TOC Elevation (ft amsl): 75.95	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.71	Well Capacity (gal): 1.14	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 11.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 14:07	
Purge End: 14:48	Total Volume Purged (gal): 2.30	

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)	Salinity	Color	Odor
14:30	8.06	1.20	0.05	0.23	25.71	429.0	5.45	-30.7	107.00		milky	none
14:33	8.07	1.40	0.06	0.16	25.65	410.0	5.44	-60.0	80.80			
14:36	8.10	1.60	0.06	0.13	25.59	398.0	5.42	-75.4	61.50			
14:40	8.10	1.90	0.07	0.11	25.58	388.0	5.42	-88.0	48.20			
14:44	8.11	2.20	0.07	0.09	25.54	380.0	5.41	-96.8	44.80			

Sampling Data

Sample Information		Final Purge Readings		Hach Field Data (mg/L)		CHEMetrics Field Data (mg/L)	
Sample Date:	6/8/2005	DO (mg/L):	0.09	DO:		DO High Range:	
Sample Start Time:	14:48	Temp (°C):	25.54	CO2:		DO High Range:	
Sample End Time:	14:54	SEC (uS/cm):	378	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.41	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-98.8	H2S:		Alkalinity High Range:	
		Turb (NTU):	37.9	Manganese:		Alkalinity Low Range:	
		Salinity:		Sulfate:			
				Sulfide:			
				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: "Muggy, Partly Cloudy, Sunny"
Sampling ID: 04-41001/5:VEW-01:6/8/05		

Notes:

Well Information

Well ID: VEW-01	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 14.50	Well Screen Interval (ft):
TOC Elevation (ft amsl): 76.32	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.24	Well Capacity (gal): 1.18	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 11.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 16:46	
Purge End: 17:29	Total Volume Purged (gal): 3.00	

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)	Salinity	Color	Odor
17:00	7.41	1.20	0.08	0.47	23.19	130.0	5.07	-181.5	448.00		brown	none
17:05	7.42	1.40	0.04	0.15	23.18	131.0	5.10	-189.9	285.00			
17:09	7.41	1.75	0.08	0.09	23.15	132.0	5.14	-193.6	173.00			
17:13	7.42	2.00	0.06	0.09	23.10	133.0	5.13	-194.8	131.00			
17:17	7.42	2.40	0.10	0.09	23.10	133.0	5.14	-196.7	93.90			
17:21	7.42	2.70	0.07	0.09	23.17	134.0	5.16	-197.7	65.20			
17:25	7.42	2.90	0.05	0.08	23.17	134.0	5.16	-198.2	59.90			

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:	6/8/2005	DO (mg/L):	0.08	DO:		DO High Range:	
Sample Start Time:	17:29	Temp (°C):	23.18	CO2:		DO High Range:	
Sample End Time:	17:40	SEC (uS/cm):	134	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.16	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-198.6	H2S:			
		Turb (NTU):	51.2	Manganese:			
		Salinity:		Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: "Hot, Muggy, Partly Cloudy, Sunny"
Sampling ID: 04-41001/5:VEW-02:6/8/05		

Notes:

Well Information

Well ID: VEW-02	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 16.00	Well Screen Interval (ft):
TOC Elevation (ft amsl): 75.86	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.39	Well Capacity (gal): 1.40	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 12.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 16:00	
Purge End: 16:35	Total Volume Purged (gal): 1.90	

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)	Salinity	Color	Odor
16:26	7.42	1.50	0.04	1.07	23.45	291.0	5.68	-206.2	1,000.00		brown	sulfuric
16:29	7.45	1.70	0.06	0.12	23.44	285.0	5.66	-209.5	1,000.00			
16:33	7.45	1.80	0.02	0.07	23.52	281.0	5.66	-209.0	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:	6/8/2005	DO (mg/L):	0.06	DO:		DO High Range:	
Sample Start Time:	16:35	Temp (°C):	23.53	CO2:		DO High Range:	
Sample End Time:	16:41	SEC (uS/cm):	280	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.67	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-209	H2S:			
		Turb (NTU):	1000	Manganese:			
		Salinity:		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: "Hot, Humid, Sunny"
Sampling ID: 04-41001/5:VEW-03:6/8/05		
Notes: Listed well capacity is incorrect. total well depth information is currently unavailable.		

Well Information

Well ID: VEW-03	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 0.00	Well Screen Interval (ft):
TOC Elevation (ft amsl): 75.28	Northing: 0	Easting: 0
Static Depth to Water (ft): 6.90	Well Capacity (gal): -1.12	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 9.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
		Turb. Meter: Hach 2100P
Purge Start: 14:26	Purge End: 15:02	Total Volume Purged (gal): 2.70

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)	Salinity	Color	Odor
14:37	6.95	1.10	0.10	0.86	25.31	148.0	4.72	56.5	166.00		turbid	none
14:40	6.95	1.20	0.03	0.83	25.66	148.0	4.75	51.0	119.00			
14:43	6.95	1.40	0.06	0.81	25.86	148.0	4.83	36.0	91.30			
14:47	6.95	1.60	0.05	0.82	26.13	148.0	4.95	18.8	71.10			
14:50	6.95	1.80	0.06	0.81	26.12	147.0	4.96	7.0	49.60			
14:53	6.95	2.00	0.06	0.83	26.17	147.0	4.95	2.5	38.70			
14:56	6.95	2.20	0.06	0.84	26.10	145.0	4.93	-1.5	28.20			
15:01	6.95	2.50	0.06	0.80	26.09	144.0	4.92	-9.4	19.40			

Sampling Data

Sample Information	Final Purge Readings	Hach Field Data (mg/L)	CHEMetrics Field Data (mg/L)
Sample Date: 6/8/2005	DO (mg/L): 0.82	DO:	DO High Range:
Sample Start Time: 15:02	Temp (°C): 26.13	CO2:	DO High Range:
Sample End Time: 15:14	SEC (uS/cm): 145	Alkalinity:	CO2 High Range:
Field Filtered: <input type="checkbox"/>	pH: 4.91	Ferrous Iron:	CO2 Low Range:
Duplicate: <input type="checkbox"/>	ORP (mV): -9.9	H2S:	
	Turb (NTU): 17.7	Manganese:	Alkalinity High Range:
	Salinity:	Sulfate:	Alkalinity Low Range:
		Sulfide:	
		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: "Hot, Muggy, Partly Cloudy, Sunny"	
Sampling ID: 04-41001/5:VEW-04:6/8/05			
Notes:			

Well Information

Well ID: VEW-04	Sampling Date: 6/8/2005		
Well Diam (in): 2.0	Total Well Depth (ft): 15.10	Well Screen Interval (ft):	
TOC Elevation (ft amsl): 75.54	Northing: 0		Easting: 0
Static Depth to Water (ft): 7.20	Well Capacity (gal): 1.28		

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE	Pump Set at (ft): 11.50	
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS	Turb. Meter: Hach 2100P
Purge Start: 14:58	Purge End: 15:48	Total Volume Purged (gal): 2.20	

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)	Salinity	Color	Odor
15:25	7.24	1.30	0.04	0.12	27.06	203.0	4.77	29.6	158.00		brown	none
15:29	7.23	1.40	0.02	0.10	27.15	203.0	4.75	30.1	130.00			
15:32	7.23	1.50	0.03	0.09	27.11	203.0	4.73	35.4	102.00			
15:36	7.23	1.70	0.05	0.12	27.06	202.0	4.73	39.1	76.80			
15:40	7.24	1.90	0.05	0.07	27.07	202.0	4.71	51.3	51.60			
15:44	7.23	2.10	0.05	0.06	26.90	201.0	4.71	60.1	47.10			

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:	6/8/2005	DO (mg/L):	0.05	DO:		DO High Range:	
Sample Start Time:	15:48	Temp (°C):	26.93	CO2:		DO High Range:	
Sample End Time:	15:54	SEC (uS/cm):	203	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	4.69	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	64.3	H2S:			
		Turb (NTU):	40.4	Manganese:			
		Salinity:		Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

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-05:6/8/05		

Notes:

Well Information

Well ID: VEW-05	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 16.85	Well Screen Interval (ft):
TOC Elevation (ft amsl): 74.63	Northing: 0	Easting: 0
Static Depth to Water (ft): 6.10	Well Capacity (gal): 1.75	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 13.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 15:29	
Purge End: 15:43	Total Volume Purged (gal): 1.20	

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)	Salinity	Color	Odor
15:34	6.25	0.40	0.08	0.39	25.14	128.0	4.72	188.8	20.20		clear	none
15:38	6.20	0.75	0.08	0.31	25.31	126.0	4.66	194.9	12.50			
15:42	6.20	1.00	0.03	0.26	25.35	127.0	4.66	200.5	12.00			

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:	6/8/2005	DO (mg/L):	0.25	DO:		DO High Range:	
Sample Start Time:	15:43	Temp (°C):	25.33	CO2:		DO High Range:	
Sample End Time:	15:54	SEC (uS/cm):	127	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	4.62	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	206.1	H2S:			
		Turb (NTU):	9.42	Manganese:			
		Salinity:		Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							

GROUNDWATER PURGING & SAMPLING LOG



Environmental Consulting

Project Information

Project No: 04-41001/5	Project Name: Day Tank 1 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: "Cloudy, Humid"
Sampling ID: 04-41001/5:VEW-07:6/8/05		

Notes:

Well Information

Well ID: VEW-07	Sampling Date: 6/8/2005	
Well Diam (in): 2.0	Total Well Depth (ft): 16.40	Well Screen Interval (ft):
TOC Elevation (ft amsl): 76.44	Northing: 0	Easting: 0
Static Depth to Water (ft): 7.90	Well Capacity (gal): 1.38	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE	Pump Set at (ft): 13.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS
Turb. Meter: Hach 2100P	Purge Start: 16:58	
Purge End: 17:18	Total Volume Purged (gal): 1.60	

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)	Salinity	Color	Odor
17:09	8.00	1.30	0.11	2.19	22.70	243.0	5.09	-123.7	33.20		brown	none
17:13	8.00	1.40	0.02	0.37	23.01	242.0	5.28	-136.8	27.40			
17:17	8.00	1.60	0.05	0.31	23.00	241.0	5.23	-135.6	26.40			

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:	6/8/2005	DO (mg/L):	0.3	DO:		DO High Range:	
Sample Start Time:	17:18	Temp (°C):	23.08	CO2:		DO High Range:	
Sample End Time:	17:35	SEC (uS/cm):	241	Alkalinity:		CO2 High Range:	
Field Filtered:	<input type="checkbox"/>	pH:	5.26	Ferrous Iron:		CO2 Low Range:	
Duplicate:	<input type="checkbox"/>	ORP (mV):	-138	H2S:			
		Turb (NTU):	26	Manganese:			
		Salinity:		Sulfate:		Alkalinity High Range:	
				Sulfide:		Alkalinity Low Range:	
				Nitrate:			
<u>Lab Analyses/Methods:</u>		<u>Technician Initials</u>					
"PAHs, VOCs"							