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NAS CECIL FIELD, FL
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SEPTEMBER 2005 POST ACTIVE REMEDIATION MONITORING REPORT FOR BUILDING 9 FORMER TANKS 9L1 AND 9L2 NAS CECIL FIELD FL

11/1/2005

TERRAINE INC ENVIRONMENTAL SERVICES

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September 2005
Post Active Remediation Monitoring Report

BUILDING 9

Former Tanks 9L1 and 9L2

Naval Air Station Cecil Field
Jacksonville, Florida

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

Submitted to:

U.S. Naval Facilities Engineering Command Southern Division

Prepared by:

TERRAINE
Environmental Consulting

2656 NW 97th Ave. Miami, FL 33172

November 2005

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.

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

Karen L. Baer
Field Superintendent
TERRAINE, Inc.

Date

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Post Active Remediation Monitoring Plan Approval Order

ACRONYMS

BGS	Below Ground Surface
BOA	Basic Ordering Agreement
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
ºC	Degrees Celsius
CTO	Contract Task Order
DO	Dissolved Oxygen
EPA	U.S. Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FL-PRO	Florida Petroleum Residual Organic
Ft.	Feet
Gal/min.	Gallons per minute
GCTL	Groundwater Cleanup Target Levels
IDW	Investigation Derived Waste
LNAPL	Light Non-Aqueous Phase Liquid
µS/cm	Microsiemens per centimeter
mg/L	Milligrams per liter
mS/cm	Millisiemens per centimeter
MTBE	Methyl-tert-butyl-ether
mV	Millivolts
NA	Not Analyzed
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
ND	Non Detect
NGVD	National Geodetic Vertical Datum
NM	Not measured
NR	Not recorded
NS	Not sampled
NTU	Nephelometric Turbidity Units
O&M	Operation and Maintenance
ORP	Oxidation Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
TERRAINE	Terraine, Inc.
TRPH	Total Recoverable Petroleum Hydrocarbons

EXECUTIVE SUMMARY

SCOPE

The objective of the remedial action at the Building 9 site was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by Florida Administrative Code (FAC) 62-777. Nutrient injection, using the *PHOSter Nutrient Injection System*, was the technology used to achieve this objective.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the nutrient injection system, the Florida Department of Environmental Protection (FDEP) approved deactivating the remediation system on approximately October 15, 2004 and a Post Active Remediation Monitoring Plan Approval Order was issued on October 18, 2004. In accordance with this order, the nutrient injection system was shut off on November 1, 2004 and Post Active Remediation Monitoring began in December, 2004.

The purpose of this Post Active Remediation Report is to provide a summary of activities performed at the site on September 8, 2005.

CONCLUSIONS AND RECOMMENDATIONS

Based on laboratory analytical results to date, it is concluded that nutrient injection was an effective remediation technology to enhance the biodegradation of contaminants such as Benzene, Toluene, Ethyl-benzene, and Xylenes (BTEX), naphthalene, and Total Recoverable Petroleum Hydrocarbons (TRPH) at the Building 9 site.

Based on groundwater analytical results obtained during Post Active Remediation Monitoring conducted in December 2004 and March, June, and September 2005, no further action is recommended for the site.

POST ACTIVE REMEDIATION MONITORING REPORT

BUILDING 9

NAVAL AIR STATION, CECIL FIELD

JACKSONVILLE, FLORIDA

SEPTEMBER 2005

PREPARED FOR:	Mr. Gabe Magwood - SOUTHDIV
PREPARED BY:	*TERRAINE, Inc*.
FIELD TEAM:	Karen Baer, Larry Wolski
CONTRACT NUMBER:	N62467-02-G-0352
TASK ORDER NUMBER:	0001
TASK ORDER MANAGER:	James L. Young, P.G.; REM
SUBMITTAL DATE:	November 2005

1.0 INTRODUCTION

Terraine, Inc. (TERRAINE) has been contracted by the Department of the Navy, Southern Division Naval Facilities Engineering Command (Southern Division, NAVFAC), to provide Operation and Maintenance (O&M) services at Building 9, Naval Air Station (NAS) Cecil Field, Jacksonville, Florida, under the **Basic Ordering Agreement (BOA) No. N62467-02-G-0352, Contract Task Order (CTO) No. 0001**. The purpose of this Post Active Remediation Report is to provide a summary of activities performed at the site on September 8, 2005.

1.1 Purpose

The objective of the remedial action at the Building 9 site was to reduce the concentrations of petroleum-related contaminants in the groundwater and unsaturated soils to target levels specified by FAC 62-777. Nutrient injection, using the *PHOSter Nutrient Injection System*, was the technology used 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.

Due to the substantial reduction of contaminant concentrations in wells within the area of influence of the nutrient injection system, the FDEP approved deactivating the remediation system on approximately October 15, 2004. The system was shut off on November 1, 2004.

1.2 Site Location and Description

A base map illustrating the site location at NAS Cecil Field 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 Water Level Measurements

Depth-to-water measurements were recorded on September 8, 2005 at the monitoring wells which were sampled (CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S). The top-of-casing elevation, depth-to-water measurements, and calculated water level elevations are provided in **Table 1, Appendix B**. Groundwater flow direction in the shallow zone on September 8, 2005 was to the north-northwest (**Figure 3, Appendix A**). Groundwater flow direction could not be determined in the deep aquifer due to limited data points. The locations of the wells are shown on **Figure 2, Appendix A.**

Light Non-Aqueous Phase Liquids (LNAPL) were not noted in any monitoring well during the monitoring period.

2.2 Groundwater Sampling

2.2.1 Methodology

Groundwater sampling was conducted at Building 9 on September 8, 2005. Five (5) wells (CEF-9-2S, CEF-9-3S, CEF-9-5S, CEF-9-7D, and CEF-9-9S) were purged and sampled using the low-flow methodology. Purging of wells consisted of removing groundwater with a Nomad© submersible pump or Geotech© peristalitic pump at a flow rate equal to or less than the groundwater recharge rate 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 parameters are summarized in **Table 2, Appendix B.** Copies of the groundwater purging/sampling logs including all field parameter measurements are provided in **Appendix C**.

2.2.2 Chemical Analysis Suite

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

- BTEX and Methyl-Tert-Butyl-Ether (MTBE) by U.S. Environmental Protection Agency (EPA) Method 8260B.
- PAHs by EPA Method 8270C.
- TRPH by Florida Petroleum Residual Organic (FL-PRO).

2.3 Investigative Derived Waste

Purge water collected from the monitoring wells was collected and containerized. All investigative derived waste (IDW) is stored at the remediation system compound at the Day Tank 1 site in 55-gallon drums. The IDW will be removed from site within 90 days of the September 8, 2005 sampling event.

3.0 SUMMARY OF SAMPLING AND LABORATORY ANALYTICAL RESULTS

3.1 Data Validation

The quality control data was reviewed and evaluated for 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 3, Appendix B**.

3.2 Groundwater Monitoring

3.2.1 BTEX/MTBE

BTEX and MTBE were not detected in groundwater sampled during the September 2005 sampling event.

3.2.2 PAHs

Naphthalene was detected in groundwater sampled from monitoring well CEF-9-5S during the September 2005 sampling event. However, the reported concentration (0.230 μg/L) was between the laboratory method detection limit and method reporting limit.

3.2.3 TRPH

TRPH was detected in groundwater sampled from monitoring well CEF-9-2S during the September 2005 sampling event. However, the reported value (87 μg/L) was between the laboratory method detection limit and the method reporting limit.

Groundwater analytical results are summarized in **Table 3, Appendix B**.

4.0 CONCLUSIONS AND RECOMMENDATIONS

September 2005 analytical laboratory results indicate that contaminant concentrations in groundwater sampled from all monitoring wells were below the applicable GCTLs. LNAPL was not noted in any monitoring well during the monitoring period.

Based on these results, it is concluded that nutrient injection was an effective remediation technology to enhance the biodegradation of contaminants such as BTEX, naphthalene, and TRPH at the Building 9 site.

Based on groundwater analytical results obtained during Post Active Remediation Monitoring conducted in December 2004 and March, June, and September 2005, no further action is recommended for the site.

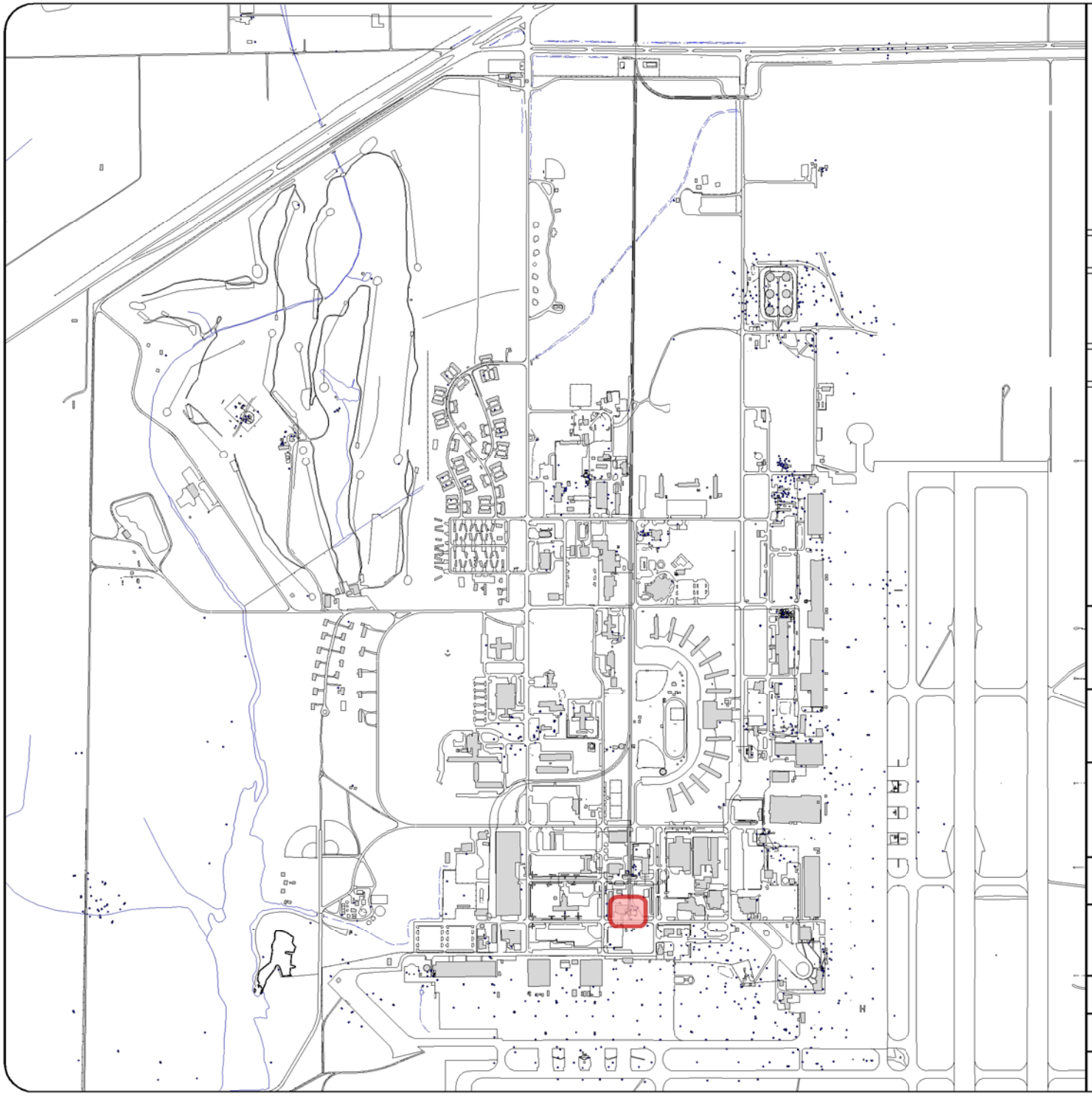
5.0 REFERENCES

Terraine, Inc. First Quarter 2004 Operation and Maintenance Status Report, Nutrient Injection System, Building 9, Naval Air Station Cecil Field, Jacksonville, Florida.

APPENDIX A

FIGURES

Figure 1	*Site Location Map, Building 9*
Figure 2	*Site Map, Building 9*
Figure 3	*Groundwater Potentiometric Surface Map, Building 9, Shallow Zone September 8, 2005*



N
W E
S

NOTES

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

LEGEND

APPROXIMATE SITE BOUNDARY

0 0.25 0.5

APPROXIMATE SCALE IN MILES

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NAS CECIL FIELD
FIGURE 1: SITE LOCATION MAP
BUILDING 9

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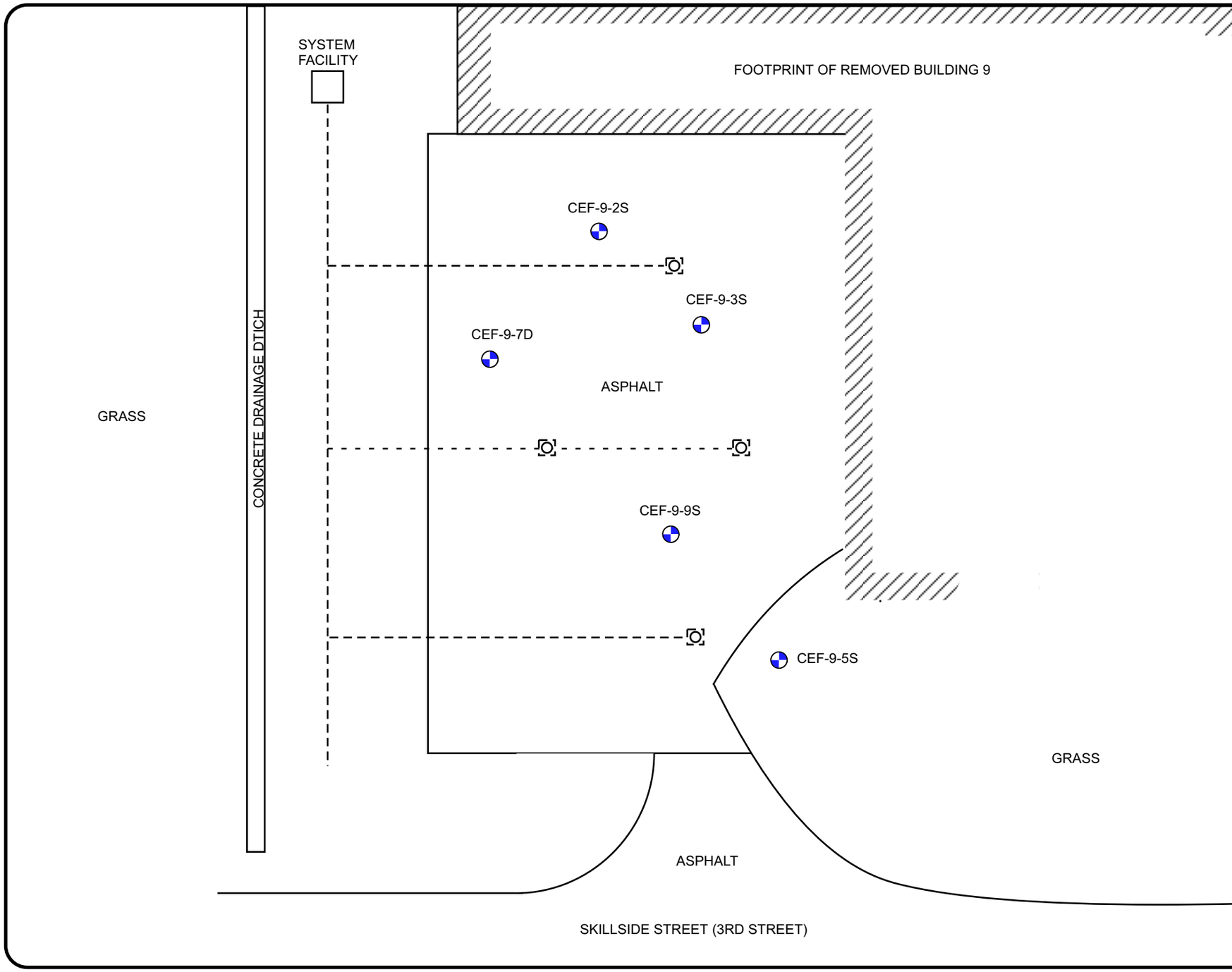
U.S. Naval Facilities Engineering Command, Southern Division

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



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NOTES

DASHED LINE INDICATES SUBSURFACE FEATURES

LEGEND

- INJECTION LINE
- INJECTION WELL
- MONITORING WELL

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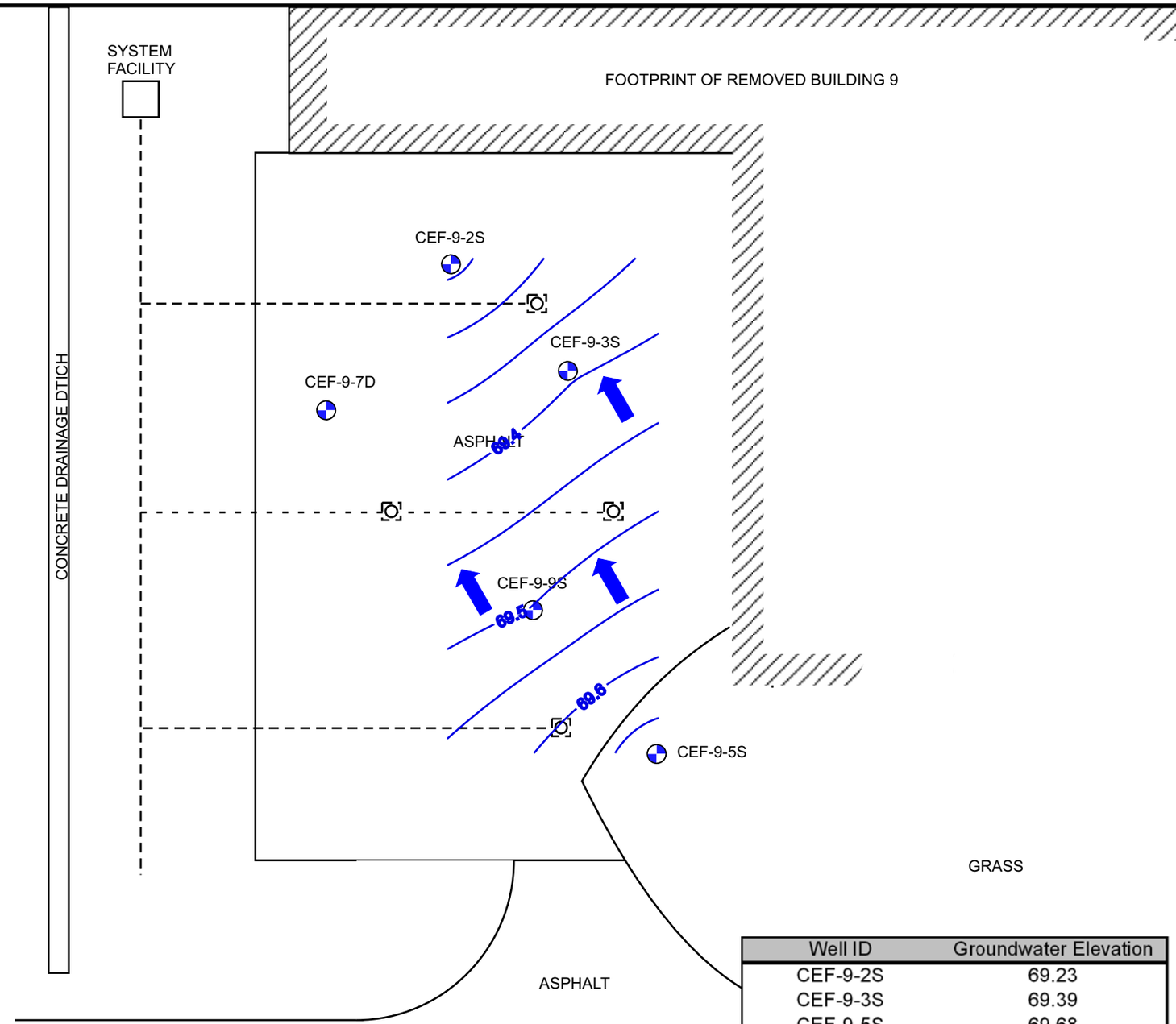
NAS CECIL FIELD
FIGURE 2: SITE MAP
BUILDING 9

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

DWN BY: KLB	CHK BY:
SCALE: MAP NOT TO SCALE	APR BY: JLY
DATE: 08-24-2004	FILE: 04-41001



Well ID	Groundwater Elevation
CEF-9-2S	69.23
CEF-9-3S	69.39
CEF-9-5S	69.68
CEF-9-9S	69.50

Groundwater elevation is in feet.

N
W E
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NOTES

DASHED LINE INDICATES SUBSURFACE FEATURES

LEGEND

- INJECTION LINE
- INJECTION WELL
- MONITORING WELL

INDICATES GROUNDWATER FLOW DIRECTION

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NAS CECIL FIELD
FIGURE 3: GROUNDWATER POTENTIOMETRIC SURFACE MAP
SHALLOW ZONE, SEPTEMBER 8, 2005
BUILDING 9

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

DWN BY: KLB	CHK BY:
SCALE: MAP NOT TO SCALE	APR BY: JLY
DATE: 07/25/05	FILE: 04-41001

APPENDIX B

TABLES

Table 1	*Groundwater Monitoring Well – Water Level and Free Product Data*
Table 2	*Groundwater Field Analytical Results*
Table 3	*Groundwater Analytical Results*

TABLE 1

GROUNDWATER MONITORING WELL - WATER LEVEL & FREE PRODUCT DATA

BUILDING 9 NUTRIENT INJECTION SYSTEM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Well Identification	Well Total Depth (Feet BGS)	Date	Top of Casing Elevation (Feet)	Depth to Product (Feet)	Depth to Water (Feet)	Water Level Elevation (Feet)
CEF-9-2S	14.45	12/18/2000	78.74	no product	7.93	70.81
		3/13/2003		no product	4.18	74.56
		6/9/2003		no product	5.35	73.39
		9/2/2003		no product	4.57	74.17
		12/10/2003		no product	7.88	70.86
		3/16/2004		no product	8.63	70.11
		6/9/2004		no product	10.11	68.63
		9/20/2004		no product	7.55	71.19
		12/3/2004		no product	11.10	67.64
		3/12/2005		no product	11.43	67.31
		6/7/2005		no product	11.21	67.53
		9/8/2005		no product	9.51	69.23
CEF-9-3S	15.54	12/18/2000	78.81	no product	8.04	70.77
		3/13/2003		no product	4.28	74.53
		6/9/2003		no product	5.30	73.51
		9/2/2003		no product	4.74	74.07
		12/10/2003		no product	8.02	70.79
		3/16/2004		no product	8.94	69.87
		6/9/2004		no product	10.08	68.73
		9/20/2004		no product	7.42	71.39
		12/3/2004		no product	11.06	67.75
		3/12/2005		no product	11.43	67.38
		6/7/2005		no product	11.19	67.62
		9/8/2005		no product	9.42	69.39
CEF-9-5S	13.72	12/18/2000	78.93	no product	8.34	70.59
		3/13/2003		no product	4.57	74.36
		6/9/2003		no product	5.50	73.43
		9/2/2003		no product	5.10	73.83
		12/10/2003		no product	8.35	70.58
		3/16/2004		no product	9.10	69.83
		6/9/2004		no product	10.10	68.83
		9/20/2004		no product	7.20	71.73
		12/3/2004		no product	10.93	68.00
		3/12/2005		no product	11.25	67.68
		6/7/2005		no product	11.10	67.83
		9/8/2005		no product	9.25	69.68
CEF-9-7D	29.23	12/18/2000	78.59	no product	7.83	70.76
		3/13/2003		no product	4.05	74.54
		6/9/2003		no product	4.90	73.69
		9/2/2003		no product	4.82	73.77
		12/10/2003		no product	7.80	70.79
		3/16/2004		no product	8.64	69.95
		6/9/2004		no product	10.00	68.59
		9/20/2004		no product	7.50	71.09
		12/3/2004		no product	10.95	67.64
		3/12/2005		no product	11.25	67.34
		6/7/2005		no product	11.05	67.54
		9/8/2005		no product	9.40	69.19
CEF-9-9S	14.23	12/18/2000	78.89	no product	8.39	70.50
		3/13/2003		no product	4.34	74.55
		6/9/2003		no product	5.40	73.49
		9/2/2003		no product	4.94	73.95
		12/10/2003		no product	8.12	70.77
		3/16/2004		no product	9.02	69.87
		6/9/2004		no product	10.26	68.63
		9/20/2004		no product	7.33	71.56
		12/3/2004		no product	11.07	67.82
		3/12/2005		no product	11.36	67.53
		6/7/2005		no product	11.20	67.69
		9/8/2005		no product	9.39	69.50

BGS = below ground surface
Elevation is referenced to National Geodetic Vertical Datum 1929 (NGVD 1929)
Depth to product measured from top of casing
Depth to water measured from top of casing

TABLE 2

GROUNDWATER FIELD ANALYTICAL RESULTS

BUILDING 9 NUTRIENT INJECTION SYSTEM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

	Date	pH	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Carbon Dioxide (mg/L)	Alkalinity as $CaCO_3$ (mg/L)	Ferrous Iron (mg/L)	Hydrogen Sulfide (mg/L)
CEF-9-2S	12/18/2000	6.19	0.192	27.20	0.0	NA	NR	80	1.2	0.3
	3/13/2003	6.48	0.148	22.2	0.4	-73.00	117	40	1.4	0.3
	6/9/2003	6.46	0.23	26.14	4.65	NM	181	25	ND	ND
	9/2/2003	6.40	0.43	29.56	6.71	54.00	80	30	ND	0.1
	12/10/2003	5.70	0.24	24.68	3.93	-208.00	168	20	ND	0.1
	3/16/2004	5.88	0.149	22.90	4.40	NM	80	30	ND	ND
	6/9/2004	5.91	0.186	26.14	0.81	38.40	108	0.8	45	0.3
	9/20/2004	5.78	0.407	28.11	0.18	99.70	88	40	0.2	0.1
	12/3/2004	6.17	0.571	25.61	0.17	81.80	NM	NM	NM	NM
	3/12/2005	7.71	0.260	23.55	0.00	-55.00	NM	NM	NM	NM
	6/7/2005	5.78	0.455	27.18	0.28	108.50	NM	NM	NM	NM
	9/8/2005	5.34	0.435	28.44	0.37	189.00	NM	NM	NM	NM
CEF-9-3S	12/18/2000	6.49	0.348	25.40	0.0	NA	17	160	3.4	0.5
	3/13/2003	6.32	0.206	22.4	1.1	-29.00	64	20	1.0	0.3
	6/9/2003	6.07	0.187	26.68	2.32	24.00	124	10	ND	ND
	9/2/2003	6.00	0.537	28.78	1.98	117.00	74	35	ND	ND
	12/10/2003	5.36	0.112	25.40	1.66	-250.00	43	15	ND	0.1
	3/16/2004	4.76	0.999	22.09	0.00	293.00	26	ND	0.2	ND
	6/9/2004	5.39	0.436	26.99	0.24	214.80	26	5	ND	ND
	9/20/2004	6.02	0.644	28.60	0.13	58.10	50	35	ND	ND
	12/3/2004	6.49	0.887	25.29	0.47	94.80	NM	NM	NM	NM
	3/12/2005	6.30	0.280	23.50	0.56	114.00	NM	NM	NM	NM
	6/7/2005	6.03	0.380	26.53	0.34	104.70	NM	NM	NM	NM
	9/8/2005	5.95	0.253	29.07	0.76	129.00	NM	NM	NM	NM
CEF-9-5S	12/18/2000	6.20	0.186	22.70	0.0	NA	10	100	ND	0.1
	3/13/2003	3.93	0.277	20.36	5.44	256.00	68	140	ND	ND
	6/9/2003	6.52	0.138	24.91	0.0	-20.00	122	40	2.0	ND
	9/2/2003	5.96	0.354	28.02	1.7	-35.00	68	85	ND	ND
	12/10/2003	6.30	0.385	24.65	0.0	166.00	42	40	0.1	ND
	3/16/2004	6.01	0.318	20.97	0.0	158.00	30	15	ND	ND
	6/9/2004	5.48	0.139	24.32	0.5	133.00	52	20	0.4	ND
	9/20/2004	5.16	0.249	26.27	1.7	134.00	84	35	ND	ND
	12/3/2004	6.69	0.211	25.40	0.85	93.00	NM	NM	NM	NM
	3/12/2005	5.93	0.287	21.89	0.61	80.20	NM	NM	NM	NM
	6/7/2005	5.93	0.253	23.71	0.46	88.40	NM	NM	NM	NM
	9/8/2005	5.94	0.306	26.77	1.05	-193.80	NM	NM	NM	NM
CEF-9-7D	12/18/2000	7.45	0.264	25.20	0.1	NA	8	85	ND	0.1
	3/13/2003	3.90	0.043	23.92	2.20	349.00	115	15	0.2	ND
	6/9/2003	5.07	0.041	24.43	0	5.00	118	10	0.2	ND
	9/2/2003	4.71	0.125	26.37	0.14	158.00	152	ND	0.6	ND
	12/10/2003	4.89	0.145	24.41	0.00	220.00	104	5	0.8	ND
	3/16/2004	5.11	0.729	24.3	5.20	NM	130	10	0.4	ND
	6/9/2004	4.52	0.87	24.82	0.01	208.00	120	5	0.4	ND
	9/20/2004	6.34	0.171	25.81	0.00	-77.00	90	40	1.4	ND
	12/3/2004	6.37	0.25	25.66	0.25	-57.60	NM	NM	NM	NM
	3/12/2005	5.80	0.343	24.38	0.11	-88.80	NM	NM	NM	NM
	6/7/2005	5.85	0.314	25.21	0.09	-167.80	NM	NM	NM	NM
	9/8/2005	6.15	0.361	26.29	0.79	-260.30	NM	NM	NM	NM
CEF-9-9S	12/18/2001	5.31	0.121	26.30	0.0	NA	NR	NR	NR	NR
	3/13/2003	5.81	0.205	22.5	0.3	-14.00	53	10	1.0	0.5
	6/9/2003	4.88	0.259	25.81	0.00	-33.00	242	5	ND	ND
	9/2/2003	3.85	0.787	28.93	1.52	292.00	54	ND	ND	ND
	12/10/2003	4.49	0.79	25.42	0.79	-218.00	62	10	0.2	0.5
	3/16/2004	4.63	0.999	22.13	0.00	246.00	59	ND	0.8	ND
	6/9/2004	4.75	0.346	26.53	0.25	276.30	47	10	0.4	0.1
	9/20/2004	4.69	0.252	28.32	0.07	33.20	41	15	0.5	ND
	12/3/2004	5.00	0.372	25.16	0.48	209.50	NM	NM	NM	NM
	3/12/2005	4.30	0.293	23.18	0.41	162.10	NM	NM	NM	NM
	6/7/2005	4.63	0.245	26.53	0.26	238.90	NM	NM	NM	NM
	9/8/2005	4.92	0.254	28.96	0.77	-63.90	NM	NM	NM	NM

NA = Not available
NM =Not Measured
NR = No Reading
ND = Non Detect

TABLE 3

GROUNDWATER ANALYTICAL RESULTS

BUILDING 9 NUTRIENT INJECTION SYSTEM
NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Well Identification	Sample Date	Benzene	Ethyl Benzene	Toluene	Xylene	BETX	Methyl tert-butyl ether	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo (a) anthracene	Chrysene	Benzo (b) fluoranthene	Benzo (k) fluoranthene	Benzo (a) pyrene	Indeno (1, 2, 3-cd) pyrene	Dibenzo (a,h) anthracene	1-Methylnaphthalene	2-Methylnaphthalene	Benzo (g,h,i) perylene	Nitrate	Nitrite	Phosphate	Sulfate	TRPH
CEF-9-2S	12/18/2000	<1.0	6.9	<1.0	1.7	8.6	NA	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	<0.20	<0.60	<0.40	<1.0	NS	<530
	3/13/2003	2.80	40.5	2.5	37.4	83.2	<1.0	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	--	--	<2.4	<0.100	<0.100	<0.100	NS	2620
	6/9/2003	<1.0	1.3	<1.0	2	3.3	<1.0	<.10	<.10	<.10	<.10	<.10	<.10	<.10	0.12	<0.10	<0.10	<0.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	2.94	<0.10	<0.100	NS	994
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	4.07	<0.10	<0.10	NS	<200
	12/10/2003	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.100	0.25	<0.100	NS	<250
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.10	NS	205
	6/9/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.17	<5.43	<2.17	<1.09	<5.43	<1.09	<1.09	<5.43	<0.217	<2.17	<0.217	<0.543	<0.217	<0.217	<0.217	<0.217	<0.217	<2.17	<0.020	<0.005	0.021 ?	NS	680
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.17	<5.43	<2.17	<2.17	<5.43	<1.09	<1.09	<5.43	<0.217	<2.17	<0.217	<0.543	<0.217	<0.217	<0.217	<2.17	<2.17	<2.17	10.3 ?	0.071	0.067	NS	<210
	12/3/2004	<0.143	<0.2010	<0.1417	<0.220	<0.220	<0.2359	<0.23	<0.237	<0.167	<0.127	<0.111	<0.120	<0.107	<0.103	<0.152	<0.085	<0.103	<0.262	<0.168	<0.134	<0.095	<0.206	<0.216	<0.162	NS	NS	NS	NS	0.14 I V
	3/12/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	NS	<18
	6/7/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.112	<0.0933	<0.124	<0.100	<0.110	<0.0867	<0.120	<0.150 J3	<0.118	<0.0700	<0.0667	<0.100	<0.171	<0.134	<0.162	<0.148	<0.233	<0.113	NS	NS	NS	46.6	<20
	9/8/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.100	<0.0840	<0.112	<0.0900	<0.100	<0.0800	<0.108	<0.135	<0.106	<0.0670	<0.0600	<0.0900	<0.150	<0.121	<0.146	<0.133	<0.203	<0.100	NS	NS	NS	NS	87 I
CEF-9-3S	12/18/2000	18	130	8.9	170	326.9	NA	29	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	<0.20	<0.60	<0.40	<1.0	NS	1500
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	--	<2.5	<0.100	<0.100	<0.100	NS	385
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<.10	<.10	<.10	<.10	<.10	<.10	<.10	0.11	<0.10	<0.10	<0.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	2.15	<0.10	<0.100	NS	894
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	0.22	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	8.18	<0.1	<0.1	NS	552
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	29.8	0.12	<0.1	NS	520 B
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	22.0	<0.30	<0.100	NS	<100
	6/9/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.510	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	11.5	0.082	0.008?	NS	220
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.510	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	16.7 ?	0.039	0.054	NS	470
	12/3/2004	<0.143	<0.2010	<0.1417	<0.220	<0.220	<0.2359	<0.23	<0.237	<0.167	<0.127	<0.111	<0.120	<0.107	<0.103	<0.152	<0.085	<0.103	<0.262	<0.168	<0.134	<0.095	<0.206	<0.216	<0.162	NS	NS	NS	NS	0.28 I V
	3/12/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	NS	<18
	6/7/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.126	<0.105	<0.140	<0.112	<0.124	<0.0975	<0.135	<0.169 J3	<0.132	<0.0788	<0.0750	<0.112	<0.192	<0.151	<0.182	<0.166	<0.262	<0.128	NS	NS	NS	35.4	18 I
	9/8/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.100	<0.0840	<0.112	<0.0900	<0.100	<0.0800	<0.108	<0.135	<0.106	<0.0670	<0.0600	<0.0900	<0.150	<0.121	<0.146	<0.133	<0.203	<0.100	NS	NS	NS	NS	<18
CEF-9-5S	12/18/2000	<1.0	<1.0	<1.0	0.52	0.52	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	<0.20	0.09	<0.40	<1.0	NS	<530
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	--	--	<2.5	<0.100	<0.100	<0.100	NS	<211
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<.10	<.10	<.10	<.10	<.10	<.10	<.10	0.11	<0.10	<0.10	<0.10	<.10	<.10	<.10	<.10	<.10	<.10	<.10	0.13	<0.10	<0.100	NS	<222
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	NS	<200
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.31	<0.1	<0.1	NS	<200
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.69	<0.10	<0.100	NS	<111
	6/9/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<5.10	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.510	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	0.04	<0.005	0.011?	NS	<200
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.20	<5.49	<2.20	<2.20	<5.49	<1.10	<1.10	<5.49	<0.220	<2.20	<0.220	<0.549	<0.220	<0.220	<0.220	<2.20	<2.20	<2.20	<0.02	<0.005	0.035	NS	<210
	12/3/2004	<0.143 J4	<0.2010	<0.1417	<0.220 J4	<0.220	<0.2359	<0.24	<0.250	<0.176	<0.134	<0.117	<0.126	<0.113	<0.109	<0.160	<0.089	<0.109	<0.276	<0.177	<0.141	<0.100	<0.217 J3	0.228 J3	<0.171	NS	NS	NS	NS	0.09 I V
	3/12/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	0.222 I	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	NS	<18
	6/7/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135 J3	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	5.80	<18
	9/8/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	0.230 I	<0.0840	<0.112	<0.0900	<0.100	<0.0800	<0.108	<0.135	<0.106	<0.0670	<0.0600	<0.0900	<0.150	<0.121	<0.146	<0.133	<0.203	<0.100	NS	NS	NS	NS	<18
CEF-9-7D	12/18/2000	<1.0	<1.0	<1.0	<1.0	<4.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	<0.20	0.30	<0.40	<1.0	NS	<500
	3/13/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	--	--	<2.4	<0.100	<0.100	<0.100	NS	<211
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	NS	<222
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	NS	<200
	12/10/2003	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.100	NS	<200
	3/16/2004	<1.00	<1.0	<1.0	<3.0	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.100	<0.100	<0.100	NS	<100
	6/9/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.510	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	<0.020	<0.005	0.010 ?	NS	<220
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.17	<5.43	<2.17	<2.17	<5.43	<1.09	<1.09	<5.43	<0.217	<2.17	<0.217	<0.543	<0.217	<0.217	<0.217	<2.17	<2.17	<2.17	<0.02	<0.005	0.015	NS	<210
	12/3/2004	<0.143	<0.2010	<0.1417	<0.220	<0.220	<0.2359	<0.22	<0.230	<0.162	<0.123	<0.107	<0.116	<0.104	<0.100	<0.147	<0.082	<0.100	<0.254	<0.163	<0.130	<0.092	<0.200	<0.210	<0.157	NS	NS	NS	NS	0.14 I V
	3/12/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	NS	<18
	6/7/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135 J3	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	23.0	<18
	9/8/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.100	<0.0840	<0.112	<0.0900	<0.100	<0.0800	<0.108	<0.135	<0.106	<0.0670	<0.0600	<0.0900	<0.150	<0.121	<0.146	<0.133	<0.203	<0.100	NS	NS	NS	NS	<18
CEF-9-9S	1/18/2001	24	210	99	640	973	<1.0	63	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--	<0.20	<0.60	<0.40	<1.0	NS	2300
	3/13/2003	<1.0	2.3	<1.0	3.0	5.3	<1.0	11.5	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	<2.4	--	--	<2.4	1.3	<0.100	<0.100	NS	446
	6/9/2003	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	11.9	<.10	<.10	<.10	<.10	<.10	<.10	0.11	<0.10	<0.10	<0.10	<.10	<.10	<.10	<.10	3.63	4.43	<.10	2.91	<0.10	<0.100	NS	500
	9/2/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	15.4	<0.1	<0.1	NS	<200
	12/10/2003	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	2.73	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	1.27	1.56	<0.10	8.51	<0.1	<0.1	NS	592 B
	3/16/2004	<1.00	<1.0	<1.0	<1.0	<1.0	<1.0	1.86	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	1.09	1.40	<0.11	11.0	<0.30	<0.100	NS	153
	6/9/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	1.93 I	<5.49	<2.20	<2.20	<5.49	<1.10	<1.10	<5.49	<0.220	<2.20	<0.220	<0.549	<0.220	<0.220	<0.220	<2.20	0.813 I	<2.20	5.7	0.007	0.008?	NS	250
	9/20/2004	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<2.04	<5.10	<2.04	<2.04	<5.10	<1.02	<1.02	<5.10	<0.204	<2.04	<0.204	<0.510	<0.204	<0.204	<0.204	<2.04	<2.04	<2.04	0.24 ?	<0.005	0.008	NS	<210
	12/3/2004	<0.143	<0.2010	<0.1417	<0.220	<0.220	<0.2359	<0.25	<0.261	<0.184	<0.140	<0.122	<0.132	<0.118	<0.114	<0.167	<0.093	<0.114	<0.289	<0.185	<0.148	<0.105	<0.227	<0.239	<0.178	NS	NS	NS	NS	0.12 I V
	3/12/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.101	<0.0840	<0.112	<0.0900	<0.0990	<0.0780	<0.108	<0.135	<0.106	<0.0630	<0.0600	<0.0900	<0.154	<0.121	<0.146	<0.133	<0.210	<0.102	NS	NS	NS	NS	<18
	6/7/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.126	<0.105	<0.140	<0.112	<0.124	<0.0975	<0.135	<0.169 J3	<0.132	<0.0788	<0.0750	<0.112	<0.192	<0.151	<0.182	<0.166	<0.262	<0.128	NS	NS	NS	42.3	<20
	9/8/2005	<0.143	<0.201	<0.142	<0.220	<0.220	<0.236	<0.100	<0.0840	<0.112	<0.0900	<0.100	<0.0800	<0.108	<0.135	<0.106	<0.0670	<0.0600	<0.0900	<0.150	<0.121	<0.146	<0.133	<0.203	<0.100	NS	NS	NS	NS	<18
Groundwater Criteria*		1	30	40	20	n/a	50	20	210	20	280	210	2100	280	210	0.2	4.8	0.2	0.5	0.2	0.2	0.2	20	20	210	10,000	1000	n/a	250	5000
Natural Attenuation Default		100	300	400	200	n/a	500	200	2100	200	2800	2100	21000	2800	2100	20	480	20	50	20	20	20	200	200	2100	100000	10000	n/a	n/a	50000

All values reported in ug/L; expcept Nitrate, Nitrite, Phosphate, and Sulfate; they are reported in mg/L
I = The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
? = Rejected during data validation
B = Analyte was detected in the method blank.
1 = Ch 62-777 F.A.C Groundwater Cleanup Target Levels (GCTLs) reported in ug/L
Shaded values indicate the compounds that exceed the GCTLs

J3 = The reported value failed to meet the established quality control criteria for either precision and/or accuracy.
NS = Not Sampled
"V" = the analyte was detected in both the sample and the associated method blank

APPENDIX C

September 2005 Purging and Groundwater Sampling Logs

GROUNDWATER PURGING & SAMPLING LOG

TERRAINE
Environmental Consulting

Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: "Cloudy, Windy"
Sampling ID: 04-41001/2:CEF-9-2S:9/8/05		
Notes:		

Well Information

Well ID: **CEF-9-2S**	Sampling Date: **9/8/2005**	
Well Diam (in): 2.0	Total Well Depth (ft): 14.45	Well Screen Interval (ft):
TOC Elevation (ft amsl): 78.74	Northing: 0	Easting: 0
Static Depth to Water (ft): 9.51	Well Capacity (gal): 0.80	

Purge Setup

Purge Method: Peristaltic	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: 09:22	Purge End: 09:45	Total Volume Purged (gal): 1.25	

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
09:35	9.86	0.80	0.06	0.49	28.01	448.0	5.74	184.7	23.50		clear	none
09:39	9.81	1.00	0.05	0.41	28.28	445.0	5.71	188.4	16.40			
09:43	9.84	1.20	0.05	0.38	28.32	438.0	5.70	188.0	15.50			

Sampling Data

Sample Information

Sample Date: 9/8/2005
Sample Start Time: 09:45
Sample End Time: 10:00
Field Filtered: ☐
Duplicate: ☐

Final Purge Readings

DO (mg/L): 0.37
Temp (*C): 28.44
SEC (uS/cm): 435
pH: 5.34
ORP (mV): 189
Turb (NTU): 16.6
Salinity:

Hach Field Data (mg/L)

DO:
CO2:
Alkalinity:
Ferrous Iron:
H2S:
Manganese:
Sulfate:
Sulfide:
Nitrate:

CHEMetrics Field Data (mg/L)

DO High Range:
DO High Range:

CO2 High Range:
CO2 Low Range:

Alkalinity High Range:
Alkalinity Low Range:

Lab Analyses/Methods:

"BTEX/MTBE, PAHs, TRPH"

Technician Initials

GROUNDWATER PURGING & SAMPLING LOG

TERRAINE
Environmental Consulting

Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Larry Wolski	Technician 2:	Weather: Partly Cloudy
Sampling ID: 04-41001/2:CEF-9-3S:9/8/05		
Notes:		

Well Information

Well ID: **CEF-9-3S**	Sampling Date: **9/8/2005**	
Well Diam (in): 2.0	Total Well Depth (ft): 15.54	Well Screen Interval (ft):
TOC Elevation (ft amsl): 78.81	Northing: 0	Easting: 0
Static Depth to Water (ft): 9.42	Well Capacity (gal): 0.99	

Purge Setup

Purge Method: Peristaltic	Tubing Material: PPE		Pump Set at (ft): 12.50
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS	Turb. Meter: Hach 2100P
Purge Start: 10:09	Purge End: 10:35	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
10:26	9.55	1.00	0.05	0.75	28.98	254.0	6.03	188.7	25.00		clear	none
10:29	9.55	1.20	0.06	0.75	29.01	251.0	5.94	127.6	22.80			
10:33	9.55	1.40	0.05	0.76	29.04	254.0	5.98	127.2	25.30			

Sampling Data

Sample Information

Sample Date: 9/8/2005
Sample Start Time: 10:35
Sample End Time: 10:52
Field Filtered: ☐
Duplicate: ☐

Final Purge Readings

DO (mg/L): 0.76
Temp (*C): 29.07
SEC (uS/cm): 253
pH: 5.95
ORP (mV): 129
Turb (NTU): 25.4
Salinity:

Hach Field Data (mg/L)

DO:
CO2:
Alkalinity:
Ferrous Iron:
H2S:
Manganese:
Sulfate:
Sulfide:
Nitrate:

CHEMetrics Field Data (mg/L)

DO High Range:
DO High Range:

CO2 High Range:
CO2 Low Range:

Alkalinity High Range:
Alkalinity Low Range:

Lab Analyses/Methods:

"BTEX/MTBE, PAHs, TRPH"

Technician Initials

GROUNDWATER PURGING & SAMPLING LOG

TERRAINE Environmental Consulting

Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Cloudy
Sampling ID: 04-41001/2:CEF-9-5S:9/8/05		
Notes:		

Well Information

Well ID: **CEF-9-5S**	Sampling Date: **9/8/2005**	
Well Diam (in): 2.0	Total Well Depth (ft): 13.72	Well Screen Interval (ft):
TOC Elevation (ft amsl): 78.93	Northing: 0	Easting: 0
Static Depth to Water (ft): 9.25	Well Capacity (gal): 0.72	

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: 08:42	Purge End: 09:11	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)	Salinity	Color	Odor
08:56	9.40	0.80	0.05	1.09	26.68	304.0	5.98	-180.0	89.50		milky	none
09:01	9.40	1.10	0.06	1.01	26.72	305.0	5.98	-197.5	45.20			
09:05	9.40	1.30	0.05	0.98	26.75	304.0	5.96	-206.5	28.70			
09:10	9.40	1.70	0.08	1.03	26.77	306.0	5.94	-194.7	16.30			

Sampling Data

Sample Information

Sample Date: 9/8/2005
Sample Start Time: 09:11
Sample End Time: 09:21
Field Filtered: ☐
Duplicate: ☐

Final Purge Readings

DO (mg/L): 1.05
Temp (*C): 26.77
SEC (uS/cm): 306
pH: 5.94
ORP (mV): -193.8
Turb (NTU): 15.5
Salinity:

Hach Field Data (mg/L)

DO:
CO2:
Alkalinity:
Ferrous Iron:
H2S:
Manganese:
Sulfate:
Sulfide:
Nitrate:

CHEMetrics Field Data (mg/L)

DO High Range:
DO High Range:

CO2 High Range:
CO2 Low Range:

Alkalinity High Range:
Alkalinity Low Range:

Lab Analyses/Methods:

"PAHs, TRPH, VOCs"

Technician Initials

GROUNDWATER PURGING & SAMPLING LOG

TERRAINE Environmental Consulting

Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Cloudy
Sampling ID: 04-41001/2:CEF-9-7D:9/8/05		
Notes:		

Well Information

Well ID: **CEF-9-7D**	Sampling Date: **9/8/2005**	
Well Diam (in): 2.0	Total Well Depth (ft): 29.23	Well Screen Interval (ft):
TOC Elevation (ft amsl): 78.59	Northing: 0	Easting: 0
Static Depth to Water (ft): 9.40	Well Capacity (gal): 3.23	

Purge Setup

Purge Method: Nomad Submersible	Tubing Material: PPE		Pump Set at (ft): 26.00
pH Meter: YSI 556 MPS	Cond. Meter: YSI 556MPS	DO Meter: YSI 556 MPS	Turb. Meter: Hach 2100P
Purge Start: 09:36	Purge End: 09:54	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
09:45	9.40	0.50	0.05	1.07	26.21	355.0	6.16	-229.0	6.10		clear	none
09:48	9.40	0.80	0.10	0.88	26.14	375.0	6.19	-252.4	5.31			
09:52	9.40	1.20	0.10	0.80	26.24	364.0	6.16	-256.6	5.66			

Sampling Data

Sample Information

Sample Date: 9/8/2005
Sample Start Time: 09:54
Sample End Time: 10:05
Field Filtered: ☐
Duplicate: ☐

Final Purge Readings

DO (mg/L): 0.79
Temp (*C): 26.29
SEC (uS/cm): 361
pH: 6.15
ORP (mV): -260.3
Turb (NTU): 4.61
Salinity:

Hach Field Data (mg/L)

DO:
CO2:
Alkalinity:
Ferrous Iron:
H2S:
Manganese:
Sulfate:
Sulfide:
Nitrate:

CHEMetrics Field Data (mg/L)

DO High Range:
DO High Range:

CO2 High Range:
CO2 Low Range:

Alkalinity High Range:
Alkalinity Low Range:

Lab Analyses/Methods:

"PAHs, TRPH, VOCs"

Technician Initials

GROUNDWATER PURGING & SAMPLING LOG

TERRAINE Environmental Consulting

Project Information

Project No: 04-41001/2	Project Name: Building 9 - Cecil Field LTM/RAO	
Technician 1: Karen Baer	Technician 2:	Weather: Cloudy
Sampling ID: 04-41001/2:CEF-9-9S:9/8/05		
Notes:		

Well Information

Well ID: **CEF-9-9S**	Sampling Date: **9/8/2005**	
Well Diam (in): 2.0	Total Well Depth (ft): 14.23	Well Screen Interval (ft):
TOC Elevation (ft amsl): 78.89	Northing: 0	Easting: 0
Static Depth to Water (ft): 9.39	Well Capacity (gal): 0.78	

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: 10:16	Purge End: 10:37	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
10:29	9.50	0.80	0.06	1.50	28.87	253.0	5.05	51.1	9.43		clear	none
10:33	9.50	1.10	0.07	0.98	28.91	252.0	4.97	3.8	8.49			
10:37	9.50	1.30	0.05	0.81	28.94	253.0	4.94	-39.2	7.30			

Sampling Data

Sample Information

Sample Date: 9/8/2005
Sample Start Time: 10:37
Sample End Time: 10:44
Field Filtered: ☐
Duplicate: ☐

Final Purge Readings

DO (mg/L): 0.77
Temp (*C): 28.96
SEC (uS/cm): 254
pH: 4.92
ORP (mV): -63.9
Turb (NTU): 5.94
Salinity:

Hach Field Data (mg/L)

DO:
CO2:
Alkalinity:
Ferrous Iron:
H2S:
Manganese:
Sulfate:
Sulfide:
Nitrate:

CHEMetrics Field Data (mg/L)

DO High Range:
DO High Range:

CO2 High Range:
CO2 Low Range:

Alkalinity High Range:
Alkalinity Low Range:

Lab Analyses/Methods:

"PAHs, TRPH, VOCs"

Technician Initials

APPENDIX D

Post Active Remediation Monitoring Plan Approval Order

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

October 13, 2004

Mr. Nick Ugolini
Code ES42 (UST RPM)
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
North Charleston, South Carolina 29419-9010

RE: First Quarter 2004 Operation and Maintenance Status Report, January 1, 2004 - March 31, 2004, Nutrient Injection System, Building 9, Former Tanks 9L1 and 9L2, Naval Air Station Cecil Field, Jacksonville, Florida

Dear Mr. Ugolini:

I have completed my review of the First Quarter 2004 Operation and Maintenance Status Report, January 1, 2004 - March 31, 2004, Nutrient Injection System, Building 9, Former Tanks 9L1 and 9L2, Naval Air Station Cecil Field, Jacksonville, dated May 2004 (received June 10, 2004, prepared and submitted by Terraine, Inc. A Post-Active Remediation Monitoring Plan Approval Order signed by Doug Jones, Bureau Chief, is attached.

If I can be of any further assistance with this matter, please contact me at (850) 245-8997.

Sincerely,

David P. Grabka, P.G.
Remedial Project Manager

13 October 2004
Date

DAVID P. GRABKA
LICENSE
NO. 2192
STATE OF FLORIDA
PROFESSIONAL GEOLOGIST

cc: Mark Davidson, SouthDiv, Charleston
John Flowe, City of Jacksonville
Mike Fitzsimmons, FDEP, Northeast District
Doyle Brittain, USEPA Region 4
James Young, Terraine, Inc.
Mark Speranza, Tetra Tech NUS, Pittsburgh
Mike Halil, CH2M Hill, Jacksonville

JJC ESN ESN

"More Protection, Less Process."

Printed on recycled paper.

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Colleen M. Castille
Secretary

October 18, 2004

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Commanding Officer
Attn: Mr. Nick Ugolini, Code ES42
Southern Division
Naval Facilities Engineering Command
Post Office Box 190010
North Charleston, South Carolina 29419-9010

Subject: Post Active Remediation Monitoring Plan Approval Order
Building 9, Tanks 9L1 and 9L2
Naval Air Station Cecil Field
Jacksonville, Duval County

Dear Mr. Ugolini:

The Bureau of Waste Cleanup has reviewed the First Quarter 2004, Operations and Maintenance Status Report, Nutrient Injection System, Building 9, Former Tanks 9L1 and 9L2 and request for post-active remediation monitoring, dated May 2004 (received June 10, 2004), prepared and submitted by Terraine, Inc., for the petroleum product discharge discovered at this site. Pursuant to Rule 62-770.750, Florida Administrative Code (F.A.C.), the Florida Department of Environmental Protection (Department) approves the Post Active Remediation Monitoring Plan. Pursuant to Rule 62-770.750(4), F.A.C., you are required to complete the monitoring program outlined below. The first sampling event must be performed within 60 days of receipt of this Post Active Remediation Monitoring Plan Approval Order (Order). Water-level measurements must be made immediately prior to each sampling event. The analytical results (laboratory report), chain of custody, cumulative summary table of the analytical results, site map(s) illustrating the most recent analytical results, and the water-level elevation information (cumulative summary table and most recent flow interpretation map), must be submitted to the Department within 60 days of sample collection.

The monitoring wells to be sampled, the sampling parameters, and the sampling frequency are as follows:

Monitoring Wells	Contaminants of Concern	Frequency	Duration
CEF-9-2S; CEF-9-3S; CEF-9-5S; CEF-9-7D; and CEF-9-9S	BTEX, PAHs and TRPH	Quarterly	One year

If concentrations of contaminants of concern in any of the designated wells increase above the action levels listed below, the well or wells must be resampled no later than 30 days after the initial positive results are known. If the results of the resampling confirm the initial sampling results, then a proposal as described in Rule 62-770.750(4)(e), F.A.C., must be submitted to the Department.

Contaminated wells:

CEF-9-2S; CEF-9-3S and CEF-9-9S: Natural Attenuation Default Concentrations, Table V, Chapter 62-777, Florida Administrative Code.

Perimeter wells (temporary points of compliance):

CEF-9-5S and CEF-9-7D: Groundwater Criteria, Table I, Chapter 62-777, Florida Administrative Code.

If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are met at the end of the monitoring period (for at least the last two sampling events), a Site Rehabilitation Completion Report, summarizing the monitoring program and containing documentation supporting the opinion that the cleanup objectives have been achieved, must be submitted as required in Rule 62-770.750(6), F.A.C. If the applicable No Further Action criteria in Rule 62-770.680, F.A.C., are not met following one year of monitoring, then a report summarizing the monitoring program must be submitted, including a proposal as described in Rule 62-770.750(4)(e), F.A.C.

Legal Issues

The Department's Order shall become final unless a timely petition for an administrative proceeding (hearing) is filed under Sections 120.569 and 120.57, Florida Statutes (F.S.), within 21 days of receipt of this Order. The procedures for petitioning for a hearing are set forth below.

Persons affected by this Order have the following options:

(A) If you choose to accept the Department's decision regarding the First Quarter 2004 Operation and Maintenance Status Report you do not have to do anything. This Order is final and effective as of the date on the top of the first page of this Order.

(B) If you choose to challenge the decision, you may do the following:

(1) File a request for an extension of time to file a petition for hearing with the Agency Clerk in the Office of General Counsel of the Department within 21 days of receipt of this Order; such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing; or

(2) File a petition for administrative hearing with the Agency Clerk in the Office of General Counsel of the Department within 21 days of receipt of this Order.

Please be advised that mediation of this decision pursuant to Section 120.573, F.S., is not available.

How to Request an Extension of Time to File a Petition for Administrative Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from addressee, shall mail a copy of the request to addressee at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be made.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) by the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from addressee, shall mail a copy of the petition to addressee at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Subsections 120.54(5)(b)4. and 120.569(2), F.S., and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
(b) A statement of when and how each petitioner received notice of the Department's action or proposed action;
(c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by the petitioner, or a statement that there are no disputed facts;
(e) A statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and
(g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or an Order Responding to Supplemental Information provided to the Department pursuant to meetings with the Department.

Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Agency Clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days after this Order is filed with the clerk of the Department (see below).

Questions

Any questions regarding the Department's review of your First Quarter 2004 Operation and Maintenance Status Report should be directed to David P. Grabka at (850) 245-8997. Questions regarding legal issues should be referred to the Department's Office of General Counsel at (850) 245-2242. Contact with any of the above does not constitute a petition for administrative hearing or request for an extension of time to file a petition for administrative hearing.

Sincerely,

Douglas A. Jones, Chief
Bureau of Waste Cleanup
Division of Waste Management

DAJ/dpg

cc: David P. Grabka, FDEP – BWC
File

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to
§120.52 Florida Statutes, with the
designated Department Clerk, receipt
of which is hereby acknowledged.

Clerk
(or Deputy Clerk)

October 18, 2004
Date