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THIRD QUARTER NATURAL ATTENUATION GROUNDWATER MONITORING REPORT YEAR 1 FOR OPERABLE UNIT 3 (OU 3) SITE 8 NAS CECIL FIELD FL

4/1/1999

TETRA TECH NUS INC

Third Quarter Natural Attenuation Groundwater Monitoring Report - Year 1

for

Operable Unit 3, Site 8

Naval Air Station Cecil Field

Jacksonville, Florida

Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0039

April 1999

049906/P

THIRD QUARTER NATURAL ATTENUATION GROUNDWATER MONITORING REPORT - YEAR 1

FOR

OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406

Submitted by:
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CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0039

APRIL 1999

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CERTIFICATION OF TECHNICAL
DATA CONFORMITY (MAY 1987)

The Contractor, Tetra Tech NUS, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete and accurate and comply with all requirements of this contract.

DATE: _____April 12, 1999_____

NAME AND TITLE OF CERTIFYING OFFICAL: Mark Speranza, P.E.
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ACRONYMS

ABB-ES	ABB Environmental Services, Incorporated
BEHP	Bis (2-ethylhexyl)phthalate
BOD	Biochemical oxygen demand
B&R	Brown & Root Environmental
°C	Degree centigrade
COC	Chemical of concern
COD	Chemical oxygen demand
CLEAN	Comprehensive Long-term Environmental Action Navy
CTO	Contract Task Order
DCA	Dichloroethane
DCE	Dichloreoethene
DO	Dissolved oxygen
FDEP	Florida Department of Environmental Protection
mg/L	Milligram per liter
msl	Mean sea level
mV	Millivolt
µg/L	Microgram per liter
NAS	Naval Air Station
ORP	Oxidation-reduction potential
OU	Operable Unit
ROD	Record of Decision
RI	Remedial Investigation
SVOC	Semivolatile organic compound
TCA	Trichloroethane
TOC	Total organic carbon
TtNUS	Tetra Tech NUS, Incorporated
VOC	Volatile organic compound
U.S. EPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This Third Quarter Groundwater Monitoring Report (Year 1) has been prepared under Contract Task Order (CTO) 039 as part of the Comprehensive Long-Term Environmental Action Navy III (CLEAN) Contract No. N62467-94-D-0888 for the Southern Division, Naval Facilities Engineering Command. This report presents a summary of work performed for the third quarter groundwater monitoring event at Operable Unit (OU) 3, Site 8 at the Naval Air Station (NAS) Cecil Field, located in Jacksonville, Florida.

Tetra Tech NUS, Incorporated (TtNUS) collected and analyzed groundwater samples from 16 monitoring wells for biodegradation natural attenuation parameters in February 1999. These activities were conducted in accordance with the methodologies and procedures outlined in the Remedial Design Workplan [Brown & Root Environmental (B&R Environmental), 1998], the Work Plan Addendum for Long-term Groundwater Monitoring at Sites 3, 5, 8, and 16 (TtNUS, 1998a), and the Environmental Investigations Standard Operating Procedures and Quality Assurance Manual [U. S. Environmental Protection Agency (U. S. EPA), 1996]. Three groundwater monitoring events have been conducted in support of the OU 3, Site 8 remedial design (B&R Environmental, 1998):

- Baseline/first quarter sampling – August 1998
- Second quarter sampling – November 1998
- Third quarter sampling – February 1998

The purpose of this work is to obtain long-term data to assess the performance, progress, and effectiveness of the biodegradation processes of natural attenuation in reducing volatile organic contaminant concentrations and retarding their migration. The evaluation consists of measuring the plume migration and geochemical and contaminant level trends over time. The collected data also will be evaluated to support a decision to either continue biodegradation natural attenuation at the site or to develop a contingency plan that will augment or replace the natural attenuation alternative. This report summarizes the results from the third quarter (February 1999) groundwater monitoring event and provides a comparison to the results obtained from the baseline/first quarter and second quarter groundwater monitoring events.

This report consists of three sections and one appendix, as listed below:

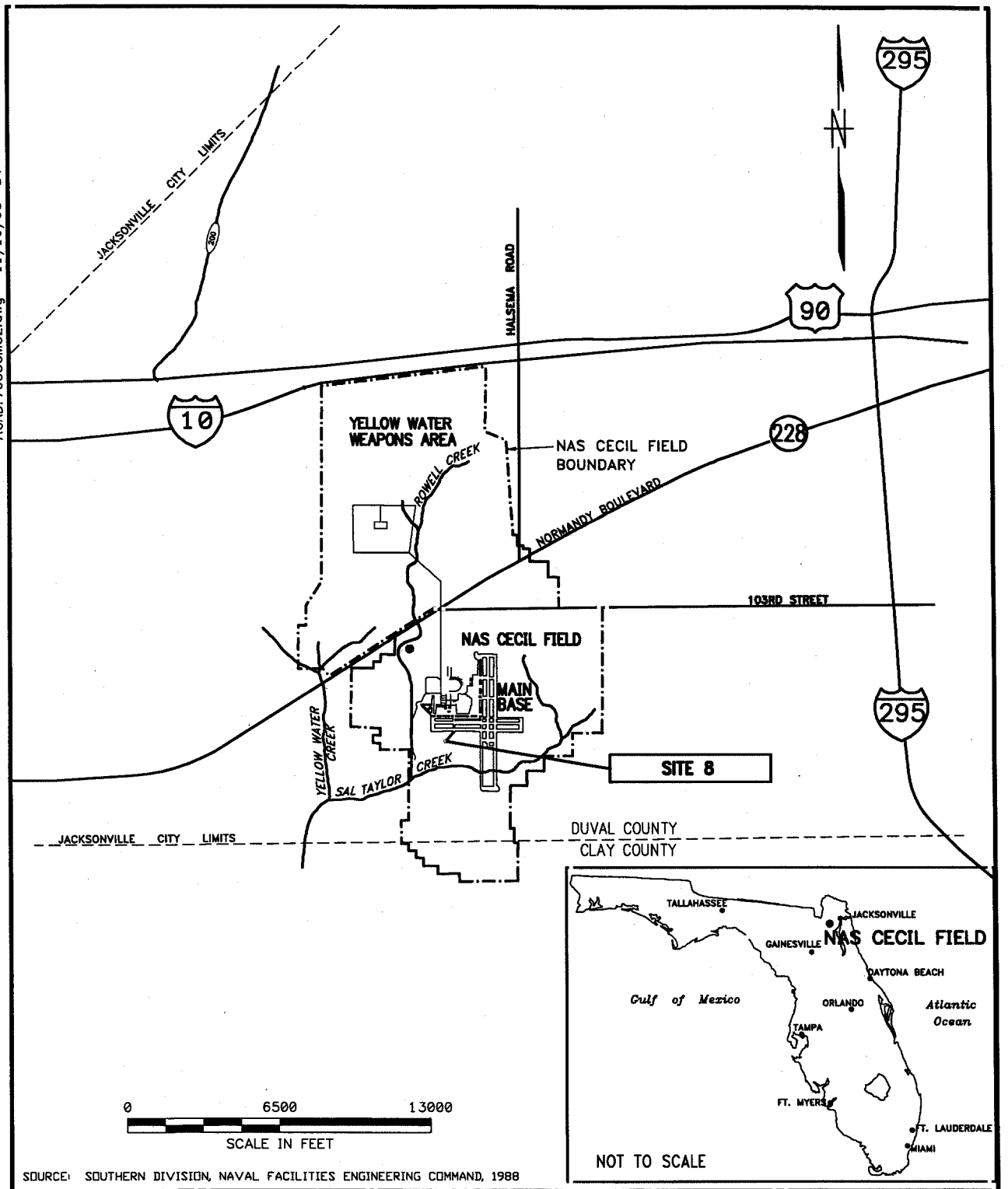
- Section 1.0 discusses the purpose of the report.

- Section 2.0 presents a summary of the analytical results at OU 3, Site 8 as they existed prior to the implementation of the natural attenuation remedy [Remedial Investigation (RI) data collected in 1995].

- Section 3.0 presents the analytical results from the baseline/first quarter, second quarter, and third quarter groundwater sampling conducted from August 1998 to February 1999.

- Appendix A contains the data validation effort for the February 1999 groundwater sample analytical results.

A description of the site history, location of waste disposal, site physical and geological conditions, and surface soil and subsurface soil contamination and a summary of the Record of Decision (ROD) can be found in the Baseline (First Quarter) Groundwater Monitoring Report for OU 3, Site 8 (TtNUS, 1998b). General location, site location map, and site layout maps are presented in Figures 1-1, 1-2, and 1-3, respectively.



SOURCE: SOUTHERN DIVISION, NAVAL FACILITIES ENGINEERING COMMAND, 1988

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GENERAL LOCATION MAP
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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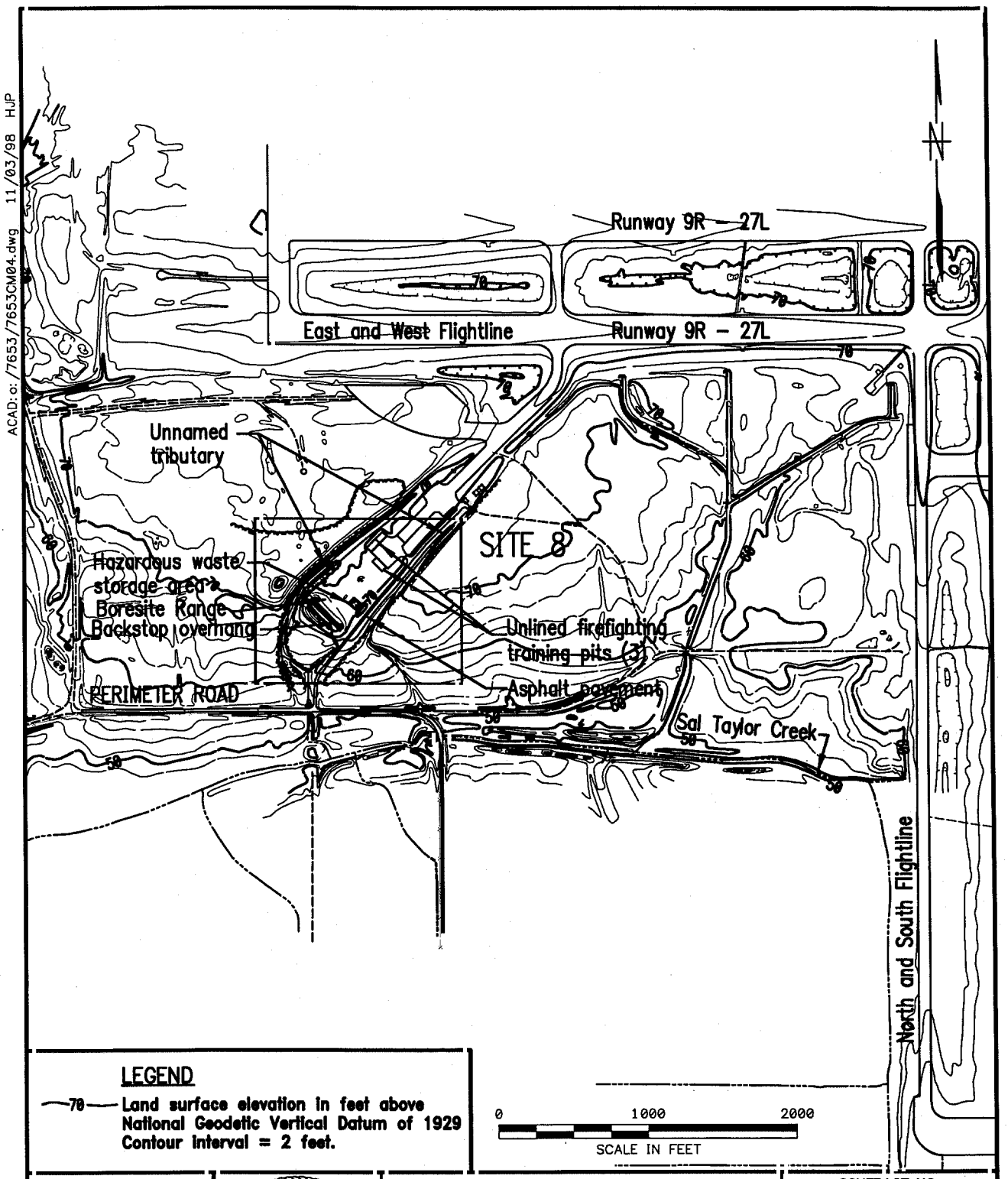

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SITE LOCATION MAP
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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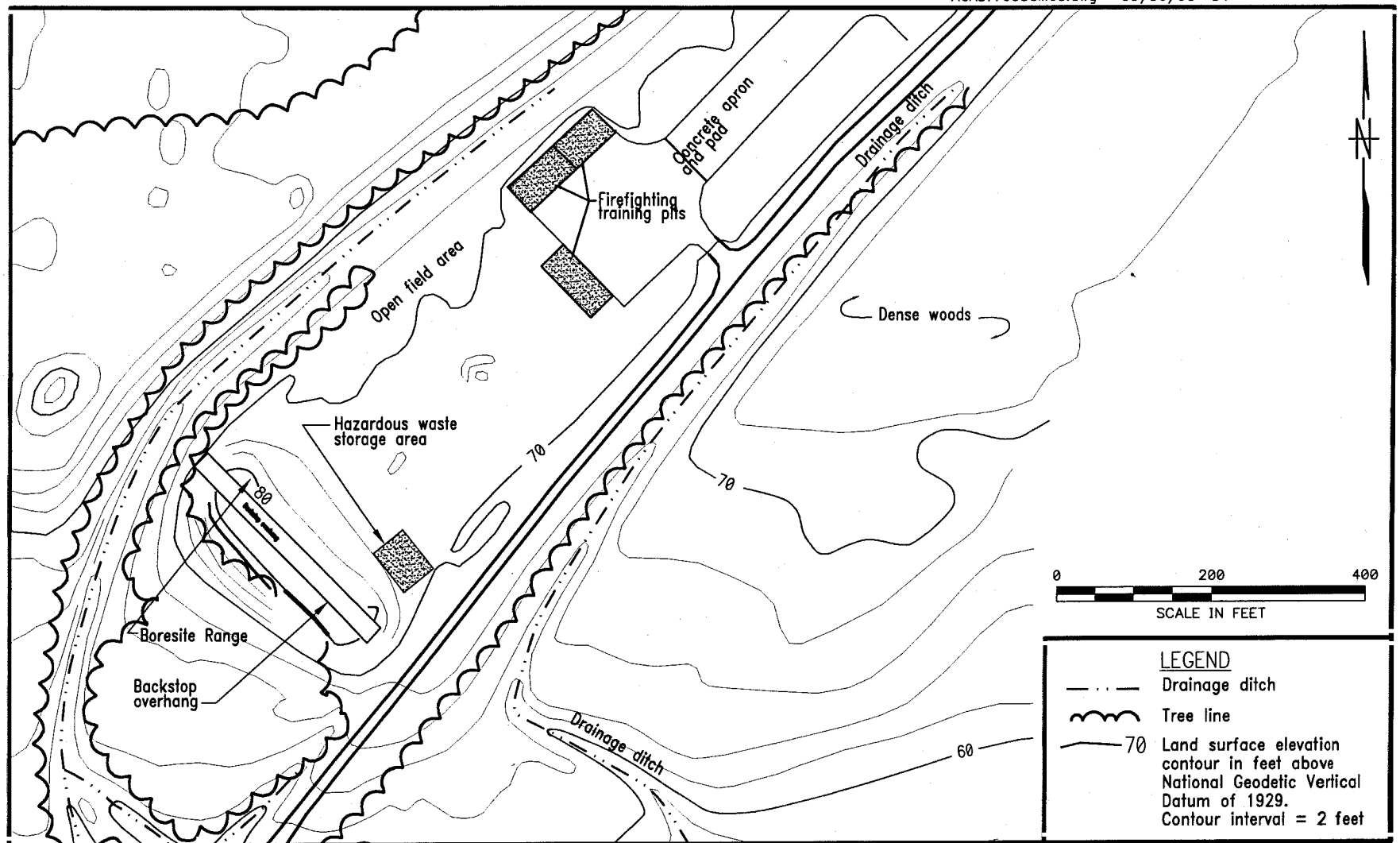

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SITE LAYOUT AND TOPOGRAPHY
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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2.0 SITE CHEMICALS OF CONCERN

The RI for OU 3, Site 8 was conducted in 1995 and included sampling of surface and subsurface soil, surface water and sediment, and groundwater. Based on analytical data from these samples, human health and ecological risk assessments were performed. The analytical results for organic compounds detected in the groundwater during the RI at OU 3, Site 8 are shown on Figure 2-1. Figure 2-1 also shows the approximate contaminant plume based on the RI for the volatile organic compounds (VOCs) at the site [ABB Environmental Services, Incorporated (ABB-ES), 1997].

The ROD for the site was completed in March 1998 and the Remedial Design Work Plan was completed in June 1998 (ABB-ES, 1998, Brown and Root, 1998). In the ROD and Remedial Design Work Plan, chemicals of concern (COCs) for OU 3, Site 8 were identified including 1,1-dichloroethene (1,1-DCE), benzene, toluene, xylenes, bis(2-ethylhexyl) phthalate, naphthalene, and aluminum.

Five groundwater monitoring events were conducted at OU 3, Site 8 after completion of the RI in 1995 and prior to the Baseline Groundwater Monitoring event in November 1998. During these events, groundwater samples were collected from selected wells and analyzed for VOCs and geochemical parameters to evaluate the biodegradation processes of natural attenuation. Table 2-1 and Figure 2-2 present chlorinated VOC data from these five monitoring events (1995 to August 1998).

A detailed description of the nature and extent of contamination at OU 3, Site 8, based on site history and previous investigations, is included in the Baseline Groundwater Monitoring Report (TtNUS, 1998b).

TABLE 2-1

SUMMARY OF POSITIVE DETECTIONS IN SURFICIAL GROUNDWATER
1995 TO FEBRUARY 1998
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 4

PARAMETER	TARGET CLEANUP GOAL*	CF8MW4S				CF8MW6S				CF8MW7S			
		1995	1996	1997	Feb-98	1995	1996	1997	Feb-98	1995	1996	1997	Feb-98
VOLATILES (ug/L)													
Benzene	1	ND	ND	ND	**6.9**	ND	ND	ND	ND	**1J**	ND	**1.1**	ND
Toluene	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.1**	ND
Xylenes	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PCE	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCE	7	**15**	**11**	**17**	ND	ND	ND	ND	ND	**14**	**27**	**11**	ND
cis-1,2-DCE	70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-DCE	100	ND	**33.4**	ND	ND	ND	ND	ND	ND	ND	**34.2**	ND	ND
1,1-DCA	70	ND	ND	**59**	**46**	ND	ND	ND	ND	**29**	ND	**23**	**14**
1,1,1-TCA	200	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	ND
Vinyl chloride	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILES (ug/L)													
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (mg/L)													
Methane	NS	NA	ND	**2.049**	**1.519**	NA	ND	**0.066**	**0.083**	NA	**1.8**	**0.805**	**0.747**
Ethane	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND
Ethene	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND

TABLE 2-1

SUMMARY OF POSITIVE DETECTIONS IN SURFICIAL GROUNDWATER
1995 TO FEBRUARY 1998
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 4

PARAMETER	TARGET CLEANUP GOAL*	CF8MW8I					CF8MW9S			CF8MW10S			
		1995	1996	1997	Feb-98	1995	1996	1997	Feb-98	1995	1996	1997	Feb-98
VOLATILES (ug/L)													
Benzene	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	**15.9**	ND	**8.5**
Toluene	40	ND	ND	ND	ND	ND	ND	ND	ND	**48**	**66.5**	ND	**15**
Ethylbenzene	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3**
Xylenes	20	ND	ND	ND	ND	ND	ND	ND	ND	**13 J**	ND	ND	**15**
PCE	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCE	7	ND	ND	ND	ND	**2**	**4.5**	**1**	ND	**95**	**113**	**33**	ND
cis-1,2-DCE	70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-DCE	100	ND	ND	ND	ND	ND	**4.7**	ND	ND	ND	**318.8**	ND	ND
1,1-DCA	70	ND	ND	ND	ND	**2**	ND	**1.3**	**2.6**	**370**	ND	**150**	**230**
1,1,1-TCA	200	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA
Vinyl chloride	1	ND	**1.1**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILES (ug/L)													
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (mg/L)													
Methane	NS	NA	ND	**0.01**	**0.016**	NA	**0.4**	**0.156**	**0.118**	NA	**3.6**	**1.092**	**2.103**
Ethane	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND
Ethene	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND

TABLE 2-1

SUMMARY OF POSITIVE DETECTIONS IN SURFICIAL GROUNDWATER
1995 TO FEBRUARY 1998
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 3 OF 4

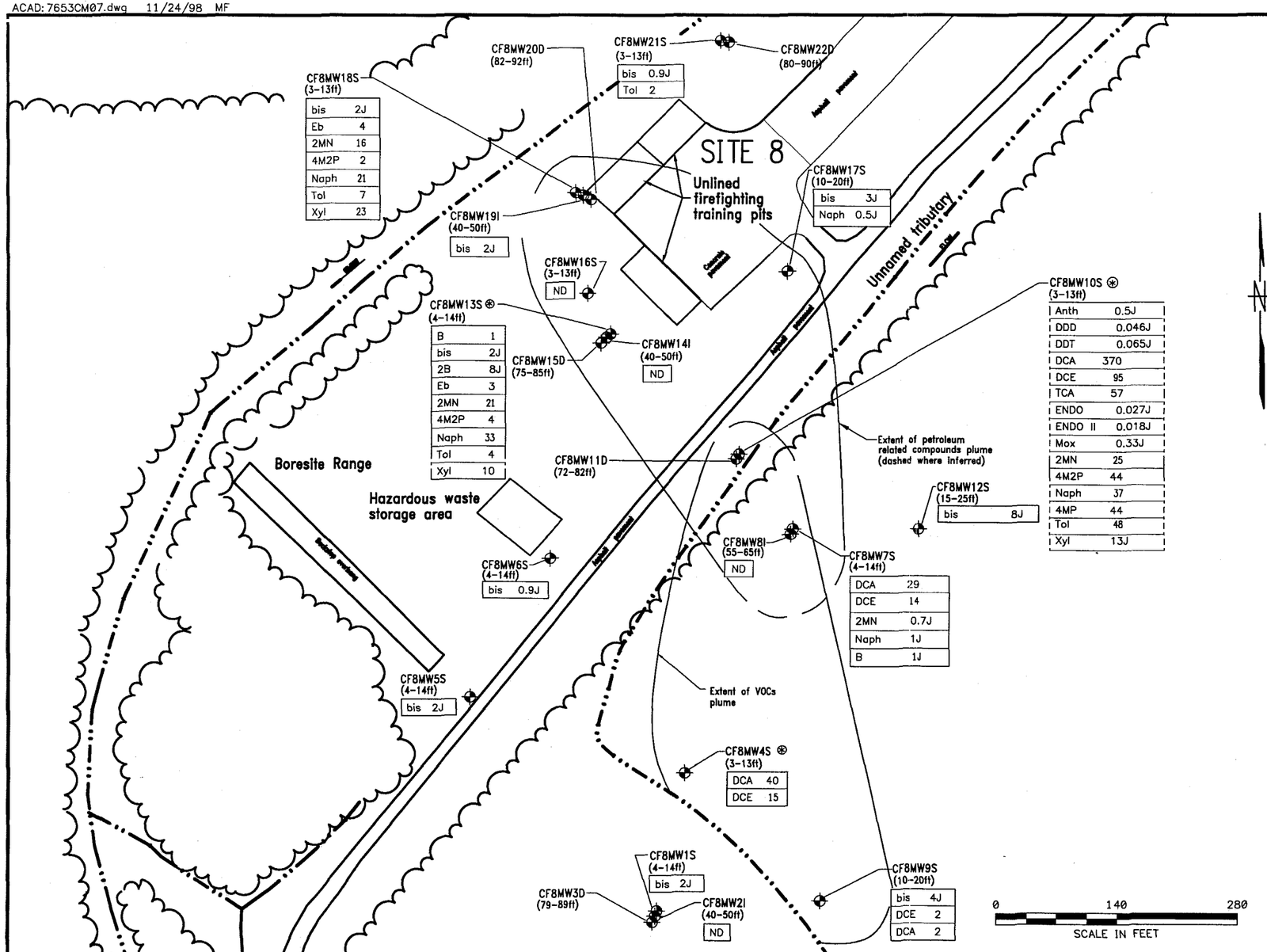
PARAMETER	TARGET CLEANUP GOAL*	CF8MW12S				CF8MW13S				CF8MW17S			
		1995	1996	1997	Feb-98	1995	1996	1997	Feb-98	1995	1996	1997	Feb-98
VOLATILES (ug/L)													
Benzene	1	ND	ND	ND	NA	**1**	**1.17**	**1.1**	ND	ND	ND	ND	ND
Toluene	40	ND	ND	ND	NA	**4**	ND	**2.6**	**9.3**	ND	ND	ND	ND
Ethylbenzene	30	ND	ND	ND	NA	**3**	ND	**3.6**	**5.4**	ND	ND	**3**	**2.6**
Xylenes	20	ND	ND	ND	NA	**10**	ND	**15**	**22.9**	ND	ND	**1.7**	**1.2**
PCE	3	ND	ND	ND	NA	ND	ND	ND	ND	ND	**18.5**	ND	ND
1,1-DCE	7	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-DCE	70	ND	ND	ND	NA	ND	ND	ND	ND	ND	**13.7**	ND	ND
trans-1,2-DCE	100	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	70	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TCA	200	ND	ND	ND	NA	ND	ND	ND	NA	ND	ND	ND	NA
Vinyl chloride	1	ND	ND	ND	NA	ND	ND	ND	ND	ND	ND	ND	ND
SEMIVOLATILES (ug/L)													
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (mg/L)													
Methane	NS	NA	**0.4**	**0.106**	**0.168**	NA	**7**	**3.791**	**5.6**	NA	**1.2**	**0.797**	**0.931**
Ethane	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND
Ethene	NS	NA	NA	ND	ND	NA	NA	ND	ND	NA	NA	ND	ND

TABLE 2-1

SUMMARY OF POSITIVE DETECTIONS IN SURFICIAL GROUNDWATER
1995 TO FEBRUARY 1998
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 4 OF 4

PARAMETER	TARGET CLEANUP GOAL*	CF8MW18S				CEF8MW21S			
		1995	1996	1997	Feb-98	1995	1996	1997	Feb-98
VOLATILES (ug/L)									
Benzene	1	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	40	**7**	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	30	**4**	ND	ND	ND	ND	ND	ND	ND
Xylenes	20	**23**	ND	**3.2**	ND	ND	ND	ND	ND
PCE	3	ND	**27.9**	ND	ND	ND	ND	ND	ND
1,1-DCE	7	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-DCE	70	ND	**31.8**	ND	ND	ND	ND	ND	ND
trans-1,2-DCE	100	ND	ND	ND	ND	ND	ND	ND	ND
1,1-DCA	70	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-TCA	200	ND	ND	ND	NA	NA	NA	NA	NA
Vinyl chloride	1	ND	ND	ND	ND	ND	**1.5**	ND	ND
SEMIVOLATILES (ug/L)									
Naphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	20	NA	NA	NA	NA	NA	NA	NA	NA
MISCELLANEOUS PARAMETERS (mg/L)									
Methane	NS	NA	**1.2**	**0.239**	**0.388**	NA	ND	ND	ND
Ethane	NS	NA	NA	ND	ND	NA	NA	ND	ND
Ethene	NS	NA	NA	ND	ND	NA	NA	ND	ND

* = Proposed groundwater target cleanup goals (Florida Department of Environmental Protection, Florida Administrative Code 62-777, 1999)
NA = Not analyzed.
ND = Not detected at or above method detection limit.
NS = No standard avalable.
Bolded values are concentrations above detection limits.
Shaded values are concentrations above current target cleanup goals.



Florida Department of Environmental Protection
Groundwater Guidance Concentrations

	Analytical Parameter	Regulatory value and type	
B	Benzene	1	PD
Eb	Ethylbenzene	700/30	PD/SD
Tol	Toluene	1,000/40	PD/SD
Xyl	Xylene	10,000/20	PD/SD
2B	2-Butanone	4,200	G
4M2P	4-Methyl-2-pentanone	350	G
DCA	1,1-Dichloroethane	700	G
DCE	1,1-Dichloroethene	7	PD
TCA	1,1,1-Trichloroethane	200	PD
Anth	Anthracene	2,100	G
2MN	2-methylnaphthalene	6.8 Total	G
Naph	Naphthalene	6.8 Total	G
bis	bis (2-Ethylhexyl) phthalate	6	PD
4MP	4 Methylphenol	35	G
P	Phenol	10	G
Ald	Aldrin	NG	
DDD	4,4'-Dichlorodiphenyldichloroethane	0.1	G
DDE	4,4'-Dichlorodiphenyldichloroethene	0.1	G
DDT	4,4-Dichlorodiphenyltrichloroethane	0.1	G
ENDO	Endosulfan sulfate	0.3	G
ENDO II	Endosulfan II	0.35	G
Mox	Methoxychlor	40	PD

NOTE:
All values reported in micrograms per liter.

PD	Primary drinking water standard
SD	Secondary drinking water standard
NG	No regulatory value given
J	Estimated value
G	Guidance value
ND	Not detected

LEGEND

CF8MW22D	Existing monitoring well with designation
	S = Shallow
	I = Intermediate
	D = Deep
	Drainage ditch
	Tree line
790	Value indicates a concentration equal to or greater than a State or Federal drinking water standard
⊛	Average of sample and duplicate
(10-20ft)	Monitoring well screen interval in feet below land surface

NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES

DRAWN BY MF DATE 3/27/98
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COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER
1994 RI ANALYTIC RESULTS
FOR ORGANIC COMPOUNDS
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. 7653
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REV. 0

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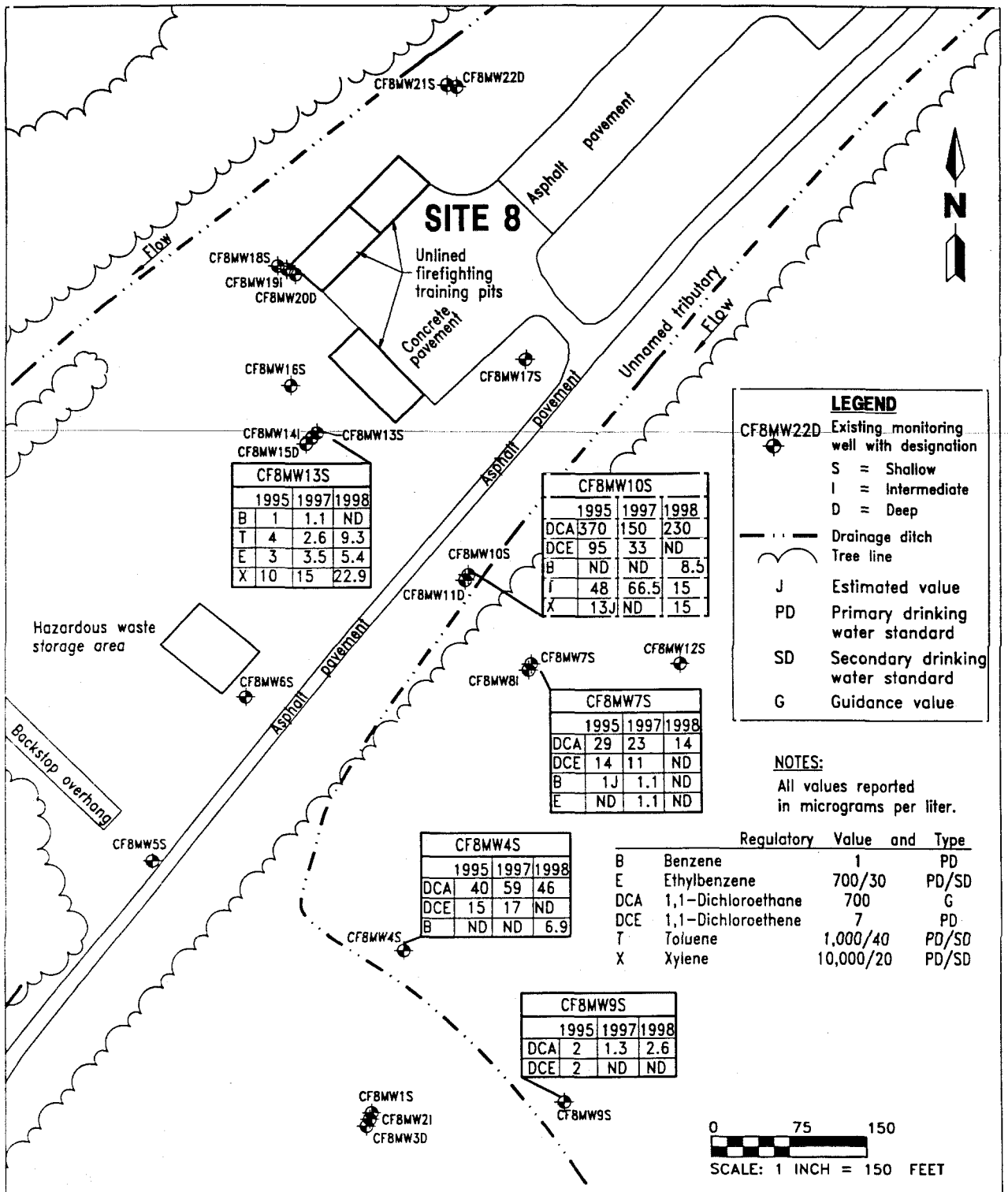

CF8MW13S	1995	1997	1998
B	1	1.1	ND
T	4	2.6	9.3
E	3	3.5	5.4
X	10	15	22.9

CF8MW10S	1995	1997	1998
DCA	370	150	230
DCE	95	33	ND
B	ND	ND	8.5
T	48	66.5	15
X	13J	ND	15

CF8MW7S	1995	1997	1998
DCA	29	23	14
DCE	14	11	ND
B	1J	1.1	ND
E	ND	1.1	ND

CF8MW4S	1995	1997	1998
DCA	40	59	46
DCE	15	17	ND
B	ND	ND	6.9

CF8MW9S	1995	1997	1998
DCA	2	1.3	2.6
DCE	2	ND	ND

		Regulatory Value	and Type
B	Benzene	1	PD
E	Ethylbenzene	700/30	PD/SD
DCA	1,1-Dichloroethane	700	G
DCE	1,1-Dichloroethene	7	PD
T	Toluene	1,000/40	PD/SD
X	Xylene	10,000/20	PD/SD

FIGURE 2-2
SITE 8
SELECT ORGANICS DETECTED IN GROUNDWATER SAMPLES

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NATURAL ATTENUATION MONITORING REPORT

NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

3.0 ANALYTICAL RESULTS AND EVALUATION

The concentrations and distribution of the COCs and natural attenuation monitoring parameters in groundwater samples from the first three quarters of groundwater sampling are presented in this section. Groundwater samples were collected from 16 selected monitoring wells and analyzed at a fixed-based laboratory for chemical parameters and selected natural attenuation parameters and analyzed in the field for the remaining natural attenuation parameters, as described in the Work Plan Addendum (TtNUS, 1998a). The wells were sampled in accordance with TtNUS Standard Operating Procedures and U. S. EPA Region 4 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual for low-flow purging and sampling of monitoring wells (U. S. EPA, 1996). Two field duplicate samples were collected from monitoring wells CF8MW13S (CF8MWDUP1) and CF8MW10S (CF8MWDUP2). GPL Laboratories in Gaithersburg, Maryland was used for analysis of the groundwater samples.

The purpose of this section is to present, in tabular and graphical form, the results of the first through third quarter groundwater monitoring events conducted from August 1998 to February 1999. Based on the data collected from these sampling events and the next quarterly sampling event, a comprehensive annual report will be prepared. The annual report will be similar in scope to the Baseline Monitoring Report for OU 3, Site 8 and will contain data interpretation regarding whether natural attenuation is occurring at the site and recommendations for future sampling.

The network of 16 monitoring wells located upgradient, within, and immediately downgradient of the VOC and petroleum-related compounds plume was used to measure long-term plume migration and biodegradation natural attenuation parameters. The rationale for the location of the long-term monitoring wells is as follows:

Monitoring Well	Rationale
CF8MW21S	Background/upgradient of plume.
CF8MW13S, CF8MW17S, CF8MW18S	Upgradient of VOC plume and within petroleum-related compounds plume.
CF8MW12S	Cross-gradient of VOC and petroleum-related compounds plumes.
CF8MW4S, CF8MW9S	Within VOC plume.
CF8MW7S, CF8MW8I, CF8MW10S	Within VOC and petroleum-related compounds plumes.

Monitoring Well	Rationale
CF8MW1S, CF8MW2I, CF8M2W3D, CF8MW23S, CF8MW24I	Downgradient of VOC and petroleum-related compounds plumes.
CF8MW6S	Downgradient of petroleum-related compounds plume.

3.1 HYDROLOGIC CHARACTERISTICS

Water-level measurements were obtained during the third quarter groundwater monitoring event from the 16 wells sampled with an electric water-level indicator using the top of the well casing pipe as the reference point. The water-level measurements and calculated groundwater elevations for the February 1999 sampling events are summarized on Table 3-1. Groundwater elevation contours are shown on Figure 3-1.

The groundwater elevations for the February 1999 sampling event range from 52.20 feet above mean sea level (msl) to 67.91 feet above msl. The groundwater flow is to the south. The groundwater gradient, calculated based on RI data, is 0.015 ft/ft.

3.2 CHEMICAL OF CONCERN DISTRIBUTION

The frequency of detection and range of positive values for samples from the first, second, and third quarter are provided in Table 3-2. Table 3-3 provides a summary of the analytical results for VOCs, SVOCs, and inorganic compounds for each well sampled, along with target cleanup goals. Appendix A contains the laboratory data sheets with the results of third-quarter analyses. Figure 3-2 provides a tag map of the VOC analytical results. Figure 3-3 provides a tag map of the semivolatile organic compound (SVOC), and Figure 3-4 provides inorganic analytical results from the first three quarters of sampling.

OU 3, Site 8 COCs that have been detected above target cleanup goals during the three quarterly sampling events included 1,1-DCE, benzene, total xylenes, 2-methylnaphthalene, and naphthalene. In addition, 1,1-dichloroethane (1,1-DCA) has been detected above its target cleanup goal in one well (CF8MW10S) during each of the three sampling rounds. VOC concentrations have generally decreased over time in samples in which target cleanup goals were exceeded. SVOC concentrations have remained relatively constant in samples in which target cleanup goals were exceeded.

3.2.1 VOCs

VOCs detected in groundwater during third quarter sampling included benzene, 1,1-DCA, 1,1-DCE, benzene, ethylbenzene, methylene chloride, toluene, total xylenes, and 1,1,1-trichloroethane (1,1-TCA).

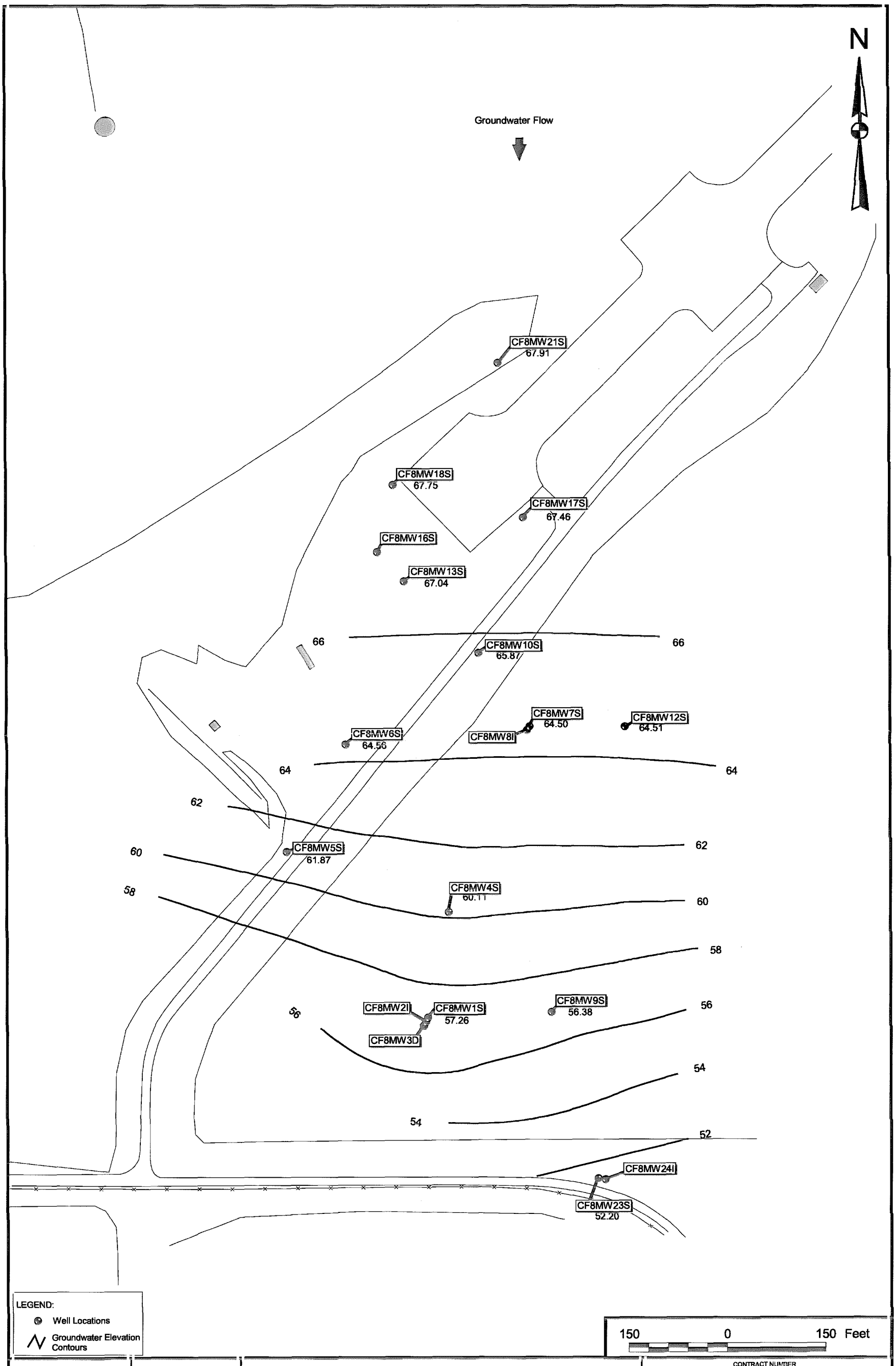
TABLE 3-1

WATER-LEVEL MEASUREMENTS AND GROUNDWATER ELEVATIONS
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Well Number	Top of Casing Elevation	Ground Surface Elevation	August 1998		November 1998		February 1998	
			Depth to Groundwater	Groundwater Elevation	Depth to Groundwater	Groundwater Elevation	Depth to Groundwater	Groundwater Elevation
MW01S	62.53	60.20	2.78	59.75	6.38	56.15	5.27	57.26
MW02I	62.30	60.10	0.00	62.30	1.39	60.91	1.09	61.21
MW03D	62.14	59.90	0.00	62.14	1.51	60.63	1.25	60.89
MW04S	65.47	63.20	4.07	61.40	5.85	59.62	5.36	60.11
MW05S	70.85	68.60	8.26	62.59	9.50	61.35	8.98	61.87
MW06S	72.18	69.80	6.25	65.93	8.00	64.18	7.62	64.56
MW07S	70.40	68.60	4.10	66.30	6.35	64.05	5.90	64.50
MW08I	70.65	68.60	6.21	64.44	7.80	62.85	7.54	63.11
MW09S	60.13	57.70	3.02	57.11	4.28	55.85	3.75	56.38
MW10S	70.90	68.70	4.53	66.37	5.44	65.46	5.03	65.87
MW12S	72.19	70.30	5.96	66.23	8.02	64.17	7.68	64.51
MW13S	74.00	71.80	4.19	69.81	7.31	66.69	6.96	67.04
MW17S	72.87	70.80	3.91	68.96	5.58	67.29	5.41	67.46
MW18S	73.17	71.00	4.06	69.11	5.55	67.62	5.42	67.75
MW21S	72.71	70.60	NM	--	4.91	67.80	4.80	67.91
MW23S	57.22	54.10	4.56	52.66	6.30	50.92	5.02	52.20
MW24I	56.73	54.10	0.00	56.73	0.00	56.73	Top of casing	56.73

NM = Not measured.
All elevations are in feet above mean sea level.

P:\GIS\Cecil\Site8_GW.APR 08-April-99 CPG LAYOUT Potentiometric Shallow Groundwater Contour



DRAWN BY CHAD P. GLICK	DATE 4/8/99	POTENTIOMETRIC SUFACE MAP SHALLOW GROUNDWATER OPERABLE UNIT 3, SITE 8 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 7898
CHECKED BY	DATE		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. Figure 3-1 REV 0

TABLE 3-2

FREQUENCY OF DETECTIONS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Parameter	Baseline / First Quarter August 1998				Second Quarter November 1998				Third Quarter February 1999			
	Range	Detection Frequency	Location of Max. Detection	Avg. of Detects	Range	Detection Frequency	Location of Max. Detection	Avg. of Detects	Range	Detection Frequency	Location of Max. Detection	Avg. of Detects
VOLATILES (µg/L)												
1,1,1-Trichloroethane	15.4	1 / 16	CF8MW10S	15	33.5 - 36.5	1 / 16	CF8MW10S	35	13.8 (14.7*)	1 / 16	CF8MW10S	14.3
1,1-Dichloroethane	0.1 - 133	7 / 16	CF8MW10S	29	1.2 - 240	4 / 16	CF8MW10SD	71	1 J - 192	4 / 16	CF8MW10S	87.2
1,1-Dichloroethene[1]	0.3 - 44.7	6 / 16	CF8MW10S	15	1.2 - 84.2	4 / 16	CF8MW10SD	22	1.1 J - 51.5	4 / 16	CF8MW10SD	25.1
1,2-Dichloroethane	ND	-	-	-	0.6	1 / 16	CF8MW06S	0.06	ND	-	-	-
Benzene[1]	0.9 - 2.9	4 / 16	CF8MW10S	1.7	0.7 - 4.3	4 / 16	CF8MW10S	1.8	0.5 J - 2.7	4 / 16	CF8MW10S	1.6
Chloroethane	2.5	1 / 16	CF8MW10S	2.5	4.1 - 6.9	1 / 16	CF8MW10S	5.5	ND	-	-	-
cis-1,2-dichloroethene	0.2	1 / 16	CF8MW10S	0.2	ND	-	-	-	ND	-	-	-
Ethylbenzene	0.6 - 3.9	5 / 16	CF8MW13S	1.9	0.5	1 / 16	CF8MW18S	0.5	0.7 - 9.1	3 / 16	CF8MW13S	3.5
Methylene chloride	ND	-	-	-	ND	-	-	-	0.6 J	1 / 16	CF8MW21S	0.6 J
Toluene[1]	1 - 10.2	3 / 16	CF8MW10S	4.5	3 - 18.6	2 / 16	CF8MW10SD	10.8	0.9 J - 5.4	2 / 16	CF8MW10S	3.8
trans-1,2-dichloroethene	0.2 - 0.3	2 / 16	CF8MW04S	0.25	ND	-	-	-	ND	-	-	-
Vinyl chloride	0.7	1 / 16	CF8MW10S	0.7	ND	-	-	-	ND	-	-	-
Total xylenes[1]	0.2 - 10.5	4 / 16	CF8MW13S	4.8	0.7 - 17.2	4 / 16	CF8MW13SD	7.9	0.6 J - 59.3	3 / 16	CF8MW13S	16.9
SEMIVOLATILES (µg/L)												
2-Methylnaphthalene	2 - 65	4 / 16	CF8MW13S	23.8	3 - 66	3 / 16	CF8MW13SD	29.8	4 J - 62	3 / 16	CF8MW13SD	31.2
BEHP[1]	NA	-	-	-	4	1 / 16	CF8MW10SD	4	1 J - 3 J	3 / 16	CF8MW10SD	2
Naphthalene[1]	1 - 69	5 / 16	CF8MW13S	23.2	1 - 65	4 / 16	CF8MW13SD	25.3	6 J - 62	3 / 16	CF8MW13S	35.4
INORGANICS (µg/L)												
Aluminum[1]	255-12,100	10 / 16	CF8MW23S	1,633	200 - 245	3 / 16	CF8MW04S	230	200 - 255	3 / 16	CF8MW04S	220
Iron, total[1]	104 - 2,280	16 / 16	CF8MW23S	647	138 - 2,190	16 / 16	CF8MW3S	633	130 - 1,420	13 / 16	CF8MW1S	591

NA - Not analyzed.

ND - Not detected at or above method detection limit.

BEHP = Bis(2-ethylhexyl) phthalate.

* Duplicate sample result.

1 Chemical of concern.

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW1S			CF8MW2I			CF8MW3D		
		08/21/98	11/13/98	02/05/99	08/21/98	11/13/98	02/05/99	08/21/98	11/13/98	02/08/99
VOLATILES (ug/L)										
1,1,1-TRICHLOROETHANE	200	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE *	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
BENZENE *	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	30	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE *	40	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL *	20	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
SEMIVOLATILES (ug/L)										
2-METHYLNAPHTHALENE*	20	7 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U
BIS(2-ETHYLHEXYL) PHTHALATE *	6	NA	4 U	4 U	NA	4 U	4 U	NA	4 U	4 U
NAPHTHALENE *	20	7 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U
INORGANICS, TOTAL (ug/L)										
ALUMINUM *	13,100 [2]	**630**	200 U	243 U	200 U	200 U	94.8 U	200 U	200 U	46.9 U
CALCIUM	81,100 [2]	**30,800**	**28,400**	NA	**1,050**	**1,280**	NA	**40,500**	**43,600**	NA
IRON*	7,760 [2]	**1,090**	**2,190**	**1420**	**450**	**491**	**447**	**432**	**498**	**520**
MAGNESIUM	10,000 [2]	**450 U**	**435**	NA	450 U	**489**	NA	**8,850**	**9,310**	NA
POTASSIUM	4,330 [2]	**1,440**	**324**	NA	**376**	**453**	NA	**1,030**	**1,100**	NA
SODIUM	160,000	**6,720**	**3,990**	NA	**2,860**	**3,310**	NA	**5,010**	**5,340**	NA

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW4S			CF8MW6S			CF8MW7S		
		08/21/98	11/18/98	02/09/99	08/19/98	11/17/98	02/05/99	08/19/98	11/12/98	02/09/99
VOLATILES (ug/L)										
1,1,1-TRICHLOROETHANE	200	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	70	**51.4**	**50.4**	**44.3**	**0.1 J**	5 U	5 U	**16.9**	**15.4**	**10.8**
1,1-DICHLOROETHENE *	7	**28**	**19.1**	**16.4**	5 U	5 U	5 U	**14.1**	**8.7**	**6**
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	**0.6 J**	3 U	3 U	3 U	3 U
BENZENE *	1	**1.9**	**1**	**1.1**	1 U	1 U	1 U	**0.9 J**	**0.7 J**	**0.5 J**
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	30	**1.4 J**	5 U	**0.7 J**	5 U	5 U	5 U	**0.6 J**	5 U	5 U
METHYLENE CHLORIDE	5	5 U	5 U	5 U	2 U	5 U	5 U	5 U	5 U	5 U
TOLUENE *	40	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	100	**0.3 J**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL *	20	**1.1 J**	**0.7 J**	**0.6 J**	5 U	5 U	5 U	5 U	5 U	5 U
SEMIVOLATILES (ug/L)										
2-METHYLNAPHTHALENE*	20	6 U	6 U	6 U	6 U	6 U	6 U	**2 J**	6 U	6 U
BIS(2-ETHYLHEXYL) PHTHALATE *	6	NA	4 U	4 U	NA	4 U	4 U	NA	4 U	4 U
NAPHTHALENE *	20	**1 J**	**1 J**	6 U	6 U	6 U	6 U	**2 J**	6 U	6 U
INORGANICS, TOTAL (ug/L)										
ALUMINUM *	13,100 [2]	**865**	**245**	**255**	**483**	200 U	234 U	200 U	**245**	**205**
CALCIUM	81,100 [2]	**9,740**	**6,470**	NA	**12,800**	**14,400**	NA	**34,300**	**12,800**	NA
IRON*	7,760 [2]	**1,200**	**1,230**	**1,190**	**181**	**201**	**130**	**853**	**876**	**661**
MAGNESIUM	10,000 [2]	**988**	**771**	NA	582 U	**604**	NA	**850**	**884**	NA
POTASSIUM	4,330 [2]	**698**	**562**	NA	**803**	**842**	NA	**229**	**188**	NA
SODIUM	160,000	**8,350**	**6,100**	NA	**1,650**	**1,840**	NA	**26,000**	**10,000**	NA

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 3 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW8I			CF8MW9S			CF8MW10S		
		08/19/98	11/12/98	02/09/99	08/21/98	11/19/98	02/08/99	08/19/98	11/17/98	Duplicate
VOLATILES (ug/L)										
1,1,1-TRICHLOROETHANE	200	5 U	5 U	5 U	5 U	5 U	5 U	**15.4**	**36.5**	**33.5**
1,1-DICHLOROETHANE	70	5 U	5 U	5 U	**1.5 J**	**1.2 J**	**1 J**	**133**	**191**	**240**
1,1-DICHLOROETHENE *	7	5 U	5 U	5 U	**2.6 J**	**1.2 J**	**1.1 J**	**44.7**	**38.8 J**	**84.2 J**
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
BENZENE *	1	1 U	1 U	1 U	1 U	1 U	1 U	**2.9**	**4.3**	**4.1**
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	**2.5 J**	**6.9**	**4.1 J**
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	**0.2 J**	5 U	5 U
ETHYLBENZENE	30	5 U	5 U	5 U	5 U	5 U	5 U	**3 J**	5 U	5 U
METHYLENE CHLORIDE	5	5 U	5 U	5 U	5 U	5 U	5 U	1.1 U	5 U	5 U
TOLUENE *	40	5 U	5 U	5 U	5 U	5 U	5 U	**10.2**	**18.5**	**18.6**
TRANS-1,2-DICHLOROETHENE	100	5 U	5 U	5 U	5 U	5 U	5 U	**0.2 J**	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	1 U	1 U	**0.7 J**	1 U	1 U
XYLENES, TOTAL *	20	5 U	5 U	5 U	5 U	5 U	5 U	**7.5**	**12.4**	**11.7**
SEMIVOLATILES (ug/L)										
2-METHYLNAPHTHALENE*	20	6 U	6 U	6 U	6 U	6 U	6 U	**22**	**26**	**23**
BIS(2-ETHYLHEXYL) PHTHALATE *	6	NA	4 U	**2 J**	NA	4 U	4 U	NA	4 U	**4 J**
NAPHTHALENE *	20	6 U	6 U	6 U	6 U	6 U	6 U	**31**	**34**	**31**
INORGANICS, TOTAL (ug/L)										
ALUMINUM *	13,100 [2]	200 U	200 U	42 U	200 U	200 U	55.9 U	**267**	200 U	200 U
CALCIUM	81,100 [2]	**1,200**	**1,240**	NA	**4,030**	**3,520**	NA	**8,930**	**3,120**	**3,380**
IRON*	7,760 [2]	**467**	**514**	**563**	**816**	**866**	**918**	**362**	**387**	**414**
MAGNESIUM	10,000 [2]	465 U	**489**	NA	**760**	**792**	NA	602 U	**556**	**593**
POTASSIUM	4,330 [2]	**678**	**653**	NA	**856**	**901**	NA	**1,780**	**1,980**	**2,050**
SODIUM	160,000	**3,520**	**3,790**	NA	**3,280**	**3,490**	NA	**4,560**	**4,290**	**4,510**

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 4 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW10S		CF8MW12S				CF8MW13S		
		02/09/99	Duplicate	08/19/98	Duplicate	11/18/98	02/09/99	08/19/98	11/17/98	Duplicate
VOLATILES (ug/L)										
1,1,1-TRICHLOROETHANE	200	**13.8**	**14.7**	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	70	**192**	**188**	**0.4 J**	**0.4 J**	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE *	7	**50.5**	**51.5**	**0.3 J**	**0.3 J**	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
BENZENE *	1	**2.7**	**2.5**	1 U	1 U	1 U	1 U	**1 J**	**1.3**	**1.3**
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	30	**2.1 J**	**2.1 J**	5 U	5 U	5 U	5 U	**3.9 J**	5 U	5 U
METHYLENE CHLORIDE	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE *	40	**5.4**	**5.2**	5 U	5 U	5 U	5 U	**2.3 J**	**3 J**	**3 J**
TRANS-1,2-DICHLOROETHENE	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL *	20	**7.3**	**7.5 J**	5 U	5 U	5 U	5 U	**10.5**	**16.3**	**17.2**
SEMIVOLATILES (ug/L)										
2-METHYLNAPHTHALENE*	20	**15**	**16**	6 U	6 U	6 U	6 U	**65**	**58**	**66**
BIS(2-ETHYLHEXYL) PHTHALATE *	6	**2 J**	**3 J**	NA	NA	4 U	4 U	NA	4 U	4 U
NAPHTHALENE *	20	**23**	**24**	6 U	6 U	6 U	6 U	**69**	**56**	**65**
INORGANICS, TOTAL (ug/L)										
ALUMINUM *	13,100 [2]	128 U	117 U	**274**	**255**	200 U	126 U	**398**	**200**	200 U
CALCIUM	81,100 [2]	NA	NA	**5,350**	**5,100**	**5,090**	NA	**15,500**	**4,410**	**4,260**
IRON*	7,760 [2]	**348**	**366**	**361**	**374**	**329**	**473**	**583**	**422**	**387**
MAGNESIUM	10,000 [2]	NA	NA	580 U	595 U	**553**	NA	**794**	**699**	**659**
POTASSIUM	4,330 [2]	NA	NA	**2,010**	**1,930**	**2,370**	NA	**5,380**	**5,260**	**4,880**
SODIUM	160,000	NA	NA	**5,030**	**4,770**	**4,150**	NA	**3,460**	**3,240**	**3,070**

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 5 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW13S		CF8MW17S			CF8MW18S			CF8MW21S
		02/09/99	Duplicate	08/19/98	11/16/98	02/03/99	08/19/98	11/12/98	02/03/99	11/16/98
VOLATILES (ug/L)										
1,1,1-TRICHLOROETHANE	200	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE *	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
BENZENE *	1	**1.4**	**1.3**	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	30	**9.1**	**3.5 J**	**0.8 J**	5 U	**1.5 J**	5 U	**0.5 J**	5 U	5 U
METHYLENE CHLORIDE	5	5 U	5 U	1.7 U	5 U	5 U	1.1 U	5 U	5 U	5 U
TOLUENE *	40	5 U	**0.9 J**	5 U	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
XYLENES, TOTAL *	20	**59.3**	**9.8**	5 U	5 U	5 U	5 U	**2.2 J**	5 U	5 U
SEMIVOLATILES (ug/L)										
2-METHYLNAPHTHALENE*	20	**59**	**62**	**6 J**	**3 J**	**4 J**	7 U	6 U	6 U	6 U
BIS(2-ETHYLHEXYL) PHTHALATE *	6	**1 J**	**2 J**	NA	4 U	4 U	NA	4 U	4 U	4 U
NAPHTHALENE *	20	**62**	**62**	**13**	**7**	**6 J**	7 U	6 U	6 U	6 U
INORGANICS, TOTAL (ug/L)										
ALUMINUM *	13,100 [2]	**200**	161 U	200 U	200 U	111 U	**279**	200 U	72.4 U	200 U
CALCIUM	81,100 [2]	NA	NA	1000 U	1000 U	NA	**52,700**	**6,800**	NA	**2,770**
IRON*	7,760 [2]	**584**	**575**	**182**	**187**	174 U	**104**	**1,080**	56.1 U	**138**
MAGNESIUM	10,000 [2]	NA	NA	**742**	**764**	NA	**1,760**	**1,620**	NA	**1,030**
POTASSIUM	4,330 [2]	NA	NA	**213**	224 U	NA	**7,790**	**1,830**	NA	**299**
SODIUM	160,000	NA	NA	**2,710**	**2,770**	NA	**5,580**	**3,720**	NA	**6,810**

TABLE 3-3

SUMMARY OF ANALYTICAL RESULTS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 6 OF 6

PARAMETER	Target Cleanup Goal[1]	CF8MW21S	CF8MW23S			CF8MW24I		
		02/02/99	08/18/98	11/19/98	02/03/99	08/18/98	11/19/98	02/03/99
VOLATILES (ug/L)								
1,1,1-TRICHLOROETHANE	200	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHANE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-DICHLOROETHENE *	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	3	3 U	3 U	3 U	3 U	5 U	3 U	3 U
BENZENE *	1	1 U	5 U	1 U	1 U	5 U	1 U	1 U
CHLOROETHANE	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	70	5 U	5 U	5 U	5 U	5 U	5 U	5 U
ETHYLBENZENE	30	5 U	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	5	**0.6 J**	5 U	5 U	5 U	5 U	5 U	5 U
TOLUENE *	40	5 U	**1 J**	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	100	5 U	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	1	1 U	1 U	1 U	1 U	5 U	1 U	1 U
XYLENES, TOTAL *	20	5 U	**0.2 J**	5 U	5 U	5 U	5 U	5 U
SEMIVOLATILES (ug/L)								
2-METHYLNAPHTHALENE*	20	6 U	7 U	6 U	6 U	6 U	6 U	6 U
BIS(2-ETHYLHEXYL)PHTHALATE *	6	4 U	NA	4 U	15 U	NA	4 U	4 U
NAPHTHALENE *	20	6 U	7 U	6 U	6 U	6 U	6 U	6 U
INORGANICS, TOTAL (ug/L)								
ALUMINUM *	13,100 [2]	177 U	**12,100**	200 U	87 U	**776**	200 U	80.8 U
CALCIUM	81,100 [2]	NA	**14,800**	**13,300**	NA	**32,400**	**36,900**	NA
IRON*	7,760 [2]	29.4 U	**2,280**	**416**	**386**	**613**	**302**	**286**
MAGNESIUM	10,000 [2]	NA	**1,780**	**1,440**	NA	**3,540**	**3,880**	NA
POTASSIUM	4,330 [2]	NA	**917**	**784**	NA	**1,010**	**972**	NA
SODIUM	160,000	NA	**3,330**	**3,350**	NA	**4,800**	**5,320**	NA

* Chemical of concern
\- No target cleanup goal
U = Not detected at or above method detection limit as listed.
J = Estimated value
NA = Not analyzed
Bolded values are concentrations above associated detection limits.
Shaded values are concentrations above associated target cleanup goals.
1 Florida Department of Environmental Protection, Florida Administrative Code 62-777, 1999
2 NAS Cecil Field Inorganic Background Data Set "hi-cut" value

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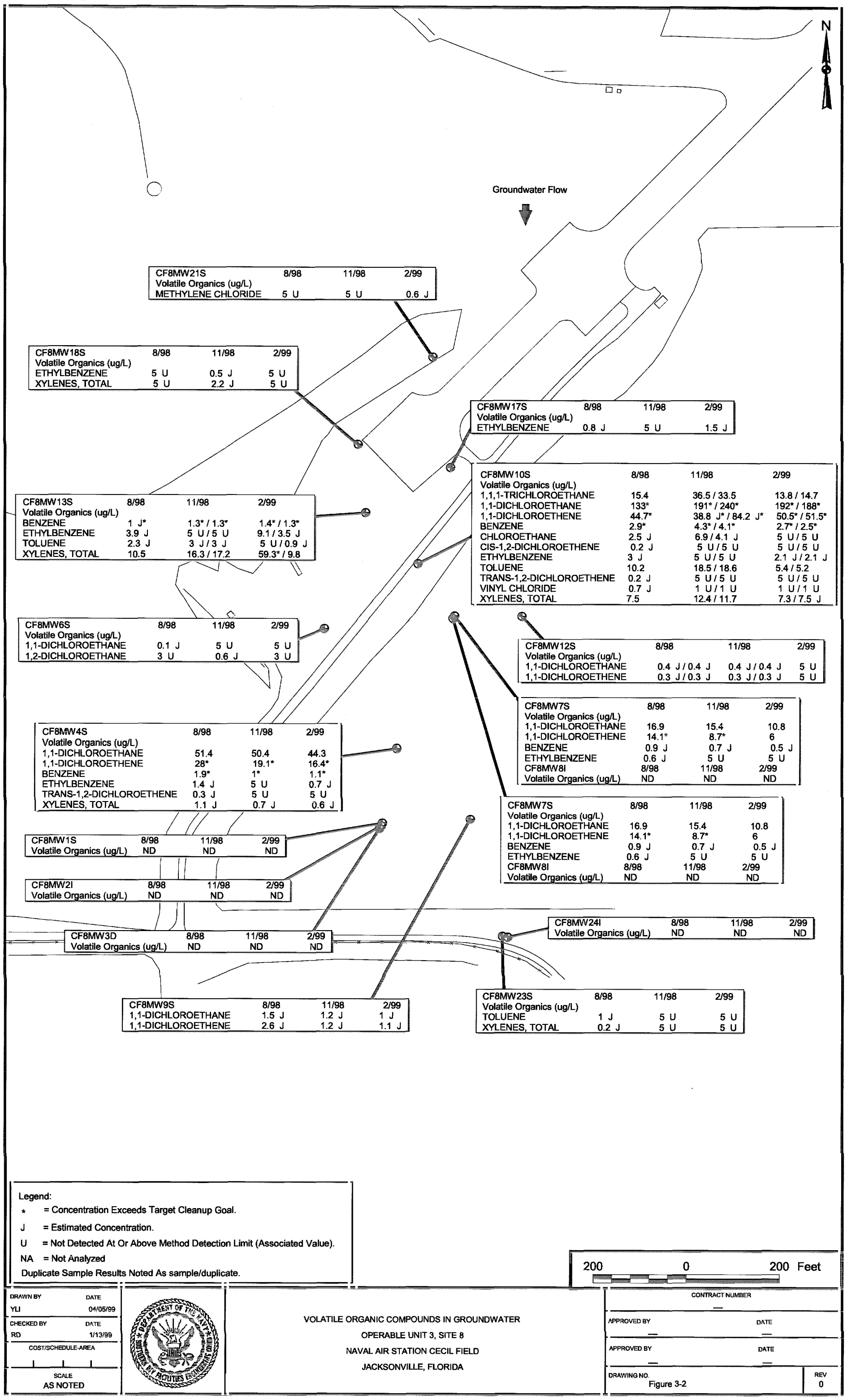

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

OPERABLE UNIT 3, SITE 8

NAVAL AIR STATION CECIL FIELD

JACKSONVILLE, FLORIDA

CONTRACT NUMBER —

APPROVED BY — DATE —

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DRAWING NO. Figure 3-2

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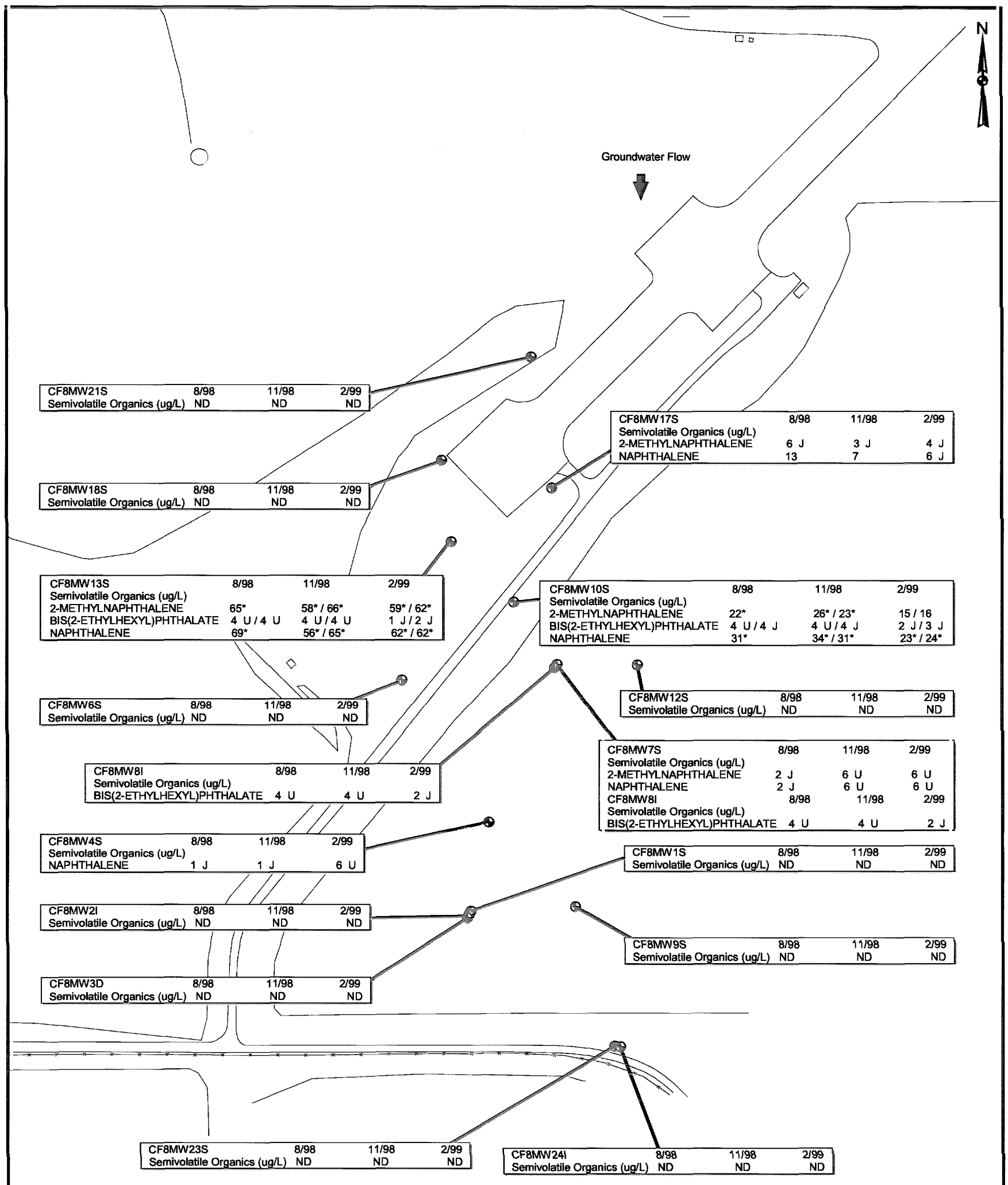

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

SEMIVOLATILE ORGANIC COMPOUNDS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER —

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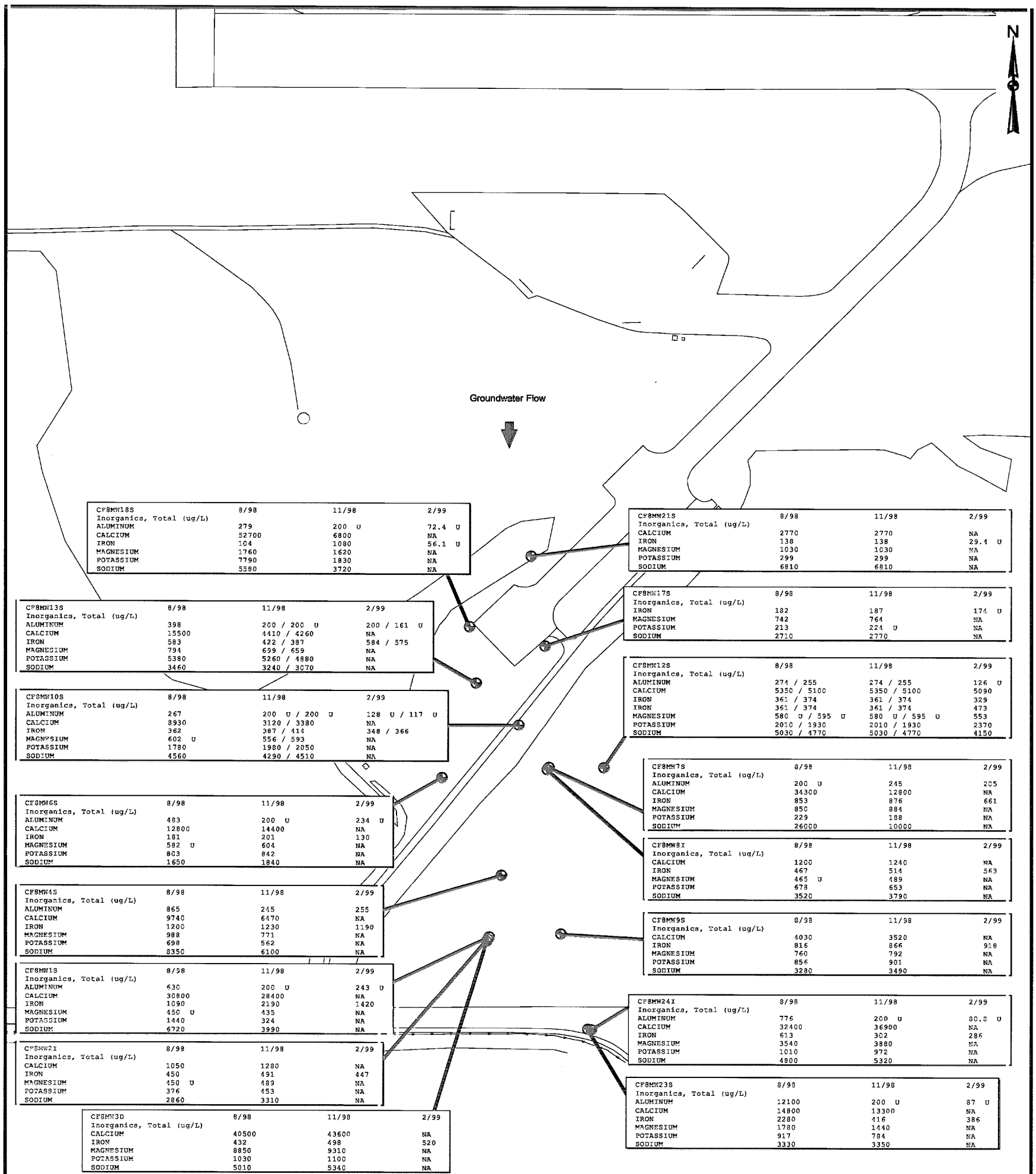

CF8MW18S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	279	200 U	72.4 U
CALCIUM	52700	6800	NA
IRON	104	1080	56.1 U
MAGNESIUM	1760	1620	NA
POTASSIUM	7790	1830	NA
SODIUM	5580	3720	NA

CF8MW13S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	398	200 / 200 U	200 / 161 U
CALCIUM	15500	4410 / 4260	NA
IRON	583	422 / 387	584 / 575
MAGNESIUM	794	699 / 659	NA
POTASSIUM	5380	5260 / 4880	NA
SODIUM	3460	3240 / 3070	NA

CF8MW10S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	267	200 U / 200 U	128 U / 117 U
CALCIUM	8930	3120 / 3380	NA
IRON	362	387 / 414	348 / 366
MAGNESIUM	602 U	556 / 593	NA
POTASSIUM	1780	1980 / 2050	NA
SODIUM	4560	4290 / 4510	NA

CF8MW6S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	483	200 U	234 U
CALCIUM	12800	14400	NA
IRON	181	201	130
MAGNESIUM	582 U	604	NA
POTASSIUM	803	842	NA
SODIUM	1650	1840	NA

CF8MW4S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	865	245	255
CALCIUM	9740	6470	NA
IRON	1200	1230	1190
MAGNESIUM	988	771	NA
POTASSIUM	698	562	NA
SODIUM	8350	6100	NA

CF8MW1S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	630	200 U	243 U
CALCIUM	30800	28400	NA
IRON	1090	2190	1420
MAGNESIUM	450 U	435	NA
POTASSIUM	1440	324	NA
SODIUM	6720	3990	NA

CF8MW2I	8/98	11/98	2/99
Inorganics, Total (ug/L)			
CALCIUM	1050	1280	NA
IRON	450	491	447
MAGNESIUM	450 U	489	NA
POTASSIUM	376	453	NA
SODIUM	2860	3310	NA

CF8MW3D	8/98	11/98	2/99
Inorganics, Total (ug/L)			
CALCIUM	40500	43600	NA
IRON	432	498	520
MAGNESIUM	8850	9310	NA
POTASSIUM	1030	1100	NA
SODIUM	5010	5340	NA

CF8MW21S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
CALCIUM	2770	2770	NA
IRON	138	138	29.4 U
MAGNESIUM	1030	1030	NA
POTASSIUM	299	299	NA
SODIUM	6810	6810	NA

CF8MW17S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
IRON	182	187	174 U
MAGNESIUM	742	764	NA
POTASSIUM	213	224 U	NA
SODIUM	2710	2770	NA

CF8MW12S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	274 / 255	274 / 255	126 U
CALCIUM	5350 / 5100	5350 / 5100	5090
IRON	361 / 374	361 / 374	329
IRON	361 / 374	361 / 374	473
MAGNESIUM	580 U / 595 U	580 U / 595 U	553
POTASSIUM	2010 / 1930	2010 / 1930	2370
SODIUM	5030 / 4770	5030 / 4770	4150

CF8MW7S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	200 U	245	205
CALCIUM	34300	12800	NA
IRON	853	876	661
MAGNESIUM	850	884	NA
POTASSIUM	229	188	NA
SODIUM	26000	10000	NA

CF8MW8I	8/98	11/98	2/99
Inorganics, Total (ug/L)			
CALCIUM	1200	1240	NA
IRON	467	514	563
MAGNESIUM	465 U	489	NA
POTASSIUM	678	653	NA
SODIUM	3520	3790	NA

CF8MW9S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
CALCIUM	4030	3520	NA
IRON	816	866	918
MAGNESIUM	760	792	NA
POTASSIUM	856	901	NA
SODIUM	3280	3490	NA

CF8MW24I	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	776	200 U	80.8 U
CALCIUM	32400	36900	NA
IRON	613	302	286
MAGNESIUM	3540	3880	NA
POTASSIUM	1010	972	NA
SODIUM	4800	5320	NA

CF8MW23S	8/98	11/98	2/99
Inorganics, Total (ug/L)			
ALUMINUM	12100	200 U	87 U
CALCIUM	14800	13300	NA
IRON	2280	416	386
MAGNESIUM	1780	1440	NA
POTASSIUM	917	784	NA
SODIUM	3330	3350	NA

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

300 0 300 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99

COST/SCHEDULE-AREA

SCALE
AS NOTED

INORGANICS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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Concentrations of benzene, 1,1-DCA, 1,1-DCE, and total xylenes exceeded target cleanup goals in third-quarter samples.

Benzene concentrations exceeded its target cleanup goal of 1 µg/L in CF8MW4S (1.1 µg/L), CF8MW10S (2.7 µg/L), and CF8MW13S (1.4 µg/L). Concentrations of benzene in groundwater from wells CF8MW4S, CF8MW10S, and CF8MW13S have remained relatively constant during the three quarters of sampling. Concentrations of benzene have ranged from 1 µg/L to 1.9 µg/L in CF8MW4S, from 2.5 µg/L to 4.3 µg/L in CF8MW10S (and associated duplicate samples), and from 1 J µg/L to 1.4 µg/L in CF8MW13S (and associated duplicate samples).

The 1,1-DCA concentration exceeded the target cleanup goal of 70 µg/L in CF8MW10S (192 µg/L). Concentrations of 1,1-DCA in CF8MW10S have remained relatively constant during the three quarters of sampling at the site, ranging from 133 µg/L in August 1998 to 240 µg/L in November 1998 to 192 µg/L in February 1999.

Concentrations of 1,1-DCE exceeded the target cleanup goal of 7 µg/L in wells CF8MW4S (16.4 µg/L) and CF8MW10S (50.5 µg/L in sample, 51.5 µg/L in duplicate). In CF8MW4S, 1,1-DCE concentrations have decreased from 28 µg/L in August 1998 to 16.4 µg/L during third quarter sampling. In CF8MW10S, detected concentrations of 1,1-DCE ranged from 44.7 µg/L in August 1998 to 38.8 J µg/L (84.2 J µg/L in duplicate) in November 1998, to 50.5 µg/L in February 1999. 1,1-DCE concentrations in CF8MW7S have decreased from a high of 14.1 µg/L in August 1998 to 6 µg/L, below the target cleanup goal, in February 1999.

The concentration of total xylenes exceeded the target cleanup goal of 20 µg/L in well CF8MW13S (59.3 µg/L). However, the xylene concentration in the duplicate sample collected from this well was 9.8 µg/L. Previously detected concentrations of xylene in well CF8MW13S ranged from 10.5 µg/L in August 1998 to 17.2 µg/L in November 1998. Xylenes were not detected above the target cleanup goal in other wells during the three quarters of groundwater sampling at the site.

3.2.2 SVOCs

SVOCs detected during third-quarter sampling at OU 3, Site 8 included 2-methylnaphthalene and naphthalene at concentrations above their target cleanup goals and bis(2-ethylhexyl) phthalate (BEHP) below its target cleanup goal.

2-Methylnaphthalene was detected at 4 J µg/L in CF8MW17S, 15 µg/L in CF8MW10S, and 59 µg/L in CF8MW13S. Concentrations in CF8MW13S exceeded the target cleanup goal of 20 µg/L for 2-methylnaphthalene. In well CF8MW17S, concentrations of 2-methylnaphthalene have remained low (below the target cleanup goal) and relatively constant during the three quarters of sampling, ranging from 3 J µg/L to 6 J µg/L. In CF8MW10S, 2-methylnaphthalene concentrations have decreased from levels above the target cleanup goal in previous quarters (22 to 26 µg/L) to below the target cleanup goal in third quarter sampling.

Naphthalene was detected at concentrations above its target cleanup goal of 20 µg/L in groundwater from wells CF8MW10S (23 µg/L) and CF8MW13S (62 µg/L) and below the cleanup goal in CF8MW17S (6 J µg/L). Comparisons of third quarter data with previous sampling events show a decrease in naphthalene concentrations in CF8MW10S and CF8MW17S. Concentrations of naphthalene have remained relatively constant in CF8MW13S over the three sampling events.

BEHP, a common laboratory and field contaminant, was detected below the target cleanup goal of 6 µg/L at concentrations of 2 J µg/L in CF8MW8I and CF8MW10S and 1 J µg/L in CF8MW13S. BEHP was not detected in CF8MW8I and CF8MW13S during previous sampling events; a similarly low estimated concentration was detected in the November 1998 duplicate sample from CF8MW10S.

3.2.3 Inorganics

Third quarter samples were analyzed for inorganics including total (unfiltered) aluminum (a COC) and magnesium. Concentrations of these inorganics did not exceed target cleanup goals in third quarter samples.

3.3 NATURAL ATTENUATION PARAMETERS

Fixed-base laboratory analyses and field analytical tests were performed on groundwater samples from the monitoring wells for biodegradation natural attenuation parameters. The fixed-base laboratory parameters included alkalinity, biochemical oxygen demand (BOD), chemical oxygen demand (COD), chloride, dissolved iron, dissolved manganese, methane, ethane, ethene, nitrate, nitrite, orthophosphate, sulfate, dissolved sulfide, and total organic carbon (TOC). Field analytical tests included pH, specific conductivity, temperature, turbidity, dissolved oxygen (DO), hydrogen sulfide, sulfide, dissolved carbon dioxide, ferrous iron, oxidation-reduction potential (ORP), manganese, and alkalinity.

This section presents the analytical results from the third quarter groundwater monitoring event conducted in February 1999 and comparisons with previous quarterly sampling results. The natural attenuation data

from the first three quarters of sampling are provided in Table 3-4. Figures 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 3-11, 3-12, and 3-13 illustrate these natural attenuation analytical results.

3.3.1 Dissolved Oxygen

Depleted DO concentrations (less than 0.5 to 1.0 mg/L) were observed in wells within the VOC and petroleum-related plumes with the exception of the DO concentration in well CF8MW18S (4.4 mg/L) (see Figure 3-5). The DO concentration in the upgradient monitoring well, CF8MW21S, located near the fire fighting training pits was 1.52 mg/L. In well CF8MW6S, downgradient of the petroleum-related plume, the DO concentration was 2.92 mg/L. DO concentrations in other wells downgradient of the plumes ranged from 0.05 mg/L to 0.23 mg/L. The DO concentration in well CF8MW18S, located at the upgradient edge of the petroleum-related plume, is 4.4 mg/L, indicating an aerobic environment in this area. The aerobic conditions along the upgradient edge of the plume are conductive to the biodegradation of petroleum-related contaminants. Downgradient of this area, in the core of the plume, DO concentrations decrease, indicating a change to anaerobic conditions. The anaerobic conditions within the plume, as indicated by low DO concentrations, are conducive to reductive dechlorination of solvents.

3.3.2 Nitrate and Nitrite

Nitrate was detected at low levels (less than 0.4 mg/L) in three wells (CF8MW18S, CF8MW6S, and CF8MW1S) at the site (see Figure 3-6). Nitrite was detected in six wells at concentrations ranging from 0.85 J to 1 J mg/L. Because the availability of nitrate in groundwater is limited at the site, it is unlikely that nitrate reduction is a significant biodegradation process at the site.

3.3.3 Ferrous Iron, Dissolved Iron, and Dissolved Manganese

During this sampling event, ferrous iron concentrations greater than 1.0 mg/L were detected at monitoring wells CF8MW4S (within the VOC plume) and CF8MW1S (downgradient of the VOC plume) as shown on Figure 3-7. These elevated ferrous iron concentrations indicate that ferric iron reduction is likely in this area of the plume.

Dissolved iron concentrations ranged from 0.116 mg/L to 2.13 mg/L during third quarter sampling. Dissolved iron concentrations in wells with elevated ferrous iron levels, 1.46 mg/L in CF8MW4S and 1.28 mg/L in CF8MW1S, suggest a sufficient supply of iron is available as a potential electron receptor at the monitoring wells at these locations.

TABLE 3-4

SUMMARY OF NATURAL ATTENUATION INDICATOR PARAMETERS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 5

PARAMETER	UNITS	CF8MW01S			CF8MW02I			CF8MW03D			CF8MW04S		
		Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99
ALKALINITY	mg/L	39.6	56.9 J	57.2	NA	7.87 J	3.1	NA	157 J	136	22.9	8.22	48
ALKALINITY, FIELD	mg/L	30.7	109	59.6	11	7	8.51	129.2	162	149	20	10	28.1
BOD	mg/L	NA	2 U	2 U	NA	2 U	2 U	NA	2 U	2.24 J	NA	3.33	2 UJ
CARBON DIOXIDE	mg/L	8.4	282	209	48	118	55.8	52.8	138	30	174	214	195
COD	mg/L	NA	40	47.4	NA	5 U	44.7	NA	6.27	15.8	NA	45.8	68.4
CHLORIDE	mg/L	3.81	1.75	4.8	NA	3.91 J	1.8 J	NA	5.67 J	6.3	12.8	14.5	12 J
FERROUS IRON	mg/L	1.2	2.14	1.3	0.6	0.41	0.34	0	0.31	0.34	1.1	1.43	1.05
DISSOLVED IRON	ug/L	NA	2130	1460	NA	470	425	NA	453	555	NA	1460	1280
DISSOLVED OXYGEN	mg/L	1.14	0	0.1	1.46	0.67	0.23	2.08	1.12	0.05	0.78	0	0.08
DISSOLVED SULFIDE	mg/L	2 U	3.92	2 UJ	0	2 U	2 UJ	0	2 U	2 UJ	2 U	4.12	2 UJ
HYDROGEN SULFIDE	mg/L	0	0.3	0.1	0	0	0	0	0	0	0	0.5	0.3
FIELD SULFIDE	mg/L	0	0.225	0.14	0	0.019	0.033	0	0	0.016	0	0.719	0.719
MANGANESE, FIELD	mg/L	NA	0.1	0	NA	0.1	0	NA	0.2	0.1	NA	0.5	0
DISSOLVED MANGANESE	ug/L	NA	50.8	37.1	NA	8.5	4.6	NA	35.9	37.4	NA	9.7	14.7
NITRATE	mg/L	0.1 U	0.1 UJ	0.14 J	NA	0.1 UJ	0.1 UJ	NA	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ
NITRITE	mg/L	0.1 U	0.1 U	0.1 U	NA	0.1 U	0.1 U	NA	0.1 U	0.5 UJ	0.162	0.1 UJ	0.85 J
ORTHOPHOSPHATE	mg/L	0.1 U	0.1 UJ	0.1 U	NA	0.1 UJ	0.1 U	NA	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ
pH	Standard units	5.49	5.83	5.7	4.9	5.05	5.1	6.87	7.07	7.42	5.19	5	5.72
ORP	mV	0.74	13	-56.9	102	160	-10.1	84	331	-164.5	-58	-261.1	-32.8
SPECIFIC CONDUCTIVITY	mS/cm	0.21	0.191	0.149	0.03	0.031	0.029	0.279	0.278	0.269	0.131	0.134	0.179
SULFATE	mg/L	51.4 J	5.45 J	14	NA	0.29 J	0.32	NA	0.1 UJ	0.1 U	12.8 J	13.3	12
TEMPERATURE	C	25.5	22.6	20.4	23.2	22.3	21.3	23	22.1	21.1	24.3	22.6	19.3
TOC	mg/L	NA	13.7	12.3	NA	1 U	2.75	NA	1 U	1 U	NA	17.5	19.2
TURBIDITY	NAU	0	7	11	0	0	0	0	0	0	0	0	0
ETHANE	ug/L	5.8 U	5.8 U	5.8 U	NA	5.8 U	5.8 U	NA	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
ETHENE	ug/L	6.2 U	6.2 U	6.2 U	NA	6.2 U	6.2 U	NA	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
METHANE	ug/L	299	331	269.5	NA	12	15.9	NA	16.9	28.4	750	415	648.5

TABLE 3-4

SUMMARY OF NATURAL ATTENUATION INDICATOR PARAMETERS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 2 OF 5

PARAMETER	UNITS	CF8MW06S			CF8MW07S			CF8MW08I			CF8MW09S		
		Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99
ALKALINITY	mg/L	27.1	28.6	39.3	45.8	15.2 J	40	NA	6.26 J	0	37.5	10.7	11.5
ALKALINITY, FIELD	mg/L	23.6	0	39.4	22.1	18.1	22.9	5	6.1	6.2	13.1	0	14.9
BOD	mg/L	NA	4.45	2 U	NA	2 U	2 UJ	NA	2 U	2 UJ	NA	2 U	2 UJ
CARBON DIOXIDE	mg/L	84	128	62	107.6	202	194	57.8	55.2	106	92.2	181	140
COD	mg/L	NA	13	34.2	NA	33.7	78.9	NA	5 U	26.3	NA	12	26.3
CHLORIDE	mg/L	4.54	4.25	1.4 J	53.5	15.6 J	41	NA	5.41	5.4	5.12	3.1	2.9
FERROUS IRON	mg/L	0.06	0.25	0.08	0.8	0.91	0.54	0.6	0.46	0.54	0.6	0.71	0.76
DISSOLVED IRON	ug/L	NA	157	139 U	NA	933	664	NA	493	597	NA	795	897
DISSOLVED OXYGEN	mg/L	2.02	0	2.92	0	0	0.1	0.72	0.72	0.15	2.06	0	0.05
DISSOLVED SULFIDE	mg/L	6	5.29	2 UJ	2 U	3.92	2 UJ	0	2 U	2 UJ	2 U	5.14	2 UJ
HYDROGEN SULFIDE	mg/L	0	0.05	0	1	0.6	0.4	0	0	0.05	0.7	0.3	0.2
FIELD SULFIDE	mg/L	0	0.094	0.084	0	0.719	0.62	0	0.044	0.06	0	0.439	0.254
MANGANESE, FIELD	mg/L	NA	0	0	NA	0.2	0.1	NA	0	0.2	NA	NA	0
DISSOLVED MANGANESE	ug/L	NA	9.3	6.9	NA	5.2	4.8	NA	43.6	4.4	NA	7.4	9.2
NITRATE	mg/L	0.1 U	0.1 U	0.32 J	0.1 U	0.1 U	0.1 UJ	NA	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ
NITRITE	mg/L	0.1 U	0.1 U	0.1 U	0.43	0.1 U	0.85 J	NA	0.1 U	0.95 J	0.16	0.1 U	0.1 UJ
ORTHOPHOSPHATE	mg/L	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 UJ	NA	0.1 UJ	0.1 UJ	0.25	0.1 U	0.31 J
pH	Standard units	5.57	5.58	5.89	5.61	5.08	5.71	5.13	4.76	5.36	5.01	5.38	5.05
ORP	mV	114	-219.1	-9	-94	115	10	37	15	80	-6	-219.3	5.6
SPECIFIC CONDUCTIVITY	mS/cm	0.085	0.097	0.091	0.382	0.152	0.141	0.035	0.035	0.015	0.049	0.049	0.099
SULFATE	mg/L	7.53	5.05 J	5	40.2	11.5 J	25	NA	1.38	0.22	1.83 J	2.66	2.3
TEMPERATURE	C	25.3	23.5	19.4	23.6	21.9	21	24.3	21.6	21.4	21.6	21.9	20.6
TOC	mg/L	NA	5.3	7.61	NA	9.06	26.9	NA	1 U	1 U	NA	1.44	1.7
TURBIDITY	NAU	8	1	9	1	1	0	9	0	0	10	0	0
ETHANE	ug/L	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	NA	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
ETHENE	ug/L	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	NA	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
METHANE	ug/L	51.2 J	32.5	32.9	335	662	295.2	NA	7.9 U	14.4 U	85.1	102	109.1

TABLE 3-4

SUMMARY OF NATURAL ATTENUATION INDICATOR PARAMETERS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 3 OF 5

PARAMETER	UNITS	CF8MW10S					CF8MW12S			
		Aug-98	Nov-98		Feb-99		Aug-98		Nov-98	Feb-99
ALKALINITY	mg/L	27.1	24.7	3.58	18	NA	20.8	14.6	15.4	0
ALKALINITY, FIELD	mg/L	214	0	NA	12.5	13.5	8.8	NA	0	13.5
BOD	mg/L	NA	4.05	33	8.9 J	24.6 J	NA	NA	2 U	2 UJ
CARBON DIOXIDE	mg/L	127.6	290	NA	245	NA	110.8	NA	266	107
COD	mg/L	NA	89.2	89.2	76.3	84.2	NA	NA	9.64	76.3
CHLORIDE	mg/L	1.79	2.27	2.12	4.4	4.3	2.74 J	2.72 J	8.98	7.8
FERROUS IRON	mg/L	0.4	0.31	NA	0.27	NA	0.5	NA	1.23	0.565
DISSOLVED IRON	ug/L	NA	355	1040	342	344	NA	NA	367	458
DISSOLVED OXYGEN	mg/L	0	0	0	0	NA	2.58	NA	0.06	0.565
DISSOLVED SULFIDE	mg/L	6	9.8	8.82	2 UJ	2 UJ	2	6	2.08	2 UJ
HYDROGEN SULFIDE	mg/L	0.7	0.7	NA	0.7	NA	0.5	NA	0.3	0.2
FIELD SULFIDE	mg/L	0	0.719	NA	0.719	NA	0	NA	0.432	0.01
MANGANESE, FIELD	mg/L	NA	0	NA	0.2	NA	NA	NA	0	0.2
DISSOLVED MANGANESE	ug/L	NA	5 U	5 U	2.2	2.1	NA	NA	8.5	12.1
NITRATE	mg/L	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
NITRITE	mg/L	0.1 U	0.1 U	0.1 U	1 J	1 J	0.1 U	0.54	0.1 UJ	1 J
ORTHOPHOSPHATE	mg/L	0.1 U	0.12 J	0.21 J	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 U	0.1 UJ
pH	Standard units	5.11	4.61	NA	5.36	NA	5	NA	5.07	5.35
ORP	mV	-112	-217.7	NA	-43.8	NA	24	NA	-217.5	60
SPECIFIC CONDUCTIVITY	mS/cm	0.078	0.049	NA	0.076	NA	0.083	NA	0.084	0.049
SULFATE	mg/L	9.18	1.28 J	NA	2.5	2.6	8.86	8.93	10.2	8.2
TEMPERATURE	C	25.7	24.3	NA	21	NA	23.1	NA	23.4	21.9
TOC	mg/L	NA	29.9	29.4	21.4	22.1	NA	NA	4.66	4.37
TURBIDITY	NAU	0	4	0	0	NA	NA	0	NA	0
ETHANE	ug/L	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
ETHENE	ug/L	214	0	NA	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
METHANE	ug/L	894.5	993	1040	832	650.5	112	105	149	90.1

TABLE 3-4

SUMMARY OF NATURAL ATTENUATION INDICATOR PARAMETERS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 4 OF 5

PARAMETER	UNITS	CF8MW13S					CF8MW17S			CF8MW18S		
		Aug-98	Nov-98		Feb-99		Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99
ALKALINITY	mg/L	52.1	17.9	17.9	50	NA	1 U	1 U	0	150	16.1 J	80
ALKALINITY, FIELD	mg/L	99.8	16	NA	24.9	41.6	3.1	0	3.19	148	152	68.1
BOD	mg/L	NA	4.75	2 U	2 UJ	11.4 J	NA	2 U	2 U	NA	2 U	2.05 J
CARBON DIOXIDE	mg/L	158.6	282	NA	260	NA	70.4	123	68	110.8	189	85
COD	mg/L	NA	141	133	179	168	NA	7.23	26.3	NA	57.8	36.8
CHLORIDE	mg/L	1.43	1.17	1.91	3.5	3.8	1.91	0.369	2.6 J	1.94	0.923	1.9 J
FERROUS IRON	mg/L	0.6	0.31	NA	0.46	NA	NA	0.4	0.01	0	1	0.03
DISSOLVED IRON	ug/L	NA	359	360	446	594	NA	174	171 U	NA	1080	67.1 U
DISSOLVED OXYGEN	mg/L	0	0	NA	0	NA	0.5	1.63	0.28	1.34	0.9	4.4
DISSOLVED SULFIDE	mg/L	4	6.27	7.84	2 UJ	2 UJ	8	3.92	2 UJ	6	2 U	2 J
HYDROGEN SULFIDE	mg/L	0.5	0.5	NA	0.3	NA	0.5	0.05	0.3	0	0.11	0.1
FIELD SULFIDE	mg/L	0	0.719	NA	0.719	NA	0	0.145	0.209	0	0.256	0.049
MANGANESE, FIELD	mg/L	NA	0.2	NA	0	NA	NA	0	0.1	NA	0.7	0.2
DISSOLVED MANGANESE	ug/L	NA	5 U	5 U	6	8.2	NA	5 U	2.9 U	NA	17.4	6.5
NITRATE	mg/L	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.16 J
NITRITE	mg/L	0.17	0.1 U	0.1 U	0.95 J	1 J	0.1 U	0.1 U	0.1 UJ	0.1 U	0.1 U	0.1 U
ORTHOPHOSPHATE	mg/L	0.1 U	0.1 J	0.1 UJ	0.1 UJ	0.1 UJ	0.1 U	0.1 UJ	0.1 UJ	0.1 U	0.181 J	0.19 J
pH	Standard units	5.42	4.82	NA	5.54	NA	4.47	4.4	4.73	6.26	5.28	6.28
ORP	mV	-109	189.1	NA	124.7	NA	45	0.3	24.3	124	-31.4	-15.6
SPECIFIC CONDUCTIVITY	mS/cm	0.147	0.066	NA	0.136	NA	0.031	0.029	0.028	0.34	0.73	0.167
SULFATE	mg/L	2.96	0.41 J	0.39 J	0.54	0.55	13.6	4.19 J	4.3	4.97	9.86 J	6.2
TEMPERATURE	C	26.5	25.1	NA	21.7	NA	25.2	25	21.8	26.4	24.4	20.7
TOC	mg/L	NA	42.8	43	50.4	46.5	NA	2.7 J	3.67 J	NA	17.6	6.71 J
TURBIDITY	NAU	10	0	NA	0	NA	0	0	0	32	70	9
ETHANE	ug/L	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U	5.8 U
ETHENE	ug/L	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
METHANE	ug/L	1920	2300	2500	1834	2016	346	224	334.4	21 U	215	176.2

TABLE 3-4

SUMMARY OF NATURAL ATTENUATION INDICATOR PARAMETERS IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 5 OF 5

PARAMETER	UNITS	CF8MW21S			CF8MW23S			CF8MW24I		
		Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99	Aug-98	Nov-98	Feb-99
ALKALINITY	mg/L	NA	12.5 J	1.6	37.5	34	34.3	NA	96.6	167
ALKALINITY, FIELD	mg/L	NA	0	2.13	28.5	37.1	40.4	73.8	103	119
BOD	mg/L	NA	2 U	2 U	NA	2 U	2 J	NA	2 U	2 U
CARBON DIOXIDE	mg/L	NA	67.4	9.8	26	39.2	45.8	114.6	85.8	91.4
COD	mg/L	NA	5 U	15.8	NA	16.9	21	NA	8.19	36.8
CHLORIDE	mg/L	NA	4.49	20 J	7.1	7.06	5.8 J	NA	2.18	4.7 J
FERROUS IRON	mg/L	NA	0.05	0.02	1	0.38	0.36	0.5	0.27	0.3
DISSOLVED IRON	ug/L	NA	116	38.6 U	NA	395	390	NA	284	360
DISSOLVED OXYGEN	mg/L	NA	0.73	1.52	0.1	0.88	0.11	0.14	0.18	0.19
DISSOLVED SULFIDE	mg/L	NA	4.9	2 UJ	4	2.08	2 UJ	0	4.12	2 UJ
HYDROGEN SULFIDE	mg/L	NA	0	0	0.3	0.05	0.1	0.3	0.05	0
FIELD SULFIDE	mg/L	NA	0.044	0	0	0.095	0.082	0	0.107	0.111
MANGANESE, FIELD	mg/L	NA	0	0	NA	0.1	0.4	NA	0	0
DISSOLVED MANGANESE	ug/L	NA	13.8	7.5	NA	12.5	12.5	NA	14.6	14.6
NITRATE	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 UJ	NA	0.1 U	0.1 UJ
NITRITE	mg/L	NA	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	NA	0.1 U	0.1 U
ORTHOPHOSPHATE	mg/L	NA	0.1 UJ	0.1 UJ	0.75	0.36	0.5 J	NA	0.1 U	0.1 UJ
pH	Standard units	NA	3.7	4.96	5.99	5.06	6.04	NA	5.01	6.41
ORP	mV	NA	131.1	82.5	29	-213.4	-96.8	-52	-235.5	-106.5
SPECIFIC CONDUCTIVITY	mS/cm	NA	0.06	0.171	0.92	0.094	0.086	0.201	0.317	0.334
SULFATE	mg/L	NA	2.17 J	12 J	0.1 U	0.66	0.23	NA	0.57	0.17
TEMPERATURE	C	NA	24.6	20.2	27.1	23.1	20.6	22.8	22.6	20.8
TOC	mg/L	NA	1 UJ	1.9 J	NA	1.07	2.67 J	NA	3.14	4.7 J
TURBIDITY	NTU	NA	11	0	11	122	0	34	7	3
ETHANE	ug/L	NA	5.8 U	5.8 U	37.5	34	5.8 U	NA	5.8 U	5.8 U
ETHENE	ug/L	NA	6.2 U	6.2 U	28.5	37.1	6.2 U	NA	6.2 U	6.2 U
METHANE	ug/L	NA	3.3 U	6.6 U	540	396	592	NA	474	648.5

BOD = Biochemical oxygen demand.
COD = Chemical oxygen demand.
ORP = Oxidation-reduction potential.
TOC = Total organic carbon.
NA = Not analyzed.
U = Not detected at or above method detection limit (associated value).
J = Estimated concentration.

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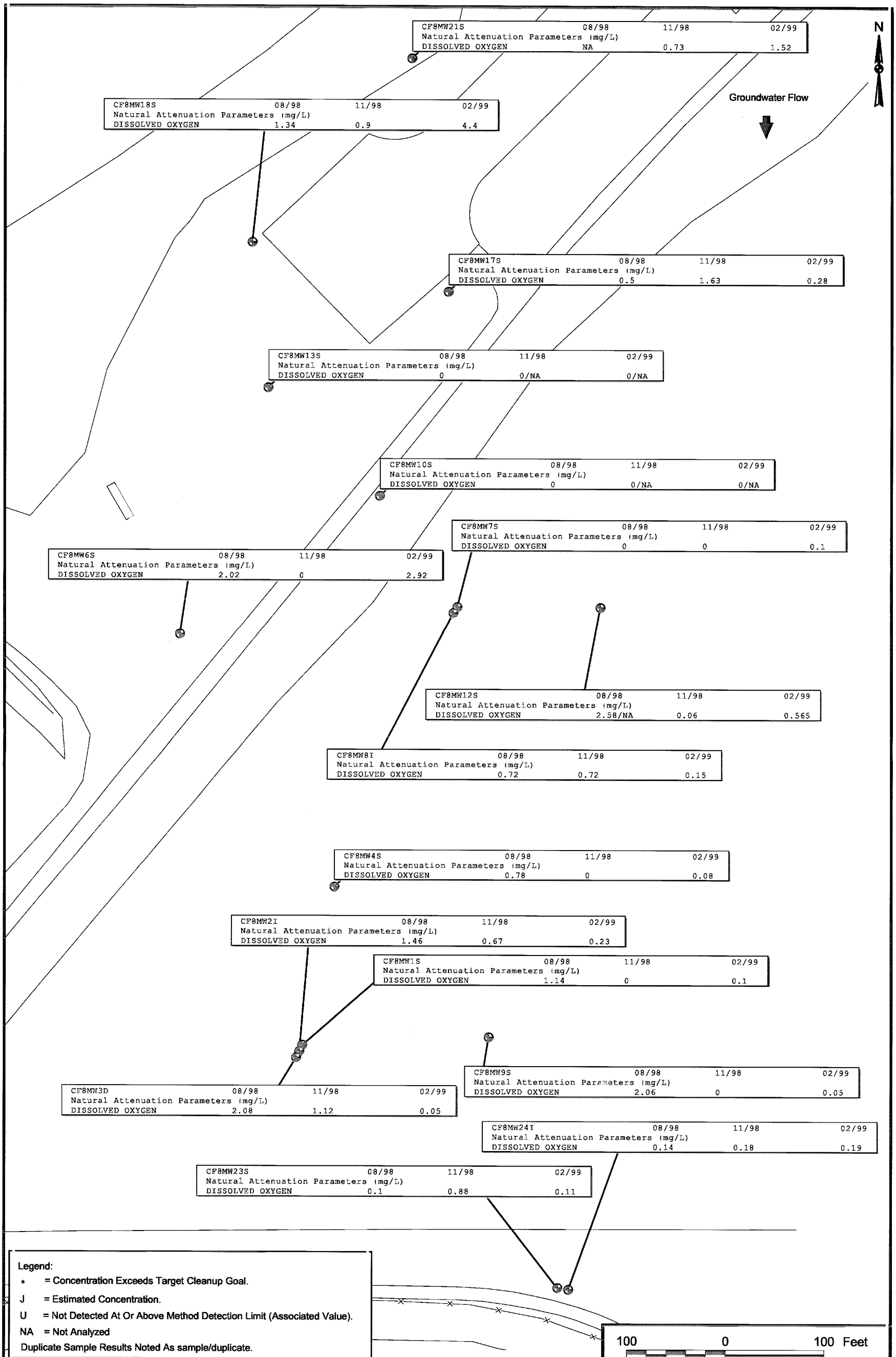

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

DISSOLVED OXYGEN IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
—	
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
DRAWING NO.	REV
Figure 3-5	0

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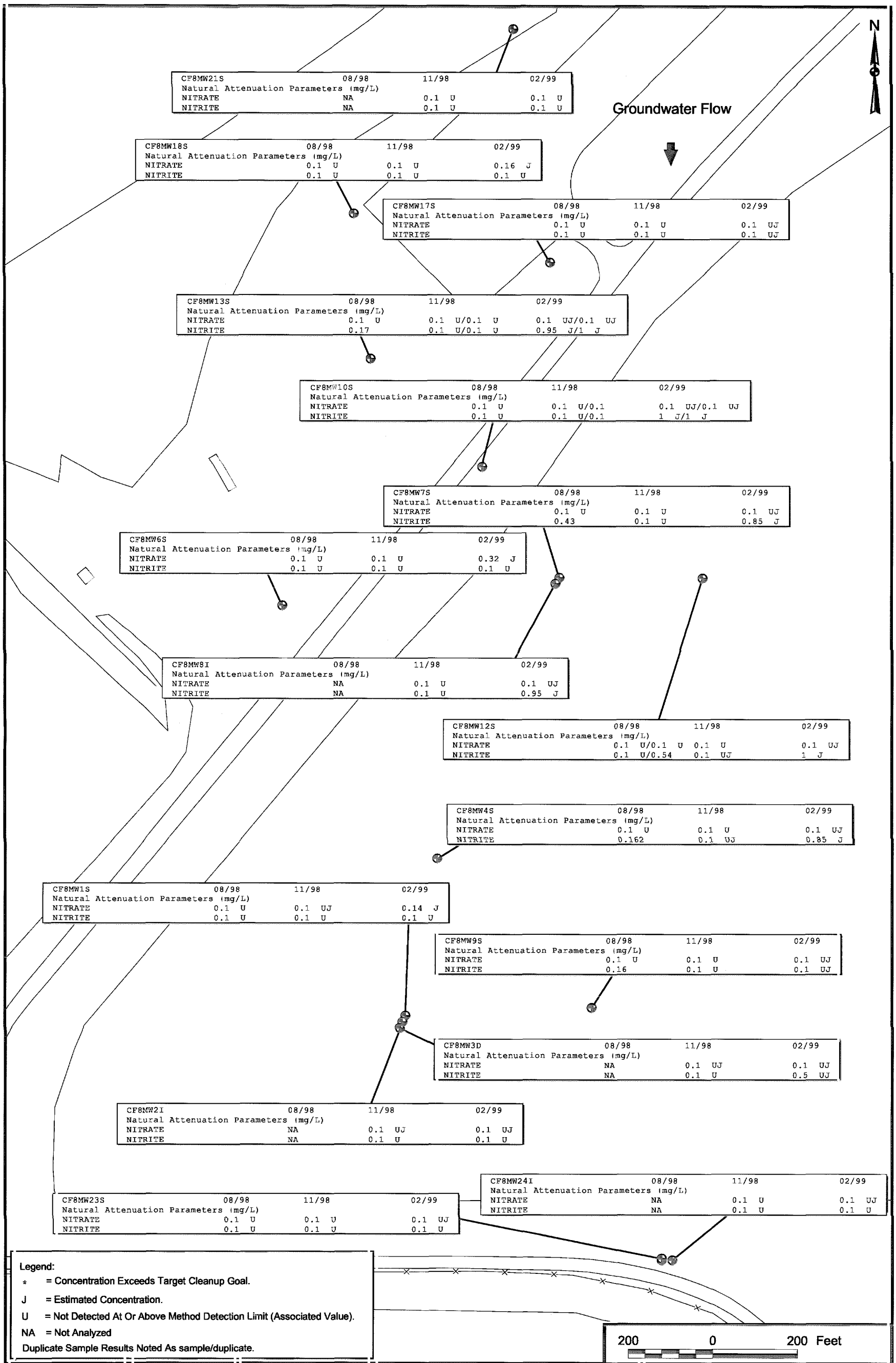


Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NITRATE AND NITRITE IN GROUNDWATER

OPERABLE UNIT 3, SITE 8

NAVAL AIR STATION CECIL FIELD

JACKSONVILLE, FLORIDA

CONTRACT NUMBER —

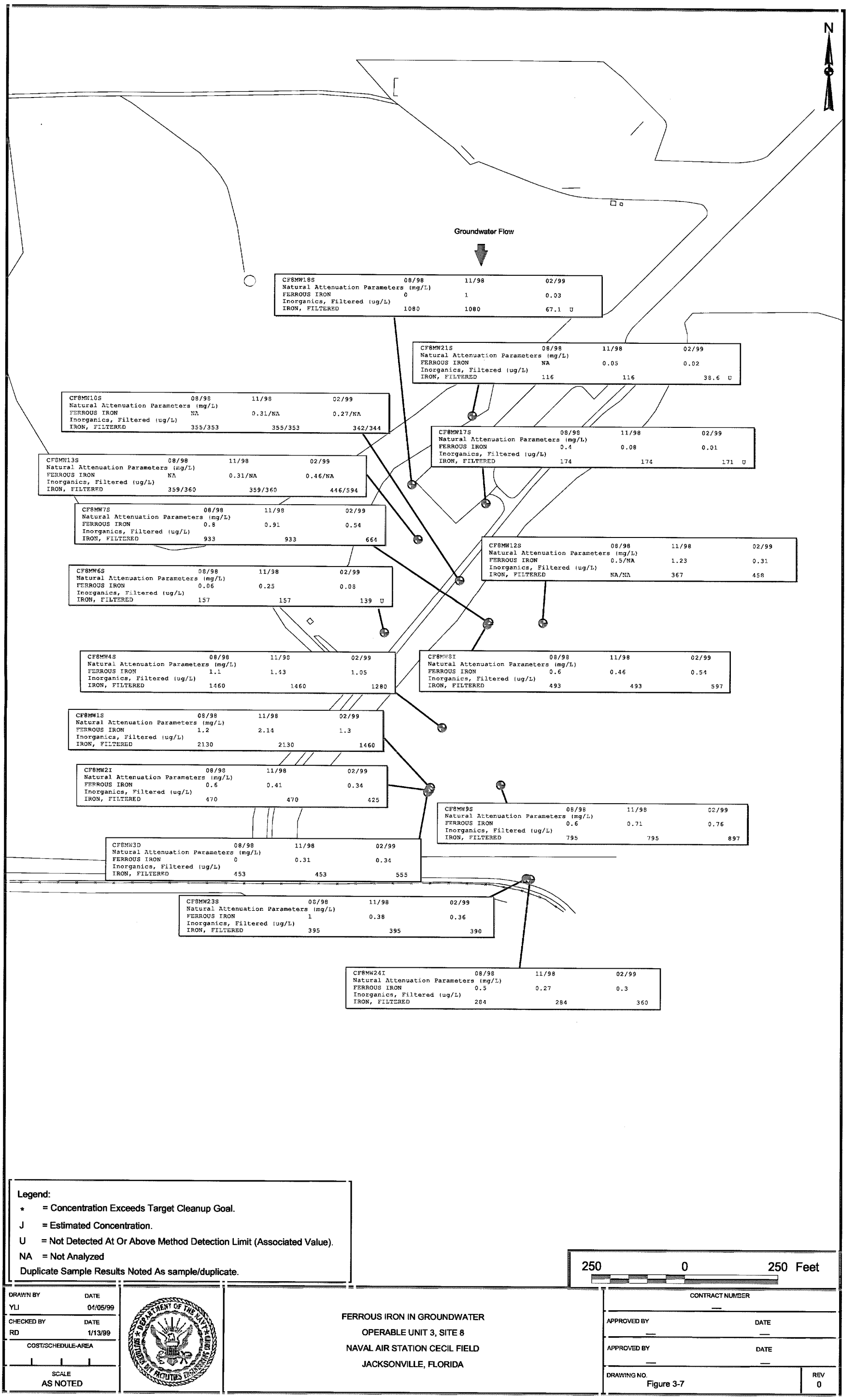
APPROVED BY — DATE —

APPROVED BY — DATE —

DRAWING NO. Figure 3-6

REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-07 FERROUS IRON



Legend:

- * = Concentration Exceeds Target Cleanup Goal.
- J = Estimated Concentration.
- U = Not Detected At Or Above Method Detection Limit (Associated Value).
- NA = Not Analyzed
- Duplicate Sample Results Noted As sample/duplicate.

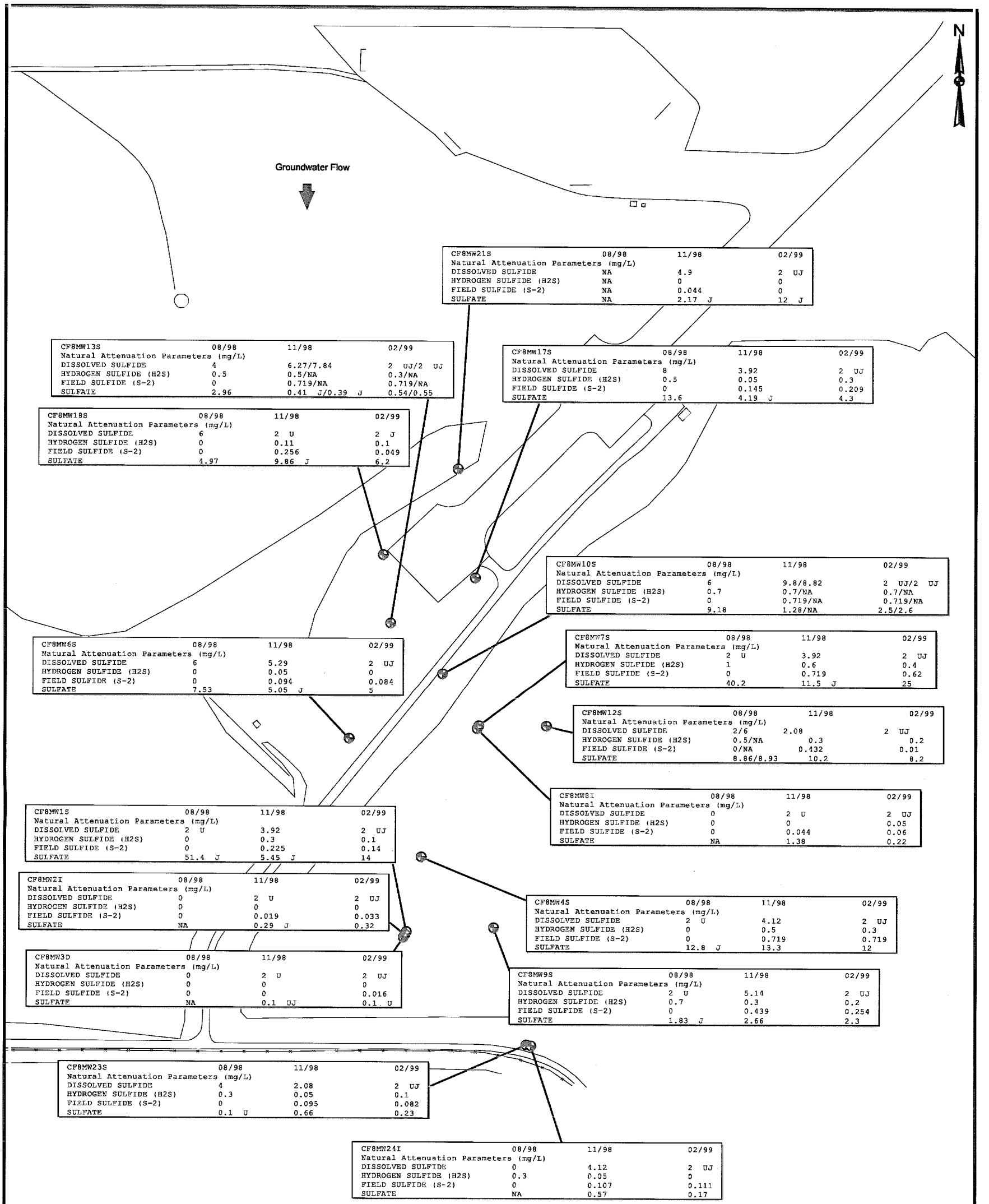
250 0 250 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

FERROUS IRON IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER —
APPROVED BY — DATE —
APPROVED BY — DATE —
DRAWING NO. Figure 3-7 REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-08 SULFATE



CF8MW21S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	NA	4.9	2 UJ
HYDROGEN SULFIDE (H2S)	NA	0	0
FIELD SULFIDE (S-2)	NA	0.044	0
SULFATE	NA	2.17 J	12 J

CF8MW13S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	4	6.27/7.84	2 UJ/2 UJ
HYDROGEN SULFIDE (H2S)	0.5	0.5/NA	0.3/NA
FIELD SULFIDE (S-2)	0	0.719/NA	0.719/NA
SULFATE	2.96	0.41 J/0.39 J	0.54/0.55

CF8MW17S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	8	3.92	2 UJ
HYDROGEN SULFIDE (H2S)	0.5	0.05	0.3
FIELD SULFIDE (S-2)	0	0.145	0.209
SULFATE	13.6	4.19 J	4.3

CF8MW18S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	6	2 U	2 J
HYDROGEN SULFIDE (H2S)	0	0.11	0.1
FIELD SULFIDE (S-2)	0	0.256	0.049
SULFATE	4.97	9.86 J	6.2

CF8MW10S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	6	9.8/8.82	2 UJ/2 UJ
HYDROGEN SULFIDE (H2S)	0.7	0.7/NA	0.7/NA
FIELD SULFIDE (S-2)	0	0.719/NA	0.719/NA
SULFATE	9.18	1.28/NA	2.5/2.6

CF8MW6S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	6	5.29	2 UJ
HYDROGEN SULFIDE (H2S)	0	0.05	0
FIELD SULFIDE (S-2)	0	0.094	0.084
SULFATE	7.53	5.05 J	5

CF8MW7S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	2 U	3.92	2 UJ
HYDROGEN SULFIDE (H2S)	1	0.6	0.4
FIELD SULFIDE (S-2)	0	0.719	0.62
SULFATE	40.2	11.5 J	25

CF8MW12S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	2/6	2.08	2 UJ
HYDROGEN SULFIDE (H2S)	0.5/NA	0.3	0.2
FIELD SULFIDE (S-2)	0/NA	0.432	0.01
SULFATE	8.86/8.93	10.2	8.2

CF8MW8I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	0	2 U	2 UJ
HYDROGEN SULFIDE (H2S)	0	0	0.05
FIELD SULFIDE (S-2)	0	0.044	0.06
SULFATE	NA	1.38	0.22

CF8MW1S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	2 U	3.92	2 UJ
HYDROGEN SULFIDE (H2S)	0	0.3	0.1
FIELD SULFIDE (S-2)	0	0.225	0.14
SULFATE	51.4 J	5.45 J	14

CF8MW2I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	0	2 U	2 UJ
HYDROGEN SULFIDE (H2S)	0	0	0
FIELD SULFIDE (S-2)	0	0.019	0.033
SULFATE	NA	0.29 J	0.32

CF8MW4S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	2 U	4.12	2 UJ
HYDROGEN SULFIDE (H2S)	0	0.5	0.3
FIELD SULFIDE (S-2)	0	0.719	0.719
SULFATE	12.8 J	13.3	12

CF8MW3D	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	0	2 U	2 UJ
HYDROGEN SULFIDE (H2S)	0	0	0
FIELD SULFIDE (S-2)	0	0	0.016
SULFATE	NA	0.1 UJ	0.1 U

CF8MW9S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	2 U	5.14	2 UJ
HYDROGEN SULFIDE (H2S)	0.7	0.3	0.2
FIELD SULFIDE (S-2)	0	0.439	0.254
SULFATE	1.83 J	2.66	2.3

CF8MW23S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	4	2.08	2 UJ
HYDROGEN SULFIDE (H2S)	0.3	0.05	0.1
FIELD SULFIDE (S-2)	0	0.095	0.082
SULFATE	0.1 U	0.66	0.23

CF8MW24I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
DISSOLVED SULFIDE	0	4.12	2 UJ
HYDROGEN SULFIDE (H2S)	0.3	0.05	0
FIELD SULFIDE (S-2)	0	0.107	0.111
SULFATE	NA	0.57	0.17

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99

COST/SCHEDULE-AREA

SCALE
AS NOTED

SULFATE, SULFIDE, AND HYDROGEN SULFIDE IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

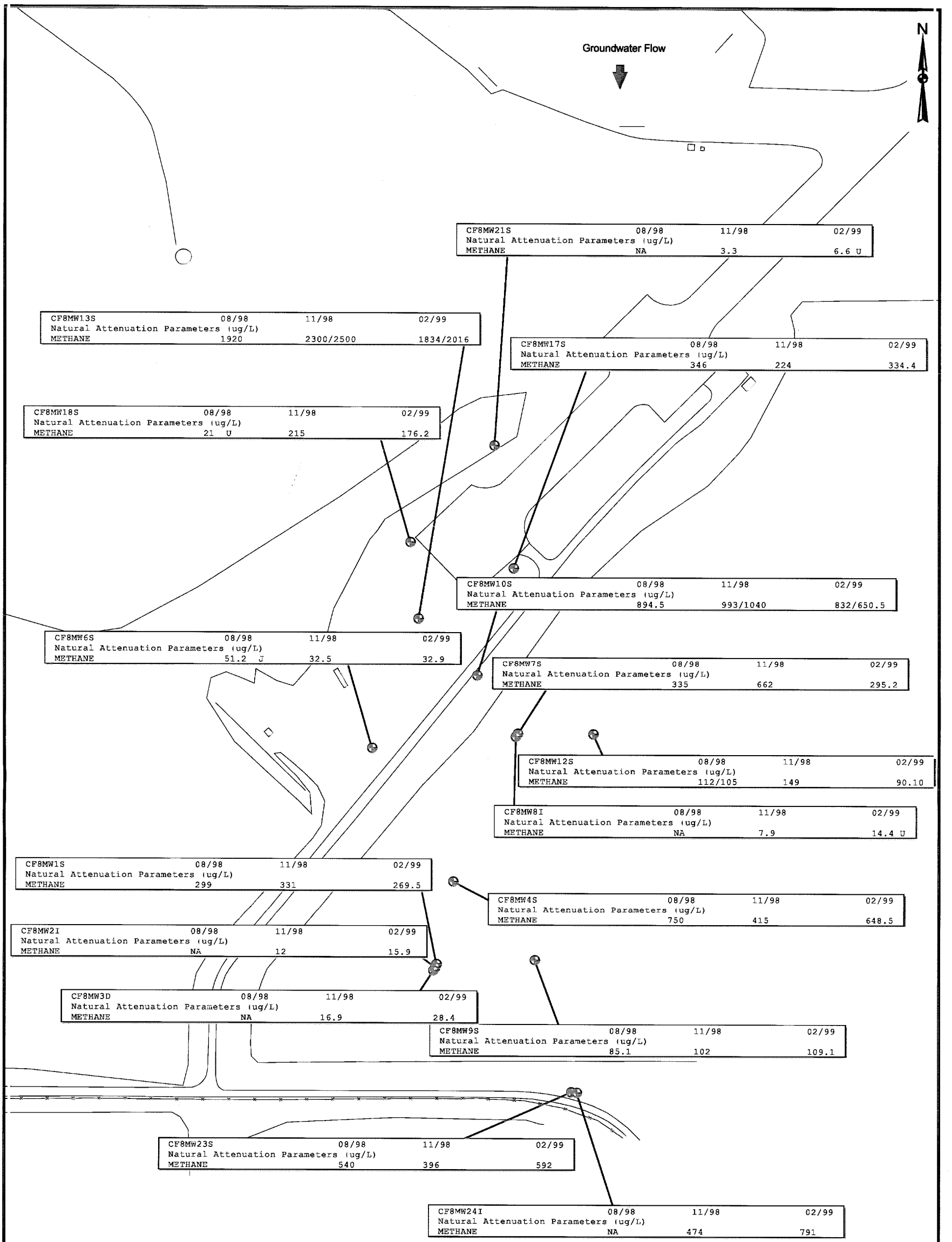
CONTRACT NUMBER —

APPROVED BY — DATE —

APPROVED BY — DATE —

DRAWING NO. Figure 3-8 REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-09 METHANE



Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY YLI	DATE 04/05/99	METHANE, ETHANE, AND ETHENE IN GROUNDWATER OPERABLE UNIT 3, SITE 8 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER —
CHECKED BY RD	DATE 1/13/99		APPROVED BY — DATE —
COST/SCHEDULE-AREA			APPROVED BY — DATE —
SCALE AS NOTED			DRAWING NO. Figure 3-9 REV 0

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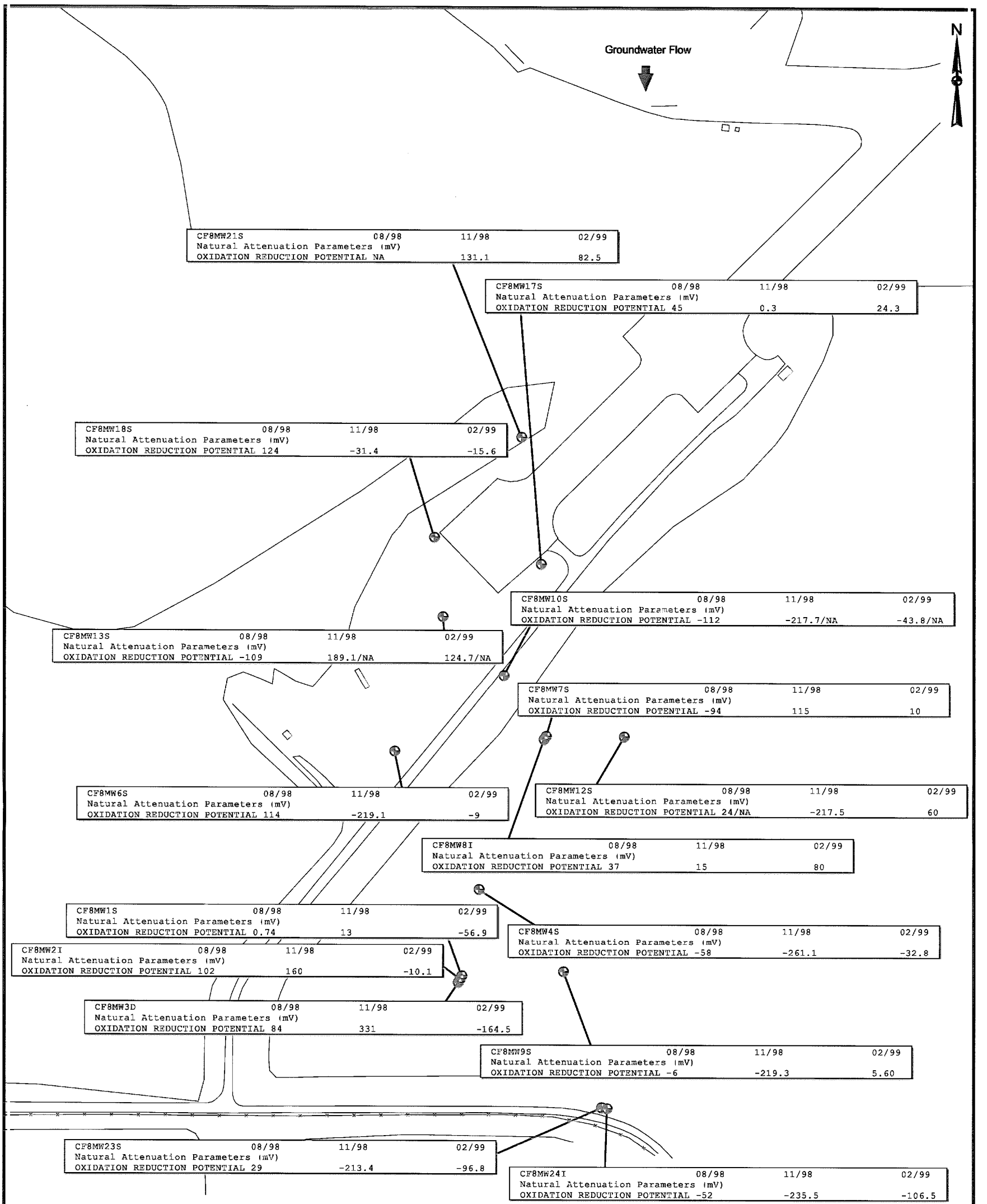

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99

COST/SCHEDULE-AREA

SCALE
AS NOTED

GROUNDWATER OXIDATION REDUCTION POTENTIAL
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER
7898

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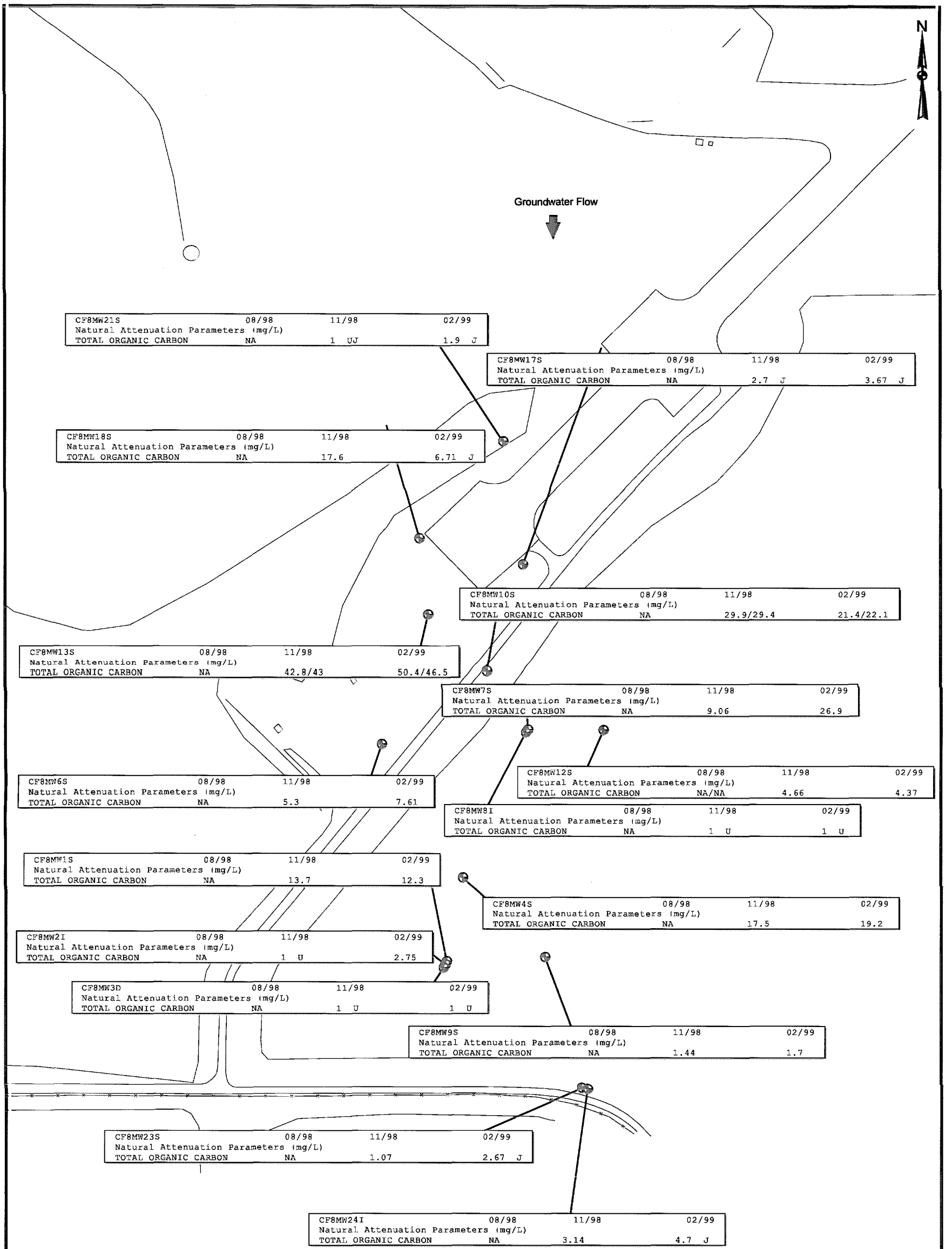
DRAWING NO. Figure 3-10

REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-11 ORGANIC CARBON



Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99

COST/SCHEDULE-AREA

SCALE
AS NOTED

TOTAL ORGANIC CARBON IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7898

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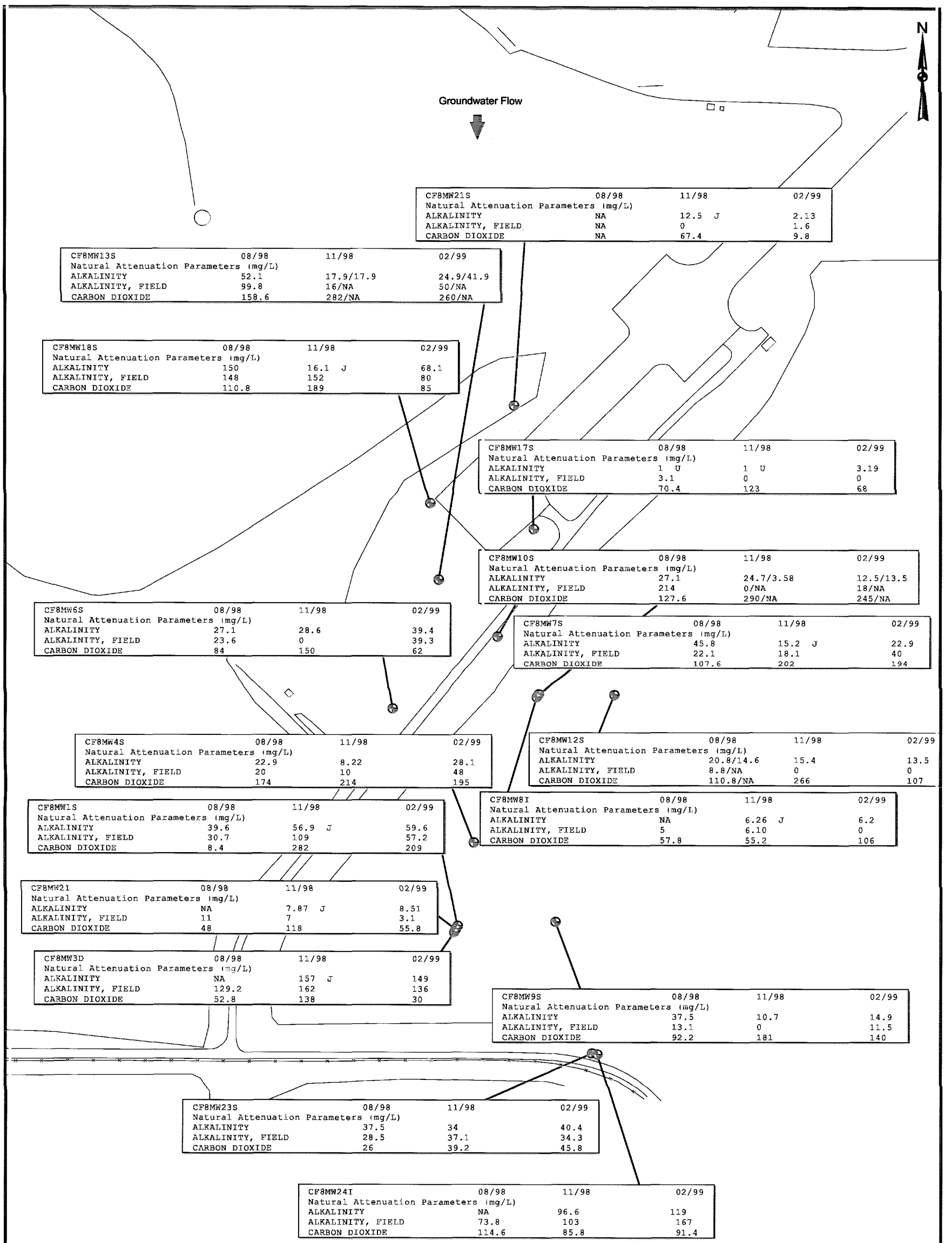
DRAWING NO. Figure 3-11 REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-12 CO2



CF8MW21S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	NA	12.5 J	2.13
ALKALINITY, FIELD	NA	0	1.6
CARBON DIOXIDE	NA	67.4	9.8

CF8MW13S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	52.1	17.9/17.9	24.9/41.9
ALKALINITY, FIELD	99.8	16/NA	50/NA
CARBON DIOXIDE	158.6	282/NA	260/NA

CF8MW18S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	150	16.1 J	68.1
ALKALINITY, FIELD	148	152	80
CARBON DIOXIDE	110.8	189	85

CF8MW17S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	1 U	1 U	3.19
ALKALINITY, FIELD	3.1	0	0
CARBON DIOXIDE	70.4	123	68

CF8MW10S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	27.1	24.7/3.58	12.5/13.5
ALKALINITY, FIELD	214	0/NA	18/NA
CARBON DIOXIDE	127.6	290/NA	245/NA

CF8MW6S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	27.1	28.6	39.4
ALKALINITY, FIELD	23.6	0	39.3
CARBON DIOXIDE	84	150	62

CF8MW7S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	45.8	15.2 J	22.9
ALKALINITY, FIELD	22.1	18.1	40
CARBON DIOXIDE	107.6	202	194

CF8MW4S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	22.9	8.22	28.1
ALKALINITY, FIELD	20	10	48
CARBON DIOXIDE	174	214	195

CF8MW12S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	20.8/14.6	15.4	13.5
ALKALINITY, FIELD	8.8/NA	0	0
CARBON DIOXIDE	110.8/NA	266	107

CF8MW8I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	NA	6.26 J	6.2
ALKALINITY, FIELD	5	6.10	0
CARBON DIOXIDE	57.8	55.2	106

CF8MW1S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	39.6	56.9 J	59.6
ALKALINITY, FIELD	30.7	109	57.2
CARBON DIOXIDE	8.4	282	209

CF8MW2I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	NA	7.87 J	8.51
ALKALINITY, FIELD	11	7	3.1
CARBON DIOXIDE	48	118	55.8

CF8MW3D	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	NA	157 J	149
ALKALINITY, FIELD	129.2	162	136
CARBON DIOXIDE	52.8	138	30

CF8MW9S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	37.5	10.7	14.9
ALKALINITY, FIELD	13.1	0	11.5
CARBON DIOXIDE	92.2	181	140

CF8MW23S	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	37.5	34	40.4
ALKALINITY, FIELD	28.5	37.1	34.3
CARBON DIOXIDE	26	39.2	45.8

CF8MW24I	08/98	11/98	02/99
Natural Attenuation Parameters (mg/L)			
ALKALINITY	NA	96.6	119
ALKALINITY, FIELD	73.8	103	167
CARBON DIOXIDE	114.6	85.8	91.4

Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	AS NOTED

CARBON DIOXIDE AND ALKALINITY IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 7898

APPROVED BY — DATE —

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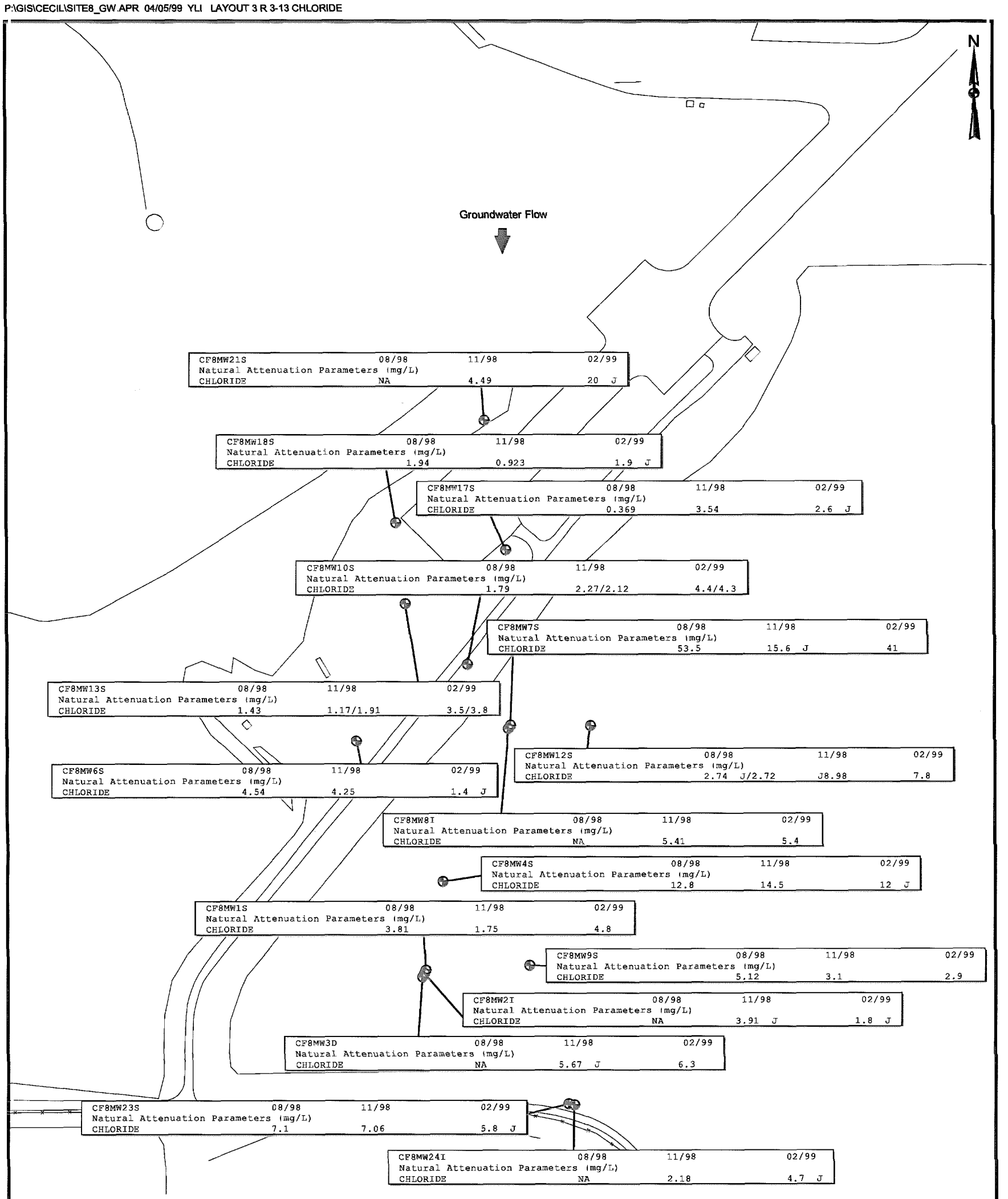
DRAWING NO. Figure 3-12 REV 0

P:\GIS\CECIL\SITE8_GW.APR 04/05/99 YLI LAYOUT 3 R 3-13 CHLORIDE



Legend:

* = Concentration Exceeds Target Cleanup Goal.

J = Estimated Concentration.

U = Not Detected At Or Above Method Detection Limit (Associated Value).

NA = Not Analyzed

Duplicate Sample Results Noted As sample/duplicate.

200 0 200 Feet

DRAWN BY	DATE
YLI	04/05/99
CHECKED BY	DATE
RD	1/13/99
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

CHLORIDE IN GROUNDWATER
OPERABLE UNIT 3, SITE 8
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER —

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DRAWING NO. Figure 3-13 REV 0

Manganese concentrations measured in the field ranged from not detected to 35.9 mg/L. Dissolved manganese concentrations ranged from not detected to 0.037 mg/L. Well CF8MW3D had the highest concentrations of both dissolved and field manganese. The low concentrations of manganese in other wells sampled suggest that manganese reduction is not a biodegradation process at the site.

3.3.4 Sulfate, Sulfide, and Hydrogen Sulfide

In the upgradient well, the sulfate concentration was 12 J mg/L, and hydrogen sulfide (H_2S) and sulfide (S 2) were not detected (see Figure 3-8). Sulfate concentrations in wells within the plumes ranged from 0.22 to 25 mg/L, with six of eight of these wells having concentrations less than the upgradient sulfate concentration. Hydrogen sulfide concentrations in wells within the plumes ranged from 0.05 to 0.7 mg/L, and concentrations in downgradient wells ranged from not detected to 0.3 mg/L. Field sulfide concentrations ranged from 0.01 mg/L in wells within the plumes and from 0.016 to 0.14 mg/L in downgradient wells. Total sulfide was detected in well CF8MW18S at a concentration of 2 J mg/L.

In certain areas of the site, decreasing sulfate concentrations and associated increasing sulfide and hydrogen sulfide concentrations suggest that sulfate reduction may be occurring.

3.3.5 Orthophosphate

Orthophosphate concentrations were below detection limits in 13 of 16 wells sampled at the site. Due to the lack of phosphate as an electron acceptor in the groundwater system, it is unlikely that phosphate reduction is a significant portion of the total biodegradation capacity of the aquifer. In addition, phosphorus is one of several important nutrients for microbes and its absence may limit the overall biodegradation capacity of the aquifer.

3.3.6 Methane, Ethane, and Ethene

Methane was not detected in the upgradient well or in well CF8MW8I, but was detected in the remaining wells at the site at concentrations ranging from 15.9 mg/L to 2,016 µg/L (see Figure 3-9). The presence of methane above background concentrations is a key indicator of the biodegradation of hydrocarbons, with methane concentrations greater than 0.5 mg/L indicating strong reducing conditions. Methane concentrations within and downgradient of both plumes, with the exception of CF8MW8I, strongly indicate that biodegradation via methanogenesis is occurring at the site.

Ethane and ethene, by-products of reductive dechlorination of chlorinated ethanes, were not detected in third quarter samples from the site.

3.3.7 Oxidation-Reduction Potential

ORP values less than 50 millivolts (mV) indicate that reductive dechlorination is possible, and values less than -100 mV indicate that this process is likely. ORP in the upgradient well was 82.5 mV, and ORP values in wells within and downgradient of the plumes ranged from -164.5 to 124.7 mV (see Figure 3-10). ORP values less than 50 mV were measured in six of eight wells within the VOC and petroleum-related plumes, indicating that, in general, reductive dechlorination is possible in these areas. In downgradient wells, ORP values measured during the third quarter were less than 50 mV, and values in two of six downgradient wells were less than –100 mV. These data indicate that reductive dechlorination is likely over a large portion of the site.

3.3.8 Total Organic Carbon

The results of TOC analyses are shown on Figure 3-11. During third-quarter sampling, the TOC concentration in the upgradient well (CF8MW21S) was 1.9 J mg/L and the concentration in the cross-gradient well (CF8MW12S) was 4.37 mg/L. TOC concentrations ranged from not detected to 50.4 mg/L in wells located within and downgradient of the VOC and petroleum-related plumes. The low concentrations of TOC in the upgradient and cross-gradient wells suggest that a minimal amount of organic carbon is present in the aquifer to act as the primary substrate for reductive dechlorination.

3.3.9 Carbon Dioxide

The carbon dioxide concentration in the upgradient well was 9.8 mg/L, and carbon dioxide concentrations in the other wells ranged from 30 mg/L to 260 mg/L, as shown on Figure 3-12. Carbon dioxide is an end product of both aerobic and anaerobic biodegradation, and the elevated concentrations (greater than twice background) detected in site wells is a strong indication that biodegradation is occurring. In addition, because carbon dioxide is utilized during methanogenesis, these concentrations are likely biased low.

3.3.10 Alkalinity

The upgradient laboratory alkalinity concentration was 2.13 mg/L, and the upgradient field alkalinity concentration was 1.6 mg/L (see Figure 3-12). Alkalinity concentrations greater than two times background concentrations suggest that biodegradation is occurring. Laboratory alkalinity results from wells within the plumes ranged from 3.19 to 68.1 mg/L, with seven of eight wells having alkalinity values greater than two times the upgradient concentration. For downgradient wells, laboratory alkalinity values ranged from 8.51 to 149 mg/L, with all detected concentrations greater than twice the concentration in the

upgradient well. Field alkalinity values follow the same pattern, with the majority of concentrations within the plumes (0 to 80 mg/L) and in downgradient wells (3.1 to 167 mg/L) greater than twice the upgradient concentration. Elevated alkalinity concentrations provide a strong indication that biodegradation is occurring at the site.

3.3.11 Chloride

Chloride is released into groundwater during solvent dechlorination; therefore, a downgradient increase in chloride concentrations provides strong evidence that dechlorination is occurring. The upgradient concentration of chloride was 20 J mg/L (see Figure 3-13). Chloride concentrations in wells within and downgradient of the VOC and petroleum-related plumes ranged from 1.4 to 41 mg/L. One well, CF8MW7S, had a chloride concentration significantly greater than the upgradient concentration. Chloride concentrations in wells within and downgradient of the VOC plume were slightly, but generally not significantly, greater than those within and downgradient of the petroleum-related plume.

3.3.12 Biochemical Oxygen Demand

BOD was measured in four of the 16 groundwater samples ranging in concentration from 2 J mg/L to 24.6 mg/L. BOD was above detection limits in CF8MW10S and CF8MW13S, the wells in which COCs were detected, but also was above detection limits in CF8MW23S and CF8MW18S in which no COCs were detected. Since the biodegradation of the chlorinated hydrocarbons is occurring under anaerobic conditions, the results of this parameter provide little information.

3.3.13 Chemical Oxygen Demand

COD concentrations ranged from 15.8 mg/L to 179 mg/L in the 16 wells sampled at the site. There did not appear to be a correlation between COD and COC concentrations. Since the biodegradation of the chlorinated hydrocarbons is occurring under anaerobic conditions, the results of this parameter provide little information.

3.3.14 pH

pH values at the site ranged from 4.73 to 7.42 standard units. The optimal range for reductive dechlorination is 5 to 9 standard units. The pH values measured at the site are within the tolerable range for biodegradation.

3.3.15 Specific Conductivity

Specific conductivity ranged from 0.015 mS/cm to 0.334 mS/cm. This minor variation indicates that all groundwater samples were from a consistent source.

3.3.16 Temperature

Temperature values ranged from approximately 19.3 ^{0}C to 21.9 ^{0}C across the site during the February 1999 sampling event. These temperatures are within the range of values required for bioremediation to occur.

3.4 SUMMARY OF ANALYSIS

The reduction in VOC concentration since the RI in 1995 is the strongest line of evidence that natural attenuation is occurring at OU 3, Site 8. In general, VOC concentrations have decreased compared to the baseline/first quarter and second quarter groundwater monitoring events. The concentrations of naphthalene and 2-methlynaphthalene have remained approximately the same compared to the baseline/first quarter and second quarter results.

The geochemical data also suggest that biodegradation natural attenuation is occurring at the site. The concentrations of by-product indicators of biodegradation (methane, ferrous iron, sulfide, and carbon dioxide, alkalinity, and chloride) suggest that biodegradation is taking place. The most significant anaerobic biodegradation processes indicated by site geochemical data include iron-reduction, methanogenesis, and sulfate-reduction in certain areas of the site.

3.5 CONCLUSIONS AND RECOMMENDATIONS

Long-term monitoring of the well network will be performed in accordance with the Work Plan (TtNUS, 1998a) and the Work Plan Addendum (TtNUS, 1998b) for the next quarter. This sampling program will be followed to determine whether significant temporal changes are observed as a result of seasonal variation. Based on the analytical data obtained during the four sampling events, a comprehensive annual monitoring report will be prepared. This report will contain data interpretation regarding whether natural attenuation is occurring at the site and recommendations for future sampling.

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APPENDIX A

ANALYTICAL LABORATORY RESULTS

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-03-9-114

TO: **MR. M. SPERANZA** **DATE: MARCH 16, 1999**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOA/SVOA/GAS**
CTO 039 – NAS CECIL FIELD, FLORIDA
SDG 9902061

SAMPLES: 10/Aqueous

CEF-8-DUP1-03	CEF-8-DUP2-03
CEF-8-MW-03D-03	CEF-8-MW-04S-03
CEF-8-MW-07S-03	CEF-8-MW-08I-03
CEF-8-MW-09S-03	CEF-8-MW-10S-03
CEF-8-MW-12S-03	CEF-8-MW-13S-03

OVERVIEW

The sample set for CTO 039, SDG 9902061, Naval Air Station (NAS) Cecil Field, Florida consists of ten (10) aqueous environmental samples. The samples were analyzed for selected volatile, semivolatile, and dissolved gas organic compounds. Two field duplicate pairs (CEF-8-DUP1-03/CEF-8-MW-13S-03 and CEF-8-DUP2-03/CEF-8-MW-10S-03) were included within this SDG.

The samples were collected by Tetra Tech, NUS on February 8th and 9th, 1999, and analyzed by GPL Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatiles, semivolatile, and dissolved gas samples were analyzed according to SW 846 Methods 8260B and 8270C and RSK SOP-147 & 175, respectively. The data in this SDG was validated with regard to the following parameters:

- Data Completeness
- * Holding Times
- Initial/continuing calibrations
- Laboratory method/field quality control blank results
- Field Duplicate Precision
- * Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

VOLATILE FRACTION

The following table summarizes the maximum concentrations of volatile organic compounds found in the method blank.

Compound	Concentration	Aqueous Action Level
Methylene chloride	2.4µg/L	24.0µg/L

Blank Actions

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < Action level; report value followed by a U.
- Value > CRQL and > Action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive results for methylene chloride reported at concentrations below the action level was qualified according to the blank action table.

Samples CEF-8-DUP2-03 and CEF-8-MW-10S-03 were diluted 5X due to the presence of 1,1-dichloroethane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

It should be noted sample CEF-8-MW-10S-03RE was labeled incorrectly on the electronic data. By using the laboratory identification as a reference, the aforementioned sample was corrected on the electronic data.

Positive results reported at concentrations below the Contract Required Quantitation Limits (CRQL) were qualified as estimated (J).

SEMIVOLATILE FRACTION

Positive results reported at concentrations below the Contract Required Quantitation Limits (CRQL) were qualified as estimated (J).

DISSOVLED GAS FRACTION

The following table summarizes the maximum concentrations of dissolved gas organic compounds found in the method blank.

Compound	Concentration	Aqueous Action Level
Methane	3.0µg/L	15.0µg/L

Blank Actions

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < Action level; report value followed by a U.
- Value > CRQL and > Action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive results for methane reported at concentrations below the action level was qualified according to the blank action table.

It should be noted several dissolved gas samples were not qualified for according to the blank action table. This is a result of elevated detection limits for methane.

Samples CEF-8-DUP1-03 and CEF-8-MW-13S-03 were diluted 200X due to the presence of methane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

Samples CEF-8-DUP2-03 and CEF-8-MW-04S-03 were diluted 50X due to the presence of methane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

Sample CEF-8-MW-10S-03 was diluted 25X due to the presence of methane above the calibration range of the instrument. The result from the dilution was transposed over the undiluted sample result and used for validation purposes.

Sample CEF-8-MW-07S-03 was diluted 20X due to the presence of methane above the calibration range of the instrument. The result from the dilution was transposed over the undiluted sample result and used for validation purposes.

Samples CEF-8-MW-09S-03 and CEF-8-MW-12S-03 were diluted 5X due to the presence of methane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

It should be noted the laboratory failed to initially provide the reanalysis of sample CEF-MW-04S-03. The laboratory was notified and in return provided the reanalysis for the aforementioned sample.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Methylene chloride and methane were detected as blank contaminants.

Other Issues Affecting Data Quality: Several volatile and dissolved gas samples were analyzed at a dilution.

MEMO TO: MR. M. SPERANZA
DATE: MARCH 16, 1999 – PAGE 4

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

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich
Chemist/Data Validator

Tetra Tech, NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-DUP1-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15266.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.3	
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	0.9	J
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	3.5	J
108-38-3	m,p-xylene	6.8	
95-47-6	o-xylene	3.0	J
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-DUP1-03DL

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09BDL

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: F15310.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/24/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10.0	U
75-01-4	Vinyl chloride	5.0	U
75-00-3	Chloroethane	25.0	U
75-35-4	1,1-Dichloroethene	25.0	U
75-09-2	Methylene chloride	25.0	U
156-60-5	Trans-1,2-dichloroethene	25.0	U
75-34-3	1,1-Dichloroethane	25.0	U
156-59-2	Cis-1,2-dichloroethene	25.0	U
67-66-3	Chloroform	25.0	U
71-55-6	1,1,1-Trichloroethane	25.0	U
56-23-5	Carbon tetrachloride	15.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	15.0	U
79-01-6	Trichloroethene	15.0	U
78-87-5	1,2-Dichloropropane	25.0	U
10061-01-5	Cis-1,3-dichloropropene	1.0	U
108-88-3	Toluene	25.0	U
10061-02-6	Trans-1,3-dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	25.0	U
127-18-4	Tetrachloroethene	15.0	U
108-90-7	Chlorobenzene	25.0	U
100-41-4	Ethylbenzene	3.5	JD
108-38-3	m,p-xylene	7.7	JD
95-47-6	o-xylene	5.4	JD
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-DUP2-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-11A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15267.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	51.5	
75-09-2	Methylene chloride	0.6	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	174.7	E
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	14.7	
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	2.5	
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.2	
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	2.1	J
108-38-3	m,p-xylene	4.7	J
95-47-6	o-xylene	2.8	J
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-DUP2-03DL

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-11BDL

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: F15311.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/24/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.0	U
75-01-4	Vinyl chloride	5.0	U
75-00-3	Chloroethane	25.0	U
75-35-4	1,1-Dichloroethene	54.1	D
75-09-2	Methylene chloride	25.0	U
156-60-5	Trans-1,2-dichloroethene	25.0	U
75-34-3	1,1-Dichloroethane	188.5	D
156-59-2	Cis-1,2-dichloroethene	25.0	U
67-66-3	Chloroform	25.0	U
71-55-6	1,1,1-Trichloroethane	13.2	JD
56-23-5	Carbon tetrachloride	15.0	U
71-43-2	Benzene	2.7	JD
107-06-2	1,2-Dichloroethane	15.0	U
79-01-6	Trichloroethene	15.0	U
78-87-5	1,2-Dichloropropane	25.0	U
10061-01-5	Cis-1,3-dichloropropene	1.0	U
108-88-3	Toluene	5.3	JD
10061-02-6	Trans-1,3-dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	25.0	U
127-18-4	Tetrachloroethene	15.0	U
108-90-7	Chlorobenzene	25.0	U
100-41-4	Ethylbenzene	25.0	U
108-38-3	m,p-xylene	4.5	JD
95-47-6	o-xylene	25.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-03D-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-01A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15248.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: not dec. Date Analyzed: 02/19/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-04S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-01A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15262.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	16.4	
75-09-2	Methylene chloride	0.6	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	44.3	
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.1	
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	0.7	J
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	0.6	J
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-7S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-07A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15265.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	6.0	
75-09-2	Methylene chloride	0.7	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	10.8	
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	0.5	J
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-08I-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-13A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15268.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	0.7	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-09S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-03A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15249.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: not dec. Date Analyzed: 02/19/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	1.1	J
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	1.0	J
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-10S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15264.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	50.5	
75-09-2	Methylene chloride	0.6	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	161.8	E
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	13.8	
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	2.7	
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.4	
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	2.1	J
108-38-3	m,p-xylene	4.6	J
95-47-6	o-xylene	2.7	J
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-10S-03DL

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05BDL

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: F15309.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/24/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10.0	U
75-01-4	Vinyl chloride	5.0	U
75-00-3	Chloroethane	25.0	U
75-35-4	1,1-Dichloroethene	56.4	D
75-09-2	Methylene chloride	3.8	JD
156-60-5	Trans-1,2-dichloroethene	25.0	U
75-34-3	1,1-Dichloroethane	192.1	D
156-59-2	Cis-1,2-dichloroethene	25.0	U
67-66-3	Chloroform	25.0	U
71-55-6	1,1,1-Trichloroethane	13.4	JD
56-23-5	Carbon tetrachloride	15.0	U
71-43-2	Benzene	2.5	JD
107-06-2	1,2-Dichloroethane	15.0	U
79-01-6	Trichloroethene	15.0	U
78-87-5	1,2-Dichloropropane	25.0	U
10061-01-5	Cis-1,3-dichloropropene	1.0	U
108-88-3	Toluene	5.3	JD
10061-02-6	Trans-1,3-dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	25.0	U
127-18-4	Tetrachloroethene	15.0	U
108-90-7	Chlorobenzene	25.0	U
100-41-4	Ethylbenzene	25.0	U
108-38-3	m,p-xylene	4.5	JD
95-47-6	o-xylene	2.6	JD
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-12S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-15A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15269.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	0.9	JB
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-13S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-03A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15263.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. Date Analyzed: 02/22/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.4	
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	9.1	
108-38-3	m,p-xylene	35.2	
95-47-6	o-xylene	24.1	
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-13S-03DL

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-03BDL

Sample wt/vol: 5.000 (g/ml) ML Lab File ID: F15308.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: not dec. _____ Date Analyzed: 02/24/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND (ug/L or ug/Kg)	UG/L	Q
74-87-3	Chloromethane	10.0	U
75-01-4	Vinyl chloride	5.0	U
75-00-3	Chloroethane	25.0	U
75-35-4	1,1-Dichloroethene	25.0	U
75-09-2	Methylene chloride	3.1	JD
156-60-5	Trans-1,2-dichloroethene	25.0	U
75-34-3	1,1-Dichloroethane	25.0	U
156-59-2	Cis-1,2-dichloroethene	25.0	U
67-66-3	Chloroform	25.0	U
71-55-6	1,1,1-Trichloroethane	25.0	U
56-23-5	Carbon tetrachloride	15.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	15.0	U
79-01-6	Trichloroethene	15.0	U
78-87-5	1,2-Dichloropropane	25.0	U
10061-01-5	Cis-1,3-dichloropropene	1.0	U
108-88-3	Toluene	25.0	U
10061-02-6	Trans-1,3-dichloropropene	1.0	U
79-00-5	1,1,2-Trichloroethane	25.0	U
127-18-4	Tetrachloroethene	15.0	U
108-90-7	Chlorobenzene	25.0	U
100-41-4	Ethylbenzene	3.4	JD
108-38-3	m,p-xylene	7.8	JD
95-47-6	o-xylene	5.5	JD
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8DUP103

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09C

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08737.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	62	
105-67-9	2-Methylnaphthalene	62	
117-81-7	bis(2-Ethylhexyl)phthalate	2	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8DUP103DL

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09CDL

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08792.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/19/99

Injection Volume: 1.0 (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	61	JD
105-67-9	2-Methylnaphthalene	60	JD
117-81-7	bis(2-Ethylhexyl)phthalate	41	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8DUP203

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-11C

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08794.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/19/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	24	
105-67-9	2-Methylnaphthalene	16	
117-81-7	bis(2-Ethylhexyl)phthalate	3	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MWO3D03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-01C

Sample wt/vol: 990 (g/ml) ML Lab File ID: H08742.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MWO4S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-01C

Sample wt/vol: 960 (g/ml) ML Lab File ID: H08733.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

8 2026

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW7S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-07C

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08736.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MWO8I03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-13C

Sample wt/vol: 990 (g/ml) ML Lab File ID: H08739.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW09S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-03C

Sample wt/vol: 980 (g/ml) ML Lab File ID: H08793.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/19/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

8 2023

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW10S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05C

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08744.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	23	
105-67-9	2-Methylnaphthalene	15	
117-81-7	bis(2-Ethylhexyl)phthalate	2	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EF8MW10S03RE

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05CRE

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08735.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	23	
105-67-9	2-Methylnaphthalene	16	
117-81-7	bis(2-Ethylhexyl)phthalate	2	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW12S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-15C

Sample wt/vol: 1000 (g/ml) ML Lab File ID: H08740.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW13S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-03C

Sample wt/vol: 980 (g/ml) ML Lab File ID: H08734.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	62	
105-67-9	2-Methylnaphthalene	59	
117-81-7	bis(2-Ethylhexyl)phthalate	2	J

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-DUP1-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14251.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	2587.3	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-DUP1-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-09F 200X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14252.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 200.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	2016.0	BD
74-84-0	Ethane	1160.0	U
74-85-1	Ethylene	1248.0	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-DUP2-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-11F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14253.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	598.0	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-DUP2-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-11F 50X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14254.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	650.5	BD
74-84-0	Ethane	290.0	U
74-85-1	Ethylene	312.0	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-03D-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-01F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13926.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	28.4	B
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-D4S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-01F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14242.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	612.1	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.
CEF-8-MW-D4S-04 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT
Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8
Matrix: (soil/water) WATER Lab Sample ID: 9902078-01F 50X
Sample wt/vol: 10 (g/ml) ML Lab File ID: N14243.D
Level: (low/med) LOW Date Received: 02/09/99
% Moisture: decanted:(Y/N) N Date Extracted:
Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99
Injection Volume: 500. (uL) Dilution Factor: 50.0
GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-82-8	Methane	648.5	BD
74-84-0	Ethane	290.0	U
74-85-1	Ethylene	312.0	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-7S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-07G

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14248.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	272.2	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-7S-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-07G 20X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14249.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

(mg/L or mg/Kg) MG/L

CAS NO.	COMPOUND		Q
74-82-8	Methane	295.2	BD
74-84-0	Ethane	116.0	U
74-85-1	Ethylene	124.8	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-08J-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-13G

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14255.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	14.4	B
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-09S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-03F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13928.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

(mg/L or mg/Kg) MG/L

CAS NO.	COMPOUND		Q
74-82-8	Methane	100.7	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

EF-8-MW-09S-03 D

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902061-03F 5X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13929.D

Level: (low/med) LOW Date Received: 02/09/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	109.1	BD
74-84-0	Ethane	29.0	U
74-85-1	Ethylene	31.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-10S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05G

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14246.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	904.8	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

EF-8-MW-10S-03 D

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-05G 25X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14247.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 25.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	832.0	BD
74-84-0	Ethane	145.0	U
74-85-1	Ethylene	156.0	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-12S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-15G

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14256.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	62.4	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

EF-8-MW-12S-03 D

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-15G 5X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14257.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	90.1	BD
74-84-0	Ethane	29.0	U
74-85-1	Ethylene	31.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-13S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-03F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14244.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	2417.5	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

TPHC ANALYSIS DATA SHEET

Client ID.

EF-8-MW-13S-03 D

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: _____ SAS No.: _____ SDG No.: CF39-8

Matrix: (soil/water) WATER Lab Sample ID: 9902078-03F 200X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N14245.D

Level: (low/med) LOW Date Received: 02/10/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: _____

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/23/99

Injection Volume: 500. (uL) Dilution Factor: 200.0

GPC Cleanup: (Y/N) N pH: _____

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(mg/L or mg/Kg) MG/L	Q
74-82-8	Methane	1834.0	BD
74-84-0	Ethane	1160.0	U
74-85-1	Ethylene	1248.0	U

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-03-9-089

TO: **M. SPERANZA** **DATE:** **MARCH 16, 1999**

FROM: **GRETCHEN PHIPPS** **COPIES:** **DV FILE**

SUBJECT: **DATA VALIDATION – ALUMINUM, IRON, DISSOLVED IRON, DISSOLVED MANGANESE, ALKALINITY, BOD, COD, CHLORIDE, DISSOLVED SUFLIDE, NITRATE, NITRITE, ORTHOPHOSPHATE, SULFATE AND TOC**
CTO 039 - NAS CECIL FIELD
SDG - 9902027

SAMPLES: 16/Aqueous/

CEF-8-MW-01S-03	CEF-8-MW-01S-03-F
CEF-8-MW-02I-03	CEF-8-MW-02I-03-F
CEF-8-MW-06S-03	CEF-8-MW-06S-03-F
CEF-8-MW-17S-03	CEF-8-MW-17S-03-F
CEF-8-MW-18S-03	CEF-8-MW-18S-03-F
CEF-8-MW-21S-03	CEF-8-MW-21S-03-F
CEF-8-MW-23S-03	CEF-8-MW-23S-03-F
CEF-8-MW-24I-03	CEF-8-MW-24I-03-F

Overview

The sample set for CTO 039, NAS Cecil Field, SDG 9902027, consists of sixteen (16) aqueous environmental samples.

All samples, with exception to those designated –F, were analyzed for aluminum, iron, alkalinity, biological oxygen demand (BOD), chemical oxygen demand (COD), chloride, dissolved sulfide, nitrate, nitrite, orthophosphate, sulfate and total organic carbon (TOC). The samples were collected by Tetra Tech NUS on and February 2, 3 and 5, 1999 and analyzed by GPL Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control criteria. Metals analyses were conducted using SW-846 method 6010B. BOD analyses were conducted using EPA method 405.1. COD analyses were conducted using EPA method 410.1. Chloride, Nitrate, Nitrite, 0-Phosphate and Sulfate analyses were conducted using EPA method 300. Dissolved sulfide analyses were conducted using EPA method 376.1. Alkalinity analyses were conducted using EPA method 310.1. TOC analyses were conducted using SW 846 method 9060.

The data was evaluated based on the following parameters:

*
- Data Completeness
- Holding Times
- Calibration Verifications
- Laboratory Blank Analyses

* - All quality control criteria were met for this parameter.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Holding Times

The 48 hour holding time for nitrate, nitrite and orthophosphate were exceeded by one (1) day affecting sample CEF-8-MW-17S-03. The nondetected results reported for nitrate, nitrite and orthophosphate in the affected sample were qualified as estimated, "UJ".

The holding time for sulfate was exceeded by four (4) days for samples CEF-8-MW-21S-03. The positive result reported for sulfate in the affected sample was qualified as estimated, "J".

The holding time for TOC was exceeded by one (1) to two (2) days affecting samples CEF-8-MW-17S-03, CEF-8-MW-18S-03, CEF-8-MW-21S-03 CEF-8-MW-23S-03 and CEF-8-MW-24I-03. The positive results reported for TOC in the affected samples were qualified as estimated, "J".

The holding time for dissolved sulfide was exceeded by three (3) to six (6) days affecting all samples. The positive and nondetected results reported for dissolved sulfide were qualified as estimated, "J" and "UJ", respectively.

Calibration Verification

An Initial Calibration Verification (ICV) Percent Recovery (%R) for BOD affecting samples CEF-8-MW-17S-03, CEF-8-MW-18S-03, CEF-8-MW-21S-03, CEF-8-MW-23S-03 and CEF-8-MW-24I-03 was >110% quality control limit. The positive results reported for BOD in the affected samples were qualified as estimated, "J".

Several Continuing Calibration Verifications (CCVs) %Rs for chloride affecting all samples with exception to CEF-8-MW-01S-03 were <90% quality control limit. The positive results reported for chloride in the affected samples were qualified as estimated, "J".

Several CCVs %Rs for dissolved sulfide affecting all samples were <90% quality control limit. The nondetected results reported for dissolved sulfide were qualified as estimated, "UJ".

Several CCVs %Rs for nitrate affecting all samples with exception to CEF-8-MW-21S-03 were <90% quality control limit. The positive and nondetected results reported for nitrate in the affected samples were qualified as estimated, "J" and "UJ", respectively.

Several CCVs %Rs for orthophosphate affecting samples CEF-8-MW-17S-03, CEF-8-MW-18S-03, CEF-8-MW-21S-03, CEF-8-MW-23S-03 and CEF-8-MW-24I-03 were <90% quality control limit. The positive and nondetected results reported for orthophosphate in the affected samples were qualified as estimated, "J" and "UJ".

Laboratory Blank Analyses

The following contaminants were present in the laboratory method blanks at the following maximum concentrations:

Affected samples: All

Analyte	Maximum Concentration	Action Level(aqueous)
Aluminum	95.4µg/L	477µg/L
Iron	52.6µg/L	263µg/L
Manganese	0.8µg/L	4.0µg/L

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when determining blank contamination. Positive results less than the blank action level for aluminum, iron and manganese were qualified, "U", as a result of blank contamination.

Notes

The samples IDs were changed from GW to MW. The data reviewer amended the Form 1s to reflect the sample ID change.

Executive Summary

Laboratory Performance: The holding times for nitrate, nitrite, orthophosphate, sulfate, TOC and dissolved sulfide were exceeded affecting one or more samples. The ICV or CCVs %Rs for BOD, chloride, dissolved sulfide, nitrate and orthophosphate were outside the 90-110% quality control limits affecting several samples. Aluminum, iron and manganese were present in the laboratory method blanks.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

Project: NAS CECIL FIELD CTO-039

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902027-01 M GAP 3-16-99
Client ID: CEF-8-~~GW~~-21S-03

Matrix: WATER
Collected: 02/02/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	2.13	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/04/99	02/09/99 AS
Chloride	300.0	20	0.50	mg/L	5		02/04/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	2.13	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/04/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/04/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/04/99 HH
Sulfate	300.0	12	0.50	mg/L	5		03/06/99 HH
Total Organic Carbon	MCAWW 415.1	1.91	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	15.8	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902037-01 M GAP 3-16-99
Client ID: CEF-8-~~GW~~-17S-03

Matrix: WATER
Collected: 02/03/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	3.19	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/04/99	02/09/99 AS
Chloride	300.0	2.6	0.10	mg/L	1		02/05/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	3.19	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/05/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Sulfate	300.0	4.3	0.10	mg/L	1		02/05/99 HH
Total Organic Carbon	MCAWW 415.1	3.67	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	26.3	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902037-03
Client ID: CEF-8-~~GW~~M-18S-03 GAP 3-16-99

Matrix: WATER
Collected: 02/03/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	68.1	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	2.05	2.00	mg/L	1	02/04/99	02/09/99 AS
Chloride	300.0	1.9	0.10	mg/L	1		02/05/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	68.1	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Nitrate	300.0	0.16	0.10	mg/L	1		02/05/99 HH
O-Phosphate	300.0	0.19	0.10	mg/L	1		02/05/99 HH
Sulfate	300.0	6.2	1.0	mg/L	10		02/05/99 HH
Total Organic Carbon	MCAWW 415.1	6.71	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	36.8	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	2.00	2.00	mg/L	1		02/15/99 JH

GP ID: 9902037-05
Client ID: CEF-8-~~GW~~M-23S-03 GAP 3-16-99

Matrix: WATER
Collected: 02/03/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	40.4	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	2.00	2.00	mg/L	1	02/04/99	02/09/99 AS
Chloride	300.0	5.8	0.10	mg/L	1		02/05/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	40.4	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/05/99 HH
O-Phosphate	300.0	0.50	0.10	mg/L	1		02/05/99 HH
Sulfate	300.0	0.23	0.10	mg/L	1		02/05/99 HH
Total Organic Carbon	MCAWW 415.1	2.67	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	21.0	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902037-07 M
Client ID: CEF-8-GW-24I-03 GP 3-16-99

Matrix: WATER
Collected: 02/03/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	119	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/04/99	02/09/99 AS
Chloride	300.0	4.7	0.10	mg/L	1		02/05/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	119	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/05/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/05/99 HH
Sulfate	300.0	0.17	0.10	mg/L	1		02/05/99 HH
Total Organic Carbon	MCAWW 415.1	4.70	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	36.8	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902057-01 M
Client ID: CEF-8-MW-06S-03 GP 3-16-99

Matrix: WATER
Collected: 02/05/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	39.4	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/06/99	02/11/99 AS
Chloride	300.0	1.4	0.10	mg/L	1		02/06/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	39.4	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Nitrate	300.0	0.32	0.10	mg/L	1		02/06/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Sulfate	300.0	5.0	0.20	mg/L	2		02/10/99 HH
Total Organic Carbon	MCAWW 415.1	7.61	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	34.2	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902057-03
Client ID: CEF-8-MW-01S-03

Matrix: WATER
Collected: 02/05/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	59.6	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/06/99	02/11/99 AS
Chloride	300.0	4.8	0.50	mg/L	5		02/10/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	59.6	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Nitrate	300.0	0.14	0.10	mg/L	1		02/06/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Sulfate	300.0	14	0.50	mg/L	5		02/10/99 HH
Total Organic Carbon	MCAWW 415.1	12.3	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	47.4	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902057-05
Client ID: CEF-8-MW-02I-03

Matrix: WATER
Collected: 02/05/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	8.51	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/06/99	02/11/99 AS
Chloride	300.0	1.8	0.10	mg/L	1		02/06/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	8.51	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/06/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/06/99 HH
Sulfate	300.0	0.32	0.10	mg/L	1		02/06/99 HH
Total Organic Carbon	MCAWW 415.1	2.75	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	44.7	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-01S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-03

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	243			P
7439-89-6	Iron	1420			P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-01S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-04

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	1460			P
7439-96-5	Manganese	37.1			P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-02I-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-05

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	94.8	B		P
7439-89-6	Iron	447			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-02I-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-06

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	425			P
7439-96-5	Manganese	4.6	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-06S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-01

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	234			P
7439-89-6	Iron	130			P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-06S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902057-02

Level (low/med): LOW Date Received: 2/6/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	139			P
7439-96-5	Manganese	6.9	B		P

Color Before: YELLOW Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~-17S-03 GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-01

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	111	B		P
7439-89-6	Iron	174			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-17S-03 (FILTERED)
CAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-02

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	171			P
7439-96-5	Manganese	2.9	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-18S-03
CTAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-03

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	72.4	B		P
7439-89-6	Iron	56.1	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

GPL Laboratories, LLLP

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~-18S-03 (FILTERED)
GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-04

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	67.1	B		P
7439-96-5	Manganese	6.5	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-21S-03
GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902027-01

Level (low/med): LOW Date Received: 2/3/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	177	B		P
7439-89-6	Iron	29.4	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

GPL Laboratories, LLLP

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-21S-03 (FILTERED)
GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902027-02

Level (low/med): LOW Date Received: 2/3/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	38.6	B		P
7439-96-5	Manganese	7.5	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-23S-03
GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-05

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	87.0	B		P
7439-89-6	Iron	386			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

GPL Laboratories, LLLP

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-GW-23S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-06

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	390			P
7439-96-5	Manganese	12.5	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-24I-03
GPR 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-07

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	80.8	B		P
7439-89-6	Iron	286			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-~~GW~~M-24I-03 (FILTERED)
GAP 3-16-99

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS027

Matrix (soil/water): WATER Lab Sample ID: 9902037-08

Level (low/med): LOW Date Received: 2/4/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	360			P
7439-96-5	Manganese	14.6	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-03-9-101

TO:	**M. SPERANZA**	**DATE:**	**MARCH 16, 1999**
FROM:	**GRETCHEN PHIPPS**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – ALUMINUM, IRON, DISSOLVED IRON, DISSOLVED MANGANESE, ALKALINITY, BOD, COD, CHLORIDE, DISSOLVED SUFLIDE, NITRATE, NITRITE, ORTHOPHOSPHATE, SULFATE AND TOC**
CTO 039 - NAS CECIL FIELD
SDG - 9902061

SAMPLES: 20/Aqueous/

CEF-8-MW-DUP1-03	CEF-8-MW-DUP1-03-F
CEF-8-MW-DUP2-03	CEF-8-MW-DUP2-03-F
CEF-8-MW-03D-03	CEF-8-MW-03D-03-F
CEF-8-MW-04S-03	CEF-8-MW-04S-03-F
CEF-8-MW-07S-03	CEF-8-MW-07S-03-F
CEF-8-MW-08I-03	CEF-8-MW-08I-03-F
CEF-8-MW-09S-03	CEF-8-MW-09S-03-F
CEF-8-MW-10S-03	CEF-8-MW-10S-03-F
CEF-8-MW-12S-03	CEF-8-MW-12S-03-F
CEF-8-MW-13S-03	CEF-8-MW-13S-03-F

Overview

The sample set for CTO 039, NAS Cecil Field, SDG 9902061, consists of twenty (20) aqueous environmental samples. Four (4) field duplicate pairs (CEF-8-MW-13S-03 / CEF-8-MW-DUP1-03, CEF-8-MW-13S-03-F / CEF-8-MW-DUP1-03-F, CEF-8-MW-10S-03 / CEF-8-MW-DUP2-03 and CEF-8-MW-10S-03-F/ CEF-8-MW-DUP2-03-F) were included within this SDG.

All samples, with exception to those designated –F, were analyzed for aluminum, iron, alkalinity, biological oxygen demand (BOD), chemical oxygen demand (COD), chloride, dissolved sulfide, nitrate, nitrite, orthophosphate, sulfate and total organic carbon (TOC). The samples designate –F were analyzed for dissolved iron and dissolved manganese. The samples were collected by Tetra Tech NUS on and February 8 and 9, 1999 and analyzed by GPL Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control criteria. Metals analyses were conducted using SW-846 method 6010B. BOD analyses were conducted using EPA method 405.1. COD analyses were conducted using EPA method 410.1. Chloride, Nitrate, Nitrite, O-Phosphate and Sulfate analyses were conducted using EPA method 300. Dissolved sulfide analyses were conducted using EPA method 376.1. Alkalinity analyses were conducted using EPA method 310.1. TOC analyses were conducted using SW 846 method 9060.

The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Calibration Verifications
• Laboratory Blank Analyses

* - All quality control criteria were met for this parameter.

The attached Table 1 summarizes the validation recommendations which were based on the following information:

Calibration Verification

An Initial Calibration Verification (ICV) Percent Recovery (%R) and several Continuing Calibration Verifications (CCVs) for dissolved sulfide affecting all samples were <90% quality control limit. The nondetected results reported for dissolved sulfide were qualified as estimated, "UJ".

The ICV %R for BOD affecting all samples was <90% quality control limit. The positive and nondetected results reported for BOD were qualified as estimated, "J" and "UJ", respectively.

A CCV %R for chloride affecting sample CEF-8-MW-04S-03 was <90% quality control limit. The positive result reported for chloride in the affected sample was qualified as estimated, "J".

The ICV and several CCV %Rs for nitrate affecting all samples were <90% quality control limit. The nondetected results reported for nitrate were qualified as estimated, "UJ".

The ICV and several CCV %Rs for nitrite affecting all samples were <90% quality control limit. The positive and nondetected results reported for nitrite were qualified as estimated, "J" and "UJ", respectively.

The ICV and several CCV %Rs for orthophosphate affecting all samples were <90% quality control limit. The positive and nondetected results reported for orthophosphate were qualified as estimated, "J" and "UJ", respectively.

Laboratory Blank Analyses

The following contaminants were present in the laboratory method blanks at the following maximum concentrations:

Affected samples: All

Analyte	Maximum Concentration	Action Level(aqueous)
Aluminum	32.7µg/L	163.5µg/L
Iron	38.3µg/L	191.5µg/L

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when determining blank contamination. Positive results less than the blank action level for aluminum were qualified, "U", as a result of blank contamination. No validation action was taken for iron as all results reported for iron were greater than the blank action level.

Notes

A comparison of field duplicate pairs (CEF-8-MW-13S-03 / CEF-8-MW-DUP1-03, CEF-8-MW-13S-03-F / CEF-8-MW-DUP1-03-F, CEF-8-MW-10S-03 / CEF-8-MW-DUP2-03 and CEF-8-MW-10S-03-F/ CEF-8-MW-DUP2-03-F) is included in Appendix C. However, no validation action is required per regional guidance.

Executive Summary

Laboratory Performance: The ICV and/or CCVs %Rs for BOD, chloride, dissolved sulfide, nitrate, nitrite and orthophosphate were <90% quality control. Aluminum and iron were present in the laboratory method blanks.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitles "Navy Installation Restoration Laboratory Quality Assurance Guide." (NFESC 2/96).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Gretchen A. Phipps

Tetra Tech NUS
Gretchen A. Phipps

Tetra Tech NUS
Joseph A. Samchuck
Quality Control Officer

Attachments:

1. Appendix A - Qualified Analytical Data
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-DUP1-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-09

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	161	B		P
7439-89-6	Iron	575			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-DUP1-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-10

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	594			P
7439-96-5	Manganese	8.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-DUP2-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-11

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	117	B		P
7439-89-6	Iron	366			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-DUP2-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-12

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	344			P
7439-96-5	Manganese	2.1	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-03D-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902061-01

Level (low/med): LOW Date Received: 2/9/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	46.9	B		P
7439-89-6	Iron	520			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-03D-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902061-02

Level (low/med): LOW Date Received: 2/9/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	555			P
7439-96-5	Manganese	37.4			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-04S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-01

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	255			P
7439-89-6	Iron	1190			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-04S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-02

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	1280			P
7439-96-5	Manganese	14.7	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-7S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-07

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	205			P
7439-89-6	Iron	661			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-7S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-08

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	664			P
7439-96-5	Manganese	4.8	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-08I-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-13

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	42.0	B		P
7439-89-6	Iron	563			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-08I-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-14

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	597			P
7439-96-5	Manganese	4.4	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-09S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902061-03

Level (low/med): LOW Date Received: 2/9/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	55.9	B		P
7439-89-6	Iron	918			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

-1-

INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-09S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902061-04

Level (low/med): LOW Date Received: 2/9/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	897			P
7439-96-5	Manganese	9.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-10S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-05

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	128	B		P
7439-89-6	Iron	348			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-10S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-06

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	342			P
7439-96-5	Manganese	2.2	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-12S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-15

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	126	B		P
7439-89-6	Iron	473			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-12S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-16

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	458			P
7439-96-5	Manganese	12.1	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-13S-03

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-03

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	200			P
7439-89-6	Iron	584			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC CLP

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

CEF-8-MW-13S-03 (FILTERED)

Contract:

Lab Code: GPL Case No.: SAS No.: SDG NO.: NUS061

Matrix (soil/water): WATER Lab Sample ID: 9902078-04

Level (low/med): LOW Date Received: 2/10/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

CAS No.	Analyte	Concentration	C	Q	M
7439-89-6	Iron	446			P
7439-96-5	Manganese	6.0	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

Project: NAS CECIL FIELD CTO-039 SITE 8

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902061-01
Client ID: CEF-8-MW-03D-03

Matrix: WATER
Collected: 02/08/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	149	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	2.24	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	6.3	0.50	mg/L	5		02/10/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	149	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.50	mg/L	5		02/10/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
Sulfate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
Total Organic Carbon	MCAWW 415.1	BQL	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	15.8	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902061-03
Client ID: CEF-8-MW-09S-03

Matrix: WATER
Collected: 02/08/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	14.9	1.00	mg/L	1	02/10/99	02/10/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	2.9	0.10	mg/L	1		02/10/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/10/99	02/10/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	14.9	1.00	mg/L	1	02/10/99	02/10/99 SN
Nitrite	300.0	BQL	0.10	mg/L	1		02/10/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
O-Phosphate	300.0	0.31	0.10	mg/L	1		02/10/99 HH
Sulfate	300.0	2.3	0.10	mg/L	1		02/10/99 HH
Total Organic Carbon	MCAWW 415.1	1.70	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	26.3	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039 SITE 8

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902078-01
Client ID: CEF-8-MW-04S-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	28.1	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	12	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	28.1	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	0.85	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	12	0.50	mg/L	5		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	19.2	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	68.4	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902078-03
Client ID: CEF-8-MW-13S-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	24.9	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	3.5	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	24.9	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	0.95	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/10/99 HH
Sulfate	300.0	0.54	0.10	mg/L	1		02/10/99 HH
Total Organic Carbon	MCAWW 415.1	50.4	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	179	10.0	mg/L	2	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039 SITE 8

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902078-05
Client ID: CEF-8-MW-10S-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	12.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	8.90	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	4.4	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	12.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	1.0	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	2.5	0.10	mg/L	1		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	21.4	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	76.3	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902078-07
Client ID: CEF-8-MW-7S-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	22.9	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	41	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	22.9	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	0.85	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	25	0.50	mg/L	5		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	26.9	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	78.9	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039 SITE 8

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902078-09
Client ID: CEF-8-DUP1-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	41.6	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	11.4	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	3.8	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	41.6	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	1.0	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	0.55	0.10	mg/L	1		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	46.5	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	168	10.0	mg/L	2	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902078-11
Client ID: CEF-8-DUP2-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	13.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	24.6	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	4.3	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	13.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	1.0	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	2.6	0.10	mg/L	1		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	22.1	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	84.2	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Project: NAS CECIL FIELD CTO-039 SITE 8

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9902078-13
Client ID: CEF-8-MW-08I-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	6.20	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	5.4	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	6.20	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	0.95	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	0.22	0.10	mg/L	1		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	BQL	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	26.3	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

GP ID: 9902078-15
Client ID: CEF-8-MW-12S-03

Matrix: WATER
Collected: 02/09/99

Parameter	Method	Result	Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Alkalinity	MCAWW 310.1	13.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Biological Oxygen Demand	MCAWW 405.1	BQL	2.00	mg/L	1	02/10/99	02/10/99 SN
Chloride	300.0	7.8	0.50	mg/L	5		02/11/99 HH
Carbonate Alkalinity	SM 4500-CO2	BQL	1.00	mg/L	1	02/22/99	02/22/99 SN
Bicarbonate Alkalinity	MCAWW 310.1	13.5	1.00	mg/L	1	02/22/99	02/22/99 SN
Nitrite	300.0	1.0	0.50	mg/L	5		02/11/99 HH
Nitrate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
O-Phosphate	300.0	BQL	0.10	mg/L	1		02/11/99 HH
Sulfate	300.0	8.2	0.50	mg/L	5		02/11/99 HH
Total Organic Carbon	MCAWW 415.1	4.37	1.00	mg/L	1		03/04/99 DCB
Chemical Oxygen Demand	MCAWW 410.4	76.3	5.00	mg/L	1	02/19/99	02/20/99 SN
Sulfide	MCAWW 376.1	BQL	2.00	mg/L	1		02/15/99 JH

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-03-9-087

TO: **MR. M. SPERANZA** **DATE: MARCH 16, 1999**

FROM: **JUSTIN ORBICH** **CC: DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOA/SVOA/GAS**
CTO 039 – NAS CECIL FIELD, FLORIDA
SDG 9902027

SAMPLES: 8/Aqueous

CEF-8-MW-01S-03	CEF-8-MW-02I-03
CEF-8-MW-06S-03	CEF-8-MW-17S-03
CEF-8-MW-18S-03	CEF-8-MW-21S-03
CEF-8-MW-23S-03	CEF-8-MW-24I-03

OVERVIEW

The sample set for CTO 039, SDG 9902027, Naval Air Station (NAS) Cecil Field, Florida consists of eight (8) aqueous environmental samples. The samples were analyzed for selected Target Compound List (TCL) volatile, semivolatile, and dissolved gas organic compounds. No field duplicates were included within this SDG.

The samples were collected by Tetra Tech, NUS on February 2nd, 3rd, and 5th, 1999, and analyzed by GPL Laboratories. All analyses were performed in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The volatiles, semivolatile, and dissolved gas samples were analyzed according to SW 846 Methods 8260B and 8270C and RSK SOP-147 & 175, respectively. The data in this SDG was validated with regard to the following parameters:

* • Data Completeness
* • Holding Times
• Initial/continuing calibrations
• Laboratory method/field quality control blank results
* • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified analytical results are presented in Appendix A.

VOLATILE FRACTION

Positive results reported at concentrations below the Contract Required Quantitation Limits (CRQL) were qualified as estimated (J).

SEMIVOLATILE FRACTION

The following table summarizes the maximum concentrations of semivolatile organic compounds found in the method blank.

Compound	Concentration	Aqueous Action Level
Bis(2-ethylhexyl)phthalate	9.0µg/L	90.0µg/L

Blank Actions

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < Action level; report value followed by a U.
- Value > CRQL and > Action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive results for bis(2-ethylhexyl)phthalate reported at concentrations below the action level were qualified according to the blank action table.

Positive results reported at concentrations below the Contract Required Quantitation Limits (CRQL) were qualified as estimated (J).

DISSOVLED GAS FRACTION

The following table summarizes the maximum concentrations of dissolved gas organic compounds found in the method blank.

Compound	Concentration	Aqueous Action Level
Methane	3.0µg/L	15.0µg/L

Blank Actions

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a U.
- Value > CRQL and < Action level; report value followed by a U.
- Value > CRQL and > Action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive results for methane reported at concentrations below the action level was qualified according to the blank action table.

Samples CEF-8-MW-01S-03 and CEF-8-MW-18S-03 were diluted 10X due to the presence of methane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

Sample CEF-8-MW-17S-03 was diluted 20X due to the presence of methane above the calibration range of the instrument. The result from the dilution was transposed over the undiluted sample results and used for validation purposes.

Samples CEF-8-MW-23S-03 and CEF-8-MW-24I-03 were diluted 50X due to the presence of methane above the calibration range of the instrument. The results from the dilution were transposed over the undiluted sample results and used for validation purposes.

MEMO TO: MR. M. SPERANZA
DATE: MARCH 16, 1999 – PAGE 3

EXECUTIVE SUMMARY

Laboratory Performance Issues: Bis(2-ethylhexyl)phthalate and methane were detected as blank contaminants.

Other Issues Affecting Data Quality: Several dissolved gas samples were analyzed at a dilution.

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

"I attest that the data referenced herein was validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Justin Orbich
Chemist/Data Validator

Tetra Tech, NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Tetra Tech, NUS

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-01S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-03B

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15238.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: not dec. _____ Date Analyzed: 02/19/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-02I-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-05A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15239.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: not dec. _____ Date Analyzed: 02/19/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-MW-06S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-01B

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15240.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: not dec. _____ Date Analyzed: 02/19/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-GW-17S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-01A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15185.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: not dec. _____ Date Analyzed: 02/15/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	1.5	J
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-GW-18S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-03A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15186.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: not dec. _____ Date Analyzed: 02/15/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-GW-21~~8~~-03 S
~~90~~ 3-11-99

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902027-01A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15167.D

Level: (low/med) LOW Date Received: 02/03/99

% Moisture: not dec. _____ Date Analyzed: 02/15/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	0.6	J
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-GW-23S-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-05A

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15187.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: not dec. _____ Date Analyzed: 02/15/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF-8-GW-24I-03

Lab Name: GPLL LABORATORIES Contract: NUS_SOUTHD

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-07B

Sample wt/vol: 25.000 (g/ml) ML Lab File ID: F15196.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: not dec. _____ Date Analyzed: 02/17/99

GC Column: RTXVOA ID: 0.53 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	2.0	U
75-01-4	Vinyl chloride	1.0	U
75-00-3	Chloroethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	Trans-1,2-dichloroethene	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	Cis-1,2-dichloroethene	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
56-23-5	Carbon tetrachloride	3.0	U
71-43-2	Benzene	1.0	U
107-06-2	1,2-Dichloroethane	3.0	U
79-01-6	Trichloroethene	3.0	U
78-87-5	1,2-Dichloropropane	5.0	U
10061-01-5	Cis-1,3-dichloropropene	0.2	U
108-88-3	Toluene	5.0	U
10061-02-6	Trans-1,3-dichloropropene	0.2	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	3.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
108-38-3	m,p-xylene	5.0	U
95-47-6	o-xylene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	0.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW01S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9901057-03C

Sample wt/vol: 980 (g/ml) ML Lab File ID: H08726.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/17/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MW02I03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9901057-05C

Sample wt/vol: 970 (g/ml) ML Lab File ID: H08741.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/18/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	3	J

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8MWO6S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9901057-01C

Sample wt/vol: 980 (g/ml) ML Lab File ID: H08723.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/12/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/17/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
105-67-9	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8GW17S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-01C

Sample wt/vol: 980 (g/ml) ML Lab File ID: D14455.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/06/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/10/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	J
91-57-6	2-Methylnaphthalene	4	J
117-81-7	bis(2-Ethylhexyl)phthalate	1	JB

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8GW18S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-02C

Sample wt/vol: 980 (g/ml) ML Lab File ID: D14463.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted: 02/06/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/10/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
91-57-6	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	B

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8GW21503

Lab Name: GPL_LABORATORIES Contract: NUS_SOU

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902027-01C

Sample wt/vol: 970 (g/ml) ML Lab File ID: P00224.D

Level: (low/med) LOW Date Received: 2/3/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 2/4/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 2/6/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
91-57-6	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	JB

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8GW23S03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-03C

Sample wt/vol: 980 (g/ml) ML Lab File ID: D14464.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/06/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/10/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
91-20-3	Naphthalene	6	U
91-57-6	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	15	B

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

CEF8GW24I03

Lab Name: GPL_LABORATORIES Contract: NUS_SOUT

Lab Code: GPLL Case No.: N/A SAS No.: N/A SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-04C

Sample wt/vol: 980 (g/ml) ML Lab File ID: D14504.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: _____ decanted:(Y/N) N Date Extracted: 02/06/99

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 02/12/99

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: 7

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
91-20-3	Naphthalene	6	U
91-57-6	2-Methylnaphthalene	6	U
117-81-7	bis(2-Ethylhexyl)phthalate	4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-01S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-03F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13923.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	223.7	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-01S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-03F 10X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13924.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	269.5	BD
74-84-0	Ethane	58.0	U
74-85-1	Ethylene	62.4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-02I-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-05F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13925.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	15.9	B
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-MW-06S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902057-01F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13922.D

Level: (low/med) LOW Date Received: 02/06/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	32.9	B
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-17S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-01F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13913.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	330.1	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-17S-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-01F 20X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13914.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 20.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	334.4	BD
74-84-0	Ethane	116.0	U
74-85-1	Ethylene	124.8	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-18S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-02F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13915.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	156.8	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-18S-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-02F 10X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13917.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 10.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	176.2	BD
74-84-0	Ethane	58.0	U
74-85-1	Ethylene	62.4	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-215-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902027-01G

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13912.D

Level: (low/med) LOW Date Received: 02/03/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	6.6	B
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-23S-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-03F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13918.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	630.2	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-23S-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-03F 50X

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13919.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	592.0	BD
74-84-0	Ethane	290.0	U
74-85-1	Ethylene	312.0	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-24I-03

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-04F

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13920.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	814.5	EB
74-84-0	Ethane	5.8	U
74-85-1	Ethylene	6.2	U

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Client ID.

CEF-8-GW-24I-03 DL

Lab Name: GPL Laboratories Contract: NUS_SOUT

Lab Code: GPL Case No.: SAS No.: SDG No.: CF39-7

Matrix: (soil/water) WATER Lab Sample ID: 9902037-0~~7~~4F 50X TMK 3/3/99

Sample wt/vol: 10 (g/ml) ML Lab File ID: N13921.D

Level: (low/med) LOW Date Received: 02/04/99

% Moisture: decanted:(Y/N) N Date Extracted:

Concentrated Extract Volume: 1 (uL) Date Analyzed: 02/11/99

Injection Volume: 500. (uL) Dilution Factor: 50.0

GPC Cleanup: (Y/N) N pH:

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/L	Q
74-82-8	Methane	791.0	BD
74-84-0	Ethane	290.0	U
74-85-1	Ethylene	312.0	U