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SECOND SEMI-ANNUAL SECOND YEAR APRIL 2010 GROUNDWATER MONITORING LETTER REPORT FOR BUILDING 82 TANK G82 NAS CECIL FIELD FL
08/05/2010
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PITT-08-10-013

August 5, 2010

Project Number 112G02267

Mr. David Grabka
Remedial Project Manager
Technical Review/Federal Facilities
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference: CLEAN V Contract Number N62470-08-D-1001
Contract Task Order JM09

Subject: Groundwater Monitoring Report, 2nd Semi-Annual, 2nd Year – April 2010
Building 82, Tank G82
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

Tetra Tech, Inc. is pleased to submit this 2nd Semi-Annual, 2nd Year Groundwater Monitoring Report for the referenced Contract Task Order for Building 82, Tank G82, at former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This Groundwater Monitoring Report was prepared for the United States Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE), under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001.

The primary objective of current activities at this site is to conduct semi-annual monitoring of groundwater associated with the shallow and intermediate zones of the surficial aquifer. The sampling program is being conducted in accordance with the revised Natural Attenuation Monitoring Plan (NAMP) submitted by CH2MHill to the Florida Department of Environmental Protection (FDEP) on May 29, 2008, based on Chapter 62-770.690, Florida Administrative Code (CH2MHill, 2008). The NAMP is provided in Attachment A. This report summarizes the field operations and analytical results for the sampling event conducted on April 20 and 21, 2010, at the subject site. The work was performed in general accordance with FDEP Standard Operating Procedures (SOPs) under DEP-SOP-001/01.

BACKGROUND

Building 82 is the air traffic control tower, and associated underground storage tank (UST) G82 was used to store diesel fuel for emergency generators. Prior to UST removal in June 1997, the tank released an unknown volume of fuel into the surrounding environment, and soil and groundwater were adversely impacted. In 1998, a piezometer was sampled, and 1-methylnaphthalene and 2-methylnaphthalene were detected in the groundwater sample at concentrations greater than FDEP Groundwater Cleanup Target Levels (GCTLs). A confirmatory sampling investigation was performed in January 1999, and the Confirmatory Sampling Report (Tetra Tech, 2000) recommended a Site Assessment (SA).

SA field activities were performed from October 1999 to July 2000. The SA Report (SAR) (Tetra Tech, 2000) recommended a Remedial Action Plan (RAP) for soil and Monitoring Only for Natural Attenuation

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(MONA) for groundwater. The FDEP approved the recommendation for the RAP but did not approve the MONA recommendation.

In October 2000, the Navy directed CH2MHill to remove the contaminated soil from the site. Because of piping and the proximity to Building 82, all of the contaminated soil could not be removed. Additional sampling to evaluate the leachability of the contaminants remaining in the soil was performed to support a SAR Addendum (SARA). The SARA (Tetra Tech, 2001) concluded that xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene could leach from the soil and result in groundwater concentrations greater than GCTLs. The presence of the concrete slabs and runways limits the amount of precipitation that can leach through the soil; therefore, the recommendation was to leave the soil in place with institutional controls to maintain the slabs and to only allow industrial use of the site (contaminant concentrations in the soil met industrial criteria but not residential criteria).

In April 2002, soil samples were collected for total recoverable petroleum hydrocarbon (TRPH) subclassification to verify that the appropriate land use controls (LUCs) were in place at the Tank G82 site. The results of the subclassification analyses showed that the residential Soil Cleanup Target Level (SCTL) was exceeded by only one fraction (C_{12} – C_{16} aliphatic) in one sample (CEF-G82-SU-203-6). The associated report (Tetra Tech, 2002) recommended a treatability study to evaluate the suitability of air sparging into the groundwater to address site contaminants. The Navy instructed CH2MHill to perform the treatability study.

In November 2006, monitoring wells were sampled and analyzed as a baseline for the treatability study. Only groundwater from wells CEF-G82-1S and CEF-G82-2S (see Figure 1) had constituents at levels exceeding GCTLs (isopropyl benzene, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)anthracene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and dibenz(a,h)anthracene). During the September 2007 Base Realignment and Closure (BRAC) Cleanup Team (BCT) meeting, FDEP agreed that, based on the 2006 site-wide groundwater sampling results, monitoring only with LUCs was appropriate and that no active remediation such as air sparging was needed at the Tank G82 site. This decision was based on the likelihood that natural attenuation was occurring because the concentrations of the contaminants of concern had been decreasing in the absence of active remediation.

On May 29, 2008, CH2MHill submitted an updated NAMP for both Building 82 (Tank G82) and the adjacent BP Wells site based on the results of the November 2006 sampling event. The updated NAMP recommends that Tank G82 be sampled for chemical parameters (volatile organic compounds [VOCs] and naphthalene, polynuclear aromatic hydrocarbons [PAHs], TRPH, and natural attenuation parameters [alkalinity, nitrate, nitrite, sulfate, sulfide and methane]) on a quarterly basis for the first 2 years. The updated NAMP is currently pending official approval by FDEP upon arrival of sealed page from CH2MHill. Year 1 and 1st Semi-Annual, 2nd Year (October 2009) sampling was performed in accordance with verbal approval of the NAMP from FDEP during the July 2008 BCT meeting. The 2nd Semi-Annual, 2nd Year – April 2010 event is in accordance with February 2, 2010, BCT meeting, Decision No. 777, to eliminate (due to lack of background concentration data) analysis for natural attenuation parameters and continue with semi-annual monitoring.

FIELD OPERATIONS

Groundwater samples were collected from existing wells CEF-G82-1S, CEF-G82-2S, CEF-G82-2I, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S on April 20 and 21, 2010. Monitoring well locations are provided on Figure 1. The samples were placed on ice and subsequently via FedEx under chain of custody to Empirical Laboratories in Nashville, Tennessee, for analysis. The laboratory analytical report is included as Attachment B.

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The laboratory analyzed the samples for the following:

- VOCs including isopropyl benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene using United States Environmental Protection Agency (USEPA) Method SW-846 8260B.
- PAHs including 1-methylnaphthalene and 2-methylnaphthalene using USEPA Method 8270.
- TRPH using the Florida Petroleum-Range Organics (FL-PRO) method.

Prior to obtaining groundwater samples, synoptic water levels and total well depths were measured and recorded on a site-specific groundwater measurement sheet for CEF-G82-1S, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S located around Building 82. On April 19, 2010, the depth to water ranged from 6.77 feet below top of casing (btoc) (CEF-G82-1S) to 10.14 feet below top of casing (btoc) (CEF-G82-6S). Depth to water measurements, top of casing elevations, and groundwater elevations are presented in Table 1. Attachment C includes the field log sheets. General sampling protocols were in accordance with FDEP SOPs and Tetra Tech SOP SA-1.1 – Groundwater Sample Acquisition and On-Site Water Quality Testing.

RESULTS

The groundwater elevation data and flow direction for the shallow zone across the Tank G82 site are shown on Figure 2. Based on the data, the general direction of shallow zone groundwater flow is east.

Groundwater analytical results from this sampling event were compared to FDEP GCTLs and Natural Attenuation Default Concentrations (NADCs). The data and standards are presented in Table 2, and results since the 1st Quarter, 1st Year – July 2008 monitoring event are presented in Table 3 and on Figure 3. During the April 2010 event, concentrations of benzene, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthlene, and naphthalene exceeded their respective GCTLs in source area well CEF-G82-2S. Isopropyl benzene was detected at a concentration exceeding its GCTL in CEF-G82-1S. No concentrations exceeded the NADCs. In all the other wells, analytes were either not detected or were detected at concentrations less than their GCTLs, including the intermediate well CEF-G82-2I.

The concentrations of benzene and naphthalene in CEF-G82-2S increased since the previous sampling event in October 2009; however, xylenes, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, and 2-methylnaphthalene concentrations decreased in CEF-G82-2S since the previous sampling event in October 2009. The isopropyl benzene concentration was less than its NADC, which had been exceeded in the previous October 2009 sampling event.

CONCLUSIONS AND RECOMMENDATIONS

The shallow groundwater flow direction in the area of the Tank G82 site is to the east, which is consistent with previous results.

During the April 2010 event, concentrations of benzene, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthlene and naphthalene exceeded their respective GCTLs in CEF-G82-2S. Isopropyl benzene was detected at a concentration exceeding its GCTL in CEF-G82-1S consistent with previous concentrations. No other analytes were detected in excess of their GCTLs in any of the other wells sampled per the NAMP. Analytes were not detected in excess of their NADCs in any of the wells sampled per the NAMP.

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It is recommended that the current monitoring program of seven wells sampled and analyzed for select VOCs, select PAHs, and TRPH on a semi-annual basis continue as identified in the Sampling and Analysis Plan (SAP) for Petroleum Sites: North-South Apron Plume; Building 82, Tank G82; BP Wells; and 815 Wash Rack (Tetra Tech, 2010)

The next semi-annual sampling event is scheduled for October 2010.

If you have any questions regarding this submittal, please feel free to contact me or Kara Wimble at (904) 730-4669, extension 217, or via e-mail at Kara.Wimble@tetratech.com.

Sincerely,

Robert F. Simcik, P.E.
Task Order Manager
P.E. Number 61263

Kara F. Wimble
Project Manager

RFS/clm

Enclosures (8)

c: A. Sanford, BRAC PMO SE (1 copy)
M. Davidson, NAVFAC SE (1 copy)
M. Halil, CH2MHill (electronic copy)
J. Trepanowski, Tt
M. Jonnet, Tt (electronic copy)
J. Johnson, Tt (1 copy, Information Repository)
S. Currie/Tetra Tech File JM09 (1 copy, unbounded)

CERTIFICATION

The information contained herein is based on the investigation data and information obtained from previously submitted reports. If conditions are determined to exist that differ from those described, the undersigned engineer should be notified to evaluate the effects of any additional information on the information described in this report. This Semi-Annual Groundwater Monitoring Report, 2nd Semi-Annual, 2nd Year – April 2010 is the fifth report since the NAMP was submitted for Building 82, Tank G82, at Former Naval Air Station Cecil Field, Jacksonville, Florida, and should not be construed to apply to any other site.

ROBERT FRANK SIMCIK
LICENSE
No. 00061263
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

August 5, 2010
Robert F. Simcik, P.E.
P.E. Number 61263

TABLES

Table 1
Groundwater Elevation and Monitoring Well Construction Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
Building 82, Tank G82
Naval Air Station Cecil Field
Jacksonville, Florida

Well Number	Total Depth of Well (feet btoc)	Top of Casing Elevation* (feet above NAVD)	July 24, 2008		October 20, 2008		January 26, 2009		April 28, 2009		October 21, 2009	
			Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)	Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)	Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)	Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)	Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)
CEF-G82-1S	15	71.13	5.41	65.72	6.20	64.93	7.39	63.74	6.59	64.54	6.42	64.71
CEF-G82-2I	35	71.28	5.68	65.60	6.63	64.65	8.05	63.23	7.01	64.27	6.92	64.36
CEF-G82-2S	14	71.23	5.68	65.55	6.45	64.78	7.56	63.67	6.80	64.43	6.60	64.63
CEF-G82-3S	14	71.20	5.27	65.93	6.18	65.02	7.42	63.78	6.58	64.62	6.41	64.79
CEF-G82-4S	15	71.74	6.24	65.50	7.05	64.69	8.37	63.37	7.41	64.33	7.32	64.42
CEF-G82-5S	15	71.53	6.87	64.66	7.21	64.32	8.16	63.37	7.31	64.22	7.26	64.27
CEF-G82-6S	15	74.44	9.19	65.25	9.92	64.52	10.73	63.71	10.16	64.28	9.89	64.55

Well Number	Total Depth of Well (feet btoc)	Top of Casing Elevation* (feet above NAVD)	April 19, 2010	
			Depth to Water (feet btoc)	Water Level Elevation (feet above NAVD)
CEF-G82-1S	15	71.13	6.77	64.36
CEF-G82-2I	35	71.28	7.31	63.97
CEF-G82-2S	14	71.23	6.95	64.28
CEF-G82-3S	14	71.20	6.79	64.41
CEF-G82-4S	15	71.74	7.66	64.08
CEF-G82-5S	15	71.53	7.49	64.04
CEF-G82-6S	15	74.44	10.14	64.30

*Top-of-casing (toc) elevations for G82-1S, G82-2I, and G82-6S were resurveyed in February 2009. Water level elevations for all events shown on this table use the new TOC elevations.

msl = Mean sea level

btoc = Below top of casing

NAVD = North American Vertical Datum of 1988

Table 2
Summary of April 2010 Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
Building 82, Tank G82
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	FDEP Criteria		CEF-G82-1S	CEF-G82-2S	CEF-G82-2I	CEF-G82-3S	CEF-G82-4S	CEF-G82-5S	CEF-G82-6S
	GCTL	NADC							
VOCs (USEPA Method 8260B) (µg/L)									
Benzene	0	10	0.21 U	**1.4**	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
Toluene	40	400	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Ethylbenzene	30	300	2.9	26.2	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Total Xylenes	20	200	2.0 J	15.1	0.54 U	0.54 U	0.54 U	0.54 U	0.54 U
Isopropyl benzene	0.8	8	**1.4**	**7.1**	0.20 U	0.20 U	0.20 U	0.46 J	0.20 U
1,2,4-Trimethylbenzene	10	100	7.4	**30.7**	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U
1,3,5-Trimethylbenzene	10	100	1.4 J	6.2	0.21 U	0.21 U	0.21 U	0.21 U	0.21 U
PAHs (USEPA Method 8270C SIM) (µg/L)									
1-Methylnaphthalene	28	280	11.6	**63.1**	0.24 U	0.24 U	0.31 J	4.7	0.24 U
2-Methylnaphthalene	28	280	16.9	**73.7**	0.24 U	0.24 U	0.24 U	3.4	0.24 U
Naphthalene	14	140	9.8	**64.2**	0.24 U	0.24 U	0.24 U	0.40 J	0.24 U
Acenaphthene	20	200	0.69 J	3.0	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Acenaphthylene	210	2100	0.48 U	0.56 J	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Benzo(a)pyrene	0.2	2	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U
Benzo(a)anthracene	0.05	5	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U	0.048 U
Fluorene	280	2800	0.90 J	4.8	0.48 U	0.48 U	0.48 U	0.48 U	0.48 U
Phenanthrene	210	2100	0.39 J	2.6	0.24 U	0.24 U	0.24 U	0.24 U	0.24 U
TRPH (FL-PRO) (mg/L)									
TRPH	5	50	0.384	2.340	0.16 U	0.16 U	0.16 U	0.232 J	0.16 U

GCTL = Groundwater Cleanup Target Level.
NADC = Natural Attenuation Default Concentration.
J - Estimated value.
U = Not detected at detection limit shown.
Shaded value indicates concentration greater than GCTL.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
NS = Not sampled.
NA = Not analyzed.
VOCs - Volatile organic compounds.
PAHs - Polynuclear aromatic hydrocarbons.
TRPH - Total recoverable petroleum hydrocarbons.

Table 3
Summary of Historical Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
Building 82, Tank G82
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	FDEP Criteria		CEF-G82-1S						CEF-G82-2S						
	GCTL	NADC	7/22/2008	10/21/2008	1/27/2009	4/28/2009	10/22/2009	4/20/2010	7/22/2008	10/20/2008	1/27/2009	10/22/2009		4/28/2009	
												Sample	Duplicate	Sample	Duplicate
VOCs (USEPA Method 8260B) (µg/L)															
Benzene	1	10	0.23 U	1 U	0.4 U	0.40 U	0.12 U	0.21 U	0.69 I	1 U	0.4 U	0.97 J	**1.0**	**2.2**	**2.0**
Toluene	40	400	0.28 U	1 U	0.35 U	0.35 U	0.14 U	0.20 U	0.28 U	1 U	0.35 U	0.14 U	0.14 U	0.35 U	0.35 U
Ethylbenzene	30	300	0.34 U	0.42 J	5	1.0	2.0	2.90	15	11	18.1	25.0	25.0	26.4	23.6
Total Xylenes	20	200	0.38 U	7	3	1.2 U	1.5	2.00 J	18	6.6	6.9	**24.0**	**25.0**	19.6	13.5
Isopropyl benzene	0.8	8	0.23 U	0.29 J	**1.4**	0.77 J	**1.2**	**1.40**	**4.8**	**6.3**	**7.3**	**9.6**	**9.8**	**7.8**	**6.5**
1,2,4-Trimethylbenzene	10	100	0.38 U	0.31 J	**11**	2.7	4.3	7.40	**21.0**	**18.0**	**13.3**	**26.0**	**26.0**	**21.1**	**13.7**
1,3,5-Trimethylbenzene	10	100	0.22 U	0.14 J	2	0.45 J	1.4	1.4 J	5.0	0.13 U	3.4	6.4	6.8	5.2	3.2
PAHs (USEPA Method 8270C SIM) (µg/L)															
1-Methylnaphthalene	28	280	0.04 J	1.5	14.7	4.9	5.8	11.60	**44**	**120**	**82.6**	**100.0**	**100.0**	**58.6**	**41.5**
2-Methylnaphthalene	28	280	0.13	1.2	23	5.4	7.1	16.90	**66**	**140**	**97**	**130.0**	**130.0**	**65.0**	**60.3**
Naphthalene	14	140	1.2	0.8 J	39.9	10.8	4.6	9.80	**65**	**67**	**115**	**66**	**68**	**85.7**	**93.3**
Acenaphthene	20	200	0.07 J	0.4	1.1	0.48 U	0.46 U	0.69 J	1.4	5.7	3.3	4.9	4.8	1.8	1.6
Acenaphthylene	210	2100	0.01 U	0.028 U	0.48 U	0.48 U	0.018 U	0.48 U	0.01 U	0.028 U	0.59 J	2.6	2.4	0.48 U	0.48 U
Benzo(a)pyrene	0.2	2	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U	0.01 U	0.028 U	0.048 U	0.018 U	0.035 U	0.048 U	0.048 U
Benzo(a)anthracene	0.05	5	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U	0.04 J	0.028 U	0.048 U	0.018 U	0.047 U	0.048 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.02 U	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	0.02 U	0.018 U	0.048 U	0.018 U	**0.031 J**	0.048 U	0.048 U
Fluorene	280	2800	0.08 J	0.38	1.5	0.48 U	0.46 U	0.90 J	1.6	8	4	7.4	6.9	3.4	2.9
Phenanthrene	210	2100	0.02 U	0.1 U	0.53 J	0.24 U	0.083 U	0.39 J	0.28	5.2	1.4	5.4	5.0	1.0	0.74
TRPH (FL-PRO) (mg/L)															
TRPH	5	50	0.042 U	0.460 U	0.752	0.163	0.260 J	0.384	0.926	2.3	2.21	2.7	3.3	1.37	1.82
Miscellaneous Parameters (mg/L)															
Methane	NA	NA	0.098	0.5	2.85	0.953	1.8	NS	1.39	4.5	4.88	7.2	9.34	4.45	3.91
Sulfate	250	NA	7.3	3.1	5.4	6.2	3.5	NS	3.8 J	2.3	1.4 J	0.33 U	0.33 U	1.6 J	2.1
Sulfide	NA	NA	0.53 J	1.1	2.5	1.4	1.4	NS	0.85 J	1.4	2.5	1.89 J	1.93 J	1.6	1.8
Nitrate as N	10	NA	0.24 J	0.15 U	0.05 U	0.09 J	0.033 U	NS	0.15 J	0.15 U	0.05 U	0.033 U	0.033 U	0.050 U	0.13
Nitrite	1	NA	0.002 U	0.25 U	**1.6**	0.05 U	0.033 U	NS	0.002 U	0.300 U	**2.6**	0.033 U	0.033 U	0.050 U	0.050 U
Alkalinity	NA	NA	100	94.7	55*	75.7	78.2	NS	150	124	130*	138.0	140	165	167
Dissolved oxygen	NA	NA	2	0.3	0.4	0.5	0.3	NS	2	0.3	0.7	0.2	NA	0.4	N/S
Dissolved carbon dioxide	NA	NA	70	48	75	90	90	NS	30	60	85	80	NA	75.0	N/S

Table 3
Summary of Historical Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
G82 Wells
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	FDEP Criteria		CEF-G82-2S			CEF-G82-2I					
	GCTL	NADC	10/22/2009		4/20/2010	7/22/2008	10/20/2008	1/27/2009	4/28/2009	10/22/2009	4/20/2010
			Sample	Duplicate							
VOCs (USEPA Method 8260B) (µg/L)											
Benzene	1	10	0.97 J	**1.0**	**1.40**	0.23 U	1 U	0.4 U	0.4 U	0.12 U	0.21 U
Toluene	40	400	0.14 U	0.14 U	0.20 U	0.28 U	1 U	0.35 U	0.35 U	0.14 U	0.20 U
Ethylbenzene	30	300	25	25	26.20	0.34 U	1 U	0.43 U	0.43 U	0.10 U	0.20 U
Total Xylenes	20	200	**24**	**25**	15.10	0.38 U	1 U	1.2 U	1.2 U	0.21 U	0.54 U
Isopropyl benzene	0.8	8	**9.6**	**9.8**	**7.1**	0.23 U	0.8 U	0.2 U	0.2 U	0.11 U	0.20 U
1,2,4-Trimethylbenzene	10	100	**26**	**26**	**30.70**	0.38 U	0.10 U	0.22 U	0.22 U	0.17 J	0.22 U
1,3,5-Trimethylbenzene	10	100	6.4	6.8	6.20	0.22 U	0.13 U	0.2 U	0.20 U	0.10 U	0.21 U
PAHs (USEPA Method 8270C SIM) (µg/L)											
1-Methylnaphthalene	28	280	**100**	**100**	**63.10**	0.01 U	0.046 U	0.24 U	0.24 U	0.46 U	0.24 U
2-Methylnaphthalene	28	280	**130**	**130**	**73.70**	0.02 U	0.0085 U	0.24 U	0.24 U	0.46 U	0.24 U
Naphthalene	14	140	**66**	**68**	**64.20**	0.04 I	1 U	1 U	1.0 U	0.46 U	0.24 U
Acenaphthene	20	200	4.9	4.8	3.00	0.02 U	0.046 U	0.48 U	0.48 U	0.46 U	0.48 U
Acenaphthylene	210	2100	2.6	2.4	0.56 J	0.01 U	0.028 U	0.48 U	0.48 U	0.018 U	0.48 U
Benzo(a)pyrene	0.2	2	0.018 U	0.035 U	0.048 U	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U
Benzo(a)anthracene	0.05	5	0.018 U	0.047 U	0.048 U	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.018 U	**0.031 J**	0.048 U	0.02 U	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U
Fluorene	280	2800	7.4	6.9	4.80	0.01 U	0.046 U	0.48 U	0.48 U	0.46 U	0.48 U
Phenanthrene	210	2100	5.4	5.0	2.60	0.02 U	0.012 U	0.24 U	0.24 U	0.027 U	0.24 U
TRPH (FL-PRO) (mg/L)											
TRPH	5	50	2.7	3.3	2.340	0.042 U	0.46 U	0.16 U	0.16 U	0.157 U	0.16 U
Miscellaneous Parameters (mg/L)											
Methane	NA	NA	7.2	9.34	NS	0.001	0.0024 U	0.002	0.00152	4.64 U	NS
Sulfate	250	NA	0.33 U	0.33 U	NS	8.4	18.1	10.1	8.4	8.9	NS
Sulfide	NA	NA	1.9	1.93	NS	0.53 J	2.1 U	0.970 J	0.60 U	1.8	NS
Nitrate as N	10	NA	0.033 U	0.033 U	NS	0.004 U	0.15 U	0.05 U	0.050 U	0.033 U	NS
Nitrite	1	NA	0.033 U	0.033 U	NS	0.002 U	0.300 U	0.49	0.050 U	0.033 U	NS
Alkalinity	NA	NA	138	140	NS	4.3 J	8.8	0*	2.8 J	4.1	NS
Dissolved oxygen	NA	NA	0.2	NA	NS	0.9	0.1	0.7	0.7	0.3	NS
Dissolved carbon dioxide	NA	NA	80	NA	NS	60	37	32	55	60	NS

Table 3
Summary of Historical Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
G82 Wells
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	FDEP Criteria		CEF-G82-3S						
	GCTL	NADC	7/22/2008		10/21/2008	1/27/2009	4/29/2009	10/22/2009	4/20/2010
			Sample	Duplicate					
BTEX/Naphthalene (USEPA Method 8260B) (µg/L)									
Benzene	1	10	0.23 U	0.23 U	1 U	0.4 U	0.40 U	0.12 U	0.21 U
Toluene	40	400	0.28 U	0.28 U	1 U	0.35 U	0.35 U	0.14 U	0.20 U
Ethylbenzene	30	300	0.34 U	0.34 U	1 U	0.43 U	0.43 U	0.10 U	0.20 U
Total Xylenes	20	200	0.38 U	0.38 U	1 U	1.2 U	1.2 U	0.21 U	0.54 U
Isopropyl benzene	0.8	8	0.23 U	0.23 U	0.8 U	0.2 U	0.20 U	0.11 U	0.20 U
1,2,4-Trimethylbenzene	10	100	0.38 U	0.38 U	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U
1,3,5-Trimethylbenzene	10	100	0.22 U	0.22 U	0.10 U	0.2 U	0.20 U	0.10 U	0.21 U
PAHs (USEPA Method 8270C SIM) (µg/L)									
1-Methylnaphthalene	28	280	0.04 J	0.01 U	0.0093 U	0.24 U	0.24 U	0.46 U	0.24 U
2-Methylnaphthalene	28	280	0.05 J	0.02 U	0.014 U	0.24 U	0.24 U	0.46 U	0.24 U
Naphthalene	14	140	0.90 J	0.35 U	1 U	1 U	1.0 U	0.46 U	0.24 U
Acenaphthene	20	200	0.02 U	0.02 U	0.0097 U	0.48 U	0.48 U	0.46 U	0.48 U
Acenaphthylene	210	2100	0.01 U	0.01 U	0.028 U	0.48 U	0.48 U	0.018 U	0.48 U
Benzo(a)pyrene	0.2	2	0.01 U	0.01 U	0.0066 J	0.048 U	0.048 U	0.018 U	0.048 U
Benzo(a)anthracene	0.05	5	0.01 U	0.01 U	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.02 U	0.02 U	**0.0056 J**	0.048 U	0.048 U	0.018 U	0.048 U
Fluorene	280	2800	0.01 U	0.01 U	0.014 U	0.48 U	0.24 U	0.46 U	0.48 U
Phenanthrene	210	2100	0.02 U	0.02 U	0.035 U	0.24 U	0.24 U	0.026 U	0.24 U
TRPH (FL-PRO) (mg/L)									
TRPH	5	50	0.042 U	0.042 U	0.46 U	0.16 U	0.16 U	0.157 U	0.16 U
Miscellaneous Parameters (mg/L)									
Methane	NA	NA	0.004	0.001	0.00096 U	0.0005	0.00094	1.0 U	NS
Sulfate	250	NA	21	22	17.7	22.8	20.3	19.7	NS
Sulfide	NA	NA	0.45 U	0.45 U	2.1 U	0.6 U	0.6 U	0.678 U	NS
Nitrate as N	10	NA	1.3	1.7	0.61	1.4	1.0	1.3	NS
Nitrite	1	NA	0.002 U	0.002 U	0.25 U	**1.7**	0.050 U	0.330 U	NS
Alkalinity	NA	NA	130	120	102	50*	104	62.8	NS
Dissolved oxygen	NA	NA	1.5	1.5	0.3	0.7	1.5	0.2	NS
Dissolved carbon dioxide	NA	NA	80	80	60	70	90	70	NS

Table 3
Summary of Historical Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
G82 Wells
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	FDEP Criteria		CEF-G82-4S						CEF-G82-5S					
	GCTL	NADC	7/22/2008	10/21/2008	1/28/2009	4/29/2009	10/23/2009	4/21/2010	7/22/2008	10/21/2008	1/27/2009	4/29/2009	10/23/2009	4/21/2010
BTEX/Naphthalene (USEPA Method 8260B) (µg/L)														
Benzene	1	10	0.23 U	1 U	0.4 U	0.40 U	0.12 U	0.21 U	0.23 U	1 U	0.4 U	0.4 U	0.13 J	0.21 U
Toluene	40	400	0.28 U	1 U	0.35 U	0.35 U	0.14 U	0.20 U	0.28 U	1 U	0.35 U	0.35 U	0.14 U	0.20 U
Ethylbenzene	30	300	0.34 U	1 U	0.43 U	0.43 U	0.10 U	0.20 U	0.34 U	1 U	0.43 U	0.43 U	0.14 J	0.20 U
Total Xylenes	20	200	0.38 U	1 U	1.2 U	1.2 U	0.21 U	0.54 U	0.38 U	1 U	1.2 U	1.2 U	0.21 U	0.54 U
Isopropyl benzene	0.8	8	0.23 U	0.8 U	0.2 U	0.20 U	0.11 U	0.20 U	0.23 U	0.19 J	0.25 J	0.2 U	0.44 J	0.20 U
1,2,4-Trimethylbenzene	10	100	0.38 U	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U	0.38 U	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U
1,3,5-Trimethylbenzene	10	100	0.22 U	0.10 U	0.2 U	0.20 U	0.10 U	0.21 U	0.22 U	0.10 U	0.2 U	0.2 U	0.10 U	0.21 U
PAHs (USEPA Method 8270C SIM) (µg/L)														
1-Methylnaphthalene	28	280	0.67	0.65	0.32 J	0.46 J	0.71 J	0.31 J	2.8	8.5	3.7	3.4	5.2	4.70
2-Methylnaphthalene	28	280	0.04 J	0.046 U	0.24 U	0.24 U	0.46 U	0.24 U	3.4	5.7	2.7	2.3	2.9	3.40
Naphthalene	14	140	0.87 J	0.33 U	1 U	1.0 U	0.46 U	0.24 U	0.35 U	2.1	7.8	7.8	0.46 U	0.40 J
Acenaphthene	20	200	0.28	0.18	0.48 U	0.48 U	0.46 U	0.48 U	0.28	0.6	0.48 U	0.24 U	0.46 U	0.48 U
Acenaphthylene	210	2100	0.1 U	0.028 U	0.48 U	0.48 U	0.018 U	0.48 U	0.06 J	0.028 U	0.48 U	0.24 U	0.12 U	0.48 U
Benzo(a)pyrene	0.2	2	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U	0.01 U	0.0078 J	0.048 U	0.048 U	0.018 U	0.048 U
Benzo(a)anthracene	0.05	5	0.01 U	0.028 U	0.048 U	0.048 U	0.018 U	0.048 U	0.01 U	0.027 U	0.048 U	0.048 U	0.018 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.02 U	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	0.02 U	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U
Fluorene	280	2800	0.30	0.17	0.48 U	0.48 U	0.46 U	0.48 U	0.11	0.24	3.8	0.48 U	0.46 U	0.48 U
Phenanthrene	210	2100	0.02 U	0.18	0.24 U	0.24 U	0.032 U	0.24 U	0.02 U	0.037 U	0.24 U	0.24 U	0.018 U	0.24 U
TRPH (FL-PRO) (mg/L)														
TRPH	5	50	0.094 J	0.46 U	0.16 U	0.16 U	0.157 U	0.16 U	0.125 J	0.46 U	228 J	0.17 J	0.216 J	0.232 J
Miscellaneous Parameters (mg/L)														
Methane	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate	250	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sulfide	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrate as N	10	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Nitrite	1	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved oxygen	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved carbon dioxide	NA	NA	NS	NA	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 3
Summary of Historical Groundwater Data

2nd Year, 2nd Semi-Annual Groundwater Monitoring Report
G82 Wells
Naval Air Station Cecil Field
Jacksonville, Florida

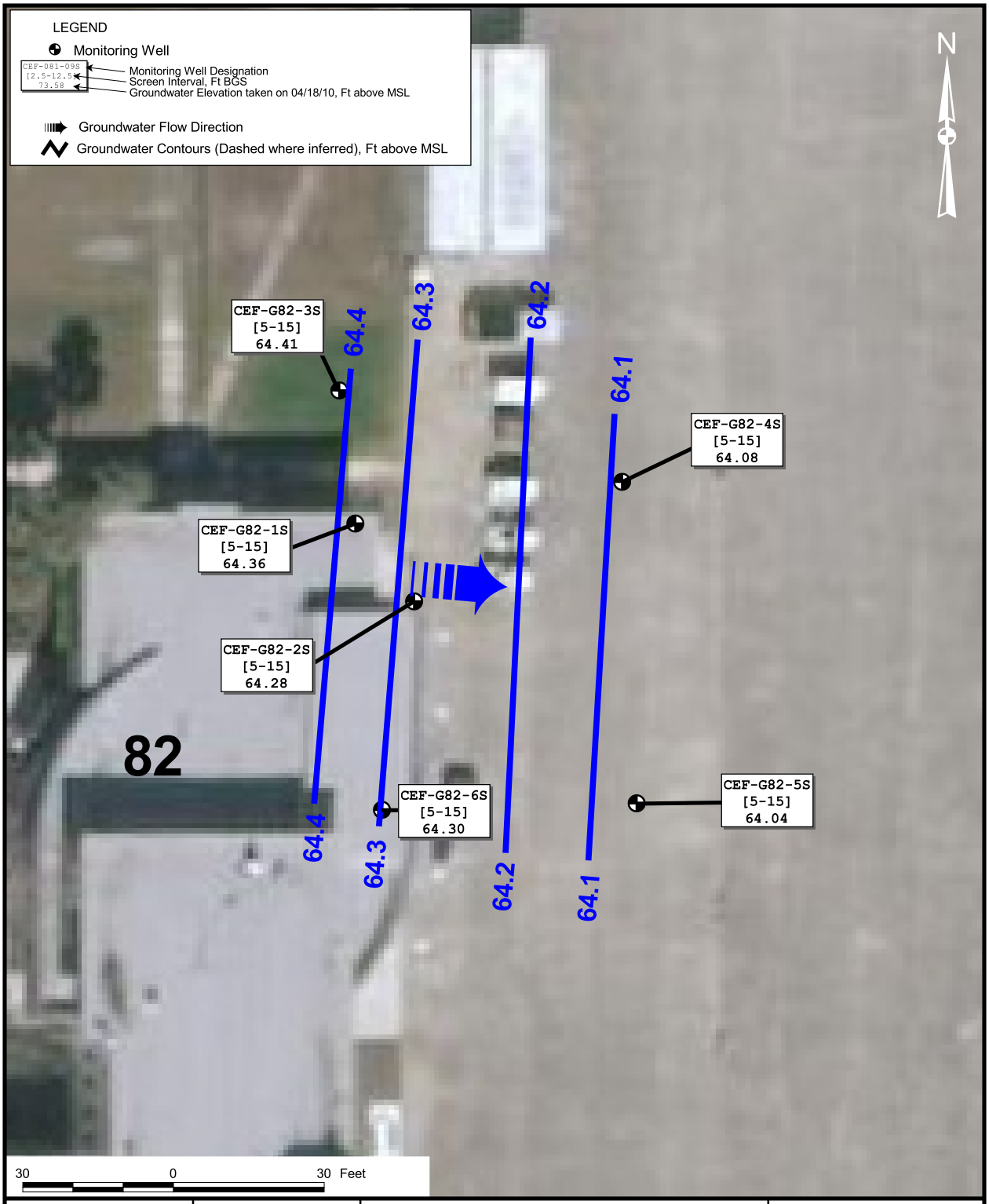
Parameter	FDEP Criteria		CEF-G82-6S							
	GCTL	NADC	7/28/2008	10/21/2008		1/28/2009		4/29/2009	10/23/2009	4/21/2010
				Sample	Duplicate	Sample	Duplicate			
BTEX/Naphthalene (USEPA Method 8260B) (µg/L)										
Benzene	1	10	0.23 U	1 U	1 U	0.4 U	0.4 U	0.4 U	0.12 U	0.21 U
Toluene	40	400	0.28 U	1 U	1 U	0.35 U	0.35 U	0.35 U	0.14 U	0.20 U
Ethylbenzene	30	300	0.34 U	1 U	1 U	0.43 U	0.43 U	0.43 U	0.10 U	0.20 U
Total Xylenes	20	200	0.38 U	1 U	1 U	1.2 U	1.2 U	1.2 U	0.21 U	0.54 U
Isopropyl benzene	0.8	8	0.23 U	0.8 U	0.8 U	0.2 U	0.2 U	0.2 U	0.11 U	0.20 U
1,2,4-Trimethylbenzene	10	100	0.38 U	0.14 U	0.14 U	0.22 U	0.22 U	0.22 U	0.14 U	0.22 U
1,3,5-Trimethylbenzene	10	100	0.22 U	0.10 U	0.10 U	0.2 U	0.2 U	0.2 U	0.10 U	0.21 U
PAHs (USEPA Method 8270C SIM) (µg/L)										
1-Methylnaphthalene	28	280	0.01 U	0.031 U	0.013 U	0.24 U	0.24 U	0.24 U	0.46 U	0.24 U
2-Methylnaphthalene	28	280	0.02 U	0.043 U	0.016 U	0.24 U	0.24 U	0.24 U	0.46 U	0.24 U
Naphthalene	14	140	0.35 U	1 U	1 U	1 U	1 U	1 U	0.46 U	0.24 U
Acenaphthene	20	200	0.02 U	0.012 U	0.02 U	0.48 U	0.48 U	0.24 U	0.46 U	0.48 U
Acenaphthylene	210	2100	0.01 U	0.028 U	0.013 J	0.48 U	0.48 U	0.24 U	0.026 U	0.48 U
Benzo(a)pyrene	0.2	2	0.01 U	0.028 U	0.022 J	0.048 U	0.048 U	0.048 U	0.018 U	0.048 U
Benzo(a)anthracene	0.05	5	0.01U	0.014 U	0.043 U	0.048 U	0.048 U	0.048 U	0.018 U	0.048 U
Dibenz(a,h)anthracene	0.005	0.05	0.02 U	0.018 U	0.018 U	0.048 U	0.048 U	0.048 U	0.018 U	0.048 U
Fluorene	280	2800	0.01 U	0.018 U	0.025 U	0.48 U	0.48 U	0.48 U	0.46 U	0.48 U
Phenanthrene	210	2100	0.06 J	0.032 U	0.046 U	0.24 U	0.24 U	0.24 U	0.056 U	0.24 U
TRPH (FL-PRO) (mg/L)										
TRPH	5	50	0.035 U	0.46 U	0.46 U	0.16 U	0.16 U	0.16 U	0.157 U	0.16 U
Miscellaneous Parameters (mg/L)										
Methane	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS
Sulfate	250	NA	NS	NS	NS	NS	NS	NS	NS	NS
Sulfide	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS
Nitrate as N	10	NA	NS	NS	NS	NS	NS	NS	NS	NS
Nitrite	1	NA	NS	NS	NS	NS	NS	NS	NS	NS
Alkalinity	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved oxygen	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS
Dissolved carbon dioxide	NA	NA	NS	NS	NS	NS	NS	NS	NS	NS

* = Due to laboratory error, the alkalinity could not be laboratory analyzed; therefore, these readings are field-based results.
GCTL = Groundwater Cleanup Target Level.
NADC = Natural Attenuation Default Concentration
J - Estimated value.
U = Not detected at detection limit shown.
Shaded value indcates concentration greater than GCTL.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
NS = Not sampled.
NA = Not available.

FIGURES

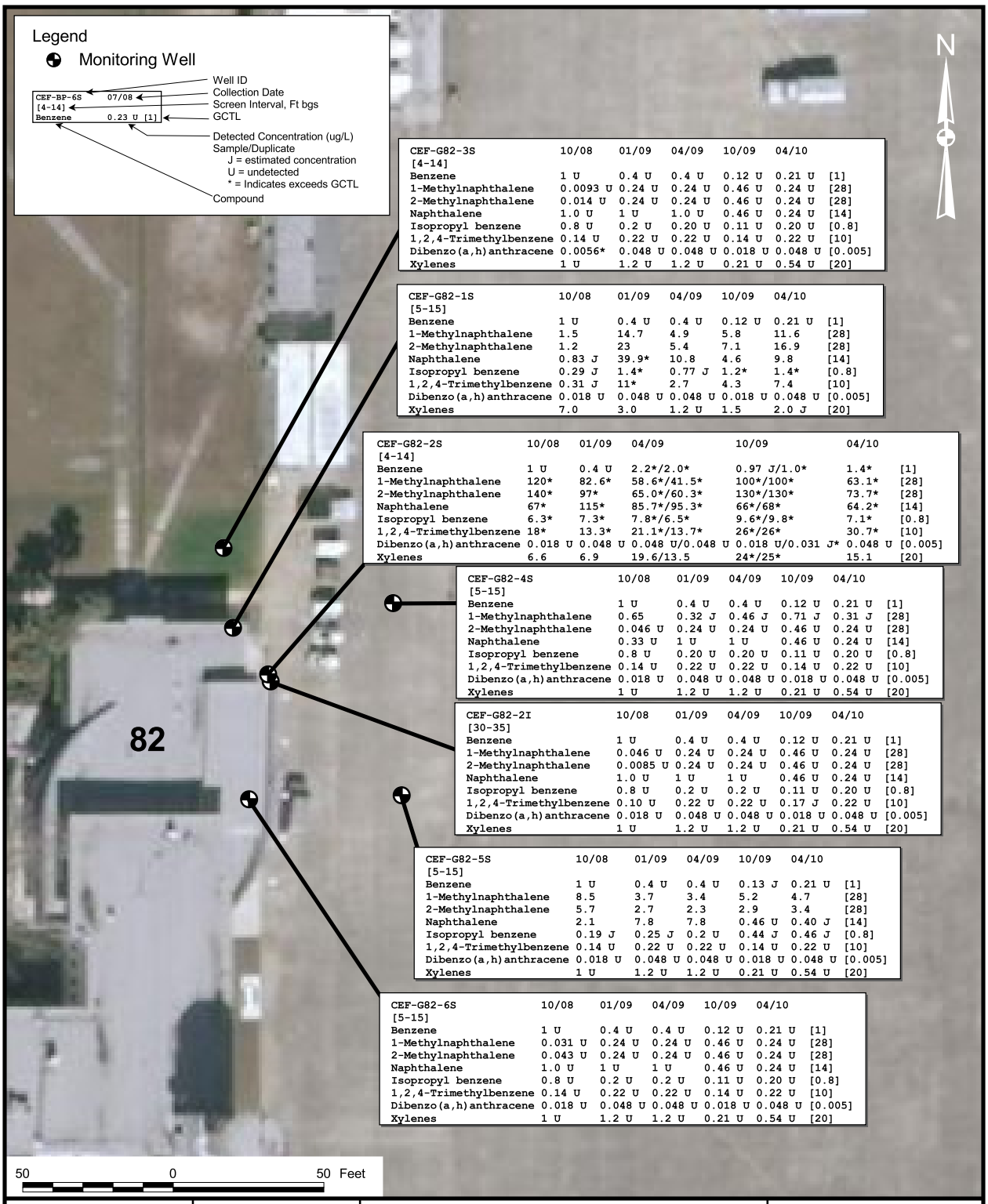
DRAWN BY MJJ	DATE 29Dec09	MONTORING WELL LOCATION MAP 2ND SEMI-ANNUAL, 2ND YEAR GROUNDWATER MONITORING REPORT BUILDING 82, TANK G82 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV 0

:\GIS\NAS_CecilField\bp-g82_20100130.apr 17Jul10 MJJ Layout03



DRAWN BY MJJ	DATE 29Dec09	GROUNDWATER FLOW MAP 2ND SEMI-ANNUAL, 2ND YEAR GROUNDWATER MONITORING REPORT BUILDING 82, TANK G82 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 / REV 0

:\GIS\NAS_CecilField\bp-g82_20100130.apr 29Jul10 MJJ Layout07



CEF-G82-3S	10/08	01/09	04/09	10/09	04/10	
[4-14]						
Benzene	1 U	0.4 U	0.4 U	0.12 U	0.21 U	[1]
1-Methylnaphthalene	0.0093 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
2-Methylnaphthalene	0.014 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
Naphthalene	1.0 U	1 U	1.0 U	0.46 U	0.24 U	[14]
Isopropyl benzene	0.8 U	0.2 U	0.20 U	0.11 U	0.20 U	[0.8]
1,2,4-Trimethylbenzene	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U	[10]
Dibenzo(a,h)anthracene	0.0056*	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	1 U	1.2 U	1.2 U	0.21 U	0.54 U	[20]

CEF-G82-1S	10/08	01/09	04/09	10/09	04/10	
[5-15]						
Benzene	1 U	0.4 U	0.4 U	0.12 U	0.21 U	[1]
1-Methylnaphthalene	1.5	14.7	4.9	5.8	11.6	[28]
2-Methylnaphthalene	1.2	23	5.4	7.1	16.9	[28]
Naphthalene	0.83 J	39.9*	10.8	4.6	9.8	[14]
Isopropyl benzene	0.29 J	1.4*	0.77 J	1.2*	1.4*	[0.8]
1,2,4-Trimethylbenzene	0.31 J	11*	2.7	4.3	7.4	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	7.0	3.0	1.2 U	1.5	2.0 J	[20]

CEF-G82-2S	10/08	01/09	04/09	10/09	04/10	
[4-14]						
Benzene	1 U	0.4 U	2.2*/2.0*	0.97 J/1.0*	1.4*	[1]
1-Methylnaphthalene	120*	82.6*	58.6*/41.5*	100*/100*	63.1*	[28]
2-Methylnaphthalene	140*	97*	65.0*/60.3*	130*/130*	73.7*	[28]
Naphthalene	67*	115*	85.7*/95.3*	66*/68*	64.2*	[14]
Isopropyl benzene	6.3*	7.3*	7.8*/6.5*	9.6*/9.8*	7.1*	[0.8]
1,2,4-Trimethylbenzene	18*	13.3*	21.1*/13.7*	26*/26*	30.7*	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U/0.048 U	0.018 U/0.031 J*	0.048 U	[0.005]
Xylenes	6.6	6.9	19.6/13.5	24*/25*	15.1	[20]

CEF-G82-4S	10/08	01/09	04/09	10/09	04/10	
[5-15]						
Benzene	1 U	0.4 U	0.4 U	0.12 U	0.21 U	[1]
1-Methylnaphthalene	0.65	0.32 J	0.46 J	0.71 J	0.31 J	[28]
2-Methylnaphthalene	0.046 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
Naphthalene	0.33 U	1 U	1 U	0.46 U	0.24 U	[14]
Isopropyl benzene	0.8 U	0.20 U	0.20 U	0.11 U	0.20 U	[0.8]
1,2,4-Trimethylbenzene	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	1 U	1.2 U	1.2 U	0.21 U	0.54 U	[20]

CEF-G82-2I	10/08	01/09	04/09	10/09	04/10	
[30-35]						
Benzene	1 U	0.4 U	0.4 U	0.12 U	0.21 U	[1]
1-Methylnaphthalene	0.046 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
2-Methylnaphthalene	0.0085 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
Naphthalene	1.0 U	1 U	1 U	0.46 U	0.24 U	[14]
Isopropyl benzene	0.8 U	0.2 U	0.2 U	0.11 U	0.20 U	[0.8]
1,2,4-Trimethylbenzene	0.10 U	0.22 U	0.22 U	0.17 J	0.22 U	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	1 U	1.2 U	1.2 U	0.21 U	0.54 U	[20]

CEF-G82-5S	10/08	01/09	04/09	10/09	04/10	
[5-15]						
Benzene	1 U	0.4 U	0.4 U	0.13 J	0.21 U	[1]
1-Methylnaphthalene	8.5	3.7	3.4	5.2	4.7	[28]
2-Methylnaphthalene	5.7	2.7	2.3	2.9	3.4	[28]
Naphthalene	2.1	7.8	7.8	0.46 U	0.40 J	[14]
Isopropyl benzene	0.19 J	0.25 J	0.2 U	0.44 J	0.46 J	[0.8]
1,2,4-Trimethylbenzene	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	1 U	1.2 U	1.2 U	0.21 U	0.54 U	[20]

CEF-G82-6S	10/08	01/09	04/09	10/09	04/10	
[5-15]						
Benzene	1 U	0.4 U	0.4 U	0.12 U	0.21 U	[1]
1-Methylnaphthalene	0.031 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
2-Methylnaphthalene	0.043 U	0.24 U	0.24 U	0.46 U	0.24 U	[28]
Naphthalene	1.0 U	1 U	1 U	0.46 U	0.24 U	[14]
Isopropyl benzene	0.8 U	0.2 U	0.2 U	0.11 U	0.20 U	[0.8]
1,2,4-Trimethylbenzene	0.14 U	0.22 U	0.22 U	0.14 U	0.22 U	[10]
Dibenzo(a,h)anthracene	0.018 U	0.048 U	0.048 U	0.018 U	0.048 U	[0.005]
Xylenes	1 U	1.2 U	1.2 U	0.21 U	0.54 U	[20]

DRAWN BY MJJ	DATE 29Dec09	ANALYTICAL RESULTS 2ND SEMI-ANNUAL, 2ND YEAR GROUNDWATER MONITORING REPORT BUILDING 82, TANK G82 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 / REV 0

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ATTACHMENT A

NATURAL ATTENUATION MONITORING PLAN

Natural Attenuation Monitoring Work Plan, Building G-82 (Tank G-82) and BP Wells Sites,

Former Naval Air Station Cecil Field, Jacksonville, Florida

PREPARED FOR: Cecil Field Base Cleanup Team

PREPARED BY: CH2M HILL Project Team

DATE: May 29, 2008

PROJECT NUMBER: 271591

1.0 Introduction

This technical memorandum outlines the long-term monitored natural attenuation (MNA) program requirements to be implemented at the Building G-82 (Tank G-82) and the BP Wells Sites at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. Figure 1 shows the location of the sites within NAS Cecil Field.

CH2M HILL Constructors, Inc. (CH2M HILL) conducted a site-wide groundwater sampling event during November 2006. Geochemical data were evaluated to determine if natural attenuation was occurring in groundwater at the two sites and if parameter concentrations were decreasing in response to naturally occurring degradation processes. The evaluation involved comparing geochemical data from source area and downgradient monitoring wells to background values measured in upgradient wells. Based on these results, a long-term monitoring program for natural attenuation parameters was developed for implementation, as described below.

1.1 Site Background

The MNA program focuses on the Building G-82 and BP Wells Sites.

1.1.1 Building G-82 Site

The Building G-82 Site comprised an air traffic control tower and underground storage tank (UST) G-82 located at the former NAS Cecil Field in Jacksonville, Florida. Tank G-82 was used to store diesel fuel for emergency generators. Tank G-82 was removed in June 1997. Soil and groundwater have been impacted near the UST as a result of leaks originating from Tank G-82. The leaking tank released an unknown volume of fuel to the environment.

Following the removal of Tank G-82, a piezometer (CEF-G-82-1S, see Figure 2) was installed near the former location of the tank in January 1998. The hydrocarbon compounds 1-methylnaphthalene and 2-methylnaphthalene were detected in groundwater samples collected from CEF-G-82-1S at concentrations that exceeded Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs). In January 1999, Harding Lawson Associates (HLA) performed additional sampling and prepared a

Confirmatory Sampling Report (CSR) recommending the completion of additional site assessment (SA) to determine the extent of hydrocarbons in the soil and groundwater.

Between October 1999 and July 2000, Tetra Tech NUS, Inc. (TtNUS) conducted the SA at Building G-82. Five shallow monitoring wells (CEF-G-82-2S through 6S) and one intermediate monitoring well (CEF-G-82-2I) were installed, and samples were collected to determine the extent of hydrocarbons in the soil and groundwater. TtNUS recommended excavation of 280 cubic yards (yd^3) of soil that contained volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs) that exceeded FDEP Soil Cleanup Target Levels (SCTLs). Following soil removal, TtNUS recommended MNA as the remedial approach for groundwater.

During 2001, CH2M HILL was contracted by Southern Division Naval Facilities Engineering Command (NAVFAC) to perform the soil excavation work. The objective of the work was to excavate and dispose of the soil exceeding the FDEP SCTLs. Soil removal continued until either headspace readings using an organic vapor analyzer (OVA) were below 10 parts per million (ppm) or predetermined excavation boundaries (foundation boundaries and concrete aircraft apron) were reached. Approximately 148 tons of petroleum-impacted soil was removed. Following completion of the excavation activities, confirmation samples were collected from the north and south excavation walls to verify that remaining soil met the SCTLs. The analytical results from these samples indicated that the north and south excavation extent was complete. However, OVA readings from the east and west excavation walls indicated headspace concentrations exceeded 10 ppm, suggesting petroleum-impacted soil with concentrations above the SCTLs likely remained outside the limits of excavation. However, due to the close proximity of the excavation to the foundation of Building G-82 and the aircraft apron, excavation activities were terminated to prevent potential damage to the infrastructure.

Following the removal action in October 2001, TtNUS performed a supplemental assessment of the site. The results of the supplemental assessment and the associated sampling were presented in the Site Assessment Report Addendum (SARA) (TtNUS, 2001).

As part of the SARA, subsurface soil samples were collected from six locations along Building G-82 and along the flightline apron. These samples were collected outside the excavation area to evaluate residual contamination following the removal action. The samples were collected at a depth of 5 to 6 feet below land surface and were analyzed for VOCs, PAHs, and Total Recoverable Petroleum Hydrocarbons (TRPH). Based on the results of the original six samples, Synthetic Precipitation Leaching Procedure (SPLP) analyses were also performed. The SARA concluded that approximately 49 yd^3 of contaminated soil remained along Building G-82 and the flightline apron. TRPH was present above its SCTLs. Xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected in the leachate of the SPLP samples at concentrations that exceed their respective GCTLs.

In April, 2002, the Base Realignment and Closure (BRAC) team (BCT) recommended sampling of subsurface soil for the purpose of identifying the TRPH subclassification. Three samples were collected; however, one sample contained TRPH below the SCTLs and was not subclassified. Of the two samples that were analyzed for TRPH hydrocarbon-chain speciation, one sample contained concentrations of one fraction (C12 – C16, aliphatic) that exceeded its subclassification SCTLs. Based on these results, TtNUS recommended a

pilot-scale air sparging treatability study for the site. These findings were presented to the BCT at the May 15, 2002, meeting. The BCT agreed that an air sparging treatability pilot study should be performed.

No action was taken until a site-wide groundwater sampling event in November 2006. The results of the sampling event (discussed in Section 1.2) indicated that natural attenuation was occurring and the concentration of the contaminants of concern had been decreasing in the absence of active remediation.

A technical memorandum presenting the groundwater sampling results was prepared by CH2M HILL and presented to FDEP (CH2M HILL, 2007). A copy of this technical memorandum is included in Attachment 1. During the September 2007 BCT meeting, FDEP agreed that, based on the 2006 site-wide groundwater sampling results, no active remediation, such as air sparging, was needed at the Building G-82 Site.

1.1.2 BP Wells Site

The BP Wells Site is located on the north-south flightline, southeast of Building 880, on the west edge of the flightline apron. From 1999 to 2000, assessment activities were performed to determine the extent of hydrocarbons in soil and groundwater beneath the BP Wells Site. A due diligence investigation was conducted by Golder Associates, Inc. (1999) for the new property tenants (Jacksonville Airport Authority and Air Kaman). Four shallow wells (CEF-BP-1S through 4S, and CEF-BP-6S) and one intermediate well (CEF-BP-5I) were installed at the site (Figure 2). The reported results indicated the presence of hydrocarbons in groundwater beneath the site.

Subsequently, the Navy directed TtNUS to conduct an SA. The SA confirmed the presence of contaminated groundwater and identified the groundwater flow direction to the southeast. A Site Assessment Report (SAR) (2000) was submitted to the FDEP recommending that a natural attenuation monitoring plan be implemented at the site. The FDEP approved the plan and issued a Natural Attenuation Monitoring Plan Approval Order (NAMPAO) on August 31, 2000. In accordance with the NAMPAO, TtNUS performed the first two semiannual groundwater sampling events in April and October of 2001. Because the hydrocarbon concentrations at the source well were greater than the applicable natural attenuation default concentrations (NADCs) and because the contaminant concentrations appeared to be increasing, the second monitoring report recommended that the semiannual monitoring program be suspended and that a Remedial Action Plan (RAP) be prepared for the site. On February 20, 2002, the FDEP agreed that a RAP was warranted. Subsequently, TtNUS recommended that a treatability study be performed to evaluate the effectiveness of in-situ enhanced bioremediation at the site. In-situ Submerged Oxygen Curtain (iSOC™) technology was to be evaluated to perform this test. In April 2004, TtNUS submitted an Enhanced Natural Attenuation Treatability Study (ENATS) Work Plan for the BP Wells Site.

Similar to the Building G-82 Site, no action was taken until a site-wide groundwater sampling event was conducted in November 2006. The results of the sampling event, discussed in Section 1.2, indicate that natural attenuation was occurring at the site and the concentration of the contaminants of concern had been decreasing.

1.1.3 Remedial Action Objectives

The remedial action objective for the Building G-82 and BP Wells Sites is to achieve cleanup of groundwater contaminant concentrations to levels below the Florida GCTLs with a short-term remedial action objective to achieve reduction of contaminant concentrates to below the Florida NADCs.

1.2 Natural Attenuation Monitoring

1.2.1 Groundwater Contamination Summary

In November 2006, the following monitoring wells were sampled for contaminant characterization:

- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S.
- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, and CEF-BP-6S.

Groundwater samples from both sites were analyzed for VOCs (U.S. Environmental Protection Agency [EPA] Method 8260B), PAHs (EPA Method 8310), and TRPH (Florida Petroleum Residual Organic [FL-PRO] Method).

Building G-82 Site

In November 2006, the following compounds were detected at concentrations exceeding the GCTLs: isopropylbenzene (cumene), naphthalene, and 1-methylnaphthalene in wells CEF-G82-1S and CEF-G82-2S; 2-methylnaphthalene in well CEF-G82-2S; and benzo(a)pyrene and dibenz(a,h)anthracene in well CEF-G82-1S. The benzo(a)pyrene detection of 7.95 micrograms per liter (µg/L) and the dibenz(a,h)anthracene detection of 35.9 µg/L in well CEF-G82-1S also exceeded NADC criteria of 2 µg/L and 0.05 µg/L, respectively.

Only groundwater sampled from wells CEF-G82-1S and CEF-G82-2S contained constituents at levels exceeding GCTLs during the November 2006 sampling event. Groundwater sampled from the surrounding monitoring wells (CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) and the well screened below the shallow monitoring wells (CEF-G82-2I) did not contain constituents of concern at elevated levels.

The following parameters were historically detected at concentrations above the GCTLs in well CEF-BP-2S: benzene, ethylbenzene, total xylenes, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. In general, the concentrations of VOCs (benzene, ethylbenzene, and total xylenes) in well CEF-G82-2S decreased in concentration when compared to previous sampling events, suggesting that biodegradation of these compounds is occurring. Concentrations of the PAH compounds 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene, and dibenz(a,h)anthracene increased slightly compared to historical results. However, because PAHs are less mobile and tend to be more persistent than VOCs, it is expected that future monitoring will indicate that PAHs decrease over time, similarly to the VOCs, at this site. A summary of the historical analytical results from the Building G-82 Site is presented as the third attachment in Attachment 1.

BP Wells Site

In November 2006, the following compounds were detected at concentrations exceeding the GCTLs: isopropylbenzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4- trimethylbenzene. All exceedances occurred in well CEF-BP-1S; however, one of these detections exceeded NADC criteria. The remaining wells at the BP Wells Site did not show any exceedances of either the GCTLs or NADC criteria.

Comparison of the November 2006 test data with historical sampling data collected in 2003 (2003 data is presented as the second attachment in Attachment 1) indicates that hydrocarbon concentrations in groundwater beneath the BP Wells Site have decreased in concentration.

1.2.2 Future Remedial Action

Future remedial action at the Building G-82 and BP Wells Sites includes long-term monitoring of natural attenuation in groundwater for an initial period of 3 years. Additional monitoring requirements will be evaluated at the end of the third year of monitoring.

1.3 Long-Term Monitoring for Natural Attenuation

1.3.1 Objectives

The objective of long-term monitoring for natural attenuation at the Building G-82 and BP Wells Sites is to collect the physical and chemical data necessary to monitor changes in dissolved hydrocarbon concentrations and verify that conditions continue to be favorable for natural attenuation to occur. Remediation for groundwater will be complete when dissolved hydrocarbon concentrations naturally attenuate to concentration below the Florida GCTLs.

1.3.2 Significance of Natural Attenuation Parameters for Long-Term Monitoring

Monitoring key natural attenuation parameters will help determine if water quality conditions remain favorable for biological degradation of hydrocarbons to occur and if parameter concentrations continue to decrease in response to the degradation processes. The following parameters will be evaluated during each sampling event: dissolved oxygen (DO), Oxidation Reduction Potential (ORP), pH, nitrates/nitrite, sulfate, sulfide, and methane. Groundwater quality in background wells will be compared to wells containing parameters in exceedance of GCTLs. A discussion of the MNA measurements made during the November 2006 sampling event is provided below.

Dissolved Oxygen (DO)

DO measurements were made to determine the distribution of DO in groundwater relative to the distribution of dissolved hydrocarbons. In the absence of hydrocarbons, DO concentrations in groundwater typically range from 1.0 to 1.5 milligrams per liter (mg/L) depending on water temperature (i.e., DO concentrations are higher in cold water and lower in warm water). DO is often depleted in groundwater contaminated with hydrocarbons as a result of in-situ biodegradation. Oxygen is consumed and carbon dioxide is produced in the biodegradation process.

In groundwater beneath the Building G-82 Site, DO concentrations ranged from 0.36 mg/L (CEF-G82-2I) to 0.84 mg/L (CEF-G82-5S). The DO concentrations measured in wells CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-4S, and CEF-G82-6S were below those in the background well CEF-G82-3S. These data suggest that subsurface conditions are

suboptimal for aerobic hydrocarbon biodegradation. However, general reductions in VOC concentrations over time suggest that anaerobic biodegradation of contaminants may be occurring.

DO concentrations at the BP Wells Site ranged from 0.6 mg/L (CEF-BP-1S) to 1.50 mg/L (CEF-BP-3S) as measured using the Chemetrics® field test kits during the November 2006 sampling event. The DO concentration of 0.6 mg/L in well CEF-BP-1S was slightly below the DO measured in the upgradient (background) well CEF-BP-2S at 0.8 mg/L. With the exception of well CEF-BP-1S, which showed slightly elevated VOCs, the DO readings at the site were generally similar to background levels. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, contaminant concentration reductions suggest that anaerobic biodegradation of contaminants may be occurring.

Oxidation Reduction Potential (ORP)

ORP is a measure of the relative tendency of ions in solution to transfer electrons. As electron acceptors are utilized, the ORP of the groundwater decreases. As DO is consumed, the ORP will decline and perhaps become negative.

ORP across the BP Wells Site ranged from -126.0 millivolts (mV) to 186.7 mV. Negative ORP levels were measured at only two well locations: CEF-BP-1S (-117.9 mV) and CEF-BP-6S (-126.0 mV). The negative ORP detected in groundwater sampled from these locations suggests that reducing conditions are prevalent in the vicinity of well CEF-BP-1S. This was the only well with parameter concentrations above GCTLs.

ORP across the Building G-82 Site ranged from -127.2 mV to 233.8 mV. ORP levels were similar in wells CEF-G82-1S (-127.2 mV) and CEF-G82-2S (-126.0 mV). These were the only monitoring wells with significantly negative ORP, and they were also the only wells with contaminant concentrations above GCTLs. Similar to the BP Wells Site, these results suggest that reducing conditions are prevalent in the vicinity of the wells showing elevated contaminant concentrations in groundwater.

pH

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units.

At the BP Wells Site, groundwater pH values ranged from 5.13 (CEF-BP-5I) to 6.49 (CEF-BP-1S) with a background value of 6.37 (CEF-BP-2S), generally within the preferred range of values for microbial activity. Further, pH in groundwater sampled from monitoring well CEF-BP-1S, the only well with parameter concentrations above GCTLs, was 6.49.

At the Building G-82 Site, the pH values ranged from 4.97 (CEF-G82-4S) to 6.02 (CEF-G82-2S) with a background value of 5.81 (CEF-G82-3S), indicating that optimal pH conditions for microbial activity were not present at all locations at this site. However, pH values in the vicinity of CEF-G82-1S and CEF-G82-2S (the two wells with contaminant concentrations exceeding GCTLs) were 5.96 and 6.02, respectively, indicating that in this area of the site, pH is generally within the range optimal for microbial activity.

Nitrates/Nitrite

After DO has been depleted, biodegradation of hydrocarbons may continue anaerobically using total nitrate/nitrite as electron acceptors (denitrification). Nitrate/nitrite concentrations will be lower in the wells containing hydrocarbons (such as benzene, toluene, ethylbenzene, and xylenes [BTEX]), if biodegradation is occurring. Nitrate and nitrite were detected in seven of the eight monitoring wells in which the parameters were analyzed.

At the BP Wells Site, nitrate and nitrite were detected in three of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations, ranging from non-detect to 561 µg/L in the downgradient wells, were lower than the concentration of the background well CEF-BP-2S (733 µg/L). No nitrate/nitrite was detected in groundwater sampled from CEF-BP-1S, the only monitoring well with contaminant concentrations exceeding GCTLs, suggesting that reducing conditions are favorable for denitrification in this area.

At the Building G-82 Site, the nitrate and nitrite concentrations ranging from 44 to 66 µg/L in the downgradient wells were similar to the concentration in background well CEF-G82-3S (72 µg/L). The presence of nitrate and nitrite in the areas of impacted groundwater suggests that conditions are unfavorable for denitrification..

Sulfate/Sulfide

After DO and total nitrogen have been depleted in the aquifer, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed sulfate reduction, and results in the production of sulfide. Portions of the hydrocarbon plume undergoing anaerobic biodegradation may have depleted sulfate concentrations and caused elevated sulfide concentrations. Sulfate reducing conditions are favorable at redox potentials of -200 mV and pH of 7.

Sulfate was detected in each of the four wells that were monitored for the parameter at the BP Wells Site. The concentrations of sulfate were higher in the downgradient wells than in the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background and low sulfide concentrations suggest that conditions favorable for sulfate reduction are not present.

Sulfate was detected in two of the four wells that were monitored for the parameter at the Building G-82 Site. The concentrations of sulfate were lower in the downgradient wells than the background well. Sulfate was not present in groundwater sampled from CEF-G82-1S, (the area of highest levels of contaminants of concern) and was detected at levels below those detected in the background sample in groundwater sampled from CEF-G82-2S (the only other site monitoring well to contain contaminants at levels exceeding GCTLs); additionally, sulfide was detected in groundwater sampled from CEF-G82-1S and CEF-G82-2S at levels exceeding those detected in the background sample. The absence or limited presence of sulfate in the areas of impacted groundwater at concentrations lower than background, coupled with the presence of sulfide at concentrations higher than background, suggests that subsurface conditions at the site may be favorable for sulfate reduction in these areas.

Methane

The presence of methane in groundwater at concentrations above background is a good indicator that methanogenesis is occurring. During methanogenesis, carbon dioxide is used as an electron acceptor and methane is formed. The presence of methane in groundwater is also indicative of strong reducing conditions.

Dissolved methane was detected in three of the four wells analyzed at the BP Wells Site. The concentration of methane exceeded background concentrations in wells CEF-BP-1S, CEF-BP-5I, and CEF-BP-6S. The presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons occurring at the site.

Dissolved methane was detected in each of the four wells analyzed at the Building G-82 Site. The concentration of methane exceeded background (estimated 1.63 µg/L) significantly in wells CEF-G82-1S (1,340 µg/L) and CEF-G82-2S estimated 680 µg/L), suggesting anaerobic microbial degradation of hydrocarbons is occurring in these source areas.

2.0 Sampling and Analysis Plan for Natural Attenuation Monitoring

This section describes the sampling procedures that will be followed during execution of the work scope. Analytical methods, data quality objectives, protocol for equipment decontamination, and procedures used for the collection of samples for waste characterization are discussed in this section.

2.1 Sampling Objectives

The objective of long-term monitoring for natural attenuation at the Building G-82 and BP Wells Sites is to collect the physical and chemical data necessary to monitor changes in dissolved hydrocarbon concentrations and verify that conditions continue to be favorable for natural attenuation to occur. Remediation for groundwater will be complete when dissolved hydrocarbon concentrations naturally attenuate to concentration below the Florida GCTLs. In order to achieve these objectives, the following tasks will be performed:

- Measure water levels quarterly to obtain the data required to prepare potentiometric surface maps and to evaluate fluctuations in groundwater elevation.
- Collect the following water quality measurements from 13 wells (CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) during the well purging process to evaluate the physical parameters of the aquifer: pH, conductivity, turbidity, DO, ORP, and temperature.
- Collect groundwater samples from 13 wells (CEF-BP-1S, CEF-BP -2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) for the analysis of BTEX and naphthalene by EPA Method 8260B, PAHs (16 PAHs including both 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270SIM, and TPH by the FL-PRO Method.
- Collect groundwater samples from eight wells (CEF-BP-1S, CEF-BP-2S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82-3S) for the analysis of sulfate/sulfide, alkalinity, nitrate/nitrite, and methane.

Details regarding completion of these tasks are described below.

2.2 Monitoring Well Network

The following eight wells will be analyzed for the MNA parameters: dissolved methane (Method RSK 175), nitrate/nitrite and sulfate (EPA Method 300.0), and sulfide (Method SM4500-S_2 F):

- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-5I, and CEF-BP-6S.
- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82-3S.

The following 13 wells will be analyzed for BTEX and naphthalene by EPA Method 8260B, PAHs (including 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270SIM, and TRPH by the FL-PRO Method:

- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, and CEF-BP-6S.
- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S.

Requirements for sample collection, preservation, and analysis are listed in Table 1.

2.3 Frequency of Monitoring

Based on discussions during the January 2008 NASCF BCT Meeting, groundwater will be monitored on a quarterly basis for the first year of long-term monitoring for the Building G-82 Site and on a semiannually basis for the BP Wells Site. During the second year, semiannual groundwater will be performed at both sites. During the third year, annual groundwater monitoring will performed at both sites. After the completion of the third year of monitoring, the natural attenuation progress will be evaluated to determine if additional monitoring is necessary.

2.4 Data Quality Levels for Measurement Data

The samples will be collected in accordance with the EPA Region IV Field Branches Quality System and Technical Procedures, November 2007, and the FDEP Standard Operating Procedures (SOPs).

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements. A Navy-, U.S. Army Corps of Engineers (USACE)-, or Air Force Center for Engineering and the Environment (AFCEE)- and FDEP-approved laboratory will be used for all sample analyses.

TABLE 1
Requirements for Sample Collection, Preservation, and Analysis

Sample Task	Sample Point	Matrix	Sampling Frequency (Note 1)	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
Groundwater Sampling													
Groundwater Sampling	Monitoring Wells (6 wells – BP Wells Site; 7 wells – Bldg G-82 Site)	Water	1st & 3rd Quarter – 1st yr; Semiannually 2nd yr; Annually 3rd yr	13 + 2 DUP + 1 MS/MSD = 17 (per event); 85 total	Grab	Hand Bailer	14 days	DQO Level IV, CCI Level C	BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
	Monitoring Wells (7 wells – Bldg G-82 Site)		2nd & 4th Quarter – 1st yr;	7 + 1 DUP + 1 MS/MSD = 10; 20 total					PAH including 1- & 2-methylnapthalene	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TRPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
	Monitoring Wells (4 wells – BP Wells Site; 4 wells – Bldg G-82 Site)	Water	1st & 3rd Quarter – 1 yr; Semiannually 2nd yr; Annually 3rd yr	8 + 1 DUP + 1 MS/MSD = 11 (per event) – 55 total	Grab	Hand Bailer	14 days		Sulfate	300.0 / 300.1	28 days	Cool to 4°C	(1) 500-mL plastic
	Monitoring Wells (4 wells – Bldg G-82 Site)		2nd & 4th Quarter – 1st yr;	4 + 1 DUP + 1 MS/MSD = 7; 14 total					Sulfide	SM 4500-S2-F	7 days	Cool to 4°C, pH>9 w/NaOH; add Zinc Acetate	(1) 1000-mL plastic
									Nitrate	300.0	48 hours	Cool to 4°C	(1) 500-mL plastic
									Nitrite	300.0	48 hours	Cool to 4°C	(1) 500-mL plastic
									Methane	RSK-175	14 days	Cool to 4°C, pH <2 w/HCl, no headspace	(2) 40 mL vials

TABLE 1
Requirements for Sample Collection, Preservation, and Analysis

Sample Task	Sample Point	Matrix	Sampling Frequency (Note 1)	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
	Equipment Rinsate Blank	Water	1 per 10% of sampling	1 per event	Prepared in Field	Analyte-free water, SS funnel	14 days		BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
									PAH including 1- & 2-methylnapthalene	8270SIM	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass
									TRPH	FL-PRO	7 days ext; 40-days analysis	HCl pH< 2; Cool to 4°C	(2) 1-L amber glass
									Sulfate	300.0 / 300.1	28 days	Cool to 4°C	(1) 500-mL plastic
									Sulfide	SM 4500-S2-F	7 days	Cool to 4°C, pH>9 w/NaOH; add Zinc Acetate	(1) 1000-mL plastic
									Nitrate	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic
									Nitrite	300.0 / 300.1	48 hours	Cool to 4°C	(1) 500-mL plastic
									Methane	RSK-175	14 days	Cool to 4°C, pH <2 w/HCl, no headspace	(2) 40 mL vials
	Trip Blank	Water	1 per cooler containing volatile samples	7	Prepared by Lab	N/A	14 days		BTEX and naphthalene	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 mL vials
Waste Characterization Sampling													
Disposal of Liquid Waste from well development, purge water, etc.	55-gallon drums containing liquid waste	Water	One per event	7	Grab	Drum thief or dip jar	7 days	DQO Level III, CCI Level B	TCL Volatiles	8260B	14 days	HCl pH< 2; Cool to 4°C	(2) 40 ml vial
									TCL Semi-volatiles	8270C	7 days ext; 40-days analysis	Cool to 4°C	(2) 1-L amber glass

TABLE 1
Requirements for Sample Collection, Preservation, and Analysis

Sample Task	Sample Point	Matrix	Sampling Frequency (Note 1)	Approx Sample No	Sampling Method	Sampling Equipment	TAT	DQO Level/ Data Package Reqmnt	Required Analysis	Analytical Method	Holding Time	Sample Preservation	Containers
									TCL Pesticides	8081A	7 days ext; 40-days analysis		(2) 1-L amber glass
									Herbicides	8151A	7 days ext; 40-days analysis		(2) 1-L amber glass
									PCBs	8082	7 days ext; 40-days analysis		(2) 1-L amber glass
									TAL Metals	6010B/7470 A	180 days; Hg = 28 days	HNO_3 pH< 2; Cool to 4°C	(1) 500ml HDPE
									Ignitability	1010A/1030	ASAP	Cool to 4°C	(1) 500ml HDPE
									Corrosivity	9040B	ASAP		

Note 1: BTEX + Naphthalene, PAHs, TRPH, and MNA parameters will be collected from wells at both sites during the 1st and 3rd quarterly events in the first year; during both semiannual events in the second year; and annually during the 3rd year. Only the wells at the Building G-82 Site will be collected for these parameters during the 2nd and 4th quarterly events in the first year.

DQO – Data Quality Objective
MS/MSD – Matrix Spike/Matrix Spike Duplicate
PCBs – polychlorinated biphenyls
TAL – Target Analyte List
TCL – Target Compound List

2.5 Groundwater Sampling and Analyses

Samples will be collected from all BP Wells Site and Building G-82 Site wells and analyzed for BTEX and naphthalene, PAHs, and TRPH. In addition, samples will be collected from four wells at each site (eight total) for MNA analyses. Groundwater samples will be collected following the EPA's procedures for low-flow groundwater sampling. The procedure outlined below is based on the EPA's report entitled, "Ground Water Issue: Low-Flow (Minimal-Drawdown) Ground-Water Sampling Procedures," (EPA, 1996) and is as follows:

1. Slowly lower the decontaminated pump or pump intake to the middle of the screened interval to minimize excessive mixing of the stagnant water in the casing above the screen with water within screened zone and to minimize re-suspension of solids that may have accumulated at the bottom of the well.

2. Once the pump is positioned in the well, an airtight flow-through cell (equipped with a YSI-type water quality meter) will be connected to the water discharge line.

3. A water level meter will then be lowered into the well to monitor changes in water level during pumping. Once purging begins, water level measurements will be monitored, and pumping rates will be adjusted so that the rate is between 0.1 to 0.3 liter per minute (L/min) to maintain minimal drawdown.

4. While purging, field parameters (DO, pH, temperature, conductivity, salinity, turbidity, and ORP) will be measured every 3 to 5 minutes using a YSI-type meter and will be recorded until all parameters have stabilized for 3 consecutive readings. Once field parameter stabilization is achieved, the sample bottles will be filled.

5. Water samples will be collected by directing the groundwater discharge stream from the pump so that it runs down the inside of the sample bottle with a minimum amount of splashing. To minimize VOC loss, samples to be analyzed for BTEX and naphthalene will be collected first, followed by the analyses for PAHs, TRPH, sulfate/sulfide, alkalinity, nitrate/nitrite, total organic carbon, and ferrous iron. The sample bottles for each analysis are as follows:

   – BTEX and naphthalene by EPA Method 8260B: Three 40-milliliter (mL) volatile organic analytic (VOA) vials containing a hydrochloric acid (HCl) preservative. Fill bottles so there is no headspace within the bottles.

   – PAHs by EPA Method 8270SIM: Two 1-liter amber bottles. Fill to the top of the bottle.

   – TRPH by the FL-PRO Method: Two 1-liter amber bottles containing either hydrochloric acid (HCl) or sulfuric acid (H_2SO_4) preservative. Fill to the top of the bottle.

   – Sulfide by Method SM 4500S_2-F: One 1,000-mL bottle containing sodium hydroxide (NaOH) and zinc acetate preservative for sulfide. Fill to the top of each bottle.

   – Nitrate, nitrite, and sulfate by EPA Method 300.0: One 1000-mL plastic bottle. Fill to the top of the bottle.

- Methane by RSK-175: Two 40-mL VOA vials or amber glass bottle containing either HCl preservative. Fill with no headspace.

6. Cap each bottle and affix label to the bottle. Label information will include laboratory, project name and number, sample identification, station identification, preservative, analysis, sampler's initials, sample date, and time. Place samples in appropriate containers and pack with ice in coolers.

Requirements for sample collection, preservation, and analysis are listed in Table 1. Samples will be delivered to the laboratory as soon as possible to allow the samples to be analyzed within the specified holding times. Requirements for quality assurance/quality control (QA/QC) samples are listed in Table 1.

Residual purge water collected during sampling will be transferred to a 55-gallon drum and will be characterized in accordance with this Sampling and Analysis Plan and disposed of based on the results of sampling analyses.

2.6 Waste Characterization and Incidental Waste Stream Sampling and Analyses

Waste characterization samples will be collected to evaluate the handling and treatment and disposal requirements of accumulated decontamination water and purge water. Water characterization samples will be collected from containment drums prior to disposal. One composite sample (and one grab for VOC analysis) will be collected per event. Water samples will be collected as follows and analyzed for the parameters listed in Table 1:

1. Use a bailer or dip jar and collect a water sample from its containment.
2. Fill the sample containers for volatile analyses first (grab sample). The 40-mL vials will be filled so that there is no headspace in each vial.
3. Then fill the sample containers for the remaining analyses.
4. Label and package the samples for shipment to the laboratory.

2.7 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The following procedure will be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Clean with potable water and Alconox® or equivalent laboratory grade detergent using a brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with potable water.
3. Rinse thoroughly with analyte-free water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse polyvinyl chloride or plastic items with isopropanol.

5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry completely.

2.8 Sample Documentation

Sampling documentation will include the following:

- Numbered Chain-of-Custody Forms
- Sample log book, which includes the following information:
  - Name of laboratories and contacts to which the samples were sent, turnaround time requested, and data results, when possible
  - Termination of a sample point or parameter and reasons
  - Unusual appearance or odor of a sample
  - Measurements, volume of flow, temperature, and weather conditions
  - Details of QC samples obtained
  - Field analytical equipment, and equipment utilized to make physical measurements
  - Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
  - Sampling station identification
  - Date and time of sample collection
  - Sampler(s)' name(s) and company
  - How the sample was collected
  - Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals

2.9 Field Quality Control

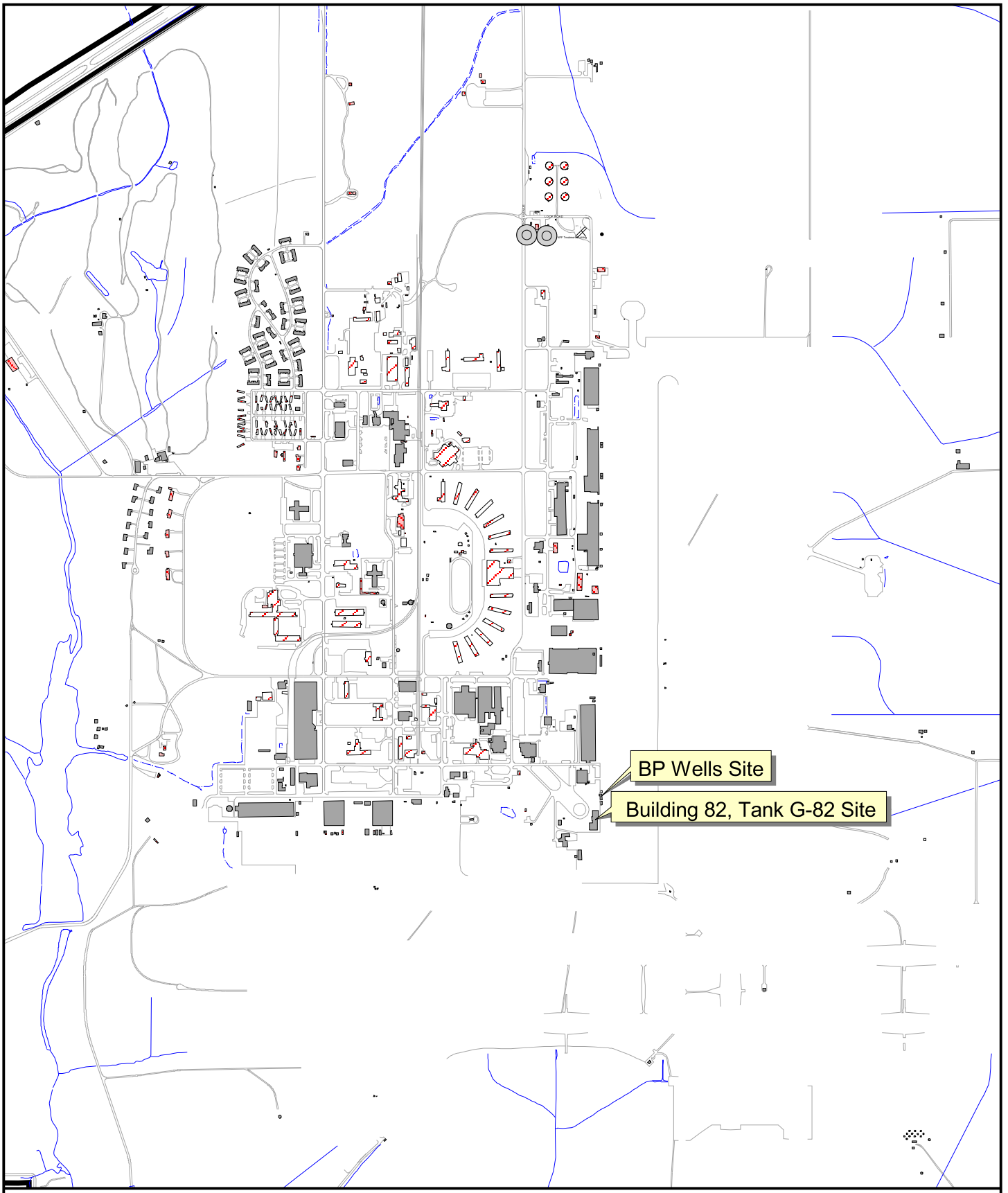
Field duplicate samples and equipment blank samples will be collected at a minimum frequency of 10 percent times the total number of samples (rounded to nearest whole number) collected for an analysis. One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples. MS/MSDs will be required at a frequency of one per sample event or a minimum of 5 percent of the total number (rounded to nearest whole number) of samples collected for an analysis. QC samples are not required for waste characterization. Quantity and frequency are detailed in Table 1.

2.10 Reporting

A report will be compiled at the completion of each of the monitoring events. Each performance monitoring report will include a description of the field sampling event, field data, updated potentiometric surface maps, validated analytical data from the monitoring event, a discussion of the MNA parameters, and charts showing trends of contaminants of concern concentrations over the period of the MNA long-term monitoring.

Figures

NOTE: Original figure created in color



N

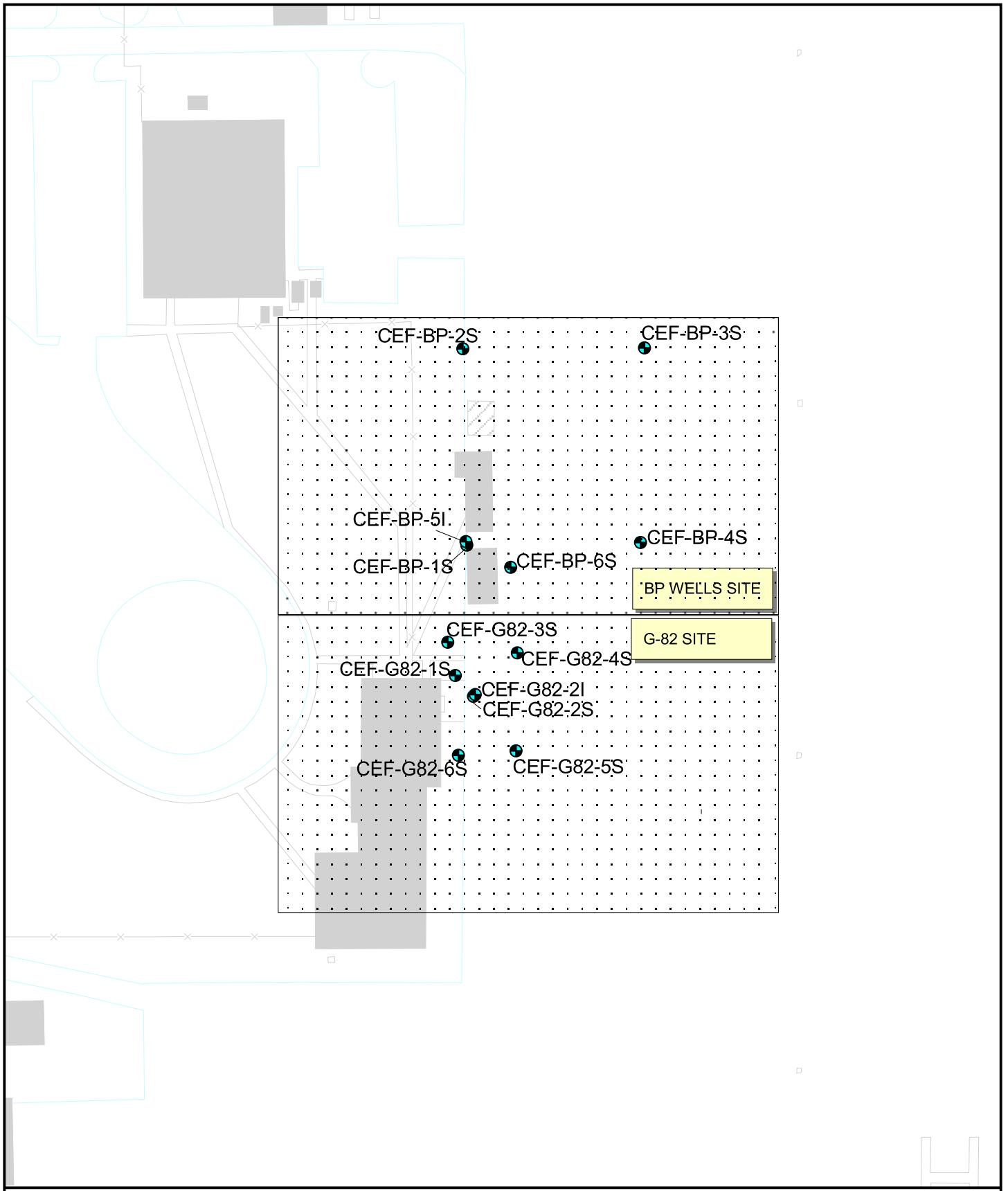
0 1000 2000 Feet

1 inch = 1376.99 feet

Figure 1
Site Location
Bldg. G-82 and BP Wells Sites
Former NAS Cecil Field, Jacksonville, FL

CH2MHILL

File Path: c:\gis\nas_cecilfield.apr, Date: 30 Oct 2006 14:38, User: SNAIK1, NAS Cecil Field Area [Florida State Plane Coordinate System NAD 83 Units Feet] - Figure 1-1 Site Location



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0 80 160 Feet

1 inch = 124 feet

Figure 2
Locations of Groundwater Monitoring Wells
Building G-82 and BP Wells Sites
Former NAS Cecil Field, Jacksonville, FL

CH2MHILL

File Path: c:\gis\nas_cecilfield.apr, Date: 05 May 2008 13:35, User: SNAIK1, NAS Cecil Field Area [Florida State Plane Coordinate System NAD 83 Units Feet] - Figure 2 Locations of Groundwater Monitoring Wells

Attachment 1

2007 CH2M HILL Technical Memorandum

Evaluation of Groundwater Analytical Results from BP Wells Site and Building 82 (Tank G82) Former Naval Air Station Cecil Field, Jacksonville, Florida

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CTO 0086 Project File

DATE: April 27, 2007

1.0 Introduction

This technical memorandum summarizes the findings from the sitewide groundwater monitoring conducted by CH2M HILL Constructors, Inc. (CH2M HILL) at the BP Wells Site and Building 82 Site (Tank G-82) at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This site-wide groundwater monitoring effort was conducted to assess current groundwater quality conditions and to evaluate whether natural attenuation of site contaminants is occurring at these two sites. This work was conducted based on the methodology described in the *Work Plan Addendum No. 18, CTO 86, NAS Cecil Field, Jacksonville, Florida* (CH2M HILL, November 2006).

2.0 Groundwater Monitoring

Figure 1 shows the locations of the BP Wells site and the Building G-82 site. Figure 2 shows the locations of the monitoring wells at these two sites.

The following monitoring wells at the BP well site and the Building G-82 Site were sampled in November 2006 for contaminant characterization:

- **BP Wells Site**: CEF-BP-1S, CEF-BP -2S, CEF-BP -3S, CEF-BP -4S, CEF-BP -5I, and –6S
- **Building G82 Site**: CEF-G82-1S, CEF-G82 -2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5I, and CEF-G82–6S

The groundwater samples from both sites were analyzed for the following parameters: volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8310, and total recoverable petroleum hydrocarbons (TRPH) by the Florida Petroleum Residual Organic (FL PRO) method. The analytical results of these samples are summarized in Table 1.

The following groundwater monitoring wells were sampled for the monitored natural attenuation (MNA) parameters:

- **BP Wells Site:** CEF-BP-1S, CEF-BP -2S, CEF-BP -5I, and CEF-BP –6S
- **Building G82 Site:** CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82–3S

The groundwater samples were analyzed for the following MNA parameters: dissolved methane by EPA Method 8315, nitrate and nitrite by EPA Method 353.2, sulfate by EPA Method 375.4, sulfide by EPA Method 376.2, total organic carbon (TOC) by EPA Method 415.1 and total inorganic carbon (TIC) by EPA Method 415.1. The MNA groundwater analytical results are summarized in Table 2.

The groundwater in each monitoring well was tested in the field for pH, conductivity, turbidity, dissolved oxygen (DO), oxidation reducing potential (ORP) and temperature, as part of the sampling protocol. The results of the field tests are included in Table 2. The analytical laboratory and data validation reports for the groundwater sampling event are included in Attachment 1.

3.0 Summary of Findings from Groundwater Sampling

3.1 Contaminant Characterization Sampling Results

BP Wells Site

The following parameters were detected concentrations above the Florida Groundwater Cleanup Target Levels (GCTLs) during the November 2006 sampling event: isopropyl-benzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. All reported exceedances were in well CEF-BP-1S. None of these detections exceeded the Florida Natural Attenuation Default Concentration (NADC) criteria. The remaining wells at the BP Wells site did not show any exceedances of either the GCTLs or NADC criteria.

A summary of the 2003 historical analytical results from the BP Well Site is included in Attachment 2. The following parameters were detected historically at concentrations above the GCTLs in well CEF-BP-1S: ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylebenzene. In general, these site groundwater constituents at the BP Wells Site have decreased in concentrations when compared to the previous sampling events conducted during 2003.

Building G-82 Site

The following parameters were detected at concentrations above the GCTLs during the November 2006 monitoring well sampling event: isopropylbenzene (cumene), naphthalene and 1-methylnaphthalene in wells CEF-G82-1S and CEF-G82-2S; 2-methylnaphthalene in well CEF-G82-2S; and benzo(a)pyrene and dibenz(a,h)anthracene in well CEF-G82-1S. The benzo(a)pyrene detection of 7.95 micrograms per liter (µg/L) and the dibenz(a,h)anthracene detection of 35.9 µg/L in well CEF-G82-1S also exceeded NADC standards of 2 µg/L and 0.05 µg/L, respectively.

A summary of the historical analytical results from the Building 82 Site is presented in Attachment 3. No parameters were detected historically at concentrations above the GCTLs in well CEF-G82-1S. The following parameters were historically detected at concentrations above the GCTLs in well CEF-BP-2S: benzene, ethylbenzene, total xylenes, 1-methyl-naphthalene, 2-methylnaphthalene, and naphthalene. In general, the concentrations of VOCs (benzene, ethylbenzene, and total xylenes) in well CEF-G82-2S from the November 2006 sampling event decreased in concentrations when compared to the previous sampling events. However, the concentrations of PAHs 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene and dibenz(a,h)anthracene increased slightly when compared with historical results.

3.2 MNA Analytical Results

Geochemical data were evaluated to determine if natural attenuation is continuing to occur in groundwater at the two sites and if parameter concentrations are decreasing in response to naturally-occurring degradation processes. The evaluation involves comparing geochemical data from source area and downgradient monitoring wells to background values measured in upgradient wells. The parameters evaluated included DO, ORP, pH, nitrate and nitrite, sulfate and sulfide, and dissolved methane. A discussion of the results of each parameter is presented below.

3.2.1 BP Wells Site

Dissolved Oxygen

DO measurements were recorded in each monitoring well during the November 2006 groundwater sampling event. Typically, DO concentrations below 1.0 milligram per liter (mg/L) indicate conditions are anoxic and a reducing environment is present. DO concentrations at the BP Wells Site ranged from 0.6 mg/L (CEF-BP-1S) to 1.50 mg/L (CEF-BP-3S) as measured using the Chemetrics® field test kits. The DO concentration of 0.6 mg/L in well CEF-BP-1S was slightly below the DO measured in the upgradient (background) well CEF-BP-2S at 0.8 mg/L. With the exception of well CEF-BP-1S, which showed slightly elevated VOCs, the DO readings at the site are generally similar to background levels. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, contaminant concentration reductions indicate that anaerobic biodegradation of contaminants could be occurring.

Oxidation/Reduction Potential (Redox potential)

Redox potential is a measure of the relative tendency of ions in solution to transfer electrons. As electron acceptors are utilized, the redox potential of the groundwater decreases. As DO is consumed, the redox potential will decline and become negative. Redox potentials across the BP Well Site ranged from –126 millivolts (mV) to 186.7 mV. The lowest redox level was measured in CEF BP-6S. Negative redox potentials were also measured in source area monitoring well CEF-BP-1S, which suggests that reducing conditions are favorable for biodegradation in the vicinity of CEF-BP-1S. This is the only well with parameter concentrations above GCTLs.

pH

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units. The pH values range from 5.13 (CEF-BP-5I) to 6.49 (CEF-BP-1S) with a background value of 6.37 (CEF-BP-2S), generally within the preferred range of values for microbial activity.

Nitrate/Nitrite

After DO has been depleted, biodegradation of hydrocarbons may continue anaerobically using total nitrate and nitrite as electron acceptors (denitrification). Nitrate and nitrite concentrations will be lower in the wells containing hydrocarbons if biodegradation is occurring. Nitrate and nitrite were detected in three of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations, ranging from non-detect to 561 ug/L in the downgradient wells, were lower than the concentrations of the background well CEF-BP-2S (733 ug/L). The presence of nitrate/nitrite in the areas of impacted groundwater suggests that reducing conditions favorable for denitrification are not present.

Sulfate/Sulfide

After DO and total nitrogen have been depleted in the aquifer, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed sulfate reduction and results in the production of sulfide. Portions of the plume containing hydrocarbons and undergoing anaerobic biodegradation may have depleted the sulfate concentrations and elevated the sulfide concentrations. Sulfate reducing conditions are favorable at redox potentials of –200 mV and ph of 7. Sulfate was detected in each of the four wells that were monitored for the parameter. The concentrations of sulfate were higher in the downgradient wells than in the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background and low sulfide concentrations suggest that conditions favorable for sulfate reduction are not present.

Dissolved Methane

The presence of methane in groundwater at concentrations above background is a good indicator that methanogenesis is occurring. During methanogenesis, carbon dioxide is used as an electron acceptor and methane is formed. The presence of methane in groundwater is indicative of strong reducing conditions. Methane was detected in three of the four wells analyzed. The concentration of methane exceeded background concentrations in wells CEF-BP-1S, CEF-BP -5I, and CEF-BP-6S. The presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons occurring at the site.

3.2.2 Building G-82 Site

Dissolved Oxygen

DO concentrations in groundwater at the Building G-82 site ranged from 0.36 mg/L (in well CEF-G82-2I) to 0.84 mg/L (in well CEF-G82-5S). The DO concentrations measured in wells CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-4S, and CEF-G82–6S were below those in

the background well CEF-G82-3S. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, general reductions in VOC concentrations over time indicate that biological degradation of contaminants is occurring.

Oxidation/Reduction Potential

Redox potentials across the Building G-82 Site ranged from –127.2 mV to 233.8 mV. The lowest redox level was measured in well CEF-G82-2S at -127.2 mV. Significantly negative redox potentials were measured only in monitoring wells CEF-G82-1S and CEF-G82–2I, suggesting that reducing conditions are prevalent in the vicinity of these wells, which are the only wells with contaminant concentrations above GCTLs.

pH

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units. The pH values range from 4.97 (CEF-G82-4S) to 6.02 (CEF-G82-2S) with a background value of 5.81 (CEF-G82-3S), indicating that optimal pH conditions for microbial activity are not present at all locations at this site.

Nitrate/Nitrite

Nitrate and nitrite were detected in each of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations ranging from 44 to 66 ug/L in the downgradient wells were similar to the concentration in background well CEF-G82-3S (72 µg/L). The presence of nitrate and nitrite in the areas of impacted groundwater suggests that reducing conditions favorable for denitrification are not present.

Sulfate/Sulfide

Sulfate was detected in two of the four wells that were monitored for the parameter. The concentrations of sulfate were lower in the downgradient wells than the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background suggests that subsurface conditions at the site may not be favorable for sulfate reduction.

Dissolved Methane

Dissolved methane was detected in each of the four wells analyzed. The concentration of methane exceeded background in wells CEF-G82-1S, CEF-G82-2I, and CEF-G82-2S. Because methane is not present in gasoline or diesel fuel, the presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons.

4.0 Conclusions

At the BP Wells Site, the following parameters were detected at concentrations above the GCTLs during the November 2006 sampling event: isopropylbenzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylebenzene in well CEF-BP-1S. Contaminant concentrations exceeded the GCTLs at only one monitoring well (CEF-BP-1S). Based on the laboratory analytical results, site contaminant concentrations in remaining wells at the BP Well site did not exceed GCTLs, and none of the detected

concentrations at this site exceed the NADC criteria. In general, the November 2006 site groundwater contaminant concentrations at the BP Wells site have decreased when compared to the historical sampling events. The MNA sampling data indicate that anaerobic degradation processes may be prevalent at the site.

Based on the analytical results, the residual groundwater contamination at this site appears to remain localized around the source area well CEF-BP-1S and does not appear to have migrated downgradient since the last sampling event in October 2003. Additionally, the impervious paved surface at the site acts as a barrier against the infiltration of precipitation, thus reducing the contaminant migration potential.

At the Building G-82 Site, the following parameters were detected at concentrations above the GCTLs during the well November 2006 sampling event: isopropylbenzene (cumene), naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene and dibenz(a,h)-anthracene. Only the dibenz(a,h)anthracene detection in well CEF-G82-1S exceeded the NADC criteria.

In summary, the concentrations of VOCs (benzene, ethylbenzene, and xylenes) in the source area well CEF-G82-2S have decreased in concentrations when compared to the previous sampling events, and the concentrations of PAHs have remained similar in CEF-G82-2S and increased slightly in well CEF-G82-1S, when compared to the historical results.

The single NADC exceedance in the source well CEF-G82-1S of dibenz(a,h)anthracene and the appearance of benzo(a)pyrene (two compounds which were not previously detected at the site above laboratory detection limits) appear to be anomalous. The PAH concentrations in CEF-G82-1S should be monitored further to establish concentration trends over time.

Tables

TABLE 1

Groundwater Analytical Results

Bldg. G82 and BP Site Groundwater

Parameter			BP WELL SITE							Building 82 Tank G82 Site							
	Station ID		CEF-BP-1S	CEF-BP-2S	CEF-BP-3S	CEF-BP-4S		CEF-BP-5I	CEF-BP-6S	CEF-G82-1S	CEF-G82-2I		CEF-G82-2S	CEF-G82-3S	CEF-G82-4S	CEF-G82-5S	CEF-G82-6S
	Sample ID		86BP1SW061108	86BP2SW061107	86BP3SW061102	86BP4SW061102	86BPDPW061102	86BP5IW061107	86BP6SW061108	86G821SW061108	86G822IW061106	86G82DPW061106	86G822SW061106	86G823SW061106	86G824SW061102	86G825SW061102	86G826SW061102
	Sample Date		11/8/2006	11/7/2006	11/2/2006	11/2/2006	11/2/2006	11/7/2006	11/8/2006	11/8/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/2/2006	11/2/2006	11/2/2006
	GCTL[1]	NADC					FIELD DUP					FIELD DUP					
SW8260B	Units in ug/L																
1,1,2-trichloro-1,2,2-trifluoroethane	210000	2100000	1.15 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trichlorobenzene	70	700	3.34 JB	5 U	5 U	5 U	5 U	5 U	3.39 JB	3.44 JB	1.08 J	5 U	5 U	5 U	3.55 J	3.57 J	5 U
1,2,4-Trimethylbenzene	10	100	**60.8 JB**	5 U	0.201 J	5 U	5 U	5 U									
1,3,5-Trimethylbenzene (Mesitylene)	10	100	**19 JB**	5 U	0.224 J	5 U	5 U	5 U									
1,2-Dichlorobenzene	600	6000	5 UJ	5 U	0.277 J	5 U	5 U	5 U	5 UJ	5 UJ	5 U	0.35 J	5 U	5 UJ	5 U	5 U	5 U
1,3-Dichlorobenzene	210	2100	5 U	5 U	0.25 JB	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	6300	63000	5.42 JB	89	25 UJ	25 UJ	25 UJ	25 U	25 JB	32.8 JB	3.25 J	6.72 B	18 J	15.9 B	7.38 JB	17.1 JB	25 U
Benzene	1	10	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	0.447 J	5 U	5 U	5 U	5 U	5 U
Bromomethane	9.8	98	5 U	5 UJ	5 U	5 U	5 U	5 UJ	0.924 JB	5 U	5 UJ	0.74 B	5 UJ	0.926 B	5 U	5 U	5 U
cyclohexane	NE	NE	5.74	5 U	5 U	5 U	5 U	5 U	5 U	3.97 J	5 U	5 U	2.62 J	5 U	5 U	5 U	5 U
Ethylbenzene	30	300	**53.1**	5 U	5 U	5 U	5 U	5 U	0.458 J	6.21	5 U	5 U	11.1	5 U	0.433 J	5 U	5 U
Isopropylbenzene (Cumene)	0.8	8	**5.61**	5 U	0.179 J	5 U	5 U	5 U	5 U	**3.66 J**	5 U	5 U	**4.02 J**	5 U	5 U	5 U	5 U
methylcyclohexane	NE	NE	9.53	5 U	0.173 J	5 U	5 U	5 U	3.95 J	4.04 J	5 U	5 U	3.23 J	5 U	5 U	5 U	5 U
Methylene chloride	5	50	10 U	10 U	1.74 JB	1.58 JB	1.46 JB	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene (PCE)	3	30	5 UJ	5 U	0.406 J	0.233 J	5 U	5 U	5 UJ	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 U	5 U
Toluene	40	400	3.16 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Xylenes, total	20	200	**101 J**	10 U	0.61 J	10 U	10 U	10 U	10 UJ	12.1 J	10 U	10 UJ	5.89 J	10 UJ	10 U	10 U	10 U
SW8310																	
1-methylnaphthalene	28	280	8.66 J	1 U	1 U	1 U	1 U	1 U	1 U	**48.8**	1 U	1 U	**138 J**	1 U	6.11 J	1 U	1 U
2-Methylnaphthalene	28	280	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	**65.9 J**	1 U	1 U	1 U	1 U
Acenaphthylene	210	2100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	5.54 J	1 U	1 U	1 U	1 U
Benzo(a)pyrene	0.2	2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**7.95 J**	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibenz(a,h)anthracene	0.005	0.05	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	**35.9 J**	0.1 U	0.1 U	1 U	0.1 U	0.1 U	0.1 U	0.1 U
Fluorene	280	2800	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	2.51 J	0.5 U	0.5 U	3.98 J	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	14	140	6.47	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	**40.7 J**	0.5 U	0.5 U	**56.5 J**	0.5 U	0.5 U	0.5 U	0.5 U
FLPRO																	
Petroleum hydrocarbons	5000	50000	459 B	126 B	86.4 B	112 B	114 B	69 JB	133 B	613 B	59 JB	59 JB	878 JB	54 JB	202 B	274 B	86 B

Notes:
All concentrations reported in micrograms per liter (ug/L).
GCTL - Groundwater Cleanup Target Level
NADC - Natural Attenuation Default Concentration
1 = Ch 62-777 FAC GCTLs reported in µg/L
U - The analyte was analyzed for, but not detected.
J - Result is estimated
UJ- Value non-detect, estimated.
JB- Estimated value; the analyte was detected in the associated method and/or calibration blank.
NE - Not Established at time of rule adoption
Bold indicates concentration exceeds GCTL.
Shaded indicates concentration exceeds NADC.

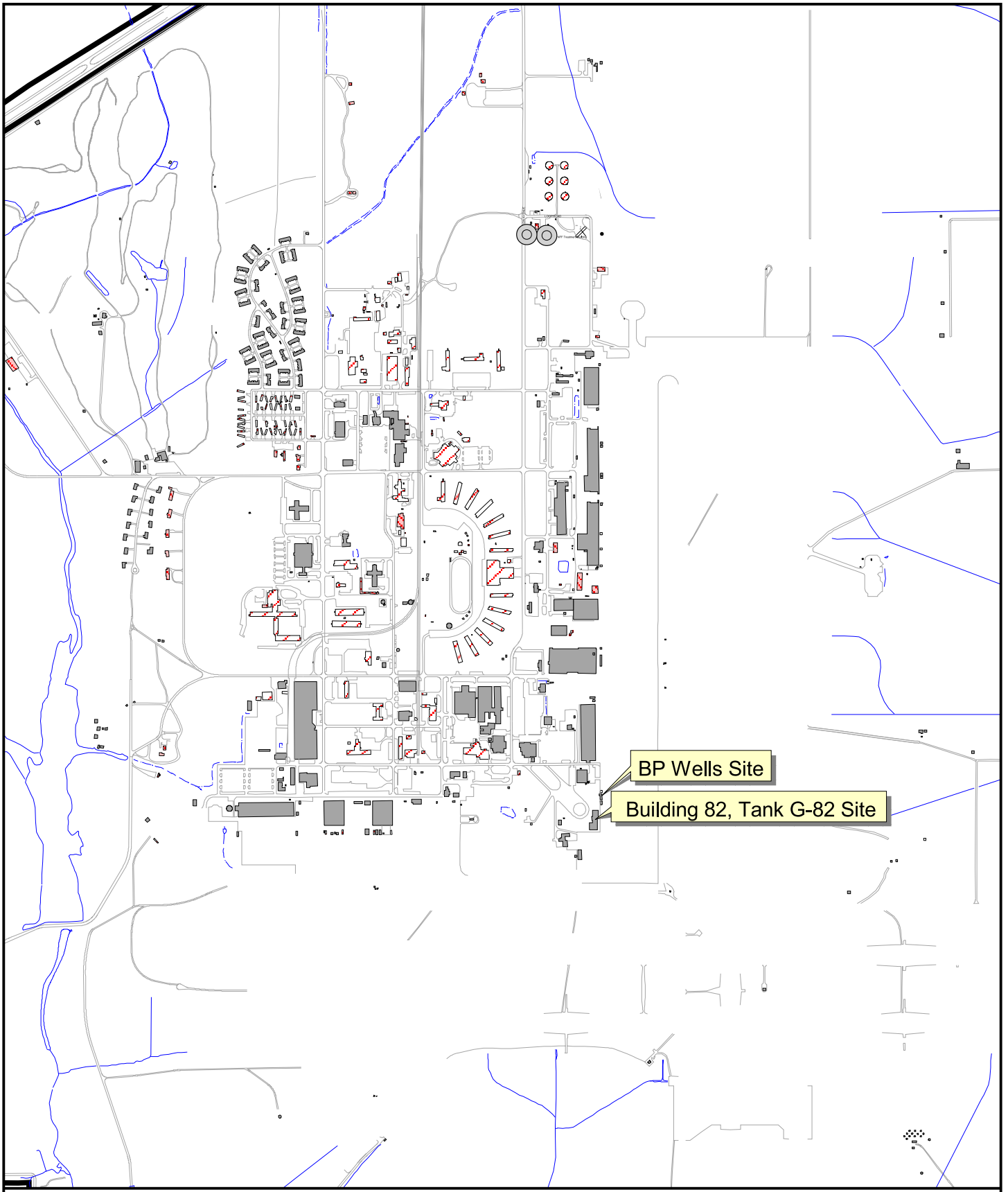
TABLE 2
MNA Parameter Results
Bldg. G82 and BP Site Groundwater

Station ID	CEF-BP-1S	CEF-BP-2S	CEF-BP-3S	CEF-BP-4S		CEF-BP-5I	CEF-BP-6S	CEF-G82-1S	CEF-G82-2I		CEF-G82-2S	CEF-G82-3S	CEF-G82-4S	CEF-G82-5S	CEF-G82-6S
Sample ID	86BP1SW061108	86BP2SW061107	86BP3SW061102	86BP4SW061102	86BPDPW061102	86BP5IW061107	86BP6SW061108	86G821SW061108	86G822IW061106	86G82DPW061106	86G822SW061106	86G823SW061106	86G824SW061102	86G825SW061102	86G826SW061102
Sample Date	11/8/2006	11/7/2006	11/2/2006	11/2/2006	11/2/2006	11/7/2006	11/8/2006	11/8/2006	11/6/2006	11/6/2006	11/6/2006	11/6/2006	11/2/2006	11/2/2006	11/2/2006
					FIELD DUP					FIELD DUP					
Parameter	**Units in ug/L**														
Nitrogen, nitrate (as n)	10 U	709 B	NA	NA	NA	561 B	10 U	10 U	10 U	10 U	36	65	NA	NA	NA
Nitrogen, nitrite	10 U	24	NA	NA	NA	10 U	3 J	44	66	59	18	7 J	NA	NA	NA
Sulfate (as SO4)	6300	4200 J	NA	NA	NA	10400	8600	5000 U	5000 J	5400	6800	31600	NA	NA	NA
E376.1															
Sulfide	4000 U	1600 J	NA	NA	NA	3200 J	4000 U	8000	3200 JB	3200 JB	5200 JB	2800 JB	NA	NA	NA
E415.1															
Total Inorganic Carbon	9400	6000	NA	NA	NA	24600	6800	6500	9600 JB	8400 JB	24900 JB	20000 JB	NA	NA	NA
Total organic carbon	9000	2300	NA	NA	NA	1000 U	8100	16700	910 J	1100	9900	7700	NA	NA	NA
RSK-175															
Methane	7.8	2 U	NA	NA	NA	1.26 J	1230	1340	2.27 JB	2.09 JB	680 JB	1.63 JB	NA	NA	NA
Field Parameteters															
pH	6.49	6.37	6.24	6.43	6.43	5.13	5.96	5.96	5.08	5.08	6.02	5.81	4.97	5.25	5
Cond. (mmhos/cm)	399	199	176	248	248	87	210	210	54	54	262	265	93	129	97
Dissolved Oxygen (mg/L) Field	0.3	0.53	1.97	0.69	0.69	1.07	0.37	0.37	0.36	0.36	0.51	0.78	0.64	0.84	0.65
Dissolved Oxygen (mg/L) Chemets	0.6	0.8	1.5	1	1	1	0.8	0.6	0.3	0.3	0.6	0.8	0.6	1	1
Dissolved Oxygen (mg/L) Hach	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	1
ORP (mV)	-117.9	129.9	186.7	76.5	76.5	261	-126	-126	-7	-7	-127.2	200.4	99.4	69.7	233.8
Temp. (^{o}C)	24.4	25.5	28.5	28.2	28.2	23.79	23.28	23.2	23.6	23.6	24.5	24.4	28.5	26.9	24.5
Turbidity (NTUs)	0.33	7.6	7.57	29.7	29.7	0.73	3.67	61.7	99.3	99.3	21.1	3.92	4.3	5.83	24

J - Result is estimated.
UJ- Value non-detect, estimated.
JB- Estimated value; the analyte was detected in the associated method and/or calibration blank.
mS/cm = millisiemans per centimeter
NTU = nephelometric turbidity units
mg/L = milligrams per liter
^{o}C = degrees Celsius
ORP = oxygen reducing potential
mV = millivolts
NA - Not analyzed

Figures

NOTE: Original figure created in color



N

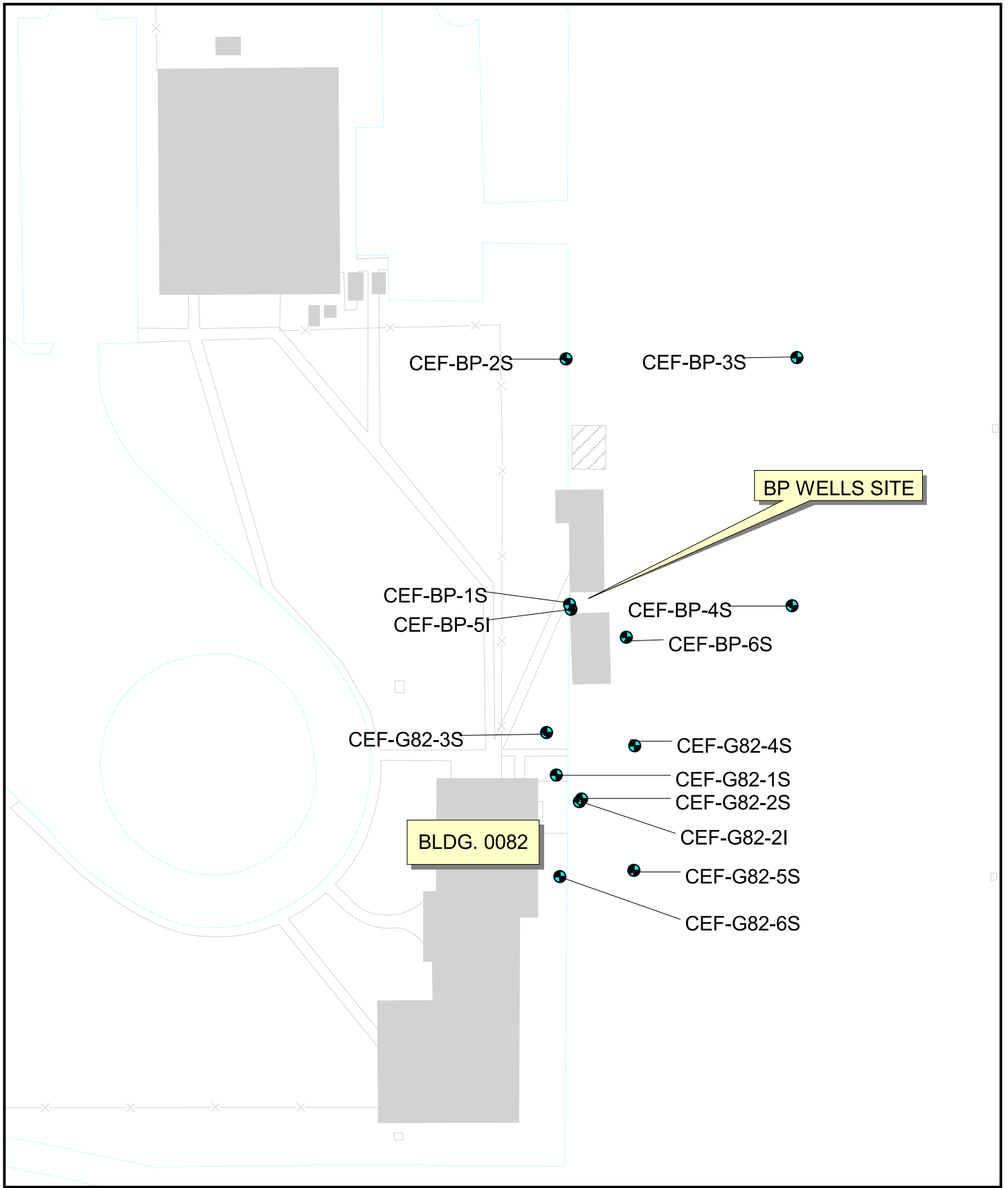
0 1000 2000 Feet

1 inch = 1376.99 feet

Figure 1
Site Location
Bldg. G-82 and BP Wells Sites
Former NAS Cecil Field, Jacksonville, FL

CH2MHILL

File Path: c:\gis\nas_cecilfield.apr, Date: 30 Oct 2006 14:38, User: SNAIK1, NAS Cecil Field Area [Florida State Plane Coordinate System NAD 83 Units Feet] - Figure 1-1 Site Location



Monitoring Wells

N

0 60 120 Feet

1 inch = 78 feet

Figure 2
Locations of Groundwater Monitoring Wells
BP Wells and Bldg. G-82 Sites
Former NAS Cecil Field, Jacksonville, FL

CH2MHILL

File Path: c:\gis\nas_cecilfield.apr, Date: 25 Apr 2007 19:18, User: SNAIK1, NAS Cecil Field Area [Florida State Plane Coordinate System NAD 83 Units Feet] - Figure 1-2 Locations of Groundwater Monitoring Wells

Attachment 1

Laboratory Analytical Reports
(provided on CD)

Attachment 2

BP Well Site Historical Analytical Results

Historical Detects in BP Wells - NAS Cecil Field

LOCID	SAMPLEID	QCTYPE	CAS	PARAMETER	RESULT	UNIT	QUALIFIER	FRACTION	MATR	SAMPLEDATE	SAMPLECODE
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	71-43-2	BENZENE	0.56	UG/L	J	OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	TTNUS001	TOTAL PETROLEUM HYDROCA	0.561	MG/L		PET	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	208-96-8	ACENAPHTHYLENE	2	UG/L		OS	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7439-95-4	MAGNESIUM	9420	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7440-23-5	SODIUM	2430	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7439-97-6	MERCURY	0.11	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7440-66-6	ZINC	45.5	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	91-20-3	NAPHTHALENE	3.9	UG/L		OS	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	108-88-3	TOLUENE	38.5	UG/L		OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	1330-20-7	TOTAL XYLENES	114	UG/L		OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7440-09-7	POTASSIUM	2260	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	100-41-4	ETHYLBENZENE	20.9	UG/L		OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7439-89-6	IRON	209	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7440-39-3	BARIUM	5.6	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	7440-70-2	CALCIUM	26800	UG/L		M	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	45.9	UG/L		OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	108-67-8	1,3,5-TRIMETHYLBENZENE	16.1	UG/L		OV	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-01	NM	91-57-6	2-METHYLNAPHTHALENE	2.7	UG/L		OS	GW	02/03/2000	NORMAL
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	TTNUS054	M+P-XYLENES	67.1	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	108-67-8	1,3,5-TRIMETHYLBENZENE	13.5	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	95-63-6	1,2,4-TRIMETHYLBENZENE	39.7	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	100-41-4	ETHYLBENZENE	15	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	95-47-6	O-XYLENE	19.1	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP1-GW-01S-02-D	FD	108-88-3	TOLUENE	30.1	UG/L		OV	GW	03/27/2000	DUP
CEF-BP-1S	CEF-BP-GW-01S-01-D	FD	95-63-6	1,2,4-TRIMETHYLBENZENE	144	UG/L		OV	GW	04/11/2001	DUP
CEF-BP-1S	CEF-BP-GW-01S-01-D	FD	108-67-8	1,3,5-TRIMETHYLBENZENE	49.9	UG/L		OV	GW	04/11/2001	DUP
CEF-BP-1S	CEF-BP-GW-01S-01-D	FD	1330-20-7	TOTAL XYLENES	432	UG/L		OV	GW	04/11/2001	DUP
CEF-BP-1S	CEF-BP-GW-01S-01A	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	156	UG/L		OV	GW	05/22/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-01A	NM	108-67-8	1,3,5-TRIMETHYLBENZENE	53.8	UG/L		OV	GW	05/22/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-01A	NM	1330-20-7	TOTAL XYLENES	634	UG/L		OV	GW	05/22/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-02A	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	360	UG/L		OV	GW	11/06/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-02A	NM	108-67-8	1,3,5-TRIMETHYLBENZENE	124	UG/L		OV	GW	11/06/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-02A	NM	1330-20-7	TOTAL XYLENES	894	UG/L		OV	GW	11/06/2001	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-03	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	262	UG/L		OV	GW	10/03/2002	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-03	NM	100-41-4	ETHYLBENZENE	117	UG/L		OV	GW	10/03/2002	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-03	NM	1330-20-7	TOTAL XYLENES	658	UG/L		OV	GW	10/03/2002	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	224	UG/L		OV	GW	01/06/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04	NM	108-67-8	1,3,5-TRIMETHYLBENZENE	71.5	UG/L		OV	GW	01/06/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04	NM	100-41-4	ETHYLBENZENE	161	UG/L		OV	GW	01/06/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04	NM	1330-20-7	TOTAL XYLENES	811	UG/L		OV	GW	01/06/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04A	NM	14797-55-8	NITRATE	0.41	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04A	NM	TTNUS003	TOTAL ORGANIC CARBON	12	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-04A	NM	74-82-8	METHANE	14	UG/L		OV	GW	01/30/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	74-82-8	METHANE	6.55	UG/L		OV	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	14797-55-8	NITRATE	0.12	MG/L		MISC	GW	04/17/2003	DUP

Historical Detects in BP Wells - NAS Cecil Field

LOCID	SAMPLEID	QCTYPE	CAS	PARAMETER	RESULT	UNIT	QUALIFIER	FRACTION	MATR	SAMPLEDATE	SAMPLECODE
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	TTNUS003	TOTAL ORGANIC CARBON	11.7	MG/L		MISC	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	95-63-6	1,2,4-TRIMETHYLBENZENE	273	UG/L		OV	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	108-67-8	1,3,5-TRIMETHYLBENZENE	144	UG/L		OV	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	100-41-4	ETHYLBENZENE	184	UG/L		OV	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01S-05-D	FD	1330-20-7	TOTAL XYLENES	542	UG/L		OV	GW	04/17/2003	DUP
CEF-BP-1S	CEF-BP-GW-01-06	NM	74-82-8	METHANE	24.5	UG/L		OV	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01-06	NM	108-67-8	1,3,5-TRIMETHYLBENZENE	38.4	UG/L		OV	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01-06	NM	95-63-6	1,2,4-TRIMETHYLBENZENE	118	UG/L		OV	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01-06	NM	100-41-4	ETHYLBENZENE	48	UG/L		OV	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01-06	NM	1330-20-7	TOTAL XYLENES	236	UG/L		OV	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-01-06	NM	TTNUS003	TOTAL ORGANIC CARBON	13	MG/L		MISC	GW	07/17/2003	NORMAL
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	1330-20-7	TOTAL XYLENES	1040	UG/L		OV	GW	10/16/2003	DUP
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	TTNUS003	TOTAL ORGANIC CARBON	12.4	MG/L		MISC	GW	10/16/2003	DUP
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	74-82-8	METHANE	28.3	UG/L		OV	GW	10/16/2003	DUP
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	108-67-8	1,3,5-TRIMETHYLBENZENE	130	UG/L		OV	GW	10/16/2003	DUP
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	95-63-6	1,2,4-TRIMETHYLBENZENE	460	UG/L		OV	GW	10/16/2003	DUP
CEF-BP-1S	CEF-BP-GW-1S-07-D	FD	100-41-4	ETHYLBENZENE	207	UG/L		OV	GW	10/16/2003	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7429-90-5	ALUMINUM	1790	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-70-2	CALCIUM	41200	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7439-95-4	MAGNESIUM	1010	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-39-3	BARIUM	11.5	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-50-8	COPPER	1.2	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7439-89-6	IRON	758	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7439-97-6	MERCURY	0.19	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-66-6	ZINC	8.6	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-23-5	SODIUM	12100	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-62-2	VANADIUM	9.2	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP1-GW-02S-01-D	FD	7440-09-7	POTASSIUM	3270	UG/L		M	GW	02/03/2000	DUP
CEF-BP-2S	CEF-BP-GW-02S-04A	NM	74-82-8	METHANE	1.4	UG/L		OV	GW	01/30/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-04A	NM	14797-55-8	NITRATE	0.88	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-04A	NM	TTNUS003	TOTAL ORGANIC CARBON	4	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-05	NM	14797-55-8	NITRATE	0.34	MG/L		MISC	GW	04/17/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-05	NM	TTNUS003	TOTAL ORGANIC CARBON	4.7	MG/L		MISC	GW	04/17/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-05	NM	74-82-8	METHANE	5.76	UG/L		OV	GW	04/17/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-02S-06	NM	TTNUS003	TOTAL ORGANIC CARBON	4.8	MG/L		MISC	GW	07/17/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-2S-07	NM	TTNUS003	TOTAL ORGANIC CARBON	4.6	MG/L		MISC	GW	10/16/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-2S-07	NM	14797-55-8	NITRATE	0.33	MG/L		MISC	GW	10/16/2003	NORMAL
CEF-BP-2S	CEF-BP-GW-2S-07	NM	74-82-8	METHANE	12.9	UG/L		OV	GW	10/16/2003	NORMAL
CEF-BP-6S	CEF-BP1-GW-06S-01	NM	67-64-1	ACETONE	26.3	UG/L		OV	GW	03/27/2000	NORMAL
CEF-BP-6S	CEF-BP1-GW-06S-01	NM	67-66-3	CHLOROFORM	1.1	UG/L		OV	GW	03/27/2000	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-04A	NM	14797-55-8	NITRATE	0.13	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-04A	NM	TTNUS003	TOTAL ORGANIC CARBON	9	MG/L		MISC	GW	01/30/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-04A	NM	74-82-8	METHANE	136	UG/L		OV	GW	01/30/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-05	NM	14797-55-8	NITRATE	0.71	MG/L		MISC	GW	04/17/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-05	NM	TTNUS003	TOTAL ORGANIC CARBON	6.1	MG/L		MISC	GW	04/17/2003	NORMAL

Historical Detects in BP Wells - NAS Cecil Field

LOCID	SAMPLEID	QCTYPE	CAS	PARAMETER	RESULT	UNIT	QUALIFIER	FRACTION	MATR	SAMPLEDATE	SAMPLECODE
CEF-BP-6S	CEF-BP-GW-06S-05	NM	100-41-4	ETHYLBENZENE	1.2	UG/L		OV	GW	04/17/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-05	NM	74-82-8	METHANE	149	UG/L		OV	GW	04/17/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-06S-06-D	FD	100-41-4	ETHYLBENZENE	0.51	UG/L	J	OV	GW	07/17/2003	DUP
CEF-BP-6S	CEF-BP-GW-06S-06-D	FD	TTNUS003	TOTAL ORGANIC CARBON	6.6	MG/L		MISC	GW	07/17/2003	DUP
CEF-BP-6S	CEF-BP-GW-06S-06-D	FD	14797-55-8	NITRATE	0.33	MG/L		MISC	GW	07/17/2003	DUP
CEF-BP-6S	CEF-BP-GW-06S-06-D	FD	74-82-8	METHANE	87.2	UG/L		OV	GW	07/17/2003	DUP
CEF-BP-6S	CEF-BP-GW-6S-07	NM	TTNUS003	TOTAL ORGANIC CARBON	8.5	MG/L		MISC	GW	10/16/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-6S-07	NM	14797-55-8	NITRATE	0.34	MG/L		MISC	GW	10/16/2003	NORMAL
CEF-BP-6S	CEF-BP-GW-6S-07	NM	74-82-8	METHANE	738	UG/L		OV	GW	10/16/2003	NORMAL

Attachment 3

Building G82 Site Historical Analytical Results

TABLE 3-1

SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER
SITE ASSESSMENT REPORT BUILDING 82, TANK G82
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA
PAGE 1 OF 2

Location Sample Number Sample Date Well Depth, Feet	FDEP GCTL, FAC 62-777	CEF-G82-1S CEF-G82-GW-1S-01 07-Oct-99 15	CEF-G82-2S CEF-G82-GW-2S-01 07-Oct-99 14	CEF-G82-3S CEF-G82-GW-3S-01 07-Oct-99 14	CEF-G82-2I CEF-G82-GW-2I-02 22-Feb-00 35
Volatile Organic Compounds (ug/L)					
BENZENE	1	1 U	19 J	1 U	1 U
CHLOROFORM	5.7	1 U	2 U	1 U	1.2
ETHYLBENZENE	30	3.3	50 J	1 U	1 U
TOLUENE	40	1 U	6.8	1 U	1 U
XYLENES,TOTAL	20	3.8	196	3 U	3 U
Semivolatile Organic Compounds (ug/L)					
1-METHYLNAPHTHALENE	20	8.7 J	53.4 J	1.1 UJ	2.4 U
2-METHYLNAPHTHALENE	20	11.6 J	53.9 J	1.1 UJ	2.4 U
ACENAPHTHENE	20	1 UJ	1.8 J	1.1 UJ	2.4 U
ACENAPHTHYLENE	210	1 UJ	1.8 J	1.1 UJ	2.4 U
FLUORANTHENE	280	1 UJ	2.3 J	1.1 UJ	2.4 U
FLUORENE	280	1.9 J	6.3 J	1.1 UJ	2.4 U
NAPHTHALENE	20	6.8 J	24.5 J	1.1 UJ	2.4 U
PHENANTHRENE	210	4 J	18.7 J	1.1 UJ	2.4 U
Total Petroleum Hydrocarbons (mg/L)					
TRPH (C8-C40)	5	1.19	3.57	0.5 U	NM

Notes:

GCTL- Groundwater Cleanup Target Level
Shaded values are greater than criteria.
µg/L - migrogram per liter
mg/L - milligram per liter
NM - Not measured
U - Not detected at detection limit shown
J - Estimated value

ATTACHMENT B

GROUNDWATER ANALYTICAL REPORTS
April 2010

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**R. SIMCIK**	**DATE:**	**JUNE 15, 2010**
FROM:	**A. COGNETTI**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – ORGANIC DATA**
SELECT VOC/ PAH/ TRPH
LIMITED REVIEW
NAS CECIL FIELD – CTO JM09
SAMPLE DELIVERY GROUP (SDG) –F73096

SAMPLES: 5/Aqueous/VOC/PAH/TRPH

CEF-G82-1,S-20100420
CEF-G82-2,S-20100420
Trip Blank
CEF-G82-2,I-20100420
CEF-G82-3,S-20100420

Overview

The sample set for NAS CECIL FIELD, CTO JM09, SDG F73096, consists of four (4) aqueous environmental samples and a trip blank. There are no field duplicate pairs associated with this SDG. All samples were analyzed for select volatile organic compounds (VOC); benzene, ethylbenzene, isopropylbenzene, naphthalene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and xylenes (total). The four (4) aqueous environmental samples were also analyzed for polycyclic aromatic hydrocarbons (PAH) and Total Recoverable Petroleum Hydrocarbons (TRPH).

The samples were collected by Tetra Tech NUS on April 20, 2010 and analyzed by Accutest Laboratories. All analyses were performed under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. VOC analyses were conducted using SW-846 method 8260B. PAH analyses followed SW-846 Method 8270C SIM. TRPH analyses followed the Florida PRO method.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibrations
* • Laboratory Method Blank Analyses
* • Detection Limits

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

Volatiles- None.

PAH- None.

TRPH- None.

Notes

Positive results reported below the reporting limit (RL) but above the method detection limit (MDL) for the organic analyses were qualified as estimated, "J".

Naphthalene is reported in both the VOC and PAH fractions.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", October 1999 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", January 2006.

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

Ann Cognetti

Tetra Tech NUS
Ann Cognetti
Chemist/ Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

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

Appendix A

Qualified Analytical Results

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can be any number of issues; e.g. poor chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02267 SDG: F73096 FRACTION: OV MEDIA: WATER	NSAMPLE	CEF-G82-1,S-20100420			CEF-G82-2,I-20100420			CEF-G82-2,S-20100420			CEF-G82-3,S-20100420		
	LAB_ID	F73096-2			F73096-3			F73096-4			F73096-1		
	SAMP_DATE	4/20/2010			4/20/2010			4/20/2010			4/20/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2,4-TRIMETHYLBENZENE		7.4			0.22	U		30.7			0.22	U	
1,3,5-TRIMETHYLBENZENE		1.4	J	P	0.21	U		6.2			0.21	U	
BENZENE		0.21	U		0.21	U		1.4			0.21	U	
ETHYLBENZENE		2.9			0.2	U		26.2			0.2	U	
ISOPROPYLBENZENE		1.4			0.2	U		7.1			0.2	U	
NAPHTHALENE		26			1	U		121			1	U	
TOLUENE		0.2	U		0.2	U		0.2	U		0.2	U	
TOTAL XYLENES		2	J	P	0.54	U		15.1			0.54	U	

PROJ_NO: 02267	NSAMPLE	TRIP BLANK		
SDG: F73096	LAB_ID	F73096-5		
FRACTION: OV	SAMP_DATE	4/20/2010		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
1,2,4-TRIMETHYLBENZENE		0.22	U	
1,3,5-TRIMETHYLBENZENE		0.21	U	
BENZENE		0.21	U	
ETHYLBENZENE		0.2	U	
ISOPROPYLBENZENE		0.2	U	
NAPHTHALENE		1	U	
TOLUENE		0.2	U	
TOTAL XYLENES		0.54	U	

PROJ_NO: 02267 SDG: F73096 FRACTION: PAH MEDIA: WATER	NSAMPLE	CEF-G82-1,S-20100420			CEF-G82-2,I-20100420			CEF-G82-2,S-20100420			CEF-G82-3,S-20100420		
	LAB_ID	F73096-2			F73096-3			F73096-4			F73096-1		
	SAMP_DATE	4/20/2010			4/20/2010			4/20/2010			4/20/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		11.6			0.24	U		63.1			0.24	U	
2-METHYLNAPHTHALENE		16.9			0.24	U		73.7			0.24	U	
ACENAPHTHENE		0.69	J	P	0.48	U		3			0.48	U	
ACENAPHTHYLENE		0.48	U		0.48	U		0.56	J	P	0.48	U	
ANTHRACENE		0.48	U		0.48	U		0.48	U		0.48	U	
BENZO(A)ANTHRACENE		0.048	U		0.048	U		0.048	U		0.048	U	
BENZO(A)PYRENE		0.048	U		0.048	U		0.048	U		0.048	U	
BENZO(B)FLUORANTHENE		0.048	U		0.048	U		0.048	U		0.048	U	
BENZO(G,H,I)PERYLENE		0.048	U		0.048	U		0.048	U		0.048	U	
BENZO(K)FLUORANTHENE		0.048	U		0.048	U		0.048	U		0.048	U	
CHRYSENE		0.095	U		0.096	U		0.096	U		0.095	U	
DIBENZO(A,H)ANTHRACENE		0.048	U		0.048	U		0.048	U		0.048	U	
FLUORANTHENE		0.24	U		0.24	U		0.24	U		0.24	U	
FLUORENE		0.9	J	P	0.48	U		4.8			0.48	U	
INDENO(1,2,3-CD)PYRENE		0.048	U		0.048	U		0.048	U		0.048	U	
NAPHTHALENE		9.8			0.24	U		64.2			0.24	U	
PHENANTHRENE		0.39	J	P	0.24	U		2.6			0.24	U	
PYRENE		0.24	U		0.24	U		0.24	U		0.24	U	

PROJ_NO: 02267 SDG: F73096 FRACTION: PET MEDIA: WATER	NSAMPLE	CEF-G82-1,S-20100420			CEF-G82-2,I-20100420			CEF-G82-2,S-20100420			CEF-G82-3,S-20100420		
	LAB_ID	F73096-2			F73096-3			F73096-4			F73096-1		
	SAMP_DATE	4/20/2010			4/20/2010			4/20/2010			4/20/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
TPH (C08-C40)		0.384			0.16	U		2.34			0.16	U	

Appendix B

Results as Reported by the Laboratory

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-1,S-20100420		
Lab Sample ID:	F73096-2	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0042699.D	1	05/04/10	MM	n/a	n/a	VM1734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	2.9	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	2.0	3.0	0.54	ug/l	I
91-20-3	Naphthalene	26.0	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	1.4	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	7.4	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	1.4	2.0	0.21	ug/l	I

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		87-116%
17060-07-0	1,2-Dichloroethane-D4	107%		76-127%
2037-26-5	Toluene-D8	98%		86-112%
460-00-4	4-Bromofluorobenzene	98%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,I-20100420		
Lab Sample ID:	F73096-3	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0042700.D	1	05/04/10	MM	n/a	n/a	VM1734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.20 U	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	110%		87-116%
17060-07-0	1,2-Dichloroethane-D4	107%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	107%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,S-20100420		
Lab Sample ID:	F73096-4	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	N0042895.D	1	05/03/10	MM	n/a	n/a	VN1732
Run #2	M0042707.D	2	05/04/10	MM	n/a	n/a	VM1734

	Purge Volume
Run #1	5.0 ml
Run #2	5.0 ml

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	1.4	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	26.2	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	15.1	3.0	0.54	ug/l	
91-20-3	Naphthalene	121 [a]	10	2.0	ug/l	
98-82-8	Isopropylbenzene	7.1	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	30.7	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	6.2	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	104%	87-116%
17060-07-0	1,2-Dichloroethane-D4	107%	90%	76-127%
2037-26-5	Toluene-D8	101%	98%	86-112%
460-00-4	4-Bromofluorobenzene	96%	96%	84-120%

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range
I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-3,S-20100420		
Lab Sample ID:	F73096-1	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0042698.D	1	05/04/10	MM	n/a	n/a	VM1734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.20 U	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	112%		87-116%
17060-07-0	1,2-Dichloroethane-D4	105%		76-127%
2037-26-5	Toluene-D8	97%		86-112%
460-00-4	4-Bromofluorobenzene	104%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	TRIP BLANK		
Lab Sample ID:	F73096-5	Date Sampled:	04/20/10
Matrix:	AQ - Trip Blank Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	M0042697.D	1	05/04/10	MM	n/a	n/a	VM1734
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.20 U	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		87-116%
17060-07-0	1,2-Dichloroethane-D4	104%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	106%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-1,S-20100420		
Lab Sample ID:	F73096-2	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051817.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.69	0.95	0.48	ug/l	I
208-96-8	Acenaphthylene	0.48 U	0.95	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.95	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.095 U	0.19	0.095	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.95	0.24	ug/l	
86-73-7	Fluorene	0.90	0.95	0.48	ug/l	I
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	11.6	0.95	0.24	ug/l	
91-57-6	2-Methylnaphthalene	16.9	0.95	0.24	ug/l	
91-20-3	Naphthalene	9.8	0.95	0.24	ug/l	
85-01-8	Phenanthrene	0.39	0.95	0.24	ug/l	I
129-00-0	Pyrene	0.24 U	0.95	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	46%		42-108%
321-60-8	2-Fluorobiphenyl	51%		40-106%
1718-51-0	Terphenyl-d14	72%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,I-20100420		
Lab Sample ID:	F73096-3	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051818.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.48 U	0.96	0.48	ug/l	
208-96-8	Acenaphthylene	0.48 U	0.96	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.96	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.096 U	0.19	0.096	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.96	0.24	ug/l	
86-73-7	Fluorene	0.48 U	0.96	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	0.24 U	0.96	0.24	ug/l	
91-57-6	2-Methylnaphthalene	0.24 U	0.96	0.24	ug/l	
91-20-3	Naphthalene	0.24 U	0.96	0.24	ug/l	
85-01-8	Phenanthrene	0.24 U	0.96	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.96	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	57%		42-108%
321-60-8	2-Fluorobiphenyl	65%		40-106%
1718-51-0	Terphenyl-d14	80%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,S-20100420		
Lab Sample ID:	F73096-4	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051819.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2	W051880.D	2	04/30/10	RB	04/27/10	OP32672	SW2603

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2	1040 ml	1.0 ml

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	3.0	0.96	0.48	ug/l	
208-96-8	Acenaphthylene	0.56	0.96	0.48	ug/l	I
120-12-7	Anthracene	0.48 U	0.96	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.096 U	0.19	0.096	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.96	0.24	ug/l	
86-73-7	Fluorene	4.8	0.96	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	63.1 [a]	1.9	0.48	ug/l	
91-57-6	2-Methylnaphthalene	73.7 [a]	1.9	0.48	ug/l	
91-20-3	Naphthalene	64.2 [a]	1.9	0.48	ug/l	
85-01-8	Phenanthrene	2.6	0.96	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.96	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	61%	91%	42-108%
321-60-8	2-Fluorobiphenyl	60%	76%	40-106%
1718-51-0	Terphenyl-d14	76%	84%	39-121%

(a) Result is from Run# 2

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range
I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-3,S-20100420		
Lab Sample ID:	F73096-1	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051816.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.48 U	0.95	0.48	ug/l	
208-96-8	Acenaphthylene	0.48 U	0.95	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.95	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.095 U	0.19	0.095	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.95	0.24	ug/l	
86-73-7	Fluorene	0.48 U	0.95	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	0.24 U	0.95	0.24	ug/l	
91-57-6	2-Methylnaphthalene	0.24 U	0.95	0.24	ug/l	
91-20-3	Naphthalene	0.24 U	0.95	0.24	ug/l	
85-01-8	Phenanthrene	0.24 U	0.95	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.95	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	57%		42-108%
321-60-8	2-Fluorobiphenyl	63%		40-106%
1718-51-0	Terphenyl-d14	79%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-1,S-20100420		
Lab Sample ID:	F73096-2	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65902.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.384	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	65%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,I-20100420		
Lab Sample ID:	F73096-3	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65905.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.16 U	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	64%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-2,S-20100420		
Lab Sample ID:	F73096-4	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65906.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	2.34	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	66%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-3,S-20100420		
Lab Sample ID:	F73096-1	Date Sampled:	04/20/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65901.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.16 U	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	73%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Appendix C

Support Documentation

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Tetra Tech NUS **Job No:** F73096

Site: Cecil Field; Site G-82 **Report Date:** 5/11/2010 11:08:30

4 Samples and 1 Trip Blank were collected on 04/20/2010 and were received at Accutest SE on 04/22/2010 properly preserved, at 4 Deg. C and intact. These Samples received an Accutest job number of F73096. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS by Method SW846 8260B

Matrix: AQ **Batch ID:** VM1734

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F73191-13MS, F73191-13MSD were used as the QC samples indicated.

Matrix: AQ **Batch ID:** VN1732

All samples were analyzed within the recommended method holding time.

Samples F73086-4MS, F73086-4MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Extractables by GCMS by Method SW846 8270C BY SIM

Matrix: AQ **Batch ID:** OP32672

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F73129-2MS, F73129-2MSD were used as the QC samples indicated.

Matrix Spike Recoverys for 1-Methylnaphthalene, 2-Methylnaphthalene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike and Matrix Spike Duplicate Recovery for Naphthalene is outside control limits. Probable cause due to matrix interference.

RPD for MSD for Naphthalene is outside control limits for sample OP32672-MSD. Probable cause due to sample non-homogeneity.

Extractables by GC by Method FLORIDA-PRO

Matrix: AQ **Batch ID:** OP32639

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Samples F73096-2MS, F73096-2MSD were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Date: May 11, 2010

Ellen Pampel, Inorganic QA (signature on file)

Tuesday, May 11, 2010

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER N2 . 2042 F73096 PAGE 1 OF 2

PROJECT NO: 1J602267	FACILITY Cecil Field Site 682	PROJECT MANAGER Rob Simcik	PHONE NUMBER 412 921 8163	LABORATORY NAME AND CONTACT: Accutest / Heather Wandrey
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Kara Wimble	PHONE NUMBER 904 636 6125	ADDRESS 4405 Vineland Rd Suite C-15
		CARRIER/WAYBILL NUMBER Accutest Courier		CITY, STATE Orlando, Fl 32811 SKIA # 33800

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G
PRESERVATIVE USED: HCl H2SO4 —

	DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs (8260B)	TRPH FL-PRO	PAHs (8270 SIM)					COMMENTS
1	4/20	1013	CEF-682-3S-20100420				GW	G	7	X	X	X					Cool to 4° C
2	4/20	1133	CEF-682-1S-20100420				GW	G	7	X	X	X					
3	4/20	1249	CEF-682-2I-20100420				GW	G	7	X	X	X					
4	4/20	1315	CEF-682-2S-20100420				GW	G	7	X	X	X					
5	4/20		Trip Blank				QC		2	X							

1. RELINQUISHED BY	DATE 4/21/10	TIME 1545	1. RECEIVED BY	DATE 4/21/10	TIME 1545
2. RELINQUISHED BY	DATE 4/21/10	TIME 1941	2. RECEIVED BY Accutest	DATE 4/22/10	TIME 8:00
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 3.2 4.0

4/02R
FORM NO. TINUS-001

4.1 4

F73096: Chain of Custody
Page 1 of 2

ACCUTEST Laboratories
F73096

ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: F73096 CLIENT: Tetra Tech PROJECT: 112G02267

DATE/TIME RECEIVED: 4/22/10 2100 (MM/DD/YY 24:00) NUMBER OF COOLERS RECEIVED: 2

METHOD OF DELIVERY: FEDEX UPS (ACCUTEST COURIER) GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS:

COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET
- [ ] WET ICE PRESENT

TRIP BLANK INFORMATION

- [x] TRIP BLANK PROVIDED
- [ ] TRIP BLANK NOT PROVIDED
- [ ] TRIP BLANK NOT ON COC
- [x] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [x] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

MISC. INFORMATION

NUMBER OF ENCORES ? 0

NUMBER OF 5035 FIELD KITS ? 0

NUMBER OR LAB FILTERED METALS ? 0

TEMPERATURE INFORMATION

- [ ] IR THERM ID IR1 CORR. FACTOR +.4
- [ ] OBSERVED TEMPS: 2.8 3.6
- [ ] CORRECTED TEMPS: 3.2 4.0

SAMPLE INFORMATION

- [ ] SAMPLE LABELS PRESENT ON ALL BOTTLES
- [ ] INCORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] DATES/TIMES ON COC DO NOT MATCH SAMPLE LABEL
- [ ] ID'S ON COC DO NOT MATCH LABEL
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING OR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] 5035 FIELD KIT FROZEN WITHIN 48 HOUR'S
- [ ] RESIDUAL CHLORINE PRESENT

(APPICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE [signature] 4/22/10 REVIEWER SIGNATURE/DATE E.T.04.22.10

NF 10/09 RECEIPT CONFIRMATION 100609 (2).xls

4.1 4

F73096: Chain of Custody
Page 2 of 2

HOLDTIME

SDG F73096

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/L	TRIP BLANK	F73096-5	NM	04/20/2010	05/04/2010	05/04/2010	14	0	14
OV	UG/L	CEF-G82-3,S-20100420	F73096-1	NM	04/20/2010	05/04/2010	05/04/2010	14	0	14
OV	UG/L	CEF-G82-2,S-20100420	F73096-4	NM	04/20/2010	05/04/2010	05/04/2010	14	0	14
OV	UG/L	CEF-G82-2,S-20100420	F73096-4	NM	04/20/2010	05/03/2010	05/03/2010	13	0	13
OV	UG/L	CEF-G82-2,I-20100420	F73096-3	NM	04/20/2010	05/04/2010	05/04/2010	14	0	14
OV	UG/L	CEF-G82-1,S-20100420	F73096-2	NM	04/20/2010	05/04/2010	05/04/2010	14	0	14
SIM	UG/L	CEF-G82-3,S-20100420	F73096-1	NM	04/20/2010	04/27/2010	04/27/2010	7	0	7
SIM	UG/L	CEF-G82-2,S-20100420	F73096-4	NM	04/20/2010	04/27/2010	04/30/2010	7	3	10
SIM	UG/L	CEF-G82-2,S-20100420	F73096-4	NM	04/20/2010	04/27/2010	04/27/2010	7	0	7
SIM	UG/L	CEF-G82-2,I-20100420	F73096-3	NM	04/20/2010	04/27/2010	04/27/2010	7	0	7
SIM	UG/L	CEF-G82-1,S-20100420	F73096-2	NM	04/20/2010	04/27/2010	04/27/2010	7	0	7
TPH	MG/L	CEF-G82-3,S-20100420	F73096-1	NM	04/20/2010	04/23/2010	04/28/2010	3	5	8
TPH	MG/L	CEF-G82-2,S-20100420	F73096-4	NM	04/20/2010	04/23/2010	04/28/2010	3	5	8
TPH	MG/L	CEF-G82-2,I-20100420	F73096-3	NM	04/20/2010	04/23/2010	04/28/2010	3	5	8
TPH	MG/L	CEF-G82-1,S-20100420	F73096-2	NM	04/20/2010	04/23/2010	04/28/2010	3	5	8

Accutest Laboratories

Sample Summary

Tetra Tech NUS

Cecil Field; Site G-82

Job No: F73096

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
F73096-1	04/20/10	10:13	KW	04/22/10	AQ	Ground Water	CEF-G82-3,S-20100420
F73096-2	04/20/10	11:33	KW	04/22/10	AQ	Ground Water	CEF-G82-1,S-20100420
F73096-3	04/20/10	12:49	KW	04/22/10	AQ	Ground Water	CEF-G82-2,I-20100420
F73096-4	04/20/10	13:45	KW	04/22/10	AQ	Ground Water	CEF-G82-2,S-20100420
F73096-5	04/20/10	00:00	KW	04/22/10	AQ	Trip Blank Water	TRIP BLANK

Instrument Performance Check (BFB)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VM1725-BFB	Injection Date:	04/23/10
Lab File ID:	M0042433.D	Injection Time:	11:55
Instrument ID:	GCMSM		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	15993	22.5		Pass
75	30.0 - 60.0% of mass 95	38914	54.9		Pass
95	Base peak, 100% relative abundance	70930	100.0		Pass
96	5.0 - 9.0% of mass 95	4916	6.9		Pass
173	Less than 2.0% of mass 174	272	0.38	(0.5) [a]	Pass
174	50.0 - 100.0% of mass 95	54029	76.2		Pass
175	5.0 - 9.0% of mass 174	3916	5.5	(7.2) [a]	Pass
176	95.0 - 101.0% of mass 174	52778	74.4	(97.7) [a]	Pass
177	5.0 - 9.0% of mass 176	3469	4.9	(6.6) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VM1725-IC1725	M0042435.D	04/23/10	12:46	00:51	Initial cal 1
VM1725-IC1725	M0042436.D	04/23/10	13:11	01:16	Initial cal 2
VM1725-IC1725	M0042437.D	04/23/10	13:36	01:41	Initial cal 3
VM1725-ICC1725	M0042438.D	04/23/10	14:02	02:07	Initial cal 4
VM1725-IC1725	M0042439.D	04/23/10	14:27	02:32	Initial cal 5
VM1725-IC1725	M0042440.D	04/23/10	14:52	02:57	Initial cal 6
VM1725-ICV1725	M0042441.D	04/23/10	15:17	03:22	Initial cal verification 4

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VM1725-ICC1725
Lab FileID: M0042438.D

Response Factor Report MSVOA7

Method : C:\MSDCHEM\1\METHODS\8260MNEW.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Sat Apr 24 10:20:26 2010
Response via : Initial Calibration

Calibration Files
1 =M0042435.D 2 =M0042436.D 3 =M0042437.D 4 =M0042438.D
5 =M0042439.D 6 =M0042440.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------							
2)		Dichlorodifluoromet	0.268	0.286	0.381	0.392	0.357	0.336	0.337	15.04
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 0.41151 *A + -0.03773 *A^2								
3)	P	Chloromethane	0.313	0.268	0.316	0.327	0.305	0.294	0.304	6.88
4)	C	Vinyl Chloride	0.229	0.233	0.315	0.315	0.298	0.296	0.281	14.05
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9996								
		Response Ratio = 0.00000 + 0.31798 *A + -0.01159 *A^2								
5)		Bromomethane	0.249	0.189	0.222	0.219	0.208	0.198	0.214	9.88
6)		Chloroethane	0.130	0.149	0.177	0.184	0.174	0.167	0.164	12.38
7)		Trichlorofluorometh	0.425	0.185	0.548	0.539	0.475	0.451	0.437	30.34
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9977								
		Response Ratio = 0.00000 + 0.56459 *A + -0.05750 *A^2								
8)		Ethyl Ether	0.222	0.255	0.268	0.280	0.272	0.258	0.259	7.81
9)		1,2-Dichlorotrifluo	0.281	0.269	0.333	0.335	0.308	0.309	0.306	8.70
10)	C	1,1-Dichloroethene	0.429	0.419	0.539	0.548	0.505	0.484	0.488	11.09
11)		Freon 113	0.209	0.199	0.257	0.256	0.238	0.234	0.232	10.26
12)		Carbon Disulfide	0.680	0.670	0.891	0.916	0.875	0.872	0.817	13.64
13)		Iodomethane	0.385	0.380	0.429	0.440	0.427	0.421	0.414	6.01
14)		Methylene Chloride	1.458	0.600	0.479	0.461	0.427	0.416	0.640	63.43
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9994								
		Response Ratio = 0.00000 + 0.48484 *A + -0.03569 *A^2								
15)		Acetone	0.024	0.027	0.026	0.028	0.025	0.024	0.026	6.00
16)		Methyl acetate	0.048	0.053	0.050	0.057	0.055	0.055	0.053	6.29
17)		trans-1,2-Dichloroe	0.452	0.444	0.518	0.514	0.485	0.474	0.481	6.39
18)		Hexane	0.010	0.035	0.050	0.045	0.044	0.045	0.038	38.67
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9988								
		Response Ratio = 0.00000 + 0.04455 *A								
19)		Methyl Tert Butyl E	0.981	0.977	1.028	1.001	0.977	0.997	0.994	1.99
20)		Di-isopropyl ether	1.087	1.090	1.244	1.226	1.202	1.184	1.172	5.80
21)	P	1,1-Dichloroethane	0.564	0.588	0.702	0.699	0.673	0.662	0.648	9.02
22)		Acrylonitrile	0.109	0.118	0.120	0.125	0.119	0.119	0.118	4.59
23)		ETBE	1.080	1.150	1.226	1.236	1.184	1.151	1.171	4.92
24)		Vinyl acetate	0.423	0.451	0.498	0.460	0.489	0.467	0.465	5.79
25)		cis-1,2-Dichloroeth	0.270	0.259	0.324	0.332	0.320	0.318	0.304	10.23
26)		2,2-Dichloropropane	0.479	0.461	0.569	0.569	0.526	0.513	0.519	8.63
27)		Bromochloromethane	0.131	0.151	0.164	0.169	0.162	0.158	0.156	8.79
28)		Cyclohexane	0.384	0.385	0.502	0.516	0.485	0.493	0.461	13.03
29)	C	Chloroform	0.717	0.681	0.758	0.762	0.731	0.709	0.726	4.24
30)		Tetrahydrofuran	0.154	0.126	0.120	0.121	0.110	0.109	0.123	13.38
31)	S	Dibromofluoromethan	0.307	0.308	0.295	0.299	0.288	0.283	0.297	3.38

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VM1725-ICC1725
Lab FileID: M0042438.D

32)		Carbon Tetrachlorid	0.468	0.460	0.609	0.611	0.591	0.574	0.552	12.64
33)		1,1,1-Trichloroetha	0.530	0.542	0.675	0.673	0.645	0.625	0.615	10.43
34)		2-Butanone	0.186	0.179	0.194	0.198	0.187	0.184	0.188	3.67
35)		1,1-Dichloropropene	0.372	0.402	0.522	0.510	0.495	0.485	0.464	13.31
36)		Benzene	1.066	1.063	1.278	1.273	1.260	1.250	1.198	8.67
37)		TAME	0.827	0.893	0.970	0.970	0.932	0.915	0.918	5.89
38)	S	1,2-Dichloroethane-	0.499	0.515	0.518	0.521	0.517	0.504	0.513	1.75
39)		1,2-Dichloroethane	0.656	0.637	0.722	0.710	0.684	0.650	0.677	5.07
40)		Trichloroethene	0.343	0.307	0.380	0.384	0.361	0.360	0.356	7.91
41)		Methylcyclohexane	0.350	0.338	0.436	0.441	0.425	0.425	0.403	11.48
42)		Dibromomethane	0.203	0.229	0.242	0.248	0.243	0.236	0.234	6.92
43)	C	1,2-Dichloropropane	0.281	0.298	0.355	0.355	0.346	0.335	0.328	9.60
44)		Bromodichloromethan	0.479	0.512	0.588	0.602	0.585	0.563	0.555	8.78
45)		2-Chloroethyl vinyl	0.206	0.236	0.263	0.259	0.253	0.246	0.244	8.61
46)		cis-1,3-Dichloropro	0.459	0.506	0.612	0.610	0.603	0.591	0.564	11.53
47)	I	Chlorobenzene-d5	----------ISTD----------							
48)	S	Toluene-d8	1.374	1.412	1.372	1.363	1.424	1.456	1.400	2.63
49)	C	Toluene	1.486	1.518	1.787	1.749	1.827	1.803	1.695	8.97
50)		2-Nitropropane	0.087	0.119	0.159	0.175	0.182	0.180	0.150	25.85

---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9994
Response Ratio = 0.00000 + 0.17102 *A + 0.00102 *A^2

51)		4-Methyl-2-pentanon	0.518	0.587	0.611	0.616	0.595	0.580	0.584	6.03
52)		trans-1,3-Dichlorop	0.590	0.726	0.803	0.814	0.830	0.822	0.764	12.20
53)		Tetrachloroethene	0.349	0.355	0.436	0.424	0.422	0.419	0.401	9.54
54)		1,1,2-Trichloroetha	0.326	0.351	0.389	0.388	0.387	0.387	0.371	7.11
55)		Dibromochloromethan	0.420	0.492	0.561	0.562	0.576	0.565	0.529	11.60
56)		1,3-Dichloropropane	0.684	0.746	0.813	0.796	0.816	0.813	0.778	6.85
57)		1,2-Dibromoethane	0.390	0.447	0.505	0.511	0.509	0.501	0.477	10.27
58)		2-hexanone	0.332	0.407	0.440	0.462	0.443	0.437	0.420	11.13
59)		1-Chlorohexane	0.503	0.464	0.598	0.600	0.605	0.599	0.561	10.97
60)	C	Ethylbenzene	1.850	1.805	2.153	2.165	2.140	2.138	2.042	8.17
61)	P	Chlorobenzene	0.967	0.950	1.100	1.093	1.088	1.069	1.044	6.48
62)		1,1,1,2-Tetrachloro	0.392	0.368	0.435	0.449	0.449	0.436	0.422	7.90
63)		m,p-Xylene	1.415	1.446	1.772	1.729	1.768	1.731	1.643	10.11
64)		o-Xylene	1.386	1.500	1.834	1.815	1.832	1.768	1.689	11.58
65)		Styrene	0.878	1.055	1.260	1.267	1.274	1.242	1.163	13.96
66)	P	Bromoform	0.269	0.336	0.379	0.415	0.420	0.415	0.372	16.15

---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9996
Response Ratio = 0.00000 + 0.40772 *A + 0.00476 *A^2

67)		Isopropylbenzene	1.316	1.424	1.780	1.751	1.725	1.680	1.612	12.02

---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9999
Response Ratio = 0.00000 + 1.80057 *A + -0.05932 *A^2

68)	I	1,4-Dichlorobenzene-d	----------ISTD----------							
69)	S	4-Bromofluorobenzen	1.299	1.259	1.253	1.267	1.280	1.248	1.268	1.50
70)		n-Propylbenzene	4.089	3.886	4.917	4.921	4.904	4.690	4.568	10.12
71)		Bromobenzene	0.901	0.905	1.027	1.006	1.022	0.968	0.972	5.86
72)	P	1,1,2,2-Tetrachloro	1.044	1.021	1.053	1.092	1.099	1.039	1.058	2.91
73)		1,3,5-Trimethylbenz	2.769	2.691	3.347	3.327	3.317	3.124	3.096	9.54
74)		2-Chlorotoluene	3.114	2.864	3.485	3.466	3.486	3.328	3.290	7.71
75)		trans-1,4-Dichloro-	0.313	0.379	0.435	0.465	0.463	0.456	0.419	14.56
76)		1,2,3-Trichloroprop	0.371	0.350	0.365	0.381	0.370	0.353	0.365	3.14
77)		Cyclohexanone	0.023	0.026	0.030	0.032	0.033	0.032	0.029	12.91

---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9994
Response Ratio = 0.00000 + 0.03261 *A + -0.00008 *A^2

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VM1725-ICC1725
Lab FileID: M0042438.D

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78)      4-Chlorotoluene      2.895 2.714 3.240 3.266 3.213 3.137 3.077   7.25
79)      tert-Butylbenzene    1.868 1.824 2.220 2.197 2.152 2.037 2.050   8.31
80)      1,2,4-Trimethylbenz  2.606 2.754 3.394 3.368 3.404 3.188 3.119  11.30
81)      sec-Butylbenzene     3.050 3.168 3.923 3.910 3.875 3.696 3.604  10.91
82)      4-Isopropyltoluene   2.307 2.351 3.078 3.016 3.040 2.869 2.777  12.76
83)      1,3-Dichlorobenzene  1.350 1.356 1.604 1.614 1.597 1.543 1.511   8.23
84)      1,4-Dichlorobenzene  1.527 1.463 1.623 1.615 1.606 1.580 1.569   3.98
85)      n-Butylbenzene       1.283 1.392 1.889 1.880 1.865 1.797 1.685  16.19
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 1.94350 *A + -0.07000 *A^2

86)      Benzyl Chloride      0.200 0.273 0.317 0.339 0.325 0.316 0.295  17.45
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 0.34198 *A + -0.01281 *A^2

87)      1,2-Dichlorobenzene  1.264 1.345 1.564 1.522 1.532 1.485 1.452   8.26
88)      1,2-Dibromo-3-Chlor  0.201 0.256 0.264 0.284 0.279 0.280 0.261  11.93
89)      Hexachlorobutadiene  0.447 0.415 0.559 0.545 0.547 0.532 0.508  11.97
90)      1,2,4-Trichlorobenz  0.771 0.781 1.000 1.006 1.050 1.029 0.940  13.61
91)      Naphthalene          1.935 2.030 2.403 2.556 2.522 2.554 2.333  11.95
92)      1,2,3-Trichlorobenz  0.718 0.772 0.910 0.940 0.950 0.922 0.869  11.33
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 0.95650 *A + -0.01494 *A^2


93) I    Tert Butyl Alcohol-d1 ----------------ISTD---------------------
94)      acrolein             1.828 1.486 1.360 1.409 1.565 1.615 1.544  10.88
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
               Response Ratio = 0.00000 + 1.33262 *A + 0.14471 *A^2

95)      Tert Butyl Alcohol   1.411 1.505 1.351 1.393 1.422 1.323 1.401   4.52
96)      tert Amyl alcohol    0.830 1.040 1.073 1.182 1.248 1.261 1.106  14.66
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
               Response Ratio = 0.00000 + 1.12902 *A + 0.03467 *A^2

97)      1,4-Dioxane          0.072 0.081 0.099 0.102 0.106 0.106 0.094  15.28
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 0.10049 *A + 0.00074 *A^2

--------------------------------------------------------------------------------
(#) = Out of Range

          8260MNEW.M        Sat Apr 24 12:15:05 2010
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5.7.1

5

Instrument Performance Check (BFB)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VM1734-BFB	Injection Date:	05/04/10
Lab File ID:	M0042693.D	Injection Time:	08:53
Instrument ID:	GCMSM		

5.4.2 5

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	17504	26.2		Pass
75	30.0 - 60.0% of mass 95	38301	57.3		Pass
95	Base peak, 100% relative abundance	66869	100.0		Pass
96	5.0 - 9.0% of mass 95	4697	7.0		Pass
173	Less than 2.0% of mass 174	129	0.19	(0.27) [a]	Pass
174	50.0 - 100.0% of mass 95	47704	71.3		Pass
175	5.0 - 9.0% of mass 174	4030	6.0	(8.4) [a]	Pass
176	95.0 - 101.0% of mass 174	46093	68.9	(96.6) [a]	Pass
177	5.0 - 9.0% of mass 176	3089	4.6	(6.7) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VM1734-CC1725	M0042694.D	05/04/10	09:23	00:30	Continuing cal 4
VM1734-BS	M0042695.D	05/04/10	09:54	01:01	Blank Spike
VM1734-MB	M0042696.D	05/04/10	10:19	01:26	Method Blank
F73096-5	M0042697.D	05/04/10	10:44	01:51	TRIP BLANK
F73096-1	M0042698.D	05/04/10	11:10	02:17	CEF-G82-3,S-20100420
F73096-2	M0042699.D	05/04/10	11:35	02:42	CEF-G82-1,S-20100420
F73096-3	M0042700.D	05/04/10	12:00	03:07	CEF-G82-2,I-20100420
ZZZZZZ	M0042701.D	05/04/10	12:26	03:33	(unrelated sample)
ZZZZZZ	M0042702.D	05/04/10	12:51	03:58	(unrelated sample)
ZZZZZZ	M0042703.D	05/04/10	13:17	04:24	(unrelated sample)
ZZZZZZ	M0042704.D	05/04/10	13:42	04:49	(unrelated sample)
ZZZZZZ	M0042705.D	05/04/10	14:07	05:14	(unrelated sample)
ZZZZZZ	M0042706.D	05/04/10	14:33	05:40	(unrelated sample)
F73096-4	M0042707.D	05/04/10	14:58	06:05	CEF-G82-2,S-20100420
ZZZZZZ	M0042708.D	05/04/10	15:23	06:30	(unrelated sample)
F73191-13	M0042709.D	05/04/10	15:48	06:55	(used for QC only; not part of job F73096)
ZZZZZZ	M0042710.D	05/04/10	16:13	07:20	(unrelated sample)
F73191-13MS	M0042711.D	05/04/10	16:39	07:46	Matrix Spike
F73191-13MSD	M0042712.D	05/04/10	17:04	08:11	Matrix Spike Duplicate
ZZZZZZ	M0042713.D	05/04/10	17:30	08:37	(unrelated sample)
ZZZZZZ	M0042714.D	05/04/10	17:55	09:02	(unrelated sample)
ZZZZZZ	M0042715.D	05/04/10	18:21	09:28	(unrelated sample)
ZZZZZZ	M0042716.D	05/04/10	18:46	09:53	(unrelated sample)
ZZZZZZ	M0042717.D	05/04/10	19:11	10:18	(unrelated sample)

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VM1734-CC1725
Lab FileID: M0042694.D

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\050410\M0042694.D Vial: 1
Acq On : 4 May 2010 9:23 am Operator: MelissaM
Sample : CC1725-4 Inst : MSVOA7
Misc : ms13906,vml734,,,,, Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\8260MNEW.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Sat Apr 24 10:20:26 2010
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Fluorobenzene	1.000	1.000	0.0	85	0.00	7.14
			Amount	Calc.	%Drift			
2		Dichlorodifluoromethane	40.000	48.875	-22.2#	99	0.00	2.50
			AvgRF	CCRF	%Dev			
3	P	Chloromethane	0.304	0.345	-13.5	89	0.00	2.74
			Amount	Calc.	%Drift			
4	C	Vinyl Chloride	40.000	42.858	-7.1	88	0.00	2.84
			AvgRF	CCRF	%Dev			
5		Bromomethane	0.214	0.228	-6.5	88	-0.01	3.19
6		Chloroethane	0.164	0.181	-10.4	83	0.00	3.28
			Amount	Calc.	%Drift			
7		Trichlorofluoromethane	40.000	46.522	-16.3	93	0.00	3.48
			AvgRF	CCRF	%Dev			
8		Ethyl Ether	0.259	0.272	-5.0	82	0.00	3.68
9		1,2-Dichlorotrifluoroetha	0.306	0.349	-14.1	88	0.00	3.91
10	C	1,1-Dichloroethene	0.488	0.580	-18.9	90	-0.01	3.93
11		Freon 113	0.232	0.269	-15.9	89	0.00	4.02
12		Carbon Disulfide	0.817	0.881	-7.8	81	0.00	4.00
13		Iodomethane	0.414	0.435	-5.1	84	-0.01	4.10
			Amount	Calc.	%Drift			
14		Methylene Chloride	40.000	43.501	-8.8	90	0.00	4.53
			AvgRF	CCRF	%Dev			
15		Acetone	0.026	0.025	3.8	78	-0.02	4.56
16		Methyl acetate	0.053	0.054	-1.9	79	0.00	4.67
17		trans-1,2-Dichloroethene	0.481	0.558	-16.0	92	0.00	4.68
			Amount	Calc.	%Drift			
18		Hexane	40.000	44.136	-10.3	92	0.00	4.74
			AvgRF	CCRF	%Dev			
19		Methyl Tert Butyl Ether	0.994	0.967	2.7	82	0.00	4.81
20		Di-isopropyl ether	1.172	1.277	-9.0	88	0.00	5.16
21	P	1,1-Dichloroethane	0.648	0.729	-12.5	88	0.00	5.31
22		Acrylonitrile	0.118	0.122	-3.4	82	0.00	5.37

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23		ETBE	1.171	1.189	-1.5	81	0.00	5.55
24		Vinyl acetate	0.465	0.544	-17.0	100	0.00	5.52
25		cis-1,2-Dichloroethene	0.304	0.334	-9.9	85	0.00	5.87
26		2,2-Dichloropropane	0.519	0.621	-19.7	92	0.00	6.00
27		Bromochloromethane	0.156	0.175	-12.2	87	0.00	6.07
28		Cyclohexane	0.461	0.532	-15.4	87	0.00	6.11
29	C	Chloroform	0.726	0.796	-9.6	88	0.00	6.13
30		Tetrahydrofuran	0.123	0.110	10.6	77	0.00	6.31
31	S	Dibromofluoromethane	0.297	0.313	-5.4	88	0.00	6.32
32		Carbon Tetrachloride	0.552	0.636	-15.2	88	0.00	6.31
33		1,1,1-Trichloroethane	0.615	0.667	-8.5	84	0.00	6.38
34		2-Butanone	0.188	0.190	-1.1	81	0.00	6.43
35		1,1-Dichloropropene	0.464	0.515	-11.0	85	0.00	6.48
36		Benzene	1.198	1.290	-7.7	86	0.00	6.73
37		TAME	0.918	0.906	1.3	79	0.00	6.84
38	S	1,2-Dichloroethane-d4	0.513	0.549	-7.0	89	0.00	6.87
39		1,2-Dichloroethane	0.677	0.755	-11.5	90	0.00	6.93
40		Trichloroethene	0.356	0.378	-6.2	83	0.00	7.31
41		Methylcyclohexane	0.403	0.462	-14.6	88	0.00	7.33
42		Dibromomethane	0.234	0.264	-12.8	90	0.00	7.74
43	C	1,2-Dichloropropane	0.328	0.365	-11.3	87	0.00	7.84
44		Bromodichloromethane	0.555	0.623	-12.3	88	0.00	7.88
45		2-Chloroethyl vinyl ether	0.244	0.254	-4.1	83	0.00	8.42
46		cis-1,3-Dichloropropene	0.564	0.641	-13.7	89	0.00	8.50
47	I	Chlorobenzene-d5	1.000	1.000	0.0	82	0.00	10.24
48	S	Toluene-d8	1.400	1.405	-0.4	85	0.00	8.69
49	C	Toluene	1.695	1.833	-8.1	86	0.00	8.75
		----------	Amount	Calc.	%Drift	----------		
50		2-Nitropropane	200.000	252.132	-26.1#	104	0.00	8.97
		----------	AvgRF	CCRF	%Dev	----------		
51		4-Methyl-2-pentanone	0.584	0.641	-9.8	85	0.00	9.10
52		trans-1,3-Dichloropropene	0.764	0.888	-16.2	89	0.00	9.14
53		Tetrachloroethene	0.401	0.429	-7.0	83	0.00	9.14
54		1,1,2-Trichloroethane	0.371	0.413	-11.3	87	0.00	9.31
55		Dibromochloromethane	0.529	0.607	-14.7	89	0.00	9.50
56		1,3-Dichloropropane	0.778	0.854	-9.8	88	0.00	9.59
57		1,2-Dibromoethane	0.477	0.527	-10.5	85	0.00	9.75
58		2-hexanone	0.420	0.466	-11.0	83	0.00	9.92
59		1-Chlorohexane	0.561	0.577	-2.9	79	0.00	10.21
60	C	Ethylbenzene	2.042	2.279	-11.6	86	0.00	10.27
61	P	Chlorobenzene	1.044	1.159	-11.0	87	0.00	10.26
62		1,1,1,2-Tetrachloroethane	0.422	0.480	-13.7	88	0.00	10.32
63		m,p-Xylene	1.643	1.871	-13.9	89	0.00	10.41
64		o-Xylene	1.689	1.941	-14.9	88	0.00	10.85
65		Styrene	1.163	1.308	-12.5	85	0.00	10.90
		----------	Amount	Calc.	%Drift	----------		
66	P	Bromoform	40.000	41.228	-3.1	84	0.00	10.94
67		Isopropylbenzene	40.000	41.704	-4.3	86	0.00	11.16
		----------	AvgRF	CCRF	%Dev	----------		
68	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	88	0.00	12.61
69	S	4-Bromofluorobenzene	1.268	1.208	4.7	84	0.00	11.46
70		n-Propylbenzene	4.568	4.844	-6.0	87	0.00	11.58
71		Bromobenzene	0.972	0.976	-0.4	86	0.00	11.58
72	P	1,1,2,2-Tetrachloroethane	1.058	1.095	-3.5	89	0.00	11.64

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Sample: VM1734-CC1725
Lab FileID: M0042694.D

73	1,3,5-Trimethylbenzene	3.096	3.241	-4.7	86	0.00	11.77
74	2-Chlorotoluene	3.290	3.506	-6.6	89	0.00	11.76
75	trans-1,4-Dichloro-2-Bute	0.419	0.483	-15.3	92	0.00	11.83
76	1,2,3-Trichloropropane	0.365	0.349	4.4	81	0.00	11.80
	----------	Amount	Calc.	%Drift	----------		
77	Cyclohexanone	200.000	190.104	4.9	84	0.00	11.86
	----------	AvgRF	CCRF	%Dev	----------		
78	4-Chlorotoluene	3.077	3.228	-4.9	87	0.00	11.92
79	tert-Butylbenzene	2.050	2.237	-9.1	90	0.00	12.11
80	1,2,4-Trimethylbenzene	3.119	3.354	-7.5	88	0.00	12.17
81	sec-Butylbenzene	3.604	3.915	-8.6	89	0.00	12.29
82	4-Isopropyltoluene	2.777	3.005	-8.2	88	0.00	12.43
83	1,3-Dichlorobenzene	1.511	1.621	-7.3	89	0.00	12.54
84	1,4-Dichlorobenzene	1.569	1.663	-6.0	91	0.00	12.62
	----------	Amount	Calc.	%Drift	----------		
85	n-Butylbenzene	40.000	42.077	-5.2	93	0.00	12.87
86	Benzyl Chloride	40.000	46.639	-16.6	100	0.00	12.87
	----------	AvgRF	CCRF	%Dev	----------		
87	1,2-Dichlorobenzene	1.452	1.562	-7.6	91	0.00	13.07
88	1,2-Dibromo-3-Chloropropa	0.261	0.284	-8.8	88	0.00	13.85
89	Hexachlorobutadiene	0.508	0.559	-10.0	91	0.00	14.42
90	1,2,4-Trichlorobenzene	0.940	1.135	-20.7#	100	0.00	14.47
91	Naphthalene	2.333	2.652	-13.7	92	0.00	14.75
	----------	Amount	Calc.	%Drift	----------		
92	1,2,3-Trichlorobenzene	40.000	45.781	-14.5	102	0.00	14.90
	----------	AvgRF	CCRF	%Dev	----------		
93 I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	87	-0.01	4.80
	----------	Amount	Calc.	%Drift	----------		
94	acrolein	200.000	157.007	21.5#	69	0.00	4.28
	----------	AvgRF	CCRF	%Dev	----------		
95	Tert Butyl Alcohol	1.401	1.245	11.1	77	-0.03	4.87
	----------	Amount	Calc.	%Drift	----------		
96	tert Amyl alcohol	400.000	336.874	15.8	73	0.00	7.01
97	1,4-Dioxane	800.000	702.307	12.2	77	0.00	8.08

(#) = Out of Range SPCC's out = 0 CCC's out = 0
M0042438.D 8260MNEW.M Tue May 04 14:19:18 2010

5.7.3 5

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM1734-MB	M0042696.D	1	05/04/10	MM	n/a	n/a	VM1734

The QC reported here applies to the following samples: Method: SW846 8260B

F73096-1, F73096-2, F73096-3, F73096-4, F73096-5

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.20	ug/l	
91-20-3	Naphthalene	ND	5.0	1.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.54	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	110%	87-116%
17060-07-0	1,2-Dichloroethane-D4	102%	76-127%
2037-26-5	Toluene-D8	101%	86-112%
460-00-4	4-Bromofluorobenzene	105%	84-120%

Instrument Performance Check (BFB)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VN1732-BFB	Injection Date:	05/03/10
Lab File ID:	N0042866.D	Injection Time:	10:57
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	37976	22.8		Pass
75	30.0 - 60.0% of mass 95	66813	40.1		Pass
95	Base peak, 100% relative abundance	166485	100.0		Pass
96	5.0 - 9.0% of mass 95	10172	6.1		Pass
173	Less than 2.0% of mass 174	1490	0.89	(1.1) [a]	Pass
174	50.0 - 100.0% of mass 95	132050	79.3		Pass
175	5.0 - 9.0% of mass 174	10433	6.3	(7.9) [a]	Pass
176	95.0 - 101.0% of mass 174	132290	79.5	(100.2) [a]	Pass
177	5.0 - 9.0% of mass 176	9063	5.4	(6.9) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN1732-IC1732	N0042867.D	05/03/10	11:23	00:26	Initial cal 1
VN1732-IC1732	N0042868.D	05/03/10	11:49	00:52	Initial cal 2
VN1732-IC1732	N0042869.D	05/03/10	12:17	01:20	Initial cal 3
VN1732-ICC1732	N0042870.D	05/03/10	12:44	01:47	Initial cal 4
VN1732-IC1732	N0042871.D	05/03/10	13:10	02:13	Initial cal 5
VN1732-IC1732	N0042872.D	05/03/10	13:36	02:39	Initial cal 6
VN1732-ICV1732	N0042873.D	05/03/10	14:04	03:07	Initial cal verification 4

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-ICC1732
Lab FileID: N0042870.D

Response Factor Report MSVOA8

Method : C:\MSDCHEM\2\METHODS\8260NNEW.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Mon May 03 14:15:57 2010
Response via : Initial Calibration

Calibration Files
1 =N0042867.D 2 =N0042868.D 3 =N0042869.D 4 =N0042870.D
5 =N0042871.D 6 =N0042872.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------							
2)		Dichlorodifluoromet	0.246	0.267	0.337	0.347	0.347	0.326	0.312	14.09
3)	P	Chloromethane	0.631	0.491	0.585	0.521	0.511	0.474	0.535	11.25
4)	C	Vinyl Chloride	0.485	0.464	0.593	0.548	0.544	0.514	0.525	8.94
5)		Bromomethane	0.496	0.305	0.372	0.310	0.265	0.224	0.329	29.14
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9988								
		Response Ratio = 0.00000 + 0.37390 *A + -0.07549 *A^2								
6)		Chloroethane	0.305	0.270	0.320	0.270	0.230	0.185	0.263	18.85
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9993								
		Response Ratio = 0.00000 + 0.33498 *A + -0.07520 *A^2								
7)		Trichlorofluorometh	0.438	0.418	0.519	0.511	0.521	0.465	0.479	9.36
8)		Ethyl Ether	0.374	0.363	0.380	0.359	0.362	0.341	0.363	3.72
9)		1,2-Dichlorotrifluo	0.380	0.364	0.443	0.393	0.411	0.388	0.397	6.91
10)	C	1,1-Dichloroethene	0.518	0.486	0.620	0.569	0.590	0.561	0.557	8.71
11)		Freon 113	0.296	0.300	0.373	0.328	0.341	0.328	0.328	8.61
12)		Carbon Disulfide	1.038	0.940	1.228	1.108	1.125	1.084	1.087	8.79
13)		Iodomethane	0.587	0.590	0.687	0.617	0.622	0.600	0.617	5.98
14)		Methylene Chloride	2.416	1.024	0.698	0.606	0.598	0.564	0.984	73.30
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9986								
		Response Ratio = 0.00000 + 0.67789 *A + -0.05772 *A^2								
15)		Acetone	0.083	0.055	0.044	0.041	0.039	0.037	0.050	34.67
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9997								
		Response Ratio = 0.00000 + 0.04395 *A + -0.00067 *A^2								
16)		Methyl acetate	0.066	0.071	0.068	0.063	0.062	0.058	0.065	7.16
17)		trans-1,2-Dichloroe	0.564	0.498	0.598	0.554	0.539	0.550	0.551	5.90
18)		Hexane	0.081	0.057	0.077	0.082	0.079	0.076	0.075	12.13
19)		Methyl Tert Butyl E	0.913	0.823	0.881	0.894	0.884	0.896	0.882	3.48
20)		Di-isopropyl ether	1.046	1.083	1.329	1.252	1.283	1.232	1.204	9.43
21)	P	1,1-Dichloroethane	0.576	0.561	0.699	0.644	0.651	0.622	0.625	8.16
22)		Acrylonitrile	0.128	0.147	0.149	0.143	0.141	0.135	0.141	5.71
23)		ETBE	0.810	1.044	1.209	1.147	1.173	1.148	1.088	13.52
24)		Vinyl acetate	0.396	0.515	0.547	0.525	0.528	0.493	0.501	10.81
25)		cis-1,2-Dichloroeth	0.243	0.263	0.340	0.339	0.365	0.364	0.319	16.52
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 0.33604 *A + 0.01490 *A^2								
26)		2,2-Dichloropropane	0.209	0.286	0.360	0.347	0.356	0.351	0.318	18.83
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998								
		Response Ratio = 0.00000 + 0.35374 *A + -0.00094 *A^2								
27)		Bromochloromethane	0.125	0.146	0.177	0.178	0.199	0.197	0.170	17.25
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9988								

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-ICC1732
Lab FileID: N0042870.D

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                Response Ratio = 0.00000 + 0.17740 *A + 0.01070 *A^2

28)      Cyclohexane          0.388 0.438 0.678 0.626 0.657 0.637 0.571  21.79
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
                Response Ratio = 0.00000 + 0.65394 *A + -0.00681 *A^2

29) C    Chloroform           0.502 0.492 0.596 0.559 0.575 0.555 0.546   7.52
30)      Tetrahydrofuran      0.219 0.134 0.125 0.121 0.123 0.116 0.140  28.12
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.12917 *A + -0.00615 *A^2

31) S    Dibromofluoromethan 0.224 0.224 0.225 0.232 0.235 0.239 0.230   2.80
32)      Carbon Tetrachlorid 0.227 0.261 0.371 0.365 0.397 0.402 0.337  22.09
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
                Response Ratio = 0.00000 + 0.35614 *A + 0.02404 *A^2

33)      1,1,1-Trichloroetha 0.303 0.293 0.404 0.390 0.414 0.418 0.370  15.40
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 0.38563 *A + 0.01688 *A^2

34)      2-Butanone           0.179 0.197 0.203 0.195 0.191 0.184 0.191   4.70
35)      1,1-Dichloropropene 0.329 0.311 0.451 0.418 0.439 0.422 0.395  15.04
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
                Response Ratio = 0.00000 + 0.44150 *A + -0.00865 *A^2

36)      Benzene              1.104 1.125 1.495 1.382 1.411 1.341 1.310  12.18
37)      TAME                 0.521 0.695 0.857 0.838 0.880 0.852 0.774  18.17
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.86562 *A + -0.00399 *A^2

38) S    1,2-Dichloroethane- 0.286 0.286 0.278 0.281 0.256 0.252 0.273   5.57
39)      1,2-Dichloroethane  0.436 0.444 0.479 0.445 0.447 0.433 0.447   3.67
40)      Trichloroethene     0.290 0.254 0.352 0.327 0.342 0.334 0.316  11.79
41)      Methylcyclohexane   0.344 0.364 0.572 0.545 0.568 0.540 0.489  21.57
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9990
                Response Ratio = 0.00000 + 0.57612 *A + -0.01628 *A^2

42)      Dibromomethane      0.186 0.188 0.209 0.208 0.215 0.209 0.203   6.04
43) C    1,2-Dichloropropane 0.318 0.349 0.423 0.394 0.395 0.376 0.376   9.89
44)      Bromodichloromethan 0.293 0.335 0.412 0.402 0.415 0.407 0.377  13.55
45)      2-Chloroethyl vinyl 0.151 0.241 0.286 0.269 0.270 0.260 0.246  19.86
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 0.28291 *A + -0.00227 *A^2

46)      cis-1,3-Dichloropro 0.376 0.432 0.570 0.545 0.567 0.540 0.505  16.03
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
                Response Ratio = 0.00000 + 0.57553 *A + -0.01601 *A^2


47) I    Chlorobenzene-d5       ----------------ISTD---------------------
48) S    Toluene-d8           1.355 1.330 1.268 1.271 1.265 1.256 1.291   3.19
49) C    Toluene              1.573 1.615 1.997 1.863 1.890 1.781 1.787   9.22
50)      2-Nitropropane       0.122 0.148 0.156 0.154 0.155 0.151 0.148   8.83
51)      4-Methyl-2-pentanon 0.411 0.570 0.586 0.559 0.547 0.506 0.530  12.09
52)      trans-1,3-Dichlorop 0.392 0.532 0.622 0.591 0.603 0.599 0.557  15.51
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
                Response Ratio = 0.00000 + 0.60212 *A + -0.00138 *A^2

53)      Tetrachloroethene   0.294 0.315 0.436 0.423 0.468 0.466 0.400  19.07
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
```

5.7.4 5

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-ICC1732
Lab FileID: N0042870.D

```
                Response Ratio = 0.00000 + 0.42223 *A + 0.02347 *A^2

54)      1,1,2-Trichloroetha 0.323 0.364 0.399 0.376 0.380 0.359 0.367   6.96
55)      Dibromochloromethan 0.295 0.316 0.392 0.412 0.442 0.456 0.386  17.22
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
                Response Ratio = 0.00000 + 0.38749 *A + 0.03510 *A^2

56)      1,3-Dichloropropane 0.583 0.658 0.757 0.721 0.735 0.701 0.693   9.11
57)      1,2-Dibromoethane   0.290 0.355 0.422 0.424 0.448 0.446 0.398  15.77
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 0.42197 *A + 0.01329 *A^2

58)      2-hexanone          0.236 0.367 0.410 0.400 0.396 0.372 0.363  17.72
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
                Response Ratio = 0.00000 + 0.42689 *A + -0.00535 *A^2

59)      1-Chlorohexane            0.382 0.669 0.655 0.680 0.661 0.610  20.89
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
                Response Ratio = 0.00000 + 0.67053 *A + -0.00266 *A^2

60) C    Ethylbenzene        1.828 1.793 2.222 2.032 2.038 1.927 1.973   8.02
61) P    Chlorobenzene       1.054 1.085 1.327 1.249 1.244 1.201 1.193   8.76
62)      1,1,1,2-Tetrachloro 0.264 0.311 0.415 0.396 0.424 0.420 0.371  18.20
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
                Response Ratio = 0.00000 + 0.40106 *A + 0.01044 *A^2

63)      m,p-Xylene          0.993 1.207 1.647 1.505 1.482 1.309 1.357  17.38
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9988
                Response Ratio = 0.00000 + 1.71862 *A + -0.09958 *A^2

64)      o-Xylene            0.769 1.091 1.657 1.572 1.594 1.531 1.369  26.10
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
                Response Ratio = 0.00000 + 1.64790 *A + -0.05531 *A^2

65)      Styrene             0.563 0.909 1.388 1.345 1.399 1.327 1.155  29.76
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
                Response Ratio = 0.00000 + 1.41705 *A + -0.03975 *A^2

66) P    Bromoform           0.152 0.213 0.283 0.298 0.328 0.334 0.268  26.65
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
                Response Ratio = 0.00000 + 0.28265 *A + 0.02661 *A^2

67)      Isopropylbenzene    0.780 1.034 1.753 1.658 1.721 1.622 1.428  29.00
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9989
                Response Ratio = 0.00000 + 1.76787 *A + -0.06697 *A^2


68) I    1,4-Dichlorobenzene-d ----------------ISTD---------------------
69) S    4-Bromofluorobenzen 0.946 0.894 0.852 0.856 0.846 0.826 0.870   4.99
70)      n-Propylbenzene     2.899 3.286 4.579 4.172 4.131 3.739 3.801  16.37
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
                Response Ratio = 0.00000 + 4.67614 *A + -0.45672 *A^2

71)      Bromobenzene        0.765 0.746 0.956 0.923 0.991 0.962 0.891  11.99
72) P    1,1,2,2-Tetrachloro 0.968 1.100 1.173 1.067 1.073 0.984 1.061   7.17
73)      1,3,5-Trimethylbenz 1.391 1.986 3.014 2.750 2.829 2.704 2.446  25.56
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
                Response Ratio = 0.00000 + 2.92819 *A + -0.10602 *A^2

74)      2-Chlorotoluene     1.914 2.370 3.041 2.726 2.796 2.685 2.589  15.24
```

5.7.4

5

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-ICC1732
Lab FileID: N0042870.D

```
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9993
            Response Ratio = 0.00000 + 2.91371 *A + -0.11053 *A^2

75)     trans-1,4-Dichloro- 0.226 0.327 0.354 0.349 0.353 0.342 0.325  15.21
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
            Response Ratio = 0.00000 + 0.36124 *A + -0.00922 *A^2

76)     1,2,3-Trichloroprop 0.191 0.253 0.290 0.281 0.286 0.273 0.262  14.17
77)     Cyclohexanone       0.027 0.026 0.029 0.030 0.030 0.029 0.028   6.56
78)     4-Chlorotoluene     1.593 2.019 2.751 2.526 2.575 2.420 2.314  18.56
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
            Response Ratio = 0.00000 + 2.73294 *A + -0.14980 *A^2

79)     tert-Butylbenzene   0.770 1.099 1.601 1.484 1.552 1.537 1.340  24.87
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
            Response Ratio = 0.00000 + 1.51792 *A + 0.01145 *A^2

80)     1,2,4-Trimethylbenz 1.490 2.123 3.075 2.845 2.898 2.733 2.527  23.87
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
            Response Ratio = 0.00000 + 3.05887 *A + -0.15567 *A^2

81)     sec-Butylbenzene    1.950 2.579 4.110 3.752 3.745 3.454 3.265  25.32
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
            Response Ratio = 0.00000 + 4.12701 *A + -0.32675 *A^2

82)     4-Isopropyltoluene  1.242 1.840 3.055 2.874 2.960 2.787 2.460  30.15
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9990
            Response Ratio = 0.00000 + 3.07195 *A + -0.13259 *A^2

83)     1,3-Dichlorobenzene 1.182 1.320 1.837 1.758 1.864 1.791 1.625  18.17
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
            Response Ratio = 0.00000 + 1.83678 *A + -0.01628 *A^2

84)     1,4-Dichlorobenzene 1.581 1.615 1.959 1.858 1.906 1.817 1.789   8.70
85)     n-Butylbenzene      0.922 1.250 2.006 1.860 1.915 1.858 1.635  26.97
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9993
            Response Ratio = 0.00000 + 1.94195 *A + -0.03879 *A^2

86)     Benzyl Chloride     0.203 0.286 0.383 0.392 0.415 0.400 0.346  24.24
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
            Response Ratio = 0.00000 + 0.40084 *A + 0.00113 *A^2

87)     1,2-Dichlorobenzene 1.259 1.342 1.796 1.747 1.809 1.751 1.617  15.34
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
            Response Ratio = 0.00000 + 1.80580 *A + -0.02265 *A^2

88)     1,2-Dibromo-3-Chlor 0.105 0.126 0.143 0.144 0.154 0.152 0.137  13.72
89)     Hexachlorobutadiene 0.286 0.315 0.443 0.418 0.474 0.509 0.407  21.82
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9995
            Response Ratio = 0.00000 + 0.38212 *A + 0.06350 *A^2

90)     1,2,4-Trichlorobenz 0.712 0.849 1.108 1.105 1.204 1.192 1.028  19.56
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9992
            Response Ratio = 0.00000 + 1.10380 *A + 0.04829 *A^2

91)     Naphthalene         1.825 2.151 2.711 2.882 3.004 2.828 2.567  18.30
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9986
            Response Ratio = 0.00000 + 2.98975 *A + -0.06551 *A^2

92)     1,2,3-Trichlorobenz 0.711 0.808 1.033 1.046 1.155 1.147 0.983  18.64
```

5.7.4 5

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-ICC1732
Lab FileID: N0042870.D

```
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9991
            Response Ratio = 0.00000 + 1.03572 *A + 0.06049 *A^2


93) I   Tert Butyl Alcohol-d1 ----------------ISTD--------------------
94)     acrolein            2.967 3.061 3.122 2.721 2.923 2.687 2.914   6.08
95)     Tert Butyl Alcohol  1.502 1.457 1.443 1.381 1.456 1.395 1.439   3.11
96)     tert Amyl alcohol   0.613 0.944 1.091 1.081 1.204 1.150 1.014  21.20
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9981
            Response Ratio = 0.00000 + 1.12613 *A + 0.00925 *A^2

97)     1,4-Dioxane         0.070 0.099 0.148 0.146 0.171 0.165 0.133  30.12
          ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9971
            Response Ratio = 0.00000 + 0.14977 *A + 0.00225 *A^2

---------------------------------------------------------------------------
(#) = Out of Range

        8260NNEW.M        Tue May 04 11:21:24 2010
```

5.7.4 5

Instrument Performance Check (BFB)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VN1732-BFB	Injection Date:	05/03/10
Lab File ID:	N0042874.D	Injection Time:	14:25
Instrument ID:	GCMSN		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	47421	21.0		Pass
75	30.0 - 60.0% of mass 95	93253	41.3		Pass
95	Base peak, 100% relative abundance	225813	100.0		Pass
96	5.0 - 9.0% of mass 95	15883	7.0		Pass
173	Less than 2.0% of mass 174	983	0.44	(0.5) [a]	Pass
174	50.0 - 100.0% of mass 95	195200	86.4		Pass
175	5.0 - 9.0% of mass 174	13857	6.1	(7.1) [a]	Pass
176	95.0 - 101.0% of mass 174	193216	85.6	(99.0) [a]	Pass
177	5.0 - 9.0% of mass 176	13476	6.0	(7.0) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VN1732-CC1732	N0042875.D	05/03/10	14:55	00:30	Continuing cal 4
VN1732-BS	N0042876.D	05/03/10	15:26	01:01	Blank Spike
VN1732-MB	N0042877.D	05/03/10	15:53	01:28	Method Blank
F73086-4	N0042878.D	05/03/10	16:24	01:59	(used for QC only; not part of job F73096)
ZZZZZZ	N0042879.D	05/03/10	16:51	02:26	(unrelated sample)
F73086-4MS	N0042880.D	05/03/10	17:17	02:52	Matrix Spike
F73086-4MSD	N0042881.D	05/03/10	17:43	03:18	Matrix Spike Duplicate
ZZZZZZ	N0042882.D	05/03/10	18:10	03:45	(unrelated sample)
ZZZZZZ	N0042883.D	05/03/10	18:36	04:11	(unrelated sample)
ZZZZZZ	N0042884.D	05/03/10	19:02	04:37	(unrelated sample)
ZZZZZZ	N0042885.D	05/03/10	19:28	05:03	(unrelated sample)
ZZZZZZ	N0042886.D	05/03/10	19:54	05:29	(unrelated sample)
ZZZZZZ	N0042887.D	05/03/10	20:20	05:55	(unrelated sample)
ZZZZZZ	N0042888.D	05/03/10	20:46	06:21	(unrelated sample)
ZZZZZZ	N0042889.D	05/03/10	21:11	06:46	(unrelated sample)
ZZZZZZ	N0042890.D	05/03/10	21:38	07:13	(unrelated sample)
F73096-4	N0042895.D	05/03/10	23:48	09:23	CEF-G82-2,S-20100420
ZZZZZZ	N0042896.D	05/04/10	00:14	09:49	(unrelated sample)
ZZZZZZ	N0042897.D	05/04/10	00:40	10:15	(unrelated sample)
ZZZZZZ	N0042898.D	05/04/10	01:06	10:41	(unrelated sample)
ZZZZZZ	N0042899.D	05/04/10	01:32	11:07	(unrelated sample)

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82
Sample: VN1732-CC1732
Lab FileID: N0042875.D

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\2\DATA\050310\N0042875.D Vial: 8
Acq On : 3 May 2010 2:55 pm Operator: MelissaM
Sample : cc1732-4 Inst : MSVOA8
Misc : ms14299,vn1732,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDCHEM\2\METHODS\8260NNEW.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Mon May 03 14:15:57 2010
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	Fluorobenzene	1.000	1.000	0.0	142	0.00	7.67
2	Dichlorodifluoromethane	0.312	0.354	-13.5	145	0.03	2.89
3 P	Chloromethane	0.535	0.516	3.6	141	0.00	3.06
4 C	Vinyl Chloride	0.525	0.541	-3.0	140	0.00	3.21
	----------	Amount	Calc.	%Drift		----------	
5	Bromomethane	40.000	31.257	21.9#	117	0.00	3.57
6	Chloroethane	40.000	31.418	21.5#	119	0.01	3.71
	----------	AvgRF	CCRF	%Dev		----------	
7	Trichlorofluoromethane	0.479	0.470	1.9	131	0.01	3.94
8	Ethyl Ether	0.363	0.323	11.0	128	0.00	4.16
9	1,2-Dichlorotrifluoroetha	0.397	0.371	6.5	134	0.01	4.41
10 C	1,1-Dichloroethene	0.557	0.529	5.0	132	0.00	4.43
11	Freon 113	0.328	0.319	2.7	139	0.02	4.50
12	Carbon Disulfide	1.087	1.047	3.7	134	0.00	4.50
13	Iodomethane	0.617	0.586	5.0	135	0.00	4.61
	----------	Amount	Calc.	%Drift		----------	
14	Methylene Chloride	40.000	34.590	13.5	130	0.00	5.05
15	Acetone	200.000	172.719	13.6	125	0.00	5.10
	----------	AvgRF	CCRF	%Dev		----------	
16	Methyl acetate	0.065	0.056	13.8	125	0.00	5.20
17	trans-1,2-Dichloroethene	0.551	0.509	7.6	131	0.00	5.22
18	Hexane	0.075	0.077	-2.7	132	0.00	5.25
19	Methyl Tert Butyl Ether	0.882	0.823	6.7	131	0.00	5.32
20	Di-isopropyl ether	1.204	1.158	3.8	132	0.00	5.68
21 P	1,1-Dichloroethane	0.625	0.586	6.2	129	0.00	5.87
22	Acrylonitrile	0.141	0.124	12.1	123	0.00	5.92
23	ETBE	1.088	1.073	1.4	133	0.00	6.07
24	Vinyl acetate	0.501	0.481	4.0	130	0.00	6.08
	----------	Amount	Calc.	%Drift		----------	
25	cis-1,2-Dichloroethene	40.000	39.911	0.2	146	0.00	6.42
26	2,2-Dichloropropane	40.000	40.942	-2.4	148	0.00	6.54
27	Bromochloromethane	40.000	41.381	-3.5	154	0.00	6.63
28	Cyclohexane	40.000	36.057	9.9	133	0.00	6.65
	----------	AvgRF	CCRF	%Dev		----------	
29 C	Chloroform	0.546	0.535	2.0	136	0.00	6.68

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-CC1732
Lab FileID: N0042875.D

			Amount	Calc.	%Drift			
30		Tetrahydrofuran	40.000	33.803	15.5	125	0.00	6.86
			AvgRF	CCRF	%Dev			
31	S	Dibromofluoromethane	0.230	0.248	-7.8	152	0.00	6.87
			Amount	Calc.	%Drift			
32		Carbon Tetrachloride	40.000	41.575	-3.9	152	0.00	6.85
33		1,1,1-Trichloroethane	40.000	40.103	-0.3	146	0.00	6.92
			AvgRF	CCRF	%Dev			
34		2-Butanone	0.191	0.169	11.5	123	0.00	6.98
			Amount	Calc.	%Drift			
35		1,1-Dichloropropene	40.000	36.270	9.3	134	0.00	7.02
			AvgRF	CCRF	%Dev			
36		Benzene	1.310	1.284	2.0	132	0.00	7.27
			Amount	Calc.	%Drift			
37		TAME	40.000	36.755	8.1	135	0.00	7.35
			AvgRF	CCRF	%Dev			
38	S	1,2-Dichloroethane-d4	0.273	0.274	-0.4	139	0.00	7.41
39		1,2-Dichloroethane	0.447	0.419	6.3	134	0.00	7.47
40		Trichloroethene	0.316	0.317	-0.3	138	0.00	7.84
			Amount	Calc.	%Drift			
41		Methylcyclohexane	40.000	36.651	8.4	135	0.00	7.84
			AvgRF	CCRF	%Dev			
42		Dibromomethane	0.203	0.198	2.5	135	0.00	8.27
43	C	1,2-Dichloropropane	0.376	0.352	6.4	127	0.00	8.36
44		Bromodichloromethane	0.377	0.382	-1.3	135	0.00	8.40
			Amount	Calc.	%Drift			
45		2-Chloroethyl vinyl ether	200.000	177.058	11.5	129	0.00	8.91
46		cis-1,3-Dichloropropene	40.000	36.311	9.2	134	0.00	9.01
			AvgRF	CCRF	%Dev			
47	I	Chlorobenzene-d5	1.000	1.000	0.0	138	0.00	10.73
48	S	Toluene-d8	1.291	1.279	0.9	139	0.00	9.19
49	C	Toluene	1.787	1.786	0.1	133	0.00	9.24
50		2-Nitropropane	0.148	0.140	5.4	126	0.00	9.48
51		4-Methyl-2-pentanone	0.530	0.489	7.7	121	0.00	9.58
			Amount	Calc.	%Drift			
52		trans-1,3-Dichloropropene	40.000	37.993	5.0	134	0.00	9.63
53		Tetrachloroethene	40.000	41.769	-4.4	151	0.00	9.63
			AvgRF	CCRF	%Dev			
54		1,1,2-Trichloroethane	0.367	0.341	7.1	126	0.00	9.80
			Amount	Calc.	%Drift			
55		Dibromochloromethane	40.000	41.271	-3.2	144	0.00	9.99
			AvgRF	CCRF	%Dev			
56		1,3-Dichloropropane	0.693	0.655	5.5	126	0.00	10.08

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-CC1732
Lab FileID: N0042875.D

			Amount	Calc.	%Drift			
57		1,2-Dibromoethane	40.000	39.052	2.4	138	0.00	10.25
58		2-hexanone	200.000	171.083	14.5	121	0.00	10.39
59		1-Chlorohexane	40.000	36.644	8.4	129	0.00	10.67
			AvgRF	CCRF	%Dev			
60	C	Ethylbenzene	1.973	1.944	1.5	133	0.00	10.74
61	P	Chlorobenzene	1.193	1.193	0.0	132	0.00	10.75
			Amount	Calc.	%Drift			
62		1,1,1,2-Tetrachloroethane	40.000	40.047	-0.1	143	0.00	10.80
63		m,p-Xylene	80.000	72.789	9.0	132	0.00	10.87
64		o-Xylene	40.000	37.178	7.1	132	0.00	11.32
65		Styrene	40.000	37.591	6.0	134	0.00	11.37
66	P	Bromoform	40.000	40.275	-0.7	142	0.00	11.43
67		Isopropylbenzene	40.000	37.174	7.1	133	0.00	11.62
			AvgRF	CCRF	%Dev			
68	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	137	0.00	13.08
69	S	4-Bromofluorobenzene	0.870	0.826	5.1	132	0.00	11.93
			Amount	Calc.	%Drift			
70		n-Propylbenzene	40.000	35.669	10.8	127	0.00	12.04
			AvgRF	CCRF	%Dev			
71		Bromobenzene	0.891	0.956	-7.3	142	0.00	12.06
72	P	1,1,2,2-Tetrachloroethane	1.061	0.942	11.2	121	0.00	12.11
			Amount	Calc.	%Drift			
73		1,3,5-Trimethylbenzene	40.000	37.733	5.7	134	0.00	12.22
74		2-Chlorotoluene	40.000	37.243	6.9	133	0.00	12.23
75		trans-1,4-Dichloro-2-Bute	40.000	35.563	11.1	124	0.00	12.29
			AvgRF	CCRF	%Dev			
76		1,2,3-Trichloropropane	0.262	0.261	0.4	127	0.00	12.27
77		Cyclohexanone	0.028	0.025	10.7	117	0.00	12.35
			Amount	Calc.	%Drift			
78		4-Chlorotoluene	40.000	36.554	8.6	130	0.00	12.40
79		tert-Butylbenzene	40.000	37.202	7.0	131	0.00	12.56
80		1,2,4-Trimethylbenzene	40.000	36.737	8.2	130	0.00	12.63
81		sec-Butylbenzene	40.000	36.070	9.8	128	0.00	12.74
82		4-Isopropyltoluene	40.000	37.237	6.9	132	0.00	12.88
83		1,3-Dichlorobenzene	40.000	39.085	2.3	139	0.00	13.01
			AvgRF	CCRF	%Dev			
84		1,4-Dichlorobenzene	1.789	1.800	-0.6	133	0.00	13.10
			Amount	Calc.	%Drift			
85		n-Butylbenzene	40.000	36.447	8.9	128	0.00	13.31
86		Benzyl Chloride	40.000	41.685	-4.2	147	0.00	13.34
87		1,2-Dichlorobenzene	40.000	38.456	3.9	135	0.00	13.53
			AvgRF	CCRF	%Dev			
88		1,2-Dibromo-3-Chloropropa	0.137	0.131	4.4	125	0.00	14.28
			Amount	Calc.	%Drift			
89		Hexachlorobutadiene	40.000	42.013	-5.0	150	0.00	14.81
90		1,2,4-Trichlorobenzene	40.000	39.915	0.2	141	0.00	14.86

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VN1732-CC1732
Lab FileID: N0042875.D

91	Naphthalene	40.000	38.106	4.7	133	0.00	15.15
92	1,2,3-Trichlorobenzene	40.000	39.842	0.4	142	0.00	15.31
	----------	AvgRF	CCRF	%Dev	----------		
93 I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	121	0.00	5.32
94	acrolein	2.914	2.924	-0.3	130	0.00	4.79
95	Tert Butyl Alcohol	1.439	1.375	4.4	121	0.00	5.39
	----------	Amount	Calc.	%Drift	----------		
96	tert Amyl alcohol	400.000	390.385	2.4	125	0.00	7.52
97	1,4-Dioxane	800.000	833.689	-4.2	136	0.00	8.58

(#) = Out of Range SPCC's out = 0 CCC's out = 0
N0042870.D 8260NNEW.M Tue May 04 11:21:12 2010

5.7.6

5

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN1732-MB	N0042877.D	1	05/03/10	MM	n/a	n/a	VN1732

The QC reported here applies to the following samples: Method: SW846 8260B

F73096-4

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.54	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	109%	87-116%
17060-07-0	1,2-Dichloroethane-D4	96%	76-127%
2037-26-5	Toluene-D8	101%	86-112%
460-00-4	4-Bromofluorobenzene	101%	84-120%

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SR1090-DFTPP	Injection Date:	04/16/10
Lab File ID:	R22160.D	Injection Time:	16:20
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	122674	37.8		Pass
68	Less than 2.0% of mass 69	1755	0.54	(1.3) [a]	Pass
69	Mass 69 relative abundance	133821	41.2		Pass
70	Less than 2.0% of mass 69	755	0.23	(0.56) [a]	Pass
127	40.0 - 60.0% of mass 198	172069	53.0		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	324517	100.0		Pass
199	5.0 - 9.0% of mass 198	21846	6.7		Pass
275	10.0 - 30.0% of mass 198	80128	24.7		Pass
365	1.0 - 100.0% of mass 198	11191	3.4		Pass
441	Present, but less than mass 443	41910	12.9	(79.1) [b]	Pass
442	40.0 - 100.0% of mass 198	277330	85.5		Pass
443	17.0 - 23.0% of mass 442	52978	16.3	(19.1) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SR1090-IC1090	R22161.D	04/16/10	16:37	00:17	Initial cal 1
SR1090-IC1090	R22162.D	04/16/10	17:04	00:44	Initial cal 2
SR1090-IC1090	R22163.D	04/16/10	17:31	01:11	Initial cal 3
SR1090-ICC1090	R22164.D	04/16/10	17:58	01:38	Initial cal 4
SR1090-IC1090	R22165.D	04/16/10	18:24	02:04	Initial cal 5
SR1090-IC1090	R22166.D	04/16/10	18:51	02:31	Initial cal 6
SR1090-IC1090	R22167.D	04/16/10	19:18	02:58	Initial cal 7
SR1090-ICV1090	R22168.D	04/16/10	19:45	03:25	Initial cal verification 4

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1090-ICC1090
Lab FileID: R22164.D

Response Factor Report MSBNA3

Method : C:\msdchem\1\METHODS\SIM_PAHX.M (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 20 12:58:41 2010
Response via : Initial Calibration

Calibration Files
L1 =R22161.D L2 =R22162.D L3 =R22163.D L4 =R22164.D
L5 =R22165.D L6 =R22166.D L7 =R22167.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8	----------ISTD----------								
2)S Nitrobenzene-d5	0.363	0.377	0.372	0.409	0.395	0.399	0.405	0.388	4.58
3)P N-nitroso-di-n-pr		0.139	0.129	0.139	0.139	0.137	0.122	0.134	5.24
4) Naphthalene	1.295	1.265	1.232	1.326	1.361	1.374	1.461	1.331	5.74
5) 2-Methylnaphthale	0.815	0.814	0.812	0.876	0.893	0.916	0.972	0.871	7.03
6) 1-Methylnaphthale	0.755	0.733	0.722	0.777	0.792	0.802	0.836	0.774	5.20
7) I Acenaphthene-d10	----------ISTD----------								
8)P Hexachlorocyclope		0.245	0.318	0.453	0.460	0.535	0.637	0.441	32.24
9)S 2-Fluorobiphenyl	1.645	1.664	1.635	1.760	1.776	1.785	1.879	1.735	5.18
10) Acenaphthylene	2.058	2.203	2.235	2.438	2.477	2.493	2.606	2.359	8.28
11)C Acenaphthene	1.445	1.430	1.421	1.542	1.562	1.571	1.653	1.518	5.78
12)P 2,4-Dinitrophenol		0.062	0.115	0.170	0.178	0.200	0.229	0.159	38.13
13)P 4-Nitrophenol		0.155	0.202	0.245	0.236	0.267	0.274	0.230	19.37
14) Fluorene	1.547	1.581	1.629	1.782	1.802	1.829	1.914	1.726	8.11
15) I Phenanthrene-d10	----------ISTD----------								
16) Phenanthrene	1.439	1.448	1.449	1.541	1.550	1.547	1.581	1.508	3.98
17) Anthracene	1.228	1.283	1.325	1.427	1.420	1.412	1.411	1.358	5.85
18)C Fluoranthene	1.398	1.495	1.552	1.671	1.675	1.679	1.720	1.599	7.47
19) I Chrysene-d12	----------ISTD----------								
20) Pyrene	2.165	2.347	2.230	2.445	2.488	2.433	2.379	2.355	5.03
21)S Terphenyl-d14	0.827	0.859	0.846	0.923	0.923	0.913	0.906	0.885	4.53
22) Benzo[a]anthracen	1.595	1.621	1.682	1.820	1.818	1.829	1.844	1.744	6.18
23) Chrysene	1.642	1.651	1.662	1.769	1.749	1.741	1.734	1.707	3.11
24) I Perylene-d12	----------ISTD----------								
25) Benzo[b]fluoranth	1.294	1.491	1.559	1.737	1.779	1.808	1.848	1.645	12.37
26) Benzo[k]fluoranth	1.435	1.547	1.662	1.814	1.870	1.840	1.894	1.723	10.34
27)C Benzo[a]pyrene	1.084	1.266	1.386	1.537	1.579	1.582	1.648	1.440	14.24
28) Indeno[1,2,3-cd]p	0.822	0.971	1.109	1.293	1.252	1.281		1.121	17.14
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9987									
Response Ratio = 0.00000 + 1.18141 *A + 0.04105 *A^2									
29) Dibenz[a,h]anthra	0.822	0.974	1.110	1.270	1.212	1.260		1.108	16.13
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9986									
Response Ratio = 0.00000 + 1.15445 *A + 0.04136 *A^2									
30) Benzo[g,h,i]peryl	1.102	1.213	1.277	1.423	1.366	1.374	1.503	1.322	10.23

(#) = Out of Range

SIM_PAHX.M Tue Apr 20 14:11:47 2010

7.7.1

7

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SR1098-DFTPP	Injection Date:	04/28/10
Lab File ID:	R22361.D	Injection Time:	11:13
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	96909	43.1		Pass
68	Less than 2.0% of mass 69	1924	0.86	(2.0*) [a]	FAIL
69	Mass 69 relative abundance	98058	43.6		Pass
70	Less than 2.0% of mass 69	494	0.22	(0.5) [a]	Pass
127	40.0 - 60.0% of mass 198	123085	54.7		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	224861	100.0		Pass
199	5.0 - 9.0% of mass 198	14959	6.7		Pass
275	10.0 - 30.0% of mass 198	51570	22.9		Pass
365	1.0 - 100.0% of mass 198	6790	3.0		Pass
441	Present, but less than mass 443	25978	11.6	(80.2) [b]	Pass
442	40.0 - 100.0% of mass 198	172682	76.8		Pass
443	17.0 - 23.0% of mass 442	32382	14.4	(18.8) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

7.4.2 7

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SR1098-CC1090	R22362.D	04/28/10	11:29	00:16	Continuing cal 4
OP32657-BS	R22363.D	04/28/10	12:31	01:18	Blank Spike
OP32657-MB	R22364.D	04/28/10	12:57	01:44	Method Blank
F73093-8	R22365.D	04/28/10	13:24	02:11	(used for QC only; not part of job F73096)
OP32657-MS	R22366.D	04/28/10	13:51	02:38	Matrix Spike
OP32657-MSD	R22367.D	04/28/10	14:18	03:05	Matrix Spike Duplicate
ZZZZZZ	R22368.D	04/28/10	14:45	03:32	(unrelated sample)
ZZZZZZ	R22369.D	04/28/10	15:12	03:59	(unrelated sample)
ZZZZZZ	R22375.D	04/28/10	18:01	06:48	(unrelated sample)
ZZZZZZ	R22376.D	04/28/10	18:27	07:14	(unrelated sample)
ZZZZZZ	R22377.D	04/28/10	18:54	07:41	(unrelated sample)
ZZZZZZ	R22378.D	04/28/10	19:21	08:08	(unrelated sample)
ZZZZZZ	R22379.D	04/28/10	19:48	08:35	(unrelated sample)
ZZZZZZ	R22380.D	04/28/10	20:15	09:02	(unrelated sample)
OP32672-MB	R22382.D	04/28/10	21:09	09:56	Method Blank
F73129-2	R22384.D	04/28/10	22:02	10:49	(used for QC only; not part of job F73096)
ZZZZZZ	R22386.D	04/28/10	22:56	11:43	(unrelated sample)

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1098-CC1090
Lab FileID: R22362.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\042810\R22362.D
Acq On : 28 Apr 2010 11:29 am
Sample : cc1090-4
Misc : op32633,sr1098,1000,,,1,1,water
MS Integration Params: RTEINT.P

Vial: 2
Operator: rayb
Inst : MSBNA3
Multiplr: 1.00

Method : C:\msdchem\1\METHODS\SIM_PAHX.M (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Wed Apr 28 15:24:39 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	88	0.00	5.63
2	S	Nitrobenzene-d5	0.388	0.373	3.9	81	0.00	5.00
3	P	N-nitroso-di-n-propylamin	0.134	0.131	2.2	83	0.00	4.89
4		Naphthalene	1.331	1.377	-3.5	92	0.00	5.64
5		2-Methylnaphthalene	0.871	0.911	-4.6	92	0.00	6.39
6		1-Methylnaphthalene	0.774	0.818	-5.7	93	0.00	6.50
7	I	Acenaphthene-d10	1.000	1.000	0.0	91	0.00	7.77
8	P	Hexachlorocyclopentadiene	0.441	0.217	50.8#	44#	-0.02	6.57
9	S	2-Fluorobiphenyl	1.735	1.801	-3.8	93	0.00	6.85
10		Acenaphthylene	2.359	2.468	-4.6	92	0.00	7.56
11	C	Acenaphthene	1.518	1.565	-3.1	92	0.00	7.81
12	P	2,4-Dinitrophenol	0.159	0.065	59.1#	35#	0.00	7.92
13	P	4-Nitrophenol	0.230	0.180	21.7	67	0.03	8.11
14		Fluorene	1.726	1.836	-6.4	94	0.02	8.64
15	I	Phenanthrene-d10	1.000	1.000	0.0	89	0.00	10.22
16		Phenanthrene	1.508	1.580	-4.8	91	0.00	10.26
17		Anthracene	1.358	1.460	-7.5	91	0.00	10.35
18	C	Fluoranthene	1.599	1.644	-2.8	87	0.02	12.43
19	I	Chrysene-d12	1.000	1.000	0.0	81	0.00	15.13
20		Pyrene	2.355	2.622	-11.3	87	-0.02	12.83
21	S	Terphenyl-d14	0.885	0.975	-10.2	86	-0.02	13.25
22		Benzo[a]anthracene	1.744	1.929	-10.6	86	0.00	15.11
23		Chrysene	1.707	1.830	-7.2	84	0.00	15.17
24	I	Perylene-d12	1.000	1.000	0.0	83	0.00	17.64
25		Benzo[b]fluoranthene	1.645	1.813	-10.2	86	0.00	17.02
26		Benzo[k]fluoranthene	1.723	1.858	-7.8	85	0.00	17.07
27	C	Benzo[a]pyrene	1.440	1.611	-11.9	87	0.00	17.54
			Amount	Calc.	%Drift			
28		Indeno[1,2,3-cd]pyrene	5.000	4.869	2.6	77	0.02	19.23
29		Dibenz[a,h]anthracene	5.000	5.455	-9.1	86	0.01	19.27
			AvgRF	CCRF	%Dev			
30		Benzo[g,h,i]perylene	1.322	1.456	-10.1	85	0.01	19.57

(#) = Out of Range SPCC's out = 0 CCC's out = 0

7.7.3

7

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1098-CC1090
Lab FileID: R22362.D

R22164.D SIM_PAHX.M Wed Apr 28 15:25:39 2010

7.7.3

7

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	R22382.D	1	04/28/10	RB	04/27/10	OP32672	SR1098

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73096-1, F73096-2, F73096-3, F73096-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	57%	42-108%
321-60-8	2-Fluorobiphenyl	57%	40-106%
1718-51-0	Terphenyl-d14	93%	39-121%

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2588-DFTPP	Injection Date:	04/12/10
Lab File ID:	W051550.D	Injection Time:	20:37
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	14119	37.1		Pass
68	Less than 2.0% of mass 69	153	0.4	(1.2) [a]	Pass
69	Mass 69 relative abundance	12243	32.2		Pass
70	Less than 2.0% of mass 69	36	0.09	(0.29) [a]	Pass
127	40.0 - 60.0% of mass 198	15616	41.0		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	38056	100.0		Pass
199	5.0 - 9.0% of mass 198	2642	6.9		Pass
275	10.0 - 30.0% of mass 198	9471	24.9		Pass
365	1.0 - 100.0% of mass 198	1089	2.9		Pass
441	Present, but less than mass 443	5228	13.7	(80.3) [b]	Pass
442	40.0 - 100.0% of mass 198	32909	86.5		Pass
443	17.0 - 23.0% of mass 442	6512	17.1	(19.8) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2588-IC2588	W051552.D	04/12/10	21:25	00:48	Initial cal 1
SW2588-IC2588	W051553.D	04/12/10	21:53	01:16	Initial cal 2
SW2588-IC2588	W051554.D	04/12/10	22:21	01:44	Initial cal 3
SW2588-ICC2588	W051555.D	04/12/10	22:50	02:13	Initial cal 4
SW2588-IC2588	W051556.D	04/12/10	23:19	02:42	Initial cal 5
SW2588-IC2588	W051557.D	04/12/10	23:47	03:10	Initial cal 6
SW2588-IC2588	W051558.D	04/13/10	00:15	03:38	Initial cal 7
SW2588-ICV2588	W051559.D	04/13/10	00:44	04:07	Initial cal verification 5

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2588-ICC2588
Lab FileID: W051555.D

Response Factor Report MSBNA01

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 13 09:59:10 2010
Response via : Initial Calibration

Calibration Files
L1 =W051552.D L2 =W051553.D L3 =W051554.D L4 =W051555.D
L5 =W051556.D L6 =W051557.D L7 =W051558.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8	----------ISTD----------								
2)S Nitrobenzene-d5	0.346	0.351	0.320	0.354	0.341	0.322	0.314	0.336	4.83
3)P N-nitroso-di-n-pr		0.120	0.110	0.116	0.102	0.098	0.092	0.106	10.23
4) Naphthalene	1.092	1.093	0.952	1.011	0.946	0.856	0.827	0.968	10.83
5) 2-Methylnaphthale	0.758	0.751	0.667	0.707	0.666	0.602	0.574	0.675	10.35
6) 1-Methylnaphthale	0.693	0.690	0.609	0.647	0.608	0.554	0.528	0.618	10.23
7) I Acenaphthene-d10	----------ISTD----------								
8)P Hexachlorocyclope		0.089	0.148	0.187	0.195	0.226	0.226	0.179	29.33
9)S 2-Fluorobiphenyl	1.585	1.604	1.726	1.588	1.489	1.631	1.544	1.595	4.63
10) Acenaphthylene	2.035	2.034	1.895	1.957	1.772	1.655	1.528	1.840	10.60
11)C Acenaphthene	1.268	1.258	1.158	1.197	1.117	1.026	1.006	1.147	9.07
12)P 2,4-Dinitrophenol		0.020	0.033	0.068	0.084	0.116	0.125	0.074	57.78
13)P 4-Nitrophenol		0.136	0.160	0.196	0.196	0.204	0.198	0.182	15.14
14) Fluorene	1.436	1.420	1.332	1.371	1.286	1.173	1.119	1.305	9.26
15) I Phenanthrene-d10	----------ISTD----------								
16) Phenanthrene	1.375	1.374	1.223	1.264	1.194	1.090	1.059	1.225	10.18
17) Anthracene	1.366	1.368	1.236	1.283	1.206	1.109	1.065	1.233	9.51
18)C Fluoranthene	1.396	1.415	1.255	1.344	1.263	1.162	1.120	1.279	8.81
19) I Chrysene-d12	----------ISTD----------								
20) Pyrene	2.068	2.071	1.896	1.931	1.821	1.657	1.614	1.865	9.71
21)S Terphenyl-d14	0.924	0.924	0.879	0.917	0.893	0.810	0.807	0.879	5.84
22) Benzo[a]anthracen	1.662	1.591	1.470	1.610	1.585	1.536	1.530	1.569	3.98
23) Chrysene	1.540	1.592	1.475	1.613	1.605	1.493	1.508	1.547	3.67
24) I Perylene-d12	----------ISTD----------								
25) Benzo[b]fluoranth	1.433	1.467	1.345	1.533	1.533	1.505	1.468	1.469	4.48
26) Benzo[k]fluoranth	1.521	1.521	1.495	1.570	1.579	1.587	1.564	1.548	2.28
27)C Benzo[a]pyrene	1.271	1.249	1.190	1.330	1.331	1.348	1.332	1.293	4.52
28) Indeno[1,2,3-cd]p	1.002	1.005	0.918	1.013	1.067	1.182	1.137	1.046	8.58
29) Dibenz[a,h]anthra	0.959	0.953	1.003	1.111	1.118	1.190	1.215	1.078	9.98
30) Benzo[g,h,i]peryl	1.241	1.211	1.131	1.218	1.293	1.356	1.292	1.249	5.82

(#) = Out of Range

sim_paha.m Tue Apr 13 10:02:38 2010

7.7.4

7

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2600-DFTPP	Injection Date:	04/27/10
Lab File ID:	W051809.D	Injection Time:	14:19
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	25069	40.0		Pass
68	Less than 2.0% of mass 69	35	0.06	(0.17) [a]	Pass
69	Mass 69 relative abundance	20195	32.2		Pass
70	Less than 2.0% of mass 69	63	0.1	(0.31) [a]	Pass
127	40.0 - 60.0% of mass 198	26308	41.9		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	62728	100.0		Pass
199	5.0 - 9.0% of mass 198	4155	6.6		Pass
275	10.0 - 30.0% of mass 198	14228	22.7		Pass
365	1.0 - 100.0% of mass 198	1766	2.8		Pass
441	Present, but less than mass 443	7874	12.6	(80.5) [b]	Pass
442	40.0 - 100.0% of mass 198	51520	82.1		Pass
443	17.0 - 23.0% of mass 442	9785	15.6	(19.0) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

7.4.4

7

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2600-CC2588	W051810.D	04/27/10	14:36	00:17	Continuing cal 5
OP32672-BS	W051811.D	04/27/10	15:12	00:53	Blank Spike
OP32672-MB	W051812.D	04/27/10	15:40	01:21	Method Blank
ZZZZZZ	W051813.D	04/27/10	16:16	01:57	(unrelated sample)
ZZZZZZ	W051814.D	04/27/10	16:44	02:25	(unrelated sample)
ZZZZZZ	W051815.D	04/27/10	17:13	02:54	(unrelated sample)
F73096-1	W051816.D	04/27/10	17:54	03:35	CEF-G82-3,S-20100420
F73096-2	W051817.D	04/27/10	18:22	04:03	CEF-G82-1,S-20100420
F73096-3	W051818.D	04/27/10	18:50	04:31	CEF-G82-2,I-20100420
F73096-4	W051819.D	04/27/10	19:19	05:00	CEF-G82-2,S-20100420
ZZZZZZ	W051820.D	04/27/10	19:47	05:28	(unrelated sample)
F73129-2	W051821.D	04/27/10	20:16	05:57	(used for QC only; not part of job F73096)
OP32672-MS	W051822.D	04/27/10	20:44	06:25	Matrix Spike
OP32672-MSD	W051823.D	04/27/10	21:13	06:54	Matrix Spike Duplicate
ZZZZZZ	W051824.D	04/27/10	21:42	07:23	(unrelated sample)
ZZZZZZ	W051825.D	04/27/10	22:10	07:51	(unrelated sample)
ZZZZZZ	W051826.D	04/27/10	22:39	08:20	(unrelated sample)
ZZZZZZ	W051827.D	04/27/10	23:07	08:48	(unrelated sample)
ZZZZZZ	W051828.D	04/27/10	23:36	09:17	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2600-DFTPP	Injection Date:	04/27/10
Lab File ID:	W051809.D	Injection Time:	14:19
Instrument ID:	GCMSW		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	W051829.D	04/28/10	00:04	09:45	(unrelated sample)
ZZZZZZ	W051830.D	04/28/10	00:32	10:13	(unrelated sample)
ZZZZZZ	W051831.D	04/28/10	01:01	10:42	(unrelated sample)
ZZZZZZ	W051832.D	04/28/10	01:30	11:11	(unrelated sample)
ZZZZZZ	W051833.D	04/28/10	01:58	11:39	(unrelated sample)

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2600-CC2588
Lab FileID: W051810.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\042710\W051810.D Vial: 2
Acq On : 27 Apr 2010 2:36 pm Operator: rayb
Sample : cc2588-5 Inst : MSBNA01
Misc : op32672,sw2600,1000,,,1,1,water Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 27 16:58:28 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	150	0.00	6.03
2	S	Nitrobenzene-d5	0.336	0.288	14.3	127	0.00	5.35
3	P	N-nitroso-di-n-propylamin	0.106	0.106	0.0	157	0.00	5.22
4		Naphthalene	0.968	0.920	5.0	146	0.00	6.05
5		2-Methylnaphthalene	0.675	0.650	3.7	147	0.00	6.83
6		1-Methylnaphthalene	0.618	0.604	2.3	149	0.01	6.96
7	I	Acenaphthene-d10	1.000	1.000	0.0	144	0.00	8.27
8	P	Hexachlorocyclopentadiene	0.179	0.215	-20.1#	159	0.00	7.03
9	S	2-Fluorobiphenyl	1.595	1.483	7.0	144	0.00	7.31
10		Acenaphthylene	1.840	1.673	9.1	136	0.00	8.06
11	C	Acenaphthene	1.147	1.080	5.8	140	0.01	8.33
12	P	2,4-Dinitrophenol	0.074	0.081	-9.5	140	0.00	8.42
13	P	4-Nitrophenol	0.182	0.175	3.8	129	0.00	8.57
14		Fluorene	1.305	1.243	4.8	140	0.00	9.17
15	I	Phenanthrene-d10	1.000	1.000	0.0	144	0.00	10.77
16		Phenanthrene	1.225	1.173	4.2	141	0.00	10.82
17		Anthracene	1.233	1.165	5.5	139	0.00	10.92
18	C	Fluoranthene	1.279	1.209	5.5	138	0.00	13.00
19	I	Chrysene-d12	1.000	1.000	0.0	139	0.00	15.70
20		Pyrene	1.865	1.819	2.5	138	0.00	13.41
21	S	Terphenyl-d14	0.879	0.883	-0.5	137	0.00	13.81
22		Benzo[a]anthracene	1.569	1.591	-1.4	139	0.00	15.68
23		Chrysene	1.547	1.581	-2.2	137	0.00	15.74
24	I	Perylene-d12	1.000	1.000	0.0	136	0.00	18.21
25		Benzo[b]fluoranthene	1.469	1.512	-2.9	134	0.00	17.59
26		Benzo[k]fluoranthene	1.548	1.620	-4.7	139	0.00	17.64
27	C	Benzo[a]pyrene	1.293	1.355	-4.8	138	0.00	18.11
28		Indeno[1,2,3-cd]pyrene	1.046	1.063	-1.6	135	0.00	19.81
29		Dibenz[a,h]anthracene	1.078	1.164	-8.0	142	0.00	19.85
30		Benzo[g,h,i]perylene	1.249	1.331	-6.6	140	0.00	20.16

(#) = Out of Range SPCC's out = 0 CCC's out = 0
W051556.D sim_paha.m Tue Apr 27 16:59:26 2010

7.7.6

7

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	W051812.D	1	04/27/10	RB	04/27/10	OP32672	SW2600

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73096-1, F73096-2, F73096-3, F73096-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	52%	42-108%
321-60-8	2-Fluorobiphenyl	59%	40-106%
1718-51-0	Terphenyl-d14	92%	39-121%

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2602-DFTPP	Injection Date:	04/29/10
Lab File ID:	W051844.D	Injection Time:	02:55
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	42430	34.5		Pass
68	Less than 2.0% of mass 69	0	0.0	(0.0) [a]	Pass
69	Mass 69 relative abundance	39799	32.4		Pass
70	Less than 2.0% of mass 69	259	0.21	(0.65) [a]	Pass
127	40.0 - 60.0% of mass 198	50872	41.4		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	122834	100.0		Pass
199	5.0 - 9.0% of mass 198	8287	6.7		Pass
275	10.0 - 30.0% of mass 198	28972	23.6		Pass
365	1.0 - 100.0% of mass 198	3193	2.6		Pass
441	Present, but less than mass 443	13720	11.2	(77.5) [b]	Pass
442	40.0 - 100.0% of mass 198	90861	74.0		Pass
443	17.0 - 23.0% of mass 442	17711	14.4	(19.5) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2602-IC2602	W051845.D	04/29/10	03:13	00:18	Initial cal 1
SW2602-IC2602	W051846.D	04/29/10	03:41	00:46	Initial cal 2
SW2602-IC2602	W051847.D	04/29/10	04:10	01:15	Initial cal 3
SW2602-ICC2602	W051848.D	04/29/10	04:38	01:43	Initial cal 4
SW2602-IC2602	W051849.D	04/29/10	05:07	02:12	Initial cal 5
SW2602-IC2602	W051850.D	04/29/10	05:36	02:41	Initial cal 6
SW2602-IC2602	W051851.D	04/29/10	06:05	03:10	Initial cal 7
SW2602-ICV2602	W051852.D	04/29/10	06:33	03:38	Initial cal verification 5
OP32687-BS	W051853.D	04/29/10	07:02	04:07	Blank Spike
OP32687-MB	W051854.D	04/29/10	07:31	04:36	Method Blank
ZZZZZZ	W051855.D	04/29/10	08:00	05:05	(unrelated sample)
ZZZZZZ	W051856.D	04/29/10	09:07	06:12	(unrelated sample)
ZZZZZZ	W051857.D	04/29/10	09:36	06:41	(unrelated sample)
ZZZZZZ	W051858.D	04/29/10	10:06	07:11	(unrelated sample)
ZZZZZZ	W051859.D	04/29/10	10:35	07:40	(unrelated sample)
ZZZZZZ	W051860.D	04/29/10	11:04	08:09	(unrelated sample)
ZZZZZZ	W051861.D	04/29/10	11:33	08:38	(unrelated sample)
ZZZZZZ	W051862.D	04/29/10	12:01	09:06	(unrelated sample)
ZZZZZZ	W051863.D	04/29/10	12:30	09:35	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2602-DFTPP	Injection Date:	04/29/10
Lab File ID:	W051844.D	Injection Time:	02:55
Instrument ID:	GCMSW		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	W051864.D	04/29/10	12:59	10:04	(unrelated sample)
ZZZZZZ	W051865.D	04/29/10	13:28	10:33	(unrelated sample)
ZZZZZZ	W051866.D	04/29/10	14:41	11:46	(unrelated sample)

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2602-ICC2602
Lab FileID: W051848.D

Response Factor Report MSBNA01

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Thu Apr 29 09:13:49 2010
Response via : Initial Calibration

Calibration Files
L1 =W051845.D L2 =W051846.D L3 =W051847.D L4 =W051848.D
L5 =W051849.D L6 =W051850.D L7 =W051851.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8	----------ISTD----------								
2)S Nitrobenzene-d5	0.316	0.322	0.302	0.322	0.308	0.291	0.293	0.308	4.19
3)P N-nitroso-di-n-pr		0.111	0.104	0.105	0.096	0.087	0.085	0.098	10.73
4) Naphthalene	1.143	1.119	0.974	1.030	0.956	0.883	0.849	0.993	11.21
5) 2-Methylnaphthale	0.778	0.777	0.672	0.714	0.662	0.613	0.586	0.686	10.93
6) 1-Methylnaphthale	0.709	0.702	0.610	0.654	0.604	0.557	0.538	0.625	10.67
7) I Acenaphthene-d10	----------ISTD----------								
8)P Hexachlorocyclope		0.306	0.336	0.382	0.401	0.359	0.383	0.361	9.73
9)S 2-Fluorobiphenyl	1.716	1.706	1.495	1.573	1.488	1.340	1.293	1.516	10.80
10) Acenaphthylene	1.962	1.960	1.741	1.784	1.620	1.498	1.456	1.717	11.86
11)C Acenaphthene	1.258	1.224	1.073	1.113	1.074	1.005	0.967	1.102	9.69
12)P 2,4-Dinitrophenol		0.013	0.034	0.060	0.102	0.122	0.148	0.080	65.82
13)P 4-Nitrophenol		0.197	0.212	0.238	0.237	0.242	0.227	0.226	7.82
14) Fluorene	1.543	1.493	1.329	1.361	1.252	1.123	1.146	1.321	12.18
15) I Phenanthrene-d10	----------ISTD----------								
16) Phenanthrene	1.350	1.344	1.194	1.241	1.143	1.064	1.024	1.194	10.68
17) Anthracene	1.340	1.338	1.199	1.250	1.153	1.068	1.035	1.197	10.11
18)C Fluoranthene	1.485	1.473	1.305	1.358	1.249	1.316	1.262	1.350	7.06
19) I Chrysene-d12	----------ISTD----------								
20) Pyrene	1.966	1.954	1.725	1.775	1.683	1.529	1.511	1.735	10.49
21)S Terphenyl-d14	0.926	0.925	0.859	0.902	0.866	0.786	0.773	0.863	7.23
22) Benzo[a]anthracen	1.774	1.741	1.581	1.694	1.659	1.569	1.531	1.650	5.59
23) Chrysene	1.584	1.613	1.498	1.641	1.582	1.508	1.469	1.556	4.16
24) I Perylene-d12	----------ISTD----------								
25) Benzo[b]fluoranth	1.639	1.665	1.536	1.685	1.691	1.621	1.548	1.626	3.85
26) Benzo[k]fluoranth	1.685	1.696	1.598	1.755	1.731	1.646	1.643	1.679	3.24
27)C Benzo[a]pyrene	1.451	1.476	1.368	1.522	1.519	1.463	1.425	1.461	3.68
28) Indeno[1,2,3-cd]p	1.154	1.168	1.105	1.261	1.227	1.243	1.216	1.196	4.66
29) Dibenz[a,h]anthra	1.144	1.150	1.099	1.269	1.253	1.312	1.225	1.208	6.42
30) Benzo[g,h,i]peryl	1.382	1.383	1.286	1.449	1.419	1.419	1.343	1.383	3.94

(#) = Out of Range

sim_paha.m Thu Apr 29 09:17:29 2010

7.7.7

Instrument Performance Check (DFTPP)

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2603-DFTPP	Injection Date:	04/30/10
Lab File ID:	W051873.D	Injection Time:	12:08
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	30145	38.1		Pass
68	Less than 2.0% of mass 69	0	0.0	(0.0) [a]	Pass
69	Mass 69 relative abundance	26808	33.9		Pass
70	Less than 2.0% of mass 69	145	0.18	(0.54) [a]	Pass
127	40.0 - 60.0% of mass 198	33747	42.7		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	79104	100.0		Pass
199	5.0 - 9.0% of mass 198	5383	6.8		Pass
275	10.0 - 30.0% of mass 198	18288	23.1		Pass
365	1.0 - 100.0% of mass 198	2191	2.8		Pass
441	Present, but less than mass 443	8817	11.1	(77.7) [b]	Pass
442	40.0 - 100.0% of mass 198	58389	73.8		Pass
443	17.0 - 23.0% of mass 442	11350	14.3	(19.4) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2603-CC2602	W051874.D	04/30/10	12:29	00:21	Continuing cal 5
OP32699-BS	W051875.D	04/30/10	12:57	00:49	Blank Spike
OP32699-MB	W051876.D	04/30/10	13:26	01:18	Method Blank
OP32672-MB	W051878.D	04/30/10	14:23	02:15	Method Blank
ZZZZZZ	W051879.D	04/30/10	14:53	02:45	(unrelated sample)
F73096-4	W051880.D	04/30/10	15:22	03:14	CEF-G82-2,S-20100420
OP32687-MB	W051881.D	04/30/10	15:50	03:42	Method Blank
ZZZZZZ	W051882.D	04/30/10	16:19	04:11	(unrelated sample)
ZZZZZZ	W051883.D	04/30/10	16:47	04:39	(unrelated sample)
ZZZZZZ	W051884.D	04/30/10	17:16	05:08	(unrelated sample)
ZZZZZZ	W051885.D	04/30/10	17:44	05:36	(unrelated sample)
F73232-2	W051886.D	04/30/10	18:13	06:05	(used for QC only; not part of job F73096)
ZZZZZZ	W051889.D	04/30/10	19:38	07:30	(unrelated sample)
ZZZZZZ	W051891.D	04/30/10	20:35	08:27	(unrelated sample)
ZZZZZZ	W051892.D	04/30/10	21:04	08:56	(unrelated sample)
ZZZZZZ	W051893.D	04/30/10	21:32	09:24	(unrelated sample)
F73232-8	W051894.D	04/30/10	22:00	09:52	(used for QC only; not part of job F73096)
ZZZZZZ	W051897.D	04/30/10	23:26	11:18	(unrelated sample)
ZZZZZZ	W051898.D	04/30/10	23:54	11:46	(unrelated sample)

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2603-CC2602
Lab FileID: W051874.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\043010\W051874.D Vial: 2
Acq On : 30 Apr 2010 12:29 pm Operator: rayb
Sample : cc2602-5 Inst : MSBNA01
Misc : op32687,sw2603,1000,,,1,1,water Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Fri Apr 30 13:39:45 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	85	0.00	6.31
2	S	Nitrobenzene-d5	0.308	0.363	-17.9	100	0.00	5.60
3	P	N-nitroso-di-n-propylamin	0.098	0.113	-15.3	99	0.00	5.47
4		Naphthalene	0.993	0.964	2.9	85	0.00	6.33
5		2-Methylnaphthalene	0.686	0.664	3.2	85	0.00	7.15
6		1-Methylnaphthalene	0.625	0.609	2.6	85	0.00	7.28
7	I	Acenaphthene-d10	1.000	1.000	0.0	86	0.00	8.64
8	P	Hexachlorocyclopentadiene	0.361	0.213	41.0#	46#	0.00	7.35
9	S	2-Fluorobiphenyl	1.516	1.435	5.3	83	0.00	7.64
10		Acenaphthylene	1.717	1.645	4.2	87	0.00	8.41
11	C	Acenaphthene	1.102	1.056	4.2	84	0.01	8.69
12	P	2,4-Dinitrophenol	0.080	0.108	-35.0#	91	0.02	8.76
13	P	4-Nitrophenol	0.226	0.214	5.3	77	0.04	8.88
14		Fluorene	1.321	1.199	9.2	82	0.02	9.54
15	I	Phenanthrene-d10	1.000	1.000	0.0	80	0.00	11.15
16		Phenanthrene	1.194	1.150	3.7	80	0.01	11.21
17		Anthracene	1.197	1.155	3.5	80	0.01	11.30
18	C	Fluoranthene	1.350	1.257	6.9	80	0.02	13.40
19	I	Chrysene-d12	1.000	1.000	0.0	80	0.00	16.09
20		Pyrene	1.735	1.681	3.1	80	0.00	13.80
21	S	Terphenyl-d14	0.863	0.866	-0.3	80	0.00	14.19
22		Benzo[a]anthracene	1.650	1.597	3.2	77	0.00	16.07
23		Chrysene	1.556	1.559	-0.2	79	0.00	16.13
24	I	Perylene-d12	1.000	1.000	0.0	79	0.00	18.59
25		Benzo[b]fluoranthene	1.626	1.652	-1.6	78	0.00	17.97
26		Benzo[k]fluoranthene	1.679	1.721	-2.5	79	0.00	18.02
27	C	Benzo[a]pyrene	1.461	1.469	-0.5	77	0.00	18.49
28		Indeno[1,2,3-cd]pyrene	1.196	1.218	-1.8	79	0.00	20.18
29		Dibenz[a,h]anthracene	1.208	1.212	-0.3	77	0.00	20.23
30		Benzo[g,h,i]perylene	1.383	1.427	-3.2	80	0.00	20.54

(#) = Out of Range SPCC's out = 0 CCC's out = 0
W051849.D sim_paha.m Fri Apr 30 13:40:31 2010

7.7.9

7

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	W051878.D	1	04/30/10	RB	04/27/10	OP32672	SW2603

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73096-1, F73096-2, F73096-3, F73096-4

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	72%	42-108%
321-60-8	2-Fluorobiphenyl	59%	40-106%
1718-51-0	Terphenyl-d14	90%	39-121%

ACCUTEST LABORATORIES SE

DATE:	04-27-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	
PROC. METHOD:	
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2191

ANALYST:	EWJC
MECL2 LOT #:	F132587
SIGNAL 1 SURR. AREA/CONC:	1508246/40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65823	1	CC 2187-1360	FL-PRO	S3512	2.5	PDB	PASS
IJ 24	2	-3110			10		PASS
IJ 25	3	CCB		—	—		ND
IJ 26	4	OP32560-MB		OP32560	1x	PDB	ND
IJ 27	5	F72900-7,2			7x		
IJ 28	6	-9,10			1x		Low Scan. No more samples available.
IJ 29	7	F72903-(1),50			50x	PDB	IRR 500x (CONC)
IJ 30	8	F72916-1,4			4x		
IJ 31	9	OP32560-MS,4				PDB	
IJ 32	10	-MSD,4					
IJ 33	11	F72916-2			1x	PDB	
IJ 34	12	-(5),2			2x		
IJ 35	13	-6			1x	PDB	
IJ 36	14	CC 2187-1360		S3512	2.5		PASS
IJ 37	15	CCB		—	—		ND
IJ 38	16	OP32619-MB		OP32619	1x	PDB	ND
IJ 39	17	F73077-1,5			5x		
IJ 40	18	-3,2			7x		
IJ 41	19	-4,4			11x	PDB	
IJ 65842	20	-5,4			11x		

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

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Analyst's Signature: [signature]

ACCUTEST LABORATORIES SE

DATE:	04-27-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	T
PROC. METHOD:	↓
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2191

ANALYST:	PDB
MECL2 LOT #:	H 37502
SIGNAL 1 SURR. AREA/CONC:	1508296/100
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65843	21	F73087-4,11	FL-PRO	OP32619	4X	PDB	✓
IJ 44	22	E3337 Surr.	—	E3337	2X	4/28/10	PASS
IJ 45	14	CC2107-1360		53512	2.5	PDB	PASS
IJ 46	15	CCB		—	—		ND
IJ 47	23	OP32676-BS		OP32676	1X		~~Failed~~ Failed Reextract 4/28/10
IJ 48	24	-MB					Failed
IJ 49	25	F73209-1					ND
IJ 50	26	OP32676-MS					Failed
IJ 51	27	-MSD					Failed
IJ 52	28	OP32659-BS		OP32659	1X	PDB	✓
IJ 53	29	-MB					ND
IJ 54	30	F73140-1				PDB	✓
IJ 55	31	F73134-2					ND
IJ 56	32	CC2107-1360		53512	2.5	PDB	PASS
IJ 57	33	CCB		—	—		ND
IJ 58	34	OP32639-BS		OP32639	1X	PDB	✓
IJ 59	35	-MB					ND
IJ 60	36	F73116-2				PDB	ND
IJ 61	37	-7					ND
IJ 65862	38	4/28/10 -9	✓				✓ F72992-8

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

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(2)

Analyst's Signature: [signature]

ACCUTEST LABORATORIES SE

DATE:	04-27-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	
PROC. METHOD:	
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 8191

ANALYST:	GNOC
MECL2 LOT #:	H132507
SIGNAL 1 SURR. AREA/CONC:	1508246/40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65863	39	F73134-1,10	FL-PRO	OP32659	10x	PDB	✓
IJ 64	40	-3			1x		ND
IJ 65	41	-4				PDB	ND
IJ 66	42	-5					ND
IJ 67	43	-6					ND
IJ 68	14	CC2187-1360		S3512	2.5	PDB	PASS
IJ 69	15	CCB		—	—		ND
IJ 70	44	F73134-7		OP32659	1x	PDB	✓
IJ 71	45	-8					✓
IJ 72	46	-9				PDB	✓
IJ 73	47	F73136-1					ND
IJ 74	48	OP32659-MS				PDB	✓
IJ 75	49	-MSD					✓
IJ 76	50	F72907-1,500		OP32560	500x 3/4/1/10	PDB	✓
IJ 77	51	F73136-4		OP32659	1x		✓
IJ 78	52	F73168-7					ND
IJ 79	53	F73175-1				PDB	ND
IJ 80	32	CC2187-1360		S3512	2.5		PASS
IJ 81	54	CC2187-3140		S3512	10x		LOW C40 (DMK)
IJ 65882	33	CCD		—	—		ND

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

gcfid1_ij_log.xls NF rev. 08/09

(3-3)

(3)

Analyst's Signature: _____

ACCUTEST LABORATORIES SE

DATE:	04-26-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	I
PROC. METHOD:	I
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2192

ANALYST:	EVOC
MECL2 LOT #:	L132502
SIGNAL 1 SURR. AREA/CONC:	673164/40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65883	1	CC2187-1360	FL-PRO	S3512	2.5	PDB	PASS
IJ 84	2	↓ -1410		I	10X	I	PASS
IJ 85	3	CCB		—	—	PDB	ND
IJ 86	4	OP32659-135		OP32659	1X	I	✓
IJ 87	5	4/29/10 I -14B			—	I	ND
IJ 88	6	~~F71~~ F73181-2				PDB	✓
IJ 89	7	F73183-1A ✓				I	✓ | RR10X (DNR)
IJ 90	8	-2A				PDB	✓
IJ 91	9	-3A ✓				I	✓ | RR20X (DNR)
IJ 92	10	E3338 Spr2 2 850 ppm		E3338	2X	I	PASS
IJ 93	11	F73095-11 ✓		OP32634	1X	PDB	✓ | RR20X (DNR)
IJ 94	12	-7			—	I	✓
IJ 95	13	-10				PDB	✓ | RR20X (DNR)
IJ 96	14	F73094-1				I	ND
IJ 97	15	-2				PDB	✓
IJ 98	16	CC2187-1360		S3512	2.5	I	PASS
IJ 99	17	CCB		—	—	PDB	ND
IJ 65900	18	F73094-3		OP32639	1X	I	ND
IJ 01	19	F73096-1				PDB	ND
IJ 65902	20	-2				I	✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PI Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

1

Analyst's Signature: [signature]

gcfid1_ij_log.xls NF rev. 08/09

ACCUTEST LABORATORIES SE

DATE:	04-28-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	I
PROC. METHOD:	I
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2192

ANALYST:	ENOE
MECL2 LOT #:	H132507
SIGNAL 1 SURR. AREA/CONC:	157516 / 40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 05903	21	OP32639 - MS	FL-PRO	OP32639	1	PDB	✓
IJ 04	22	I -MSD	I	I	I	I	✓
IJ 05	23	F73096 -3				PDB	ND
IJ 06	24	I -4				I	✓
IJ 07	25	F73136 -3		I	I	PDB	✓
IJ 08	26	CC2197 - 1360		S3512	2.5	I	PASS 4/29/10
IJ 09	27	OP32644 - BS		OP32644	1	PDB	~~ND~~ ✓
IJ 10	28	I -MB		I	I	I	ND
IJ 11	29	F73290 -1				PDB	ND
IJ 12	30	OP32644 -MS					✓
IJ 13	31	I -MSD		I	I		✓
IJ 05914	26	ECC2197 - 1360	I	S3512	2.5	I	PASS
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							

(FEA 04/29/10)

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PI Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

Analyst's Signature: [illegible]

gcfid1_ij_log.xls NF rev. 08/09

(2 - 2) 2

Initial Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2187-ICC2187
Lab FileID: IJ65696.D

Response Factor Report FID 1

Method : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title : TPH by FL_PRO
Last Update : Thu Apr 22 10:27:44 2010
Response via : Initial Calibration

Calibration Files
255 =IJ65693.D 340 =IJ65694.D 680 =IJ65695.D 1360=IJ65696.D
2040=IJ65697.D 2720=IJ65698.D 3400=IJ65699.D

Compound	255	340	680	1360	2040	2720	3400	Avg	%RSD
1)S O-TERPHENYL	4.497	4.512	4.536	4.397	4.238	4.435	4.572	4.455 E4	2.52
2)H TPH (C8-C40)	4.003	4.002	3.949	3.853	3.627	3.818	3.868	3.874 E4	3.38

(#) = Out of Range

FL_PRO_R.M Thu Apr 22 10:39:50 2010

9.6.1

9

Initial Calibration Verification

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2187-ICV2187
Lab FileID: IJ65700.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0421PRO\IJ65700.D          Vial: 9
Acq On    : 21 Apr 2010   5:22 pm                   Operator: marke
Sample    : icv2187-1360                            Inst    : FID 1
Misc      : op32536,gij2187,1000,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Thu Apr 22 10:27:44 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

		Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1	S	O-TERPHENYL		----------NA----------				
2	H	TPH (C8-C40)	1360.000	1278.247	6.0	94	0.00	2.49-10.17

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 22 10:39:36 2010

9.6.2 9

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2191-CC2187
Lab FileID: IJ65856.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0427PRO\IJ65856.D          Vial: 32
Acq On    : 28 Apr 2010   4:39 am                   Operator: enoca
Sample    : cc2187-1360                             Inst    : FID 1
Misc      : op32659,gij2191,1050,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	34.794	13.0	88	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1143.050	16.0	85	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Wed Apr 28 16:27:18 2010

9.6.3

9

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2191-CC2187
Lab FileID: IJ65868.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0427PRO\IJ65868.D          Vial: 14
Acq On    : 28 Apr 2010   8:40 am                    Operator: enoca
Sample    : cc2187-1360                              Inst    : FID 1
Misc      : op32659,gij2191,1050,,,1,1,water         Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

		Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1	S	O-TERPHENYL	40.000	33.925	15.2	86	0.00	5.36- 5.56
2	H	TPH (C8-C40)	1360.000	1126.258	17.2	83	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Wed Apr 28 16:27:18 2010

9.6.4

9

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2192-CC2187
Lab FileID: IJ65898.D

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65898.D
Acq On : 28 Apr 2010 7:53 pm
Sample : cc2187-1360
Misc : op32639,gij2192,1050,,,1,1,water
IntFile : events.e

Vial: 16
Operator: enoca
Inst : FID 1
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title : TPH by FL_PRO
Last Update : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	31.724	20.7	80	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1079.013	20.7	80	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 29 08:53:05 2010

9.6.5

9

Continuing Calibration Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2192-CC2187
Lab FileID: IJ65908.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65908.D          Vial: 26
Acq On    : 28 Apr 2010  11:15 pm                   Operator: enoca
Sample    : cc2187-1360                             Inst    : FID 1
Misc      : op32676,gij2192,30.4,,,1,1,soil         Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	35.397	11.5	90	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1201.698	11.6	89	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 29 08:53:05 2010

9.6.6

9

Method Blank Summary

Job Number: F73096
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32639-MB	IJ65859.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2191

The QC reported here applies to the following samples: Method: FLORIDA-PRO

F73096-1, F73096-2, F73096-3, F73096-4

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	ND	0.25	0.17	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	73%	38-122%

Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO:	**R. SIMCIK**	**DATE:**	**JUNE 15, 2010**
FROM:	**A. COGNETTI**	**COPIES:**	**DV FILE**

SUBJECT: **DATA VALIDATION – ORGANIC DATA**
SELECT VOC/ PAH/ TRPH
LIMITED REVIEW
NAS CECIL FIELD – CTO JM09
SAMPLE DELIVERY GROUP (SDG) –F73094

SAMPLES: 3/Aqueous/VOC/PAH/TRPH

CEF-G82-4,S-20100421 CEF-G82-5,S-20100421
CEF-G82-6,S-20100421

Overview

The sample set for NAS CECIL FIELD, CTO JM09, SDG F73094, consists of three (3) aqueous environmental samples. There are no field duplicate pairs associated with this SDG. All samples were analyzed for select volatile organic compounds (VOC); benzene, ethylbenzene, isopropylbenzene, naphthalene, toluene, 1,2,4-trimethylbenzene. 1,3,5-trimethylbenzene and xylenes (total). The three (3) aqueous environmental samples were also analyzed for polycyclic aromatic hydrocarbons (PAH) and Total Recoverable Petroleum Hydrocarbons (TRPH).

The samples were collected by Tetra Tech NUS on April 21, 2010 and analyzed by Accutest Laboratories. All analyses were performed under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. VOC analyses were conducted using SW-846 method 8260B. PAH analyses followed SW-846 Method 8270C SIM. TRPH analyses followed the Florida PRO method.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibrations
* • Laboratory Method Blank Analyses
* • Detection Limits

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

Volatiles- None.

PAH- None.

TRPH- None.

Notes

Positive results reported below the reporting limit (RL) but above the method detection limit (MDL) for the organic analyses were qualified as estimated, "J".

Naphthalene is reported in both the VOC and PAH fractions.

Executive Summary

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", October 1999 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", January 2006.

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

Ann Cognetti

Tetra Tech NUS
Ann Cognetti
Chemist/ Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

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

Appendix A

Qualified Analytical Results

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can be any number of issues; e.g. poor chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02267	NSAMPLE	CEF-G82-4,S-20100421			CEF-G82-5,S-20100421			CEF-G82-6,S-20100421		
SDG: F73094	LAB_ID	F73094-1			F73094-2			F73094-3		
FRACTION: OV	SAMP_DATE	4/21/2010			4/21/2010			4/21/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1,2,4-TRIMETHYLBENZENE		0.22	U		0.22	U		0.22	U	
1,3,5-TRIMETHYLBENZENE		0.21	U		0.21	U		0.21	U	
BENZENE		0.21	U		0.21	U		0.21	U	
ETHYLBENZENE		0.2	U		0.2	U		0.2	U	
ISOPROPYLBENZENE		0.2	U		0.46	J	P	0.2	U	
NAPHTHALENE		1	U		1	U		1	U	
TOLUENE		0.2	U		0.2	U		0.2	U	
TOTAL XYLENES		0.54	U		0.54	U		0.54	U	

PROJ_NO: 02267	NSAMPLE	CEF-G82-4,S-20100421			CEF-G82-5,S-20100421			CEF-G82-6,S-20100421		
SDG: F73094	LAB_ID	F73094-1			F73094-2			F73094-3		
FRACTION: PAH	SAMP_DATE	4/21/2010			4/21/2010			4/21/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
1-METHYLNAPHTHALENE		0.31	J	P	4.7			0.24	U	
2-METHYLNAPHTHALENE		0.24	U		3.4			0.24	U	
ACENAPHTHENE		0.48	U		0.48	U		0.48	U	
ACENAPHTHYLENE		0.48	U		0.48	U		0.48	U	
ANTHRACENE		0.48	U		0.48	U		0.48	U	
BENZO(A)ANTHRACENE		0.048	U		0.048	U		0.048	U	
BENZO(A)PYRENE		0.048	U		0.048	U		0.048	U	
BENZO(B)FLUORANTHENE		0.048	U		0.048	U		0.048	U	
BENZO(G,H,I)PERYLENE		0.048	U		0.048	U		0.048	U	
BENZO(K)FLUORANTHENE		0.048	U		0.048	U		0.048	U	
CHRYSENE		0.095	U		0.096	U		0.095	U	
DIBENZO(A,H)ANTHRACENE		0.048	U		0.048	U		0.048	U	
FLUORANTHENE		0.24	U		0.24	U		0.24	U	
FLUORENE		0.48	U		0.48	U		0.48	U	
INDENO(1,2,3-CD)PYRENE		0.048	U		0.048	U		0.048	U	
NAPHTHALENE		0.24	U		0.4	J	P	0.24	U	
PHENANTHRENE		0.24	U		0.24	U		0.24	U	
PYRENE		0.24	U		0.24	U		0.24	U	

PROJ_NO: 02267	NSAMPLE	CEF-G82-4,S-20100421			CEF-G82-5,S-20100421			CEF-G82-6,S-20100421		
SDG: F73094	LAB_ID	F73094-1			F73094-2			F73094-3		
FRACTION: PET	SAMP_DATE	4/21/2010			4/21/2010			4/21/2010		
MEDIA: WATER	QC_TYPE	NM			NM			NM		
	UNITS	MG/L			MG/L			MG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
TPH (C08-C40)		0.16	U		0.232	J	P	0.16	U	

Appendix B

Results as Reported by the Laboratory

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-4,S-20100421		
Lab Sample ID:	F73094-1	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J055795.D	1	05/05/10	KW	n/a	n/a	VJ3195
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.20 U	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		87-116%
17060-07-0	1,2-Dichloroethane-D4	90%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	102%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range
I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-5,S-20100421		
Lab Sample ID:	F73094-2	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J055796.D	1	05/05/10	KW	n/a	n/a	VJ3195
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.46	1.0	0.20	ug/l	I
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		87-116%
17060-07-0	1,2-Dichloroethane-D4	87%		76-127%
2037-26-5	Toluene-D8	99%		86-112%
460-00-4	4-Bromofluorobenzene	100%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-6,S-20100421		
Lab Sample ID:	F73094-3	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8260B	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	J055797.D	1	05/05/10	KW	n/a	n/a	VJ3195
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

Purgeable Aromatics, Naphthalene

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.21 U	1.0	0.21	ug/l	
108-88-3	Toluene	0.20 U	1.0	0.20	ug/l	
100-41-4	Ethylbenzene	0.20 U	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	0.54 U	3.0	0.54	ug/l	
91-20-3	Naphthalene	1.0 U	5.0	1.0	ug/l	
98-82-8	Isopropylbenzene	0.20 U	1.0	0.20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.22 U	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.21 U	2.0	0.21	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		87-116%
17060-07-0	1,2-Dichloroethane-D4	89%		76-127%
2037-26-5	Toluene-D8	101%		86-112%
460-00-4	4-Bromofluorobenzene	104%		84-120%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-4,S-20100421		
Lab Sample ID:	F73094-1	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051813.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.48 U	0.95	0.48	ug/l	
208-96-8	Acenaphthylene	0.48 U	0.95	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.95	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.095 U	0.19	0.095	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.95	0.24	ug/l	
86-73-7	Fluorene	0.48 U	0.95	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	0.31	0.95	0.24	ug/l	I
91-57-6	2-Methylnaphthalene	0.24 U	0.95	0.24	ug/l	
91-20-3	Naphthalene	0.24 U	0.95	0.24	ug/l	
85-01-8	Phenanthrene	0.24 U	0.95	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.95	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	63%		42-108%
321-60-8	2-Fluorobiphenyl	70%		40-106%
1718-51-0	Terphenyl-d14	93%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range
I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-5,S-20100421		
Lab Sample ID:	F73094-2	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051814.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.48 U	0.96	0.48	ug/l	
208-96-8	Acenaphthylene	0.48 U	0.96	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.96	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.096 U	0.19	0.096	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.96	0.24	ug/l	
86-73-7	Fluorene	0.48 U	0.96	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	4.7	0.96	0.24	ug/l	
91-57-6	2-Methylnaphthalene	3.4	0.96	0.24	ug/l	
91-20-3	Naphthalene	0.40	0.96	0.24	ug/l	I
85-01-8	Phenanthrene	0.24 U	0.96	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.96	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	51%		42-108%
321-60-8	2-Fluorobiphenyl	60%		40-106%
1718-51-0	Terphenyl-d14	76%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range
I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-6,S-20100421		
Lab Sample ID:	F73094-3	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	SW846 8270C BY SIM SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	W051815.D	1	04/27/10	RB	04/27/10	OP32672	SW2600
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	0.48 U	0.95	0.48	ug/l	
208-96-8	Acenaphthylene	0.48 U	0.95	0.48	ug/l	
120-12-7	Anthracene	0.48 U	0.95	0.48	ug/l	
56-55-3	Benzo(a)anthracene	0.048 U	0.19	0.048	ug/l	
50-32-8	Benzo(a)pyrene	0.048 U	0.19	0.048	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048 U	0.19	0.048	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.048 U	0.19	0.048	ug/l	
207-08-9	Benzo(k)fluoranthene	0.048 U	0.19	0.048	ug/l	
218-01-9	Chrysene	0.095 U	0.19	0.095	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.048 U	0.19	0.048	ug/l	
206-44-0	Fluoranthene	0.24 U	0.95	0.24	ug/l	
86-73-7	Fluorene	0.48 U	0.95	0.48	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.048 U	0.19	0.048	ug/l	
90-12-0	1-Methylnaphthalene	0.24 U	0.95	0.24	ug/l	
91-57-6	2-Methylnaphthalene	0.24 U	0.95	0.24	ug/l	
91-20-3	Naphthalene	0.24 U	0.95	0.24	ug/l	
85-01-8	Phenanthrene	0.24 U	0.95	0.24	ug/l	
129-00-0	Pyrene	0.24 U	0.95	0.24	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	64%		42-108%
321-60-8	2-Fluorobiphenyl	67%		40-106%
1718-51-0	Terphenyl-d14	67%		39-121%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-4,S-20100421		
Lab Sample ID:	F73094-1	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65896.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.16 U	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	69%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result >= MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-5,S-20100421		
Lab Sample ID:	F73094-2	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65897.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.232	0.24	0.16	mg/l	I

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	66%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	CEF-G82-6,S-20100421		
Lab Sample ID:	F73094-3	Date Sampled:	04/21/10
Matrix:	AQ - Ground Water	Date Received:	04/22/10
Method:	FLORIDA-PRO SW846 3510C	Percent Solids:	n/a
Project:	Cecil Field; Site G-82		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	IJ65900.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2192
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	0.16 U	0.24	0.16	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	65%		38-122%

U = Not detected MDL - Method Detection Limit
RL = Reporting Limit = PQL
L = Indicates value exceeds calibration range

I = Result > = MDL but < RL J = Estimated value
V = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Appendix C

Support Documentation

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Tetra Tech NUS **Job No:** F73094

Site: Cecil Field; Site G-82 **Report Date:** 5/11/2010 11:03:44

3 Samples were collected on 04/21/2010 and were received at Accutest SE on 04/22/2010 properly preserved, at 2.4 Deg. C and intact. These Samples received an Accutest job number of F73094. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

Volatiles by GCMS by Method SW846 8260B

Matrix: AQ **Batch ID:** VJ3195

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F73094-1MS, F73094-1MSD were used as the QC samples indicated.

Matrix Spike and Matrix Spike Duplicate Recoverys for Xylene (total) are outside control limits. Probable cause due to matrix interference.

Extractables by GCMS by Method SW846 8270C BY SIM

Matrix: AQ **Batch ID:** OP32672

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F73129-2MS, F73129-2MSD were used as the QC samples indicated.

Matrix Spike Recoverys for 1-Methylnaphthalene, 2-Methylnaphthalene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike and Matrix Spike Duplicate Recovery for Naphthalene is outside control limits. Probable cause due to matrix interference.

RPD for MSD for Naphthalene is outside control limits for sample OP32672-MSD. Probable cause due to sample non-homogeneity.

Extractables by GC by Method FLORIDA-PRO

Matrix: AQ **Batch ID:** OP32639

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Samples F73096-2MS, F73096-2MSD were used as the QC samples indicated.

Accutest Laboratories Southeast (ALSE) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALSE and as stated on the COC. ALSE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALSE Quality Manual except as noted above. This report is to be used in its entirety. ALSE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Date: May 11, 2010

Ellen Pampel, Inorganic QA (signature on file)

Tuesday, May 11, 2010

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER № 2059 F73094 PAGE 2 OF 2

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112602267	Cecil Field Site 6-82	Rob Simcik	412 921 8163	Accutest / Heather Wandrey
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: Jeff Krone	PHONE NUMBER: 904 699 7423	ADDRESS: 4405 Vineland Rd Suite C-15
		CARRIER/WAYBILL NUMBER: Accutest Courier		CITY, STATE: Orlando, Fl 32811

STANDARD TAT ☒
RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G
PRESERVATIVE USED: HCl Hosbl —

	DATE YEAR 2010	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOCs (8260B)	TRPH (FL-PRO)	PAHs (8270 SIM)						COMMENTS
1	4/21	1010	CEF-682-4S-20100421				GW	G	7	X	X	X						Cool to 4° C
2	4/21	1108	CEF-682-5S-20100421				GW	G	7	X	X	X						
3	4/21	1222	CEF-682-6S-20100421				GW	G	7	X	X	X						

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	4/21/10	1545	1. RECEIVED BY 4/21/10	4/21/10	1545
2. RELINQUISHED BY	4/21/10	1741	2. RECEIVED BY Accutest	4/22/10	8:00
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS 2.0 2.4

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TINUS-001

4.1 4

F73094: Chain of Custody
Page 1 of 2

ACCUTEST Laboratories F73094

ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: F73094 CLIENT: Tetra Tech PROJECT: 112G02267

DATE/TIME RECEIVED: 4/22/10 8:00 (MM/DD/YY 24:00) NUMBER OF COOLERS RECEIVED: 2

METHOD OF DELIVERY: FEDEX UPS ACCUTEST COURIER GREYHOUND DELIVERY OTHER

AIRBILL NUMBERS:

COOLER INFORMATION

- [ ] CUSTODY SEAL NOT PRESENT OR NOT INTACT
- [ ] CHAIN OF CUSTODY NOT RECEIVED (COC)
- [ ] ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- [ ] SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- [ ] TEMPERATURE CRITERIA NOT MET
- [ ] WET ICE PRESENT

TRIP BLANK INFORMATION

- [ ] TRIP BLANK PROVIDED
- [x] TRIP BLANK NOT PROVIDED
- [x] TRIP BLANK NOT ON COC
- [ ] TRIP BLANK INTACT
- [ ] TRIP BLANK NOT INTACT
- [ ] RECEIVED WATER TRIP BLANK
- [ ] RECEIVED SOIL TRIP BLANK

MISC. INFORMATION

NUMBER OF ENCORES ? 0

NUMBER OF 5035 FIELD KITS ? 0

NUMBER OR LAB FILTERED METALS ? 0

TEMPERATURE INFORMATION

- [ ] IR THERM ID 501 CORR. FACTOR 1.4
- [ ] OBSERVED TEMPS: 1.6 2.0
- [ ] CORRECTED TEMPS: 2.0 2.4

SAMPLE INFORMATION

- [ ] SAMPLE LABELS PRESENT ON ALL BOTTLES
- [ ] INCORRECT NUMBER OF CONTAINERS USED
- [ ] SAMPLE RECEIVED IMPROPERLY PRESERVED
- [ ] INSUFFICIENT VOLUME FOR ANALYSIS
- [ ] DATES/TIMES ON COC DO NOT MATCH SAMPLE LABEL
- [ ] ID'S ON COC DO NOT MATCH LABEL
- [ ] VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- [ ] BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- [ ] NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- [ ] UNCLEAR FILTERING OR COMPOSITING INSTRUCTIONS
- [ ] SAMPLE CONTAINER(S) RECEIVED BROKEN
- [ ] % SOLIDS JAR NOT RECEIVED
- [ ] 5035 FIELD KIT FROZEN WITHIN 48 HOUR'S
- [ ] RESIDUAL CHLORINE PRESENT

(APPICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

SUMMARY OF COMMENTS:

TECHNICIAN SIGNATURE/DATE CLR 4/22/10 REVIEWER SIGNATURE/DATE RT 04.22.10

NF 10/09 RECEIPT CONFIRMATION 100609 (2).xls

4.1 4

F73094: Chain of Custody
Page 2 of 2

HOLDTIME

SDG F73094

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/L	CEF-G82-6,S-20100421	F73094-3	NM	04/21/2010	05/05/2010	05/05/2010	14	0	14
OV	UG/L	CEF-G82-5,S-20100421	F73094-2	NM	04/21/2010	05/05/2010	05/05/2010	14	0	14
OV	UG/L	CEF-G82-4,S-20100421	F73094-1	NM	04/21/2010	05/05/2010	05/05/2010	14	0	14
SIM	UG/L	CEF-G82-6,S-20100421	F73094-3	NM	04/21/2010	04/27/2010	04/27/2010	6	0	6
SIM	UG/L	CEF-G82-5,S-20100421	F73094-2	NM	04/21/2010	04/27/2010	04/27/2010	6	0	6
SIM	UG/L	CEF-G82-4,S-20100421	F73094-1	NM	04/21/2010	04/27/2010	04/27/2010	6	0	6
TPH	MG/L	CEF-G82-6,S-20100421	F73094-3	NM	04/21/2010	04/23/2010	04/28/2010	2	5	7
TPH	MG/L	CEF-G82-5,S-20100421	F73094-2	NM	04/21/2010	04/23/2010	04/28/2010	2	5	7
TPH	MG/L	CEF-G82-4,S-20100421	F73094-1	NM	04/21/2010	04/23/2010	04/28/2010	2	5	7

Sample Summary

Tetra Tech NUS

Cecil Field; Site G-82

Job No: F73094

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
F73094-1	04/21/10	10:10 JK	04/22/10	AQ	Ground Water	CEF-G82-4,S-20100421
F73094-2	04/21/10	11:08 JK	04/22/10	AQ	Ground Water	CEF-G82-5,S-20100421
F73094-3	04/21/10	12:22 JK	04/22/10	AQ	Ground Water	CEF-G82-6,S-20100421

Instrument Performance Check (BFB)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VJ3182-BFB	Injection Date:	04/24/10
Lab File ID:	J055506.D	Injection Time:	10:34
Instrument ID:	GCMSJ		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	27320	27.4		Pass
75	30.0 - 60.0% of mass 95	47021	47.2		Pass
95	Base peak, 100% relative abundance	99704	100.0		Pass
96	5.0 - 9.0% of mass 95	7016	7.0		Pass
173	Less than 2.0% of mass 174	373	0.37	(0.39) [a]	Pass
174	50.0 - 100.0% of mass 95	94749	95.0		Pass
175	5.0 - 9.0% of mass 174	7071	7.1	(7.5) [a]	Pass
176	95.0 - 101.0% of mass 174	90229	90.5	(95.2) [a]	Pass
177	5.0 - 9.0% of mass 176	6336	6.4	(7.0) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VJ3182-IC3182	J055507.D	04/24/10	10:54	00:20	Initial cal 1
VJ3182-IC3182	J055508.D	04/24/10	11:18	00:44	Initial cal 2
VJ3182-IC3182	J055509.D	04/24/10	11:41	01:07	Initial cal 3
VJ3182-ICC3182	J055510.D	04/24/10	12:04	01:30	Initial cal 4
VJ3182-IC3182	J055511.D	04/24/10	12:27	01:53	Initial cal 5
VJ3182-IC3182	J055512.D	04/24/10	12:50	02:16	Initial cal 6
VJ3182-ICV3182	J055513.D	04/24/10	13:13	02:39	Initial cal verification 4
VJ3182-BS	J055514.D	04/24/10	13:36	03:02	Blank Spike
VJ3182-MB	J055515.D	04/24/10	13:59	03:25	Method Blank
ZZZZZZ	J055516.D	04/24/10	14:22	03:48	(unrelated sample)
F72975-2	J055517.D	04/24/10	14:46	04:12	(used for QC only; not part of job F73094)
F72975-2MS	J055518.D	04/24/10	15:08	04:34	Matrix Spike
F72975-2MSD	J055519.D	04/24/10	15:31	04:57	Matrix Spike Duplicate
ZZZZZZ	J055520.D	04/24/10	15:55	05:21	(unrelated sample)
ZZZZZZ	J055521.D	04/24/10	16:18	05:44	(unrelated sample)
ZZZZZZ	J055522.D	04/24/10	16:40	06:06	(unrelated sample)
ZZZZZZ	J055524.D	04/24/10	17:27	06:53	(unrelated sample)
ZZZZZZ	J055525.D	04/24/10	17:50	07:16	(unrelated sample)
ZZZZZZ	J055526.D	04/24/10	18:13	07:39	(unrelated sample)
ZZZZZZ	J055527.D	04/24/10	18:37	08:03	(unrelated sample)
ZZZZZZ	J055528.D	04/24/10	19:00	08:26	(unrelated sample)
ZZZZZZ	J055529.D	04/24/10	19:24	08:50	(unrelated sample)
ZZZZZZ	J055530.D	04/24/10	19:46	09:12	(unrelated sample)
ZZZZZZ	J055531.D	04/24/10	20:09	09:35	(unrelated sample)

Instrument Performance Check (BFB)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VJ3182-BFB	Injection Date:	04/24/10
Lab File ID:	J055506.D	Injection Time:	10:34
Instrument ID:	GCMSJ		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	J055532.D	04/24/10	20:33	09:59	(unrelated sample)
ZZZZZZ	J055533.D	04/24/10	20:56	10:22	(unrelated sample)
ZZZZZZ	J055534.D	04/24/10	21:19	10:45	(unrelated sample)
ZZZZZZ	J055536.D	04/24/10	22:05	11:31	(unrelated sample)
ZZZZZZ	J055537.D	04/24/10	22:28	11:54	(unrelated sample)

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3182-ICC3182
Lab FileID: J055510.D

Response Factor Report MSVOA6

Method : C:\MSDCHEM\1\METHODS\8260-J.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Mon Apr 26 09:29:32 2010
Response via : Initial Calibration

Calibration Files
1 =J055507.D 2 =J055508.D 3 =J055509.D 4 =J055510.D
5 =J055511.D 6 =J055512.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------ISTD----------							
2)		Dichlorodifluoromet	0.244	0.327	0.303	0.314	0.295	0.287	0.295	9.73
3)	P	Chloromethane	0.720	0.664	0.574	0.577	0.545	0.520	0.600	12.73
4)	C	Vinyl Chloride	0.473	0.532	0.472	0.477	0.448	0.427	0.472	7.51
5)		Bromomethane	0.349	0.310	0.268	0.250	0.224	0.206	0.268	20.07
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9998								
		Response Ratio = 0.00000 + 0.27698 *A + -0.03587 *A^2								
6)		Chloroethane	0.274	0.276	0.253	0.245	0.217	0.192	0.243	13.65
7)		Trichlorofluorometh	0.446	0.576	0.517	0.524	0.481	0.459	0.501	9.60
8)		Ethyl Ether	0.317	0.321	0.355	0.354	0.346	0.333	0.338	4.94
9)		1,2-Dichlorotrifluo	0.326	0.367	0.373	0.376	0.348	0.331	0.353	6.13
10)	C	1,1-Dichloroethene	0.501	0.559	0.599	0.600	0.553	0.537	0.558	6.80
11)		Freon 113	0.224	0.302	0.312	0.319	0.299	0.289	0.291	11.87
12)		Carbon Disulfide	0.929	0.990	1.040	1.051	0.966	0.934	0.985	5.27
13)		Iodomethane	0.585	0.617	0.663	0.674	0.651	0.644	0.639	5.11
14)		Methylene Chloride	1.416	0.676	0.649	0.611	0.591	0.587	0.755	43.15
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9998								
		Response Ratio = 0.00000 + 0.59229 *A								
15)		Acetone	0.026	0.024	0.026	0.026	0.025	0.025	0.025	2.71
16)		Methyl acetate	0.031	0.035	0.040	0.039	0.039	0.039	0.037	8.97
17)		trans-1,2-Dichloroe	0.493	0.504	0.557	0.558	0.544	0.553	0.535	5.38
18)		Hexane	0.307	0.348	0.359	0.377	0.359	0.364	0.352	6.80
19)		Methyl Tert Butyl E	0.613	0.626	0.731	0.732	0.730	0.740	0.695	8.49
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9999								
		Response Ratio = 0.00000 + 0.71936 *A + 0.01011 *A^2								
20)		Di-isopropyl ether	1.224	1.265	1.443	1.445	1.437	1.436	1.375	7.42
21)	P	1,1-Dichloroethane	0.592	0.595	0.664	0.666	0.654	0.654	0.637	5.38
22)		Acrylonitrile	0.097	0.095	0.104	0.103	0.104	0.104	0.101	3.94
23)		ETBE	0.887	0.919	1.109	1.120	1.149	1.152	1.056	11.36
24)		Vinyl acetate	0.438	0.445	0.499	0.507	0.509	0.497	0.483	6.72
25)		cis-1,2-Dichloroeth	0.281	0.284	0.318	0.327	0.318	0.312	0.307	6.38
		---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9999								
		Response Ratio = 0.00000 + 0.33060 *A + -0.00912 *A^2								
26)		2,2-Dichloropropane	0.374	0.384	0.412	0.423	0.428	0.429	0.408	5.81
27)		Bromochloromethane	0.152	0.160	0.187	0.186	0.190	0.189	0.177	9.42
28)		Cyclohexane	0.479	0.606	0.648	0.688	0.660	0.670	0.625	12.24
29)	C	Chloroform	0.580	0.541	0.589	0.589	0.581	0.585	0.577	3.16
30)		Tetrahydrofuran	0.170	0.098	0.098	0.093	0.098	0.098	0.109	27.27
		---- Linear regr., Force(0,0) ---- Coefficient = 0.9995								
		Response Ratio = 0.00000 + 0.09738 *A								
31)	S	Dibromofluoromethan	0.280	0.279	0.281	0.282	0.280	0.282	0.281	0.34

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3182-ICC3182
Lab FileID: J055510.D

```
32)      Carbon Tetrachlorid 0.311 0.360 0.393 0.417 0.408 0.417 0.384  10.85
33)      1,1,1-Trichloroetha 0.366 0.418 0.460 0.476 0.465 0.474 0.443   9.76
34)      2-Butanone          0.139 0.129 0.149 0.150 0.154 0.151 0.145   6.69
35)      1,1-Dichloropropene 0.346 0.405 0.428 0.442 0.427 0.427 0.413   8.39
36)      Benzene             1.160 1.172 1.276 1.276 1.251 1.223 1.226   4.14
37)      TAME                0.568 0.575 0.702 0.716 0.719 0.724 0.667  11.14
38)  S   1,2-Dichloroethane- 0.321 0.327 0.336 0.342 0.337 0.377 0.340   5.81
39)      1,2-Dichloroethane  0.427 0.427 0.490 0.496 0.502 0.500 0.474   7.69
40)      Trichloroethene     0.329 0.301 0.325 0.330 0.327 0.329 0.323   3.44
41)      Methylcyclohexane   0.364 0.471 0.492 0.519 0.489 0.493 0.471  11.63
42)      Dibromomethane      0.152 0.162 0.187 0.190 0.194 0.190 0.179   9.86
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 0.19230 *A + -0.00076 *A^2

43)  C   1,2-Dichloropropane 0.322 0.336 0.384 0.384 0.384 0.379 0.365   7.81
44)      Bromodichloromethan 0.297 0.351 0.412 0.423 0.434 0.432 0.391  14.23
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
               Response Ratio = 0.00000 + 0.41949 *A + 0.00708 *A^2

45)      2-Chloroethyl vinyl 0.134 0.147 0.188 0.193 0.224 0.204 0.182  18.99
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9947
               Response Ratio = 0.00000 + 0.20829 *A

46)      cis-1,3-Dichloropro 0.381 0.400 0.496 0.509 0.526 0.511 0.470  13.40
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9996
               Response Ratio = 0.00000 + 0.51675 *A + -0.00121 *A^2


47)  I   Chlorobenzene-d5      ----------------ISTD--------------------
48)  S   Toluene-d8           1.333 1.305 1.265 1.270 1.245 1.233 1.275   2.95
49)  C   Toluene              1.678 1.609 1.709 1.701 1.643 1.597 1.656   2.85
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  1.0000
               Response Ratio = 0.00000 + 1.75431 *A + -0.07866 *A^2

50)      2-Nitropropane      0.069 0.071 0.099 0.110 0.118 0.119 0.098  23.00
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9994
               Response Ratio = 0.00000 + 0.10407 *A + 0.00157 *A^2

51)      4-Methyl-2-pentanon 0.344 0.347 0.421 0.420 0.415 0.398 0.391   9.27
52)      trans-1,3-Dichlorop 0.392 0.426 0.537 0.545 0.566 0.558 0.504  14.89
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 0.54598 *A + 0.00750 *A^2

53)      Tetrachloroethene   0.423 0.421 0.453 0.472 0.477 0.495 0.457   6.64
54)      1,1,2-Trichloroetha 0.254 0.252 0.290 0.293 0.293 0.284 0.278   6.96
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 0.30017 *A + -0.00739 *A^2

55)      Dibromochloromethan 0.284 0.299 0.387 0.417 0.431 0.433 0.375  17.84
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 0.42937 *A

56)      1,3-Dichloropropane 0.513 0.538 0.595 0.603 0.593 0.579 0.570   6.39
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
               Response Ratio = 0.00000 + 0.61526 *A + -0.01778 *A^2

57)      1,2-Dibromoethane   0.263 0.282 0.336 0.348 0.351 0.343 0.321  11.85
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 0.35123 *A + -0.00341 *A^2
```

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3182-ICC3182
Lab FileID: J055510.D

```
58)      2-hexanone           0.217 0.219 0.284 0.292 0.296 0.281 0.265  13.83
59)      1-Chlorohexane       0.523 0.549 0.579 0.609 0.588 0.588 0.573   5.43
60)  C   Ethylbenzene         1.841 1.762 1.867 1.892 1.852 1.761 1.829   3.01
61)  P   Chlorobenzene        1.027 1.055 1.157 1.186 1.200 1.168 1.132   6.40
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 1.20677 *A + -0.01702 *A^2

62)      1,1,1,2-Tetrachloro 0.348 0.332 0.405 0.414 0.415 0.427 0.390  10.16
63)      m,p-Xylene           1.261 1.321 1.432 1.455 1.397 1.290 1.359   5.87
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 1.56179 *A + -0.06639 *A^2

64)      o-Xylene             1.176 1.263 1.422 1.462 1.439 1.406 1.361   8.42
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
               Response Ratio = 0.00000 + 1.48162 *A + -0.03618 *A^2

65)      Styrene              0.817 0.930 1.160 1.218 1.225 1.204 1.092  16.00
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9997
               Response Ratio = 0.00000 + 1.20974 *A

66)  P   Bromoform            0.140 0.169 0.232 0.265 0.280 0.278 0.227  26.24
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9992
               Response Ratio = 0.00000 + 0.27622 *A

67)      Isopropylbenzene     1.267 1.337 1.504 1.567 1.508 1.486 1.445   8.04
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9998
               Response Ratio = 0.00000 + 1.57253 *A + -0.04333 *A^2


68)  I   1,4-Dichlorobenzene-d ----------------ISTD---------------------
69)  S   4-Bromofluorobenzen 0.840 0.824 0.805 0.798 0.790 0.779 0.806   2.80
70)      n-Propylbenzene      3.376 3.429 3.654 3.707 3.591 3.338 3.516   4.41
71)      Bromobenzene         0.747 0.818 0.914 0.952 1.017 1.014 0.910  11.96
72)  P   1,1,2,2-Tetrachloro 0.564 0.602 0.685 0.659 0.662 0.642 0.636   7.03
73)      1,3,5-Trimethylbenz 2.191 2.275 2.524 2.625 2.607 2.496 2.453   7.30
74)      2-Chlorotoluene      2.267 2.247 2.466 2.514 2.485 2.358 2.390   4.83
75)      trans-1,4-Dichloro- 0.077 0.094 0.149 0.175 0.193 0.183 0.145  33.68
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9967
               Response Ratio = 0.00000 + 0.17442 *A + 0.00599 *A^2

76)      1,2,3-Trichloroprop 0.154 0.175 0.192 0.192 0.201 0.196 0.185   9.55
77)      Cyclohexanone        0.011 0.013 0.016 0.017 0.018 0.017 0.015  18.13
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9972
               Response Ratio = 0.00000 + 0.01736 *A

78)      4-Chlorotoluene      2.039 2.027 2.289 2.296 2.277 2.168 2.183   5.72
79)      tert-Butylbenzene    1.252 1.297 1.400 1.449 1.398 1.415 1.368   5.56
80)      1,2,4-Trimethylbenz 2.128 2.304 2.574 2.612 2.565 2.475 2.443   7.77
81)      sec-Butylbenzene     2.838 2.944 3.207 3.261 3.151 3.019 3.070   5.33
82)      4-Isopropyltoluene   2.198 2.371 2.598 2.705 2.643 2.584 2.517   7.65
83)      1,3-Dichlorobenzene 1.434 1.454 1.628 1.656 1.674 1.649 1.583   6.84
84)      1,4-Dichlorobenzene 1.620 1.536 1.712 1.743 1.736 1.712 1.677   4.88
85)      n-Butylbenzene       1.353 1.372 1.535 1.627 1.578 1.550 1.502   7.52
86)      Benzyl Chloride      0.195 0.172 0.278 0.301 0.324 0.327 0.266  25.08
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9990
               Response Ratio = 0.00000 + 0.32239 *A

87)      1,2-Dichlorobenzene 1.244 1.323 1.526 1.539 1.543 1.525 1.450   9.07
88)      1,2-Dibromo-3-Chlor 0.054 0.070 0.086 0.091 0.096 0.099 0.083  20.95
             ---- Quadratic regr., Force(0,0) ----  Coefficient =  0.9999
```

5.7.1

5

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3182-ICC3182
Lab FileID: J055510.D

```
                Response Ratio = 0.00000 + 0.08492 *A + 0.00741 *A^2

89)      Hexachlorobutadiene 0.577 0.498 0.537 0.591 0.611 0.647 0.577   9.21
90)      1,2,4-Trichlorobenz 0.906 0.876 1.065 1.149 1.155 1.224 1.062  13.41
91)      Naphthalene         1.389 1.414 1.796 1.908 1.891 1.886 1.714  14.30
92)      1,2,3-Trichlorobenz 0.831 0.772 0.911 1.002 1.010 1.033 0.927  11.58

93) I    Tert Butyl Alcohol-d1 ----------------ISTD---------------------
94)      acrolein            2.161 1.799 1.883 1.962 1.897 1.823 1.921   6.80
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9988
                Response Ratio = 0.00000 + 1.85927 *A

95)      Tert Butyl Alcohol  1.261 1.347 1.534 1.498 1.480 1.425 1.424   7.24
96)      tert Amyl alcohol   0.713 0.742 0.972 1.045 1.050 1.042 0.927  17.00
             ---- Linear regr., Force(0,0) ----  Coefficient =  0.9998
                Response Ratio = 0.00000 + 1.04214 *A

97)      1,4-Dioxane         0.106 0.101 0.120 0.123 0.126 0.117 0.116   8.64
---------------------------------------------------------------------------
(#) = Out of Range

          8260-J.M          Mon Apr 26 10:02:55 2010
```

5.7.1

5

Instrument Performance Check (BFB)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	VJ3195-BFB	Injection Date:	05/05/10
Lab File ID:	J055786.D	Injection Time:	10:05
Instrument ID:	GCMSJ		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	28093	26.3		Pass
75	30.0 - 60.0% of mass 95	47677	44.7		Pass
95	Base peak, 100% relative abundance	106736	100.0		Pass
96	5.0 - 9.0% of mass 95	7842	7.3		Pass
173	Less than 2.0% of mass 174	257	0.24	(0.26) [a]	Pass
174	50.0 - 100.0% of mass 95	100381	94.0		Pass
175	5.0 - 9.0% of mass 174	7328	6.9	(7.3) [a]	Pass
176	95.0 - 101.0% of mass 174	97005	90.9	(96.6) [a]	Pass
177	5.0 - 9.0% of mass 176	6101	5.7	(6.3) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VJ3195-CC3182	J055787.D	05/05/10	10:24	00:19	Continuing cal 4
VJ3195-BS	J055789.D	05/05/10	11:10	01:05	Blank Spike
VJ3195-MB	J055791.D	05/05/10	11:56	01:51	Method Blank
ZZZZZZ	J055792.D	05/05/10	12:19	02:14	(unrelated sample)
ZZZZZZ	J055793.D	05/05/10	12:42	02:37	(unrelated sample)
ZZZZZZ	J055794.D	05/05/10	13:05	03:00	(unrelated sample)
F73094-1	J055795.D	05/05/10	13:29	03:24	CEF-G82-4,S-20100421
F73094-2	J055796.D	05/05/10	13:52	03:47	CEF-G82-5,S-20100421
F73094-3	J055797.D	05/05/10	14:15	04:10	CEF-G82-6,S-20100421
ZZZZZZ	J055798.D	05/05/10	14:38	04:33	(unrelated sample)
ZZZZZZ	J055799.D	05/05/10	15:01	04:56	(unrelated sample)
ZZZZZZ	J055800.D	05/05/10	15:24	05:19	(unrelated sample)
ZZZZZZ	J055801.D	05/05/10	15:47	05:42	(unrelated sample)
ZZZZZZ	J055802.D	05/05/10	16:10	06:05	(unrelated sample)
ZZZZZZ	J055803.D	05/05/10	16:34	06:29	(unrelated sample)
ZZZZZZ	J055804.D	05/05/10	16:57	06:52	(unrelated sample)
F73094-1MS	J055806.D	05/06/10	08:34	22:29	Matrix Spike
F73094-1MSD	J055807.D	05/06/10	08:57	22:52	Matrix Spike Duplicate

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3195-CC3182
Lab FileID: J055787.D

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\050510\J055787.D Vial: 1
Acq On : 5 May 2010 10:24 am Operator: KarenW
Sample : CC3182-4 Inst : MSVOA6
Misc : ms14402,vj3195,,,,, Multiplr: 1.00
MS Integration Params: Tiny.p

Method : C:\MSDCHEM\1\METHODS\8260-J.M (RTE Integrator)
Title : SW-846 Method 5030B/8260B & EPA 624
Last Update : Mon Apr 26 09:29:32 2010
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1 I	Fluorobenzene	1.000	1.000	0.0	108	0.00	7.47
2	Dichlorodifluoromethane	0.295	0.304	-3.1	105	0.00	2.77
3 P	Chloromethane	0.600	0.528	12.0	99	0.00	2.93
4 C	Vinyl Chloride	0.472	0.410	13.1	93	0.00	3.06
		Amount	Calc.	%Drift			
5	Bromomethane	40.000	37.604	6.0	102	0.00	3.44
		AvgRF	CCRF	%Dev			
6	Chloroethane	0.243	0.220	9.5	97	0.00	3.58
7	Trichlorofluoromethane	0.501	0.456	9.0	94	0.00	3.73
8	Ethyl Ether	0.338	0.303	10.4	93	0.00	4.02
9	1,2-Dichlorotrifluoroetha	0.353	0.315	10.8	91	0.00	4.23
10 C	1,1-Dichloroethene	0.558	0.501	10.2	91	0.00	4.28
11	Freon 113	0.291	0.275	5.5	94	0.00	4.34
12	Carbon Disulfide	0.985	0.838	14.9	87	0.00	4.34
13	Iodomethane	0.639	0.589	7.8	95	0.00	4.44
		Amount	Calc.	%Drift			
14	Methylene Chloride	40.000	39.134	2.2	103	0.00	4.86
		AvgRF	CCRF	%Dev			
15	Acetone	0.025	0.023	8.0	97	0.00	4.89
16	Methyl acetate	0.037	0.036	2.7	101	0.00	5.01
17	trans-1,2-Dichloroethene	0.535	0.489	8.6	95	-0.01	5.03
18	Hexane	0.352	0.340	3.4	98	0.00	5.11
		Amount	Calc.	%Drift			
19	Methyl Tert Butyl Ether	40.000	37.036	7.4	100	0.00	5.15
		AvgRF	CCRF	%Dev			
20	Di-isopropyl ether	1.375	1.324	3.7	99	0.00	5.51
21 P	1,1-Dichloroethane	0.637	0.593	6.9	97	0.00	5.66
22	Acrylonitrile	0.101	0.100	1.0	105	0.00	5.69
23	ETBE	1.056	1.054	0.2	102	0.00	5.88
24	Vinyl acetate	0.483	0.485	-0.4	104	0.00	5.87
		Amount	Calc.	%Drift			
25	cis-1,2-Dichloroethene	40.000	37.334	6.7	100	0.00	6.21
		AvgRF	CCRF	%Dev			
26	2,2-Dichloropropane	0.408	0.387	5.1	99	0.00	6.35

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3195-CC3182
Lab FileID: J055787.D

27		Bromochloromethane	0.177	0.181	-2.3	105	0.00	6.41
28		Cyclohexane	0.625	0.622	0.5	98	0.00	6.47
29	C	Chloroform	0.577	0.539	6.6	99	0.00	6.47
		----------	Amount	Calc.	%Drift		----------	
30		Tetrahydrofuran	40.000	37.077	7.3	105	0.00	6.64
		----------	AvgRF	CCRF	%Dev		----------	
31	S	Dibromofluoromethane	0.281	0.278	1.1	107	0.00	6.65
32		Carbon Tetrachloride	0.384	0.396	-3.1	103	0.00	6.66
33		1,1,1-Trichloroethane	0.443	0.437	1.4	100	0.00	6.72
34		2-Butanone	0.145	0.142	2.1	102	-0.01	6.74
35		1,1-Dichloropropene	0.413	0.392	5.1	96	0.00	6.83
36		Benzene	1.226	1.180	3.8	100	0.00	7.08
37		TAME	0.667	0.675	-1.2	102	0.00	7.16
38	S	1,2-Dichloroethane-d4	0.340	0.316	7.1	100	0.00	7.19
39		1,2-Dichloroethane	0.474	0.434	8.4	95	0.00	7.26
40		Trichloroethene	0.323	0.306	5.3	101	0.00	7.64
41		Methylcyclohexane	0.471	0.483	-2.5	101	0.00	7.67
		----------	Amount	Calc.	%Drift		----------	
42		Dibromomethane	40.000	37.476	6.3	102	0.00	8.06
		----------	AvgRF	CCRF	%Dev		----------	
43	C	1,2-Dichloropropane	0.365	0.343	6.0	97	0.00	8.15
		----------	Amount	Calc.	%Drift		----------	
44		Bromodichloromethane	40.000	36.997	7.5	101	0.00	8.19
45		2-Chloroethyl vinyl ether	200.000	181.233	9.4	106	0.00	8.72
46		cis-1,3-Dichloropropene	40.000	36.242	9.4	100	0.00	8.81
		----------	AvgRF	CCRF	%Dev		----------	
47	I	Chlorobenzene-d5	1.000	1.000	0.0	110	0.00	10.54
48	S	Toluene-d8	1.275	1.250	2.0	109	0.00	9.00
		----------	Amount	Calc.	%Drift		----------	
49	C	Toluene	40.000	37.754	5.6	104	0.00	9.05
50		2-Nitropropane	200.000	182.758	8.6	101	0.00	9.25
		----------	AvgRF	CCRF	%Dev		----------	
51		4-Methyl-2-pentanone	0.391	0.393	-0.5	103	0.00	9.38
		----------	Amount	Calc.	%Drift		----------	
52		trans-1,3-Dichloropropene	40.000	35.290	11.8	98	0.00	9.44
		----------	AvgRF	CCRF	%Dev		----------	
53		Tetrachloroethene	0.457	0.460	-0.7	107	0.00	9.45
		----------	Amount	Calc.	%Drift		----------	
54		1,1,2-Trichloroethane	40.000	36.510	8.7	101	0.00	9.60
55		Dibromochloromethane	40.000	36.673	8.3	104	0.00	9.80
56		1,3-Dichloropropane	40.000	35.661	10.8	98	0.00	9.88
57		1,2-Dibromoethane	40.000	36.901	7.7	102	0.00	10.05
		----------	AvgRF	CCRF	%Dev		----------	
58		2-hexanone	0.265	0.267	-0.8	101	0.00	10.20
59		1-Chlorohexane	0.573	0.551	3.8	100	0.00	10.51
60	C	Ethylbenzene	1.829	1.701	7.0	99	0.00	10.57

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3195-CC3182
Lab FileID: J055787.D

			Amount	Calc.	%Drift			
61	P	Chlorobenzene	40.000	36.831	7.9	102	0.00	10.56
			AvgRF	CCRF	%Dev			
62		1,1,1,2-Tetrachloroethane	0.390	0.401	-2.8	107	0.00	10.61
			Amount	Calc.	%Drift			
63		m,p-Xylene	80.000	69.740	12.8	97	0.00	10.71
64		o-Xylene	40.000	36.334	9.2	100	0.00	11.15
65		Styrene	40.000	37.222	6.9	102	0.00	11.19
66	P	Bromoform	40.000	39.181	2.0	112	0.00	11.24
67		Isopropylbenzene	40.000	38.016	5.0	103	0.00	11.46
			AvgRF	CCRF	%Dev			
68	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	113	0.00	12.90
69	S	4-Bromofluorobenzene	0.806	0.732	9.2	104	0.00	11.75
70		n-Propylbenzene	3.516	3.197	9.1	98	0.00	11.88
71		Bromobenzene	0.910	0.866	4.8	103	0.00	11.88
72	P	1,1,2,2-Tetrachloroethane	0.636	0.589	7.4	101	0.00	11.92
73		1,3,5-Trimethylbenzene	2.453	2.311	5.8	100	0.00	12.06
74		2-Chlorotoluene	2.390	2.144	10.3	97	0.00	12.05
			Amount	Calc.	%Drift			
75		trans-1,4-Dichloro-2-Bute	40.000	33.574	16.1	97	0.00	12.11
			AvgRF	CCRF	%Dev			
76		1,2,3-Trichloropropane	0.185	0.173	6.5	102	0.00	12.08
			Amount	Calc.	%Drift			
77		Cyclohexanone	200.000	175.454	12.3	100	0.00	12.14
			AvgRF	CCRF	%Dev			
78		4-Chlorotoluene	2.183	1.961	10.2	97	0.00	12.22
79		tert-Butylbenzene	1.368	1.265	7.5	99	0.00	12.40
80		1,2,4-Trimethylbenzene	2.443	2.329	4.7	101	0.00	12.47
81		sec-Butylbenzene	3.070	3.020	1.6	105	0.00	12.59
82		4-Isopropyltoluene	2.517	2.512	0.2	105	0.00	12.72
83		1,3-Dichlorobenzene	1.583	1.563	1.3	107	0.00	12.83
84		1,4-Dichlorobenzene	1.677	1.570	6.4	102	0.00	12.92
85		n-Butylbenzene	1.502	1.426	5.1	99	0.00	13.16
			Amount	Calc.	%Drift			
86		Benzyl Chloride	40.000	35.748	10.6	109	0.00	13.16
			AvgRF	CCRF	%Dev			
87		1,2-Dichlorobenzene	1.450	1.433	1.2	106	0.00	13.35
			Amount	Calc.	%Drift			
88		1,2-Dibromo-3-Chloropropa	40.000	35.965	10.1	101	0.00	14.11
			AvgRF	CCRF	%Dev			
89		Hexachlorobutadiene	0.577	0.518	10.2	99	0.00	14.69
90		1,2,4-Trichlorobenzene	1.062	1.055	0.7	104	0.00	14.72
91		Naphthalene	1.714	1.774	-3.5	105	0.00	15.00
92		1,2,3-Trichlorobenzene	0.927	0.906	2.3	103	0.00	15.16
93	I	Tert Butyl Alcohol-d10	1.000	1.000	0.0	103	0.00	5.12
			Amount	Calc.	%Drift			

5.7.3

5

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: VJ3195-CC3182
Lab FileID: J055787.D

94	acrolein	200.000	153.726	23.1#	75	0.00	4.60
	----------	AvgRF	CCRF	%Dev	----------		
95	Tert Butyl Alcohol	1.424	1.341	5.8	92	0.00	5.20
	----------	Amount	Calc.	%Drift	----------		
96	tert Amyl alcohol	400.000	368.020	8.0	95	0.00	7.31
	----------	AvgRF	CCRF	%Dev	----------		
97	1,4-Dioxane	0.116	0.118	-1.7	99	0.00	8.38

(#) = Out of Range SPCC's out = 0 CCC's out = 0
J055510.D 8260-J.M Thu May 06 09:19:40 2010

5.7.3 5

Method Blank Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ3195-MB	J055791.D	1	05/05/10	KW	n/a	n/a	VJ3195

The QC reported here applies to the following samples: Method: SW846 8260B

F73094-1, F73094-2, F73094-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.20	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.20	ug/l	
91-20-3	Naphthalene	ND	5.0	1.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	0.22	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	0.21	ug/l	
108-88-3	Toluene	ND	1.0	0.20	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.54	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	98%	87-116%
17060-07-0	1,2-Dichloroethane-D4	91%	76-127%
2037-26-5	Toluene-D8	100%	86-112%
460-00-4	4-Bromofluorobenzene	101%	84-120%

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SR1090-DFTPP	Injection Date:	04/16/10
Lab File ID:	R22160.D	Injection Time:	16:20
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	122674	37.8		Pass
68	Less than 2.0% of mass 69	1755	0.54	(1.3) [a]	Pass
69	Mass 69 relative abundance	133821	41.2		Pass
70	Less than 2.0% of mass 69	755	0.23	(0.56) [a]	Pass
127	40.0 - 60.0% of mass 198	172069	53.0		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	324517	100.0		Pass
199	5.0 - 9.0% of mass 198	21846	6.7		Pass
275	10.0 - 30.0% of mass 198	80128	24.7		Pass
365	1.0 - 100.0% of mass 198	11191	3.4		Pass
441	Present, but less than mass 443	41910	12.9	(79.1) [b]	Pass
442	40.0 - 100.0% of mass 198	277330	85.5		Pass
443	17.0 - 23.0% of mass 442	52978	16.3	(19.1) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SR1090-IC1090	R22161.D	04/16/10	16:37	00:17	Initial cal 1
SR1090-IC1090	R22162.D	04/16/10	17:04	00:44	Initial cal 2
SR1090-IC1090	R22163.D	04/16/10	17:31	01:11	Initial cal 3
SR1090-ICC1090	R22164.D	04/16/10	17:58	01:38	Initial cal 4
SR1090-IC1090	R22165.D	04/16/10	18:24	02:04	Initial cal 5
SR1090-IC1090	R22166.D	04/16/10	18:51	02:31	Initial cal 6
SR1090-IC1090	R22167.D	04/16/10	19:18	02:58	Initial cal 7
SR1090-ICV1090	R22168.D	04/16/10	19:45	03:25	Initial cal verification 4

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1090-ICC1090
Lab FileID: R22164.D

Response Factor Report MSBNA3

Method : C:\msdchem\1\METHODS\SIM_PAHX.M (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 20 12:58:41 2010
Response via : Initial Calibration

Calibration Files
L1 =R22161.D L2 =R22162.D L3 =R22163.D L4 =R22164.D
L5 =R22165.D L6 =R22166.D L7 =R22167.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8	----------ISTD----------								
2)S Nitrobenzene-d5	0.363	0.377	0.372	0.409	0.395	0.399	0.405	0.388	4.58
3)P N-nitroso-di-n-pr		0.139	0.129	0.139	0.139	0.137	0.122	0.134	5.24
4) Naphthalene	1.295	1.265	1.232	1.326	1.361	1.374	1.461	1.331	5.74
5) 2-Methylnaphthale	0.815	0.814	0.812	0.876	0.893	0.916	0.972	0.871	7.03
6) 1-Methylnaphthale	0.755	0.733	0.722	0.777	0.792	0.802	0.836	0.774	5.20
7) I Acenaphthene-d10	----------ISTD----------								
8)P Hexachlorocyclope		0.245	0.318	0.453	0.460	0.535	0.637	0.441	32.24
9)S 2-Fluorobiphenyl	1.645	1.664	1.635	1.760	1.776	1.785	1.879	1.735	5.18
10) Acenaphthylene	2.058	2.203	2.235	2.438	2.477	2.493	2.606	2.359	8.28
11)C Acenaphthene	1.445	1.430	1.421	1.542	1.562	1.571	1.653	1.518	5.78
12)P 2,4-Dinitrophenol		0.062	0.115	0.170	0.178	0.200	0.229	0.159	38.13
13)P 4-Nitrophenol		0.155	0.202	0.245	0.236	0.267	0.274	0.230	19.37
14) Fluorene	1.547	1.581	1.629	1.782	1.802	1.829	1.914	1.726	8.11
15) I Phenanthrene-d10	----------ISTD----------								
16) Phenanthrene	1.439	1.448	1.449	1.541	1.550	1.547	1.581	1.508	3.98
17) Anthracene	1.228	1.283	1.325	1.427	1.420	1.412	1.411	1.358	5.85
18)C Fluoranthene	1.398	1.495	1.552	1.671	1.675	1.679	1.720	1.599	7.47
19) I Chrysene-d12	----------ISTD----------								
20) Pyrene	2.165	2.347	2.230	2.445	2.488	2.433	2.379	2.355	5.03
21)S Terphenyl-d14	0.827	0.859	0.846	0.923	0.923	0.913	0.906	0.885	4.53
22) Benzo[a]anthracen	1.595	1.621	1.682	1.820	1.818	1.829	1.844	1.744	6.18
23) Chrysene	1.642	1.651	1.662	1.769	1.749	1.741	1.734	1.707	3.11
24) I Perylene-d12	----------ISTD----------								
25) Benzo[b]fluoranth	1.294	1.491	1.559	1.737	1.779	1.808	1.848	1.645	12.37
26) Benzo[k]fluoranth	1.435	1.547	1.662	1.814	1.870	1.840	1.894	1.723	10.34
27)C Benzo[a]pyrene	1.084	1.266	1.386	1.537	1.579	1.582	1.648	1.440	14.24
28) Indeno[1,2,3-cd]p	0.822	0.971	1.109	1.293	1.252	1.281		1.121	17.14
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9987									
Response Ratio = 0.00000 + 1.18141 *A + 0.04105 *A^2									
29) Dibenz[a,h]anthra	0.822	0.974	1.110	1.270	1.212	1.260		1.108	16.13
---- Quadratic regr., Force(0,0) ---- Coefficient = 0.9986									
Response Ratio = 0.00000 + 1.15445 *A + 0.04136 *A^2									
30) Benzo[g,h,i]peryl	1.102	1.213	1.277	1.423	1.366	1.374	1.503	1.322	10.23

(#) = Out of Range

SIM_PAHX.M Tue Apr 20 14:11:47 2010

7.7.1

7

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SR1098-DFTPP	Injection Date:	04/28/10
Lab File ID:	R22361.D	Injection Time:	11:13
Instrument ID:	GCMSR		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	96909	43.1		Pass
68	Less than 2.0% of mass 69	1924	0.86	(2.0*) [a]	FAIL
69	Mass 69 relative abundance	98058	43.6		Pass
70	Less than 2.0% of mass 69	494	0.22	(0.5) [a]	Pass
127	40.0 - 60.0% of mass 198	123085	54.7		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	224861	100.0		Pass
199	5.0 - 9.0% of mass 198	14959	6.7		Pass
275	10.0 - 30.0% of mass 198	51570	22.9		Pass
365	1.0 - 100.0% of mass 198	6790	3.0		Pass
441	Present, but less than mass 443	25978	11.6	(80.2) [b]	Pass
442	40.0 - 100.0% of mass 198	172682	76.8		Pass
443	17.0 - 23.0% of mass 442	32382	14.4	(18.8) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SR1098-CC1090	R22362.D	04/28/10	11:29	00:16	Continuing cal 4
OP32657-BS	R22363.D	04/28/10	12:31	01:18	Blank Spike
OP32657-MB	R22364.D	04/28/10	12:57	01:44	Method Blank
F73093-8	R22365.D	04/28/10	13:24	02:11	(used for QC only; not part of job F73094)
OP32657-MS	R22366.D	04/28/10	13:51	02:38	Matrix Spike
OP32657-MSD	R22367.D	04/28/10	14:18	03:05	Matrix Spike Duplicate
ZZZZZZ	R22368.D	04/28/10	14:45	03:32	(unrelated sample)
ZZZZZZ	R22369.D	04/28/10	15:12	03:59	(unrelated sample)
ZZZZZZ	R22375.D	04/28/10	18:01	06:48	(unrelated sample)
ZZZZZZ	R22376.D	04/28/10	18:27	07:14	(unrelated sample)
ZZZZZZ	R22377.D	04/28/10	18:54	07:41	(unrelated sample)
ZZZZZZ	R22378.D	04/28/10	19:21	08:08	(unrelated sample)
ZZZZZZ	R22379.D	04/28/10	19:48	08:35	(unrelated sample)
ZZZZZZ	R22380.D	04/28/10	20:15	09:02	(unrelated sample)
OP32672-MB	R22382.D	04/28/10	21:09	09:56	Method Blank
F73129-2	R22384.D	04/28/10	22:02	10:49	(used for QC only; not part of job F73094)
ZZZZZZ	R22386.D	04/28/10	22:56	11:43	(unrelated sample)

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1098-CC1090
Lab FileID: R22362.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\042810\R22362.D Vial: 2
Acq On : 28 Apr 2010 11:29 am Operator: rayb
Sample : cc1090-4 Inst : MSBNA3
Misc : op32633,sr1098,1000,,,1,1,water Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\SIM_PAHX.M (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Wed Apr 28 15:24:39 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	88	0.00	5.63
2	S	Nitrobenzene-d5	0.388	0.373	3.9	81	0.00	5.00
3	P	N-nitroso-di-n-propylamin	0.134	0.131	2.2	83	0.00	4.89
4		Naphthalene	1.331	1.377	-3.5	92	0.00	5.64
5		2-Methylnaphthalene	0.871	0.911	-4.6	92	0.00	6.39
6		1-Methylnaphthalene	0.774	0.818	-5.7	93	0.00	6.50
7	I	Acenaphthene-d10	1.000	1.000	0.0	91	0.00	7.77
8	P	Hexachlorocyclopentadiene	0.441	0.217	50.8#	44#	-0.02	6.57
9	S	2-Fluorobiphenyl	1.735	1.801	-3.8	93	0.00	6.85
10		Acenaphthylene	2.359	2.468	-4.6	92	0.00	7.56
11	C	Acenaphthene	1.518	1.565	-3.1	92	0.00	7.81
12	P	2,4-Dinitrophenol	0.159	0.065	59.1#	35#	0.00	7.92
13	P	4-Nitrophenol	0.230	0.180	21.7	67	0.03	8.11
14		Fluorene	1.726	1.836	-6.4	94	0.02	8.64
15	I	Phenanthrene-d10	1.000	1.000	0.0	89	0.00	10.22
16		Phenanthrene	1.508	1.580	-4.8	91	0.00	10.26
17		Anthracene	1.358	1.460	-7.5	91	0.00	10.35
18	C	Fluoranthene	1.599	1.644	-2.8	87	0.02	12.43
19	I	Chrysene-d12	1.000	1.000	0.0	81	0.00	15.13
20		Pyrene	2.355	2.622	-11.3	87	-0.02	12.83
21	S	Terphenyl-d14	0.885	0.975	-10.2	86	-0.02	13.25
22		Benzo[a]anthracene	1.744	1.929	-10.6	86	0.00	15.11
23		Chrysene	1.707	1.830	-7.2	84	0.00	15.17
24	I	Perylene-d12	1.000	1.000	0.0	83	0.00	17.64
25		Benzo[b]fluoranthene	1.645	1.813	-10.2	86	0.00	17.02
26		Benzo[k]fluoranthene	1.723	1.858	-7.8	85	0.00	17.07
27	C	Benzo[a]pyrene	1.440	1.611	-11.9	87	0.00	17.54
		----------	Amount	Calc.	%Drift		----------	
28		Indeno[1,2,3-cd]pyrene	5.000	4.869	2.6	77	0.02	19.23
29		Dibenz[a,h]anthracene	5.000	5.455	-9.1	86	0.01	19.27
		----------	AvgRF	CCRF	%Dev		----------	
30		Benzo[g,h,i]perylene	1.322	1.456	-10.1	85	0.01	19.57

(#) = Out of Range SPCC's out = 0 CCC's out = 0

7.7.3

7

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SR1098-CC1090
Lab FileID: R22362.D

R22164.D SIM_PAHX.M Wed Apr 28 15:25:39 2010

7.7.3

7

Method Blank Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	R22382.D	1	04/28/10	RB	04/27/10	OP32672	SR1098

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73094-1, F73094-2, F73094-3

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	57%	42-108%
321-60-8	2-Fluorobiphenyl	57%	40-106%
1718-51-0	Terphenyl-d14	93%	39-121%

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2588-DFTPP	Injection Date:	04/12/10
Lab File ID:	W051550.D	Injection Time:	20:37
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	14119	37.1		Pass
68	Less than 2.0% of mass 69	153	0.4	(1.2) [a]	Pass
69	Mass 69 relative abundance	12243	32.2		Pass
70	Less than 2.0% of mass 69	36	0.09	(0.29) [a]	Pass
127	40.0 - 60.0% of mass 198	15616	41.0		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	38056	100.0		Pass
199	5.0 - 9.0% of mass 198	2642	6.9		Pass
275	10.0 - 30.0% of mass 198	9471	24.9		Pass
365	1.0 - 100.0% of mass 198	1089	2.9		Pass
441	Present, but less than mass 443	5228	13.7	(80.3) [b]	Pass
442	40.0 - 100.0% of mass 198	32909	86.5		Pass
443	17.0 - 23.0% of mass 442	6512	17.1	(19.8) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2588-IC2588	W051552.D	04/12/10	21:25	00:48	Initial cal 1
SW2588-IC2588	W051553.D	04/12/10	21:53	01:16	Initial cal 2
SW2588-IC2588	W051554.D	04/12/10	22:21	01:44	Initial cal 3
SW2588-ICC2588	W051555.D	04/12/10	22:50	02:13	Initial cal 4
SW2588-IC2588	W051556.D	04/12/10	23:19	02:42	Initial cal 5
SW2588-IC2588	W051557.D	04/12/10	23:47	03:10	Initial cal 6
SW2588-IC2588	W051558.D	04/13/10	00:15	03:38	Initial cal 7
SW2588-ICV2588	W051559.D	04/13/10	00:44	04:07	Initial cal verification 5

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2588-ICC2588
Lab FileID: W051555.D

Response Factor Report MSBNA01

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 13 09:59:10 2010
Response via : Initial Calibration

Calibration Files
L1 =W051552.D L2 =W051553.D L3 =W051554.D L4 =W051555.D
L5 =W051556.D L6 =W051557.D L7 =W051558.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8		----------ISTD----------							
2)S Nitrobenzene-d5	0.346	0.351	0.320	0.354	0.341	0.322	0.314	0.336	4.83
3)P N-nitroso-di-n-pr		0.120	0.110	0.116	0.102	0.098	0.092	0.106	10.23
4) Naphthalene	1.092	1.093	0.952	1.011	0.946	0.856	0.827	0.968	10.83
5) 2-Methylnaphthale	0.758	0.751	0.667	0.707	0.666	0.602	0.574	0.675	10.35
6) 1-Methylnaphthale	0.693	0.690	0.609	0.647	0.608	0.554	0.528	0.618	10.23
7) I Acenaphthene-d10		----------ISTD----------							
8)P Hexachlorocyclope		0.089	0.148	0.187	0.195	0.226	0.226	0.179	29.33
9)S 2-Fluorobiphenyl	1.585	1.604	1.726	1.588	1.489	1.631	1.544	1.595	4.63
10) Acenaphthylene	2.035	2.034	1.895	1.957	1.772	1.655	1.528	1.840	10.60
11)C Acenaphthene	1.268	1.258	1.158	1.197	1.117	1.026	1.006	1.147	9.07
12)P 2,4-Dinitrophenol		0.020	0.033	0.068	0.084	0.116	0.125	0.074	57.78
13)P 4-Nitrophenol		0.136	0.160	0.196	0.196	0.204	0.198	0.182	15.14
14) Fluorene	1.436	1.420	1.332	1.371	1.286	1.173	1.119	1.305	9.26
15) I Phenanthrene-d10		----------ISTD----------							
16) Phenanthrene	1.375	1.374	1.223	1.264	1.194	1.090	1.059	1.225	10.18
17) Anthracene	1.366	1.368	1.236	1.283	1.206	1.109	1.065	1.233	9.51
18)C Fluoranthene	1.396	1.415	1.255	1.344	1.263	1.162	1.120	1.279	8.81
19) I Chrysene-d12		----------ISTD----------							
20) Pyrene	2.068	2.071	1.896	1.931	1.821	1.657	1.614	1.865	9.71
21)S Terphenyl-d14	0.924	0.924	0.879	0.917	0.893	0.810	0.807	0.879	5.84
22) Benzo[a]anthracen	1.662	1.591	1.470	1.610	1.585	1.536	1.530	1.569	3.98
23) Chrysene	1.540	1.592	1.475	1.613	1.605	1.493	1.508	1.547	3.67
24) I Perylene-d12		----------ISTD----------							
25) Benzo[b]fluoranth	1.433	1.467	1.345	1.533	1.533	1.505	1.468	1.469	4.48
26) Benzo[k]fluoranth	1.521	1.521	1.495	1.570	1.579	1.587	1.564	1.548	2.28
27)C Benzo[a]pyrene	1.271	1.249	1.190	1.330	1.331	1.348	1.332	1.293	4.52
28) Indeno[1,2,3-cd]p	1.002	1.005	0.918	1.013	1.067	1.182	1.137	1.046	8.58
29) Dibenz[a,h]anthra	0.959	0.953	1.003	1.111	1.118	1.190	1.215	1.078	9.98
30) Benzo[g,h,i]peryl	1.241	1.211	1.131	1.218	1.293	1.356	1.292	1.249	5.82

(#) = Out of Range

sim_paha.m Tue Apr 13 10:02:38 2010

7.7.4

7

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2600-DFTPP	Injection Date:	04/27/10
Lab File ID:	W051809.D	Injection Time:	14:19
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	25069	40.0		Pass
68	Less than 2.0% of mass 69	35	0.06	(0.17) [a]	Pass
69	Mass 69 relative abundance	20195	32.2		Pass
70	Less than 2.0% of mass 69	63	0.1	(0.31) [a]	Pass
127	40.0 - 60.0% of mass 198	26308	41.9		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	62728	100.0		Pass
199	5.0 - 9.0% of mass 198	4155	6.6		Pass
275	10.0 - 30.0% of mass 198	14228	22.7		Pass
365	1.0 - 100.0% of mass 198	1766	2.8		Pass
441	Present, but less than mass 443	7874	12.6	(80.5) [b]	Pass
442	40.0 - 100.0% of mass 198	51520	82.1		Pass
443	17.0 - 23.0% of mass 442	9785	15.6	(19.0) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2600-CC2588	W051810.D	04/27/10	14:36	00:17	Continuing cal 5
OP32672-BS	W051811.D	04/27/10	15:12	00:53	Blank Spike
OP32672-MB	W051812.D	04/27/10	15:40	01:21	Method Blank
F73094-1	W051813.D	04/27/10	16:16	01:57	CEF-G82-4,S-20100421
F73094-2	W051814.D	04/27/10	16:44	02:25	CEF-G82-5,S-20100421
F73094-3	W051815.D	04/27/10	17:13	02:54	CEF-G82-6,S-20100421
ZZZZZZ	W051816.D	04/27/10	17:54	03:35	(unrelated sample)
ZZZZZZ	W051817.D	04/27/10	18:22	04:03	(unrelated sample)
ZZZZZZ	W051818.D	04/27/10	18:50	04:31	(unrelated sample)
ZZZZZZ	W051819.D	04/27/10	19:19	05:00	(unrelated sample)
ZZZZZZ	W051820.D	04/27/10	19:47	05:28	(unrelated sample)
F73129-2	W051821.D	04/27/10	20:16	05:57	(used for QC only; not part of job F73094)
OP32672-MS	W051822.D	04/27/10	20:44	06:25	Matrix Spike
OP32672-MSD	W051823.D	04/27/10	21:13	06:54	Matrix Spike Duplicate
ZZZZZZ	W051824.D	04/27/10	21:42	07:23	(unrelated sample)
ZZZZZZ	W051825.D	04/27/10	22:10	07:51	(unrelated sample)
ZZZZZZ	W051826.D	04/27/10	22:39	08:20	(unrelated sample)
ZZZZZZ	W051827.D	04/27/10	23:07	08:48	(unrelated sample)
ZZZZZZ	W051828.D	04/27/10	23:36	09:17	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2600-DFTPP	Injection Date:	04/27/10
Lab File ID:	W051809.D	Injection Time:	14:19
Instrument ID:	GCMSW		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	W051829.D	04/28/10	00:04	09:45	(unrelated sample)
ZZZZZZ	W051830.D	04/28/10	00:32	10:13	(unrelated sample)
ZZZZZZ	W051831.D	04/28/10	01:01	10:42	(unrelated sample)
ZZZZZZ	W051832.D	04/28/10	01:30	11:11	(unrelated sample)
ZZZZZZ	W051833.D	04/28/10	01:58	11:39	(unrelated sample)

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2600-CC2588
Lab FileID: W051810.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\042710\W051810.D Vial: 2
Acq On : 27 Apr 2010 2:36 pm Operator: rayb
Sample : cc2588-5 Inst : MSBNA01
Misc : op32672,sw2600,1000,,,1,1,water Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Tue Apr 27 16:58:28 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	150	0.00	6.03
2	S	Nitrobenzene-d5	0.336	0.288	14.3	127	0.00	5.35
3	P	N-nitroso-di-n-propylamin	0.106	0.106	0.0	157	0.00	5.22
4		Naphthalene	0.968	0.920	5.0	146	0.00	6.05
5		2-Methylnaphthalene	0.675	0.650	3.7	147	0.00	6.83
6		1-Methylnaphthalene	0.618	0.604	2.3	149	0.01	6.96
7	I	Acenaphthene-d10	1.000	1.000	0.0	144	0.00	8.27
8	P	Hexachlorocyclopentadiene	0.179	0.215	-20.1#	159	0.00	7.03
9	S	2-Fluorobiphenyl	1.595	1.483	7.0	144	0.00	7.31
10		Acenaphthylene	1.840	1.673	9.1	136	0.00	8.06
11	C	Acenaphthene	1.147	1.080	5.8	140	0.01	8.33
12	P	2,4-Dinitrophenol	0.074	0.081	-9.5	140	0.00	8.42
13	P	4-Nitrophenol	0.182	0.175	3.8	129	0.00	8.57
14		Fluorene	1.305	1.243	4.8	140	0.00	9.17
15	I	Phenanthrene-d10	1.000	1.000	0.0	144	0.00	10.77
16		Phenanthrene	1.225	1.173	4.2	141	0.00	10.82
17		Anthracene	1.233	1.165	5.5	139	0.00	10.92
18	C	Fluoranthene	1.279	1.209	5.5	138	0.00	13.00
19	I	Chrysene-d12	1.000	1.000	0.0	139	0.00	15.70
20		Pyrene	1.865	1.819	2.5	138	0.00	13.41
21	S	Terphenyl-d14	0.879	0.883	-0.5	137	0.00	13.81
22		Benzo[a]anthracene	1.569	1.591	-1.4	139	0.00	15.68
23		Chrysene	1.547	1.581	-2.2	137	0.00	15.74
24	I	Perylene-d12	1.000	1.000	0.0	136	0.00	18.21
25		Benzo[b]fluoranthene	1.469	1.512	-2.9	134	0.00	17.59
26		Benzo[k]fluoranthene	1.548	1.620	-4.7	139	0.00	17.64
27	C	Benzo[a]pyrene	1.293	1.355	-4.8	138	0.00	18.11
28		Indeno[1,2,3-cd]pyrene	1.046	1.063	-1.6	135	0.00	19.81
29		Dibenz[a,h]anthracene	1.078	1.164	-8.0	142	0.00	19.85
30		Benzo[g,h,i]perylene	1.249	1.331	-6.6	140	0.00	20.16

(#) = Out of Range SPCC's out = 0 CCC's out = 0
W051556.D sim_paha.m Tue Apr 27 16:59:26 2010

7.7.6

Method Blank Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	W051878.D	1	04/30/10	RB	04/27/10	OP32672	SW2603

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73094-1, F73094-2, F73094-3

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	72%	42-108%
321-60-8	2-Fluorobiphenyl	59%	40-106%
1718-51-0	Terphenyl-d14	90%	39-121%

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2602-DFTPP	Injection Date:	04/29/10
Lab File ID:	W051844.D	Injection Time:	02:55
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	42430	34.5		Pass
68	Less than 2.0% of mass 69	0	0.0	(0.0) [a]	Pass
69	Mass 69 relative abundance	39799	32.4		Pass
70	Less than 2.0% of mass 69	259	0.21	(0.65) [a]	Pass
127	40.0 - 60.0% of mass 198	50872	41.4		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	122834	100.0		Pass
199	5.0 - 9.0% of mass 198	8287	6.7		Pass
275	10.0 - 30.0% of mass 198	28972	23.6		Pass
365	1.0 - 100.0% of mass 198	3193	2.6		Pass
441	Present, but less than mass 443	13720	11.2	(77.5) [b]	Pass
442	40.0 - 100.0% of mass 198	90861	74.0		Pass
443	17.0 - 23.0% of mass 442	17711	14.4	(19.5) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2602-IC2602	W051845.D	04/29/10	03:13	00:18	Initial cal 1
SW2602-IC2602	W051846.D	04/29/10	03:41	00:46	Initial cal 2
SW2602-IC2602	W051847.D	04/29/10	04:10	01:15	Initial cal 3
SW2602-ICC2602	W051848.D	04/29/10	04:38	01:43	Initial cal 4
SW2602-IC2602	W051849.D	04/29/10	05:07	02:12	Initial cal 5
SW2602-IC2602	W051850.D	04/29/10	05:36	02:41	Initial cal 6
SW2602-IC2602	W051851.D	04/29/10	06:05	03:10	Initial cal 7
SW2602-ICV2602	W051852.D	04/29/10	06:33	03:38	Initial cal verification 5
OP32687-BS	W051853.D	04/29/10	07:02	04:07	Blank Spike
OP32687-MB	W051854.D	04/29/10	07:31	04:36	Method Blank
ZZZZZZ	W051855.D	04/29/10	08:00	05:05	(unrelated sample)
ZZZZZZ	W051856.D	04/29/10	09:07	06:12	(unrelated sample)
ZZZZZZ	W051857.D	04/29/10	09:36	06:41	(unrelated sample)
ZZZZZZ	W051858.D	04/29/10	10:06	07:11	(unrelated sample)
ZZZZZZ	W051859.D	04/29/10	10:35	07:40	(unrelated sample)
ZZZZZZ	W051860.D	04/29/10	11:04	08:09	(unrelated sample)
ZZZZZZ	W051861.D	04/29/10	11:33	08:38	(unrelated sample)
ZZZZZZ	W051862.D	04/29/10	12:01	09:06	(unrelated sample)
ZZZZZZ	W051863.D	04/29/10	12:30	09:35	(unrelated sample)

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2602-DFTPP	Injection Date:	04/29/10
Lab File ID:	W051844.D	Injection Time:	02:55
Instrument ID:	GCMSW		

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
ZZZZZZ	W051864.D	04/29/10	12:59	10:04	(unrelated sample)
ZZZZZZ	W051865.D	04/29/10	13:28	10:33	(unrelated sample)
ZZZZZZ	W051866.D	04/29/10	14:41	11:46	(unrelated sample)

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2602-ICC2602
Lab FileID: W051848.D

Response Factor Report MSBNA01

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Thu Apr 29 09:13:49 2010
Response via : Initial Calibration

Calibration Files
L1 =W051845.D L2 =W051846.D L3 =W051847.D L4 =W051848.D
L5 =W051849.D L6 =W051850.D L7 =W051851.D

Compound	L1	L2	L3	L4	L5	L6	L7	Avg	%RSD
1) I Naphthalene-d8	----------ISTD----------								
2)S Nitrobenzene-d5	0.316	0.322	0.302	0.322	0.308	0.291	0.293	0.308	4.19
3)P N-nitroso-di-n-pr		0.111	0.104	0.105	0.096	0.087	0.085	0.098	10.73
4) Naphthalene	1.143	1.119	0.974	1.030	0.956	0.883	0.849	0.993	11.21
5) 2-Methylnaphthale	0.778	0.777	0.672	0.714	0.662	0.613	0.586	0.686	10.93
6) 1-Methylnaphthale	0.709	0.702	0.610	0.654	0.604	0.557	0.538	0.625	10.67
7) I Acenaphthene-d10	----------ISTD----------								
8)P Hexachlorocyclope		0.306	0.336	0.382	0.401	0.359	0.383	0.361	9.73
9)S 2-Fluorobiphenyl	1.716	1.706	1.495	1.573	1.488	1.340	1.293	1.516	10.80
10) Acenaphthylene	1.962	1.960	1.741	1.784	1.620	1.498	1.456	1.717	11.86
11)C Acenaphthene	1.258	1.224	1.073	1.113	1.074	1.005	0.967	1.102	9.69
12)P 2,4-Dinitrophenol		0.013	0.034	0.060	0.102	0.122	0.148	0.080	65.82
13)P 4-Nitrophenol		0.197	0.212	0.238	0.237	0.242	0.227	0.226	7.82
14) Fluorene	1.543	1.493	1.329	1.361	1.252	1.123	1.146	1.321	12.18
15) I Phenanthrene-d10	----------ISTD----------								
16) Phenanthrene	1.350	1.344	1.194	1.241	1.143	1.064	1.024	1.194	10.68
17) Anthracene	1.340	1.338	1.199	1.250	1.153	1.068	1.035	1.197	10.11
18)C Fluoranthene	1.485	1.473	1.305	1.358	1.249	1.316	1.262	1.350	7.06
19) I Chrysene-d12	----------ISTD----------								
20) Pyrene	1.966	1.954	1.725	1.775	1.683	1.529	1.511	1.735	10.49
21)S Terphenyl-d14	0.926	0.925	0.859	0.902	0.866	0.786	0.773	0.863	7.23
22) Benzo[a]anthracen	1.774	1.741	1.581	1.694	1.659	1.569	1.531	1.650	5.59
23) Chrysene	1.584	1.613	1.498	1.641	1.582	1.508	1.469	1.556	4.16
24) I Perylene-d12	----------ISTD----------								
25) Benzo[b]fluoranth	1.639	1.665	1.536	1.685	1.691	1.621	1.548	1.626	3.85
26) Benzo[k]fluoranth	1.685	1.696	1.598	1.755	1.731	1.646	1.643	1.679	3.24
27)C Benzo[a]pyrene	1.451	1.476	1.368	1.522	1.519	1.463	1.425	1.461	3.68
28) Indeno[1,2,3-cd]p	1.154	1.168	1.105	1.261	1.227	1.243	1.216	1.196	4.66
29) Dibenz[a,h]anthra	1.144	1.150	1.099	1.269	1.253	1.312	1.225	1.208	6.42
30) Benzo[g,h,i]peryl	1.382	1.383	1.286	1.449	1.419	1.419	1.343	1.383	3.94

(#) = Out of Range

sim_paha.m Thu Apr 29 09:17:29 2010

7.7.7

Instrument Performance Check (DFTPP)

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample:	SW2603-DFTPP	Injection Date:	04/30/10
Lab File ID:	W051873.D	Injection Time:	12:08
Instrument ID:	GCMSW		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
51	30.0 - 60.0% of mass 198	30145	38.1		Pass
68	Less than 2.0% of mass 69	0	0.0	(0.0) [a]	Pass
69	Mass 69 relative abundance	26808	33.9		Pass
70	Less than 2.0% of mass 69	145	0.18	(0.54) [a]	Pass
127	40.0 - 60.0% of mass 198	33747	42.7		Pass
197	Less than 1.0% of mass 198	0	0.0		Pass
198	Base peak, 100% relative abundance	79104	100.0		Pass
199	5.0 - 9.0% of mass 198	5383	6.8		Pass
275	10.0 - 30.0% of mass 198	18288	23.1		Pass
365	1.0 - 100.0% of mass 198	2191	2.8		Pass
441	Present, but less than mass 443	8817	11.1	(77.7) [b]	Pass
442	40.0 - 100.0% of mass 198	58389	73.8		Pass
443	17.0 - 23.0% of mass 442	11350	14.3	(19.4) [c]	Pass

(a) Value is % of mass 69
(b) Value is % of mass 443
(c) Value is % of mass 442

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
SW2603-CC2602	W051874.D	04/30/10	12:29	00:21	Continuing cal 5
OP32699-BS	W051875.D	04/30/10	12:57	00:49	Blank Spike
OP32699-MB	W051876.D	04/30/10	13:26	01:18	Method Blank
OP32672-MB	W051878.D	04/30/10	14:23	02:15	Method Blank
ZZZZZZ	W051879.D	04/30/10	14:53	02:45	(unrelated sample)
ZZZZZZ	W051880.D	04/30/10	15:22	03:14	(unrelated sample)
OP32687-MB	W051881.D	04/30/10	15:50	03:42	Method Blank
ZZZZZZ	W051882.D	04/30/10	16:19	04:11	(unrelated sample)
ZZZZZZ	W051883.D	04/30/10	16:47	04:39	(unrelated sample)
ZZZZZZ	W051884.D	04/30/10	17:16	05:08	(unrelated sample)
ZZZZZZ	W051885.D	04/30/10	17:44	05:36	(unrelated sample)
F73232-2	W051886.D	04/30/10	18:13	06:05	(used for QC only; not part of job F73094)
ZZZZZZ	W051889.D	04/30/10	19:38	07:30	(unrelated sample)
ZZZZZZ	W051891.D	04/30/10	20:35	08:27	(unrelated sample)
ZZZZZZ	W051892.D	04/30/10	21:04	08:56	(unrelated sample)
ZZZZZZ	W051893.D	04/30/10	21:32	09:24	(unrelated sample)
F73232-8	W051894.D	04/30/10	22:00	09:52	(used for QC only; not part of job F73094)
ZZZZZZ	W051897.D	04/30/10	23:26	11:18	(unrelated sample)
ZZZZZZ	W051898.D	04/30/10	23:54	11:46	(unrelated sample)

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: SW2603-CC2602
Lab FileID: W051874.D

Evaluate Continuing Calibration Report

Data File : C:\msdchem\1\DATA\043010\W051874.D Vial: 2
Acq On : 30 Apr 2010 12:29 pm Operator: rayb
Sample : cc2602-5 Inst : MSBNA01
Misc : op32687,sw2603,1000,,,1,1,water Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\msdchem\1\METHODS\sim_paha.m (RTE Integrator)
Title : PAH's by 8270 SIM
Last Update : Fri Apr 30 13:39:45 2010
Response via : Multiple Level Calibration

Min. RRF : 0.050 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)	R.T.
1	I	Naphthalene-d8	1.000	1.000	0.0	85	0.00	6.31
2	S	Nitrobenzene-d5	0.308	0.363	-17.9	100	0.00	5.60
3	P	N-nitroso-di-n-propylamin	0.098	0.113	-15.3	99	0.00	5.47
4		Naphthalene	0.993	0.964	2.9	85	0.00	6.33
5		2-Methylnaphthalene	0.686	0.664	3.2	85	0.00	7.15
6		1-Methylnaphthalene	0.625	0.609	2.6	85	0.00	7.28
7	I	Acenaphthene-d10	1.000	1.000	0.0	86	0.00	8.64
8	P	Hexachlorocyclopentadiene	0.361	0.213	41.0#	46#	0.00	7.35
9	S	2-Fluorobiphenyl	1.516	1.435	5.3	83	0.00	7.64
10		Acenaphthylene	1.717	1.645	4.2	87	0.00	8.41
11	C	Acenaphthene	1.102	1.056	4.2	84	0.01	8.69
12	P	2,4-Dinitrophenol	0.080	0.108	-35.0#	91	0.02	8.76
13	P	4-Nitrophenol	0.226	0.214	5.3	77	0.04	8.88
14		Fluorene	1.321	1.199	9.2	82	0.02	9.54
15	I	Phenanthrene-d10	1.000	1.000	0.0	80	0.00	11.15
16		Phenanthrene	1.194	1.150	3.7	80	0.01	11.21
17		Anthracene	1.197	1.155	3.5	80	0.01	11.30
18	C	Fluoranthene	1.350	1.257	6.9	80	0.02	13.40
19	I	Chrysene-d12	1.000	1.000	0.0	80	0.00	16.09
20		Pyrene	1.735	1.681	3.1	80	0.00	13.80
21	S	Terphenyl-d14	0.863	0.866	-0.3	80	0.00	14.19
22		Benzo[a]anthracene	1.650	1.597	3.2	77	0.00	16.07
23		Chrysene	1.556	1.559	-0.2	79	0.00	16.13
24	I	Perylene-d12	1.000	1.000	0.0	79	0.00	18.59
25		Benzo[b]fluoranthene	1.626	1.652	-1.6	78	0.00	17.97
26		Benzo[k]fluoranthene	1.679	1.721	-2.5	79	0.00	18.02
27	C	Benzo[a]pyrene	1.461	1.469	-0.5	77	0.00	18.49
28		Indeno[1,2,3-cd]pyrene	1.196	1.218	-1.8	79	0.00	20.18
29		Dibenz[a,h]anthracene	1.208	1.212	-0.3	77	0.00	20.23
30		Benzo[g,h,i]perylene	1.383	1.427	-3.2	80	0.00	20.54

(#) = Out of Range SPCC's out = 0 CCC's out = 0
W051849.D sim_paha.m Fri Apr 30 13:40:31 2010

7.7.9

7

Method Blank Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32672-MB	W051812.D	1	04/27/10	RB	04/27/10	OP32672	SW2600

The QC reported here applies to the following samples: Method: SW846 8270C BY SIM

F73094-1, F73094-2, F73094-3

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	1.0	0.50	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.50	ug/l	
120-12-7	Anthracene	ND	1.0	0.50	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.20	0.050	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.20	0.050	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.20	0.050	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.20	0.050	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.20	0.050	ug/l	
218-01-9	Chrysene	ND	0.20	0.10	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.20	0.050	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.25	ug/l	
86-73-7	Fluorene	ND	1.0	0.50	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.20	0.050	ug/l	
90-12-0	1-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.25	ug/l	
91-20-3	Naphthalene	ND	1.0	0.25	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.25	ug/l	
129-00-0	Pyrene	ND	1.0	0.25	ug/l	

CAS No.	Surrogate Recoveries		Limits
4165-60-0	Nitrobenzene-d5	52%	42-108%
321-60-8	2-Fluorobiphenyl	59%	40-106%
1718-51-0	Terphenyl-d14	92%	39-121%

ACCUTEST LABORATORIES SE

DATE:	04/21/10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FLPAO
ACQ. METHOD:	FLPAO-A
PROC. METHOD:	FLPAO-A
CALIB. DATE:	04/21/10
RUN BATCH:	GIJ 2187

ANALYST:	NE
MECL2 LOT #:	173102
SIGNAL 1 SURR. AREA/CONC:	1758472/40
SIGNAL 2 SURR. AREA/CONC:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65687	1	Test 1360	FLPAO				
IJ 88	2						
IJ 89	3						
IJ 90	4						
IJ 91	5						
IJ 92	1						
IJ 93	2	ICV2187-255		S3512	75:1000		
IJ 94	3	-340			x10		
IJ 95	4	-680			x5		
IJ 96	5	-1360			2:5		
IJ 97	6	-2040			3:5		
IJ 98	7	-2720			4:5		
IJ 99	8	-3400			>1		curve passed
IJ 700	9	ICV2187-1360		4472B	80:500		passed
IJ							
IJ							
IJ							
IJ		04/22/10					
IJ							
IJ							

Manual Integration Rationale SOP QA029: **MP** Missed Peak, **OP** Overlapping Peak, **SP** Split Peak, **PDB** Poorly Defined Baseline, **BR** Baseline Ripple, **PII** Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

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Analyst's Signature: [signature]

ACCUTEST LABORATORIES SE

DATE:	04-27-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	
PROC. METHOD:	
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2191

ANALYST:	EVSC
MECL2 LOT #:	F132587
SIGNAL 1 SURR. AREA/CONC:	1508246/40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65823	1	CC 2187-1360	FL-PRO	S3512	2.5	PDB	PASS
IJ 24	2	-3110			10x		PASS
IJ 25	3	CCB		—	—		ND
IJ 26	4	OP32560-MB		OP32560	1x	PDB	ND
IJ 27	5	F72900-7,2			2x		
IJ 28	6	-9,10			1x		Low Signal. No more sample available.
IJ 29	7	F72903-1,50			50x	PDB	IRR 500x (OVR)
IJ 30	8	F72916-1,4			4x		
IJ 31	9	OP32560-MS,4				PDB	
IJ 32	10	-MSD,4					
IJ 33	11	F72916-2			1x	PDB	
IJ 34	12	-5,2			2x		
IJ 35	13	-6			1x	PDB	
IJ 36	14	CC 2187-1360		S3512	2.5		PASS
IJ 37	15	CCB		—	—		ND
IJ 38	16	OP32619-MB		OP32619	1x	PDB	ND
IJ 39	17	F75077-1,5			5x		
IJ 40	18	-3,2			2x		
IJ 41	19	-4,4			4x	PDB	
IJ 65842	20	-5,4			4x		

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

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Analyst's Signature: [signature]

ACCUTEST LABORATORIES SE

DATE:	04-27-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FC-PRO
ACQ. METHOD:	T
PROC. METHOD:	↓
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2191

ANALYST:	EWS
MECL2 LOT #:	H 37507
SIGNAL 1 SURR. AREA/CONC:	5092 96/100
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65843	21	F73087-4,11	FC-PRO	OP32619	4X	PDB	✓
IJ 44	22	E3337 Surrm.	—	E3337	2X	9/4/2010	PASS
IJ 45	14	CC7187-1360		53512	2.5	PDB	PASS
IJ 46	15	CCB		—	—		ND
IJ 47	23	OP32676-BS		OP32676	1X		~~Failed~~ Failed Reject 9/4/2010
IJ 48	24	-MB					Failed
IJ 49	25	F73209-1					ND
IJ 50	26	OP32676-MS					Failed
IJ 51	27	-MSD					Failed
IJ 52	28	OP32659-BS		OP32659	1X	PDB	✓
IJ 53	29	-MB					ND
IJ 54	30	F73140-1				PDB	✓
IJ 55	31	F73134-2					ND
IJ 56	32	CC7187-1360		53512	2.5	PDB	PASS
IJ 57	33	CCB		—	—		ND
IJ 58	34	OP32639-BS		OP32639	1X	PDB	✓
IJ 59	35	-MB					ND
IJ 60	36	F73116-2				PDB	ND
IJ 61	37	-7					ND
IJ 65862	38	9/24/10 -9	✓				✓ F72992-8

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

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(2)

Analyst's Signature: [signature]

ACCUTEST LABORATORIES SE

DATE:	04-21-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	
PROC. METHOD:	
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 8191

ANALYST:	GNOC
MECL2 LOT #:	F12507
SIGNAL 1 SURR. AREA/CONC:	1508246/100
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 65863	39	F73134-1,10	FL-PRO	OP32659	10X	PDB	✓
IJ 64	40	-3			1X		ND
IJ 65	41	-4				PDB	ND
IJ 66	42	-5					ND
IJ 67	43	-6					ND
IJ 68	14	CC2187-1360		S3512	2:5	PDB	PASS
IJ 69	15	CCB		—	—		ND
IJ 70	44	F73134-7		OP32659	1X	PDB	✓
IJ 71	45	-8					✓
IJ 72	46	-9				PDB	✓
IJ 73	47	F73136-1					ND
IJ 74	48	OP32659-MS				PDB	✓
IJ 75	49	-MSD					✓
IJ 76	50	F72907-1,500		OP32560	500X	PDB	✓
IJ 77	51	F73136-4		OP32659	1X		✓
IJ 78	52	F73168-7					ND
IJ 79	53	F73175-1				PDB	ND
IJ 80	32	CC2187-1360		S3512	2:5		PASS
IJ 81	54	CC2187-3110		S3512	10X		LOW C40 (DMX)
IJ 65892	33	CCD		—	—		ND

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PI Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

gcfid1_ij_log.xls NF rev. 08/09

(3-3) 3

Analyst's Signature: [signature]

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2191-CC2187
Lab FileID: IJ65856.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0427PRO\IJ65856.D          Vial: 32
Acq On    : 28 Apr 2010   4:39 am                   Operator: enoca
Sample    : cc2187-1360                             Inst    : FID 1
Misc      : op32659,gij2191,1050,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	34.794	13.0	88	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1143.050	16.0	85	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Wed Apr 28 16:27:18 2010

9.6.3

9

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2191-CC2187
Lab FileID: IJ65868.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0427PRO\IJ65868.D          Vial: 14
Acq On    : 28 Apr 2010   8:40 am                   Operator: enoca
Sample    : cc2187-1360                             Inst    : FID 1
Misc      : op32659,gij2191,1050,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

		Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1	S	O-TERPHENYL	40.000	33.925	15.2	86	0.00	5.36- 5.56
2	H	TPH (C8-C40)	1360.000	1126.258	17.2	83	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Wed Apr 28 16:27:18 2010

9.6.4 9

ACCUTEST LABORATORIES SE

DATE:	04-26-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FL-PRO
ACQ. METHOD:	I
PROC. METHOD:	I
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2192

ANALYST:	EVOC
MECL2 LOT #:	L132502
SIGNAL 1 SURR. AREA/CONC:	675164/40
SIGNAL 2 SURR. AREA/CONC:	—

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 658834	1	CC2187-1360	FL-PRO	S3512	2.5	PDB	PASS
IJ 84	2	↓ -1410		I	10X	I	PASS
IJ 85	3	CCB		—	—	PDB	ND
IJ 86	4	OP32659-135		OP32659	1X	I	✓
IJ 87	5	Pu 4/20/10 I -1413			—	I	ND
IJ 88	6	~~F71~~ F73181-2				PDB	✓
IJ 89	7	F73183-1A				I	✓ | RR10X (DNR)
IJ 90	8	-2A				PDB	✓
IJ 91	9	-3A				I	✓ | RR20X (DNR)
IJ 92	10	E33338 Spr 2 850 rpm		E33338	2X	I	PASS
IJ 93	11	F73095-11		OP32659	1X	PDB	✓ | RR20X (DNR)
IJ 94	12	-7			—	I	✓
IJ 95	13	-10				PDB	✓ | RR20X (DNR)
IJ 96	14	F73094-1				I	ND
IJ 97	15	-2				PDB	✓
IJ 98	16	CC2187-1360		S3512	2.5	I	PASS
IJ 99	17	CCB		—	—	PDB	ND
IJ 65900	18	F73094-3		OP32634	1X	I	ND
IJ 01	19	F73096-1				PDB	ND
IJ 65902	20	-2				I	✓

15% R
-25% R

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PII Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

1

Analyst's Signature: [signature]

gcfid1_ij_log.xls NF rev. 08/09

ACCUTEST LABORATORIES SE

DATE:	04-28-10
COLUMN TYPE:	DB-5
AMOUNT INJECTED:	1 ul
INSTRUMENT:	FID1-IJ

GC FID3-IJ ANALYSIS LOG

METHODS:	FC-PRO
ACQ. METHOD:	I
PROC. METHOD:	I
CALIB. DATE:	04-21-10
RUN BATCH:	GIJ 2192

ANALYST:	ENOE
MECL2 LOT #:	H132507
SIGNAL 1 SURR. AREA/CONC:	157516 7/40
SIGNAL 2 SURR. AREA/CONC:	— —

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	MANUALLY INTEGRATED PEAKS RATIONALE, PEAK #	COMMENTS
IJ 05903	21	OP32639 - MS	FC-PRO	OP32639	1	PDB	✓
IJ 04	22	I -MSD	I	I	I	I	✓
IJ 05	23	F73096 -3				PDB	ND
IJ 06	24	I -4				I	✓
IJ 07	25	F73136 -3				PDB	✓
OK IJ 08	26	CC2187 - 1360		S3512	2.5	I	PASS 4/29/10
IJ 09	27	OP32694 - BS		OP32694	1	PDB	~~ND~~ ✓
IJ 10	28	I -MB		I	I	I	ND
IJ 11	29	F73290 -1				PDB	ND
IJ 12	30	OP32694 -MS					✓
IJ 13	31	I -MSD					✓
IJ 05914	26	CC2187 - 1360		S3512	2.5		PASS
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							
IJ							

(FEA 04/29/10)

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, BR Baseline Ripple, PI Poor Instrument Integration
All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

Analyst's Signature: [illegible]

gcfid1_ij_log.xls NF rev. 08/09

(2 - 2) (2)

Initial Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2187-ICC2187
Lab FileID: IJ65696.D

Response Factor Report FID 1

Method : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title : TPH by FL_PRO
Last Update : Thu Apr 22 10:27:44 2010
Response via : Initial Calibration

Calibration Files
255 =IJ65693.D 340 =IJ65694.D 680 =IJ65695.D 1360=IJ65696.D
2040=IJ65697.D 2720=IJ65698.D 3400=IJ65699.D

Compound	255	340	680	1360	2040	2720	3400	Avg	%RSD
1)S O-TERPHENYL	4.497	4.512	4.536	4.397	4.238	4.435	4.572	4.455 E4	2.52
2)H TPH (C8-C40)	4.003	4.002	3.949	3.853	3.627	3.818	3.868	3.874 E4	3.38

(#) = Out of Range

FL_PRO_R.M Thu Apr 22 10:39:50 2010

9.6.1

9

Initial Calibration Verification

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2187-ICV2187
Lab FileID: IJ65700.D

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0421PRO\IJ65700.D          Vial: 9
Acq On    : 21 Apr 2010   5:22 pm                   Operator: marke
Sample    : icv2187-1360                            Inst    : FID 1
Misc      : op32536,gij2187,1000,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Thu Apr 22 10:27:44 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL		----------NA----------				
2 H	TPH (C8-C40)	1360.000	1278.247	6.0	94	0.00	2.49-10.17

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 22 10:39:36 2010

9.6.2

9

Raw Data: IJ65883.D

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2192-CC2187
Lab FileID: IJ65883.D

CCV affecting samples

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65883.D          Vial: 1
Acq On    : 28 Apr 2010   2:38 pm                   Operator: enoca
Sample    : cc2187-1360                             Inst    : FID 1
Misc      : op32659,gij2192,1030,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

		Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1	S	O-TERPHENYL	40.000	35.355	11.6	90	0.00	5.36- 5.56
2	H	TPH (C8-C40)	1360.000	1233.411	9.3	91	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 29 08:53:04 2010

9.6.5

9

ACCUTEST Laboratories
F73094

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2192-CC2187
Lab FileID: IJ65884.D CCV affecting samples

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65884.D          Vial: 2
Acq On    : 28 Apr 2010   2:58 pm                   Operator: enoca
Sample    : cc2187-340                              Inst    : FID 1
Misc      : op32659,gij2192,1030,,,1,1,water        Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	10.000	8.491	15.1	84	0.00	5.36- 5.56
2 H	TPH (C8-C40)	340.000	319.059	6.2	91	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65694.D FL_PRO_R.M Thu Apr 29 08:53:40 2010

Raw Data: IJ65898.D

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: ~~GIJ2192-CC2187~~
Lab FileID: IJ65898.D CCV affecting samples

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65898.D Vial: 16
Acq On : 28 Apr 2010 7:53 pm Operator: enoca
Sample : cc2187-1360 Inst : FID 1
Misc : op32639,gij2192,1050,,,1,1,water Multiplr: 1.00
IntFile : events.e

Method : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title : TPH by FL_PRO
Last Update : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	31.724	20.7	80	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1079.013	20.7	80	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 29 08:53:05 2010

9.6.7

9

Raw Data: IJ65908.D

Continuing Calibration Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample: GIJ2192-CC2187
Lab FileID: IJ65908.D CCV affecting samples

Evaluate Continuing Calibration Report

```
Data File : C:\HPCHEM\1\DATA\0428PRO\IJ65908.D          Vial: 26
Acq On    : 28 Apr 2010  11:15 pm                    Operator: enoca
Sample    : cc2187-1360                              Inst    : FID 1
Misc      : op32676,gij2192,30.4,,,1,1,soil          Multiplr: 1.00
IntFile   : events.e

Method       : C:\HPCHEM\1\METHODS\FL_PRO_R.M (Chemstation Integrator)
Title        : TPH by FL_PRO
Last Update  : Wed Apr 28 15:39:18 2010
Response via : Multiple Level Calibration

Min. RRF     :   0.000  Min. Rel. Area :  50%  Max. R.T. Dev  0.50min
Max. RRF Dev :  25%     Max. Rel. Area : 150%
```

	Compound	Amount	Calc.	%Drift	Area%	Dev(min)	RT Window
1 S	O-TERPHENYL	40.000	35.397	11.5	90	0.00	5.36- 5.56
2 H	TPH (C8-C40)	1360.000	1201.698	11.6	89	0.00	2.46-10.12

(#) = Out of Range SPCC's out = 0 CCC's out = 0
IJ65696.D FL_PRO_R.M Thu Apr 29 08:53:05 2010

9.6.8

9

ACCUTEST Laboratories F73094

Method Blank Summary

Job Number: F73094
Account: TETRPAPT Tetra Tech NUS
Project: Cecil Field; Site G-82

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP32639-MB	IJ65859.D	1	04/28/10	FEA	04/23/10	OP32639	GIJ2191

The QC reported here applies to the following samples: Method: FLORIDA-PRO

F73094-1, F73094-2, F73094-3

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	ND	0.25	0.17	mg/l	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	73%	38-122%

ATTACHMENT C

COMPLETED FIELD FORMS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Bldg G82 and BP Wells Site
Project No.: CTO JM09 112G02267
Location: NAS Cecil Field
Personnel: Jeff Krone
Weather Conditions:
Measuring Device: Heron Water Tape
Tidally Influenced: Yes ___ No _X_
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
CEF-G82-1S	4/19/10	1220	71.46	15.00	6.77			
CEF-G82-2I		1151	71.60	35.00	7.31			
CEF-G-82-2S		1149	71.23	14.00	6.95			
CEF-G82-3S		1147	71.20	14.00	6.79			
CEF-G82-4S		1204	71.74	15.00	7.66			
CEF-G82-5S		1200	71.53	15.00	7.49			
CEF-G82-6S	4/19/10	1203	71.95	15.00	10.14			

* All measurements to the nearest 0.01 foot

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-1S	SAMPLE ID: CEF-G82-1S-201004 20	DATE: 04 / 20 / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 – 15'	STATIC DEPTH TO WATER (ft): 6.77	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
5x = 24.9 4.98 Liters 15 - 6.77 = 8.23 x .016 = .131 x 3.785 = 4.98

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 7	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 0850	PURGE ENDED AT: 1126	TOTAL VOLUME PURGED (Liters): 27.6

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0850	—	—	200								
0950	12.0	12.0	200	7.07	6.15	19.79	0.181	0.37	16.4	-23.6	clear
1050	12.00	24.0	100	7.07	6.15	19.82	0.181	0.35	15.9	-23.0	yellow clear
1120	3.0	27.0	100	7.01	6.12	19.95	0.181	0.40	14.6	-22.8	yellow clear
1123	.3	27.3	100	7.00	6.11	19.97	0.182	0.39	13.9	-23.1	yellow clear
1126	.3	27.6	100	7.00	6.12	20.01	0.182	0.39	13.4	-23.1	yellow clear
1133	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1133	SAMPLING ENDED AT: 1200
PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP FLOW RATE (mL per minute): 200/100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____ FILTER SIZE: ____ µm		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	APP
VOC's	3	CG	40 ml	HCl			8260B	RFPP
PAHS	2	AG	1 L	None			8270 SIM	APP

REMARKS: **NA field testing**
Reduced purge rate to lower turbidity..
Purged 5+ well volumes before sampling

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: **NAS Cecil Field G82/BP Wells**
Sample ID No.: **CEF-G82-1S-201004**
Project No.: **112G02267**
Sample Location: **CEF-G82-1S**
Sampled By: Jeff Krone
Duplicate: ☐
Field Analyst: **Jeff Krone**
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): JC

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (^{0}C)	ORP (Eh) (+/- mv)
Date: 4/20/10							
Time: 1126							
Method: Peristaltic	clear	6.12	0.182	13.4	0.39	20.01	-23.1

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:
Equipment: Chemetrics K-7501 or K-7512
Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L
Analysis Time: 1159
Concentration: 0.9 mg/L
Notes:

Sulfide (S^{2-}):
Equipment: DR-890
Program/Module: 93 / 610 nm
Analysis Time: 1203
Concentration: 0.80 mg/L
Notes:

Carbon Dioxide:
Equipment: (Range: 10 to 100 mg/L)
CHEMetrics K1910, K1920, or K1925.
Analysis Time: 1201
Concentration: 90 mg/L
Notes:

Alkalinity:
Equipment: (Range: 10 to 100 mg/L)
CHEMetrics K9810, K9815, or K9820.
Analysis Time: 1155
Concentration: 52 mg/L
Notes:

~~**Ferrous Iron (Fe^{2+}):**~~
~~Equipment: DR-890 IR-18C Color Wheel~~
~~Program/Module: 33 / 500nm~~
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Filtered:~~ ☐
~~Notes:~~

~~**Hydrogen Sulfide (H_2S):**~~
~~Equipment: HS-C~~
~~Exceeded 5.0 mg/L range on color chart:~~ ☐
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Notes:~~

QA/QC Checklist:
All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Multiplication is correct for each *Multiplier* table: ☒
Final concentration is within the appropriate *Range Used* block: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Title block is initialized by person who performed the QA/QC Checklist: ☒

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-2I	SAMPLE ID: CEF-G82-2I-201004 20	DATE: 04 / 20 / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 30 – 35'	STATIC DEPTH TO WATER (ft): 7.30	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) 5x = 15.5 _____ Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 1.185 Liters .0014 x 35 = .049 x 3.785 = .185 + 1 = 1.185

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 33	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 31	PURGE INITIATED AT: 1107	PURGE ENDED AT: 1246	TOTAL VOLUME PURGED (Liters): 16.2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1107	—	—	200	—							
1210	12.6	12.6	200	7.46	4.96	22.87	0.049	0.31	52.7	35.1	cloudy
1240	3.0	15.6	100	7.41	4.82	22.90	0.047	1.21	9.89	46.9	clear
1243	.3	15.9	100	7.41	4.83	22.93	0.047	1.17	9.71	44.3	clear
1246	.3	16.2	100	7.41	4.84	22.98	0.048	1.17	8.93	44.5	clear
1249	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff KroneTtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1249	SAMPLING ENDED AT: 1315
PUMP OR TUBING DEPTH IN WELL (feet): 31	SAMPLE PUMP FLOW RATE (mL per minute): 200/100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: _____	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	APP
VOC's	3	CG	40 ml	HCl			8260B	RFPP
PAHS	2	AG	1 L	None			8270 SIM	APP

REMARKS: **NA field testing**
Turbidity began to rise just prior to sampling
5 + well volumes purged

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NAS Cecil Field G82/BP Wells**
Sample ID No.: **CEF-G82-2I-201004**
Project No.: **112G02267**
Sample Location: **CEF-G82-2I**
Sampled By: Jeff Krone
Duplicate: ☐
Field Analyst: **Jeff Krone**
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): JK

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (^{0}C)	ORP (Eh) (+/- mv)
Date: 1/20/10							
Time: 1236							
Method: Peristaltic	Cloudy	4.84	0.048	8.93	1.17	22.98	44.5

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:
Equipment: Chemetrics K-7501 or K-7512 (circled)
Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L
Analysis Time: 1317
Concentration: 0.9 mg/L
Notes:

Sulfide (S^{2-}):
Equipment: DR-890
Program/Module: 93 / 610 nm
Analysis Time: 1322
Concentration: 0.17 mg/L
Notes:

Carbon Dioxide:
Equipment: CHEMetrics K1910, K1920, or K1925. (circled)
(Range: 10 to 100 mg/L)
Analysis Time: 1321
Concentration: 60 mg/L
Notes:

Alkalinity:
Equipment: CHEMetrics K9810, K9815, or K9820.
(Range: 10 to 100 mg/L)
Analysis Time: 1323
Concentration: 00 mg/L
Notes:

~~**Ferrous Iron (Fe^{2+}):**~~
~~Equipment: DR-890~~ ~~IR-18C Color Wheel~~
~~Program/Module: 33 / 500nm~~
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Filtered:~~ ☐
~~Notes:~~

~~**Hydrogen Sulfide (H_2S):**~~
~~Equipment: HS-C~~
~~Exceeded 5.0 mg/L range on color chart:~~ ☐
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Notes:~~

QA/QC Checklist:
All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Multiplication is correct for each *Multiplier* table: ☑
Final concentration is within the appropriate *Range Used* block: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Title block is initialized by person who performed the QA/QC Checklist: ☑

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-2S	SAMPLE ID: CEF-G82-2S-201004 20	DATE: 04 / 20 / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 4 – 14'	STATIC DEPTH TO WATER (ft): 6.97	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) 14-6.97=7.03x.16=1.12x3.785= 4.25
4.25 Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 1210	PURGE ENDED AT: 1336	TOTAL VOLUME PURGED (Liters): 8.6

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1210	—	—	100								
1330	8.0	8.0	100	7.27	6.24	21.39	0.327	0.34	0.93	-25.4	yellow clear
1333	.3	8.3	100	7.28	6.25	21.39	0.326	0.33	0.71	-26.1	yellow clear
1336	.3	8.6	100	7.28	6.25	21.41	0.326	0.32	0.55	-26.7	yellow clear
1345	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1345	SAMPLING ENDED AT: 1400
PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	
VOC's	3	CG	40 ml	HCl			8260B	
PAHS	2	AG	1 L	None			8270 SIM	

REMARKS: **NA field testing**

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS, Inc.

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Project Site Name: **NAS Cecil Field G82/BP Wells**
Sample ID No.: **CEF-G82-2S-201004**
Project No.: **112G02267**
Sample Location: **CEF-G82-2S**
Sampled By: Jeff Krone
Duplicate: ☐
Field Analyst: **Jeff Krone**
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): JK

SAMPLING DATA:

Date: 07/20/09	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (^{0}C)	ORP (Eh) (+/- mv)
Time: 1336							
Method: Peristaltic	yellow clear	6.25	0.326	0.55	0.32	21.41	-26.7

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:
Equipment: Chemetrics K-7501 or K-7512 (circled)
Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L
Analysis Time: 1410
Concentration: 0.9 mg/L
Notes:

Sulfide (S^{2-}):
Equipment: DR-890
Program/Module: 93 / 610 nm
Analysis Time: 1415
Concentration: 0.49 mg/L
Notes:

Carbon Dioxide:
Equipment: (Range: 100 to 1000 mg/L)
CHEMetrics K1910, K1920, or K1925. (K1920 circled)
Analysis Time: 1421
Concentration: 110 mg/L
Notes:

Alkalinity:
Equipment: (Range: 10 to 100 mg/L)
CHEMetrics K9810, K9815, or K9820.
Analysis Time: 1424
Concentration: 60 mg/L
Notes:

~~**Ferrous Iron (Fe^{2+}):**~~
~~Equipment: DR-890~~ ~~IR-18C Color Wheel~~
~~Program/Module: 33 / 500nm~~
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Filtered:~~ ☐
~~Notes:~~

~~**Hydrogen Sulfide (H_2S):**~~
~~Equipment: HS-C~~
~~Exceeded 5.0 mg/L range on color chart:~~ ☐
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Notes:~~

QA/QC Checklist:
All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Multiplication is correct for each *Multiplier* table: ☑
Final concentration is within the appropriate *Range Used* block: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Title block is initialized by person who performed the QA/QC Checklist: ☑

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**		SITE LOCATION: **NAS Cecil Field**
WELL NO: CEF-G82-3S	SAMPLE ID: CEF-G82-3S-201004 20	DATE: 04/ 20 / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 4 – 14'	STATIC DEPTH TO WATER (ft): 6.81	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable)
5x = 21.77 4.35 14 - 6.81 = 7.19 x .16 = 1.15 x 3.785 = 4.35 Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
_____ Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 7.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 0845	PURGE ENDED AT: 1008	TOTAL VOLUME PURGED (Liters): 8.3

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0845	—	—	100	—	—	—	—	—	—	—	—
0945	6.0	6.0	100	6.86	6.29	19.49	0.273	2.41	5.58	158.8	clear
1002	1.7	7.7	100	6.86	6.24	19.47	0.267	2.43	5.29	153.8	clear
1005	.3	8.0	100	6.86	6.21	19.45	0.264	2.38	4.81	151.9	clear
1008	.3	8.3	100	6.86	6.21	19.45	0.261	2.38	3.21	152.6	clear
1013	Sample	time									

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1013	SAMPLING ENDED AT: 1100
PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: _____	FILTER SIZE: ____ µm	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	APP
VOC's	3	CG	40 ml	HCl			8260B	RFPP
PAHS	2	AG	1 L	None			8270 SIM	APP

REMARKS: **NA field testing**

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: **NAS Cecil Field G82/BP Wells**
Sample ID No.: **CEF-G82-3S-201004**
Project No.: **112G02267**
Sample Location: **CEF-G82-3S**
Sampled By: Jeff Krone
Duplicate: ☐
Field Analyst: **Jeff Krone**
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): K

SAMPLING DATA:

	Color (Visual)	pH (SU)	S.C. (mS/cm)	Turbidity (NTU)	DO (Meter, mg/l)	Temp. (°C)	ORP (Eh) (+/- mv)
Date: 4/20/10 ~~11/20/00~~ 10							
Time: 1008							
Method: Peristaltic	Clear	6.21	0.261	3.21	2.38	19.45	152.6

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Dissolved Oxygen:
Equipment: Chemetrics K-7501 or K-7512 (circled)
Range ☐ 0 - 1.0 mg/L ☒ 1 - 12 mg/L
Analysis Time: 1040
Concentration: 1.5 mg/L
Notes:

Sulfide (S^{2-}):
Equipment: DR-890
Program/Module: 93 / 610 nm
Analysis Time: 1057
Concentration: 0.0 mg/L
Notes:

Carbon Dioxide:
Equipment: (Range: 10 to 100 mg/L)
CHEMetrics K1910, K1920, or K1925. (circled)
Analysis Time: 1100
Concentration: 70 mg/L
Notes:

Alkalinity:
Equipment: (Range: 10 to 100 mg/L)
CHEMetrics K9810, K9815, or K9820. (circled)
Analysis Time: 1055
Concentration: 52 mg/L
Notes:

~~**Ferrous Iron (Fe^{2+}):**~~
~~Equipment: DR-890~~ ~~IR-18C Color Wheel~~
~~Program/Module: 33 / 500nm~~
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Filtered:~~ ☐
~~Notes:~~

~~**Hydrogen Sulfide (H_2S):**~~
~~Equipment: HS-C~~
~~Exceeded 5.0 mg/L range on color chart:~~ ☐
~~Analysis Time:~~
~~Concentration: mg/L~~
~~Notes:~~

QA/QC Checklist:
All data fields have been completed as necessary: ☑
Correct measurement units are cited in the SAMPLING DATA block: ☑
Multiplication is correct for each *Multiplier* table: ☑
Final concentration is within the appropriate *Range Used* block: ☑
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☑
Title block is initialized by person who performed the QA/QC Checklist: ☑

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-4S	SAMPLE ID: CEF-G82-4S-201004 21	DATE: 04 / 21 / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 – 15'	STATIC DEPTH TO WATER (ft): 7.70	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) 4.42 Liters 15-7.7= 7.3 X .16 = 1.168 X 3.785 = 4.42

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 0850	PURGE ENDED AT: 1005	TOTAL VOLUME PURGED (Liters): 7.5

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0850	—	—	100	—					3.68	—	
0950	6.0	6.0	100	7.74	5.29	22.38	0.132	3.24	0.91	167.6	clear
0953	.3	6.3	100	7.74	5.26	22.38	0.130	2.77	0.86	147.0	clear
0956	.3	6.6	100	7.74	5.22	22.40	0.128	2.04	0.73	137.8	clear
0959	.3	6.9	100	7.74	5.21	22.40	0.127	1.47	0.86	106.3	clear
1002	.3	7.2	100	7.74	5.19	22.44	0.127	1.45	0.85	99.9	clear
1005	.3	7.5	100	7.75	5.20	22.45	0.128	1.44	0.72	95.9	clear
1010	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jeff Krone	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1010	SAMPLING ENDED AT: 1025
PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____ FILTER SIZE: ____ µm		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	APP
VOC's	3	CG	40 ml	HCl			8260B	RFPP
PAHS	2	AG	1 L	None			8270 SIM	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-5S	SAMPLE ID: CEF-G82-5S-201004	DATE: 04 / / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 – 15'	STATIC DEPTH TO WATER (ft): 7.53	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) 4.52 Liters 15-7.53=7.47 x .16 = 1.19 x 3.785 = 4.52

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGE INITIATED AT: 0855	PURGE ENDED AT: 1101	TOTAL VOLUME PURGED (Liters): 12.6

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
0855	—	—	100	—	—	—	—	—	—	—	—
1055	12.0	12.0	100	7.56	5.62	22.25	0.125	1.99	2.14	47.1	clear
1058	.3	12.3	100	7.56	5.62	22.20	0.125	1.99	2.06	47.2	clear
1101	.3	12.6	100	7.56	5.63	22.22	0.124	1.98	1.99	47.9	clear
1108	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS/	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1108	SAMPLING ENDED AT: 1130
PUMP OR TUBING DEPTH IN WELL (feet): 8	SAMPLE PUMP FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____ FILTER SIZE: ____ µm		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	APP
VOC's	3	CG	40 ml	HCl			8260B	RFPP
PAHS	1	AG	1 L	None			8270 SIM	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **G82/BP Wells**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-G82-6S	SAMPLE ID: CEF-G82-6S-201004	DATE: 04 / / 2010

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 - 15	STATIC DEPTH TO WATER (ft): 10.16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
only fill out if applicable) 5x= 14.65 2.93 Liters 15 - 10.16 = 4.84 x .16 = 0.77 x 3.785 = 2.93

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 11	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 11	PURGE INITIATED AT: 1050	PURGE ENDED AT: 1216	TOTAL VOLUME PURGED (Liters): 8.6

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (ft)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR
1050	—	—	100	—	—	—	—	—	—	—	—
1150	6.0	6.0	100	10.20	5.88	20.73	0.191	1.76	11.4	56.5	cloudy
1210	2.0	8.0	100	10.20	5.84	20.71	0.190	1.61	9.72	56.4	clear
1213	.3	8.3	100	10.20	5.85	20.71	0.190	1.48	9.72	55.9	clear
1216	.3	8.6	100	10.20	5.85	20.69	0.191	1.57	9.72	56.3	clear
1222	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jeff Krone	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1222	SAMPLING ENDED AT: 1235
PUMP OR TUBING DEPTH IN WELL (feet): 11	SAMPLE PUMP FLOW RATE (mL per minute): 100	TUBING MATERIAL CODE: Teflon	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
TRPH	2	AG	1 L	H_2SO_4			FL-PRO	App
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