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QUARTERLY GROUNDWATER MONITORING REPORT THIRD QUARTER FIRST YEAR FOR BUILDING 81 TANKS 81 A, B AND C NAS CECIL FIELD FL

03/25/2011

TETRA TECH NUS

TETRA TECH

PITT-03-11-069

March 25, 2011

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, 3rd Quarter, 1st Year – January 2011
Tanks 81 A, B, and C
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

On behalf of the Navy, Tetra Tech, Inc. (Tetra Tech) is pleased to submit this 3rd Quarter, Year 1 Groundwater Monitoring Report for the referenced Contract Task Order for Tanks 81 A, B, and C at former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This Groundwater Monitoring Report was prepared for 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 quarterly monitoring of groundwater associated with the intermediate and deep zones of the surficial aquifer. The sampling program is being conducted in accordance with the Uniform Federal Policy Sampling and Analysis Plan (UFP-SAP) developed by Tetra Tech in March 2010 and approved by the Florida Department of Environmental Protection (FDEP) on July 7, 2010.. Relevant portions of the UFP-SAP are provided in Attachment A.

This 3rd Quarter, 1st Year Groundwater Monitoring Report summarizes field operations and analytical results for the subject site for the sampling event conducted on January 19, 2011. The work was performed in general accordance with Tetra Tech Standard Operating Procedures (SOPs) and FDEP SOPs under DEP-SOP-001/01 as detailed in the approved UFP-SAP.

BACKGROUND

The site is located on the main base side of the former facility, as shown on Figure 1. Petroleum contamination at the Tanks 81 A, B, and C site was first identified during the Environmental Baseline Study conducted at NAS Cecil Field in 1994. A Site Assessment Report (SAR) followed in September 1998, which concluded that soil at the site was impacted by petroleum contamination. A source removal was conducted in September and October 1999. A Confirmatory Sampling Event was completed in June 2000 and recommended no further action for soils in the area of Tanks 81 A, B, and C; but groundwater contamination at the site was still in question. In 2001 and 2002 a direct push technology (DPT) investigation and installation and sampling of groundwater monitoring wells were conducted. The SAR that followed recommended a 5 year groundwater monitoring plan. The first round of groundwater monitoring was conducted in January 2003, and it was determined based on the results that it was

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necessary to delineate the horizontal and vertical extent of contamination prior to continuing the monitoring program. A Supplemental Site Assessment event was conducted in February 2005. A Natural Attenuation Monitoring Plan (NAMP) was prepared in November 2007 based on the results of the Supplemental Site Assessment, and monitoring was conducted under this plan for 2 years. Five constituents of concern (COCs) were originally identified in the 2007 NAMP, but the NAMP was revised in 2008 and a NAMP Approval Order (NAMPAO) was submitted in June 2008 by FDEP that identified a groundwater sampling program for isopropylbenzene. Another DPT investigation was conducted in March 2009 to redefine the horizontal extent of the groundwater plume. Based on the DPT results, a UFP-SAP was completed detailing the long-term monitoring plan for Tanks 81 A, B, and C. The first groundwater monitoring event under the UFP-SAP was conducted in July 2010. In December 2010, a Field Task Modification Request (FTMR) was submitted by Tetra Tech and subsequently approved by FDEP, which included the measurement of synoptic water levels from additional intermediate wells (CEF-081-01I, CEF-081-02I, CEF-081-03I, CEF-081-05I, CEF-081-18I, CEF-081-19I, CEF-081-20I, CEF-081-21I). The FTMR is included as Attachment A.

FIELD OPERATIONS

January 2011 field operations were performed in general accordance with Tetra Tech SOPs and FDEP SOPs under DEP-SOP-001/01. Groundwater samples were collected from existing wells CEF-081-04I, CEF-081-22I, CEF-081-24I, CEF-081-25I, CEF-081-26I, CEF-081-27D, and CEF-081-28D, on January 19, 2011. Monitoring well locations are provided on Figure 2. The samples were placed on ice and subsequently shipped via FedEx for next-day delivery under chain of custody to Empirical Laboratories, Inc., in Nashville, Tennessee. The laboratory analyzed the samples for isopropylbenzene using United States Environmental Protection Agency Method SW-846 8260B.

Prior to obtaining groundwater samples, synoptic water levels and total well depths were measured and recorded on a site-specific groundwater measurement sheet for all sampled wells, and additional intermediate wells included in the December 2010 FTMR. A synoptic water level and total well depth reading measurements were unable to be obtained from intermediate well CEF-081-20I, due to damage to the well riser. Groundwater elevations in the intermediate wells ranged from 68.12 (CEF-081-26I) to 68.54 (CEF-081-24I) feet above mean sea level. Depth-to-water measurements, top-of-casing elevations, and groundwater elevations are presented in Table 1. Field documentation is included in Attachment B.

RESULTS

The groundwater elevation data and flow directions for the intermediate zone of the shallow surficial aquifer are shown on Figure 3. Based on the data, intermediate zone groundwater flow is to the northeast, northwest, and southwest, which differs only slightly from the groundwater flow directions during the previous sampling event in October 2010 (northeast, southeast, and southwest); however, it is estimated that there is a slight groundwater sink located in the area of intermediate wells CEF-081-03I and CEF-081-04I. This was groundwater sink was not previously detected in previous groundwater elevation data.

The only COC at this site is isopropylbenzene. Isopropylbenzene concentrations reported by the laboratory for the groundwater samples collected during this sampling event were compared to the FDEP Groundwater Cleanup Target Level (GCTL) and Natural Attenuation Default Concentration (NADC). The data and standards are presented in Table 2, and the results are presented on Figure 4.

During the January 19, 2011 sampling event, isopropylbenzene was detected at concentrations greater than the GCTL of 0.8 microgram per liter (µg/L), but less than the NADC of 8 µg/L in intermediate wells CEF-081-04I (0.971 I µg/L), CEF-081-22I (2.04 µg/L), CEF-081-24I (2.57 µg/L), and CEF-081-25I (3.49 µg/L). In all other wells sampled during this sampling event, isopropylbenzene was either not detected or

was detected at estimated concentrations less than the GCTL. Groundwater analytical data are provided as Attachment C.

As identified in Figure 4, portions of the isopropylbenzene plume are outside of the identified Land Use Control (LUC) area. It was identified in the FDEP correspondence dated January 24, 2011 regarding review of the 1st Quarter, Year 1 report, that a Restrictive Covenant with the current property owner (the City of Jacksonville) is not required at this time, and the Navy will continue to keep the appropriate City of Jacksonville officials informed of site conditions.

CONCLUSIONS AND RECOMMENDATIONS

During the January 2011 sampling event, intermediate zone groundwater was estimated to flow to the northeast, northwest, and southwest from the area around well CEF-081-24I. It is estimated that there is also a slight groundwater sink located in the area of intermediate wells CEF-081-03I and CEF-081-04I.

Isopropylbenzene was detected at concentrations greater than the GCTL in four of seven wells sampled during the January 2011 sampling event. All of the four isopropylbenzene GCTL exceedances were in intermediate zone wells. Groundwater COC concentrations from all four wells with GCTL exceedances were found to be less than concentrations observed during the October 2010 event from each respective well. The isopropylbenzene concentration from well CEF-081-04I exceeded the GCTL for the first time during the October 2010 sampling event, and also exceeded the GCTL during this sampling event (0.971 I µg/L). This well was formerly an upgradient well; however, a groundwater flow sink now exists in this location. If the concentration of isopropylbenzene remains elevated in CEF-081-04I, and groundwater sink conditions continue to exist in this location, the addition of monitoring well CEF-081-05I to the sampling program may be appropriate. Tetra Tech recommends that the quarterly monitoring program proposed in the UFP-SAP continue in April 2011, and that a decision regarding the addition of monitoring well CEF-081-05I and potentially the addition of other monitoring wells be addressed based on April 2011 groundwater conditions.

If you have any questions regarding this submittal, please feel free to contact me at (412) 921-8163, or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

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

Enclosures (6)

c: A. Sanford, BRAC PMO SE (electronic copy)
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S. Martin, NAVFAC Atlantic (electronic copy)
D. Vaughn-Wright, U.S. EPA (electronic copy)
M. Halil, CH2M Hill (electronic copy)
S. Currie, Tetra Tech CTO JM09 project file (1 copy, unbound)
J. Trepanowski, Tetra Tech
M. Jonnet, Tetra Tech (electronic copy)
J. Johnson, Tetra Tech (1 copy for Information Repository)

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 Quarterly Groundwater Monitoring Report, 3rd Quarter, 1st Year (January 2011) was developed for the Tanks 81 A, B, and C site at Former Naval Air Station Cecil Field, Jacksonville, Florida, and should not be construed to apply to any other site.

ROBERT F. SONCIK
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PROFESSIONAL ENGINEER

Robert F. Soncik, P.E.
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REFERENCES

CH2MHill (CH2MHill Constructors, Inc.), 2000. Source Removal Report, Underground Storage Tank Removal at Building 81, Naval Air Station Cecil Field, Jacksonville, Florida. May.

FDEP (Florida Department of Environmental Protection), 2008. Natural Attenuation Monitoring Plan Approval Order, Building 81, Tanks 81 A, B, and C, Naval Air Station Cecil Field, Jacksonville, Florida. June.

Harding Lawson Associates, 1998. Site Assessment Report, Building 81, Tank 81, Underground Storage Tank and Aboveground Storage Tank Grey Sites, Naval Air Station Cecil Field, Jacksonville, Florida. September.

Tetra Tech (Tetra Tech NUS, Inc.), 2000. Confirmatory sampling Report for Building 81, Tanks 81 A, B, and C, Naval Air Station Cecil Field, Jacksonville, Florida. September.

Tetra Tech, 2002. Site Assessment Report for Building 81, Tanks 81 A, B, and C, Naval Air Station Cecil Field, Jacksonville, Florida. July.

Tetra Tech, 2005. Supplemental Site Assessment Letter Report, Building 81, Tanks 81 A, B, and C, Naval Air Station Cecil Field, Jacksonville, Florida. August.

Tetra Tech, 2007. Natural Attenuation Monitoring Plan, Building 81, Tanks 81 A, B, and C, Naval Air Station Cecil Field, Jacksonville, Florida.

TABLES

Table 1
Groundwater Elevation Data

Groundwater Monitoring Report, 3rd Quarter, 1st Year - January 2011
Building 81, Tanks 81 A, B, and C
Naval Air Station Cecil Field
Jacksonville, Florida

Monitoring Well	Well Depth (feet btoc)	TOC Elevation (feet above msl)	July 19, 2010		October 18, 2010		January 19, 2011	
			Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)
CEF-081-01I	25-30	77.73	NM	NA	NM	NA	9.34	68.39
CEF-081-02I	25-30	77.42	NM	NA	7.56	69.86	9.11	68.31
CEF-081-03I	25-30	77.78	NM	NA	NM	NA	9.49	68.29
CEF-081-04I	25-30	77.54	7.34	70.20	7.72	69.82	9.25	68.29
CEF-081-05I	25-30	77.84	NM	NA	7.98	69.86	9.53	68.31
CEF-081-14S	3-13	78.30	NM	NA	NM	NA	9.94	68.36
CEF-081-15S	5-15	78.03	NM	NA	NM	NA	9.66	68.37
CEF-081-18I	30-35	78.33	NM	NA	8.38	69.95	9.96	68.37
CEF-081-19I	30-35	78.15	NM	NA	8.27	69.88	9.79	68.36
CEF-081-20I	30-35	77.63	NM	NA	7.65	69.98	NM*	NA
CEF-081-21I	30-35	78.78	NM	NA	8.99	69.79	10.48	68.3
CEF-081-22I	30-35	78.35	8.19	70.16	8.54	69.81	10.02	68.33
CEF-081-24I	30-35	78.39	8.03	70.36	8.38	70.01	9.85	68.54
CEF-081-25I	30-35	78.19	8.06	70.13	8.38	69.81	9.71	68.48
CEF-081-26I	30-35	77.87	8.29	69.58	8.56	69.31	9.75	68.12
CEF-081-27D	50-55	78.16	8.27	69.89	NM	NA	9.70	68.46
CEF-081-28D	50-55	78.38	8.24	70.14	NM	NA	9.83	68.55

* Well was found during January 2011 sampling event to have been damaged.
TOC = Top of casing.
btoc = Below top of casing.
msl = Mean sea level.
NA = Not available.
NM = Not measured.

Table 2
Groundwater Analytical Data

Groundwater Monitoring Report, 3rd Quarter, 1st Year - January 2011
Building 81, Tanks 81 A, B, and C
Naval Air Station Cecil Field
Jacksonville, Florida

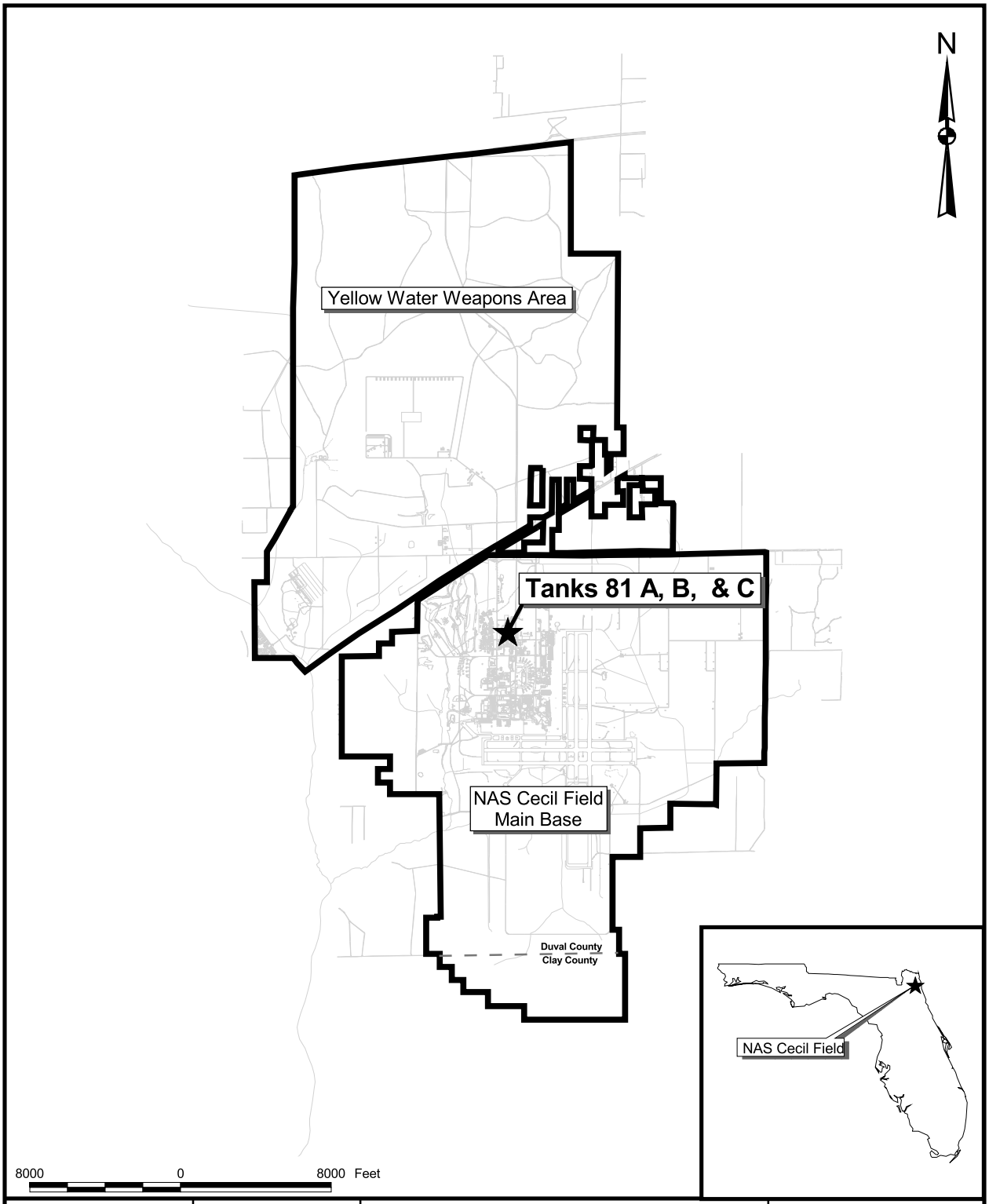
Parameter	GCTL	NADC	CEF-081-04I				CEF-081-09I	CEF-081-22I				CEF-081-24I			
			Jun-09	Jul-10	Oct-10	Jan-11	Jun-09	Jun-09	Jul-10	Oct-10	Jan-11	Jun-09	Jul-10	Oct-10	Jan-11
Isopropylbenzene	0.8	8	**0.32 J**	**0.397**	**1.2 [G]**	**0.971 I [G]**	**0.77 J**	**1.5 [G]**	**2.24 [G]**	**2.66 [G]**	**2.04 [G]**	**8.5 [G] [N]**	**4.23 [G]**	**2.99 [G]**	**2.57 [G]**

Parameter	GCTL	NADC	CEF-081-25I				CEF-081-26I				CEF-081-27D				
			Jun-09	Jul-10	Oct-10	Jan-11	Jun-09	Jul-10	Oct-10	Jan-11	Jun-09	Jul-10	Oct-10	Jan-11	
														Sample	Duplicate
Isopropylbenzene	0.8	8	**5.7 [G]**	**4.83 [G]**	**3.63 [G]**	**3.49 [G]**	0.2 U	0.3 U	**0.723 J**	**0.281 I**	0.2 U	0.3 U	0.25 U	0.25 U	0.25 U

Parameter	GCTL	NADC	CEF-081-28D				CEF-081-29DD
			Jun-09	Jul-10	Oct-10	Jan-11	Jun-09
Isopropylbenzene	0.8	8	**1.6 [G]**	**1 [G]**	**1.18 [G]**	**0.667 I**	0.2 U

GCTL = Groundwater Cleanup Target Level.
NADC = Natural Attenuation Default Concentration.
µg/L = Micrograms per liter.
U = Not detected at detection limit shown.
J = Estimated concentration.
I = Reported value is between laboratory method detection limit and laboratory practical quantitation limit.
Bold indicated detected concentrations.
Shading indicates concentration greater than criterion.
[G] indicates that the concentration exceeds the FDEP GCTLs.
[N] indicates that the concentration exceeds the NADC.
FDEP GCTL and NADC from Chapter 62-777, Florida Administrative Code (F.A.C).

FIGURES



DRAWN BY MJJ	DATE 08Jan10	GENERAL LOCATION MAP TANKS 81 A, B, & C 3rd QUARTERLY, YEAR 1 EVENT - JANUARY 2011 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

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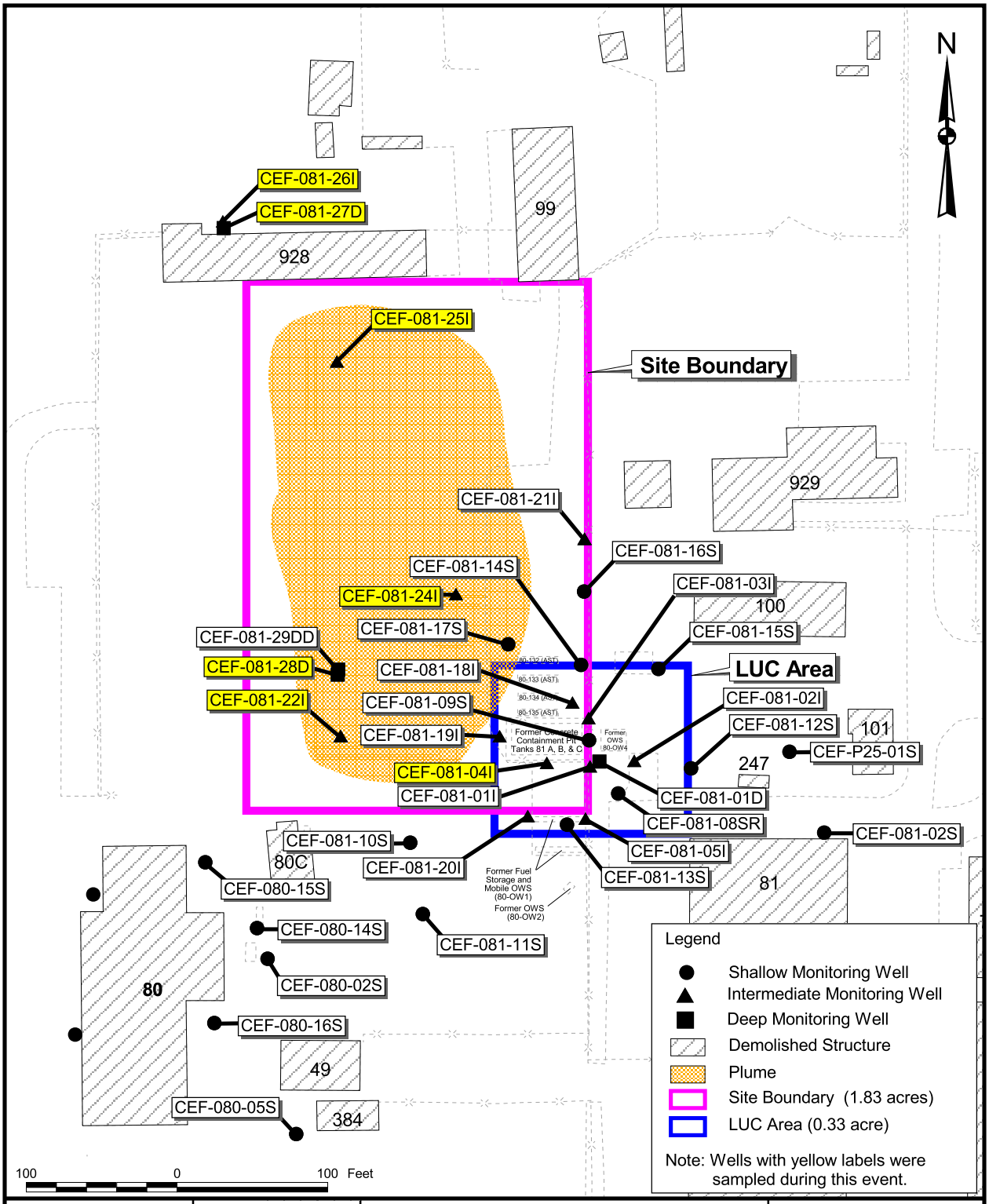
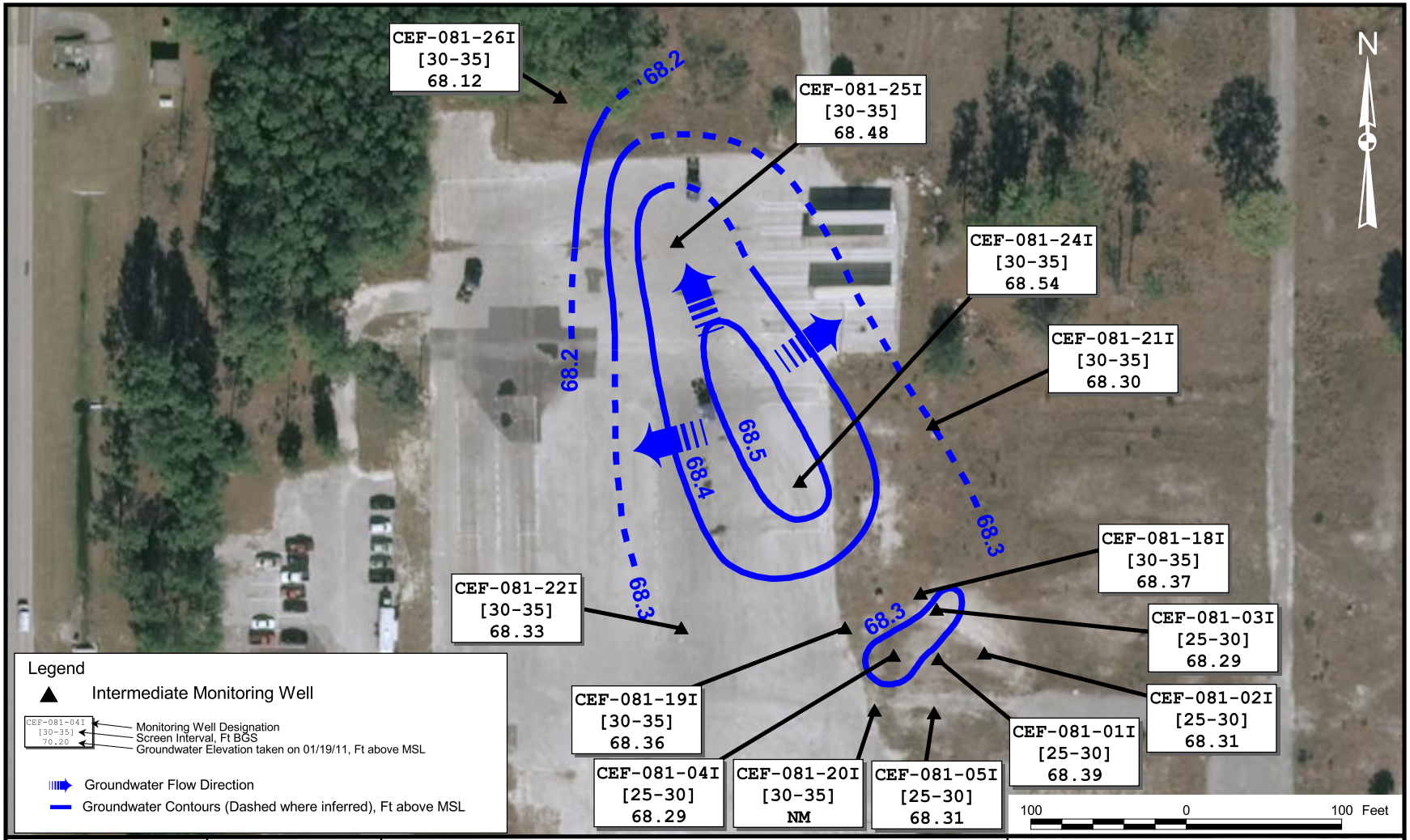


DRAWN BY MJJ	DATE 08Jan10	MONITORING WELL LOCATION MAP TANKS 81 A, B, & C 3rd QUARTERLY, YEAR 1 EVENT - JANUARY 2011 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 / REV 0

\GIS\NAS_CecilField\Tank_81abc_20110119.apr 19Mar11 MJJ Layout12



DRAWN BY	DATE
MJJ	29Jan11
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	

NAVFAC

INTERMEDIATE ZONE GROUNDWATER FLOW MAP

TANKS 81 A, B, & C

3rd QUARTERLY, YEAR 1 EVENT - JANUARY 2011

NAVAL AIR STATION CECIL FIELD

JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
2267	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	REV
FIGURE 3	0

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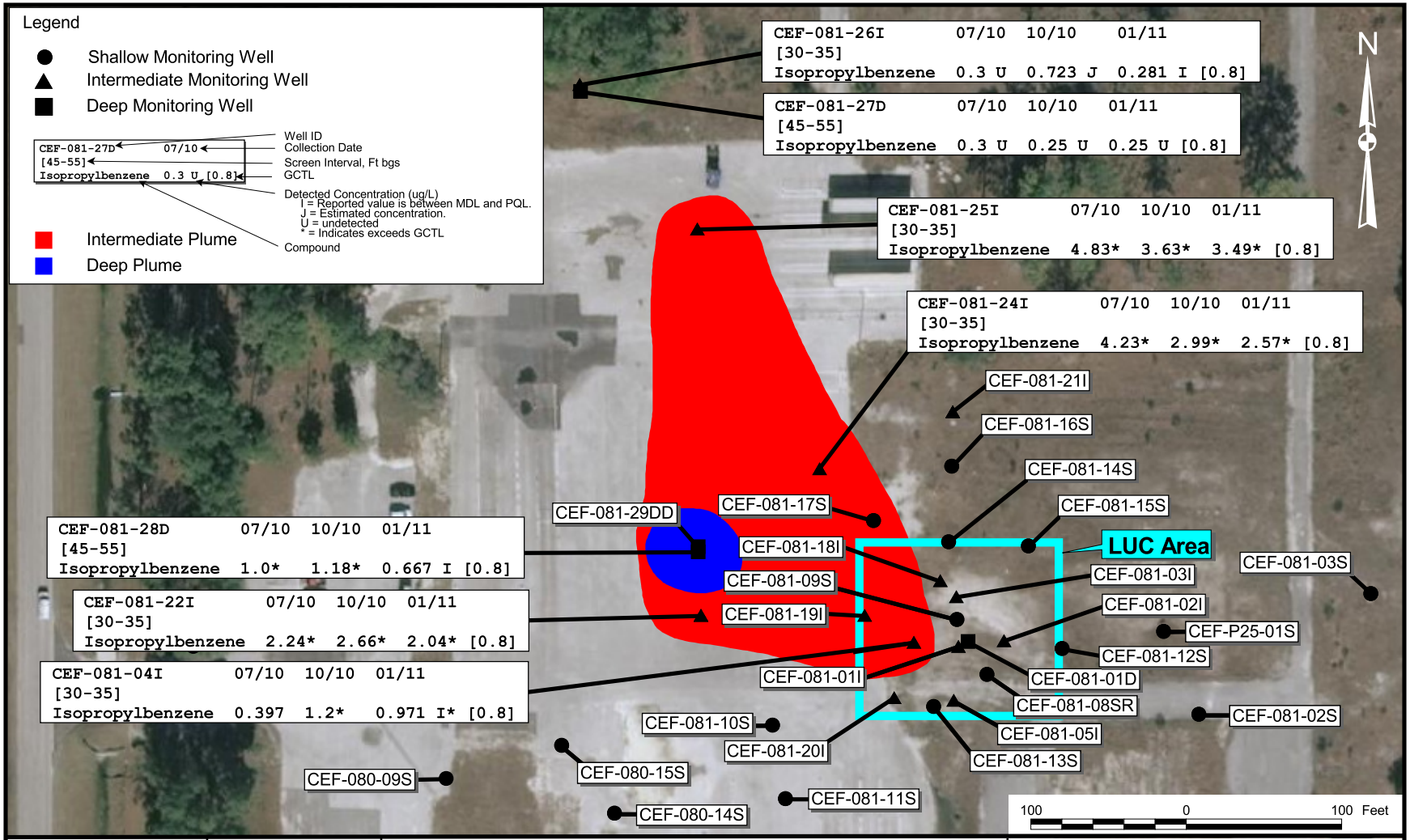

DRAWN BY	DATE
MJJ	08Jan10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

ISOPROPYLBENZENE RESULTS

TANKS 81 A, B, & C

3rd QUARTERLY, YEAR 1 EVENT - JANUARY 2011

NAVAL AIR STATION CECIL FIELD

JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
2267	
APPROVED BY	DATE
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ATTACHMENT A

SELECT WORKSHEETS
FROM THE UFP-SAP FOR TANKS 81 A, B, AND C
JULY 2010
AND FTMR 01

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

SAP Worksheet #11 -- Project Quality Objectives/Systematic Planning Process Statements (UFP-QAPP Manual Section 2.6.1)

11.1 PROBLEM DEFINITION

Isopropylbenzene remain in groundwater of the Tanks 81 A, B, and C area at concentrations that exceed FDEP GCTLs. The project team must determine the extent of the isopropylbenzene contamination in groundwater so an appropriate response can be formulated to mitigate the potential risk associated with this contamination.

11.2 INFORMATION INPUTS

Requirements for groundwater sampling and analysis methods are described below. Additional detail (e.g., the exact methods and SOPs to be used) is provided in Worksheets #15, #19, and #21.

Tanks 81 A, B, and C

Required Analyses

Matrix	Volatile Organic Compounds (VOCs)	Purpose
Groundwater	Isopropylbenzene only	Quarterly monitoring

Analytical Methods

Analytical methods were selected to be the same as those used previously or at least comparable to previously used analytical methods with respect to precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS parameters). See Worksheets #20 and #23 for a list of the analytical methods applicable to each site.

Sampling Methods

Sampling methods were selected to be the same as those used previously or to at least be consistent with the representativeness and comparability of data for each media being sampled at each site. See Worksheet #21 for a list of sampling methods.

Project Action Levels (PALs)

The PAL for isopropylbenzene in groundwater is included within Worksheet #15. The Project Quantitation Limit Goal (PQLG) is set as one-third of the PAL and project team strives to select analytical

methods which are capable of detecting concentrations equal to or less than the PQLG. The BCT has ensured that the selected laboratory (Empirical) Method Detection Limit (MDL) for isopropylbenzene is low enough to measure concentrations in groundwater that are less than the PAL in order to conduct comparisons of site data to the PAL, as the MDL is equal to the PQLG. Values less than the MDL will be reported as the limit of detection (LOD) value with a "U" flag. Detectable results of a magnitude between the limit of quantitation (LOQ) and MDL will be "J" flagged to indicate that the reported results are less precise than results that are greater than the LOQ. The BCT will accept these analytical results as usable (without additional qualification) without qualification unless quality evaluations indicate that the data quality has been compromised. Laboratory MDLs change over time. If the PAL is less than the reported laboratory MDL in any sample, the BCT accepts the LOQ as the PAL for decision making purposes, as is suggested in "Guidance for the Selection of Analytical Methods for the Evaluation of Practical Quantitation Limits" (FDEP, 2004).

11.3 STUDY BOUNDARIES

The Tanks 81 A, B, and C area covers approximately 0.33 acres. The area is show in Figure 8. The vertical boundary extends from the shallow groundwater plume to 52 ft bgs. The groundwater isopropylbenzene contaminant plume is the population of interest and constitutes the spatial decision unit. Three areas were identified that represent the plume or define the boundaries of the plume:

- Upgradient – represents conditions in groundwater entering the site and is thus unaffected by the site.
- Plume – represents conditions in the known isopropylbenzene plume.
- Downgradient – represents uncontaminated groundwater that could become contaminated through migration of contamination.

The temporal decision unit is each round of monitoring when determining whether an exceedance of GCTL has occurred and it is two consecutive monitoring rounds when determining whether parameters or wells may be eliminated from monitoring. Based on knowledge of groundwater flow directions and past data establishing the extent of isopropylbenzene contamination in excess of GCTLs (see Figure 8), existing wells cover enough of the contaminated and potentially contaminated areas for delineating the extent of isopropylbenzene contamination and monitoring temporal concentration trends. The groundwater sampling frequency must be quarterly to satisfy project objectives.

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

11.4 ANALYTIC APPROACH

The following decision rules govern data use for the monitoring programs at Tanks 81 A, B, and C. Each decision rule must be applied to each well in each round of sampling. If the decision rules lead to a change in the list of wells that are to be sampled, the PM will review the change in the list of wells with the BCT and gain the approval of the team prior to using the new list in a sampling event. Concentration trends will be represented by the best fit line through the data points.

Decision Rule #1: If the measured isopropylbenzene concentrations in groundwater samples from any monitoring well within the plume are less than the GCTL for the two most recent sampling events, then recommend the well for removal from the monitoring program; but if the last two rounds of measured isopropylbenzene concentrations in groundwater samples from a well are not less than the GCTL, then continue long-term monitoring in that well until levels of isopropylbenzene are below the GCTL for two consecutive sampling rounds. At this point, the BCT will recommend removal of the well from the sampling program.

Decision Rule #2: If the measured isopropylbenzene concentrations in a groundwater sample from all upgradient and downgradient wells are less than the GCTL, then continue with the scheduled monitoring program; otherwise resample any well in which concentrations exceed GCTL for verification prior to the next scheduled sampling event. If the exceedance is not confirmed, then continue with the scheduled monitoring program. If the exceedance is confirmed, the BCT will convene to determine appropriate actions to address the exceedance such as 1) verify groundwater flow direction, 2) further delineation of the plume, 3) modification of the sampling plan.

Decision Rule #3: If all measured isopropylbenzene concentrations in all groundwater samples collected from the targeted monitoring wells are less than the GCTL for two consecutive sampling events, then recommend the site for NFA.

11.5 PERFORMANCE CRITERIA

Measured isopropylbenzene concentrations in individual samples and temporal isopropylbenzene concentration trends within individual wells will be compared to the project action level. If all data have been collected as planned and no data points are missing or rejected for quality reasons, the monitoring event completeness and quality will be considered satisfactory. Quality evaluations will be performed in

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

accordance with Worksheets #35 through #37. If any data gaps are identified, including missing or rejected data, the BCT will assess whether a claim of having obtained project objectives is reasonable. This assessment will depend on the number and type of identified data gaps; therefore, a more detailed strategy cannot be presented. All stakeholders will be involved in rendering the final conclusion regarding adequacy of the data

11.6 PLAN FOR OBTAINING DATA

The plan for obtaining data at the Tanks 81 A, B, and C site is described in detail on Worksheet #17 along with the sampling designs and rationales.

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report, 1st Quarter, 1st Year

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

SAP Worksheet #14 -- Summary of Project Tasks

(UFP-QAPP Manual Section 2.8.1)

Summary of Project Tasks

Long-term monitoring at the petroleum sites includes the following tasks:

- Mobilization/demobilization
- Site-specific health and safety training
- Monitoring equipment calibration
- Groundwater level measurements
- Groundwater sampling
- Investigation-derived waste (IDW) management
- Field decontamination procedures
- Field documentation procedures
- Analytical Tasks
- Data Management

Mobilization/Demobilization

Mobilization shall consist of the delivery of all equipment, materials, and supplies to the site, the complete assembly in satisfactory working order of all such equipment at the site, and the satisfactory storage at the site of all such materials and supplies. Tetra Tech will store the equipment and supplies at either the Tetra Tech office or at the IDW Storage Building. Site-specific Health and Safety Training will be provided to all Tetra Tech subcontractors as part of the site mobilization.

Demobilization shall consist of the prompt and timely removal of all equipment, materials, and supplies from the site following completion of the work. Demobilization includes the cleanup and removal of IDW generated during the conduct of the investigation.

Site-Specific Health and Safety Training

Site-specific health and safety training will be provided to all Tetra Tech field staff and subcontractors as part of the site mobilization and is also addressed in Worksheet # 8.

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report, 1st Quarter, 1st Year

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

Monitoring Equipment Calibration

These procedures are described in Worksheet # 22.

Water Level Measurements

One synoptic round of water-level measurements will be conducted at the site as part of each groundwater sampling event to provide information regarding groundwater flow patterns and gradients. Water level measurements will be completed within the shortest time possible on the same day, and no sooner than 24 hours after a significant precipitation event to minimize the precipitation effects on the data sets. Water level measurements will be recorded to the nearest 0.01 foot and referenced to a top of casing notch or north side of the well casing, if there is no notch. The measurement instrument will be decontaminated prior to conducting the measurement event and between each monitoring well.

Groundwater Sampling

Groundwater samples will be collected using low-flow purging techniques (discharge rate of less than 1 liter per minute) with a peristaltic pump using Teflon™ tubing dedicated to each well. All groundwater samples will be collected using the procedures specified in FDEP FS 2200, Groundwater Sampling. Worksheets #17 and #18 specify the groundwater sample locations and analytes for this investigation. Worksheet # 23 specifies the analytical methods to be used.

Prior to groundwater sample collection, the monitoring wells will be purged. Both purging and sampling operations will be conducted at a flow rate that results in a groundwater turbidity measurement of 20 Nephelometric turbidity units (NTUs) or less (inherent turbidity will be minimized to the greatest extent possible using low flow techniques; individual well conditions and local geology may preclude meeting the 20 NTU criteria).

The sample aliquot for isopropylbenzene analysis will be collected last by slowly pulling the Teflon™ tubing out of the well to minimize agitation of the water in the monitoring well and then transferring the contents of the tubing to a VOC vial. After collection, the samples will be placed in a cooler, chilled with ice, and shipped under chain-of-custody protocol to the off-site laboratory for analysis.

Investigation Derived Waste (IDW) Management

IDW generated during the activities will be managed in accordance with the former NAS Cecil Field IDW Plan and will be conducted in an environmentally responsible manner consistent with former NAS Cecil Field requirements (e.g., designation of staging areas). The objectives of the IDW management are:

- Management of IDW in a manner that prevents contamination of uncontaminated areas (by IDW) and that is protective of human health and the environment.

- Minimization of IDW, thereby reducing costs and the potential for human or ecological exposure to contaminated materials.

- Compliance with federal and state requirements that are Applicable or Relevant and Appropriate Requirements (including 62-770.400, 62-770.650, 62-770.680, 62-770.690, 62-770.700, 62-770.750, 62-770.800, 62-770.890, 62-770.900 FAC).

Used personal protective equipment, such as gloves, will be bagged and disposed of as regular trash in an appropriate facility waste container.

Field Decontamination Procedure

Decontamination of major equipment and sampling equipment will be in general accordance with FDEP FC 1000, Cleaning / Decontamination Procedures.

Field Documentation Procedures

Pre-preserved, certified-clean bottleware will be supplied by the subcontracted laboratory. Matrix-specific sample logsheets will be maintained for each sample collected. In addition, sample collection information will be recorded in bound field notebooks or specific field forms. Samples will be packaged and shipped according to FDEP FS 1000, General Sampling Procedures.

Field documentation will be performed in accordance with Tetra Tech SOP SA-6.3 (Appendix C). A summary of all field activities will be properly recorded in a bound logbook with consecutively number pages that cannot be removed. Logbooks will be assigned to field personnel and will be stored in a secured area when not in use.

At a minimum, the following information will be recorded in the site logbook:

- Name of the person to whom the logbook is assigned.
- Project name.
- Project start date.
- Names and responsibilities of on-site project personnel including subcontractor personnel.
- Arrival/departure of site visitors.
- Arrival/departure of equipment.
- Sampling activities and sample log sheet references.
- Description of subcontractor activities.
- Sample pick-up information, including chain-of-custody numbers, air bill numbers, carrier, time, and date.
- Description of borehole or monitoring well installation activities and operations.
  - Health and safety issues.
  - Description of photographs including date, time, photographer, roll and picture number, location, and compass direction of photograph.

All entries will be written in ink and no erasures will be made. If an incorrect entry is made, striking a single line through the incorrect information will make the correction; the person making the correction will initial and date the change.

Analytical Tasks

Chemical analysis will be performed by Empirical. Empirical is a current Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) certified laboratory. A copy of the laboratory certification can be found in Appendix E. Analyses will be performed in accordance with the analytical methods identified in Worksheet #19. Empirical will meet the PAL as shown in Worksheet #15. Empirical will perform chemical analysis following laboratory-specific SOPs (Worksheets #19 and #23) developed based on the analytical methods listed in Worksheets #19 and #30. Copies of the laboratories SOPs are included in Appendix C.

Data Management

Data Handling and Management - After the field investigation is completed, the field sampling log sheets will be organized by date and media and filed in the project files. The field logbooks for this project will be used only for these sites, and will also be categorized and maintained in the project files after the completion of the field program. Project personnel completing concurrent field sampling activities may maintain multiple field logbooks. When possible, logbooks will be segregated by sampling activity. The field logbooks will be titled based on date and activity. The data handling procedures to be followed by the laboratories will meet the requirements of the technical specification. The electronic data results will be automatically downloaded into the Tetra Tech database in accordance with proprietary Tetra Tech processes.

Data Tracking and Control.-The Tetra Tech PM (or designee) is responsible for the overall tracking and control of data generated for the project.

- Data Tracking: Data is tracked from its generation to its archiving in the Tetra Tech project-specific files. The Tetra Tech Project Chemist (or designee) is responsible for tracking the samples collected and shipped to the subcontracted laboratory. Upon receipt of the data packages from the analytical laboratory, the Project Chemist will oversee the data validation effort, which includes verifying that the data packages are complete and results for all samples have been delivered by the analytical laboratory.

- Data Storage, Archiving, and Retrieval: The data packages received from the subcontracted laboratory are tracked in the data validation logbook. After the data are validated, the data packages are entered into the Tetra Tech CLEAN file system and archived in secure files. The field records including field logbooks, sample logs, chain-of-custody records, and field calibration logs will be submitted by the FOL to be entered into the CLEAN file system prior to archiving in secure project files. The project files are audited for accuracy and completeness. At the completion of the Navy contract the records will be stored by Tetra Tech and eventually handed over to BRAC PMO.

- Data Security: The Tetra Tech project files are restricted to designated personnel only. Records can only be borrowed temporarily from the project file using a sign-out system. The Tetra Tech Data Manager maintains the electronic data files. Access to the data files is restricted to qualified personnel only. File and data backup procedures are routinely performed.

Assessment and Oversight – Refer to Worksheet #32 for assessment findings and CAs and Worksheet #33 for QA management reports.

Data Review

- Data verification is described in Worksheet #34.
- Data validation is described in Worksheets #35 and #36.
- Usability assessment is described in Worksheet #37.

Monitoring Reports

Monitoring reports will be prepared after each groundwater monitoring event. The reports will include appropriate sections concerning site background, investigation activities, physical characteristics, nature and extent of contamination, and conclusions and recommendations.

Each report will be issued in draft to BRAC PMO SE as the presentation of the data at the quarterly BCT meetings. Comments received from the BCT during the BCT meetings will be addressed and the final report will be issued for regulatory review.

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report, 1st Quarter, 1st Year

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

SAP Worksheet #15 -- Reference Limits for Groundwater

(UFP-QAPP Manual Section 2.8.1)

Matrix: Groundwater
Analytical Group: VOCs

Analyte	Chemical Abstract Service Number	Project Action Limit (1) (µg/L)	Project Action Limit Reference	Project Quantitation Limit Goal (2) (µg/L)	Empirical		
					LOQ (µg/L)	LOD (µg/L)	MDL (µg/L)
Isopropylbenzene	98-82-8	0.8	FDEP GCTL	0.3	1.0	0.50	0.3

1 FDEP GCTLs, April 2005.
2 The laboratory QL does not meet the PAL; however, the MDL is sufficiently low to detect isopropylbenzene below the FDEP GCTL. Results reported between the MDL and LOQ will be flagged by the laboratory and will be considered usable for decision-making.
µg/L = Micrograms per liter.

Attachment A - Building 81, Tanks 81 A, B, and C Groundwater Monitoring Report, 1st Quarter, 1st Year

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

SAP Worksheet #18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

Sampling Location / Identification Number	**Matrix**	**Screen Interval**	**Analytical Group**	**Number of Samples** (identify field duplicates)(1)	**Sampling SOP Reference**(2)
Upgradient well CEF-81-04I; Plume well CEF-81-22I; Plume well CEF-81-24I; Plume well CEF-81-25I; Downgradient well CEF-81-26I;	Groundwater	30-35 feet below ground surface (bgs)	VOCs (isopropyl-benzene only)	7 plus 1 duplicate, plus 1 trip blank	FDEP FS 2200, 2008; Tetra Tech, SA-1.1, April 2008
Downgradient well CEF-81-27D; and Plume well CEF-81-28D		45 to 55 feet bgs			

1 Field duplicates may be consolidated across events at the FOL's discretion so as to yield one field duplicate per 10 environmental samples

2 SOP that describes the sample collection procedures.

The following was extracted from the UFP SAP for Tanks 81 A, B, C for information purposes and is not the complete approved document.

SAP Worksheet #20 -- Field Quality Control Sample Summary Table

(UFP-QAPP Manual Section 3.1.1)

Matrix	Analytical Group	Number of Sampling Locations	Number of Field Duplicates	Number of Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	Number of Rinsate Blanks	Number of Equipment Blanks	Number of (Volatile Organic Aromatic) Trip Blanks	Number of Proficiency Testing Samples	Total Number of Samples to Lab
Groundwater	VOC (isopropyl-benzene only)	7	1	1/1	0	0	1	0	11

TETRA TECH NUS
FIELD TASK MODIFICATION REQUEST FORM

LTM/NAS Cecil Field Project/Installation Name	**CTO JM09, 112G002267** CTO & Project Number	**01** Task Mod. Number
SAP for Tanks 81 A, B, and C Modification To (e.g. Work Plan)	**Tanks 81 A, B, and C** Site/Sample Location	**12/1/10** Date

Activity Description: The groundwater at Building 81, Tanks A, B, and C is currently being sampled and analyzed for isopropylbenzene on a quarterly basis in accordance with the Sampling and Analysis Plan (SAP) for Tanks 81 A, B, and C. The SAP identifies seven total monitoring wells (CEF-081-04I, CEF-081-22I, CEF-081-24I, CEF-081-25I, CEF-081-26I, CEF-081-27D, and CEF-081-28D) from which groundwater is to be sampled during the quarterly events. Prior to obtaining groundwater samples during the quarterly events, synoptic water levels and total wells depths are measured and recorded on a site-specific groundwater measurement sheet for the sample wells. It was identified during the July 2010 sampling event that the intermediate groundwater flow was estimated to be to the north-northwest and south-southwest. Prior to this event, groundwater flow at the site was estimated to be to the north-northwest, and occasionally slightly northeast only. The southern component measured during this event is the first southern groundwater flow component at the site since sampling began. Based on this finding, the Team decided during the November 2010 BCT meeting that water levels measurements will be collected from eight additional wells (CEF-081-01I, CEF-081-02I, CEF-081-03I, CEF-081-05I, CEF-081-18I, CEF-081-19I, CEF-081-20I, CEF-081-21I) during future quarterly sampling events to estimate intermediate zone groundwater flow. The wells included in the quarterly groundwater sampling events, as well as the additional groundwater elevation measurement wells are shown on Figure 1.

Reason for Change: An unforeseen groundwater flow component was measured during the July 2010 sampling event. Results of this additional assessment will provide information to be used in determining if the existing sampling plan is adequate for the site conditions. The proposed changes to the sampling plan are relatively minor and therefore preparing a new UFP SAP for this modification is not appropriate.

Recommended Disposition: Verification of acceptance of the revised sampling program via approval of this FTMR via e-mail approval from Tetra Tech PM, BRAC PMO RPM, EPA, and FDEP (attached in project file).

T. Johnston — 11-29-10

Quality Assurance Manager (QAPP lead developer) — Date

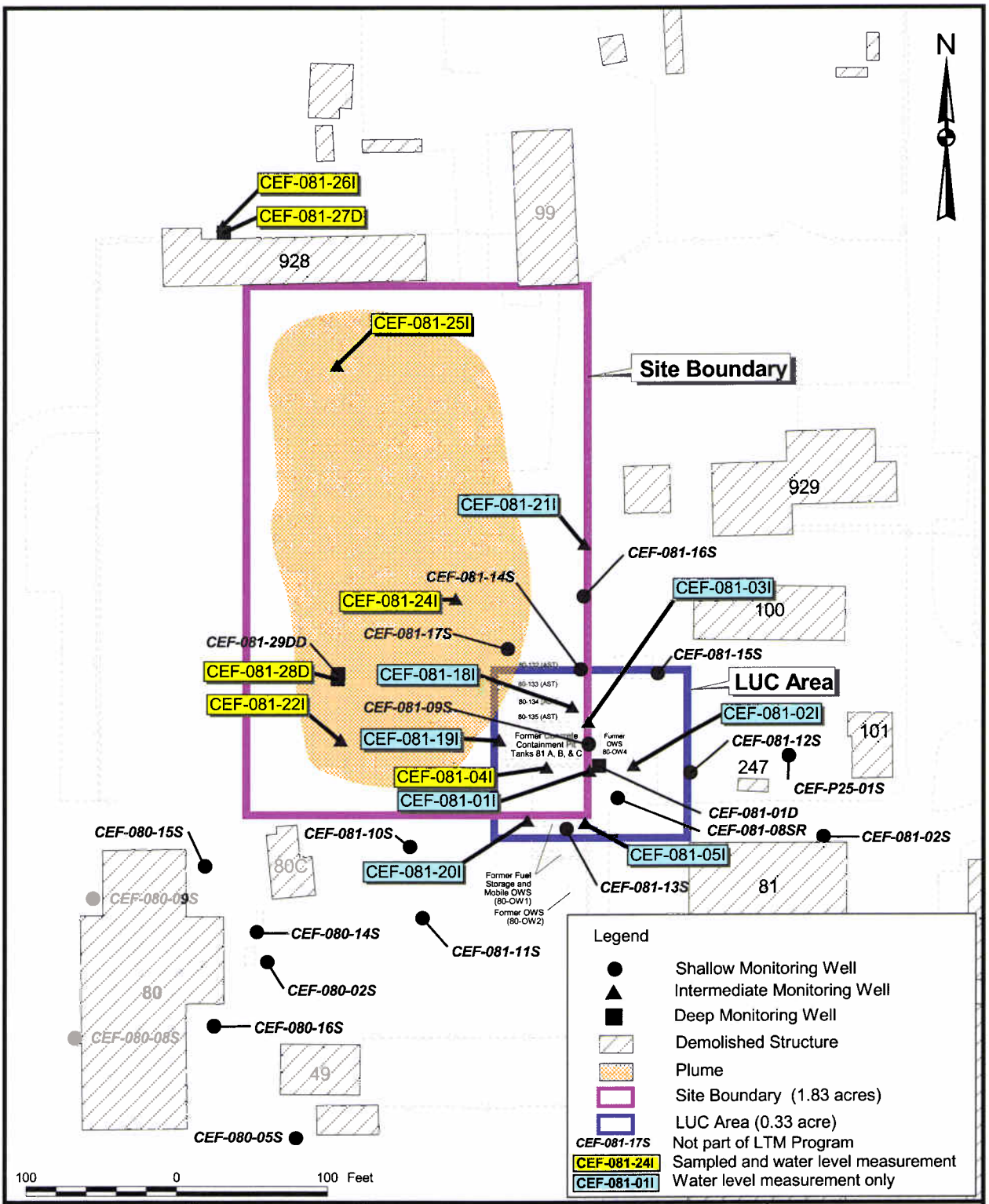
Approved Disposition:

Project/Task Order Manager (Signature) — 11/29/10 Date

Distribution:

Program/Project File – 112G02267
Project/Task Order Manager – Robert Simcik
Field Operations Leader – Jeff Krone
BRAC PMO RPM – Art Sanford

Other: _____



DRAWN BY MJJ	DATE 24Nov10	MONITORING WELL LOCATION MAP TANKS 81 A, B, & C 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

NAVFAC

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ATTACHMENT B

FIELD DOCUMENTATION
JANUARY 2011

Tetra Tech NUS, Inc.

YSI EQUIPMENT CALIBRATION SHEET

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: YSI 556 MPS

SITE NAME: Tanks 81 A, B, C

MANUFACTURER: YSI

PROJECT No.: 112G02267

SERIAL NUMBER: 10J100598

		Date of Calibration (mm/dd/yy)	Person Performing Calibration (Name)	Machine Serial No.	Machine Settings	Instrument Readings Pre-cal	Instrument Readings Post-cal	Calibration Standard (Lot#/Expiration Date)	Comments
pH (4)	(S.U.)	1/19/11	JK	10J100598		3.57	4.00	Lot# 2803109 Exp.Date: 6/11	
pH (10)	(S.U.)					8.95	10.00	Lot# 1002035 Exp.Date: 7/11	
D.O.	%				100%	100%	100%	Lot# Exp.Date:	
Cond.	(mS/cm)				1.413	1.414	1.413	Lot# 7809 Exp.Date: 3/11	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)				240	239.8	240	Lot# 2232 Exp.Date: 3/15	
								Lot# Exp.Date:	
pH (4)	(S.U.)							Lot# Exp.Date:	
pH (10)	(S.U.)							Lot# Exp.Date:	
D.O.	%							Lot# Exp.Date:	
Cond.	(mS/cm)							Lot# Exp.Date:	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)							Lot# Exp.Date:	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NAS Cecil Field

SITE NAME: Tanks 81 A, B, C

PROJECT No.: 112G02267

INSTRUMENT NAME/MODEL: Turbidimeter

MANUFACTURER:

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
11/19/11	~~103100 SN~~	K	1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	13.6	10.00		
	M= 11480		1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	.33	1.00		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
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			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: 81 ABC
Location: NAS Cecil Field
Weather Conditions: Cloudy 65°
Tidally Influenced: Yes ___ No _X_

Project No.: CTO JM09 112G02267
Personnel: Jeff Krone
Measuring Device: KECK
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)* NAVD-88	Total Well Depth (feet)*	Water Level Indicator Reading (feet)* BTOC	Thickness of Free Product (feet)*	Groundwater Elevation (feet)* NAVD-88	Comments
CEF-081-04I	1/19/11	0956	77.54	30.00	9.25			
CEF-081-22I		0952	78.35	35.00	10.02			
CEF-081-24I		0942	78.39	35.00	9.85			
CEF-081-25I		0943	78.19	35.00	9.71			
CEF-081-26I		0947	77.87	35.00	9.75			
CEF-081-21I		1008	78.78	35.00	10.48			
CEF-081-18I		0921	78.33	35.00	9.96			
CEF-081-19I		0958	78.15	35.00	9.79			
CEF-081-20I	Destroyed		77.63	35.00				
CEF-081-05I	1/19/11	1001	77.84	30.00	9.53			
CEF-081-02I		1020	77.42	30.00	9.11			
CEF-081-01I		1004			9.34			
CEF-081-03I		0919		30.43	9.49			
CEF-081-27D		0946			9.70			
CEF-081-28D		0950			9.83			
CEF-081-15S		0924		15.03	9.66			
CEF-081-14S		0935		13.38	9.94			

* All measurements to the nearest 0.01 foot

Tetra Tech NUS / FDEP Groundwater Sampling Sheet

SITE NAME: **Tanks 81 ABC**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-081-04I	SAMPLE ID: CEF-081-04I-201101 19	DATE: 01 / 19 / 2011

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 25-30	STATIC DEPTH TO WATER (ft): 9.25	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)
3.6 Liters (0.00529 x 35 + 1) (3)

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
3.6 Liters (0.00529 x 35 + 1) (3)

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 27	PURGE INITIATED AT: 1210	PURGE ENDED AT: 1226	TOTAL VOLUME PURGED (Liters): 4.0

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	—	—	400	9.28	—	—	—	—	—	—	Clear
1215	2.0	2.0	200	9.41	5.77	24.07	0.070	0.93	11.3	46.3	↓
1220	1.0	3.0	200	9.35	5.80	24.15	0.076	0.31	8.64	15.2	↓
1225	1.0	4.0	200	9.33	5.80	24.13	0.074	0.27	5.10	13.1	↓
1226	Sample	Time									

WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12" = 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ ~~Jeff Krone~~ Zach Scribner	SAMPLER(S) SIGNATURES: Zach Scribner	SAMPLING INITIATED AT: 1226	SAMPLING ENDED AT: 1228
PUMP OR TUBING DEPTH IN WELL (feet): 27	SAMPLE PUMP FLOW RATE (mL per minute): 200	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				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
VOCs Iso benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Isobenzene only

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: Tanks 81 A,B,C	SITE LOCATION: NAS Cecil Field	
WELL NO: CEF-081-22I	SAMPLE ID: CEF-081-22I-201101 19	DATE: 10 / 19 / 2011

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 30.5-35.5	STATIC DEPTH TO WATER (ft): 9.98	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)

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

3.63 Liters (0.00529 x 40 + 1)(3)

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 33	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 33	PURGE INITIATED AT: 1130	PURGE ENDED AT: 1155	TOTAL VOLUME PURGED (Liters): 4.0

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
1130	—	—	200	9.98	—	—	—	—	—	—	—
1135	1.0	1.0	200	10.03	4.91	24.41	0.118	0.67	120	119.2	Clear
1140	1.0	2.0	200	10.04	4.92	24.58	0.119	0.54	20.2	120.9	
1145	1.0	3.0	200	10.04	4.93	24.63	0.119	0.42	21.7	128.7	
1150	0.5	3.5	100	10.02	4.93	24.55	0.118	0.48	16.3	132.4	
1155	0.5	4.0	100	10.01	4.93	24.57	0.119	0.49	8.42	139.6	

WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12"= 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ ~~Jeff Krone~~ Zach Scribner	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1155	SAMPLING ENDED AT: 1155
PUMP OR TUBING DEPTH IN WELL (feet): 33	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				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
VOCs Iso-benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Iso-benzene only

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: Tanks 81 A,B,C	SITE LOCATION: NAS Cecil Field
WELL NO: CEF-081-24I	SAMPLE ID: CEF-081-24I-201101 19 — DATE: 01/ 19 /2011

PURGING DATA

WELL DIAMETER (in): 1"	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 30-35	STATIC DEPTH TO WATER (ft): 9.89	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)

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 3.63 Liters (0.00529 x 40 + 1)(3)

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 32	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 32	PURGE INITIATED AT: 1035	PURGE ENDED AT: 1051	TOTAL VOLUME PURGED (Liters): 4.0

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
1035	—	—	200	9.89	—	—	—	—	35.1	—	clr
1040	2.0	2.0	200	9.74	5.78	22.56	0.136	0.47	14.2	29.1	↓
1045	1.0	3.0	200	9.78	5.74	22.58	0.138	0.36	7.52	31.3	↓
1050	1.0	4.0	200	9.78	5.74	22.57	0.139	0.36	7.04	37.4	↓
1051	Sample Time										

WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12"= 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ ~~Jeff Krone~~ Zach Scribner	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1051	SAMPLING ENDED AT: 1054
PUMP OR TUBING DEPTH IN WELL (feet): 32	SAMPLE PUMP FLOW RATE (mL per minute): 200	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		
VOCs Iso-benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Iso-benzene only

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: Tanks 81 A,B,C	SITE LOCATION: NAS Cecil Field
WELL NO: CEF-081-25I	SAMPLE ID: CEF-081-25I-201101 19 — DATE: 01 / 19 / 2011

PURGING DATA

WELL DIAMETER (in): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 30-35	STATIC DEPTH TO WATER (ft): 9.71	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) _____ Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 3x=3.63 1.21 Liters .00529 x 40 = .21 +1 = 1.21

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 33	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 33	PURGE INITIATED AT: 1135	PURGE ENDED AT: 1201	TOTAL VOLUME PURGED (Liters): 5.2

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
1035	—	—	200	9.71	—						
1155	4.0	4.0	200	10.21	4.08	24.73	107	0.44	5.22	-54.4	-
1158	.6	4.6	200	10.24	4.07	24.70	107	0.46	4.12	-54.8	clear
1201	.6	5.2	200	10.21	4.07	24.70	107	0.45	1.93	-53.9	clear
1208	Sample time										

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.0757; **1"** = 0.151; **1.25"** = 0.227; **2"** = 0.605; **3"** = 0.37; **4"** = 1.40; **5"** = 3.861; **6"** = 5.564; **12"** = 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): **1/8"** = 0.00227; **3/16"** = 0.00529; **1/4"** = 0.00984; **5/16"** = 0.0151; **3/8"** = 0.0227; **1/2"** = 0.0378; **5/8"** = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jeff Krone	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1208	SAMPLING ENDED AT: 1220
PUMP OR TUBING DEPTH IN WELL (feet): 33	SAMPLE PUMP FLOW RATE (mL per minute): 200	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				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
VOCs Iso-benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Iso-benzene only

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: **Tanks 81 A,B,C**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-081-26I	SAMPLE ID: CEF-081-26I-201101 19	DATE: 01 / 19 / 2011

PURGING DATA

WELL DIAMETER (in): ~~2~~ 1"	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 30-35	STATIC DEPTH TO WATER (ft): 9.75	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) _____ Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 3.63 Liters ~~.0014~~ .00529 X 40 = .21 + 1 = 1.2116

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 33	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 33	PURGE INITIATED AT: 1030	PURGE ENDED AT: 1056	TOTAL VOLUME PURGED (Liters): 5.2	

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
1030	—	—	200	9.75	—	—	—	—	—	—	—
1050	4.0	4.0	200	9.89	4.84	22.96	97	0.47	1.40	-57.9	clear
1053	.6	4.6	200	9.89	4.84	23.00	97	0.46	1.36	-58.0	clear
1056	.6	5.2	200	9.89	4.82	23.01	98	0.45	1.23	-57.9	clear
1103	Sample time										

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.0757; **1"** = 0.151; **1.25"** = 0.227; **2"** = 0.605; **3"** = 0.37; **4"** = 1.40; **5"** = 3.861; **6"** = 5.564; **12"**= 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): **1/8"** = 0.00227; **3/16"** = 0.00529; **1/4"** = 0.00984; **5/16"** = 0.0151; **3/8"** = 0.0227; **1/2"** = 0.0378; **5/8"** = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jeff Krone	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1103	SAMPLING ENDED AT: 1110
PUMP OR TUBING DEPTH IN WELL (feet): 33	SAMPLE PUMP FLOW RATE (mL per minute): 200	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				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
VOCs Iso-benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Iso-benzene only

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: **Tanks 81 A,B,C**	SITE LOCATION: **NAS Cecil Field**	
WELL NO: CEF-081-27D	SAMPLE ID: CEF-081-27D-201101 19	DATE: 01/ 19 /2011

PURGING DATA

WELL DIAMETER (in): 1" 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 50-55	STATIC DEPTH TO WATER (ft): 9.70	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)

Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 3x: 3.95 1.31 .00529 x 60 = .3174 ft = 1.3

Liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 53	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 53	PURGE INITIATED AT: 1040	PURGE ENDED AT: 1106	TOTAL VOLUME PURGED (Liters): 5.2

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
1040	—	—	200	9.70	—	—	—	—	—	—	—
1100	4.0	4.0	200	9.78	4.81	22.52	62	0.42	6.25	-61.1	clear
1103	.6	4.6	200	9.78	4.80	22.55	62	0.44	7.39	-61.3	clear
1106	.6	5.2	200	9.78	4.80	22.55	62	0.44	6.48	-61.4	clear
1113	Sample time										

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.0757; **1"** = 0.151; **1.25"** = 0.227; **2"** = 0.605; **3"** = 0.37; **4"** = 1.40; **5"** = 3.861; **6"** = 5.564; **12"** = 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): **1/8"** = 0.00227; **3/16"** = 0.00529; **1/4"** = 0.00984; **5/16"** = 0.0151; **3/8"** = 0.0227; **1/2"** = 0.0378; **5/8"** = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ Jeff Krone	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1113	SAMPLING ENDED AT: 1122
PUMP OR TUBING DEPTH IN WELL (feet): 53	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: Teflon	CEF-081-DUP01-20110119
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N) Filtration Equipment Type: ____ FILTER SIZE: ____ µm		DUPLICATE: (Y) N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
VOCs Iso-benzene	3	CG	40 ml	HCl			8260B	

REMARKS:
Iso-benzene only

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: **Tanks 81 A,B,C**	SITE LOCATION: **NAS Cecil Field**
WELL NO: CEF-081-28D	SAMPLE ID: CEF-081-28D-20111 19 / DATE: 01 / 19 / 2011

PURGING DATA

WELL DIAMETER (in): 1"	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH (ft): 50-55	STATIC DEPTH TO WATER (ft): 9.84	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) _____ Liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable) 4.0 Liters (0.00529 x 60 + 1) 3

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 52	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 52	PURGE INITIATED AT: 1100	PURGE ENDED AT: 1117	TOTAL VOLUME PURGED (Liters): 4.4

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
1100	—	—	400	9.84				—	20.1	—	clear
1105	2.0	2.0	200	9.96	5.53	22.98	0.125	0.54	11.1	-12.4	↓
1110	1.0	3.0	200	10.01	4.98	23.10	0.133	0.27	4.19	10.9	
1115	1.0	4.0	200	10.03	4.94	23.14	0.134	0.25	3.29	41.7	
1117	0.4	4.4	200	10.01	4.91	23.14	0.135	0.24	3.14	43.7	

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.0757; **1"** = 0.151; **1.25"** = 0.227; **2"** = 0.605; **3"** = 0.37; **4"** = 1.40; **5"** = 3.861; **6"** = 5.564; **12"** = 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): **1/8"** = 0.00227; **3/16"** = 0.00529; **1/4"** = 0.00984; **5/16"** = 0.0151; **3/8"** = 0.0227; **1/2"** = 0.0378; **5/8"** = 0.0605

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: TtNUS/ ~~Jeff Krone~~ Zach Scribner	SAMPLER(S) SIGNATURES: [signature]	SAMPLING INITIATED AT: 1117	SAMPLING ENDED AT: 1122
PUMP OR TUBING DEPTH IN WELL (feet): 52	SAMPLE PUMP FLOW RATE (mL per minute): 200	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		
VOCs Isobenzene	3	CG	40 ml	HCl			8260B	

REMARKS: Iso-benzene only
*MS/MSD

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.

CHAIN OF CUSTODY

NUMBER № 2136

PAGE ____ OF _____

PROJECT NO: 112602867	FACILITY: Cecil Field 81 ABC	PROJECT MANAGER: Rob Simcik	PHONE NUMBER: 412 921 8163	LABORATORY NAME AND CONTACT: Empirical Labs/Kim Kostzer
SAMPLERS (SIGNATURE): Jeff Kronc		FIELD OPERATIONS LEADER: Jeff Kronc	PHONE NUMBER: 904 699 7473	ADDRESS: 621 Mainstream Drive Suite 270
		CARRIER/WAYBILL NUMBER: 8660 1730 2311		CITY, STATE: Nashville, TN 37228

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED: HCl

TYPE OF ANALYSIS: VOCs (Isopropyl Benzene 8260)

DATE YEAR 2011	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 (Isopropyl Benzene 8260)								COMMENTS
1/19	1051	CEF-081-24I-20110119				GW	G	3	X								Cool to 4°C
1/19	1103	CEF-081-26I-20110119				GW	G	3	X								
1/19	1113	CEF-081-27D-20110119				GW	G	3	X								
1/19	0000	CEF-081-DUP01-20110119				GW	G	3	X								
1/19	1117	CEF-081-28D-20110119				GW	G	9	X								MS/MSD
1/19	1155	CEF-081-22I-20110119				GW	G	3	X								
1/19	1208	CEF-081-25I-20110119				GW	G	3	X								
1/19	1226	CEF-081-04I-20110119				GW	G	3	X								
		Trip Blank				QC	G	2									

1. RELINQUISHED BY	DATE 1/19/11	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

112602267 NAS Cecil Field GW Sampling 815 Wash Rack 19 Jan 11

Personnel: Jeff Krone and Zach Scribner
Truck: 2001 and 2006 F-250
PPE: Level D
Weather: Partly Cloudy 60°
Objective: Groundwater Sampling

0730 Departed home for Cecil Field
0800 Arrived at Tower, moved to Site
0815 On Site, began uncapping wells and calibrating instruments
0921 Commenced gw level measurements.
1020 Completed measurements, commenced sampling event. See table below for details.

Well ID	Sample ID	Start	Stop	Sample time	analysis
81-24I	CEF-081-24I-20110119	1035	1050	1051	VOCs
81-26I	CEF-081-26I-20110119	1030	1056	1103	VOCs
81-27D	CEF-081-27D-20110119 *	~~1040~~ 1040	1106	1113	VOCs
81-28D	CEF-081-28D-20110119 * *	1100	1117	1117	VOCs
81-22I	CEF-081-22I-20110119	1130	1155	1155	VOCs
81-25I	CEF-081-25I-20110119	1135	1201	1208	VOCs
81-04I	CEF-081-04I-20110119	1210	1225	1226	VOCs

* Indicates Duplicate sample CEF-081-DUP01-20110119
** Indicates MS/MSD All samples cooled to 4°c

1300 Completed sampling event, packed equipment and samples for transportation, gave IDW to Zach Scribner for disposal in tote 3.
1315 Departed Cecil Field
1415 Transferred Samples to Empirical Labs via FedEx Airbill 8660 1730 2311.
1500 Arrived at office

FedEx Express **US Airbill**

FedEx Tracking Number **8660 1730 2311**

Form ID No. 0215 **Sender's Copy**

From *Please print and press hard.*

Date 1/19/11 Sender's FedEx Account Number 1772-0315-7

Sender's Name DISTRIBUTION Phone (904) 636-6125

Company TETRA TECH NUS INC/GOVT

Address 8640 PHILIPS HWY STE 16 Dept./Floor/Suite/Room

City JACKSONVILLE State FL ZIP 32256-1209

Your Internal Billing Reference First 24 characters will appear on invoice. 112602267

To

Recipient's Name Sample Receiving Phone (615) 345 1115

Company Empirical Laboratories

Recipient's Address 621 mainstream Drive

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address Suite 270

To request a package be held at a specific FedEx location, print FedEx address here.

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0383105710

Schedule a pickup at fedex.com
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4a Express Package Service *Packages up to 150 lbs.*

- [x] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate. * To most locations.

4b Express Freight Service *Packages over 150 lbs.*

- [ ] FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation. ** To most locations.

5 Packaging

- [ ] FedEx Envelope*
- [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak.
- [ ] FedEx Box
- [ ] FedEx Tube
- [x] Other

* Declared value limit $500.

6 Special Handling Include FedEx address in Section 3.

- [ ] SATURDAY Delivery — NOT Available for FedEx Standard Overnight, FedEx First Overnight, FedEx Express Saver, or FedEx 3Day Freight.
- [ ] HOLD Weekday at FedEx Location — NOT Available for FedEx First Overnight.
- [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

- [x] No
- [ ] Yes — As per attached Shipper's Declaration.
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry ice, 9, UN 1845 _____ x _____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging. [ ] Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below.

- [x] Sender — Acct. No. in Section 1 will be billed.
- [ ] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

FedEx Acct. No. / Credit Card No. Exp. Date

Total Packages	Total Weight	Total Declared Value†
1		$ .00

†Our liability is limited to $100 unless you declare a higher value. See back for details. By using this Airbill you agree to the service conditions on the back of this Airbill and in the current FedEx Service Guide, including terms that limit our liability.

8 Residential Delivery Signature Options If you require a signature, check Direct or Indirect.

- [ ] No Signature Required — Package may be left without obtaining a signature for delivery.
- [ ] Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.
- [ ] Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. Fee applies.

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Rev. Date 10/06•Part #158279•©1994-2006 FedEx•PRINTED IN U.S.A.•SRS

FedEx Office

10400 SAN JOSE BLVD
JACKSONVILLE, FL 32257

Location: NRBKK
Device ID: NRBKK-POS2
Employee: 2264346
Transaction: 76098841446

PRIORITY OVERNIGHT 30.95
866017302311 32.70 lb (S)
Scheduled Delivery Date 01/20/2011

Shipment subtotal: 30.95

Total Due: 30.95

FedEx Account: 30.95
*****3157

N = Weight entered manually
S = Weight read from scale
T = taxable item

Subject to additional charges. See FedEx Service Guide at fedex.com for details. All merchandise sales final.

Visit us at: fedex.com
Or call 1.800.GoFedEx
1.800.463.3339

ATTACHMENT C

GROUNDWATER ANALYTICAL REPORT
JANUARY 2011

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**R. SIMCIK**	**DATE:**	**MARCH 17, 2011**
FROM:	**MICHELLE ALLEN**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION – ISOPROPYLBENZENE/VOC**
CTO JM09, NAS CECIL FIELD
SDG CTOJM09CF_12

SAMPLES: 9/Aqueous /VOC

CEF-081-04I-20110119	CEF-081-22I-20110119	CEF-081-24I-20110119
CEF-081-25I-20110119	CEF-081-26I-20110119	CEF-081-27D-20110119
CEF-081-28D-20110119	CEF-081-DUP-01-20110119	Trip Blank_20110119

OVERVIEW

The sample set for NAS Cecil Field SDG CTOJM09CF_12 consisted of nine (9) aqueous environmental samples including one (1) aqueous trip blank sample. The samples were analyzed for select volatile organic compound (VOC), isopropylbenzene. One field duplicate pair was associated with this Sample Delivery Group (SDG); CEF-081-DUP-01-20110119/CEF-081-27D-20110119.

The samples were collected by TetraTech NUS on January 19, 2011 and analyzed by Empirical Laboratories, LLC. All analyses were conducted in accordance with SW-846 Method 8260B analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times/Sample Preservation
* • Initial/Continuing Calibrations
* • Laboratory Method Blank Results
* • Field Duplicate Results
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

The text of this report is formatted to address only gross non-compliances resulting in the rejection of data and the elimination of false positives.

VOC

No issues were identified.

NOTES

Positive results reported below the Limit of Quantitation (LOQ) but above the Method Detection Limit (MDL) were qualified as estimated, (J).

EXECUTIVE SUMMARY

Laboratory Performance Issues: There were no laboratory issues.

Other Factors Affecting Data Quality: Positive results reported below the LOQ but above the MDL were qualified as estimated, (J).

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), SW-846 Method 8260B analytical and reporting protocols, 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.

Tetra Tech NUS
Michelle L. Allen
Chemist/Data Validator

Edward Sedlyar /for
TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
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 $r < 0.995$ / ICP PDS Recovery Noncompliance
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 encompass a number of issues; e.g. 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-081-04I-201101119			CEF-081-22I-20110119			CEF-081-241-20110119			CEF-081-25I-20110119		
SDG: CTOJM09CF_12	LAB_ID	1101104-08			1101104-06			1101104-01			1101104-07		
FRACTION: OV	SAMP_DATE	1/19/2011			1/19/2011			1/19/2011			1/19/2011		
MEDIA: WATER	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
ISOPROPYLBENZENE		0.971	J	P	2.04			2.57			3.49		

PROJ_NO: 02267	NSAMPLE	CEF-081-261-20110119			CEF-081-27D-20110119			CEF-081-28D-20110119			CEF-081-DUP01-20110119		
SDG: CTOJM09CF_12	LAB_ID	1101104-02			1101104-03			1101104-05			1101104-04		
FRACTION: OV	SAMP_DATE	1/19/2011			1/19/2011			1/19/2011			1/19/2011		
MEDIA: WATER	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										CEF-081-27D-20110119		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ISOPROPYLBENZENE		0.281	J	P	0.25	U		0.667	J	P	0.25	U	

PROJ_NO: 02267	NSAMPLE	Trip Blank_20110119		
SDG: CTOJM09CF_12	LAB_ID	1101104-09		
FRACTION: OV	SAMP_DATE	1/19/2011		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
ISOPROPYLBENZENE		0.25	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

CEF-081-04I-201101119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-08	File ID:	0110408.D
Sampled:	01/19/11 12:26	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 03:56
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	0.971	0.250	0.500	1.00	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.20	104	75 - 120	
Dibromofluoromethane	30.00	33.71	112	85 - 115	
1,2-Dichloroethane-d4	30.00	29.44	98.1	70 - 120	
Toluene-d8	30.00	31.10	104	85 - 120	

ANALYSIS DATA SHEET

CEF-081-22I-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-06	File ID:	0110406.D
Sampled:	01/19/11 11:55	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 02:56
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	2.04	0.250	0.500	1.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.54	98.5	75 - 120	
Dibromofluoromethane	30.00	34.33	114	85 - 115	
1,2-Dichloroethane-d4	30.00	34.60	115	70 - 120	
Toluene-d8	30.00	28.70	95.7	85 - 120	

ANALYSIS DATA SHEET

CEF-081-241-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-01	File ID:	0110401.D
Sampled:	01/19/11 10:51	Prepared:	01/26/11 00:00	Analyzed:	01/26/11 19:06
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26009 Sequence: 1A02703 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	2.57	0.250	0.500	1.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	30.44	101	75 - 120	
Dibromofluoromethane	30.00	33.08	110	85 - 115	
1,2-Dichloroethane-d4	30.00	31.93	106	70 - 120	
Toluene-d8	30.00	28.94	96.5	85 - 120	

ANALYSIS DATA SHEET

CEF-081-25I-20110119

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOJM09CF_012	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTO JM09 Site 81abc_2010	
Matrix:	Water	Laboratory ID:	1101104-07	File ID:	0110407.D
Sampled:	01/19/11 12:08	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 03:26
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	3.49	0.250	0.500	1.00	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.83	99.4	75 - 120	
Dibromofluoromethane	30.00	32.51	108	85 - 115	
1,2-Dichloroethane-d4	30.00	30.89	103	70 - 120	
Toluene-d8	30.00	29.89	99.6	85 - 120	

ANALYSIS DATA SHEET

CEF-081-261-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-02	File ID:	0110402.D
Sampled:	01/19/11 11:03	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 01:57
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	0.281	0.250	0.500	1.00	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.83	99.4	75 - 120	
Dibromofluoromethane	30.00	33.69	112	85 - 115	
1,2-Dichloroethane-d4	30.00	30.92	103	70 - 120	
Toluene-d8	30.00	30.36	101	85 - 120	

ANALYSIS DATA SHEET

CEF-081-27D-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-03	File ID:	0110403.D
Sampled:	01/19/11 11:13	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 02:27
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene		0.250	0.500	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.55	98.5	75 - 120	
Dibromofluoromethane	30.00	33.23	111	85 - 115	
1,2-Dichloroethane-d4	30.00	30.62	102	70 - 120	
Toluene-d8	30.00	28.92	96.4	85 - 120	

ANALYSIS DATA SHEET

CEF-081-28D-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-05	File ID:	0110405.D
Sampled:	01/19/11 11:17	Prepared:	01/26/11 00:00	Analyzed:	01/26/11 20:05
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26009 Sequence: 1A02703 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene	0.667	0.250	0.500	1.00	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.33	104	75 - 120	
Dibromofluoromethane	30.00	33.84	113	85 - 115	
1,2-Dichloroethane-d4	30.00	33.17	111	70 - 120	
Toluene-d8	30.00	30.46	102	85 - 120	

ANALYSIS DATA SHEET

CEF-081-DUP01-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-04	File ID:	0110404.D
Sampled:	01/19/11 00:00	Prepared:	01/26/11 00:00	Analyzed:	01/26/11 19:35
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26009 Sequence: 1A02703 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene		0.250	0.500	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	31.43	105	75 - 120	
Dibromofluoromethane	30.00	33.03	110	85 - 115	
1,2-Dichloroethane-d4	30.00	31.31	104	70 - 120	
Toluene-d8	30.00	30.35	101	85 - 120	

ANALYSIS DATA SHEET

Trip Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:	Water	Laboratory ID:	1101104-09	File ID:	0110409.D
Sampled:	01/19/11 00:00	Prepared:	01/26/11 00:00	Analyzed:	01/27/11 00:58
Solids:		Preparation:	5030B	Dilution:	1

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene		0.250	0.500	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.35	97.8	75 - 120	
Dibromofluoromethane	30.00	32.24	107	85 - 115	
1,2-Dichloroethane-d4	30.00	31.10	104	70 - 120	
Toluene-d8	30.00	30.33	101	85 - 120	

APPENDIX C

SUPPORT DOCUMENTATION

HOLDTIME

SDG CTOJM09CF_

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/L	Trip Blank_20110119	1101104-09	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8
OV	UG/L	CEF-081-DUP01-2011011	1101104-04	NM	01/19/2011	01/26/2011	01/26/2011	7	0	7
OV	UG/L	CEF-081-28D-20110119	1101104-05	NM	01/19/2011	01/26/2011	01/26/2011	7	0	7
OV	UG/L	CEF-081-27D-20110119	1101104-03	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8
OV	UG/L	CEF-081-261-20110119	1101104-02	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8
OV	UG/L	CEF-081-25I-20110119	1101104-07	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8
OV	UG/L	CEF-081-241-20110119	1101104-01	NM	01/19/2011	01/26/2011	01/26/2011	7	0	7
OV	UG/L	CEF-081-22I-20110119	1101104-06	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8
OV	UG/L	CEF-081-04I-201101119	1101104-08	NM	01/19/2011	01/26/2011	01/27/2011	7	1	8

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER № 2136 | PAGE ___ OF ___

PROJECT NO: 112602267	FACILITY: Cecil Field 81 ABC	PROJECT MANAGER Rob Simcik	PHONE NUMBER 412 921 8163	LABORATORY NAME AND CONTACT: ~~412~~ Empirical Labs/Kim Kostzer
SAMPLERS (SIGNATURE) Jeff Krone		FIELD OPERATIONS LEADER Jeff Krone	PHONE NUMBER 904 699 7423	ADDRESS 621 Mainstream Drive Suite 270
		CARRIER/WAYBILL NUMBER 8660 1730 2311		CITY, STATE Nashville, TN 37228

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

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

DATE YEAR 2011	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	TYPE OF ANALYSIS: VOCs (Isopropyl Benzene only)								COMMENTS
1/19	1051	CEF-081-241-20110119				GW	G	3	X			110	1104-01				Cool to 4°C
1/19	1103	CEF-081-261-20110119				GW	G	3	X				02				
1/19	1113	CEF-081-27D-20110119				GW	G	3	X				03				
1/19	0000	CEF-081-DUP01-20110119				GW	G	3	X				04				
1/19	1117	CEF-081-28D-20110119				GW	G	9	X				05				MS/MSD
1/19	1155	CEF-081-221-20110119				GW	G	3	X				06				
1/19	1208	CEF-081-251-20110119				GW	G	3	X				07				
1/19	1226	CEF-081-047-20110119				GW	G	3	X				08				
		Trip Blank				QC	G	2					09				

1. RELINQUISHED BY	DATE 1/19/11	TIME 1700	1. RECEIVED BY	DATE 1/20/11	TIME 0830
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

8

CTOJM09CF_012 Summ Package

Sample Delivery Group Case Narrative

Receipt Information
The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision
This is an original submittal of the final report package.

Analytical Information
All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:
The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.
B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
C: The peak was manually integrated to correct the baseline from the original chromatogram.
D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B:
No anomalies or deviations are noted.

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix. For DoD QSM 4.1 reporting purposes, this definition is also applied to the reported Detection Limit (DL).

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.1 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.1 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** An exceeding quality control criteria is associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero. **For Florida DEP reports this qualifier is "V".**

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. **For Florida DEP reports this qualifier is "L".**

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL. **For Florida DEP reports this qualifier is "I".**

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters MDL/RL has been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The RPD and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard failed criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

LIMS Definitions / Naming Conventions:
The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And **"RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:
I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_012

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 Site 81abc_2010

Batch: 1A26011 Batch Matrix: Water Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-081-261-20110119	1101104-02	01/26/11 00:00	5.00	5.00
CEF-081-27D-20110119	1101104-03	01/26/11 00:00	5.00	5.00
CEF-081-22I-20110119	1101104-06	01/26/11 00:00	5.00	5.00
CEF-081-25I-20110119	1101104-07	01/26/11 00:00	5.00	5.00
CEF-081-04I-201101119	1101104-08	01/26/11 00:00	5.00	5.00
Trip Blank	1101104-09	01/26/11 00:00	5.00	5.00
Blank	1A26011-BLK1	01/26/11 00:00	5.00	5.00
LCS	1A26011-BS1	01/26/11 00:00	5.00	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_012

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09 Site 81abc_2010

Batch: 1A26009 Batch Matrix: Water

Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-081-241-20110119	1101104-01	01/26/11 00:00	5.00	5.00
CEF-081-DUP01-20110119	1101104-04	01/26/11 00:00	5.00	5.00
CEF-081-28D-20110119	1101104-05	01/26/11 00:00	5.00	5.00
Blank	1A26009-BLK1	01/26/11 00:00	5.00	5.00
LCS	1A26009-BS1	01/26/11 00:00	5.00	5.00
CEF-081-28D-20110119	1A26009-MS1	01/26/11 00:00	5.00	5.00
CEF-081-28D-20110119	1A26009-MSD1	01/26/11 00:00	5.00	5.00

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Sequence:	1A02703	Instrument:	MS-VOA3
Calibration:	1013002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A02703-TUN1	0126TU1.D	01/26/11 10:20
Calibration Check	1A02703-CCV1	0126CC1.D	01/26/11 10:46
LCS	1A26009-BS1	0126LS1.D	01/26/11 11:16
Blank	1A26009-BLK1	0126BL1.D	01/26/11 15:38
CEF-081-241-20110119	1101104-01	0110401.D	01/26/11 19:06
CEF-081-DUP01-20110119	1101104-04	0110404.D	01/26/11 19:35
CEF-081-28D-20110119	1101104-05	0110405.D	01/26/11 20:05
CEF-081-28D-20110119	1A26009-MS1	0110405M.D	01/26/11 21:04
CEF-081-28D-20110119	1A26009-MSD1	0110405S.D	01/26/11 21:34

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Lab File ID:	0126TU1.D	Injection Date:	01/26/11
Instrument ID:	MS-VOA3	Injection Time:	10:20
Sequence:	1A02703	Lab Sample ID:	1A02703-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	22.9	PASS
75	30 - 60% of 95	49.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.4	PASS
173	Less than 2% of 174	0.798	PASS
174	50 - 200% of 95	86.9	PASS
175	5 - 9% of 174	7.49	PASS
176	95 - 101% of 174	97.9	PASS
177	5 - 9% of 176	6.69	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Instrument ID:	MS-VOA3	Calibration:	1013002
Lab File ID:	0126CC1.D	Calibration Date:	01/12/11 11:53
Sequence:	1A02703	Injection Date:	01/26/11
Lab Sample ID:	1A02703-CCV1	Injection Time:	10:46

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Isopropylbenzene	A	100.0	103.7	1.654514	1.715915		3.7	20
Bromofluorobenzene	A	30.00	30.57	0.8693917	0.8858271		1.9	20
Dibromofluoromethane	A	30.00	30.86	0.2526019	0.2598109		2.9	20
1,2-Dichloroethane-d4	A	30.00	29.26	0.055187	5.381991E-02		-2.5	20
Toluene-d8	A	30.00	27.41	2.020509	1.846168		-8.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Sequence:	1A02710	Instrument:	MS-VOA3
Calibration:	1013002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A02710-TUN1	0126TU1E.D	01/26/11 22:06
Calibration Check	1A02710-CCV1	0126CC1E.D	01/26/11 22:33
LCS	1A26011-BS1	0126LS1E.D	01/26/11 23:02
Blank	1A26011-BLK1	0126BL1E.D	01/27/11 00:29
Trip Blank	1101104-09	0110409.D	01/27/11 00:58
CEF-081-261-20110119	1101104-02	0110402.D	01/27/11 01:57
CEF-081-27D-20110119	1101104-03	0110403.D	01/27/11 02:27
CEF-081-22I-20110119	1101104-06	0110406.D	01/27/11 02:56
CEF-081-25I-20110119	1101104-07	0110407.D	01/27/11 03:26
CEF-081-04I-201101119	1101104-08	0110408.D	01/27/11 03:56

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Lab File ID:	0126TU1E.D	Injection Date:	01/26/11
Instrument ID:	MS-VOA3	Injection Time:	22:06
Sequence:	1A02710	Lab Sample ID:	1A02710-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	25.1	PASS
75	30 - 60% of 95	51.5	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	5.87	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	66.7	PASS
175	5 - 9% of 174	6.89	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.37	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Instrument ID:	MS-VOA3	Calibration:	1013002
Lab File ID:	0126CC1E.D	Calibration Date:	01/12/11 11:53
Sequence:	1A02710	Injection Date:	01/26/11
Lab Sample ID:	1A02710-CCV1	Injection Time:	22:33

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Isopropylbenzene	A	100.0	105.1	1.654514	1.739236		5.1	20
Bromofluorobenzene	A	30.00	29.43	0.8693917	0.8530046		-1.9	20
Dibromofluoromethane	A	30.00	29.96	0.2526019	0.2522714		-0.1	20
1,2-Dichloroethane-d4	A	30.00	27.64	0.055187	5.084562E-02		-7.9	20
Toluene-d8	A	30.00	27.17	2.020509	1.830218		-9.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:		Laboratory ID:	1A26009-BLK1	File ID:	0126BL1.D
Sampled:		Prepared:		Analyzed:	01/26/11 15:38
Solids:		Preparation:	5030B	Dilution:	

Batch: 1A26009 Sequence: 1A02703 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene		0.250	0.500	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.34	97.8	75 - 120	
Dibromofluoromethane	30.00	32.81	109	85 - 115	
1,2-Dichloroethane-d4	30.00	30.47	102	70 - 120	
Toluene-d8	30.00	30.11	100	85 - 120	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Sequence:	1A01301	Instrument:	MS-VOA3
Calibration:	1013002		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A01301-TUN1	0112TU1.D	01/12/11 11:23
Cal Standard	1A01301-CAL1	SEQ-CAL1.D	01/12/11 11:53
Cal Standard	1A01301-CAL2	SEQ-CAL2.D	01/12/11 12:22
Cal Standard	1A01301-CAL3	SEQ-CAL3.D	01/12/11 12:52
Cal Standard	1A01301-CAL4	SEQ-CAL4.D	01/12/11 13:22
Cal Standard	1A01301-CAL5	SEQ-CAL5.D	01/12/11 13:51
Cal Standard	1A01301-CAL6	SEQ-CAL6.D	01/12/11 14:21
Cal Standard	1A01301-CAL7	SEQ-CAL7.D	01/12/11 14:51
Cal Standard	1A01301-CAL8	SEQ-CAL8.D	01/12/11 15:20
Cal Standard	1A01301-CAL9	SEQ-CAL9.D	01/12/11 15:50
Initial Cal Check	1A01301-ICV1	SEQ-ICV1.D	01/12/11 16:20

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Lab File ID:	0112TU1.D	Injection Date:	01/12/11
Instrument ID:	MS-VOA3	Injection Time:	11:23
Sequence:	1A01301	Lab Sample ID:	1A01301-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.1	PASS
75	30 - 60% of 95	43.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	5.72	PASS
173	Less than 2% of 174	0.659	PASS
174	50 - 200% of 95	86.6	PASS
175	5 - 9% of 174	7.09	PASS
176	95 - 101% of 174	96.6	PASS
177	5 - 9% of 176	6.05	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Calibration:	1013002	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	1/12/2011 11:53:57AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acetone	8.064984E-02	8.405808	5.359333	0.1130282			15	
Acrolein	3.623719E-02	26.8551	5.204	0.1147555	0.9984696		0.995	
Acrylonitrile	9.866283E-02	10.20931	6.044222	7.883985E-02			15	
Benzene	0.9147224	6.5206	12.09622	3.696975E-02			15	
Bromobenzene	0.6446848	8.326313	17.21033	2.104903E-02			15	
Bromochloromethane	0.1136967	14.6434	9.603125	0.1068052			15	
Tert-Amyl Methyl Ether	0.6670554	14.64619	12.44475	2.909129E-02			15	
Bromodichloromethane	0.2777846	12.51998	13.10111	3.364502E-02			15	
Bromoform	0.2502681	25.67797	16.50367	0.0230264	0.9988092		SPCC (0.1)	
Bromomethane	0.119565	24.04905	4.374778	6.853443E-02	0.9968107		0.995	
Bromofluorobenzene	0.8693917	5.084001	17.043	2.212189E-02			15	
n-Butylbenzene	1.364455	9.40366	18.393	1.513749E-02			15	
2-Butanone	9.788035E-02	41.3497	8.8595	0.3230605	0.9992354		0.995	
sec-Butylbenzene	1.790365	7.450728	17.94367	1.921279E-02			15	
tert-Butylbenzene	1.442027	7.065618	18.071	1.373776E-02			15	
Carbon disulfide	0.7085108	9.721389	6.581	4.532016E-02			15	
Carbon tetrachloride	0.2092528	16.57798	12.052	3.056224E-02	0.9995585		0.995	
Chlorobenzene	1.379148	12.57317	16.09589	2.812794E-02			SPCC (0.3)	
Chloroethane	0.1499881	13.0599	4.543	0.1144359			15	
Chloroform	0.4003395	7.781734	9.759444	0.0541458			CCC (20)	
2-Chloroethyl vinyl ether	0.1504082	17.6726	13.69756	5.424746E-02	0.9993532		0.995	
Chloromethane	0.3090919	8.82089	3.716889	0.1232293			SPCC (0.1)	
1-Chlorohexane	1.141253	12.42603	16.055	1.674673E-02			15	
2-Chlorotoluene	1.569179	6.232869	17.42867	2.109436E-02			15	
4-Chlorotoluene	1.619296	5.956415	17.487	0.0227698			15	
Cyclohexane	0.3604052	9.634262	11.94678	2.386268E-02			15	
Dibromochloromethane	0.3832343	17.80407	15.08133	2.570645E-02	0.9982534		0.995	
1,2-Dibromo-3-chloropropane	9.946732E-02	26.61525	18.74133	2.445055E-02	0.9981616		0.995	
1,2-Dibromoethane (EDB)	0.4676748	6.780443	15.313	2.585748E-02			15	
Dibromomethane	0.1628485	8.711286	12.91933	1.346488E-02			15	
1,2-Dichlorobenzene	1.015586	5.479385	18.367	9.859982E-03			15	
1,3-Dichlorobenzene	1.051632	8.026897	18.02333	2.563658E-03			15	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Calibration:	1013002	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	1/12/2011 11:53:57AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
1,4-Dichlorobenzene	1.123631	8.934171	18.07167	4.418164E-03			15	
Dichlorodifluoromethane	0.1927224	10.32147	3.507	1.820138E-02			15	
1,1-Dichloroethane	0.4275324	6.15943	7.884333	9.332373E-02			SPCC (0.1)	
1,2-Dichloroethane	0.3389077	6.875599	11.251	5.774366E-02			15	
1,1-Dichloroethene	0.1808032	8.4975	6.006333	0.1065342			CCC (20)	
cis-1,2-Dichloroethene	0.2429771	8.06032	9.235111	7.930925E-02			15	
trans-1,2-Dichloroethene	0.2265366	10.05672	7.374	0.1155533			15	
1,2-Dichloroethene (total)	0.2347569	8.066436	0	0			15	
1,2-Dichloropropane	0.2705505	7.90964	12.98233	2.895518E-02			CCC (20)	
1,3-Dichloropropane	0.7651451	8.521785	14.83867	3.226204E-02			15	
2,2-Dichloropropane	0.249069	11.9522	9.993222	0.133028			15	
1,1-Dichloropropene	0.2969522	8.037406	11.805	5.227225E-02			15	
cis-1,3-Dichloropropene	0.3436351	16.66489	13.94067	4.677926E-02	0.9991764		0.995	
trans-1,3-Dichloropropene	0.5486816	19.63362	14.42967	3.360889E-02	0.9984019		0.995	
Diisopropyl Ether	0.8991741	14.74941	9.006667	9.641568E-02			15	
Ethylbenzene	2.174706	11.24759	16.26067	1.949862E-02			CCC (20)	
Ethyl tert-Butyl Ether	0.6821686	15.02387	10.08975	7.473357E-02	0.999432		0.995	
Ethyl Methacrylate	0.4811612	30.46642	14.91122	7.619157E-02	0.9989028		0.995	
Hexachlorobutadiene	0.2650331	12.00178	20.297	0.0167408			15	
2-Hexanone	0.3117348	32.71218	15.0245	0.1255279	0.9992453		0.995	
Iodomethane	0.1911641	34.64014	6.045667	0.1166378	0.9995772		0.995	
Isopropylbenzene	1.654514	8.969675	17.012	1.049839E-02			15	
p-Isopropyltoluene	1.218248	8.095274	17.77433	9.325871E-03			15	
Methylene chloride	0.2636496	9.932986	6.22	8.175985E-02			15	
Methyl Acetate	0.2047375	7.514991	6.263111	0.1591514			15	
Methylcyclohexane	0.2787263	8.796608	13.72633	4.451275E-02			15	
Naphthalene	1.432295	16.47061	20.259	1.825011E-02	0.9997482		0.995	
Methyl Methacrylate	0.1986159	32.71145	13.3825	9.795862E-02	0.999672		0.995	
4-Methyl-2-pentanone	0.228089	24.924	14.086	0.0598532	0.9994717		0.995	
Methyl t-Butyl Ether	0.5014836	13.3066	7.630556	0.1192416			15	
n-Propylbenzene	2.262125	6.162005	17.347	2.228063E-02			15	
Styrene	1.33712	11.61301	16.67522	3.134616E-02			15	

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Calibration:	1013002	Instrument:	MS-VOA3
Matrix:	Water	Calibration Date:	1/12/2011 11:53:57AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
1,1,2,2-Tetrachloroethane	0.5787994	7.683674	16.73978	1.584485E-02			SPCC (0.3)	
1,1,1,2-Tetrachloroethane	0.3617513	11.29277	16.03767	0.0230695			15	
tert-Butyl alcohol	1.687927E-02	22.96425	6.01	0.1776952	0.9960037		0.995	
Tetrachloroethene	0.4936913	9.298253	15.50256	1.414961E-02			15	
Toluene	1.227229	8.434471	14.77611	3.129201E-02			CCC (20)	
1,2,3-Trichlorobenzene	0.5583232	12.43673	20.502	2.261096E-02			15	
1,2,4-Trichlorobenzene	0.602543	10.95007	19.99433	0.0293537			15	
1,1,2-Trichloroethane	0.3919917	5.496525	14.581	2.309597E-02			15	
1,1,1-Trichloroethane	0.2966137	9.180517	11.45333	2.758216E-02			15	
Tetrahydrofuran	6.614518E-02	18.73379	10.62375	0.2296526	0.9996939		0.995	
Trichloroethene	0.2555685	6.673099	13.06667	3.707834E-02			15	
Trichlorofluoromethane	0.3134891	7.463325	5.248111	7.876223E-02			15	
1,2,3-Trichloropropane	0.1687538	13.12445	16.84467	0.019802			15	
1,3,5-Trimethylbenzene	1.488186	9.066003	17.54911	1.497229E-02			15	
1,2,4-Trimethylbenzene	1.510137	11.75851	17.852	2.790448E-03			15	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.1855971	6.201379	6.325778	8.645985E-02			15	
Vinyl chloride	0.275803	9.259583	3.921445	0.1307371			CCC (20)	
m,p-Xylene	1.622515	12.77942	16.41667	2.024565E-02			15	
o-Xylene	1.800957	8.888939	16.73267	1.621916E-02			15	
Vinyl acetate	0.2696653	26.95271	8.175125	0.1975992	0.9995176		0.995	
Xylenes (total)	1.681996	11.18592	0	0			15	
Dibromofluoromethane	0.2526019	3.058941	10.07433	2.899251E-02			15	
1,2-Dichloroethane-d4	0.055187	3.814733	11.10033	1.871227E-02			15	
Toluene-d8	2.020509	6.710572	14.70022	1.957189E-03			15	
tert-Amyl alcohol	9.511786E-03	37.13722	10.96425	0.1525271		0.9996011	0.99	
tert-Amyl ethyl ether	0.5731055	15.90077	13.61989	1.612336E-02	0.9993112		0.995	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Site 81abc_2010
Instrument ID:	MS-VOA3	Calibration:	1013002
Lab File ID:	SEQ-ICV1.D	Calibration Date:	01/12/11 11:53
Sequence:	1A01301	Injection Date:	01/12/11
Lab Sample ID:	1A01301-ICV1	Injection Time:	16:20

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Isopropylbenzene	A	100.0	106.7	1.654514	1.765542		6.7	20
Bromofluorobenzene	A	30.00	29.11	0.8693917	0.8435694		-3.0	20
Dibromofluoromethane	A	30.00	29.14	0.2526019	0.2453821		-2.9	20
1,2-Dichloroethane-d4	A	30.00	28.81	0.055187	5.299266E-02		-4.0	20
Toluene-d8	A	30.00	28.48	2.020509	1.91838		-5.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_012
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Site 81abc_2010
Matrix:		Laboratory ID:	1A26011-BLK1	File ID:	0126BL1E.D
Sampled:		Prepared:		Analyzed:	01/27/11 00:29
Solids:		Preparation:	5030B	Dilution:	

Batch: 1A26011 Sequence: 1A02710 Calibration: 1013002 Instrument: MS-VOA3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
98-82-8	Isopropylbenzene		0.250	0.500	1.00	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Bromofluorobenzene	30.00	29.88	99.6	75 - 120	
Dibromofluoromethane	30.00	32.03	107	85 - 115	
1,2-Dichloroethane-d4	30.00	31.12	104	70 - 120	
Toluene-d8	30.00	29.78	99.3	85 - 120	