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NAS CECIL FIELD  
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SUPPLEMENTAL SITE ASSESSMENT REPORT FOR TANKS 81A, 81B AND 81C FOR  
TEMPORARY AND PERMANENT WELLS INSTALLED IN MAY AND OCTOBER 2013 NAS  
CECIL FIELD FL  
12/20/2013  
RESOLUTION CONSULTANTS

# SUPPLEMENTAL SITE ASSESSMENT REPORT

TANKS 81 A, B, AND C  
FORMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA

Revision: 0

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Comprehensive Long-Term Environmental Action Navy  
Contract Number: N62470-11-D-8013  
CTO JM43

20 December 2013

**CERTIFICATION**

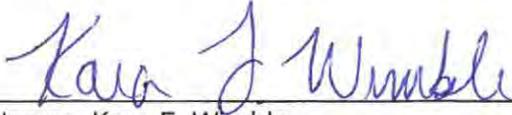
This Supplemental Site Assessment Report for Tanks 81 A, B, and C of the Former Naval Air Station Cecil Field, Jacksonville, Florida, has been prepared under the responsible charge of a Florida Registered Professional Geologist by Resolution Consultants, a joint venture of AECOM and EnSafe. Our professional services have been performed using the degree of care and skill ordinarily exercised under similar circumstances by registered professionals practicing in the field of geology. All drawings, reports, plats, or other geologic information contained herein have been prepared or approved by the undersigned professional geologist, or a subordinate employee under his direction, for issuance into the public record within the State of Florida. This certification of geologic work contained herein applies only to the original document and does not pertain to copies of this document, which can be changed by the entity with whom such document(s) are filed. No other representation, expressed or implied, is made as to the professional advice in this report.

Resolution Consultants

  
John C. King III PG  
Florida Professional Geologist No. 2770  
12/20/13  
Date



**Concurrence by:**

  
Name: Kara F. Wimble  
Title: Contract Task Order Manager

12-20-13  
Date

## LIST OF ACRONYMS

AST	Aboveground storage tank
BCT	Base Realignment and Closure Cleanup Team
FDEP	Florida Department of Environmental Protection
bgs	Below ground surface
GCTL	Groundwater Cleanup Target Level
NAS	Naval Air Station
OD	Outer diameter
PVC	Polyvinyl chloride
SSAR	Supplemental Site Assessment Report

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## **1.0 INTRODUCTION**

This Supplemental Site Assessment Report (SSAR) presents assessment activities and groundwater monitoring results for the Tanks 81 A, B, and C site (the Site) located at the former Naval Air Station (NAS) Cecil Field in Jacksonville, Duval County, Florida. This SSAR was prepared by Resolution Consultants under United States Navy, Naval Facilities Engineering Command contract number N62470-11-D-8013, Contract Task Order JM43, for consideration by Naval Facilities Engineering Command and the Florida Department of Environmental Protection (FDEP). The work was completed in accordance with an approved *Supplemental Site Assessment Work Plan* (Resolution Consultants 2013) to determine the appropriate location for a new permanent compliance monitoring well downgradient of CEF-081-26I.

## **2.0 SITE DESCRIPTION**

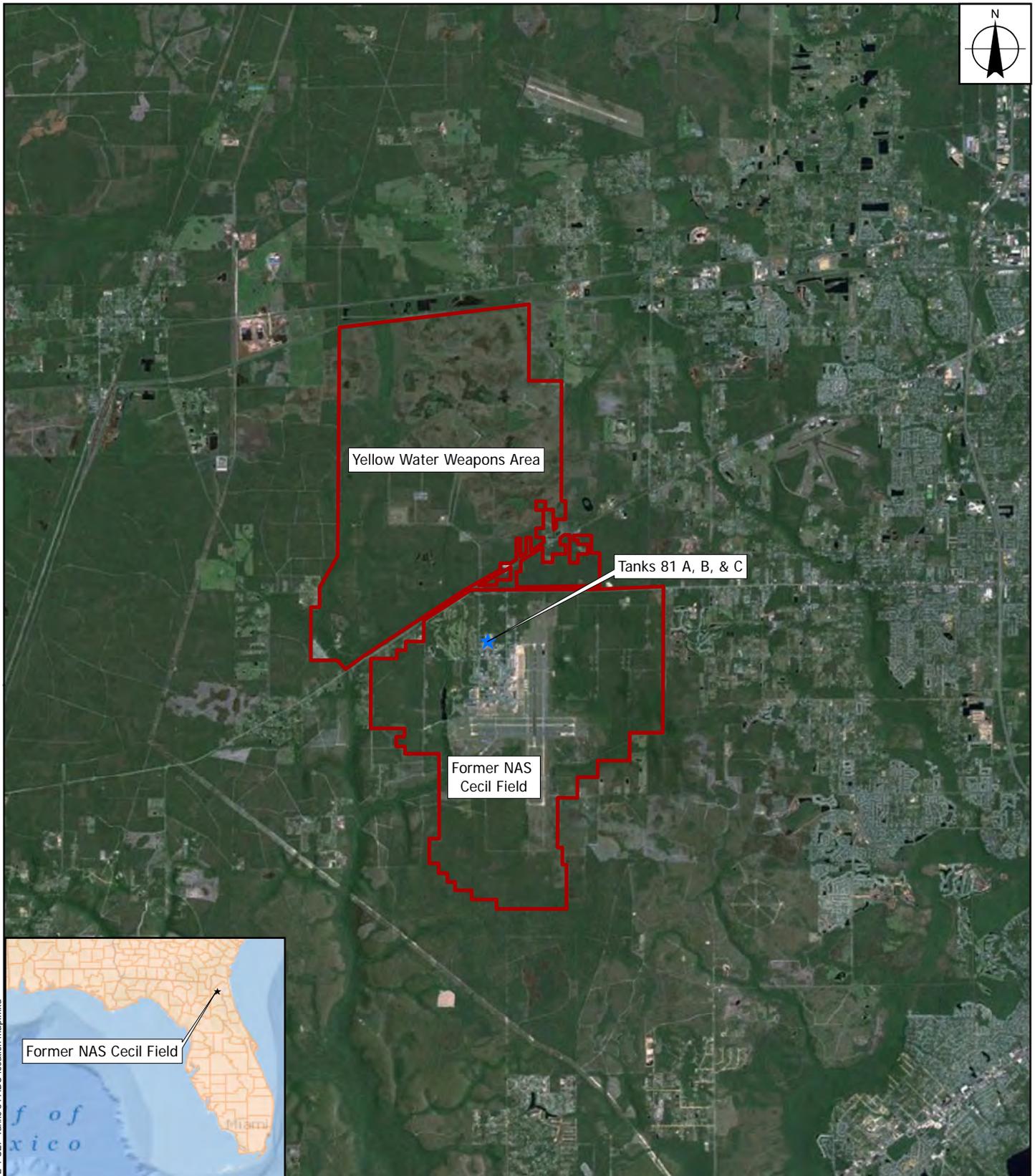
The Site is located at the Former NAS Cecil Field located in Jacksonville, Duval County, Florida, with latitude 30°, 14', and 05" North and longitude 81°, 53', and 15" West. The Site is located to the northeast of the intersection of Cecil Pines Street (9th Street) and New World Avenue. The property associated with the Site is currently owned by the city of Jacksonville. The Site was formerly owned by the United States Navy and was transferred to the city of Jacksonville via Quit Claim Deed on 12 June 2008. The deed was recorded in Duval County Official Record Book 14535, Page 2157. A General Vicinity Map illustrating the site location is shown on Figure 2-1.

The Site was formerly occupied by three aboveground storage tanks (ASTs) within a concrete secondary containment structure located northwest of former Building 81. The three ASTs and the associated concrete secondary containment structure have been removed from the Site. The contents of the former storage tanks are not known; however, due to the Site's proximity to the former Transportation and Fuel Management compound located west of Building 81, the former ASTs may have held petroleum-based fuels. Currently, worn pavement and grasses cover a majority of the Site, with the exception of the northwest corner of the property, which is heavily wooded.

### **2.1 Purpose**

Data collected prior to the May 2013 temporary monitoring well installation indicated that isopropylbenzene contamination is located in the intermediate groundwater zone of the surficial aquifer at approximately 30-35 feet below ground surface (bgs). Isopropylbenzene, the only remaining contaminant of concern at the Site, had been detected in groundwater collected from the downgradient compliance well (CEF-081-261) at concentrations greater than the FDEP organoleptic Groundwater Cleanup Target Level (GCTL) of 0.8 milligrams per liter for three consecutive semi-annual sampling events (October 2011, April 2012, and October 2012). Per 62-780.690(8)(a) of the Florida Administrative Code, the FDEP requires a downgradient compliance well that does not exceed GCTLs during natural attenuation monitoring. Since groundwater from the existing downgradient compliance well CEF-081-261 exceeded the GCTL for isopropylbenzene, a new downgradient well was required.

During the February 2013 Base Realignment and Closure Cleanup Team (BCT) meeting, FDEP stated that a new permanent monitoring well should be installed downgradient of CEF-081-261. Resolution Consultants recommended conducting the installation of five temporary monitoring wells



X:\Navy\NAS - CecilField\Tanks 81 ABC\Figure 2-1 CEF Tanks 81 ABC location map.mxd

### Legend

 Installation Boundary

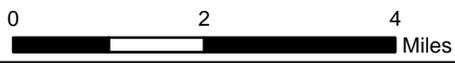


FIGURE 2-1  
GENERAL LOCATION MAP  
TANKS 81 A, B, & C  
FORMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA



REQUESTED BY: K. Wimble  
DRAWN BY: kburnum

DATE: 12/16/2013  
TASK ORDER NUMBER: JM43

Service Layer Credits: Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, NAVTEQ, Geonames.org, and other contributors. Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

to the north and east of monitoring well CEF-081-26I. Groundwater elevation data from depth-to-water measurements, and analytical data from groundwater samples from the new wells, would serve to confirm groundwater flow direction in the area and aid in selecting a suitable location for a new permanent downgradient point-of-compliance well (Meeting minute No. 2786, Decision 863). A site map with monitoring well locations is shown on Figure 2-2. Current and recent historical groundwater results are shown on Figure 2-3.

## **2.2 Conceptual Site Model**

The conceptual site model based on existing site conditions is shown on Figure 2-4. Based on the environmental investigations and actions to date at the Site, potential sources of contamination may be from the petroleum-based products stored in Tanks 81 A, B, and C, or from the former petroleum-related operations in the area of Building 81.

## **2.3 Recent Groundwater Monitoring Results**

The first semi-annual groundwater monitoring event for Year 3 (Tetra Tech 2012) was completed in October 2012. Results from this report indicated that the groundwater sample collected from the most downgradient monitoring well (CEF-081-26I) contained isopropylbenzene at a concentration that exceeded its GCTL. Because the existing downgradient compliance well had exceeded the GCTL for three consecutive semi-annual sampling events, a new downgradient well was required.

During the February 2013 BCT meeting, the partnering team agreed that a new downgradient compliance well (intermediate depth of 30-35 feet below land surface) should be installed along the outer edge of the wooded area to the north-northwest of the existing Site plume, approximately 300 feet from existing well CEF-081-026I. The partnering team also agreed that a new monitoring well should not be placed in the wooded area due to access issues. Based on historical groundwater monitoring data, the potentiometric surface of the intermediate surficial aquifer in the vicinity of the Site varies, with observed groundwater flow to the north-northwest and to the west. Therefore, Resolution Consultants proposed the installation of five temporary wells for the purpose of determining the groundwater flow direction and the proper placement of the new downgradient compliance monitoring well(s) (Meeting Minute No. 2786, Decision 863).



CEF-081-30I and CEF-081-31I were temporary wells installed in May 2013 and converted to permanent wells in October 2013. LTM Program Monitor Wells are currently sampled for Isopropylbenzene only.

FIGURE 2-2  
SAMPLE LOCATION MAP  
TANKS 81 A, B, & C  
FOMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA

**Legend**

-  LTM Monitoring Well
-  Abandoned Monitoring Well
-  Water Level Only
-  LUC Boundary



**Monitoring Well Information**

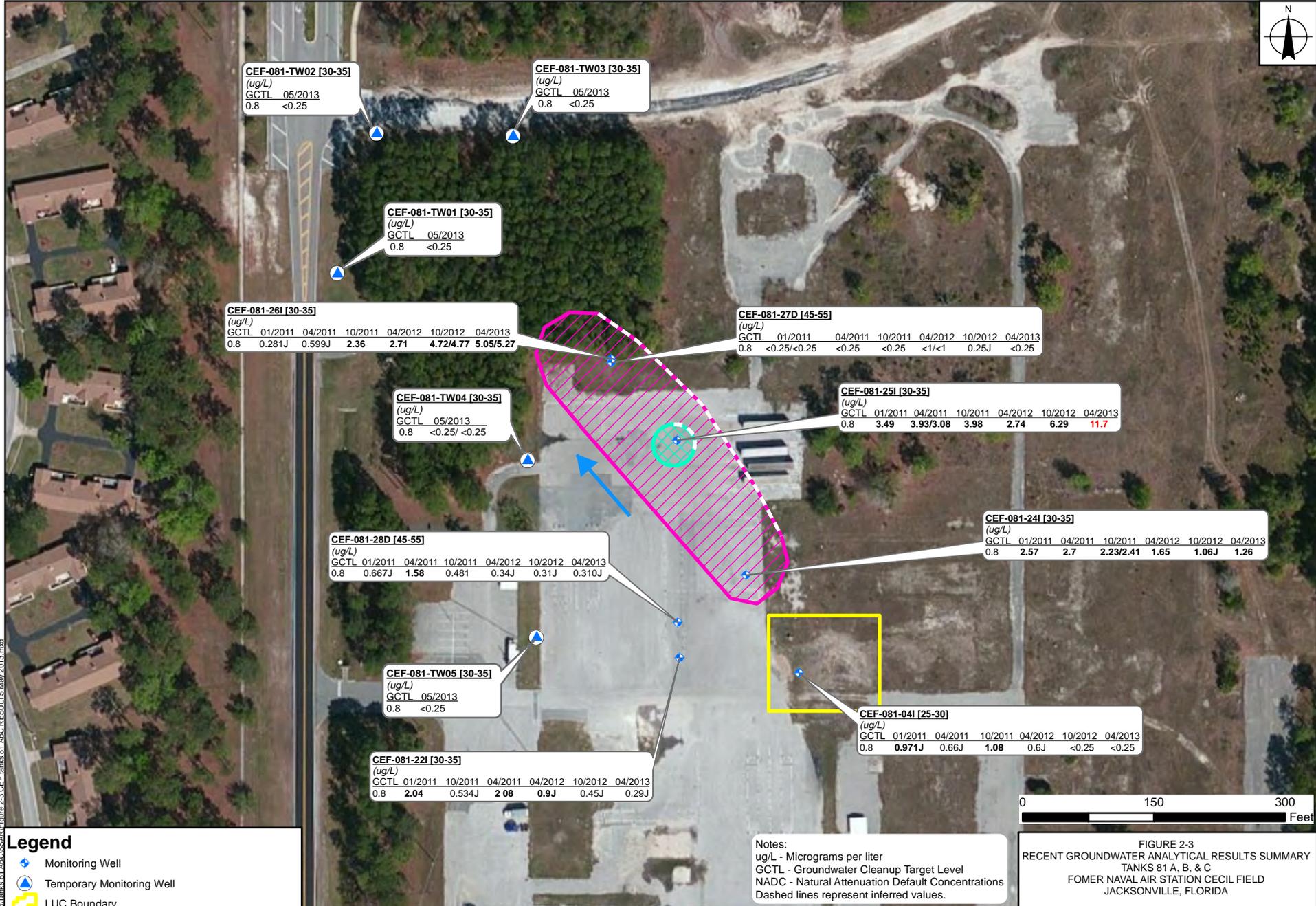
Monitoring Well ID \_\_\_\_\_ Screen Interval \_\_\_\_\_

CEF-081-30I [30-35]



REQUESTED BY: K. Wimble	DATE: 12/17/2013
DRAWN BY: kburnum	TASK ORDER NUMBER: JM43

X:\Navv\NAS\_CecilField\Tanks 81 ABC\Figure 2-2\_CEF-Tanks 81 ABC Sample Locations\_Nov-2013.mxd



**CEF-081-TW02 [30-35]**  
(ug/L)  
GCTL 05/2013  
0.8 <0.25

**CEF-081-TW03 [30-35]**  
(ug/L)  
GCTL 05/2013  
0.8 <0.25

**CEF-081-TW01 [30-35]**  
(ug/L)  
GCTL 05/2013  
0.8 <0.25

**CEF-081-26I [30-35]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 0.281J 0.599J 2.36 2.71 4.72/4.77 5.05/5.27

**CEF-081-27D [45-55]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 <0.25/<0.25 <0.25 <0.25 <1/<1 0.25J <0.25

**CEF-081-TW04 [30-35]**  
(ug/L)  
GCTL 05/2013  
0.8 <0.25/ <0.25

**CEF-081-25I [30-35]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 3.49 3.93/3.08 3.98 2.74 6.29 11.7

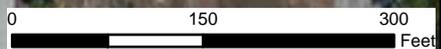
**CEF-081-28D [45-55]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 0.667J 1.58 0.481 0.34J 0.31J 0.310J

**CEF-081-24I [30-35]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 2.57 2.7 2.23/2.41 1.65 1.06J 1.26

**CEF-081-TW05 [30-35]**  
(ug/L)  
GCTL 05/2013  
0.8 <0.25

**CEF-081-04I [25-30]**  
(ug/L)  
GCTL 01/2011 04/2011 10/2011 04/2012 10/2012 04/2013  
0.8 0.971J 0.66J 1.08 0.6J <0.25 <0.25

**CEF-081-22I [30-35]**  
(ug/L)  
GCTL 01/2011 10/2011 04/2011 04/2012 10/2012 04/2013  
0.8 2.04 0.534J 2.08 0.9J 0.45J 0.29J



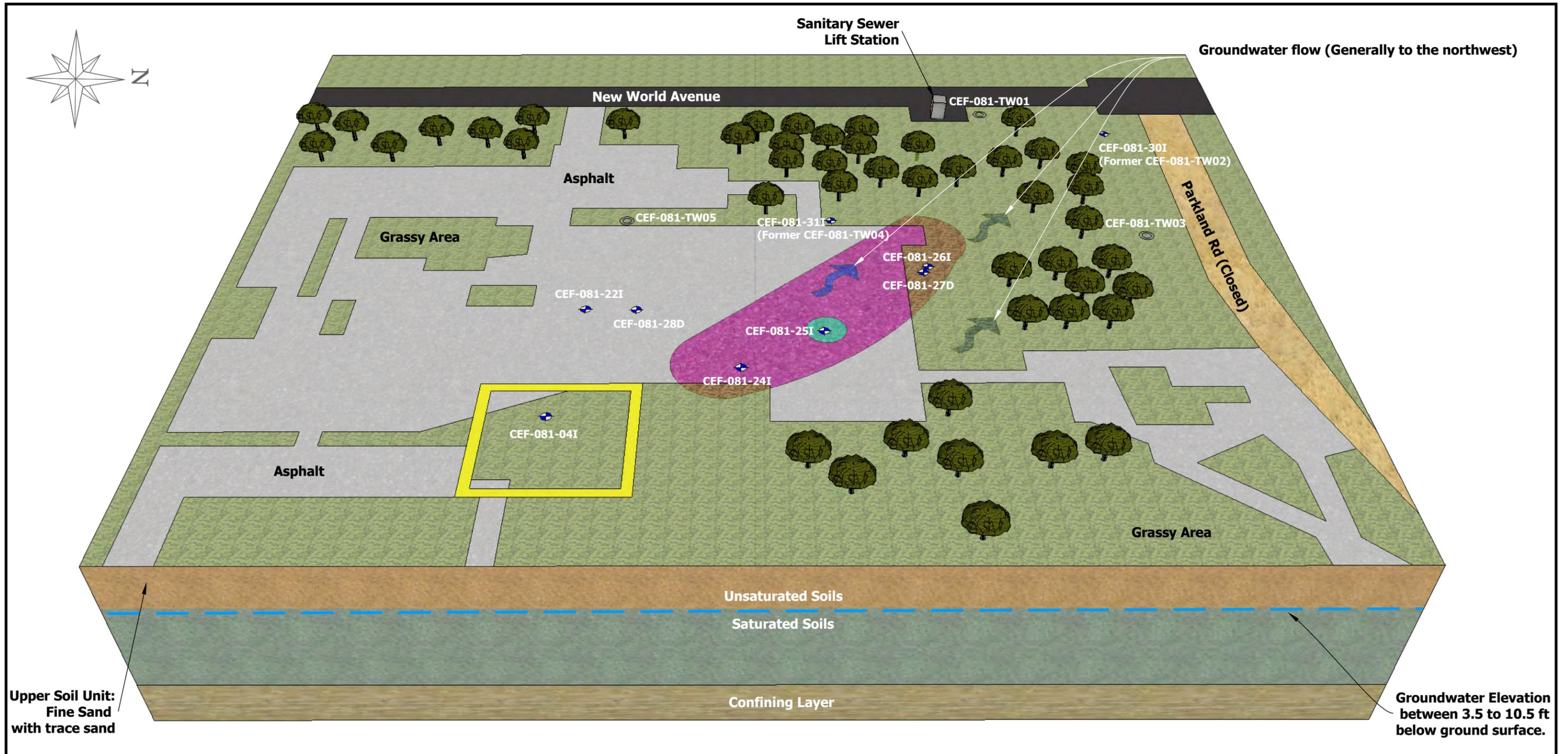
- Legend**
- Monitoring Well
  - Temporary Monitoring Well
  - LUC Boundary
  - Groundwater Flow
  - Isopropylbenzene (0.8 ug/L) GCTL Exceedances Plume
  - Isopropylbenzene (8 ug/L) NADC Exceedances Plume

Notes:  
ug/L - Micrograms per liter  
GCTL - Groundwater Cleanup Target Level  
NADC - Natural Attenuation Default Concentrations  
Dashed lines represent inferred values.

Monitoring Well ID	<b>CEF-081-TW05 [30-35]</b>
Unit	(ug/L)
Groundwater Cleanup Target Level	GCTL 05/2013
GCTL Value	0.8 <0.5
Screen Interval	
Date	
Result	

**FIGURE 2-3**  
RECENT GROUNDWATER ANALYTICAL RESULTS SUMMARY  
TANKS 81 A, B, & C  
FOMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA

REQUESTED BY: K. Wimble      DATE: 12/17/2013  
DRAWN BY: kbumum      TASK ORDER NUMBER: JM43



**Contaminant Source:**  
Former Tanks 81 A,B, and C and former oil-water separators in vicinity of former building 81, Site 25

**Receptors:**  
Human: None due to current and future land use  
Ecological: None due to lack of habitat

**Land Use controls:**  
\* Groundwater may not be used for human consumption  
\* Groundwater may not be used for industrial purposes  
\* Tampering or damaging any Navy wells or remediations systems is prohibited

- Legend**
- Groundwater Monitoring Well
  - Abandoned Monitoring Well
  - Controlled Land Use Parcel
  - Intermediate (30' - 35" bgs) Contaminant Plume (Isopropylbenzene) above GCTLs
  - Intermediate (30' - 35" bgs) Contaminant Plume (Isopropylbenzene) above NADC

- NOTES:**
- Conceptual Site Model not to scale. Horizontal dimensions based on recent aerial imaging, site visits, and historical knowledge. Vertical dimensions exaggerated for purpose of conveying pertinent site information.
  - Groundwater monitoring well locations approximated based on existing site figures and geographic information system data.

**Figure 2-4**  
**Conceptual Site Model**  
**Tanks 81 A, B, & C**  
**Former NAS Cecil Field**  
**Jacksonville, Florida**




REQUESTED BY: K Wimble	Date: 12/02/2013
DRAWN BY: K Burnum	CTO NO. JM43

### **3.0 SUPPLEMENTAL SITE ASSESSMENT FIELD ACTIVITIES**

#### **3.1 Temporary Monitoring Well Installation**

On 7 and 8 May 2013, five temporary monitoring wells were installed along the northwest and west portions of the Site, downgradient of monitoring well CEF-081-261 (See Figure 2-2). These monitoring wells were installed using 8-inch outer diameter (OD) hollow-stem steel augers to a depth of 35 feet bgs. A 2-inch OD, 10 feet length of 0.01 inch slotted Schedule 40 polyvinyl chloride (PVC) screen was installed from 30 feet to 35 feet bgs in each temporary monitoring well. A 2-inch OD Schedule 40 PVC piping was then installed from the well screen to ground surface. A sealed protective well cap was securely fastened to the top of the monitoring well opening to prevent tampering. Monitoring well construction and depth-to-water information is included in Table 3-1. Monitoring well construction logs are included in Appendix A.

During temporary well installation, 19 drums of investigation derived waste (15 drums of soil and 4 drums of purge water) were generated and stored at Building 536. For disposal and characterization purposes, representative samples were collected from the soil drums of investigation derived waste and analyzed by a laboratory for pH and for Toxic Characteristic Leaching Procedure of Volatile Organic Compounds only for submittal to NAS Jacksonville — Public Works Department for proper disposal as non-hazardous waste.

#### **3.2 Groundwater Sampling from Piezometers**

On 14 May 2013, these five temporary wells were sampled for analytical purposes (isopropylbenzene only) according to the *Work Plan for Supplement Site Assessment at Tanks 81 A, B, and C. Former Naval Air Station Cecil Field, Jacksonville, Florida*. (Resolution Consultants 2013). Analytical results from all five temporary monitoring wells (provided in Appendix B) indicated isopropylbenzene below laboratory detection limits. A summary of analytical results is presented in Table 3-2, and shown on Figure 2-3.

On 10 June 2013, site-wide water levels were collected and the temporary monitoring wells were surveyed by First Coast Surveying. The depth to groundwater was measured at each well to the nearest 0.01-foot relative to the top of the well casing using an electronic water level indicator to determine relative groundwater elevations and flow direction. The water level depth measurements were then converted to groundwater elevations by cross-correlating the survey and depth data. Water level elevation data were then plotted on a scaled site map, and by using

**TABLE 3-1  
MONITORING WELL CONSTRUCTION AND  
GROUNDWATER ELEVATION MEASUREMENTS  
SUPPLEMENTAL SITE ASSESSMENT REPORT**



**TANK 81 A, B, and C  
FORMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

<b>WELL NUMBER</b>	CEF-081-01I		CEF-081-02I		CEF-081-03I		CEF-081-04I		CEF-081-05I		CEF-081-14S		CEF-081-15S		CEF-081-18I	
<b>WELL DEPTH</b>	30	feet	13	feet	15	feet	35	feet								
<b>SCREEN INTERVAL</b>	25-30	feet	3-13	feet	5-15	feet	30-35	feet								
<b>TOC ELEVATION</b>	77.73	feet	77.42	feet	77.78	feet	77.54	feet	77.84	feet	78.30	feet	78.03	feet	78.33	feet
<b>DATE</b>	<b>ELEV</b>	<b>DTW</b>														
7/19/2010	NA	NM	NA	NM	NA	NM	70.20	7.34	NA	NM	NA	NM	NA	NM	NA	NM
10/18/2010	NA	NM	69.86	7.56	NA	NM	69.82	7.72	69.86	7.98	NA	NM	NA	NM	69.95	8.38
1/19/2011	68.39	9.34	68.31	9.11	68.29	9.49	68.29	9.25	68.31	9.53	68.36	9.94	68.37	9.66	68.37	9.96
4/20/2011	69.85	7.88	69.79	7.63	69.76	8.02	69.75	7.79	69.83	8.01	NA	NM	NA	NM	69.82	8.51
10/17/2011	68.69	9.04	67.62	9.80	68.50	9.28	68.59	8.95	68.64	9.20	NA	NM	NA	NM	68.65	9.68
4/11/2012	67.86	9.87	67.80	9.62	67.78	10.00	67.78	9.76	67.83	10.01	NA	NM	NA	NM	67.87	10.46
10/22/2012	72.63	5.10	72.62	4.80	72.53	5.25	72.56	4.98	72.65	5.19	NA	NM	NA	NM	72.62	5.71
4/1/2013	71.00	6.73	70.96	6.46	70.90	6.88	70.89	6.65	70.97	6.87	NA	NM	NA	NM	70.96	7.37
6/1/2013	73.65	4.08	73.66	3.76	73.55	4.23	73.54	4.00	73.63	4.21	NA	NM	NA	NM	73.59	4.74

**Notes:**  
 TOC = Top of Casing  
 ELEV = Elevation  
 NM = Not Measured  
 DTW = Depth to Water  
 All Measurements = Feet  
 NA = Not Applicable  
 \* = Well was found destroyed

**TABLE 3-1  
MONITORING WELL CONSTRUCTION AND  
GROUNDWATER ELEVATION MEASUREMENTS  
SUPPLEMENTAL SITE ASSESSMENT REPORT**



**TANK 81 A, B, and C  
FORMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

<b>WELL NUMBER</b>	CEF-081-19I		CEF-081-20I		CEF-081-21I		CEF-081-22I		CEF-081-24I		CEF-081-25I		CEF-081-26I		CEF-081-27D	
<b>WELL DEPTH</b>	35	feet	55	feet												
<b>SCREEN INTERVAL</b>	30-35	feet	50-55	feet												
<b>TOC ELEVATION</b>	78.15	feet	77.63	feet	78.78	feet	78.35	feet	78.39	feet	78.19	feet	77.87	feet	78.16	feet
<b>DATE</b>	<b>ELEV</b>	<b>DTW</b>														
7/19/2010	NA	NM	NA	NM	NA	NM	70.16	8.19	70.36	8.03	70.13	8.06	69.58	8.29	69.89	8.27
10/18/2010	69.88	8.27	69.98	7.65	69.79	8.99	69.81	8.54	70.01	8.38	69.81	8.38	69.31	8.56	NA	NM
1/19/2011	68.36	9.79	NA	NM	68.30	10.48	68.33	10.02	68.54	9.85	68.48	9.71	68.12	9.75	68.46	9.70
4/20/2011	69.81	8.34	NA	NA*	69.75	9.03	69.74	8.61	69.97	8.42	69.69	8.50	69.30	8.57	69.62	8.54
10/17/2011	68.65	9.50	NA	NA	68.54	10.24	68.61	9.74	68.80	9.59	68.67	9.52	68.24	9.63	68.55	9.61
4/11/2012	67.85	10.30	NA	NA	67.80	10.98	67.84	10.51	68.07	10.32	68.05	10.14	67.56	10.31	68.00	10.16
10/22/2012	72.48	5.67	NA	NA	72.47	6.31	72.37	5.98	72.56	5.83	72.09	6.10	71.30	6.57	71.64	6.52
4/1/2013	70.95	7.20	NA	NA	70.84	7.94	70.86	7.49	71.04	7.35	70.80	7.39	70.19	7.68	70.51	7.65
6/1/2013	73.53	4.62	NA	NA	73.39	5.39	73.36	4.99	73.52	4.87	73.06	5.13	72.21	5.66	72.53	5.63

**Notes:**  
 TOC = Top of Casing  
 ELEV = Elevation  
 NM = Not Measured  
 DTW = Depth to Water  
 All Measurements = Feet  
 NA = Not Applicable  
 \* = Well was found destroyed

**TABLE 3-1  
MONITORING WELL CONSTRUCTION AND  
GROUNDWATER ELEVATION MEASUREMENTS  
SUPPLEMENTAL SITE ASSESSMENT REPORT**



**TANK 81 A, B, and C  
FORMER NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA**

<b>WELL NUMBER</b>	CEF-081-28D		CEF-081-TW01		CEF-081-TW02		CEF-081-TW03		CEF-081-TW04		CEF-081-TW05	
<b>WELL DEPTH</b>	55	feet	35	feet								
<b>SCREEN INTERVAL</b>	50-50	feet	30-35	feet								
<b>TOC ELEVATION</b>	78.38	feet	78.55	feet	79.03	feet	79.10	feet	79.32	feet	79.72	feet
<b>DATE</b>	<b>ELEV</b>	<b>DTW</b>	<b>ELEV</b>	<b>DTW</b>	<b>ELEV</b>	<b>DTW</b>	<b>ELEV</b>	<b>DTW</b>	<b>ELEV</b>	<b>DTW</b>	<b>ELEV</b>	<b>DTW</b>
7/19/2010	70.14	8.24	NA	NA								
10/18/2010	NA	NM	NA	NA								
1/19/2011	68.55	9.83	NA	NA								
4/20/2011	69.94	8.44	NA	NA								
10/17/2011	68.79	9.59	NA	NA								
4/11/2012	68.02	10.36	NA	NA								
10/22/2012	72.49	5.89	NA	NA								
4/1/2013	71.01	7.37	NA	NA								
6/1/2013	73.46	4.92	69.61	8.94	68.91	10.12	69.65	9.45	71.76	7.56	72.31	7.41
<b>Notes:</b> TOC = Top of Casing ELEV = Elevation NM = Not Measured DTW = Depth to Water All Measurements = Feet NA = Not Applicable * = Well was found destroyed												

**TABLE 3-2  
 TEMPORARY WELLS ANALYTICAL DATA  
 TANK 81 A, B, and C  
 FORMER NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA**



Location ID	ISOPROPYLBENZENE (µg/L)			
	FDEP GCTL	0.8		
	FDEP NADC	8		
CEF-081-TW01	May 2013	<0.25	U	
CEF-081-TW02	May 2013	<0.25	U	
CEF-081-TW03	May 2013	<0.25	U	
CEF-081-TW04	May 2013	Sample	<0.25	U
		Duplicate	<0.25	U
CEF-081-TW05	May 2013	<0.25	U	

**Notes:**

FDEP - Florida Department of Environmental Protection

**GCTL - Groundwater Cleanup Target Level exceedances, per FDEP, 62-777 FAC, Table I**

**NADC - Natural Attenuation Default Concentration exceedance, per FDEP 62-777 FAC, Table I**

µg/L - Microgram per liter

U - Non-detect

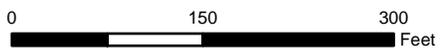
J - Estimated Value



X:\Info\NAS\_CecilField\Tanks 81 ABC\SSAR\Figure 3-1 CEF-Tanks 81 ABC Plot.mxd, June 2013, SSAAS.mxd

**Legend**

-  Intermediate Monitoring Well
-  Temporary Monitoring Well
-  Groundwater Contour Line (dashed where inferred)
-  Groundwater Flow Direction



CEF-081-04	Monitoring Well ID
[30-35]	Screen Interval
70.86	Groundwater Elevation

**FIGURE 3-1**  
**GROUNDWATER FLOW**  
**INTERMEDIATE SURFICIAL AQUIFER - JUNE 2013**  
**TANKS 81 A, B, & C**  
**FORMER NAVAL AIR STATION CECIL FIELD**  
**JACKSONVILLE, FLORIDA**




REQUESTED BY: K. Wimble	DATE: 12/17/2013
DRAWN BY: kburum	TASK ORDER NUMBER: JM43

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP,

extrapolation and interpolation methods, the data was contoured to aid in estimating the groundwater flow direction and water level gradient. The groundwater flow direction in the intermediate surficial aquifer, based on the 10 June 2013 groundwater elevation data, is to the northwest (Figure 3-1).

### **3.3 Permanent Monitoring Well Construction and Piezometer Abandonment**

During the August 2013 BCT meeting, it was the Team's consensus that, based on the recent potentiometric site map and analytical data collected from the temporary monitoring wells installed in May 2013, temporary monitoring wells CEF-081-TW02 and CEF-081-TW04 be converted to flush-mount permanent monitoring wells CEF-081-30I and CEF-081-31I, respectively, and that these new wells should be included in the long-term monitoring program (Meeting Minutes, August 2013). Depth-to-water measurements and groundwater samples, to be analyzed for isopropylbenzene only, are to be collected from CEF-081-30I. Only depth-to-water measurements are to be collected from monitoring well CEF-081-31I, to monitor the western component of the groundwater flow in the area.

On 1 October 2013, three temporary wells (CEF-081-TW01, CEF-081-TW03, and CEF-081-TW05) were abandoned in place. The wells were grouted from the bottom up with Type I/II Portland cement and the PVC cut off approximately one foot below grade. The two temporary wells CEF-081-TW02 and CEF-081-TW04 were converted to permanent flush-mount monitoring wells, and designated CEF-081-30I and CEF-081-31I, respectively. Associated forms, permits, well abandonment reports, and field notes are included in Appendix C. On 14 October 2013, the new permanent monitoring wells and several other Site wells without survey data were surveyed.

### **3.4 Current Status**

The new permanent well CEF-081-30I and the other wells in the long-term monitoring program (CEF-081-04I, CEF-081-24I, CEF-081-25I, CEF-081-26I, and CEF-081-27D), for which analytical data collection was required, were sampled for isopropylbenzene on 21 and 22 October 2013, as part of the established semi-annual sampling schedule. Survey data and analytical results for the wells sampled in October 2013 will be presented in the Long-Term Groundwater Monitoring Report for Tanks 81 A, B, and C — Year 4, 1st Semi-Annual Event.



#### 4.0 REFERENCES

Cecil Field Base Realignment and Closure Cleanup Team Meeting. Meeting Minutes. Meeting minute reference No. 2786, Action 1682, Decision 863. 13 February 2013.

Cecil Field Base Realignment and Closure Cleanup Team Meeting. Meeting Minutes. Meeting minute reference No. 11.1. 13 and 14 August 2013.

Resolution Consultants. *Draft Sampling and Analysis Plan for Petroleum Sites — North-South Apron; Building 82, Tank G82; BP Wells; Hangar 815 Wash Rack; Tanks 81 A, B, and C; South Fuel Farm; and Ocala Crash Site. Former Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Naval Facilities Engineering Command Southeast. January 2013.

Resolution Consultants. *Work Plan-Supplemental Site Assessment, Building 81, Tanks 81 A, B, and C. Former Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Naval Facilities Engineering Command Southeast. March 2013.

Tetra Tech NUS, Inc. *Groundwater Monitoring Report, 1st Semi-Annual, Year 3, Tanks 81 A, B, and C. Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Naval Facilities Engineering Command Southeast. December 2012.

**Appendix A**  
**Monitoring Well Construction Logs**

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA			
Well Number: <u>CF-051-TW01</u>	Site Name: <u>Cecil Field - Tanks 81 ABC,</u>	FDEP Facility I.D. Number: <u>NA</u>	Well Install Date(s): <u>05/08/13</u>
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade <input checked="" type="checkbox"/> Right-of-Way		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)	Well Install Method: <u>HSA</u>  Surface Casing Install Method: <u>NA</u>
If AG, list feet of riser above land surface:			
Borehole Depth (feet): <u>35'</u>	Well Depth (feet): <u>35'</u>	Borehole Diameter (inches): <u>8'</u>	Manhole Diameter (inches): <u>NA</u>
Well Pad Size: <u>NA</u> feet by <u>NA</u> feet		Riser Diameter and Material: <u>2" Sch 40 PVC</u>	Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)
Riser Length: <u>30</u> feet from <u>0</u> feet to <u>30</u> feet		Screen Diameter and Material: <u>2" Sch 40 PVC</u>	Screen Slot Size: <u>0.010"</u>
Screen Length: <u>5</u> feet from <u>30</u> feet to <u>35</u> feet		1 <sup>st</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary	1 <sup>st</sup> Surface Casing I.D. (inches): <u>NA</u>
1 <sup>st</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet		2 <sup>nd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	2 <sup>nd</sup> Surface Casing I.D. (inches): <u>NA</u>
2 <sup>nd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet		3 <sup>rd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	3 <sup>rd</sup> Surface Casing I.D. (inches): <u>NA</u>
3 <sup>rd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet		Filter Pack Material and Size: <u>20/30</u>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Filter Pack Length: <u>7</u> feet from <u>28</u> feet to <u>35</u> feet		Filter Pack Seal Material and Size: <u>30-65 Fine Sand (2") and 3/8" hole plug (2")</u>	Filter Pack Seal Length: <u>2</u> feet from <u>26</u> feet to <u>28</u> feet
Surface Seal Material: <u>Titan Portland Cement</u>		Surface Seal Length: <u>26</u> feet from <u>0</u> feet to <u>26</u> feet	

WELL DEVELOPMENT DATA			
Well Development Date: <u>05/08/13</u>	Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)		
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)	Depth to Groundwater (before developing in feet): <u>≈ 9' by 5</u>		
Pumping Rate (gallons per minute): <u>NA</u>	Maximum Drawdown of Groundwater During Development (feet): <u>NA</u>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <u>55</u>	Development Duration (minutes): <u>30</u>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <u>Pale gray, no odor</u>		Water Appearance (color and odor) At End of Development: <u>Turbidity 720, no odor</u>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: CEF-081-TW01		Permit Number: 2013-0509		FDEP Facility Identification Number: NA	
Site Name: Lecil Field - Site Tanks & LAB		Borehole Start Date: 05/08/13		Borehole Start Time: 0820 <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
		End Date: 05/08/13		End Time: 1000 <input type="checkbox"/> AM <input type="checkbox"/> PM	
Environmental Contractor: Resolution Consultants		Geologist's Name: ROBERT BAILEY		Environmental Technician's Name: NA	
Drilling Company: Preferred Drilling		Pavement Thickness (inches): NA		Borehole Diameter (inches): 8"	
				Borehole Depth (feet): 35'	
Drilling Method: HSA - Continuous		Apparent Borehole DTW (in feet from soil moisture content): 9		Measured Well DTW (in feet after water recharges in well):	
				OVA (list model and check type): Min. Rate 3000 <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other (describe if other or multiple items are checked):					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA	0-5'	60/60	NA	NA	NA	Hand Auger	1	0-0.6 Topsoil w/ organics, some sfs sand, trace gravels, dark grayish tan	SM	Dry	
							2	0.6-1.0 light to pale gray fs sands trace fines, slight moist to dry	SW		
							3		SP		
							4				
							5				
SS	5-7	24/24	34-45 (8)	NA	NA	0.2	6	6-7.7 SAA, inc. Fe staining, grades to pale gray w/ orange streaking	SP	D	
							7				
SS	7-9	18/24	45-77 (12)	NA	NA	0.2	8	7.7-9 SAA, dec Fe staining, grades to pale gray becoming inc moist	SP	M	
							9				
SS	9-11	18/24	1-1-1 (2)	NA	NA	0.1	10	9-11 SAA saturated, slight pink/purplish hue, no staining, trace flex	SP	S	
							11			W	
SS	11-13	20/24	12-22	NA	NA	NA	12	11-13 SAA (ufs), trace fines	SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CFE-051-Two1		NA		Ceil Field - 61 ABC		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	13-15	24/24	2-3-3-4 (6)	NA	NA	NA	13	SAA - Rec to wet, trace flex	SP	W	
SS	15-17	24/24	1-1-1 (2)	NA	NA	NA	14	SAA - inc moisture	SP	S	
SS	17-19	24/24	3-4-3-2 (7)	NA	NA	NA	15	SAA	SP	S	
SS	19-21	18/24	1-1-2-1 (3)	NA	NA	NA	16	SAA, fine grained, light pale gray, trace flex	SP	S	
SS	21-23	20/24	2-3-6-7 (9)	NA	NA	NA	17	SAA, fine grained	SP	S	
SS	23-25	20/24	1-1-3-10 (4)	NA	NA	NA	18	SAA, inc flex material	SP	S	
SS	25-27	21/24	1-1-3-4 (4)	NA	NA	NA	19	SAA, grades pale gray, trace fines	SP	S	
SS	27-29	17/24	3-6-6-5 (12)	NA	NA	NA	20	SAA	SP	S	
SS	29-31	19/24	2-3-7-5 (8)	NA	NA	NA	21	SAA	SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

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Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CF-081-TW01		NA		Cecil Field - Tanks 817BC		05/08/17		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	31	SAA	SP	S	
SS	31-33	18/24	2-2-33 (5)	NA	NA	NA	32				
-	-	-	-	-	-	-	33	SAA	SP	W	
SS	33-35	20/24	3-5-77 (3)	NA	NA	NA	34				
-	-	-	-	-	-	-	35	TD-35' screen 30'-35'			
-	-	-	-	-	-	-	36				
-	-	-	-	-	-	-	37				
-	-	-	-	-	-	-	38				
-	-	-	-	-	-	-	39				
-	-	-	-	-	-	-	40				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

**WELL CONSTRUCTION AND DEVELOPMENT LOG**

WELL CONSTRUCTION DATA					
Well Number: <u>CEF-081-TWOZ</u>	Site Name: <u>Cecil Field-Tanks 81,ABC</u>	FDEP Facility I.D. Number: <u>NA</u>	Well Install Date(s): <u>05/08/13</u>		
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)	Well Install Method: <u>HSA</u>		
If AG, list feet of riser above land surface:		Surface Casing Install Method: <u>NA</u>			
Borehole Depth (feet): <u>35</u>	Well Depth (feet): <u>35</u>	Borehole Diameter (inches): <u>8"</u>	Manhole Diameter (inches): <u>NA</u>	Well Pad Size: <u>NA</u> feet by <u>NA</u> feet	
Riser Diameter and Material: <u>2" Sch 40 PVC</u>	Riser/Screen Connections: <input type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <u>30</u> feet from <u>30</u> feet to <u>0</u> feet			
Screen Diameter and Material: <u>2" Sch 40 PVC</u>	Screen Slot Size: <u>0.01"</u>	Screen Length: <u>5</u> feet from <u>35</u> feet to <u>30</u> feet			
1 <sup>st</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	1 <sup>st</sup> Surface Casing I.D. (inches): <u>NA</u>	1 <sup>st</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
2 <sup>nd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	2 <sup>nd</sup> Surface Casing I.D. (inches): <u>NA</u>	2 <sup>nd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
3 <sup>rd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	3 <sup>rd</sup> Surface Casing I.D. (inches): <u>NA</u>	3 <sup>rd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
Filter Pack Material and Size: <u>20/30</u>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Filter Pack Length: <u>7</u> feet from <u>35</u> feet to <u>28</u> feet			
Filter Pack Seal Material and Size: <u>30-65 Fine Sand (#1) and 3/8" hole plug (2#)</u>		Filter Pack Seal Length: <u>3</u> feet from <u>28</u> feet to <u>25</u> feet			
Surface Seal Material: <u>Titan Portland Cement</u>		Surface Seal Length: <u>25</u> feet from <u>25</u> feet to <u>0</u> feet			

WELL DEVELOPMENT DATA			
Well Development Date: <u>05/08/13</u>	Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)		
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)	Depth to Groundwater (before developing in feet): <u>≈ 9' bgs</u>		
Pumping Rate (gallons per minute): <u>NA</u>	Maximum Drawdown of Groundwater During Development (feet): <u>NA</u>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <u>55 gal</u>	Development Duration (minutes): <u>45</u>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <u>Light brown, no odor</u>		Water Appearance (color and odor) At End of Development: <u>Clear, no odor</u>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <b>CE-081-TW02</b>		Permit Number: <b>2013-0509</b>		FDEP Facility Identification Number: <b>NA</b>	
Site Name: <b>Cecil Field - Tanks 81 ABC</b>		Borehole Start Date: <b>05/08/13</b>		Borehole Start Time: <b>1205</b> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
		End Date: <b>05/08/13</b>		End Time: <b>1345</b> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: <b>Resolution Consultants</b>		Geologist's Name: <b>ROBERT BAILEY</b>		Environmental Technician's Name: <b>Ketina Burnum</b>	
Drilling Company: <b>Preferred Drilling</b>		Pavement Thickness (inches): <b>NA</b>		Borehole Diameter (inches): <b>8"</b>	
				Borehole Depth (feet): <b>35</b>	
Drilling Method: <b>HSA-Continuous</b>		Apparent Borehole DTW (in feet from soil moisture content): <b>4</b>		Measured Well DTW (in feet after water recharges in well): <b>NA</b>	
				OVA (list model and check type): <b>MiniRAE 3000</b> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
(describe if other or multiple items are checked):					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)	
HA	0-5'	60/60	NA	HA	NA	0.1	1	0-0.6 Topsoil + fg sand, dark brownish black	SM	D		
								2	0.6-5 loose fg sand, pale gray, w/trace flecty mottled			
								3				
								4				
								5				
SS	5-7	24/24	5-5-6-6 (1)	NA	NA	4.1	6	5-7 pale brown, fine, rounded sand, mottled, trace fines & flecty, trace silt	SP	M		
						0.5	7	hit refusal, will offset <sup>offset</sup> 3 times				
NA	NA	NA	NA	NA	NA	NA	8	to closer by trace line. <del>had</del> to push through to 9'. No Litho from 7-9	SP	M		
							9					
SS	9-11	10/24	4-5-3-1 (5)	NA	NA	2.1	10	Loose, fg sand, mottled, trace fines & flecty	SP	M		
							11	trace trace organics				
SS	11-13	12/24	6-0-0-1-2	NA	NA	NA	12	SAA, becoming light pale gray, trace Fe staining	SP	WS		

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number: CEF-081-TWOZ		FDEP Facility Identification Number: NA			Site Name: Ceil Field - Tanks 81 ABC		Borehole Start Date: 05/08/13 End Date: 05/08/13				
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	13	SAA, no Fe staining	SP	S	
SS	13-15	24/24	2-2-2-4 (4)	NA	NA	NA	14				
-	-	-	-	-	-	-	15	SAA, slight inc in grain size, intervals		S	
SS	15-17	24/24	6-4-6-8 (10)	NA	NA	NA	16	of pale white + pale gray sands	SP		
-	-	-	-	-	-	-	17	SAA		S	
SS	17-19	24/24	2-4-2-2 (6)	NA	NA	NA	18		SP		
-	-	-	-	-	-	-	19	SAA, inc pale white sands		S	
SS	19-21	24/24	3-4-4-4	NA	NA	NA	20		SP		
-	-	-	-	-	-	-	21	SAA		S	
SS	21-23	24/24	5-8-9-12	NA	NA	NA	22		SP		
-	-	-	-	-	-	-	23	SAA, grades pale gray from 24-24.5		S	
SS	23-25	24/24	8-9-12-3	NA	NA	NA	24	pale brown from 24.5-25	SP		
-	-	-	-	-	-	-	25	No litho 25-31 b/c out of water		S	
NA	NA	NA	NA	NA	NA	NA	26	which we need to flush out	SP		
-	-	-	-	-	-	-	27	observable sand in augers.		S	
NA	NA	NA	NA	NA	NA	NA	28	will resume litho at 31' b/c	SP		
-	-	-	-	-	-	-	29			S	
NA	NA	NA	NA	NA	NA	NA	30		SP		

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

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Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TWOZ		NA		Cecil Field-Tanks 81		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	31	SAA			
SS	31-33	24/24	7-7-9-10	NA	NA	NA	32		SP	S	
-	-	-	-	-	-	-	33	SAA			
SS	33-35	24/24	9-9-11-8	NA	NA	NA	34		SP	S	
-	-	-	-	-	-	-	35	TD 35'			

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <b>CEP-081-TW03</b>		Site Name: <b>CEP Cecil Field - Tanks 81ABC</b>		FDEP Facility I.D. Number: <b>NA</b>	Well Install Date(s): <b>05/08/13</b>
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade			Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Method: <b>HSA</b>
If AG, list feet of riser above land surface: <b>NA</b>					
Borehole Depth (feet): <b>35</b>	Well Depth (feet): <b>35</b>	Borehole Diameter (inches): <b>8'</b>	Manhole Diameter (inches): <b>NA</b>	Well Pad Size: <b>NA</b> _____ feet by _____ feet	
Riser Diameter and Material: <b>2" Sch 40 PVC</b>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <b>30</b> feet from <b>0</b> feet to <b>30</b> feet		
Screen Diameter and Material: <b>2" Sch 40 PVC</b>		Screen Slot Size: <b>0.010"</b>	Screen Length: <b>5</b> feet from <b>30</b> feet to <b>35</b> feet		
1 <sup>st</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <b>NA</b>	1 <sup>st</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to _____ feet		
2 <sup>nd</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <b>NA</b>	2 <sup>nd</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to _____ feet		
3 <sup>rd</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <b>NA</b>	3 <sup>rd</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to _____ feet		
Filter Pack Material and Size: <b>20/30 Silica Sand</b>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <b>7</b> feet from <b>28</b> feet to <b>35</b> feet		
Filter Pack Seal Material and Size: <b>30-65 Fine Sand (2') + 3/8" Ho se plug (2')</b>			Filter Pack Seal Length: <b>4</b> feet from <b>24</b> feet to <b>28</b> feet		
Surface Seal Material: <b>Titan Portland Cement</b>			Surface Seal Length: <b>24</b> feet from <b>0</b> feet to <b>24</b> feet		

WELL DEVELOPMENT DATA			
Well Development Date: <b>05/08/13</b>		Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <b>NA ~ 9' bgs</b>	
Pumping Rate (gallons per minute): <b>NA</b>	Maximum Drawdown of Groundwater During Development (feet): <b>NA</b>	Well Purged Dry (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <b>55</b>	Development Duration (minutes): <b>55</b>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <b>Light to medium brown / no odor</b>		Water Appearance (color and odor) At End of Development: <b>Clear / no odor</b>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: LEF-081-TW03		Permit Number: 2013-0509		FDEP Facility Identification Number: NA	
Site Name: LECIL FIELD - Tanks 81ABC		Borehole Start Date: 05/08/13 End Date: 05/08/13		Borehole Start Time: 1630 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM End Time: 1745 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: Resolution Consultants		Geologist's Name: ROBERT BAILEY		Environmental Technician's Name: Katrina Burnham	
Drilling Company: Preferred Drillers		Pavement Thickness (inches): NA	Borehole Diameter (inches): 8"		Borehole Depth (feet): 35'
Drilling Method: HSA - Continuous	Apparent Borehole DTW (in feet from soil moisture content): 9'	Measured Well DTW (in feet after water recharges in well): NA		OVA (list model and check type): Min. KAE 5000 <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other (describe if other or multiple items are checked):					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
						NA	1	Hand Augered 0-5' bgs	SM	D	
							2	0-0.6 Top soil + fine grained SAND, dark brownish black			
							3	0.5-5 Loose fine grained SAND, pale grey, with trace flecks, mottled	SP	D	
							4	Because of difficulty w/ sampling + drilling, will log on 5' centers			
							5				
SS	5-7	20/24	455-6	NA	NA	1.3	6	5-7 Pale brown, fine grained SAND, mottling, trace fines & flecks, trace silt	SP	M	
						0.3	7				
							8	Because of "flowing sands," making drilling difficult.			
							9	will sample remaining litho on 5ft centers			
							10				
SS	10-12	24/24	543-3 (7)	NA	NA	1.9	11	Loose, fine grained SAND, mottled, trace fines & flecks, trace organics	SP	S	
							12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:															
CEF-061-TW03		NA		Cecil Field-Tanks ABC		05/08/13															
End Date:		Sample Recovery (inches)		SPT Blows (per six inches)		Unfiltered OVA		Filtered OVA		Net OVA		Depth (feet)		Sample Description (Include grain size based on USCS, odors, staining, and other remarks)		USCS Symbol		Moisture Content		Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)	
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)										
-	-	-	-	-	-	-	13	Sampling litho w/ 5ft centers.													
-	-	-	-	-	-	-	14	See note at 7-10' bgs													
SS	15-17	18-4	2-223	NA	NA	NA	15	loose fine grained wetted SAND,	SP	S											
-	-	-	-	-	-	-	16	Slight increase in grain size down column, intervals of pale white & pale gray SANDS													
-	-	-	-	-	-	-	17	Sampling litho w/ 5ft centers.													
-	-	-	-	-	-	-	18	See note at 7-10' bgs													
-	-	-	-	-	-	-	19	same as above, increasing white SANDS													
SS	20-22	24	5-34	NA	NA	NA	20	Sampling litho w/ 5ft centers.	SP	S											
-	-	-	-	-	-	-	21	See note at 7-10' bgs													
-	-	-	-	-	-	-	22	same as above													
SS	25-27	24	3-4-44	NA	NA	NA	23	Sampling litho w/ 5' centers.	SP	S											
-	-	-	-	-	-	-	24	See note at 7-10' bgs													
-	-	-	-	-	-	-	25														
-	-	-	-	-	-	-	26														
-	-	-	-	-	-	-	27														
-	-	-	-	-	-	-	28														
-	-	-	-	-	-	-	29														
-	-	-	-	-	-	-	30														

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

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Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
TW03		NA		Ceil Fiddl-Tanks #1		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	31-33	12/24	2-3-12-15	NA	NA	NA	31	Same as above			
-	-	-	-	-	-	-	32	Sampling litho w/ 5' centers See note at 7-10' bgs			
-	-	-	-	-	-	-	33				
SS	33-35	12/24		NA	NA	NA	34				
-	-	-	791112	-	-	-	35				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <i>CEF-081-TW04</i>		Site Name: <i>Cecil Field-Tanks 81 ABC,</i>		FDEP Facility I.D. Number: <i>NA</i>	Well Install Date(s): <i>05/07/13</i>
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade			Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Method: <i>HSA</i>
If AG, list feet of riser above land surface:					
Borehole Depth (feet): <i>35'</i>	Well Depth (feet): <i>35'</i>	Borehole Diameter (inches): <i>8"</i>	Manhole Diameter (inches): <i>NA</i>	Well Pad Size: <i>NA</i> _____ feet by _____ feet	
Riser Diameter and Material: <i>2" SCHD 40 PVC</i>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <i>30</i> feet from <i>0</i> feet to <i>30</i> feet		
Screen Diameter and Material: <i>2" SCHD 40 PVC</i>		Screen Slot Size: <i>0.010"</i>	Screen Length: <i>5</i> feet from <i>30</i> feet to <i>35</i> feet		
1 <sup>st</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <i>NA</i>	1 <sup>st</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
2 <sup>nd</sup> Surface Casing Material: <i>NP</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <i>NA</i>	2 <sup>nd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
3 <sup>rd</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <i>NA</i>	3 <sup>rd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
Filter Pack Material and Size: <i>20-30 silica sand</i>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <i>7</i> feet from <i>35</i> feet to <i>28</i> feet		
Filter Pack Seal Material and Size: <i>30-65 fine silica sand (2') 2" Smooth 3/8" Hole Plug Caps (2')</i>		Filter Pack Seal Length: <i>4</i> feet from <i>28</i> feet to <i>24</i> feet			
Surface Seal Material: <i>NA</i>		Surface Seal Length: <i>NA</i> feet from <i>24</i> feet to <i>0</i> feet			

WELL DEVELOPMENT DATA			
Well Development Date: <i>05/07/13</i>		Well Development Method (check one): <input type="checkbox"/> Surge/Pump <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <i>in 9' bgs</i>	
Pumping Rate (gallons per minute): <i>1.5 gpm</i>	Maximum Drawdown of Groundwater During Development (feet): <i>NA</i>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <i>45 gal</i>	Development Duration (minutes): <i>30</i>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <i>light brown, cloudy &gt;1000 NTU/no odor</i>		Water Appearance (color and odor) At End of Development: <i>clear / no odor</i>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS
<i>Start 1550 End 1420</i>

# BORING LOG

Boring/Well Number: CEF-081-TW04		Permit Number: 2013-0509		FDEP Facility Identification Number: NA	
Site Name: Cecil Field - Tanks 81 ABC		Borehole Start Date: 05/07/13 End Date: 05/07/13		Borehole Start Time: <del>0700</del> 1400 <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM End Time: 1530 <input type="checkbox"/> AM <input type="checkbox"/> PM	
Environmental Contractor: Resolution Consultants		Geologist's Name: ROBERT BAILEY		Environmental Technician's Name: John King	
Drilling Company: Preferred Drilling		Pavement Thickness (inches): 4"	Borehole Diameter (inches): 8"		Borehole Depth (feet): 35'
Drilling Method: HSA - Continuous	Apparent Borehole DTW (in feet from soil moisture content): ~ 7'		Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): PID - Mini Roc 3000 <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: (describe if other or multiple items are checked):					
Borehole Completion (check one): <input type="checkbox"/> Well <input checked="" type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
		HA	NA	NA	NA	Hand Auger	1	0-0.2 Topsoil, black, organics	SM	D	
							2	0.2-1.5 gravel/asphalt/limestone fill			
HA	0-5						3	1.5-2.5 light, pale gray fine grained sand	SP	M	
							4	2.5-3.5 light tannish gray sand, vty, trace fines		M	
							5	3.5-5 SAA, grades pale gray down column		M	
SS	5-7	12/24	4-3-3-3 (6)	NA	NA	0.0	6	5-7 pale gray, loose, wet, fine, rounded, Fe stains, matting	SP	W	
							7	7-9 SAA, less staining, wet		W	
SS	7-9	12/24	2-2-2-3 (4)	NA	NA	0.0	8		SP		
							9	9-9.4 SAA, still unsorted, becoming better sorted		W	
SS	9-11	4/24	3-3-3-3 (6)	NA	NA	0.0	10	9.4-11 SAA, dec matting	SP	S	
							11				
SS	11-13	12/24	3-3-3-2 (6)	NA	NA	0.0	12	11-12.2 SAA, Fe staining, traces fines, becoming lighter gray	SP	W	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TW04		NA		Cecil Field - Site Tanks 81		05/07/13		05/07/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	NA	FA	0.0	13	SAA			
SS	13-15	24/24	2344 (7)	NA	NA	↓	14				
-	-	-	-	-	-	0.0	15	15-16.1 Fe staining, trace fines,	W		
SS	15-17	24/24	0222 (4)	NA	NA	↓	16	becoming light gray down column	W		
-	-	-	-	-	-	↓	17	SAA, trace fine trace fines, trace flux	W		
SS	17-19	24/24	2222 (4)	NA	NA	↓	18				
-	-	-	-	-	-	↓	19	19-20.4 SAA			
SS	19-21	24/24	24344 (7)	NA	NA	NA	20	20.4-20.7 SAA, bc w/trace fines, mottled	W		
-	-	-	-	-	-	-	21	20.7-21 Becoming pale gray, vfg, saturated	S		
-	-	-	-	-	-	-	22	21-22 - SAA			
SS	21-23	12/24	2-3-67	NA	NA	NA	22	22-23 SAA, grades w/staining (orange)	W		
-	-	-	-	-	-	-	23	SAA	S		
SS	23-25	2/24	3-6-9-11 (15)	NA	NA	NA	24				
-	-	-	-	-	-	-	25	SAA	S		
SS	25-27	8/24	7-9-10-12 (4)	NA	NA	NA	26				
-	-	-	-	-	-	-	27	SAA	S		
SS	27-29	6/24	6-4-44 (8)	NA	NA	NA	28				
-	-	-	-	-	-	-	29				
SS	29-31	14/24	5-7-9-15 (16)	NA	NA	NA	30	SAA - no staining, frained		S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

Page 3 of 3

Boring/Well Number: <i>CEP-081-TW04</i>		FDEP Facility Identification Number: <i>NA</i>			Site Name: <i>Ceal Field - Tank 181 ABC</i>		Borehole Start Date: <i>05/07/13</i> End Date: <i>05/07/13</i>				
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	12/24	1	-	-	-	31	SAA, increasing <sup>Fe</sup> staining	SP	S	
SS	31-33	-	57/214 (14)	NA	NA	NA	-				
-	-	-	-	-	-	-	33	SAA, inc. staining (orange)	SP	S	
SS	33-35	12/24	5-8-15-17 (25)	NA	NA	NA	-				
-	-	-	-	-	-	-	-	TD = 35' bgs	SP		

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <i>LEF-051-TW05</i>		Site Name: <i>Cecil Field - Tanks 61A/B/C</i>		FDEP Facility I.D. Number: <i>NA</i>	Well Install Date(s): <i>05/07/13</i>
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade			Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Method: <i>HSA</i>
If AG, list feet of riser above land surface:					Surface Casing Install Method: <i>NA</i>
Borehole Depth (feet): <i>35</i>	Well Depth (feet): <i>35</i>	Borehole Diameter (inches): <i>2 8</i>	Manhole Diameter (inches): <i>NA</i>	Well Pad Size: <i>NA</i> feet by ___ feet	
Riser Diameter and Material: <i>2 in sch 40 PVC</i>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <i>30</i> feet from <i>30</i> feet to <i>0</i> feet		
Screen Diameter and Material: <i>2 in sch 40 PVC</i>		Screen Slot Size: <i>0.010"</i>	Screen Length: <i>5</i> feet from <i>35</i> feet to <i>30</i> feet		
1 <sup>st</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <i>NA</i>	1 <sup>st</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to ___ feet		
2 <sup>nd</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <i>NA</i>	2 <sup>nd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to ___ feet		
3 <sup>rd</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <i>NA</i>	3 <sup>rd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to ___ feet		
Filter Pack Material and Size: <i>20/30 silica sand</i>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <i>7</i> feet from <i>35</i> feet to <i>28</i> feet		
Filter Pack Seal Material and Size: <i>30-65 fine sand (2') and Boroid 3/8" Huc plug (2')</i>			Filter Pack Seal Length: <i>4'</i> feet from <i>28</i> feet to <i>24</i> feet		
Surface Seal Material: <i>TITAN PORTLAND CEMENT</i>			Surface Seal Length: <i>NA</i> feet from <i>24</i> feet to <i>0</i> feet		

WELL DEVELOPMENT DATA			
Well Development Date: <i>05/07/13</i>		Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <i>24' bgs</i>	
Pumping Rate (gallons per minute): <i>NA</i>	Maximum Drawdown of Groundwater During Development (feet): <i>NA</i>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <i>55</i>	Development Duration (minutes): <i>10:00</i>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <i>Dark to light brown, No odor</i>		Water Appearance (color and odor) At End of Development: <i>Clear / No odor</i>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <b>CEP-081-TW05</b>		Permit Number: <b>2013-0509</b>		FDEP Facility Identification Number: <b>NA</b>	
Site Name: <b>Levil Field - \$1 ABC</b>		Borehole Start Date: <b>05/07/13</b>		Borehole Start Time: <b>1120</b> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
		End Date:		End Time: <b>1355</b> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: <b>Resolution Consultants</b>		Geologist's Name: <b>ROBERT BAILEY</b>		Environmental Technician's Name: <b>John King</b>	
Drilling Company: <b>Preferred Drilling</b>		Pavement Thickness (inches):		Borehole Diameter (inches): <b>8"</b>	
				Borehole Depth (feet): <b>BOS = 35'</b>	
Drilling Method: <b>HSA - continuous</b>		Apparent Borehole DTW (in feet from soil moisture content): <b>29.6</b>		Measured Well DTW (in feet after water recharges in well):	
				OVA (list model and check type): <b>MiniPac 3000</b> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
(describe if other or multiple items are checked):					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
					0.0	NA	1	Hand auger to 5' by 8" for clearance			
HA	NA	025 60	NA		0.0	NA	2	Surface/alpha cuttings, sand/gravel mix, dry, white sand, vfg, <del>moist</del> , dry to moist	SM	D	
					0.0	NA	3	grades to dark br gray vfg sand, trace gravels, slight moist	SP	D	
					0.0	NA	4	SAA			
					0.0	NA	5				
SS	5-7	24 24	NA	NA	0.0	NA	6	5.0-5.4 SAA, slight grayish dry, trace o.sponus	SP	M	
					0.0	NA	7	5.4-6.2 SAA, gray			
					0.0	NA	8	6.2-7 SAA, trace br red sand, trace mottling, little to some times			
SS	7-9	24 24	4	NA	0.0	NA	9	7-8.4 SAA, inc moisture, sl moist to moist	SP	W	
					0.0	NA	10	8.4-9 SAA, becoming slight pinkish hue, inc moisture			
					0.0	NA	11	7-9.6 SAA, tannish gray			
SS	9-11	12 24	8 6 (11) 5 5	NA	0.0	NA	12	9.6-11 SAA, saturated	SP	S	
							11	11-13 SAA, saturated			
SS	11-13	14 24	3-1-1-1 (3)	NA			12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number: CEF-081-TW05		FDEP Facility Identification Number: NA		Site Name: Cecil Field - Tanks & LAB		Borehole Start Date: 05/01/13 End Date: 05/07/13					
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	13-15	4 1/2 / 24	44-33 (7)	NA	NA	0-0	13	13-15. Becoming more coarse grained	SP	S	
SS	15-17	20 / 24	34-44 (8)			0-0	15	15-15.6 SAA, saturated	SP	S	
							16	15.6-17 SAA, wet			
SS	17-19	20 / 24	12-1-1 (3)			0-0	17	17-19 becoming white SAA	SP	S	
SS	19-21	WDR / 24	0-0-3-6 (3)			0-0	19	19-21 SAA, wet	SP	S	
							20	20-20.7 (1-2 inch pink sand)			
SS	21-23	24 / 24	3-4-6-7 (10)			0-0	21	21-23 SAA, becoming more white	SP	S	
							22	sands down column, w/ trace of black flux			
SS	23-25	22 / 24	3-5-10-8 (15)			0-0	23	23-25 light gray, trace fines, becomes drier moisture	SP	S	
							24				
SS	25-27	22 / 24	5-7-8-8			0-0	25	25-27 SAA	SP	S	
							26				
SS	27-29	20 / 24	4-4-6 (8)			0-0	27	27-29 SAA, becoming pale gray	SP	S	
							28				
SS	29-31	18 / 24	4-6-6-8 (12)				29	29-31 SAA	SP	S	
							30				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

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Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TW05		NA		Cecil Field - Tanks 81A6L		05/07/13		05/07/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	31-33	24/24	5-6-8-10 (14)	NA	NA	0.0	31	SAA	SP	S	
						↓	32	trace fines at 31.6, <del>32.0</del>			
SS	33-35	24/24	7-7-9-10 (16)	NA	NA	0.0	33	SAA,	SP	S	
						↓	34				
						↓	35				
TD = 35' bgs											

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

**Appendix B**  
**Temporary Monitoring Well**  
**Laboratory Analytical Results**  
**(Submitted Under Separate Cover)**

**Appendix C**  
**Field Documentation**

# Activity Hazard Analysis (AHA)

Activity/Work Task: <b>Well Installation Oversight</b>	Overall Risk Assessment Code (RAC) (Use highest code)	<b>M</b>
Project Location: NAS Cecil Field	<b>Risk Assessment Code (RAC) Matrix</b>	
Project Number: 0888812660	<b>Severity</b>	<b>Probability</b>
Date Prepared: 4/2/2013		Frequent    Likely    Occasional    Seldom    Unlikely
Prepared by (Name/Title): Eric Allen/ H&S Specialist	Catastrophic	E    E    H    H    M
Reviewed by (Name/Title): Kara Wimble/ Project Manager	Critical	E    H    H    M    L
	Marginal	H    M    M    L    L
	Negligible	M    L    L    L    L
<b>Notes:</b> (Field Notes, Review Comments, etc.)	Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above)	
	"Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent, Likely, Occasional, Seldom or Unlikely.	<b>RAC Chart</b>
	"Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic, Critical, Marginal, or Negligible	E = Extremely High Risk
	Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.	H = High Risk M = Moderate Risk L = Low Risk
<b>Recommended PPE:</b> <input checked="" type="checkbox"/> Safety Glasses With Sideshields <input checked="" type="checkbox"/> Steel-Toed Boots <input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> Nitrile Gloves <input type="checkbox"/> Leather Gloves <input checked="" type="checkbox"/> Hearing Protection <input type="checkbox"/> Flame Retardant Clothing		
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>
General Physical Hazards	<ul style="list-style-type: none"> <li>Slip/Trip/Fall</li> <li>Cold/Heat Stress</li> <li>Biological Hazards</li> <li>Cuts/Scrapes/Bruises</li> <li>Manual lifting</li> </ul>	<ul style="list-style-type: none"> <li>Level D PPE required.</li> <li>Maintain a clean and organized work area.</li> <li>Watch your step and ensure proper footing.</li> <li>Provide drinking water and first aid kit.</li> <li>Wear appropriate clothing for weather conditions.</li> <li>Assess work area for poisonous plants and animals and communicate observations to avoid them.</li> <li>Wear appropriate work gloves for task</li> <li>Use proper lifting techniques by bending and lifting with legs and not back, and do not over extend or twist (Do not lift over 49lb. without assistance)</li> </ul>
	<ul style="list-style-type: none"> <li>Adverse Weather</li> </ul>	<ul style="list-style-type: none"> <li>Be aware of changing weather condition and provide appropriate weather gear.</li> <li>When work is halted due to inclement weather, personnel are to seek shelter in vehicles or building designated Shelter in Place (SIP)</li> </ul>
		<b>L</b>

Job Steps	Hazards	Controls	RAC
Mobilization / Site Set Up	<ul style="list-style-type: none"> <li>Slips, Trips, Falls</li> </ul>	<ul style="list-style-type: none"> <li>Clear trees, roots, weeds, limbs and other ground hazards from the drilling location. Practice good housekeeping to keep the ground around the drilling site clear of obstructions, equipment, and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces.</li> </ul>	L
	<ul style="list-style-type: none"> <li>General equipment hazards               <ul style="list-style-type: none"> <li>Overhead and underground utilities</li> <li>Noise Hazard</li> <li>Pinch points/swing radius</li> <li>Chemical exposure potential</li> <li>Eye Injury</li> <li>Fire</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>All equipment will be properly secured during transport.</li> <li>All vehicles and equipment will comply with DOT requirements.</li> <li>Never move the DPT rig with the mast upright. Ensure the sampling site foundation is stable and as level as possible.</li> <li>Use a ground guide along with a functioning back-up alarm during equipment backing.</li> <li>Confirm Utility Locations</li> <li>Inspect vehicles and equipment daily (Checklists provided in HASP)</li> <li>Maintain clean and organized work area.</li> <li>Wear appropriate clothing and PPE, (no loose clothing or jewelry)</li> <li>Earplugs and/or ear muffs required in EZ</li> <li>Position the drill rig and personnel up wind of drilling location</li> <li>Monitoring breathing zone with PID and upgrade PPE as required.</li> <li>Avoid creating splash hazards while drilling.</li> <li>Keep a safe distance from drill rig.</li> <li>Use hand signals, keep clear of moving equipment, and ensure eye contact with operator prior to approaching.</li> <li>Have fire extinguisher on site.</li> </ul>	
	<ul style="list-style-type: none"> <li>Contact with utilities</li> </ul>	<ul style="list-style-type: none"> <li>Inspect for buried and overhead utilities in the vicinity of the drilling location. Clearance will be required, as stipulated in the HASP.</li> </ul>	
	<ul style="list-style-type: none"> <li>Traffic in adjacent roadway</li> </ul>	<ul style="list-style-type: none"> <li>Use combination of vehicles, cones, traffic barriers, and caution tape</li> </ul>	
Boring Process	<ul style="list-style-type: none"> <li>Cuts</li> </ul>	<ul style="list-style-type: none"> <li>Wear appropriate work gloves to prevent cuts, lacerations</li> </ul>	M
	<ul style="list-style-type: none"> <li>Dermal Contact</li> </ul>	<ul style="list-style-type: none"> <li>Wear appropriate protective clothing to avoid dermal or personal clothing contact with sampled material.</li> </ul>	

Job Steps	Hazards	Controls	RAC
	<ul style="list-style-type: none"> <li>Slips, Trips, Falls</li> </ul>	<ul style="list-style-type: none"> <li>Clear trees, roots, weeds, limbs and other ground hazards from the drilling location. Practice good housekeeping to keep the ground around the drilling site clear of obstructions, equipment and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces.</li> </ul>	
	<ul style="list-style-type: none"> <li>Volatile Organic Compounds (VOCs)</li> </ul>	<ul style="list-style-type: none"> <li>If the results of previous surveys indicate the presence of VOCs in hazardous levels, rig operators should be prepared to protect both personnel and equipment from VOC inhalation and flammable atmospheres.</li> </ul>	
Sample collection and packaging	<ul style="list-style-type: none"> <li>Chemical exposure potential</li> </ul>	<ul style="list-style-type: none"> <li>Follow proper decontamination procedures</li> </ul>	L
	<ul style="list-style-type: none"> <li>Cuts/Scrapes</li> </ul>	<ul style="list-style-type: none"> <li>Inspect glassware for breakage and avoid sharp edges and wear gloves (nitrile and cut resistant leather or Kevlar)</li> </ul>	
	<ul style="list-style-type: none"> <li>Manual lifting of equipment</li> </ul>	<ul style="list-style-type: none"> <li>Use proper lifting techniques and do not over-extend</li> </ul>	
Rig decontamination	<ul style="list-style-type: none"> <li>High pressure water</li> <li>Splash Hazard</li> </ul>	<ul style="list-style-type: none"> <li>Spray away from body</li> <li>Wear full-face shield, gloves, rubber boots, and Tyvek or other suitable attire.</li> </ul>	L

<b>Chemical Hazards and Monitoring Procedures</b>	
<b>Chemical Hazard(s) (list):</b>	<b>VOC's, PAH's, Metals, Pesticides</b>
<b>Applicable SSHP Section(s):</b>	<b>H.2.4</b>
<b>Monitoring Instrument(s):</b>	<b>N/A</b>

<b>Additional Safety Considerations</b>
<ol style="list-style-type: none"> <li>Ensure all personnel have read the HASP</li> <li>Ensure all equipment is equipped with necessary fire extinguishers (min 5 lbs BC). Ensure equipment has a working kill switch and back-up alarms, and follow equipment inspection procedures.</li> <li>Ensure underground utilities are verified with facility, marked, markings maintained, and operator aware of location</li> <li>All equipment operators must be Competent Persons for the task/equipment being performed/operated.</li> <li>All ground personnel must stay clear of equipment and make eye contact (and receive confirmation) with operator prior to approaching. Wear high visibility reflective vests and stay out of travel lanes and swing radius of heavy equipment.</li> <li>Dust hazard are expected to be minimal due to saturated state of soils and regular precipitation. If visible emissions of dust observed, then dust suppression techniques will be implemented.</li> <li>Follow safe driving procedures. Always use the buddy system when moving vehicles. Plan your travel path ahead of time. Use maps and known construction zones to make your selection. Consult with the other team members before making any changes to travel path.</li> <li>Use an equipment checklist to verify you have the appropriate equipment/tools for your tasks. Consult appropriate THAs or SOPs.</li> <li>Stow all materials in vehicle properly, use appropriate cases and bags. Secure equipment in bed of truck with netting or straps. Do not leave any equipment loose in the cab or bed of the truck. It can cause property damage or serious injuries by falling from vehicle.</li> <li>When securing equipment, watch for pinch points. Straps and netting can get caught on objects and snap back as well as trap a finger if hand placement is not correct. Use a buddy to help secure equipment when possible.</li> </ol>

### Additional Safety Considerations

11. Conduct equipment inspection of all hoses and switches. Stay clear of running equipment.
12. Maintain good housekeeping practices. When possible, use mechanical equipment to perform lifting of heavy objects. When lifting, follow safe lifting practices. Use the buddy system when lifting.
13. Stay clear of moving rig, do not move rig with mast raised, do not drive on slopes greater than 30 degrees, avoid soft areas when moving rig and setting up, chock wheels. Use spotter when moving rig, check for overhead obstructions.
14. Wear nitrile gloves when collecting samples in soil to avoid dermal contact with potential contaminants. Be observant for tripping hazards, holes, stickups, vines, old fence wire, etc.
15. For equipment decontamination, triple rinse using distilled or deionized water andalconox for first rinse and distilled or deionized water for second and third rinses. Always clean materials between locations and at the site. Do not bring equipment back to the office without proper decontamination.

Additional Operational Safety Procedures	PPE
05-305, Hand & Power Tools 05-308, Manual Lifting 05-313, Wildlife, Plants, Insects 05-405, Drilling and Boring 05-406, Overhead Electrical Lines 05-417, Identifying Underground Utilities 05-508, Hazardous Materials and Sample Shipping 05-511, Heat Stress	LEVEL D <ul style="list-style-type: none"> <li>• ANSI approved hard hat</li> <li>• ANSI approved safety glasses</li> <li>• Shirts with sleeves and full-length pants.</li> <li>• ANSI approved steel safety-toe boots or approved equivalent.</li> <li>• High visibility reflective traffic vest</li> <li>• Nitrile Gloves</li> <li>• Leather work gloves</li> <li>• Hearing protection required when around operating machines (85 dBA).</li> <li>• First aid kit (located in vehicle).</li> <li>• Fire extinguisher (located in vehicle).</li> </ul> Modified LEVEL D (biohazard avoidance) <ul style="list-style-type: none"> <li>• Tyvek suit</li> </ul> LEVEL C (upgrade per Air Monitoring Requirements) <ul style="list-style-type: none"> <li>• APR with OV/P100 cartridges ; change cartridges daily</li> </ul>

Equipment to be Used	Training Requirements/Competent or Qualified Personnel name(s)	Inspection Requirements
Drill Rig	Drilling to be performed by competent person as certified by employer.	Equipment will be inspected daily by drill rig operator. Any safety deficiencies detected will require cessation of sampling activities until appropriate repairs have been made.

### Acknowledgement

All employees, subcontractors, and visitors must sign the Acknowledgement form, in this section, before conducting field activities at this site.

By signing this form, Resolution Consultants employees agree that:

- I have read this Task Hazard Analysis and I understand the requirements of the THA.
- I will conduct work at this site in accordance with the requirements of the THA.

By signing this form, subcontractors and visitors agree that:

- I have read and understood the potential hazards associated with the site.
- I will ensure compliance with my company's policies on health and safety.

John Kiner/ENSAFE  
Print Name & Company

5/7/13  
Date

[Signature]  
Signature

KATRINA BERNARD/ENSAFE  
Print Name & Company

5/6/13  
Date

[Signature]  
Signature

Ariel Torres PDS  
Print Name & Company

5/10/13  
Date

[Signature]  
Signature

Jose Minguéz  
Print Name & Company

5/10/13  
Date

[Signature]  
Signature

Jeffrey Barnes  
Print Name & Company

5-10-13  
Date

[Signature]  
Signature

DANIEL MYERS  
Print Name & Company

5-10-13  
Date

[Signature]  
Signature

\_\_\_\_\_  
Print Name & Company

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name & Company

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print Name & Company

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature



# Resolution Consultants

## Daily Safe Work Assessment & Permit (SWAP)

This form must be filled out **daily prior to work in the field and reviewed with all project personnel in a daily safety brief.** The SWAP is to be completed before each work day to continually assess and communicate project-related hazards. Please have all SWAPs initiated by the Project Manager or Supervisor after returning from the field and place all completed SWAPs in the project file.

### Section 1: Project Information

Project/Client Name: Former NAS Cecil Field SWAP Date/Time: 05/07/2013 -- 1354  
 Location of the Work: Site 59 or (Tanks 81 ABC) (circle one) Project Number: 0888813467-FI-FK01 or (FK02)  
 SWAP Originator: Robert Bailey Additional Personnel: Preferred Drilling:  
 Description of Work: Oversight of the Installation of monitoring wells; development of monitoring wells installed; groundwater sampling

Has a HASP been created for this job?  Yes  No If Yes, has the HASP been reviewed prior to work?  Yes  No

### Section 2: Identify hazards associated with tasks and tools FOR THIS DAY:

Critical Safety Tasks are listed below: (If answered "Yes" please call H&S for additional guidance/checks)

	Yes	No		Yes	No
Performing work in Confined Spaces or Excavations - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Use of Respiratory Protection- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous Chemical Exposure- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Involvement with Lockout/Tagout Activities - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falls Greater than Six (6) Feet- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Field Investigations (No Call Required) - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

List each task that presents hazards and identify controls you will take to minimize risk. If No hazards were identified, write NONE in the first Task box. All additional project personnel involved must initial the bottom of each task identified below signifying that they have reviewed this information. Use back of SWAP as necessary for General Safety and Precautions, and to add additional hazards.

Following is a non-inclusive list of potential hazards.

- Chemicals (inhalation, dermal)
- Biologic Hazards (poison ivy, ants, snakes)
- Potentially unsafe area or neighborhood
- Sampling around heavy equipment (backhoe bucket, Vac. Truck, etc.)
- Working around high noise (> 85 dBA)
- Activities that require coring or drilling
- Drilling around underground utilities
- Work with equipment around power lines
- Slick, uneven walking/working surfaces
- Climbing ladders / scaffolds
- Using gas or propane powered equipment in enclosed areas
- Work in extreme heat (> 104°F) or extreme cold (<30°F)
- Working around heavy equipment / traffic
- Power tools (hammer drills, auger, etc.)
- Working with lifting / hoisting equipment
- Vehicular traffic, fork lifts, scissors lifts
- Inclement weather (lightning, high winds)
- Work with ergonomic hazards (lifting hazards, twisting, excessive repetitive)
- Working in proximity to deep water > 3ft
- Remote location w/ limited communication

Task: Oversight of the Installation of permanent and temporary monitoring wells

Hazards: Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, overhead hazards, load noises, snakes, etc., pinch points, underground utilities

Controls: Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellent, eye contact with the driller and associated workers, sunshine on call + HA to 5' dls

Task: Development of monitoring wells

Hazards: Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, snakes,

Controls: Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellent, eye contact with the driller and associated workers

Task: Groundwater Sampling

Hazards: Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, snakes,

Controls: Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellent, eye contact with the driller and associated workers

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

**Section 3: Chemical Hazards and PPE:**

**Chemical Hazards**

	Yes	No		Yes	No
Radiation or Other Contamination - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Environmental Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable/Combustible Materials or Vapors (< 140° FP)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reactive, Volatile or Explosive - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RCRA Hazardous Materials (listed or characteristic) - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Irritant or Sensitizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosive (pH >12.5 or < 2) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Oxidizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poison, Target Organ Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Teratogen or Mutagen - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Biological (mold, poison oak-ivy-sumac, etc.) - - - - -	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Carcinogen - - - - -	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Routes of Exposure:**

	Yes	No		Yes	No
Inhalation- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ingestion (poor hygiene and work practice) - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Skin (dermal absorp.) or Mucus Membranes (eyes, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Injection (rare) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Personal Protective Equipment (PPE) FOR THIS DAY**

Level of Protection:  A  B  C  D

Respiratory Protection:  None  Full Face  Half Face Cartridge Type: \_\_\_\_\_

Protective Clothing:  Work Uniform  Protective Suit: \_\_\_\_\_  High-Visibility Vest/Shirt

Gloves:  Latex  Nitrile  Butyl  PVC  Neoprene  Leather  Other: \_\_\_\_\_

Footwear:  Steel-Toe Leather  Steel-Toe Rubber  Other: \_\_\_\_\_

Eye/Face Protection:  Safety Glasses  Face Shield  Chemical Goggles

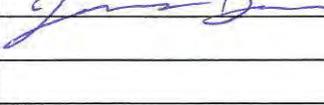
Head Protection:  Hard Hat  Bump Cap  Other: \_\_\_\_\_

Hearing Protection:  Ear Plugs  Muffs  Combination (List) \_\_\_\_\_

**Section 4: Emergency Contact Information**

<b>Name:</b> 911 EMERGENCY Number(s): 911	<b>Name:</b> Kara Wimble (PM) <b>Number(s):</b> 904-367-4324
<b>Name:</b> Kelly Dollarhide Number(s): 904-626-1002	<b>Name:</b> Resolution Consultants Health and Safety – John Knopf <b>Number(s):</b> 901-372-7962

**Section 5: SWAP Review and Certification (All crew members and affected subcontractors)**

Printed Name	Signature
Juan Kines	
Ariel Torres	
Jose Minguez	
Jeffrey Barnes	

**THE LOCATION WHERE THE WORK IS TO BE DONE HAS BEEN EXAMINED AND NECESSARY PRECAUTIONS TAKEN FOR THE WORK.**  
I certify that the above listed project has been evaluated for hazards, protective measures assigned and communicated with all personnel on the jobsite. Changes in scope of work or work conditions may require the modification of existing SWAP or creation of a new SWAP.

ROBERT BAILEY                      Robert Bail                      \_\_\_\_\_  
SWAP Completed By: Print                      SWAP Completed By: Sign                      PM Review (Initials)

**Review with everyone on-site before the start of work, and return the completed form to your Project Manager to review and archive in the project file.**

**Contact H&S if you have any questions.**



# Resolution Consultants

## Daily Safe Work Assessment & Permit (SWAP)

This form must be filled out **daily** prior to work in the field and **reviewed** with all project personnel in a **daily safety brief**. The SWAP is to be completed before each work day to continually assess and communicate project-related hazards. Please have all SWAPs initiated by the Project Manager or Supervisor after returning from the field and place all completed SWAPs in the project file.

### Section 1: Project Information

Project/Client Name: Former NAS Cecil Field SWAP Date/Time: 05/08/2013 -- 0836  
 Location of the Work: Site 59 or Tanks 81 ABC (circle one) Project Number: 0888813467-FI-FK01 or FK02  
 SWAP Originator: Robert Bailey Additional Personnel: Preferred Drilling: Aerial, Jeff, Joe, Jose  
 Description of Work: Oversight of the Installation of monitoring wells; development of monitoring wells installed; groundwater sampling

Has a HASP been created for this job?  Yes  No If Yes, has the HASP been reviewed prior to work?  Yes  No

### Section 2: Identify hazards associated with tasks and tools FOR THIS DAY:

Critical Safety Tasks are listed below: (If answered "Yes" please call H&S for additional guidance/checks)

	Yes	No		Yes	No
Performing work in Confined Spaces or Excavations - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Use of Respiratory Protection- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous Chemical Exposure- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Involvement with Lockout/Tagout Activities - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falls Greater than Six (6) Feet- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Field Investigations (No Call Required) - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

List each task that presents hazards and identify controls you will take to minimize risk. If No hazards were identified, write NONE in the first Task box. All additional project personnel involved must initial the bottom of each task identified below signifying that they have reviewed this information. Use back of SWAP as necessary for General Safety and Precautions, and to add additional hazards.

Following is a non-inclusive list of potential hazards.

- Chemicals (inhalation, dermal)
- Biologic Hazards (poison ivy, ants, snakes)
- Potentially unsafe area or neighborhood
- Sampling around heavy equipment (backhoe bucket, Vac. Truck, etc.)
- Working around high noise (> 85 dBA)
- Activities that require coring or drilling
- Drilling around underground utilities
- Work with equipment around power lines
- Slick, uneven walking/working surfaces
- Climbing ladders / scaffolds
- Using gas or propane powered equipment in enclosed areas
- Work in extreme heat (> 104°F) or extreme cold (<30°F)
- Working around heavy equipment / traffic
- Power tools (hammer drills, auger, etc.)
- Working with lifting / hoisting equipment
- Vehicular traffic, fork lifts, scissors lifts
- Inclement weather (lightning, high winds)
- Work with ergonomic hazards (lifting hazards, twisting, excessive repetitive)
- Working in proximity to deep water > 3ft
- Remote location w/ limited communication

**Task:** Oversight of the Installation of permanent and temporary monitoring wells

**Hazards:** Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, overhead hazards, load noises, snakes, etc., pinch points

**Controls:** Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellant, eye contact with the driller and associated workers

**Task:** Development of monitoring wells

**Hazards:** Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, snakes,

**Controls:** Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellant, eye contact with the driller and associated workers

**Task:** Groundwater Sampling

**Hazards:** Slips/Trips/Falls, Vehicular/Plane Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, snakes,

**Controls:** Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellant, eye contact with the driller and associated workers

**Task:** \_\_\_\_\_

**Hazards:** \_\_\_\_\_

**Controls:** \_\_\_\_\_

**Section 3: Chemical Hazards and PPE:**

**Chemical Hazards**

	Yes	No		Yes	No
Radiation or Other Contamination - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Environmental Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable/Combustible Materials or Vapors (< 140° FP)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reactive, Volatile or Explosive - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RCRA Hazardous Materials (listed or characteristic) - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Irritant or Sensitizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosive (pH >12.5 or < 2) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Oxidizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poison, Target Organ Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Teratogen or Mutagen - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Biological (mold, poison oak-ivy-sumac, etc.) - - - - -	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Carcinogen - - - - -	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Routes of Exposure:**

	Yes	No		Yes	No
Inhalation- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ingestion (poor hygiene and work practice) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Skin (dermal absorp.) or Mucus Membranes (eyes, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Injection (rare) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Personal Protective Equipment (PPE) FOR THIS DAY**

Level of Protection:  A  B  C  D

Respiratory Protection:  None  Full Face  Half Face Cartridge Type: \_\_\_\_\_

Protective Clothing:  Work Uniform  Protective Suit: \_\_\_\_\_  High-Visibility Vest/Shirt

Gloves:  Latex  Nitrile  Butyl  PVC  Neoprene  Leather  Other: \_\_\_\_\_

Footwear:  Steel-Toe Leather  Steel-Toe Rubber  Other: \_\_\_\_\_

Eye/Face Protection:  Safety Glasses  Face Shield  Chemical Goggles

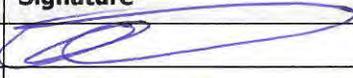
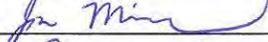
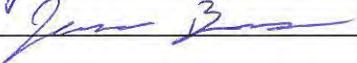
Head Protection:  Hard Hat  Bump Cap  Other: \_\_\_\_\_

Hearing Protection:  Ear Plugs  Muffs  Combination (List) \_\_\_\_\_

**Section 4: Emergency Contact Information**

<b>Name:</b> 911 EMERGENCY Number(s): 911	<b>Name:</b> Kara Wimble (PM) Number(s): 904-367-4324
<b>Name:</b> Kelly Dollarhide Number(s): 904-626-1002	<b>Name:</b> Resolution Consultants Health and Safety – John Knopf Number(s): 901-372-7962

**Section 5: SWAP Review and Certification (All crew members and affected subcontractors)**

Printed Name	Signature
Katrina P. Bernum	
Arciel Torres	
Jose Minguez	
Jeffrey Barnes	

**THE LOCATION WHERE THE WORK IS TO BE DONE HAS BEEN EXAMINED AND NECESSARY PRECAUTIONS TAKEN FOR THE WORK.**  
I certify that the above listed project has been evaluated for hazards, protective measures assigned and communicated with all personnel on the jobsite. Changes in scope of work or work conditions may require the modification of existing SWAP or creation of a new SWAP.

ROBERT BAILEY                      Robert Bailey                      \_\_\_\_\_  
SWAP Completed By: Print              SWAP Completed By: Sign              PM Review (Initials)

**Review with everyone on-site before the start of work, and return the completed form to your Project Manager to review and archive in the project file.**

**Contact H&S if you have any questions.**



# Resolution Consultants Daily Safe Work Assessment & Permit (SWAP)

This form must be filled out **daily prior to work in the field** and **reviewed with all project personnel in a daily safety brief**. The SWAP is to be completed before each work day to continually assess and communicate project-related hazards. Please have all SWAPs initiated by the Project Manager or Supervisor after returning from the field and place all completed SWAPs in the project file.

## Section 1: Project Information

Project/Client Name: Former NAS Cecil Field SWAP Date/Time: 05/14/13 @ 0823  
 Location of the Work: Tanks 81 ABC Project Number: 0888813467-FI-FK02  
 SWAP Originator: Robert Bailey Additional Personnel: \_\_\_\_\_  
 Description of Work: Water Level Collection and Ground Water Sampling

Has a HASP been created for this job?  Yes  No If Yes, has the HASP been reviewed prior to work?  Yes  No

## Section 2: Identify hazards associated with tasks and tools FOR THIS DAY:

Critical Safety Tasks are listed below: (If answered "Yes" please call H&S for additional guidance/checks)

	Yes	No		Yes	No
Performing work in Confined Spaces or Excavations - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Use of Respiratory Protection- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous Chemical Exposure- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Involvement with Lockout/Tagout Activities - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falls Greater than Six (6) Feet- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Field Investigations (No Call Required) - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

List each task that presents hazards and identify controls you will take to minimize risk. If No hazards were identified, write NONE in the first Task box. All additional project personnel involved must initial the bottom of each task identified below signifying that they have reviewed this information. Use back of SWAP as necessary for General Safety and Precautions, and to add additional hazards.

Following is a non-inclusive list of potential hazards.

- Chemicals (inhalation, dermal)
- Biologic Hazards (poison ivy, ants, snakes)
- Potentially unsafe area or neighborhood
- Sampling around heavy equipment (backhoe bucket, Vac. Truck, etc.)
- Working around high noise (> 85 dBA)
- Activities that require coring or drilling
- Drilling around underground utilities
- Work with equipment around power lines
- Slick, uneven walking/working surfaces
- Climbing ladders / scaffolds
- Using gas or propane powered equipment in enclosed areas
- Work in extreme heat (> 104°F) or extreme cold (<30°F)
- Working around heavy equipment / traffic
- Power tools (hammer drills, auger, etc.)
- Working with lifting / hoisting equipment
- Vehicular traffic, fork lifts, scissors lifts
- Inclement weather (lightning, high winds)
- Work with ergonomic hazards (lifting hazards, twisting, excessive repetitive)
- Working in proximity to deep water > 3ft
- Remote location w/ limited communication

Task: Water Level Collection and Ground Water Sampling

Hazards: Slips/Trips/Falls, Vehicular/Aircraft Traffic, Heavy Lifting, Bending/Squatting, COCs, Weather, biting insects, snakes

Controls: Aware of surroundings, High Viz Vest, Careful Lifting/Bending/Squatting, Proper PPE (See Back), Sun Block, Insect Repellant, snake chaps available

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_





# Resolution Consultants Daily Safe Work Assessment & Permit (SWAP)

This form must be filled out **daily** prior to work in the field and **reviewed** with all project personnel in a daily safety brief. The SWAP is to be completed before each work day to continually assess and communicate project-related hazards. Please have all SWAPs initiated by the Project Manager or Supervisor after returning from the field and place all completed SWAPs in the project file.

### Section 1: Project Information

Project/Client Name: Cecil Field - Tanks 81 ABC SWAP Date/Time: 05/15/19 1016  
 Location of the Work: Cecil Field - IDW Bldg Project Number: 0888813467 - FI - FK02  
 Description of Work: IDW Sampling

Has a HASP been created for this job?  Yes  No If Yes, has the HASP been reviewed prior to work?  Yes  No

### Section 2: Identify hazards associated with tasks and tools FOR THIS DAY:

Critical Safety Tasks are listed below: (If answered "Yes" please call H&S for additional guidance/checks)

	Yes	No		Yes	No
Performing work in Confined Spaces - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Use of Respiratory Protection- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hazardous Chemical Exposure- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Involvement with Lockout/Tagout Activities - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falls Greater than Six (6) Feet- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Trenching or Excavation - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

List each task that presents hazards and identify controls you will take to minimize risk. If No hazards were identified, write NONE in the first Task box. All additional project personnel involved must initial the bottom of each task identified below signifying that they have reviewed this information. Use back of SWAP as necessary for General Safety and Precautions, and to add additional hazards.

Following is a non-inclusive list of potential hazards.

- Chemicals (inhalation, dermal)
- Biologic Hazards (poison ivy, ants, snakes)
- Potentially unsafe area or neighborhood
- Sampling around heavy equipment (backhoe bucket, Vac. Truck, etc.)
- Working around high noise (> 85 dBA)
- Activities that require coring or drilling
- Drilling around underground utilities
- Work with equipment around power lines
- Slick, uneven walking/working surfaces
- Climbing ladders / scaffolds
- Using gas or propane powered equipment in enclosed areas
- Work in extreme heat (> 104°F) or extreme cold (<30°F)
- Working around heavy equipment / traffic
- Power tools (hammer drills, auger, etc.)
- Working with lifting / hoisting equipment
- Vehicular traffic, fork lifts, scissors lifts
- Inclement weather (lightning, high winds)
- Work with ergonomic hazards (lifting hazards, twisting, excessive repetitive)
- Working in proximity to deep water > 3ft
- Remote location w/ limited communication

Task: IDW Sampling

Hazards: Slips/trips/falls, heavy lifting/lowering, <sup>twisting</sup> squatting, COCs, heat,

Controls: Proper PPE, aware of surroundings, regular drink breaks, sun block

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

Task: \_\_\_\_\_

Hazards: \_\_\_\_\_

Controls: \_\_\_\_\_

**Section 3: Chemical Hazards and PPE:**

**Chemical Hazards**

	Yes	No		Yes	No
Radiation or Other Contamination - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Environmental Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable/Combustible Materials or Vapors (< 140° FP)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Reactive, Volatile or Explosive - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RCRA Hazardous Materials (listed or characteristic) - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Irritant or Sensitizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Corrosive (pH >12.5 or < 2) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Oxidizer - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poison, Target Organ Toxin - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Teratogen or Mutagen - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Biological (mold, poison oak-ivy-sumac, etc.) - - - - -	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Carcinogen - - - - -	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**Routes of Exposure:**

	Yes	No		Yes	No
Inhalation- - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Ingestion (poor hygiene and work practice) - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Skin (dermal absorp.) or Mucus Membranes (eyes, etc.)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Injection (rare) - - - - -	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Personal Protective Equipment (PPE) FOR THIS DAY**

Level of Protection:  A  B  C  D

Respiratory Protection:  None  Full Face  Half Face Cartridge Type: \_\_\_\_\_

Protective Clothing:  Work Uniform  Protective Suit: \_\_\_\_\_  High-Visibility Vest/Shirt

Gloves:  Latex  Nitrile  Butyl  PVC  Neoprene  Leather  Other: \_\_\_\_\_

Footwear:  Steel-Toe Leather  Steel-Toe Rubber  Other: \_\_\_\_\_

Eye/Face Protection:  Safety Glasses  Face Shield  Chemical Goggles

Head Protection:  Hard Hat  Bump Cap  Other: \_\_\_\_\_

Hearing Protection:  Ear Plugs  Muffs  Combination (List) \_\_\_\_\_

**Section 4: Emergency Contact Information**

Name: 911 Emergency Name: Kara Wimble  
 Number(s): 911 Number(s): 904-367-4324

Name: Name: Resolution Consultants Health and Safety – John Knopf  
 Number(s): Number(s): 901-451-1464 (Cell) 901-937-4255 (Office)

**Section 5: SWAP Review and Certification (All crew members and affected subcontractors)**

Printed Name	Signature
DAVID MORG	

**THE LOCATION WHERE THE WORK IS TO BE DONE HAS BEEN EXAMINED AND NECESSARY PRECAUTIONS TAKEN FOR THE WORK.**  
 I certify that the above listed project has been evaluated for hazards, protective measures assigned and communicated with all personnel on the jobsite. Changes in scope of work or work conditions may require the modification of existing SWAP or creation of a new SWAP.

ROBERT BAILEY                      Robert Bailey                      \_\_\_\_\_  
 SWAP Completed By: Print                      SWAP Completed By: Sign                      PM Review (Initials)



### PRE-DRILLING/EXCAVATION UTILITY CHECKLIST (COMPLETE IN ADDITION TO THE SWAP)

Site Name & Address: Cecil Field - Tanks 81, B, C - Former NAFS Cecil Field

EnSafe Project Number & Manager: 0888813467 - FI - FK02

Proposed Date of Field Work & Duration: May 7-10 2013

Project Manager Signature AFTER fieldwork has been completed: \_\_\_\_\_

(A)=To be accomplished during planning stages (B)=To be accomplished onsite before fieldwork activities

UNDERGROUND UTILITIES (PUBLIC AND PRIVATE PROPERTY) REQUIREMENTS		YES	NO
<b>1(A).</b> Has the "State-Specific One Call" been notified to mark the locations of all underground utilities? <i>Update One-Call Every 2 Weeks.</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>2(A).</b> One-Call Ticket Info. <i>Date Called: May 1, 2013 One-Call Phone#: 1-800-638-4097</i> <b>(REQUIRED BY LAW).</b> <i>Ticket Number: 121307125</i> <i>Performed by Preferred Drilling Beginning &amp; Expiration Date/Time: May 3, 2013 @ 23:59 / May 31, 2013 @ 23:59 ET</i> <i>Entities to be contacted separately: N/A</i>			
<b>3(A&amp;B).</b> Have facility (and other relevant) personnel been interviewed and asked to provide copies of all available facility diagrams and drawings about underground utilities near the excavation area?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>4(B).</b> Has an onsite walk-through been accomplished to identify surface indicators of utilities?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>5(B).</b> Have the types/positions of underground utilities been marked on the surface by one-call and/or the facility? <i>If this answer is NO, contact a Qualified Safety Reviewer listed on the EnSafe Intranet for review and clarification.</i>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>6(A&amp;B).</b> Have the locations of utilities been inserted on the work area drawing(s)?		<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>7(B).</b> Has all available information concerning the type/location/depth of known underground utilities been given to the responsible supervisor or contractor at the work site for review and possible offset/relocation?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>8(B).</b> Have suitable cable and pipe locating devices ( <b>PM/Qualified Safety Review approval</b> ) been used to confirm position of the utilities?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>9(B).</b> Have appropriate "diameter" tools been used to dig trial holes ( <b>minimum depth of 4 FEET below ground surface and minimum diameter of downhole sampling tool, including any surficial materials</b> ) to visually identify position/depth of the underground utilities, or to determine that utilities are not present within the test location?		<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>EXCAVATION ONLY</b>	<b>10(B).</b> During excavation (at all times), a watch is kept for evidence of cables, pipes, or other underground utilities not previously identified.		
	<b>11(B).</b> If heavy equipment is required to cross an area where underground utilities are known to be present, the cross points are kept to a minimum and are clearly marked.		

— Please refer to the back of this form for explanations and tips on how to answer the questions listed above. Also use the back of this checklist for comments/concerns to any of these questions and/or contact a Qualified Safety Reviewer (listed on the EnSafe Intranet) for the specific State that fieldwork is performed.

— A Qualified Safety Reviewer MUST be consulted and approve this form BEFORE fieldwork may commence (If the answer to Question 5 is NO). This approval (Telephone/Email/In Person) may be obtained/received immediately prior to starting work operations.

**Checklist Submitted By:**

Name: ROBERT BAILEY  
Signature: Robert Bail  
Date: 05/07/13

**Qualified Safety Review (If Needed):**

Name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_



## PRE-DRILLING/EXCAVATION UTILITY CHECKLIST (EXPLANATIONS AND TIPS)

The instructions below have been developed to assist field personnel in accomplishing the tasks on the front of this form. If at any time field personnel are unclear on how to perform these necessary pre-job steps, refer to the Qualified Safety Reviewer list on the EnSafe Intranet.

**(A)**=To be accomplished during planning stages **(B)**=To be accomplished onsite before fieldwork activities

<b>UNDERGROUND UTILITIES (PUBLIC AND PRIVATE PROPERTY)</b>	
	<b>1(A).</b> This is <b>REQUIRED</b> no matter if the work area is on public or private property. Borings/excavations should be located onsite before One-Call notification, if possible, with <b>WHITE</b> paint/flagging. <b>Update One-Call every 2 weeks, and locators need 3 working days to mark all utilities within the work area.</b>
	<b>2(A).</b> This may be accomplished by telephone/internet. Most state-specific one-call agencies are open 8AM-5PM local time, Monday thru Friday.
	<b>3(A&amp;B).</b> This may happen the morning of the drilling/excavation activities to be performed. All personnel need to be aware of underground utilities within (or near) the work area. Offsets may be performed to minimize the probability of encountering underground utilities.
	<b>4(B).</b> Example: light posts, valve pits, pit covers, curb/gutter inlets, manholes, surface indentations, saw cut areas, etc. This is best performed during the pre-bid site visit, but may be performed immediately before activities.
	<b>5(B).</b> One-Call color markings typically are as follows: <b>WHITE</b> (Excavation/Borings), <b>RED</b> (Power/Electrical), <b>YELLOW</b> (Gas/Petroleum), <b>ORANGE</b> (Communication/Fiber Optics), <b>BLUE</b> (Potable Water), <b>GREEN</b> (Sanitary/Storm Sewer). Review all colors and positions with field personnel prior to beginning drilling/excavating.
	<b>6(A&amp;B).</b> This refers to simply looking at the underground utilities onsite and plotting them (by hand initially) on the site drawing or aerial.
	<b>7(B).</b> If <b>NO</b> , please explain. After all underground utilities have been plotted on the drawing, review the locations with the EnSafe PM, all personnel (including subcontractors), and the client if deemed necessary. This will help to orient all field personnel as to the location of the underground utilities within or near work operations. If the utilities are marked within a 3 horizontal feet lateral distance of the boring/excavation, offsets <b>SHOULD</b> be considered.
	<b>8(B).</b> This refers to the use of a private utility locator to assist in locating underground utilities on private property that haven't been located by the One-Call system. This is highly dependent upon the makeup of the underground utility (metal, plastic, clay terra cotta, etc.) and complications due to rebar within concrete, multiple utilities crossing points, etc. Only previously trained personnel (most likely private utility locator and/or geophysical subcontractors) should use these devices. The Qualified Safety Reviewer <b>AND</b> the EnSafe PM <b>AND</b> the client will make the decision <b>TOGETHER</b> if a private utility locator is required.
	<b>9(B).</b> Example — hand augers, probe rod, vacuum extraction, post-hoe digger, etc. This is <b>NON-NEGOTIABLE</b> for drilling activities. Every boring must be advanced (without mechanical means) to a depth of four (4) feet below ground surface (or maximum boring depth if boring terminal depth is less than 4 feet). <b>NO EXCEPTIONS.</b>
<b>EXCAVATION ONLY</b>	<b>10(B).</b> This is site-specific, but usually no closer than 3 horizontal feet from any and all underground utilities (especially lines with high pressure or voltage/flammable/combustible substances). The safe distance for overhead utilities is 10 horizontal - 10 vertical feet (up to 50kV). Stay alert at all times. All personnel (EnSafe and Subcontractors) have stop work authority in reference to underground utilities. No job is too important to compromise safety.
	<b>11(B).</b> The depth/alignment of the underground utility to be crossed should be determined to prevent damage to each buried utility.

**Insert Field Notes/Concerns Here:**

*→ Tank 81 ABC* *tomorrow 5/9*

Ticket : 121307125 Rev:000 Taken: 05/01/13 14:48ET

State: FL Cnty: DUVAL GeoPlace: JACKSONVILLE  
 CallerPlace: JACKSONVILLE  
 Subdivision:

Address :  
 Street : NEW WORLD AVE  
 Cross 1 : PARKLAND RD  
 Within 1/4 mile: Y

Locat: LOCATE SOUTHEAST CORNER OF INTERSECTION GOING SOUTH APPROX 150FT TO UTILITY CIRCLE AND GOING EAST FOR APPROX 200FT TO END OF WOODLINE

:  
 Remarks : \*\*\* LOOKUP BY MANUAL \*\*\*

:  
 Grids : 3014D8153C

Work date: 05/08/13 Time: 08:00ET Hrs notc: 113 Category: 3 Duration: 02 DAYS  
 Due Date : 05/03/13 Time: 23:59ET Exp Date : 05/31/13 Time: 23:59ET  
 Work type: INSTALL MONITOR TEST WELLS Boring: N White-lined: U  
 Ug/Oh/Both: U Machinery: Y Depth: 20FT Permits: N N/A  
 Done for : ENSAFE

Company : PREFERRED DRILLING SOLUTIONS Type: CONT  
 Co addr : 11747 87TH ST N  
 City : LARGO State: FL Zip: 33773  
 Caller : TIM COLVARD Phone: 727-561-7477  
 Contact : TIM COLVARD Phone: 727-647-1428  
 BestTime: 9-5  
 Mobile : 727-647-1428  
 Fax : 727-561-9028  
 Email : TIM@PDSFLORIDA.COM

Submitted: 05/01/13 14:48ET Oper: TIM Chan: WEB  
 Mbrs : CCTV03 JE1359 JEA JEA773 SBF17

Service Area Code	Service Area Name	Contact	Phone Numbers	Utility Type
CCTV03	COMCAST CABLE COMMUNICATIONS INC	CENTRAL LOCATING SERVICE**	Day: (800) 778 - 9140	CABLE TV
JE1359	JACKSONVILLE ELECTRIC AUTHORITY: JEA-WSBU - SEWER	DAVID MEANS	Day: (904) 665 - 8410	SEWER
JEA	JACKSONVILLE ELECTRIC AUTHORITY	DAVID MEANS	Day: (904) 665 - 8410	ELECTRIC & FIBER
JEA773	JACKSONVILLE ELECTRIC AUTHORITY: JEA-WSBU WATER	DAVID MEANS	Day: (904) 665 - 8410	WATER
SBF17	A T & T/ DISTRIBUTION	USIC DISPATCH***	Day: (800) 778 - 9140 x5 Alt: (800) 468 - 8243	TELEPHONE

1-800-852-2057

onlineoil.com

14

Location JACKSONVILLE FLDate 5/7/13Project / Client CELL FIELD

JM43 08888-13467 FI FK02

FLY CLOUDY 60°ROBERT BAILEY / JOHN KING

TEAM - ROBERT BAILEY, JOHN KING

0915 - ENSAFE ARRIVES ON-SITE, PREPARED  
DRILLING ON-SITE

DRILL TEAM DRIVER - ARIEL

ASSISTANTS - JEFF, JOE, JASE

TASK - INSTALLATION OF 5 MONITORING WELLS  
TO 35' BGS - 2" DIAMETER w/  
5' SCREENS FROM 30'-35' bgs0940 - KARA ON-SITE <sup>(ENSAGE)</sup> COVER H+S PLAN + SCOPE  
w/ DRILLERS0950 - CHECK IN @ AVIATION OFFICE FOR VEHICLE  
PASSES - 6 TOTAL - 4 for drillers, 2 for ENSAGE1015 - SITE 59 LOCATIONS NOT LOCATED - MOVE  
TO 81 ABC LOCATIONS, DRILLERS LOAD  
UP ON WATER1030 - Arrive @ site, discuss well locations and  
utility clearance - all utilities have  
been cleared1045 - Leave site w/ drill assistants to pick up poly  
drums from IDW storage

1100 - Pick up 11 drums from storage

1115 - Return to site, set up @ first monitoring well  
CEF-081-TW05

1120 - Begin drilling @ CEF-081-TW05 - see Borings

15

Location JACKSONVILLE FLDate 5/7/13Project / Client CELL FIELD

JM43 08888-13467 FI FK02

CLOUDY 65°ROBERT BAILEY / JOHN KINGLog + well installation form for additional  
detail

1320 Completed CEF-081-TW05 installation.

1325 started making decan pad.

1340 started pressure wash decan.

BLC used grout, will have to let sit 24  
hrs prior to developing.

1400 Setting up at CEF-081-TW04.

1548 Completed CEF-081-TW04, see form  
for details.

1600 Developing CEF-081-TW04.

1700 Complete developing TW04. Decanning  
augers. Going to leave drill rig onsite.  
Grid to be onsite between 7:00 + 8am

1713 All offsite.

Robert Bailey

Location Jacksonville, FL Date 05/08/13

Project / Client Cecil Field - Tanks 81 ABC

JM 43 - 0888813467-F1-FK02

Sunny 60% @ 0735

Personnel: preferred Drilling: Same crew as previous day  
 Estimate/RC: R. Bailey (RB)

0732 All personnel onsite. Aerial started developing

TWO5 at 0729, purged approx 50 gals

RB took drillers to get drill water + more poly drums.

0810 Back at site. Setting up on TWO1

Will fill out SWAP + other paperwork

0820 Started HSA at CEF-081-TWO1. See form for

log details. Katrina onsite + dropped off coolers.

1000 To depth at TWO1 (35' logs). Will pull augers + set temp well to 35' logs (5' screen)

RB put IDW labels on drums.

Going to set only sand in well for now to develop.

1030 Katrina onsite.

1100 Completed developing TWO1

1120-1140 Lunch

1140 Setting up on TWO2

1215 Hand augering to 0-5' logs

See form for logging details.

1300 Hit refusal twice. Moved right at tree line

1538 Completed CEF-081-TWO3. Starting developing

1617 Completed developing TWO2

Location Jacksonville, FL Date 05/08/13

Project / Client Cecil Field - Tanks 81 ABC

JM 43 - 0888813467-F1-FK02

1617 Talked w/ D. Myers (RC). Discussed use of coring at Site 59. Notified Kara, then drillers. Drillers said had to get a contractor to core if concrete thicker than 6-8 inches. Chris West (JFA) said concrete maybe 12 inches. Drillers called a Ken + can come tomorrow at 0830. Drillers paying + will expense later.

1630 Started TWO3. Sampled on 5' centers due to time of day

1752 Started developing TWO3. Turbidity down to 6.62.

1826 Completed developing TWO3.

Decided to keep 81 ABC drums in place until tomorrow morning.

1845 Loading vehicles + organizing equip for tomorrow's drilling at Site 59.

Robert Bas

Location Jacksonville, FL Date 05/14/13Project / Client Cecil Field - Tanks S1 ABCJM43 - 0888813467 - F1 - FK02

Sunny 60s

Start

0800 Robert Bailey onsite. Left open lock for Kelly Dollarhide to put an ~~FR05E~~ north gate.

0813 At S1 ABC. 1

Tasks: collect gw samples from 5 new temp wells for Isopropylbenzene only. Send to Empirical Labs.

0825 Filled out SWAP (See form).

0828 Opening all tw caps for water levels

0840 All open will let sit.

0847 Start water level collection

well	TD	stick up height	WL
TW01	38.03	NA	9.20
TW02	37.39		10.34
TW03	38.04		9.65
TW04	37.01		7.84
TW05	37.62		7.67

0900 ~~CEF-081-TB-GW-05413~~ collected (Trip Blank)

0903 Setting up to sample TW05. See form for details.

0955 CEF-081-TW05-GW-0513 collected from TW05.

1006 Setting up on TW04. See form for details

1045 CEF-081-TW04-GW-0513 collected from TW041045 CEF-081-TW04-GW-0513-H collected from TW04 (DUP)

1050 Setting up on TW03. See form for details.

1140 CEF-081-TW03-GW-0513 collected from TW03Location Jacksonville, FL Date 05/14/13Project / Client Cecil Field - Tanks S1 ABCJM43 - 0888813467 - F1 - FK02

Sunny, 70s

Cont.

1148 Setup on TW02. See form for details

1235 CEF-081-TW02-GW-0513 collected from TW02.  
(MSMSD also collected)

1240 Moving to TW01.

1244 Started purging TW01

1345 CEF-081-TW01-GW-0513 collected

1350 Will go to IDW bldg.

1400 Will be at IDW bldg tomorrow &amp; will drum purge water then.

RB offsite to ship samples

Robert Bag

Location JACKSONVILLE, FL Date 05/15/2013

Project / Client COLTEL FIELD - TANKS 81 ABC

SM43 0888813467 - FI - F402

WEATHER: SUNNY, 80's START

10:00 ARRIVE onsite, PREPARE SWAP  
ROBERT BAILEY & DAVID MONTY

10:25 DRUM RC-081-01  
approx. 15 gallons purge water  
from 05/14/2013 sampling event  
TW01, TW02, TW03, TW04, TW05

10:30 CALIBRATION OF HANNA pH meter  
MODEL # HI 99121 HANNA  
SERIAL # 08358139

(RC-80-081-30)

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:35	01	6.98	TW05
11:36	02	7.12	TW05
11:38	(03)	11.70	TW05
11:22	04	6.85	TW04
11:35	05	7.21	TW04
11:15	(06)	11.43	TW04
11:43	(07)	11.41	TW04
11:20	08	7.09	TW01
11:32	09	5.07	TW01
11:29	10	5.41	TW01

Location JACKSONVILLE, FL Date 05/15/2013

Project / Client COLTEL FIELD - TANKS 81 ABC

CONTINUED

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:12	11	5.51	TW01
11:25	12	4.96	TW01
11:31	13	6.30	TW02
<del>11:37</del>	14*	SO: 15.16, DI H2O: 5.64	
11:24	15	7.63	TW02

\* No liquid in drum, some water  
max @ 11:00

11:18 COLLECT SAMPLE FROM DRUM 06  
FOR LAB ANALYSIS FOR pH  
ID: CEF-081-IDW-06

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:34	16	8.68	TW03
11:33	17	6.00	TW03
11:37	18	6.52	TW03

11:49 Collect Sample from Drum 03 for pH  
ID: CEF-081-IDW-03

11:52 Collect Sample from Drum 07 for pH  
ID: CEF-081-IDW-07

Location JACKSONVILLE, FL Date 05/15/2013Project / Client CECOT Field - TANKS 81 ABCIM43 0888813467 - F1 - F4021215 Representative Soil IDW sample collected  
from drum RC-50-081-03

ID: CEF-081-IDW-50-0513 collected.

RC-DW-081	Drum ID	pH	well ID
	-01	6.67	TW04
	-02	6.54	TW05
	-03	6.52	TW01
1238	-04	6.68	TW02
	-05	5.98	TW03

DRUM ID RC-081-GW-01 6.18  
collected 05/04/13 TW01-TW05

Location \_\_\_\_\_ Date \_\_\_\_\_

Project / Client \_\_\_\_\_

Location JACKSONVILLE, FL Date 05/15/2013

Project / Client CECIL FIELD - TANKS 81 ABC

SM43 0888813467-FI-FL02

WEATHER: SUNNY, 80'S

START

10:00 ARRIVE onsite, PREPARE SUMP  
ROBERT BAILEY, DAVID MORTON

10:25 DRUM RC-081-01  
approx. 15 gallons purge water  
from 05/14/2013 sampling event  
TWO1, TWO2, TWO3, TWO4, TWO5

10:30 CALIBRATION OF HANNA pH meter  
MODEL # HI 99121 HANNA  
SERIAL # 08358139

(RC-01-081-01)

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:35	01	6.98	TWO5
11:36	02	7.12	TWO5
11:38	(03)	11.70	TWO5
11:22	04	6.85	TWO4
11:35	05	7.21	TWO4
11:35	(06)	11.43	TWO4
11:43	(07)	11.41	TWO4
11:20	08	7.09	TWO1
11:32	09	5.07	TWO1
11:29	10	5.41	TWO1

Location JACKSONVILLE, FL Date 05/15/2013

Project / Client CECIL FIELD - TANKS 81 ABC

CONTINUED

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:12	11	5.51	TWO1
11:25	12	4.96	TWO1
11:31	13	6.30	TWO2
<del>11:17</del>	14*	SO: 1.5, 16, DI: 20: 5.64	
11:24	15	7.63	TWO2

\* No LEAD IN DRUM, SOURCE WATER  
MAY @ 11:00

11:18 COLLECT SAMPLE FROM DRUM 06  
FOR LAB ANALYSIS FOR pH

ID: CEF-081-IDW-06

	<u>DRUM ID</u>	<u>pH</u>	<u>WELL ID</u>
11:34	16	8.68	TWO3
11:33	17	6.00	TWO3
11:37	18	6.52	TWO3

11:49 Collect Sample from Drum 03 for pH

ID: CEF-081-IDW-03

11:52 Collect Sample from Drum 07 for pH

ID: CEF-081-IDW-07

22

Location JACKSONVILLE, FL Date 05/15/2013Project / Client CRUZZ FIELD - JAMES 81 ABC  
IM43 0888813467 - F1 - F4021215 Representative Soil IDW sample collected  
from drum RC-50-081-03

ID: CEF-081-IDW-50-0513 collected.

RC-DW-081	Development water + purge water drums		
Drum ID	pH		well ID
-01	6.67		TW04
-02	6.54		TW05
-03	6.52		TW01
1238 -04	6.68		TW02
-05	5.98		TW03

DRUM ID RC-081-6W-01 6.18  
collected 05/14/13

TW01-TW05

**Field Instrument Calibration Form**

Calibrated by: ROBERT BAILEY  
Date: 05/14/13

Equipment (Make/Model/Serial#): YSI 556 10M100157  
Equipment (Make/Model/Serial#): Lammate 2020we - 2028-1012

pH (su)		Standard: ± 0.2 standard units	
Initial Calibration		Initial Calibration Verification	
Hach SL	Reading	Pine SL	Reading
pH7 A3095	7.00	210278	7.05
pH4 A3113	4.01	2202287	4.02
Continuing Calibration Verification			
Hach SL	Reading	Deviation	Acceptable Variance (Y/N)
pH7 A3095	6.99	0.01	Y
pH4 A3113	4.03	0.02	Y

DO (mg/L)		Standard: ± 0.3 mg/L of theoretical*	
IC (Temp: 20.90 )		ICV (Temp: 20.90 )	
Saturation (%)	Reading (%)	Theoretical (mg/L)	Reading (mg/L)
100	99.2	8.915	7.12
CCV (Temp: 23.15 )			
Saturation (%)	Reading (%)	Deviation	Acceptable Variance (Y/N)
100	100.2	1.0	Y
Theoretical (mg/L)	Reading (mg/L)	Deviation	Acceptable Variance (Y/N)
8.578	8.48	0.1	Y

ORP (mV)		Standard: NA	
IC (Zobell SL: 3682 )		ICV (Pine SL: 4761 )	
TCS (Std/Temp)	Reading	TCS (Std/Temp)	Reading
234.9/22.52	233.5	234.9/22.52	233.5
CCV (Zobell SL: 3682 )			
TCS (Std/Temp)	Reading	Deviation	Acceptable Variance (Y/N)
233.6/23.15	234.0	0.64	Y

Turbidity (ntu)		Standard: ±10% of Standard	
Initial Calibration			
Standard	Reading		
10.0	10.0		
Continuing Calibration Verification			
Standard	Reading	Deviation	Acceptable Variance (Y/N)
10.0	9.86	0.14	Y

Conductivity (ms/cm)		Standard: ± 5% of standard value	
IC (YSI SL: 3167 )		ICV (Pine SL: 10115 )	
Standard	Reading	Standard	Reading
1.000	1.000	1.413	1.391
CCV (YSI SL: )			
Standard	Reading	Deviation	Acceptable Variance (Y/N)
1.000	1.003	0.003	Y

Comments:

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Notes: SL solution for standard temperature corrected standard temperature      su millivolts      standard units millivolts percent milligrams per liter      ntu nephelometric turbidity units      °C degrees Celsius      ms/cm millisiemens per centimeter (temperature corrected)      \* Theoretical value

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <u>CEP-081-TW01</u>		Site Name: <u>Cecil Field - Tanks 81 ABC</u>		FDEP Facility I.D. Number:	
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Off-Site Private Property <input type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Date(s): <u>05/08/13</u>	
If AG, list feet of riser above land surface:				Well Install Method: <u>HSA</u>	
Borehole Depth (feet): <u>35'</u>		Well Depth (feet): <u>35'</u>		Borehole Diameter (inches): <u>8"</u>	
Manhole Diameter (inches): <u>NA</u>		Well Pad Size: <u>NA</u>		feet by feet	
Riser Diameter and Material: <u>2" Sch 40 PVC</u>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)		Riser Length: <u>30</u> feet from <u>0</u> feet to <u>30</u> feet	
Screen Diameter and Material: <u>2" Sch 40 PVC</u>		Screen Slot Size: <u>0.010"</u>		Screen Length: <u>5</u> feet from <u>30</u> feet to <u>35</u> feet	
1 <sup>st</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <u>NA</u>		1 <sup>st</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
2 <sup>nd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <u>NA</u>		2 <sup>nd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
3 <sup>rd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <u>NA</u>		3 <sup>rd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
Filter Pack Material and Size: <u>20/30</u>		Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <u>7</u> feet from <u>28</u> feet to <u>35</u> feet	
Filter Pack Seal Material and Size: <u>30-65 Fine Sand (2')</u> and <u>3/8" hole plug (2')</u>				Filter Pack Seal Length: <u>2</u> feet from <u>26</u> feet to <u>28</u> feet	
Surface Seal Material: <u>Titan Portland Cement</u>				Surface Seal Length: <u>26</u> feet from <u>0</u> feet to <u>26</u> feet	

WELL DEVELOPMENT DATA			
Well Development Date: <u>05/08/13</u>		Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <u>≈ 9' by S</u>	
Pumping Rate (gallons per minute): <u>NA</u>		Maximum Drawdown of Groundwater During Development (feet): <u>NA</u>	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent		Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Total Development Water Removed (gallons): <u>55</u>		Development Duration (minutes): <u>30</u>	
Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Water Appearance (color and odor) At Start of Development: <u>Pale gray, no odor</u>		Water Appearance (color and odor) At End of Development: <u>Turbidity 720, no odor</u>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <i>CEF-081-TW01</i>		Permit Number:		FDEP Facility Identification Number:	
Site Name: <i>Lecil Field - Site Tanks 61 ABC</i>		Borehole Start Date: <i>05/08/13</i>		Borehole Start Time: <i>0820</i> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
		End Date: <i>05/08/13</i>		End Time: <i>1000</i> <input type="checkbox"/> AM <input type="checkbox"/> PM	
Environmental Contractor: <i>Resolution Consultants</i>		Geologist's Name: <i>ROBERT BAILEY</i>		Environmental Technician's Name: <i>NA</i>	
Drilling Company: <i>Preferred Drilling</i>		Pavement Thickness (inches): <i>NA</i>		Borehole Diameter (inches): <i>8"</i>	
				Borehole Depth (feet): <i>35'</i>	
Drilling Method: <i>HSA - Continuous</i>		Apparent Borehole DTW (in feet from soil moisture content): <i>9</i>		Measured Well DTW (in feet after water recharges in well):	
				OVA (list model and check type): <i>Mini Rax 3000</i> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
<i>(describe if other or multiple items are checked):</i>					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
HA	0-5'	60/60	NA	NA	NA	NA <i>Hand Auger</i>	1	0-0.6 Topsoil w/ organics, some vts sand, trace gravels, dark grayish tan	SM	Dry	
							2	0.6-6' light to pale gray fs sands trace fines, slight moist to dry	SW		
							3				
							4		SP		
							5				
SS	5-7	24	3-4-5 (5)	NA	NA	0.2	6	6-7.7 SAA, inc. Fe staining, grades to pale gray w/ orange streaking	SP	D	
							7			D	
SS	7-9	24	4-5-7 (12)	NA	NA	0.2	8	7.7-9 SAA, dec Fe staining, grades to pale gray becoming inc moist	SP	M	
							9				
SS	9-11	24	1-1-1 (2)	NA	NA	0.1	10	9-11 - SAA saturated, slight pink/purplish hue, no staining, trace flex	SP	S	
							11			W	
SS	11-13	24	2-2-2	NA	NA	NA	12	11-13 SAA (vts), trace fines	SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-051-Two1				Cecil Field - S1 ABC		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	13-15	24/24	—	NA	NA	NA	13	SAA - Dec to wet, trace flex	SP	W	
SS	15-17	24/24	2-3-3-4 (6)	NA	NA	NA	14				
—	—	—	—	—	—	—	15	SAA - inc moisture		S	
SS	17-19	24/24	0-1-1-1 (2)	NA	NA	NA	16		SP	S	
—	—	—	—	—	—	—	17	SAA		S	
SS	19-21	24/24	3-4-3-2 (7)	NA	NA	NA	18		SP	S	
—	—	—	—	—	—	—	19	SAA, fine grained, light pale gray, trace flex	SP	S	
SS	21-23	24/24	1-1-2-1 (3)	NA	NA	NA	20		SP	S	
—	—	—	—	—	—	—	21	SAA, fine grained		S	
SS	23-25	24/24	2-3-6-7 (9)	NA	NA	NA	22		SP	S	
—	—	—	—	—	—	—	23	SAA, inc flex material		S	
SS	25-27	24/24	1-1-3-10 (4)	NA	NA	NA	24		SP	S	
—	—	—	—	—	—	—	25	SAA, grades pale gray, trace fines	SP	S	
SS	27-29	24/24	1-1-3-4 (4)	NA	NA	NA	26		SP	S	
—	—	—	—	—	—	—	27	SAA	SP	S	
SS	29-31	24/24	3-6-6-5 (12)	NA	NA	NA	28		SP	S	
—	—	—	—	—	—	—	29	SAA	SP	S	
SS	31-33	24/24	2-3-7-5 (8)	NA	NA	NA	30		SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

Page 3 of 3

Boring/Well Number: <u>CEF-081-TW01</u>		FDEP Facility Identification Number:		Site Name: <u>Cecil Field - Tanks 817BC</u>		Borehole Start Date: <u>05/08/13</u> End Date: <u>05/08/13</u>					
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	31	SAA	SP	S	
SS	31-33	18/24	2-2-33 (6)	NA	NA	NA	32				
-	-	-	-	-	-	-	33	SAA	SP	W	
SS	33-35	20/24	3-5-77 (2)	NA	NA	NA	34				
-	-	-	-	-	-	-	35	TD - 35' screen 30'-35'			
-	-	-	-	-	-	-	36				
-	-	-	-	-	-	-	37				
-	-	-	-	-	-	-	38				
-	-	-	-	-	-	-	39				
-	-	-	-	-	-	-	40				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <u>CEF-081-TWOZ</u>		Site Name: <u>Cecil Field-Tanks 81,ABC</u>		FDEP Facility I.D. Number:	
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Date(s): <u>05/08/13</u>	
If AG, list feet of riser above land surface:		Well Install Method: <u>HSA</u>		Surface Casing Install Method: <u>NA</u>	
Borehole Depth (feet): <u>35</u>	Well Depth (feet): <u>35</u>	Borehole Diameter (inches): <u>6"</u>	Manhole Diameter (inches): <u>NA</u>	Well Pad Size: <u>NA</u> feet by <u>NA</u> feet	
Riser Diameter and Material: <u>2" Sch 40 PVC</u>		Riser/Screen Connections: <input type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)		Riser Length: <u>30</u> feet from <u>30</u> feet to <u>0</u> feet	
Screen Diameter and Material:		Screen Slot Size:		Screen Length: <u>5</u> feet from <u>35</u> feet to <u>30</u> feet	
1 <sup>st</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <u>NA</u>		1 <sup>st</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
2 <sup>nd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <u>NA</u>		2 <sup>nd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
3 <sup>rd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <u>NA</u>		3 <sup>rd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet	
Filter Pack Material and Size: <u>20/30</u>		Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <u>7</u> feet from <u>35</u> feet to <u>28</u> feet	
Filter Pack Seal Material and Size: <u>30-65 Fine Sand (#1) and 3/8" hole plug (2")</u>		Filter Pack Seal Length: <u>3</u> feet from <u>28</u> feet to <u>25</u> feet		Surface Seal Length: <u>25</u> feet from <u>25</u> feet to <u>0</u> feet	
Surface Seal Material: <u>Titan Portland Cement</u>					

WELL DEVELOPMENT DATA			
Well Development Date: <u>05/08/13</u>		Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <u>≈ 9' bgs</u>	
Pumping Rate (gallons per minute): <u>NA</u>		Maximum Drawdown of Groundwater During Development (feet): <u>NA</u>	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent		Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Total Development Water Removed (gallons): <u>55 gal</u>		Development Duration (minutes): <u>45</u>	
Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Water Appearance (color and odor) At Start of Development: <u>Light brown, no odor</u>		Water Appearance (color and odor) At End of Development: <u>Clear, no odor</u>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <i>CE-081-TW02</i>		Permit Number:		FDEP Facility Identification Number:	
Site Name: <i>Cecil Field - Tanks 81 A,B,C</i>		Borehole Start Date: <i>05/08/13</i>		Borehole Start Time: <i>1205</i> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
		End Date: <i>05/08/13</i>		End Time: <i>1345</i> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: <i>Resolution Consultants</i>		Geologist's Name: <i>ROBERT BAILEY</i>		Environmental Technician's Name: <i>Ketrian Burnum</i>	
Drilling Company: <i>Preferred Drilling</i>		Pavement Thickness (inches): <i>NA</i>		Borehole Diameter (inches): <i>8"</i>	
				Borehole Depth (feet): <i>35</i>	
Drilling Method: <i>HSA-Continuous</i>		Apparent Borehole DTW (in feet from soil moisture content): <i>~4</i>		Measured Well DTW (in feet after water recharges in well): <i>NA</i>	
				OVA (list model and check type): <i>MiniRAE 3000</i> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
<i>(describe if other or multiple items are checked):</i>					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)		
HA	0-5'	60/60	NA	HA	NA	0.1	1	0-0.6 Topsoil + fg sand, dark brownish black	SM	D			
									2			0.6-5 loose fg sand, pale gray, w/trace flect, mottled	
									3				
									4				
									5				
SS	5-7	20/24	5-5-6-6 (1)	NA	NA	4.1	6	5-7 pale brown, fine, <sup>well</sup> mottled sand, trace fines & flect, trace silt	SP	M			
						0.5	7	kit refusal, will offset <del>with</del> <sup>offset</sup> 3 times					
NA	NA	NA	NA	NA	NA	NA	8	to closer by trace line. <del>Hold</del> <sup>Hold</sup> to push through to 9'. No Litho from 7-9	SP	M			
							9						
SS	9-11	10/24	9-5-3-1 (5)	NA	NA	2.1	10	Loose, fg sand, mottled, trace fines, <del>trace</del> trace organics	SP	M			
							11						
SS	11-13	12/24	10-0-1-2	NA	NA	NA	12	SAA, becoming light pale gray, trace Fe staining	SP	W/S			

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number: CEF-081-TWOZ		FDEP Facility Identification Number:		Site Name: Ceil Field Tanks 8i ABC		Borehole Start Date: 05/08/13 End Date: 05/10/13					
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	13	SAA, no Fe staining	SP	S	
SS	13-15	24/24	2-2-2-4 (LA)	NA	NA	NA	14				
-	-	-	-	-	-	-	15	SAA, slight inc in grain size, intervals of pale white + pale gray Sands	SP	S	
SS	15-17	24/24	6-4-6-8 (W)	NA	NA	NA	16				
-	-	-	-	-	-	-	17	SAA		S	
SS	17-19	24/24	24-2-2 (G)	NA	NA	NA	18		SP	S	
-	-	-	-	-	-	-	19	SAA, inc pale white Sands		S	
SS	19-21	24/24	3-4-4-4	NA	NA	NA	20		SP		
-	-	-	-	-	-	-	21	SAA		S	
SS	21-23	24/24	5-8-9-12	NA	NA	NA	22		SP	S	
-	-	-	-	-	-	-	23	SAA, grades pale gray from 24-24.5 pale brown from 24.5-25	SP	S	
SS	23-25	24/24	8-9-12-8	NA	NA	NA	24				
-	-	-	-	-	-	-	25	No Litho 25-31 b/c out of water which we need to flush out augers w/ sand in augers.			
NA	NA	NA	NA	NA	NA	NA	26		SP	S	
-	-	-	-	-	-	-	27	will resume litho at 31' bgs			
NA	NA	NA	NA	NA	NA	NA	28		SP	S	
-	-	-	-	-	-	-	29				
NA	NA	NA	NA	NA	NA	NA	30		SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Page 3 of 3

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TW02				Cecil Field-Tanks 81		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
—	—	—	—	—	—	—	31	SAA			
SS	31-33	24/24	7-7-9-10	NA	NA	NA	32		SP	S	
—	—	—	—	—	—	—	33	SAA			
SS	33-35	24/24	9-9-11-8	NA	NA	NA	34		SP	S	
—	—	—	—	—	—	—	35	TD 35'			

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <b>CEP-081-TW03</b>		Site Name: <b>CEP-Cecil Field-Tanks 81ABC</b>		FDEP Facility I.D. Number:	
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Date(s): <b>05/08/13</b>	
If AG, list feet of riser above land surface:				Well Install Method: <b>HSA</b>	
				Surface Casing Install Method: <b>NA</b>	
Borehole Depth (feet): <b>35</b>	Well Depth (feet): <b>35</b>	Borehole Diameter (inches): <b>8'</b>	Manhole Diameter (inches): <b>NA</b>	Well Pad Size: <b>NA</b> feet by ___ feet	
Riser Diameter and Material: <b>2" Sch 40 PVC</b>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <b>30</b> feet from <b>0</b> feet to <b>30</b> feet		
Screen Diameter and Material: <b>2" Sch 40 PVC</b>		Screen Slot Size: <b>0.010</b>	Screen Length: <b>5</b> feet from <b>30</b> feet to <b>35</b> feet		
1 <sup>st</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <b>NA</b>	1 <sup>st</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to ___ feet		
2 <sup>nd</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <b>NA</b>	2 <sup>nd</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to ___ feet		
3 <sup>rd</sup> Surface Casing Material: <b>NA</b> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <b>NA</b>	3 <sup>rd</sup> Surface Casing Length: <b>NA</b> feet from <b>0</b> feet to ___ feet		
Filter Pack Material and Size: <b>20/30 Silica Sand</b>		Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Filter Pack Length: <b>7</b> feet from <b>28</b> feet to <b>35</b> feet		
Filter Pack Seal Material and Size: <b>30-65 Fine Sand (2') + 3/8" Ho se plug (2')</b>		Filter Pack Seal Length: <b>4</b> feet from <b>24</b> feet to <b>28</b> feet			
Surface Seal Material: <b>Titan Portland Cement</b>		Surface Seal Length: <b>24</b> feet from <b>0</b> feet to <b>24</b> feet			

WELL DEVELOPMENT DATA			
Well Development Date: <b>05/08/13</b>		Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <b>NA ~ 9' bgs</b>	
Pumping Rate (gallons per minute): <b>NA</b>	Maximum Drawdown of Groundwater During Development (feet): <b>NA</b>	Well Purged Dry (check one): <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <b>55</b>	Development Duration (minutes): <b>55</b>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <b>Light to medium brown / no odor</b>		Water Appearance (color and odor) At End of Development: <b>Clear / no odor</b>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <u>LEF-081-TW03</u>		Permit Number:		FDEP Facility Identification Number:	
Site Name: <u>CECIL FIELD - Tanks 81ABC</u>		Borehole Start Date: <u>05/08/13</u>		Borehole Start Time: <u>1630</u> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
		End Date: <u>05/08/13</u>		End Time: <u>1745</u> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: <u>Resolution Consultants</u>		Geologist's Name: <u>ROBERT BAILEY</u>		Environmental Technician's Name: <u>Katrina Burnham</u>	
Drilling Company: <u>Preferred Drillers</u>		Pavement Thickness (inches): <u>NA</u>		Borehole Diameter (inches): <u>8"</u>	
				Borehole Depth (feet): <u>35'</u>	
Drilling Method: <u>HSA - Continuous</u>		Apparent Borehole DTW (in feet from soil moisture content): <u>~9'</u>		Measured Well DTW (in feet after water recharges in well): <u>NA</u>	
				OVA (list model and check type): <u>Min. RAE 5000</u> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
<i>(describe if other or multiple items are checked):</i>					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
						NA	1	Hand Augered 0-5' by S	SM	D	
							2	0-0.6 Top soil + fine grained SAND, dark brownish black	SP	D	
							3	0.5-5 Loose fine grained SAND, pale gray, with trace flecks, mottled			
							4	Because of difficulty w/ sampling + drilling, will log on 5' centers			
							5				
SS	5-7	20/24	455-6	NA	NA	1.3	6	5-7 Pale brown, fine grained SAND, mottling, trace fines & <sup>black</sup> flecks, trace silt	SP	M	
						0.3	7				
							8				
							9				
							10				
SS	10-12	24/24	5433 (7)	NA	NA	1.9	11	Loose, fine grained SAND, mottled, trace fines & <sup>black</sup> flecks, trace organics	SP	S	
							12				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

SEE TW02 for litho

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-051-TW03				Leed Field - Tanks ABC		05/08/13		05/05/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	13				
-	-	-	-	-	-	-	14				
SS	15-17	18/24	2-223	NA	NA	NA	15				
-	-	-	-	-	-	-	16	Loose fine grained mottled SAND, slight increase in grain size down column, intervals of pale white & pale gray SANDS	SP	S	
-	-	-	-	-	-	-	17				
-	-	-	-	-	-	-	18				
-	-	-	-	-	-	-	19				
-	-	-	-	-	-	-	20				
SS	20-22	24/24	15-34	NA	NA	NA	20				
-	-	-	-	-	-	-	21	Same as above, increasing white SANDS	SP	S	
-	-	-	-	-	-	-	22				
-	-	-	-	-	-	-	23				
-	-	-	-	-	-	-	24				
-	-	-	-	-	-	-	25				
SS	25-27	24/24	3-4-44	NA	NA	NA	25				
-	-	-	-	-	-	-	26	Same as above	SP	S	
-	-	-	-	-	-	-	27				
-	-	-	-	-	-	-	28				
-	-	-	-	-	-	-	29				
-	-	-	-	-	-	-	30				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

Page 3 of 3

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
TW03				Ceil Field - Tanks #1		05/08/13		05/08/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	31-33	12/24	213-215	NA	NA	NA	31	Same as above			
-	-	-	-	-	-	-	32				
-	-	-	-	-	-	-	33				
SS	33-35	12/24		NA	NA	NA	34				
-	-	-	791112	-	-	-	35				

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <i>GEF-081-TW04</i>		Site Name: <i>Cecil Field - Tanks 81 ABC</i>		FDEP Facility I.D. Number:	Well Install Date(s): <i>05/07/13</i>
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade If AG, list feet of riser above land surface:			Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Method: <i>HSA</i>
			Surface Casing Install Method: <i>NA</i>		
Borehole Depth (feet): <i>35'</i>	Well Depth (feet): <i>35'</i>	Borehole Diameter (inches): <i>8"</i>	Manhole Diameter (inches): <i>NA</i>	Well Pad Size: <i>NA</i> _____ feet by _____ feet	
Riser Diameter and Material: <i>2" SCHD 40 PVC</i>		Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <i>30</i> feet from <i>0</i> feet to <i>30</i> feet		
Screen Diameter and Material: <i>2" SCHD 40 PVC</i>		Screen Slot Size: <i>0.010"</i>	Screen Length: <i>5</i> feet from <i>30</i> feet to <i>35</i> feet		
1 <sup>st</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		1 <sup>st</sup> Surface Casing I.D. (inches): <i>NA</i>	1 <sup>st</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
2 <sup>nd</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		2 <sup>nd</sup> Surface Casing I.D. (inches): <i>NA</i>	2 <sup>nd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
3 <sup>rd</sup> Surface Casing Material: <i>NA</i> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary		3 <sup>rd</sup> Surface Casing I.D. (inches): <i>NA</i>	3 <sup>rd</sup> Surface Casing Length: <i>NA</i> feet from <i>0</i> feet to _____ feet		
Filter Pack Material and Size: <i>20-30 Silica Sand</i>		Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Filter Pack Length: <i>7</i> feet from <i>35</i> feet to <i>28</i> feet	
Filter Pack Seal Material and Size: <i>30-60 fine Silica Sand (2') Bond 3/8" Hole Plug Chips (2')</i>				Filter Pack Seal Length: <i>4</i> feet from <i>28</i> feet to <i>24</i> feet	
Surface Seal Material: <i>NA</i>				Surface Seal Length: <i>NA</i> feet from <i>24</i> feet to <i>0</i> feet	

WELL DEVELOPMENT DATA			
Well Development Date: <i>05/07/13</i>		Well Development Method (check one): <input type="checkbox"/> Surge/Pump <input checked="" type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)	
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)		Depth to Groundwater (before developing in feet): <i>29' bgs</i>	
Pumping Rate (gallons per minute): <i>1.5 gpm</i>	Maximum Drawdown of Groundwater During Development (feet): <i>NA</i>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <i>45 gal</i>	Development Duration (minutes): <i>30</i>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <i>light brown, cloudy &gt;1000 NTU/no odor</i>		Water Appearance (color and odor) At End of Development: <i>clear / no odor</i>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS
<i>Start 1550 End 1920</i>

# BORING LOG

Boring/Well Number: <i>CEF-091-TW04</i>		Permit Number:		FDEP Facility Identification Number:	
Site Name: <i>Cecil Field - Tanks SI ABC</i>		Borehole Start Date: <i>05/07/13</i>		Borehole Start Time: <del>05/07</del> <i>1400</i> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
		End Date: <i>05/07/13</i>		End Time: <i>1530</i> <input type="checkbox"/> AM <input type="checkbox"/> PM	
Environmental Contractor: <i>Resolution Consultants</i>		Geologist's Name: <i>ROBERT BAILEY</i>		Environmental Technician's Name: <i>John King</i>	
Drilling Company: <i>Preferred Drilling</i>		Pavement Thickness (inches): <i>4"</i>		Borehole Diameter (inches): <i>8"</i>	
				Borehole Depth (feet): <i>35'</i>	
Drilling Method: <i>HSA - Continuous</i>		Apparent Borehole DTW (in feet from soil moisture content):		Measured Well DTW (in feet after water recharges in well):	
				OVA (list model and check type): <i>PID MiniRoc 300W</i> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
<i>(describe if other or multiple items are checked):</i>					
Borehole Completion (check one): <input type="checkbox"/> Well <input checked="" type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
		HA	NA	NA	NA	Hand Auger	1	0-0.2 Topsoil, black, organics			
							2	0.2-1.5 gravel/asphalt/limestone fill	SM	D	
HA	0-5						3	1.5-2.5 light/pale gray fine grained sand	SP	M	
							4	2.5-3.5 light tannish gray sand, vty, trace fines		M	
							5	3.5-5 SAA, grades pale gray down column		M	
SS	5-7	12/24	4-3-3-3 (6)	NA	NA	0.0	6	5-7 Pale gray, loose, wet, fine grained, Fe stains, matting	SP	W	
							7				
SS	7-9	12/24	2-2-2-3 (4)	NA	NA	0.0	8	7-9 SAA, less staining, wet	SP	W	
							9				
SS	9-11	4/24	3-3-3-3 (6)	NA	NA	0.0	10	9-9.4 SAA, soil mottled, becoming saturated	SP	W	
							11	9.4-11 SAA, dec matting		S	
SS	11-13	12/24	3-3-3-2 (6)	NA	NA	0.0	12	11-12.2 SAA, Fe staining, traces fines, becoming light gray	SP	W	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TW04				Cecil Field - Site Tanks 81		05/07/13		05/07/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	NA	NA	0.0	13	SAA			
SS	13-15	24/24	2344 (7)	NA	NA	↓	14				
-	-	-	-	-	-	0.0	15				
SS	15-17	24/24	0222 (4)	NA	NA	↓	16	15-16.1 Fe staining, trace fines, becoming light gray down column	W		
-	-	-	-	-	-	0.0	17				
SS	17-19	24/24	2222 (4)	NA	NA	↓	18	SAA, trace above trace fines, trace flux	W		
-	-	-	-	-	-	0.0	19				
SS	19-21	24/24	2334 (7)	NA	NA	NA	20	19-20.4 SAA	W		
-	-	-	-	-	-	-	21	20.4-20.7 SAA, bc w/trace fines, rattled	W		
SS	21-23	12/24	2367	NA	NA	NA	21	20.7-21 Becoming pale gray, vfg, saturated	S		
-	-	-	-	-	-	-	22	21-22 - SAA			
SS	23-25	12/24	3649-11 (15)	NA	NA	NA	22	22-23 SAA, grades w/staining (orange)	W		
-	-	-	-	-	-	-	23	SAA	S		
SS	25-27	8/24	791012 (4)	NA	NA	NA	24		S		
-	-	-	-	-	-	-	25	SAA	S		
SS	27-29	6/24	6444 (8)	NA	NA	NA	26		S		
-	-	-	-	-	-	-	27	SAA	S		
SS	29-31	12/24	57915 (6)	NA	NA	NA	28				
-	-	-	-	-	-	-	29	SAA - no staining, fgrained			
SS							30		S		

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## BORING LOG

Page 3 of 3

Boring/Well Number: <i>CBF-081-TW04</i>		FDEP Facility Identification Number:			Site Name: <i>Cecil Field - Tank 181 ABC</i>		Borehole Start Date: <i>05/07/13</i> End Date: <i>05/07/13</i>				
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	31	<i>SAA, increasing <sup>Fe</sup> staining</i>	SP	S	
SS	31-33	<i>12/24</i>	<i>57214 (19)</i>	NA	NA	NA	-				
-	-	-	-	-	-	-	33	<i>SAA, inc. staining (orange)</i>	SP	S	
SS	33-35	<i>12/24</i>	<i>5-3-15-17 (25)</i>	NA	NA	NA	-				
-	-	-	-	-	-	-	-	<i>TD = 35' bgs</i>	SP		

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

## WELL CONSTRUCTION AND DEVELOPMENT LOG

WELL CONSTRUCTION DATA					
Well Number: <u>LEF-081-TW05</u>	Site Name: <u>Cecil Field - Tanks 61A/B/C</u>	FDEP Facility I.D. Number:	Well Install Date(s): <u>05/07/13</u>		
Well Location and Type (check appropriate boxes): <input checked="" type="checkbox"/> On-Site <input type="checkbox"/> Right-of-Way <input type="checkbox"/> Off-Site Private Property <input checked="" type="checkbox"/> Above Grade (AG) <input type="checkbox"/> Flush-to-Grade		Well Purpose: <input type="checkbox"/> Perched Monitoring <input type="checkbox"/> Shallow (Water-Table) Monitoring <input checked="" type="checkbox"/> Intermediate or Deep Monitoring <input type="checkbox"/> Remediation or Other (describe)		Well Install Method: <u>HSA</u>	
If AG, list feet of riser above land surface:				Surface Casing Install Method: <u>NA</u>	
Borehole Depth (feet): <u>35</u>	Well Depth (feet): <u>35</u>	Borehole Diameter (inches): <u>2 8</u>	Manhole Diameter (inches): <u>NA</u>	Well Pad Size: <u>NA</u> feet by <u>NA</u> feet	
Riser Diameter and Material: <u>2 in sch 40 PVC</u>	Riser/Screen Connections: <input checked="" type="checkbox"/> Flush-Threaded <input type="checkbox"/> Other (describe)	Riser Length: <u>30</u> feet from <u>30</u> feet to <u>0</u> feet			
Screen Diameter and Material: <u>2 in sch 40 PVC</u>	Screen Slot Size: <u>0.010"</u>	Screen Length: <u>5</u> feet from <u>35</u> feet to <u>30</u> feet			
1 <sup>st</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	1 <sup>st</sup> Surface Casing I.D. (inches): <u>NA</u>	1 <sup>st</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
2 <sup>nd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	2 <sup>nd</sup> Surface Casing I.D. (inches): <u>NA</u>	2 <sup>nd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
3 <sup>rd</sup> Surface Casing Material: <u>NA</u> also check: <input type="checkbox"/> Permanent <input type="checkbox"/> Temporary	3 <sup>rd</sup> Surface Casing I.D. (inches): <u>NA</u>	3 <sup>rd</sup> Surface Casing Length: <u>NA</u> feet from <u>0</u> feet to <u>NA</u> feet			
Filter Pack Material and Size: <u>20/30 silica sand</u>	Prepacked Filter Around Screen (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Filter Pack Length: <u>7</u> feet from <u>35</u> feet to <u>28</u> feet			
Filter Pack Seal Material and Size: <u>30-65 fine sand (2') and Boroid 3/8" Huc plugs (2')</u>		Filter Pack Seal Length: <u>4'</u> feet from <u>28</u> feet to <u>24</u> feet			
Surface Seal Material: <u>TITAN PORTLAND CEMENT</u>		Surface Seal Length: <u>NA</u> feet from <u>NA</u> feet to <u>NA</u> feet			

WELL DEVELOPMENT DATA			
Well Development Date: <u>05/07/13</u>	Well Development Method (check one): <input checked="" type="checkbox"/> Surge/Pump <input type="checkbox"/> Pump <input type="checkbox"/> Compressed Air <input type="checkbox"/> Other (describe)		
Development Pump Type (check): <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Centrifugal <input type="checkbox"/> Peristaltic <input type="checkbox"/> Other (describe)	Depth to Groundwater (before developing in feet): <u>29' bgs</u>		
Pumping Rate (gallons per minute): <u>NA</u>	Maximum Drawdown of Groundwater During Development (feet): <u>NA</u>	Well Purged Dry (check one): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Pumping Condition (check one): <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> Intermittent	Total Development Water Removed (gallons): <u>55</u>	Development Duration (minutes): <u>10:60</u>	Development Water Drummed (check one): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water Appearance (color and odor) At Start of Development: <u>Dark to light brown, No odor</u>		Water Appearance (color and odor) At End of Development: <u>Clear/No odor</u>	

WELL CONSTRUCTION OR DEVELOPMENT REMARKS

# BORING LOG

Boring/Well Number: <u>CEF-081-TW05</u>		Permit Number:		FDEP Facility Identification Number:	
Site Name: <u>Cecil Field - 81 ABC</u>		Borehole Start Date: <u>05/07/13</u>		Borehole Start Time: <u>1120</u> <input checked="" type="checkbox"/> AM <input type="checkbox"/> PM	
		End Date:		End Time: <u>1355</u> <input type="checkbox"/> AM <input checked="" type="checkbox"/> PM	
Environmental Contractor: <u>Resolution Consultants</u>		Geologist's Name: <u>ROBERT BAILEY</u>		Environmental Technician's Name: <u>John King</u>	
Drilling Company: <u>Preferred Drilling</u>		Pavement Thickness (inches):		Borehole Diameter (inches): <u>8"</u>	
				Borehole Depth (feet): <u>805 = 35'</u>	
Drilling Method: <u>ASA - continuous</u>		Apparent Borehole DTW (in feet from soil moisture content):		Measured Well DTW (in feet after water recharges in well):	
				OVA (list model and check type): <u>MiniRac 3000</u> <input type="checkbox"/> FID <input checked="" type="checkbox"/> PID	
Disposition of Drill Cuttings [check method(s)]: <input checked="" type="checkbox"/> Drum <input type="checkbox"/> Spread <input type="checkbox"/> Backfill <input type="checkbox"/> Stockpile <input type="checkbox"/> Other					
<i>(describe if other or multiple items are checked):</i>					
Borehole Completion (check one): <input checked="" type="checkbox"/> Well <input type="checkbox"/> Grout <input type="checkbox"/> Bentonite <input type="checkbox"/> Backfill <input type="checkbox"/> Other (describe)					

Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
					0.0	NA	1	Hand auger to 5' b/c for clearance			
HA	NA	025 60	NA		0.0	NA	2	Surface asphalt cuttings, sand/gravel mix, dry, white sand, vfg, <del>moist</del> , dry to moist	SM	D	
					0.0	NA	3	grades to dark br gray vfg sand, trace gravels, slight moist	SP	D	
					0.0	NA	4	SAA			
	5-7				0.0	NA	5	5.0-5.4 SAA, slight grayish, dry, trace <sup>of silt</sup> <sub>of silts</sub>		M	
SS	7-9	24 24	NA	NA	0.0	NA	6	5.4-6.2 SAA, gray	SP		
					0.0	NA	7	6.2-7 SAA, trace br red sand, trace mottling, little to some times		M	
	7-9		4		0.0	NA	8	7-8.4 SAA, inc moisture, sl moist to moist		W	
SS	9-11	24/24	7 (10)	NA	0.0	NA	9	8.4-9 SAA, becoming slight pinkish hue, inc moisture	SP	W	
			9		0.0	NA	10	9-9.6 SAA, tannish gray		W	
SS	11-13	12/24	8	NA	0.0	NA	10	9.6-11 SAA, saturated	SP	S	
			6 (11) 5 5	NA			11				
SS	11-13	14/24	3-1-1-1 (2)	NA			12	11-13 SAA, saturated		S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CEF-081-TW05				Cecil Field - Tanks & LAB		05/01/13		05/07/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
SS	13-15	4/24	4433 (7)	NA	NA	0.0	13	13-15. Becoming more coarse grained	SP	S	
SS	15-17	20/24	3444 (8)			0.0	15	15-15.6 SAA, saturated	SP	S	
							16	15.6-17 SAA, wet			
SS	17-19	20/24	1-2-1-1 (3)			0.0	17	17-19 becoming white SAA	SP	S	
SS	19-21	20/24	0-0-3-6 (3)			0.0	19	19-21 SAA, wet	SP	S	
							20	20-20.7 (1-2 inch of pink sand)			
SS	21-23	24/24	3-4-6-7 (10)			0.0	21	21-23 SAA, becoming more white	SP	S	
							22	Sands down column, w/ traces of black flux			
SS	23-25	22/24	3-5-10-12 (15)			0.0	23	23-25 light gray, trace fines, becoming drier moisture	SP	S	
SS	25-27	22/24	5-7-8-6			0.0	25	25-27 SAA	SP	S	
SS	27-29	20/24	4446 (8)			0.0	27	27-29 SAA, becoming pale gray	SP	S	
SS	29-31	18/24	4-6-6-8 (12)				29	29-31 SAA	SP	S	

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

# BORING LOG

Page 3 of 3

Boring/Well Number:		FDEP Facility Identification Number:		Site Name:		Borehole Start Date:		End Date:			
CF-081-TW05				Cecil Field - Tanks 81ABC		05/07/13		05/07/13			
Sample Type	Sample Depth Interval (feet)	Sample Recovery (inches)	SPT Blows (per six inches)	Unfiltered OVA	Filtered OVA	Net OVA	Depth (feet)	Sample Description (Include grain size based on USCS, odors, staining, and other remarks)	USCS Symbol	Moisture Content	Lab Soil and Groundwater Samples (list sample number and depth or temporary screen interval)
-	-	-	-	-	-	-	31	SAA			
SS	31-33	24/24	5-6-8-10 (14)	NA	NA	0.0	32	trace fines at 31.6- <del>32.0</del>	SP	S	
-	-	-	-	-	-	-	33	SAA,			
SS	33-35	24/24	7-7-9-10 (16)	NA	NA	0.0	34		SP	S	
-	-	-	-	-	-	-	35				
								TD = 35' bgs			

Sample Type Codes: PH = Post Hole; HA = Hand Auger; SS = Split Spoon; ST = Shelby Tube; DP = Direct Push; SC = Sonic Core; DC = Drill Cuttings  
 Moisture Content Codes: D = Dry; M = Moist; W = Wet; S = Saturated

**Resolution Consultants / Form FD 9000-24 (modified)  
GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Former NAS Cecil Field - Building 81, Tanks 81 A, B, C</b>	SITE LOCATION: <b>Building 81, Tanks 81 A, B, C</b>
WELL NO: <b>CEF-081-TW01</b>	SAMPLE ID: <b>CEF-081-TW01-GW-0513</b>
SAMPLE DATE/TIME: <b>05/14/13 @ 1345</b>	

**PURGING DATA**

WELL DIAMETER (inches): <b>2</b>	TUBING DIAMETER (in): <b>3/16 (ID)</b>	WELL SCREEN INTERVAL DEPTH: <sup>35</sup> <del>30</del> feet to <sup>35</sup> <del>32.7</del> feet	STATIC DEPTH TO WATER (feet): <b>9.20</b>	PURGE PUMP TYPE OR BAILER: <b>PERSTALTIC</b>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <b>NA</b> feet - <b>NA</b> feet) X <b>NA</b> gallons/foot = <b>NA</b> gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = <b>0</b> gallons + ( <b>0.0014</b> gallons/foot X <b>50</b> feet) + <b>0.1</b> gallons = <b>0.17</b> gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>	PURGING INITIATED AT: <b>1250</b>	PURGING ENDED AT: <b>1345</b>	TOTAL VOLUME PURGED (gallons): <b>2.5</b>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mg/L)	COLOR/ODOR (describe)
1325	2.0	2.0	0.033	9.26	5.25	23.10	0.085	0.85	81.8	-190.2	None
1328	0.1	2.1	0.033	9.26	5.27	23.16	0.085	0.74	106.8	-187.6	"
1331	0.1	2.2	0.033	9.26	5.25	23.18	0.084	0.72	57.8	-184.5	"
1334	0.1	2.3	0.033	9.26	5.23	23.16	0.083	0.72	47.9	-187.5	"
1337	0.1	2.4	0.033	9.27	5.23	23.21	0.083	0.70	42.5	-187.9	"
1340	0.1	2.5	0.033	9.27	5.22	23.15	0.083	0.71	20.2	-188.9	"
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 PURGING EQUIPMENT CODES: B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>ROBERT BAILEY / RC</b>				SAMPLER(S) SIGNATURE(S): <i>Robert Bailey</i>				SAMPLING INITIATED AT: <b>1345</b>		SAMPLING ENDED AT: <b>1350</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>				TUBING MATERIAL CODE: <b>(T)</b>		FIELD-FILTERED: Y <b>(N)</b>			FILTER SIZE: _____ μm			
FIELD DECONTAMINATION: PUMP Y <b>(N)</b>				TUBING Y <b>(N)</b> N (replaced)				DUPLICATE: Y <b>(N)</b>				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)			
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH						
	<b>3</b>	<b>CG</b>	<b>40 mL</b>	<b>HCL</b>	<b>120</b>	<b>NA</b>	<b>Isopropylbenzene</b>	<b>RFPP</b>	<b>200</b>			
REMARKS: <i>On last reading, turbidity from pump = 30.2. Will collect sample.</i>												
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)												

**NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

**2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)**

**pH:** ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

**Resolution Consultants / Form FD 9000-24 (modified)**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Former NAS Cecil Field - Building 81, Tanks 81 A, B, C</b>	SITE LOCATION: <b>Building 81, Tanks 81 A, B, C</b>
WELL NO: <b>CEF-081-TW02</b>	SAMPLE ID: <b>CEF-081-TW02-GW-0513</b>
SAMPLE DATE/TIME: <b>05/14/13 @ 1235</b>	

**PURGING DATA**

WELL DIAMETER (inches): <b>2</b>	TUBING DIAMETER (in): <b>3/16 (ID)</b>	WELL SCREEN INTERVAL <sup>35</sup> DEPTH: <del>30</del> feet to <del>35</del> feet <i>52.00</i> feet to <i>52.28</i> feet	STATIC DEPTH TO WATER (feet): <b>10.34</b>	PURGE PUMP TYPE OR BAILER: <b>PERSTALTIC</b>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <i>NA</i> feet - <i>NA</i> feet ) X <i>NA</i> gallons/foot = <i>NA</i> gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = <i>0</i> gallons + ( <i>0.0014</i> gallons/foot X <i>50</i> feet ) + <i>0.1</i> gallons = <i>0.17</i> gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <i>32.5</i>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <i>32.5</i>	PURGING INITIATED AT: <b>1148</b>	PURGING ENDED AT: <b>1235</b>	TOTAL VOLUME PURGED (gallons): <b>2.75</b>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or (μS/cm)	DISSOLVED OXYGEN (circle units) (mg/L) or % saturation	TURBIDITY (NTUs)	ORP (mg/L)	COLOR/ODOR (describe)
1216	1.75	1.75	<del>0.06</del> <i>0.033</i>	10.39	5.06	22.42	0.042	1.14	<del>52.3</del> <i>34.4</i>	-157.0	Sulfur
1219	0.2	1.95	0.06	10.39	5.06	22.32	0.042	1.27	34.4	-159.9	"
1222	0.2	2.15	0.06	10.39	5.05	22.28	0.041	1.17	30.9	-162.8	"
1225	0.2	2.35	0.06	10.39	5.04	22.26	0.041	1.14	24.3	-167.7	"
1228	0.2	2.55	0.06	10.39	5.04	22.25	0.041	1.11	19.5	-166.9	"
1231	0.2	2.75	0.06	10.39	5.04	22.25	0.041	1.11	17.1	-167.6	"
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>ROBERT BAILEY / RC</b>				SAMPLER(S) SIGNATURE(S): <i>Robert Bailey</i>				SAMPLING INITIATED AT: <b>1235</b>		SAMPLING ENDED AT: <b>1240</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <i>32.5</i>				TUBING MATERIAL CODE: <b>T</b>		FIELD-FILTERED: Y <b>N</b>		FILTER SIZE: _____ μm			
FIELD DECONTAMINATION: PUMP Y <b>N</b>				TUBING Y <b>N</b> (replaced)				DUPLICATE: Y <b>N</b> <i>Buy MS/MSD collected</i>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH					
	<i>89</i>	<b>CG</b>	<b>40 mL</b>	<b>HCL</b>	<b>120 360</b>		<b>Isopropylbenzene</b>	<b>RFPP</b>	<b>200</b>		
REMARKS: <i>Initial turbidity high. Will purge until visibly low, then start readings. After several readings, ORP still dropping. Will sample anyway since others have stabilized</i>											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)											
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)											

- NOTES:** 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.  
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)  
pH: ± 0.2 units Temperature: ± 0.2 °C Specific Conductance: ± 5% Dissolved Oxygen: all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) Turbidity: all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

**Resolution Consultants / Form FD 9000-24 (modified)**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Former NAS Cecil Field – Building 81, Tanks 81 A, B, C</b>	SITE LOCATION: <b>Building 81, Tanks 81 A, B, C</b>
WELL NO: <b>CEF-081-TW03</b>	SAMPLE ID: <b>CEF-081-TW03-GW-0513</b>
SAMPLE DATE/TIME: <b>05/14/13 @ 1140</b>	

**PURGING DATA**

WELL DIAMETER (inches): <b>2</b>	TUBING DIAMETER (in): <b>3/16 (ID)</b>	WELL SCREEN INTERVAL DEPTH: <b>30.30</b> feet to <b>35</b> feet	STATIC DEPTH TO WATER (feet): <b>9.65</b>	PURGE PUMP TYPE OR BAILER: <b>PERSTALTIC</b>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <b>NA</b> feet – <b>NA</b> feet) X <b>NA</b> gallons/foot = <b>NA</b> gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = <b>0</b> gallons + ( <b>0.004</b> gallons/foot X <b>50</b> feet) + <b>0.1</b> gallons = <b>0.17</b> gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>	PURGING INITIATED AT: <b>1059</b>	PURGING ENDED AT: <b>1140</b>	TOTAL VOLUME PURGED (gallons): <b>2.0</b>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) $\mu\text{mhos/cm}$ or $\mu\text{S/cm}$	DISSOLVED OXYGEN (circle units) (mg/L) or % saturation	TURBIDITY (NTUs)	ORP (mg/L)	COLOR/ODOR (describe)
1123	1.5	1.5	0.033	9.72	5.13	21.59	0.078	0.83	36.4	-14.8	None
1126	0.1	1.6	0.033	9.72	5.13	21.59	0.077	0.82	26.7	-120.4	None
1129	0.1	1.7	0.033	9.73	5.10	21.59	0.077	0.79	23.8	-126.1	None
1132	0.1	1.8	0.033	9.73	5.11	21.60	0.077	0.77	20.0	-121.9	None
1135	0.1	1.9	0.033	9.73	5.11	21.62	0.076	0.77	16.6	-125.7	None
1138	0.1	2.0	0.033	9.73	5.10	21.63	0.075	0.75	15.8	-127.1	None
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>ROBERT BAILEY / RC</b>				SAMPLER(S) SIGNATURE(S): <i>Robert Bailey</i>				SAMPLING INITIATED AT: <b>1140</b>		SAMPLING ENDED AT: <b>1145</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>32.5</b>				TUBING MATERIAL CODE: <b>T</b>		FIELD-FILTERED: <b>Y</b> <input checked="" type="checkbox"/> <b>N</b> <input type="checkbox"/>			FILTER SIZE: _____ $\mu\text{m}$			
FIELD DECONTAMINATION: PUMP <b>Y</b> <input checked="" type="checkbox"/> <b>N</b> <input type="checkbox"/>				TUBING <b>Y</b> <input checked="" type="checkbox"/> <b>N</b> (replaced) <input type="checkbox"/>				DUPLICATE: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	Isopropylbenzene		RFPP		200	
	<b>3</b>	<b>CG</b>	<b>40 mL</b>	<b>HCL</b>	<b>120</b>							
REMARKS: <i>Very turbid during initial purge - will let run for a while prior to collecting readings</i>												
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)												

**NOTES:** 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.  
 2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)  
 pH:  $\pm 0.2$  units Temperature:  $\pm 0.2$  °C Specific Conductance:  $\pm 5\%$  Dissolved Oxygen: all readings  $\leq 20\%$  saturation (see Table FS 2200-2); optionally,  $\pm 0.2$  mg/L or  $\pm 10\%$  (whichever is greater) Turbidity: all readings  $\leq 20$  NTU; optionally  $\pm 5$  NTU or  $\pm 10\%$  (whichever is greater)

**Resolution Consultants / Form FD 9000-24 (modified)**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Former NAS Cecil Field - Building 81, Tanks 81 A, B, C</b>	SITE LOCATION: <b>Building 81, Tanks 81 A, B, C</b>
WELL NO: <b>CEF-081-TW04</b>	SAMPLE ID: <b>CEF-081-TW04-GW-0513</b> <i>(EF-081-TW04-GW-0513-H (DUP))</i>
SAMPLE DATE/TIME: <b>05/14/13 @ 1045</b>	

**PURGING DATA**

WELL DIAMETER (inches): <b>2</b>	TUBING DIAMETER (in): <b>3/16 (ID)</b>	WELL SCREEN INTERVAL DEPTH: <del>30</del> <b>30</b> feet to <b>35</b> feet	STATIC DEPTH TO WATER (feet): <b>7.84</b>	PURGE PUMP TYPE OR BAILER: <b>PERSTALTIC</b>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = ( <b>NA</b> feet - <b>NA</b> feet ) X <b>NA</b> gallons/foot = <b>NA</b> gallons											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = <b>0</b> gallons + ( <b>0.0014</b> gallons/foot X <b>50</b> feet ) + <b>0.1</b> gallons = <b>0.17</b> gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <del>325</del> <b>325</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <del>325</del> <b>325</b>	PURGING INITIATED AT: <b>0007</b>	PURGING ENDED AT: <b>1045</b>	TOTAL VOLUME PURGED (gallons): <b>2.55</b>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or (μS/cm)	DISSOLVED OXYGEN (circle units) (mg/L or % saturation)	TURBIDITY (NTUs)	ORP (mg/L)	COLOR/ODOR (describe)
1028	1.75	1.75	0.06	7.92	5.34	24.36	0.099	0.67	13.4	13.7	None
1031	0.2	1.95	0.06	7.92	5.35	24.40	0.100	0.68	11.38	4.3	None
1034	0.2	2.15	0.06	7.93	5.35	24.43	0.100	0.64	10.03	0.8	None
1037	0.2	2.35	0.06	7.93	5.34	24.45	0.099	0.62	8.37	-5.9	None
1040	0.2	2.55	0.06	7.93	5.34	24.49	0.099	0.60	7.51	-7.4	None
1043 <del>RB</del>											
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>ROBERT BAILEY / RC</b>				SAMPLER(S) SIGNATURE(S): <i>Robert Bailey</i>			SAMPLING INITIATED AT: <b>1045</b>		SAMPLING ENDED AT: <b>1050</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <del>325</del> <b>325</b>				TUBING MATERIAL CODE: <b>T</b>		FIELD-FILTERED: <b>Y</b> <input checked="" type="radio"/> <b>N</b> <input type="radio"/>		FILTER SIZE: _____ μm		
FIELD DECONTAMINATION: PUMP <b>Y</b> <input checked="" type="radio"/> <b>N</b> <input type="radio"/>				TUBING <b>Y</b> <input checked="" type="radio"/> <b>N</b> (replaced) <input type="radio"/>		DUPLICATE: <b>Y</b> <input checked="" type="radio"/> <b>N</b> <input type="radio"/>				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH				
	<b>3</b>	<b>CG</b>	<b>40 mL</b>	<b>HCL</b>	<b>120</b>		<b>Isopropylbenzene</b>	<b>RFPP</b>	<b>200</b>	
<b>DUP</b>	<b>3</b>	<b>CG</b>	<b>40mL</b>	<b>HCL</b>	<b>120</b>		<b>Isopropylbenzene</b>	<b>RFPP</b>	<b>200</b>	
REMARKS: <i>ORP unstable however will collect sample b/c other parameters stabilized</i>										
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)										
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)										

**NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.**

**2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)**

**pH:** ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)



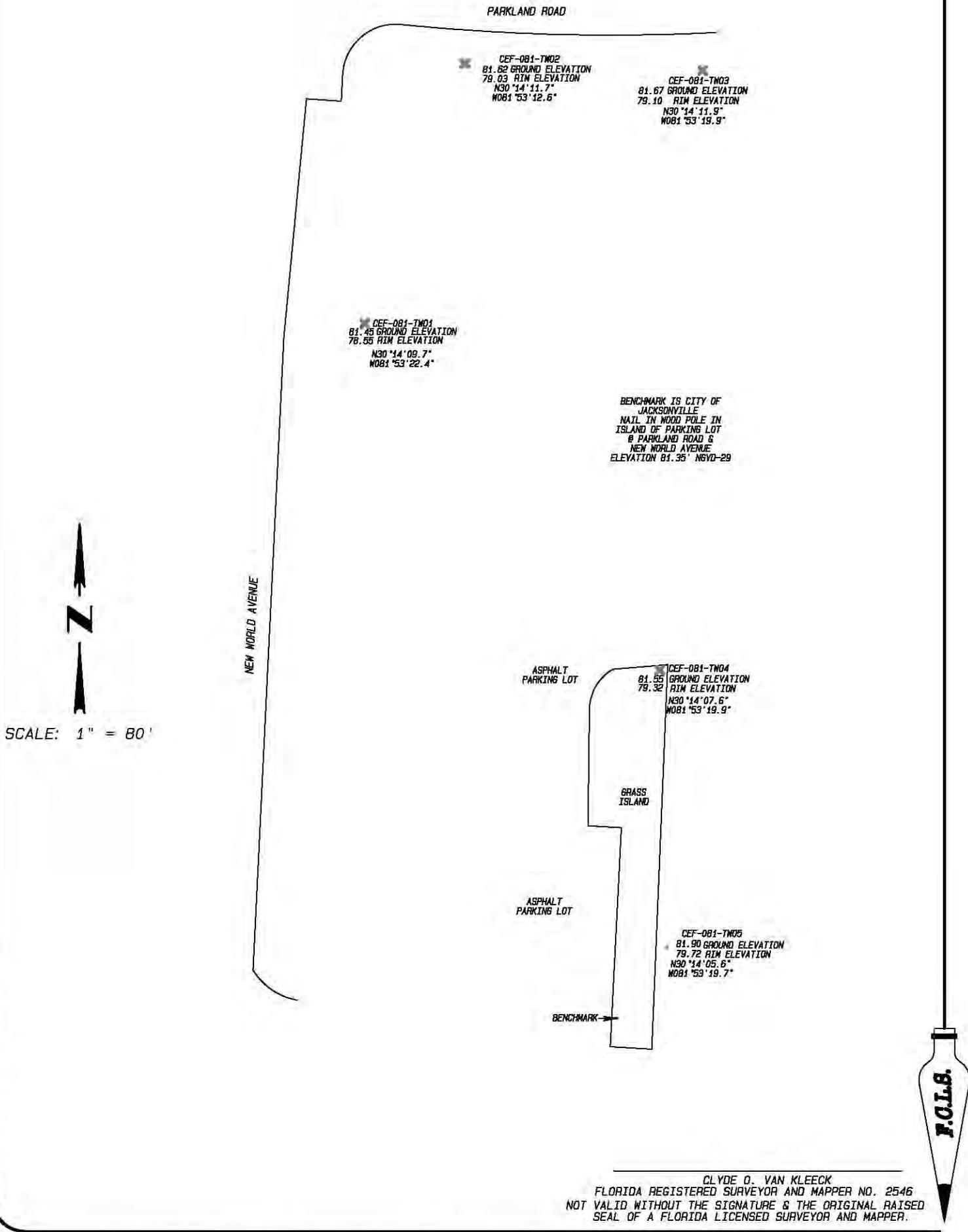
**Tanks 81 A, B, and C**  
**Jun-13**

06/10/13

Location ID	TOC Elevation	June 2013 Water Level	Water Level Elevation
CEF-081-01I	77.73	4.08	1227
CEF-081-02I	77.42	3.76	1229
CEF-081-03I	77.78	4.23	1232
CEF-081-04I	77.54	4.00	1225
CEF-081-05I	77.84	4.21	1231
CEF-081-18I	78.33	4.74	1235
CEF-081-19I	78.15	4.62	1228
CEF-081-20I	77.63	Destroyed ✓	—
CEF-081-21I	78.78	5.39	1253
CEF-081-22I	78.35	4.99	1238
CEF-081-24I	78.39	4.87	1242
CEF-081-25I	78.19	5.13	1250
CEF-081-26I	77.87	5.66	1256
CEF-081-27D	78.16	5.63	1259
CEF-081-28D	78.38	4.92	1240
CEF-081-TW01		8.94	1306
CEF-081-TW02		10.12	1304
CEF-081-TW03		9.45	1302
CEF-081-TW04		7.56	1248
CEF-081-TW05		7.41	1246

SPECIFIC PURPOSE SURVEY TO SHOW MONITORING WELLS  
 CECIL COMMERCE CENTER

MONITORING WELLS LOCATED AT  
 THE DIRECTION OF ROBERT BAILEY  
 WITH ENSAFE, INC. (CLIENT)



BENCHMARK IS CITY OF JACKSONVILLE  
 NAIL IN WOOD POLE IN ISLAND OF PARKING LOT @ PARKLAND ROAD & NEW WORLD AVENUE  
 ELEVATION 81.35' NGVD-29

F.C.L.S.

CLYDE O. VAN KLEECK  
 FLORIDA REGISTERED SURVEYOR AND MAPPER NO. 2546  
 NOT VALID WITHOUT THE SIGNATURE & THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

F.C.M. - FOUND CONCRETE MONUMENT	C.M. - CONCRETE MONUMENT	SEC - SECTION	F/H - FIRE HYDRANT	OHE - OVERHEAD ELECTRIC
F.I.R.C. - FOUND IRON ROD AND CAP	P.T. - POINT OF TANGENCY	TWP - TOWNSHIP	C - CURVE	C.L.F. - CHAIN LINK FENCE
F.I.R. - FOUND IRON ROD	P.C. - POINT OF CURVATURE	RGE - RANGE	FND - FOUND	W.F. - WOOD FENCE
F.I.P. - FOUND IRON PIPE	U.E. - UTILITY EASEMENT	P.I. - POINT OF INTERSECTION	(P) - PLAT	C.B. - CHORD BEARING
S.I.R.C. - SET IRON ROD AND CAP	D.E. - DRAINAGE EASEMENT	A/C - AIR CONDITION UNIT	EC - ELECTRIC BOX	NM - WATER METER
F.N&D - FOUND NAIL AND DISK	C & G - CURB & GUTTER	NTS - NOT TO SCALE	CONC. - CONCRETE	WP - WOOD POLE
(M) - FIELD MEASUREMENT	R/W - RIGHT OF WAY	4' C.L.F. - 4' CHAIN LINK FENCE	CB - CABLE BOX	LP - LIGHT POLE
(C) - CALCULATED MEASUREMENT	C/L - CENTERLINE	6' W.F. - 6' WOOD FENCE	PB - PHONE BOX	M/H - MANHOLE

FIELD SURVEY DATE
PLOT PLAN
FIELD WORK 06/10/2013
FORMBOARD
FOUNDATION
FINAL

**FIRST COAST LAND SURVEYING, INC.**  
 1839-106 LANE AVENUE SOUTH, JACKSONVILLE, FL. 32210  
 PHONE (904) 779-2062 FAX (904) 779-7784  
 CERTIFICATE NO. LB 7261  
 DADSURVEYOR@AOL.COM

PROJECT INFORMATION
ORDER NO: 23971B
DRAWN BY: TNP
REVIEWED BY: TNP
CHECKED BY: VAN

FILE NAME: \\fclssrvr\TerraModel\Jobs\JOBS\23000-24000\23971b.dwg

Location Cecil Field - Ocala Crush Site Date 08/08/13

Project / Client NAVY CLEAN

JM 34 - 0588812660 - LT - OP8

Site = Ocala Crush Site, Ocala National Forest

Event = August 2013 (Semi Annual 2013)

Tasks = Collect 10 water levels + 2 groundwater samples for Select VOCs + Select PATEs.

0735 Left office (R. Bailey, + P. Adams)

0950 Onsite. RB started calibrations + PA started water levels. Went over SWAP.

1100 Started purging CEF-LS10-GW

B/c at water level, had to use 2 peristaltics in tandem to sample.

1200 CEF-LS10-GW-2013 collected from CEF-LS10. (M/S/MSD)

1235 Moved to CEF-LS01AR

1328 CEF-LS01AR-GW-2013 collected from CEF-LS01AR

1328 CEF-LS01AR-GW-2013-H collected (Field DUP)

1333 RB did end of day calibration verifications.

1448 All offsite to ship samples in JAR. Will dump purge water in Tote tomorrow.

Robert Baig

Location Cecil Field - Tanks 81 ABC

Date 10/01/13

Project / Client

Personnel = RC - P. Adams; Preferred Drilling (Dusty, Justin)

Tasks = Abandonment/completion of temporary monitoring wells

1320 - Arrive onsite together (from Site 45) and show driller's locations of 3 wells to abandon + 2 wells to convert to permanent monitoring wells; Reviewed HASP

1340 - Abandon CEF-081-TW03 in woods

1415 - Abandon CEF-081-TW05 in asphalt lot; patch top with concrete

1445 - Convert CEF-081-TW04 to CEF-081-31I; construct well pad (flush-mount well)

1530 - Convert CEF-081-TW02 to CEF-081-30I on edge of woodline; Construct well pad for flush-mount well

1605 - Abandon CEF-081-TW01 in grass by road

1625 - Parker and driller's offsite

pa

Location Cecil Field - Tanks 81ABC Date 10/14/13Project / Client Well Surveying

Personal - P Adams (RC) ; Arc Surveying (Jason + Mike)

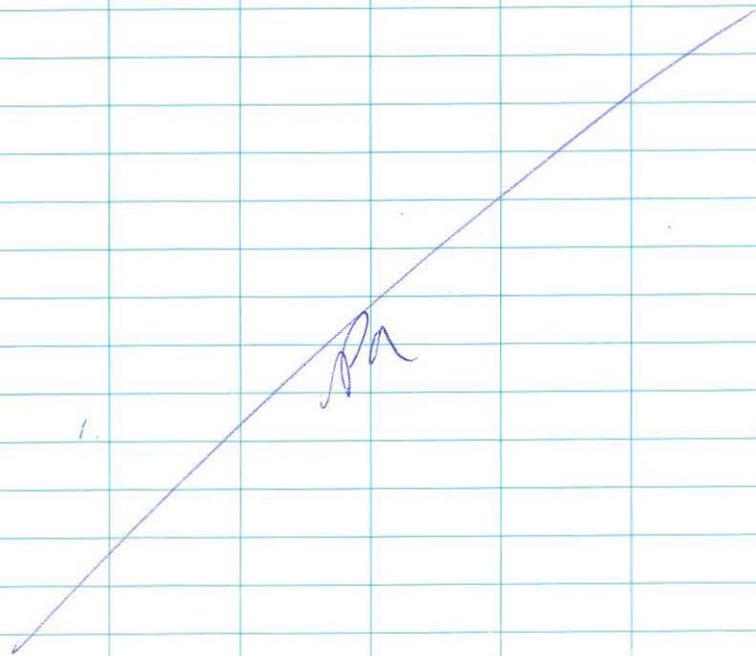
Weather; 70s ; Overcast

Task : Survey Wells

1350 - Arrive onsite after surveying wells @ Site 59 + Site 45

1555 - Survey wells: CEF-081-01I, 02I, 03I, 04I, 05I,

18I, 19I, 21I, 22I, 24I, 25I, 26I, 27D, 28D, 30I, + 31I

1550 - Complete well survey + leave site to Site 59 to breakdown  
control point.

**WELL COMPLETION REPORT** (Please complete in black ink or type.)

PERMIT # 2013-1004 <sup>CUP#</sup> <sub>WUP#</sub> \_\_\_\_\_ DID # \_\_\_\_\_

If permit is for multiple wells indicate the number of wells drilled 3  
 Indicate remaining wells to be cancelled 0 <sup>Plugged</sup>

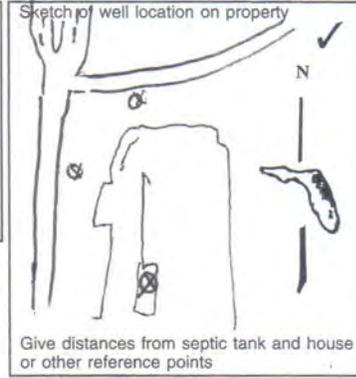
WATER WELL CONTRACTOR'S (All wells drilled need an individual completion report)

SIGNATURE [Signature] License # 2613  
 I certify that the information provided in this report is accurate and true.

Grout	No. of Bags	From (Ft.)	To (Ft.)
Neat Cement:	<u>72</u>	<u>0</u>	<u>35</u>
Bentonite:			

WELL LOCATION: Site Address 6011 New World Ave (County) Deval  
 \_\_\_\_\_ 114 of \_\_\_\_\_ 114 of Section \_\_\_\_\_ Twp: \_\_\_\_\_ Rge: \_\_\_\_\_  
 Latitude 30°14'5.17 N Longitude 81°53'20.00 W

DATE STAMP  
 \_\_\_\_\_  
 Official Use Only



CHEMICAL ANALYSIS WHEN REQUIRED  
 Iron: \_\_\_\_\_ ppm Sulfate: \_\_\_\_\_ ppm  
 Chloride: \_\_\_\_\_ ppm  
 Lab Test  Field Test Kit  
 Pump Type  
 Centrifugal  Jet  Submersible  Turbine  
 Horsepower \_\_\_\_\_ Capacity \_\_\_\_\_ G.P.M. \_\_\_\_\_  
 Pump Depth \_\_\_\_\_ Ft. Intake Depth \_\_\_\_\_ Ft.

OWNER'S NAME City of Jacksonville OED  
 COMPLETION DATE 10-1-13 Florida Unique I.D. \_\_\_\_\_  
 WELL USE: DEP/Public \_\_\_\_\_ Irrigation \_\_\_\_\_ Domestic \_\_\_\_\_ Monitor   
 HRS Limited \_\_\_\_\_ 62-524 \_\_\_\_\_ Other \_\_\_\_\_

DRILL METHOD  Rotary  Cable Tool  Combination  
 Jet  Auger  Other Tremi Pipe

Measured Static Water Level <u>6</u>		Measured Pumping Water Level _____	
After _____ Hours at _____ G.P.M. Measuring Pt. (Describe): _____			
Which is _____ Ft. <input type="checkbox"/> Above <input type="checkbox"/> Below Land Surface			
Casing: <input type="checkbox"/> Black Steel <input type="checkbox"/> Galv. <input checked="" type="checkbox"/> PVC Other _____			
<input type="checkbox"/> Open Hole	Depth (Ft.)		DRILL CUTTINGS LOG Examine
<input checked="" type="checkbox"/> Screen			cuttings every 20 ft. or at formation changes.
Casing Diameter & Depth (Ft.)	From	To	Note cavities, depth to producing zones.
			Color   Grain Size   Type of Material
Diameter <u>2</u>	<u>0</u>	<u>35</u>	<u>CE5-081-Tw 03</u>
From _____			
To _____	<u>0</u>	<u>35</u>	<u>CE5-081-Tw 01</u>
Diameter _____	<u>0</u>	<u>35</u>	<u>CE5-081-Tw 05</u>
From _____			
To _____			
			<u>Plugged 3-2"X35' wells</u>
Liner <input type="checkbox"/> or			
Casing <input type="checkbox"/>			
Diameter _____			
From _____			
To _____			

Driller's Name: Dusty Dunaway  
 (print or type)

ENVIRONMENTAL QUALITY DIVISION



**Well Permit 2013-1004**

<b>Granted To:</b> City of Jacksonville OED, care of Mr. Edward Randolph 117 Duval Street West Unit 275 Jacksonville, FL 32202	<b>Well Type:</b> Abandoned / Plugged Well <b>Permit #:</b> 2013-1004 <b>Well #:</b> 29263
<b>Well Location:</b> 6011 New World Avenue Jacksonville, 32221	<b>Contractor:</b> Gregory Campbell <b>License #:</b> 2613

Authorization is hereby granted to construct, repair, alter or abandon well(s) at the above location in accordance with information supplied on the application for permit form according to the following provisions, and with the authority of Chapter 366, City of Jacksonville Ordinance Code (OC). The permittee and any future property owners hereby hold the City of Jacksonville harmless from responsibility to comply with or obtain permits pursuant to any other federal, state, or local law. All permitted work must be accomplished by a Water Well Contractor with a valid State of Florida registration within one year of the issue date. This well shall not be used for the purpose(s) other than that indicated via the following provisions.

**Provisions**

1. There may be a difference between the items requested in the application for the well and the requirements issued by EQD.
2. This well must be constructed, abandoned, repaired or modified in accordance with Chapters 62-532 and 40C-3 FAC.
3. A legible and completed copy of the State of Florida Well Completion Report shall be submitted to the Groundwater Section (GS) within 30 days after completion of the permitted well activity.
4. A copy of this permit should be given to any future property owner when the property is sold.
5. Wells shall be located, constructed, cased, grouted, plugged, capped, or sealed to prevent uncontrolled surface flow, uncontrolled movement of water from one aquifer or water bearing zone to another, contamination of groundwater or surface water resources, or other adverse impacts.
6. All wells shall be plugged by a state licensed well contractor within six (6) months after their use has been permanently discontinued, or when the well is determined to be in a state of disrepair and/or subject to abandonment pursuant to Chapter 366, OC, EPB Rule 8, Chapters 62-532 and 40C-3, Florida Administrative Code (FAC), or as otherwise noted in subsequent provisos.
7. In the event that the location of monitor well(s) to be constructed/abandoned can not be known until the day of construction, an updated site sketch shall be provided to show the location of each well, with a corresponding identification number, along with the well completion/abandonment report.

ENVIRONMENTAL QUALITY DIVISION

8. This well shall be plugged in a manner consistent with Chapter 40C-3, Florida Administrative Code (FAC).
9. The well casing shall be cleared of all internal obstructions to its original constructed depth and sounded for total depth prior to plugging.
10. Efforts shall be taken to ensure the well is plugged in a continuous manner by having adequate additional material on site or by obtaining a more accurate estimate of the wells volume, through sounding or logging before the work begins. The well contractor shall initially attempt to fill the well with a volume of cement equal to the calculated volume of the well and open hole plus twenty percent (20%).
11. This permit is not a sanction that the volume of material stated on the application will be adequate to satisfy the requirements of Chapter 366 of the City Ordinance Code or Chapter 40C-3, FAC.
12. This permit allows for the abandonment of 3 well(s) previously used for environmental monitoring or remediation. Individually this/these well(s) is/are 2 inch(es) diameter completed to an estimated depth of 35 feet below land surface.

Amendo David

Issued By

9/26/13

Date

ENVIRONMENTAL QUALITY DIVISION



**Well Permit 2013-1005**

<b>Granted To:</b> City of Jacksonville OED, care of Mr. Edward Randolph 117 Duval Street West Unit 275 Jacksonville, FL 32202	<b>Well Type:</b> Monitoring Well  <b>Permit #:</b> 2013-1005 <b>Well #:</b> 29744
<b>Well Location:</b> 6011 New World Avenue Jacksonville, 32221	<b>Contractor:</b> Gregory Campbell <b>License #:</b> 2613

Authorization is hereby granted to construct, repair, alter or abandon well(s) at the above location in accordance with information supplied on the application for permit form according to the following provisions, and with the authority of Chapter 366, City of Jacksonville Ordinance Code (OC). The permittee and any future property owners hereby hold the City of Jacksonville harmless from responsibility to comply with or obtain permits pursuant to any other federal, state, or local law. All permitted work must be accomplished by a Water Well Contractor with a valid State of Florida registration within one year of the issue date. This well shall not be used for the purpose(s) other than that indicated via the following provisions.

**Provisions**

1. There may be a difference between the items requested in the application for the well and the requirements issued by EQD.
2. This well must be constructed, abandoned, repaired or modified in accordance with Chapters 62-532 and 40C-3 FAC.
3. A legible and completed copy of the State of Florida Well Completion Report shall be submitted to the Groundwater Section (GS) within 30 days after completion of the permitted well activity.
4. A copy of this permit should be given to any future property owner when the property is sold.
5. Wells shall be located, constructed, cased, grouted, plugged, capped, or sealed to prevent uncontrolled surface flow, uncontrolled movement of water from one aquifer or water bearing zone to another, contamination of groundwater or surface water resources, or other adverse impacts.
6. If confining units are penetrated by a well, construction shall include a casing and grout seal to the confining unit to protect underlying aquifers of differing quality groundwater.
7. Bentonite grout shall not be used on well(s) constructed in any identified contamination site.

ENVIRONMENTAL QUALITY DIVISION

8. Well(s) shall be constructed with a locking cap or other security devices(s) meeting the Florida Department of Environmental Protection (FDEP) and SJRWMD specifications.
9. Wells permitted or constructed as a monitoring well shall not be used for contamination removal and/or product recovery without first obtaining a recovery well permit from the EQD.
10. All wells shall be plugged by a state licensed well contractor within six (6) months after their use has been permanently discontinued, or when the well is determined to be in a state of disrepair and/or subject to abandonment pursuant to Chapter 366, OC, EPB Rule 8, Chapters 62-532 and 40C-3, Florida Administrative Code (FAC), or as otherwise noted in subsequent provisos.
11. In the event that the location of monitor well(s) to be constructed/abandoned can not be known until the day of construction, an updated site sketch shall be provided to show the location of each well, with a corresponding identification number, along with the well completion/abandonment report.
12. The upper terminus of the well shall extend either to land surface or to finished grade, whichever is higher.
13. This permit allows for the construction of 2 well(s) to be used for environmental monitoring. Individually this/these well(s) is/are 2 inch(es) diameter to be completed to an estimated depth of 35 feet below land surface.

Amanda Davis  
Issued By

9/26/13  
Date

ENVIRONMENTAL QUALITY DIVISION



**Well Permit 2013-1007**

<b>Granted To:</b>	City of Jacksonville OED, care of Mr. Edward Randolph 117 Duval Street West Unit 275 Jacksonville, FL 32202	<b>Well Type:</b>	Monitoring Well
		<b>Permit #:</b>	2013-1007
		<b>Well #:</b>	29746
<b>Well Location:</b>	6146 Authority Avenue Jacksonville, 32221	<b>Contractor:</b>	Gregory Campbell
		<b>License #:</b>	2613

Authorization is hereby granted to construct, repair, alter or abandon well(s) at the above location in accordance with information supplied on the application for permit form according to the following provisions, and with the authority of Chapter 366, City of Jacksonville Ordinance Code (OC). The permittee and any future property owners hereby hold the City of Jacksonville harmless from responsibility to comply with or obtain permits pursuant to any other federal, state, or local law. All permitted work must be accomplished by a Water Well Contractor with a valid State of Florida registration within one year of the issue date. This well shall not be used for the purpose(s) other than that indicated via the following provisions.

**Provisions**

1. There may be a difference between the items requested in the application for the well and the requirements issued by EQD.
2. This well must be constructed, abandoned, repaired or modified in accordance with Chapters 62-532 and 40C-3 FAC.
3. A legible and completed copy of the State of Florida Well Completion Report shall be submitted to the Groundwater Section (GS) within 30 days after completion of the permitted well activity.
4. A copy of this permit should be given to any future property owner when the property is sold.
5. Wells shall be located, constructed, cased, grouted, plugged, capped, or sealed to prevent uncontrolled surface flow, uncontrolled movement of water from one aquifer or water bearing zone to another, contamination of groundwater or surface water resources, or other adverse impacts.
6. If confining units are penetrated by a well, construction shall include a casing and grout seal to the confining unit to protect underlying aquifers of differing quality groundwater.
7. Bentonite grout shall not be used on well(s) constructed in any identified contamination site.

ENVIRONMENTAL QUALITY DIVISION

8. Well(s) shall be constructed with a locking cap or other security devices(s) meeting the Florida Department of Environmental Protection (FDEP) and SJRWMD specifications.
9. Wells permitted or constructed as a monitoring well shall not be used for contamination removal and/or product recovery without first obtaining a recovery well permit from the EQD.
10. All wells shall be plugged by a state licensed well contractor within six (6) months after their use has been permanently discontinued, or when the well is determined to be in a state of disrepair and/or subject to abandonment pursuant to Chapter 366, OC, EPB Rule 8, Chapters 62-532 and 40C-3, Florida Administrative Code (FAC), or as otherwise noted in subsequent provisos.
11. In the event that the location of monitor well(s) to be constructed/abandoned can not be known until the day of construction, an updated site sketch shall be provided to show the location of each well, with a corresponding identification number, along with the well completion/abandonment report.
12. The upper terminus of the well shall extend either to land surface or to finished grade, whichever is higher.
13. This permit allows for the construction of 2 well(s) to be used for environmental monitoring. Individually this/these well(s) is/are 2 inch(es) diameter to be completed to an estimated depth of 65 feet below land surface.

Amanda Davis

9/26/13

Issued By

Date