N60200.AR.009552
NAS CECIL FIELD
5090.3a

RESPONSE TO FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION COMMENT ON SITE 3 TECHNICAL MEMORANDUM FOR NAS CECIL FIELD FL

08/05/2015

RESOLUTION CONSULTANTS

Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

5 August 2015

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

RE: Response to Comments
Site 3 Technical Memorandum
Former NAS Cecil Field, Jacksonville, Florida
Contract No: N62470-11-D-8013
CTO JM76

Dear Mr. Grabka:

Please note the following responses to comments received from the Florida Department of Environmental Protection on April 10, 2015. These responses to comments are associated with the attached Site 3 Technical Memorandum dated July, 2015 (Revision 1).

Comment #1:

It states in the bottom paragraph that "Surface water samples were inadvertently collected from Rowell Creek instead of well points during quarterly sampling events from December 2012 through December 2013." It also states in that paragraph that analysis of those samples indicated that chemicals of concern associated with Site 3 were not detected. These statements conflict with the information provided in Table 3-1 and Figure 3-1, which indicate that samples were collected from three well points in September and December 2013 and that analysis of those samples show detected concentrations of various chemicals of concern, with concentrations of 1,1 dichloroethene and vinyl chloride above their respective surface water cleanup target levels. Please correct this inconsistency.

Response #1:

Sample results shown in Table 3-1 and Figure 3-1 for the three well points (CEF-003-WP2, CEF-003-WP3, and CEF-003-WP4) are accurate. Language in the associated paragraph will be clarified. Results for sampling collected directly from the surface water of Rowell Creek between December 2012 and December 2013 are not shown in Site 3 Technical Memorandum

RESOLUTION CONSULTANTS

since the direct surface water sampling from Rowell Creek was performed in error. Ongoing quarterly sampling associated with the solar-powered air-sparge treatment system is only performed on the three well points adjacent to Rowell Creek.

Comment #2:

In Table 3-1, it says that full system startup occurred on November 2012. Please provide the pre-system startup baseline analytical data. If the July 2012 data that is presented in the memo is considered baseline data, please identify it as such.

Response #2:

Table 3-1 has been revised to indicate that the July 2012 is the baseline analytical data.

Comment #3:

In Table 3-1 and in Figure 3-1, the analytical results for well CEF-003-31S has the September 2012 data reported before the July 2012 data. Please verify whether the September 2012 data is actually from that date or if it may be from September 2011.

Response #3:

Table 3-1 and Figure 3-1 have been revised to show results in chronological order for monitoring well CEF-003-31S.

Comment #4:

Please provide details on the method by which well point samples were collected. Please also provide details on the collection of the surface water samples that were inadvertently collected.

Response #4:

Ongoing sampling from well points adjacent to Rowell Creek is performed in accordance with FDEP standard operating procedure FS 2200 Groundwater Sampling. Surface water sampling directly from Rowell Creek was performed using typical surface water sampling practices as evidenced by the attached surface water sampling forms and associated field notes. Surface water sampling practices included calibration and use of water quality and turbidity meters, “grab” sampling from downstream to upstream locations, logging surface water

parameters and samples on sample log sheets, and use of chains of custody to transfer samples to the laboratory.

Comment #5:

Please provide a more detailed discussion of the decisions that have been made in the operation of the treatment system.

Response #5:

The purpose of the Site 3 Technical Memorandum is to assess the current status of the groundwater adjacent to Rowell Creek. Operation and optimization decisions associated with the Site 3 solar-powered air-sparge treatment system are currently being documented under a separate construction/operation report which will be provided to the Cecil Field BCT upon completion.

Upon approval of these comments, a revised technical memorandum will be submitted. If you have any additional comments, please contact Kara Wimble at 904-301-4503.

Sincerely,

Resolution Consultants

By: Kara F. Wimble
Task Order Manager

Attachments:

Technical Memorandum, Solar-Powered Air-Spraging Treatment System, Rev. 1, July 2015
Field Notes and Sampling Forms for Rowell Creek Surface Water Sampling

cc: David Barney, BRAC PMO EAST
Art Sanford, BRAC PMO EAST
Pete Dao, EPA Region 4
Megan Ved, Tetra Tech

Technical Memorandum, Solar-Powered Air-Spraging Treatment System, Rev. 1, July 2015

TECHNICAL MEMORANDUM
SOLAR-POWERED AIR-SPARGING TREATMENT SYSTEM

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

Revision: 1

Prepared for:

Base Realignment and Closure Program Management Office East
4911 South Broad Street
Building 679
Philadelphia, Pennsylvania 19122

Naval Facilities Engineering Command Southeast
Building 135 North P.O. Box 30
Jacksonville, Florida 32212-0030

Prepared by:

Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

Contract Number: N62470-11-D-8013
CTO JM76

July 2015

FLORIDA PROFESSIONAL ENGINEER SEAL

I am registered to practice engineering by the State of Florida Board of Professional Engineers. I certify, under penalty of law, that this technical memorandum associated with Operable Unit 8, Site 3 of the Former Naval Air Station Cecil Field, Jacksonville, Florida, was prepared in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. To the best of my knowledge and belief, the information submitted is true, accurate, and complete, and the contents of this document are consistent with currently accepted engineering practices.

Name: David A. Myers

License Number: 66483

State: Florida

Signature: _____

Date: _____

Concurrence by:

_____ _____

Kara F. Wimble Date

CTO Manager

Table of Contents

FLORIDA PROFESSIONAL ENGINEER SEAL i

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION 1
- 2.1 System Decisions and Actions 1
- 2.2 Conceptual Site Model 5

3.0 DATA EVALUATION 9

4.0 CONCLUSIONS 13

5.0 REFERENCES 14

Figures

Figure 2-1 General Vicinity Map 2
Figure 2-2 Site Map 3
Figure 2-3 Overall Conceptual Site Model 6
Figure 2-4 SPAS System Conceptual Site Model 7
Figure 2-5 Cross-Section Conceptual Site Model 8
Figure 3-1 Analytical Results 10

Tables

Table 2-1 System Decisions and Actions 4
Table 2-2 Geologic Depth Intervals 5
Table 3-1 Analytical Results 11

1.0 INTRODUCTION

This technical memorandum is related to the solar-powered air-sparging treatment curtain (SPAS system) at Operable Unit (OU) 8, Site 3 located at the former Naval Air Station (NAS) Cecil Field. This technical memorandum summarizes the field activities and analytical results associated with the SPAS system, which was installed and operated adjacent to Rowell Creek, from June 2012 to the present.

This technical memorandum was prepared by Resolution Consultants under United States Navy, Naval Facilities Engineering Command contract number N62470-11-D-8013, Contract Task Order JM76, for consideration by Naval Facilities Engineering Command, and the Florida Department of Environmental Protection (FDEP), and the United States Environmental Protection Agency.

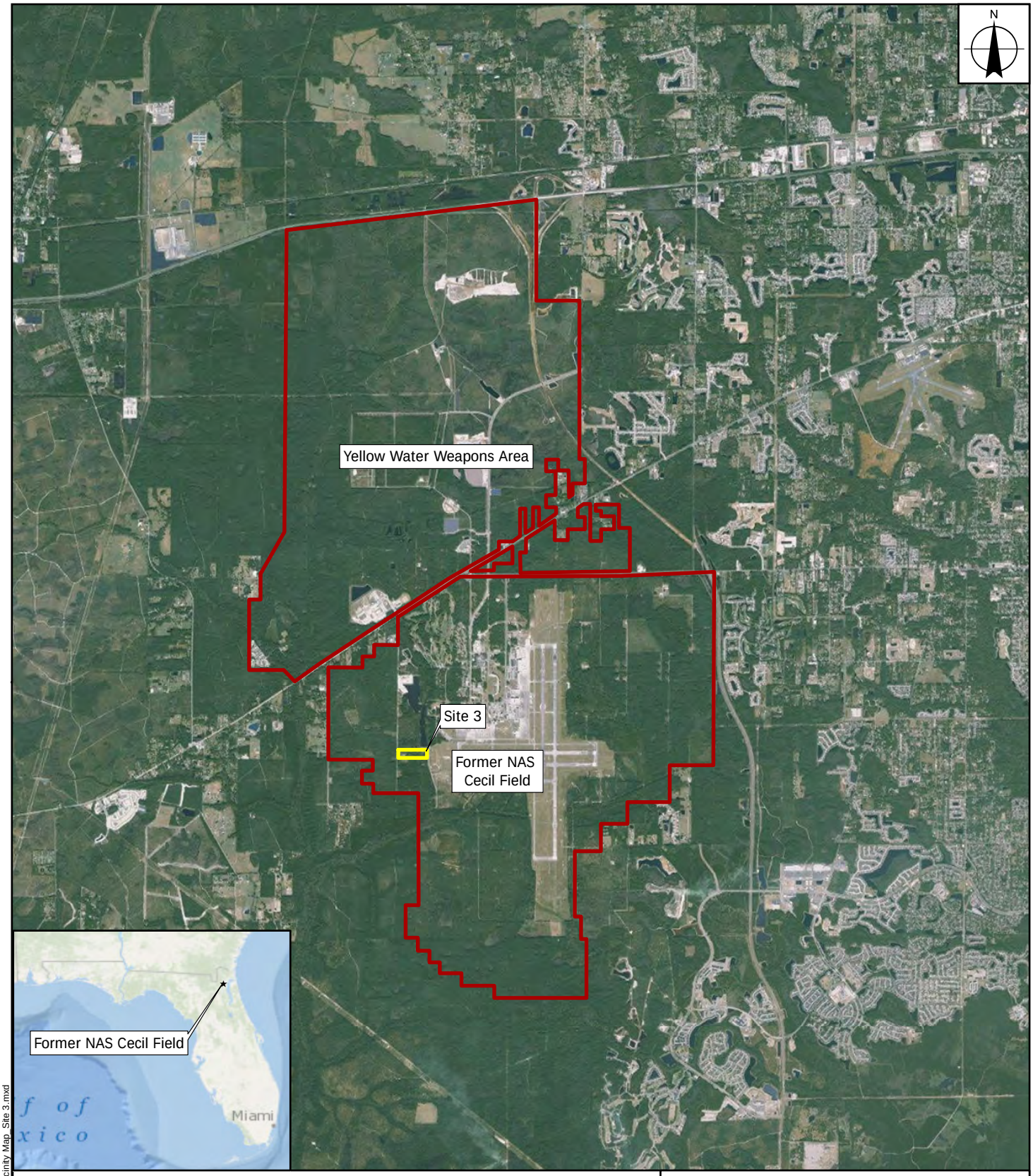
2.0 SITE DESCRIPTION

The SPAS system is located at Operable Unit 8, Site 3 within the Former NAS Cecil Field in Jacksonville, Duval County, Florida, with latitude 30 degrees, 13 minutes, and 1.5 seconds (north) and longitude 81 degrees, 53 minutes and 54.4 seconds (west). Please refer to the General Vicinity Map (Figure 2-1) for the site location.

The majority of Site 3 is vegetated woodlands with an unpaved access road, which intersects the northwest portion of the site. Additionally, Rowell Creek runs through the eastern portion of Site 3. Rowell Creek flows from north to south through Site 3, and is fed via storm water outfall structures from the south end of Lake Fretwell, which is located approximately 200 feet north of Site 3 across an elevated portion of the unpaved access road. Structures associated with Site 3 include the existing air-sparging system located in the northwest corner of the site and the SPAS system located adjacent to the western bank of Rowell Creek. Please refer to the Site Map (Figure 2-2) for existing site features.

2.1 System Decisions and Actions

Based on the *Third Five-Year Review Report, Naval Air Station Cecil Field, Jacksonville, Florida*, long-term protectiveness for the Site 3 remedy was deferred until an evaluation of actions necessary to address the groundwater plume exceedances near Rowell Creek could be conducted (Tetra Tech NUS 2011). As a result, the SPAS system was installed near the edge of Rowell Creek. A summary of decisions and actions associated with the SPAS system is detailed in Table 2-1.



Legend

- LUC Boundary
- Installation Boundary

0 1.5 3 Miles

FIGURE 2-1
GENERAL VICINITY MAP
SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

NAVFAC Naval Facilities Engineering Command
RESOLUTION CONSULTANTS

REQUESTED BY: K. Wimble	DATE: 7/30/2015
DRAWN BY: kburnum	TASK ORDER NUMBER: JM76

X:\Navy\NAS_CecilField\Site 3\Figure 2-1 Vicinity Map_Site 3.mxd

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Sources: Esri, GEBCO, NOAA, National Geographic, DeLorme, NAVTEQ, Geonames.org, and other contributors

FIGURE 2-2
SITE MAP
OU8, SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Legend

- Monitoring Well
- Monitoring Well (not located in field)
- Well Point Monitoring location
- Creek
- LUC Boundary
- Former Disposal Pit Area

0 250 500 Feet

NAVFAC Naval Facilities Engineering Command

RESOLUTION CONSULTANTS

REQUESTED BY: D. Myers	DATE: 7/30/2015
DRAWN BY: kburnum	TASK ORDER NUMBER: JM76

Service Layer Credits: City of Jacksonville

X:\Navy\NAS_CecilField\Site 3\Figure 2-2 Site Map_Site 3.mxd

The SPAS system includes three solar panels, which generate power to operate air-sparge compressors at each panel location. Each solar-powered air-sparge compressor is connected to three air-sparge wells located in the vicinity of the panels for a total of nine air-sparging wells. The nine air-sparging wells were installed in a general north to south alignment along the western bank of Rowell Creek to provide a "curtain" of air-sparging groundwater treatment adjacent to Rowell Creek. In the event groundwater monitoring results in the vicinity of the system are favorable, then BCT may consider moving the system upgradient toward the source area.

Table 2-1
System Decisions and Actions

Event Date	Decisions/Actions
February 2011	BCT decides to perform air-sparging pilot test to address groundwater contamination near Rowell Creek.
October 2011	Pilot Test Work Plan submitted to BCT, U.S. EPA approved.
November 2011	FDEP approved Pilot Test Work Plan.
June 2012	Construction of system began including monitoring wells, concrete system pads, and support poles.
June 2012	Flooding and sediment deposits at site due to Tropical Storm Debbie on 25 June 2012; 12.56 inches of rain fell in two days.
July 2012	System components installed during the weeks of 9 July and 16 July 2012.
October 2012	Air-sparge wells re-installed 17-19 October 2012, due to tight soil formations below 40' bgs. Well screen depths: AS-A1 30-32 feet bgs AS-A2 26-28 feet bgs AS-A3 28.5-30.5 feet bgs AS-B1 36.5-38.5 feet bgs AS-B2 through AS-C3 all 38-40feet bgs
November 2012	Full system start-up occurred on 7 November 2012.
January 2014	Due to unfavorable results, BCT agrees to adjust system to direct air-sparging to one air-sparge well at each of the three solar panel locations.
July 2014	Tetra Tech recommends directing all air-sparging from all three solar panels to three air-sparge wells at central Unit B.
September 2014	Annual sampling is conducted by Solution-IES; results are consistent with previous results.
February 2015	Tetra Tech operates reconfigured system since October 2014. June 2015 sampling event results show decrease in vinyl chloride levels in all three well points adjacent to Rowell Creek.

Notes:

BCT = Base Cleanup Team
bgs = Below ground surface
COC = Contaminants of concern
FDEP = Florida Department of Environmental Protection
U.S. EPA = United States Environmental Protection Agency

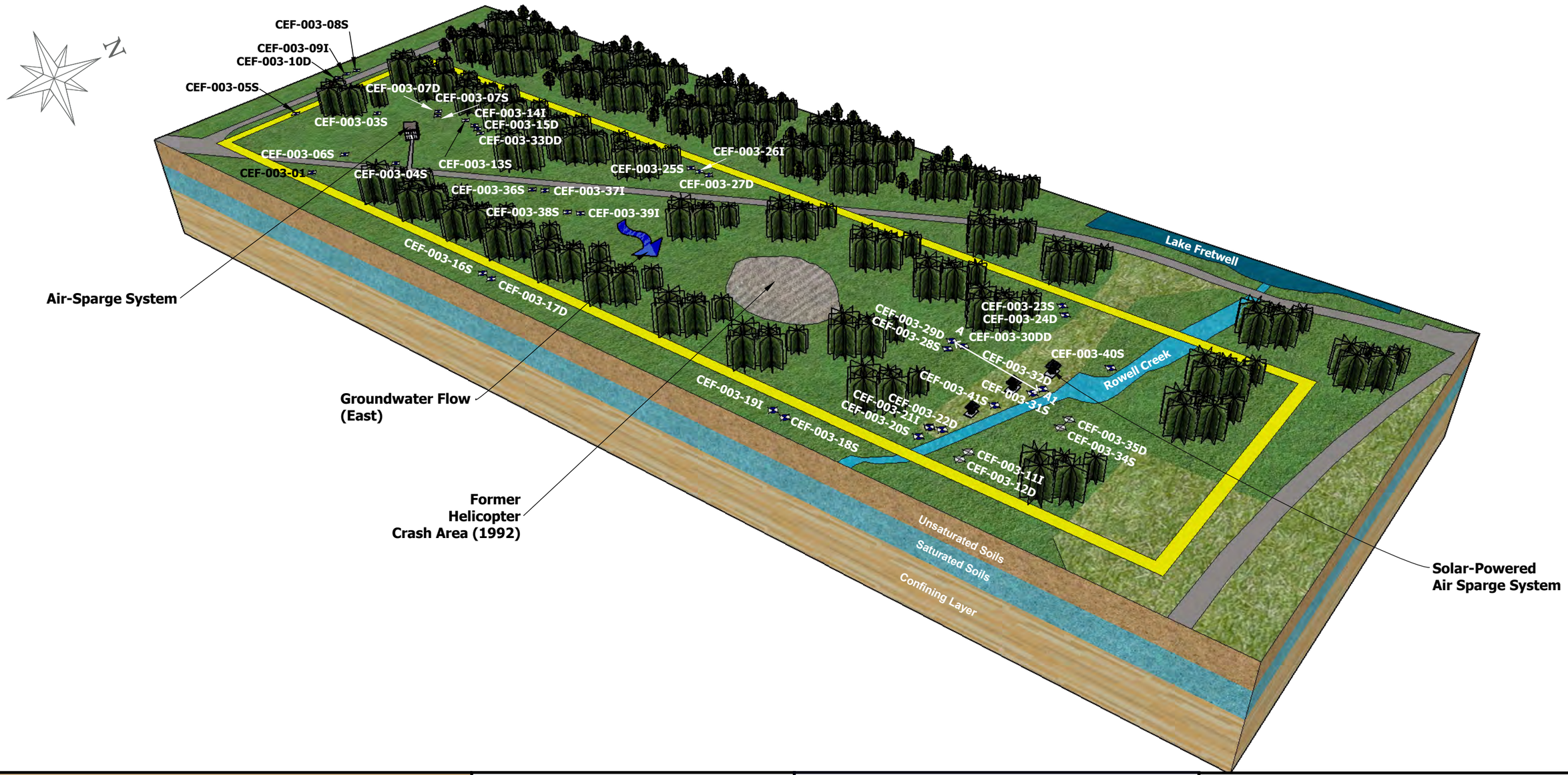
2.2 Conceptual Site Model

A graphic depiction of the overall conceptual site model based on existing site conditions is shown in Figure 2-3. The SPAS system adjacent to Rowell Creek is shown in Figure 2-4. A cross section in the vicinity of SPAS system and Rowell Creek is shown in Figure 2-5. Table 2-2 provides a general description of geologic features in the vicinity of the Site 3 SPAS system.

Table 2-2
Geologic Depth Intervals

Depth (ft bgs)	Upper Boundary Geologic Feature	Lower Boundary Geologic Feature
0 to 55	Top of water table (0 to 10 ft bgs) Sand from 0 to 55 feet bgs	Sandy Clay starts at approximately 55 ft bgs
55 to 75	Sandy Clay at 55 ft bgs	Clayey Sand starts at approximately 75 ft bgs
75 to 90	Clayey Sand at 75 ft bgs	Blue-Marl confining unit starts at approximately 90 ft bgs
90 to 95	Blue-Marl confining unit at 90 ft bgs	Dolomite (upper rock unit) starts at approximately 95 ft bgs
95 to 105	Dolomite (upper rock unit) at 95 ft bgs	Gray-Marl confining unit starts at approximately 105 ft bgs
105 to 120	Gray-Marl confining unit 105 ft bgs	Gray-Marl confining unit continues past 120 ft bgs

Notes:
ft bgs = Feet below ground surface
Sources: *Ground-Water Flow in The Surficial Aquifer System and Potential Movement of Contaminants from Selected Waste Disposal Sites at Cecil Field Naval Air Station, Jacksonville, Florida* (U.S. Geological Survey 1998) and the *Final Remedial Investigation at Operable Unit 8 (OU 8) Site 3 NAS Cecil Field FL* (ABB Environmental Services 1996).



Contaminant Source:
Oil and Sludge Disposal Pit/Helicopter Crash Site

Land Use Controls:
*Land within Site 3 may not be used for residential, recreational, or agricultural use.
*Rowell creek sediments within Site 3 may not be altered or disturbed.
*Surface and subsurface soils within Site 3 may not be disturbed.
*Surficial aquifer groundwater use within Site 3 is prohibited.
*Tampering or damaging any Navy wells or remediation systems is prohibited.

Legend

- Groundwater Monitoring Well
- Groundwater Monitoring Well (could not located during September 2014 Basewide Monitoring Well Survey)
- Groundwater Flow Directions
- Land Use Control Parcel

NOTES:

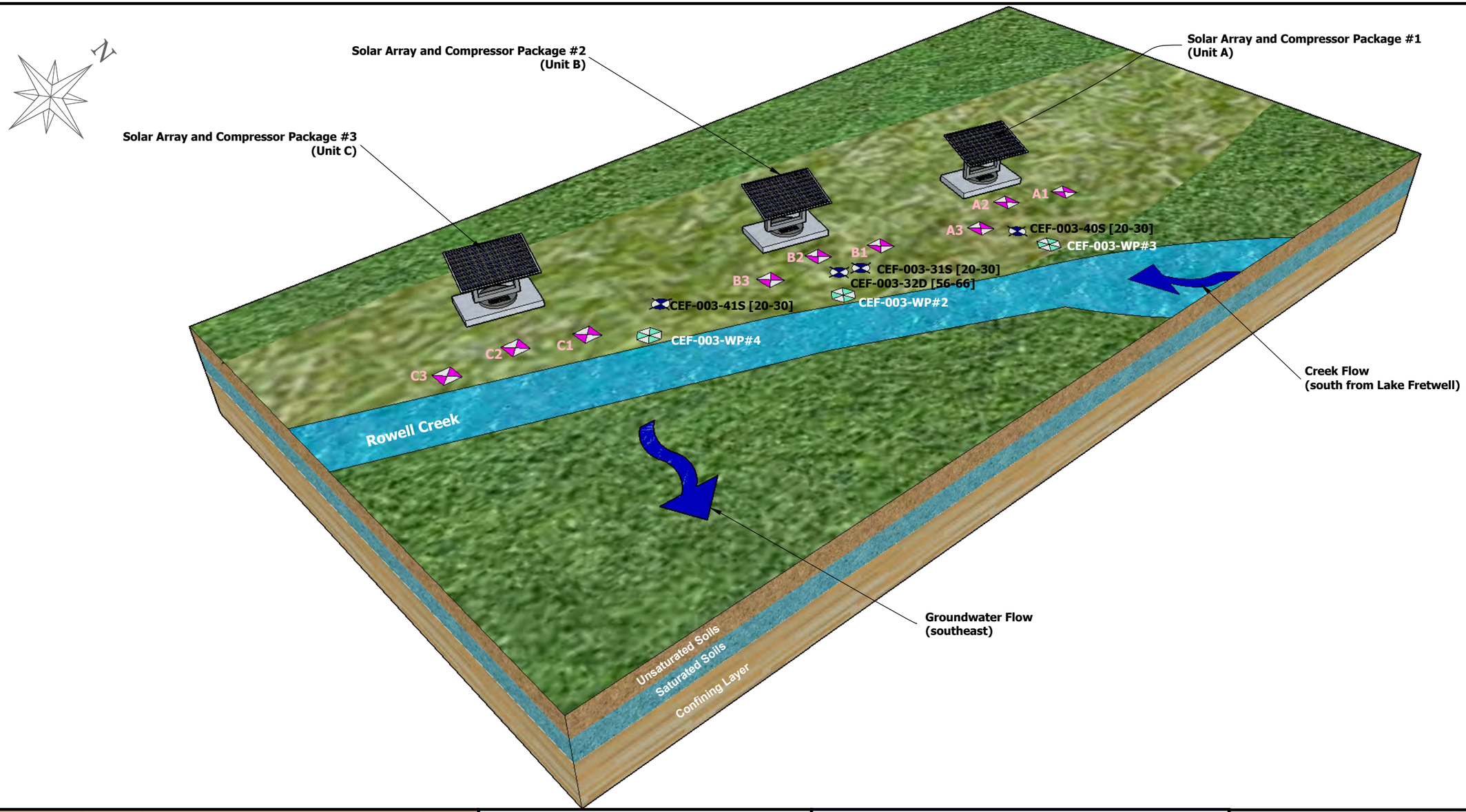
- Conceptual Site Model not to scale. Horizontal dimensions based on recent aerial imaging, site visits, and historical knowledge. Vertical dimensions exaggerated for purpose of conveying pertinent site information.
- Groundwater monitoring well locations approximated based on existing site figures and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

FIGURE 2-3
CONCEPTUAL SITE MODEL
OU8, SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

NAVFAC Naval Facilities Engineering Command
RESOLUTION CONSULTANTS

REQUESTED BY: D. Myers	Date: February 4, 2015
DRAWN BY: Kburnum	CTO NO.: JM76

J:\Jacksonville\Clients\A - L_CSMs\Navy - CLEAN\Former NAS Cecil Field\CSMs\Site 3\Draft Final\Main CSM_Site 3Figure 2-3 Site 3 v2



Contaminant Source: Oil and Sludge Disposal Pit/Helicopter Crash Site

Land Use Controls:

***Land within Site 3 may not be used for residential, recreational, or agricultural use.**
***Rowell creek sediments within Site 3 may not be altered or disturbed.**
***Surface and subsurface soils within Site 3 may not be disturbed.**
***Surficial aquifer groundwater use within Site 3 is prohibited.**
***Tampering or damaging any Navy wells or remediation systems is prohibited.**

Legend

- Groundwater Monitoring Well [well screen interval]
- Well Point
- Air Sparge Well
- Flow Directions

NOTES:

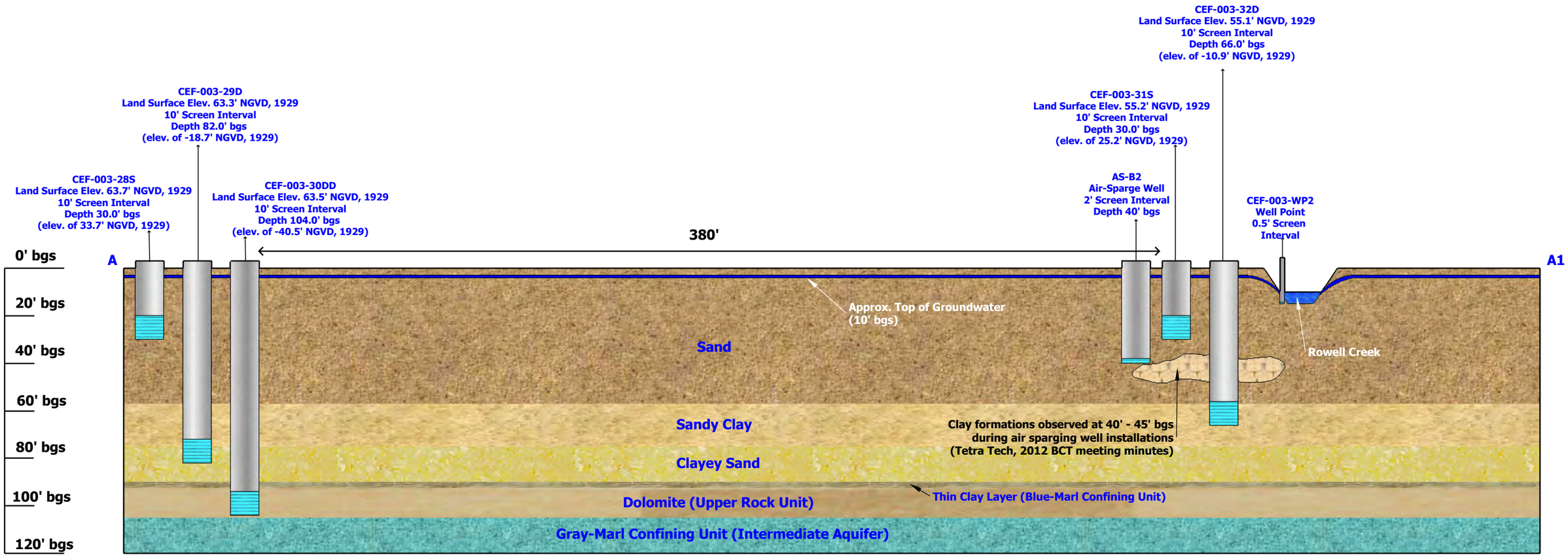
- Conceptual Site Model not to scale. Horizontal dimensions based on recent aerial imaging, site visits, and historic knowledge. Vertical dimensions exaggerated for purpose of conveying pertinent site information.
- Groundwater monitoring well locations approximated based on existing site figures and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

FIGURE 2-4
SOLAR-POWERED AIR-SPARGE SYSTEM
CONCEPTUAL SITE MODEL
SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

NAVFAC Naval Facilities Engineering Command
RESOLUTION CONSULTANTS

REQUESTED BY: D. Myers	Date: July 31, 2015
DRAWN BY: K. Burnum	CTO NO.: JM76

J:\Jacksonville\Clients\A - L_CSMs\Navy - CLEAN\Former NAS Cecil Field\CSMs\Site 3\Draft Final\Inset CSM_Site 3\Figure 2-4 Inset for Site 3



References:

1) "Ground-water flow in the Surficial Aquifer System and Potential Movement of Contaminants from Selected Waste Disposal Sites at Cecil Field Naval Air Station, Jacksonville, Florida", USGS (1998)
2) "Final Remedial Investigation at Operable Unit 8 (OU 8) Site 3 NAS Cecil Field FL", ABB Environmental Services, Inc. (2/1/1996)
3) "Draft Year 15, Annual Groundwater Monitoring Report 2013", Solutions-IES (1/21/2014)

Contaminant Source: Oil and Sludge Disposal Pit/Helicopter Crash Site

Land Use Controls:

***Land within Site 3 may not be used for residential, recreational, or agricultural use.**
***Rowell creek sediments within Site 3 may not be altered or disturbed.**
***Surface and subsurface soils within Site 3 may not be disturbed.**
***Surficial aquifer groundwater use within Site 3 is prohibited.**
***Tampering or damaging any Navy wells or remediation systems is prohibited.**

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.**
- **Site COC: Select VOCs**

FIGURE 2-5
CONCEPTUAL SITE MODEL-CROSS SECTION
SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

NAVFAC Naval Facilities Engineering Command
RESOLUTION CONSULTANTS

REQUESTED BY: D Myers	Date: February 4, 2015
DRAWN BY: K. Burnum	CTO NO.: JM76

J:\Jacksonville\Clients\A - L_CSMs\Navy - CLEAN\Former NAS Cecil Field\CSMs\Site 3\Draft Final\Cross-Section_Site 3\Figure 2-5 Cross Section Site 3

3.0 DATA EVALUATION

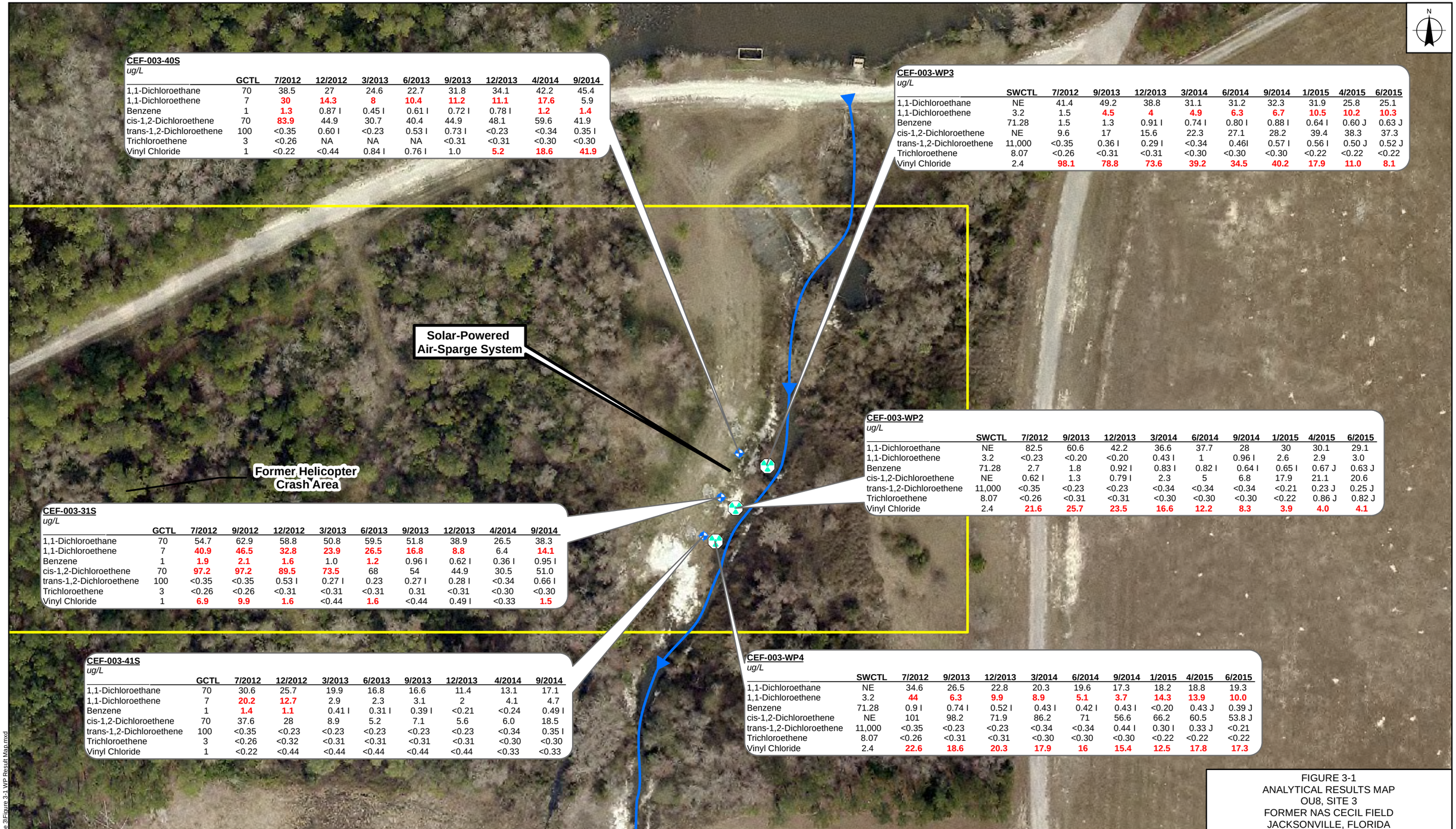
From July 2012 through September 2014, groundwater samples were collected for select volatile organic compounds from monitoring wells (CEF-003-31S, CEF-003-40S, and CEF-003-41S) and associated well points (CEF-003-WP2, CEF-003-WP3, CEF-003-WP4). In January, April, and June 2015, additional samples were collected from the above listed well points. The sample results are shown in Table 3-1 and in Figure 3-1. The following section discusses the general findings from these sampling events.

- Vinyl chloride results in CEF-003-31S have generally ranged from non-detect to 1.5 microgram per liter (µg/L) following installation of the SPAS system, exceeding its FDEP Groundwater Cleanup Target Level (GCTL) of 1 µg/L. 1,1-dichloroethene (1,1-DCE) concentrations have decreased from 32.8 µg/L in December 2012 to 14.1 µg/L in September 2014, exceeding its GCTL of 7 µg/L.

- Vinyl chloride concentrations in CEF-003-40S exhibited a continuing upward trend since the first quarter 2013 and had a result of 41.9 µg/L in September 2014. 1,1-DCE concentrations have decreased from 14.3 µg/L in December 2012 to 5.9 µg/L in September 2012.

- Well point COC concentrations have generally decreased from base-line sampling in July 2012 to September 2014. However, the June 2015 sampling results show increases in 1,1-dichloroethane (1,1-DCA) (except at CEF-003-WP3), 1,1-DCE, and cis-1,2-dichloroethene (cis-1,1-DCE) (except at CEF-003-WP4). Vinyl chloride concentrations have decreased since July 2012, over 80 percent in CEF-003-WP2 and CEF-003-WP3, and about 20 percent in CEF-003-WP4, but all three well points still exceed the FDEP Surface Water Cleanup Target Level (SWCTL) of 2.4 µg/L. 1,1-DCE concentrations exceeded the SWCTL of 3.2 µg/L in CEF-003-WP3 (10.3 µg/L) and in CEF-003-WP4 (10.0 µg/L) during the January 2015 sampling event.

Surface water samples were inadvertently collected directly from Rowell Creek instead of well points during quarterly sampling events from December 2012 through December 2013. These results are summarized in the Site 3 presentation that Tetra Tech prepared for the January 2014 BCT meeting (Tetra Tech NUS 2014). These surface water sample results indicated that Rowell Creek surface water was non-detect for OU 8, Site 3 COCs; however, sample results collected from well points adjacent to Rowell Creek continue to show COC detections as well as exceedances of FDEP SWCTLs including in 1,1-DCE and vinyl chloride.



CEF-003-40S
ug/L

	GCTL	7/2012	12/2012	3/2013	6/2013	9/2013	12/2013	4/2014	9/2014
1,1-Dichloroethane	70	38.5	27	24.6	22.7	31.8	34.1	42.2	45.4
1,1-Dichloroethene	7	**30**	**14.3**	**8**	**10.4**	**11.2**	**11.1**	**17.6**	5.9
Benzene	1	**1.3**	0.87 I	0.45 I	0.61 I	0.72 I	0.78 I	**1.2**	**1.4**
cis-1,2-Dichloroethene	70	**83.9**	44.9	30.7	40.4	44.9	48.1	59.6	41.9
trans-1,2-Dichloroethene	100	<0.35	0.60 I	<0.23	0.53 I	0.73 I	<0.23	<0.34	0.35 I
Trichloroethene	3	<0.26	NA	NA	NA	<0.31	<0.31	<0.30	<0.30
Vinyl Chloride	1	<0.22	<0.44	0.84 I	0.76 I	1.0	**5.2**	**18.6**	**41.9**

CEF-003-WP3
ug/L

	SWCTL	7/2012	9/2013	12/2013	3/2014	6/2014	9/2014	1/2015	4/2015	6/2015
1,1-Dichloroethane	NE	41.4	49.2	38.8	31.1	31.2	32.3	31.9	25.8	25.1
1,1-Dichloroethene	3.2	1.5	**4.5**	**4**	**4.9**	**6.3**	**6.7**	**10.5**	**10.2**	**10.3**
Benzene	71.28	1.5	1.3	0.91 I	0.74 I	0.80 I	0.88 I	0.64 I	0.60 J	0.63 J
cis-1,2-Dichloroethene	NE	9.6	17	15.6	22.3	27.1	28.2	39.4	38.3	37.3
trans-1,2-Dichloroethene	11,000	<0.35	0.36 I	0.29 I	<0.34	0.46I	0.57 I	0.56 I	0.50 J	0.52 J
Trichloroethene	8.07	<0.26	<0.31	<0.31	<0.30	<0.30	<0.30	<0.22	<0.22	<0.22
Vinyl Chloride	2.4	**98.1**	**78.8**	**73.6**	**39.2**	**34.5**	**40.2**	**17.9**	**11.0**	**8.1**

CEF-003-WP2
ug/L

	SWCTL	7/2012	9/2013	12/2013	3/2014	6/2014	9/2014	1/2015	4/2015	6/2015
1,1-Dichloroethane	NE	82.5	60.6	42.2	36.6	37.7	28	30	30.1	29.1
1,1-Dichloroethene	3.2	<0.23	<0.20	<0.20	0.43 I	1	0.96 I	2.6	2.9	3.0
Benzene	71.28	2.7	1.8	0.92 I	0.83 I	0.82 I	0.64 I	0.65 I	0.67 J	0.63 J
cis-1,2-Dichloroethene	NE	0.62 I	1.3	0.79 I	2.3	5	6.8	17.9	21.1	20.6
trans-1,2-Dichloroethene	11,000	<0.35	<0.23	<0.23	<0.34	<0.34	<0.34	<0.21	0.23 J	0.25 J
Trichloroethene	8.07	<0.26	<0.31	<0.31	<0.30	<0.30	<0.30	<0.22	0.86 J	0.82 J
Vinyl Chloride	2.4	**21.6**	**25.7**	**23.5**	**16.6**	**12.2**	**8.3**	**3.9**	**4.0**	**4.1**

CEF-003-31S
ug/L

	GCTL	7/2012	9/2012	12/2012	3/2013	6/2013	9/2013	12/2013	4/2014	9/2014
1,1-Dichloroethane	70	54.7	62.9	58.8	50.8	59.5	51.8	38.9	26.5	38.3
1,1-Dichloroethene	7	**40.9**	**46.5**	**32.8**	**23.9**	**26.5**	**16.8**	**8.8**	6.4	**14.1**
Benzene	1	**1.9**	**2.1**	**1.6**	1.0	**1.2**	0.96 I	0.62 I	0.36 I	0.95 I
cis-1,2-Dichloroethene	70	**97.2**	**97.2**	**89.5**	**73.5**	68	54	44.9	30.5	51.0
trans-1,2-Dichloroethene	100	<0.35	<0.35	0.53 I	0.27 I	0.23	0.27 I	0.28 I	<0.34	0.66 I
Trichloroethene	3	<0.26	<0.26	<0.31	<0.31	<0.31	0.31	<0.31	<0.30	<0.30
Vinyl Chloride	1	**6.9**	**9.9**	**1.6**	<0.44	**1.6**	<0.44	0.49 I	<0.33	**1.5**

CEF-003-41S
ug/L

	GCTL	7/2012	12/2012	3/2013	6/2013	9/2013	12/2013	4/2014	9/2014
1,1-Dichloroethane	70	30.6	25.7	19.9	16.8	16.6	11.4	13.1	17.1
1,1-Dichloroethene	7	**20.2**	**12.7**	2.9	2.3	3.1	2	4.1	4.7
Benzene	1	**1.4**	**1.1**	0.41 I	0.31 I	0.39 I	<0.21	<0.24	0.49 I
cis-1,2-Dichloroethene	70	37.6	28	8.9	5.2	7.1	5.6	6.0	18.5
trans-1,2-Dichloroethene	100	<0.35	<0.23	<0.23	<0.23	<0.23	<0.23	<0.34	0.35 I
Trichloroethene	3	<0.26	<0.32	<0.31	<0.31	<0.31	<0.31	<0.30	<0.30
Vinyl Chloride	1	<0.22	<0.44	<0.44	<0.44	<0.44	<0.44	<0.33	<0.33

CEF-003-WP4
ug/L

	SWCTL	7/2012	9/2013	12/2013	3/2014	6/2014	9/2014	1/2015	4/2015	6/2015
1,1-Dichloroethane	NE	34.6	26.5	22.8	20.3	19.6	17.3	18.2	18.8	19.3
1,1-Dichloroethene	3.2	**44**	**6.3**	**9.9**	**8.9**	**5.1**	**3.7**	**14.3**	**13.9**	**10.0**
Benzene	71.28	0.9 I	0.74 I	0.52 I	0.43 I	0.42 I	0.43 I	<0.20	0.43 J	0.39 J
cis-1,2-Dichloroethene	NE	101	98.2	71.9	86.2	71	56.6	66.2	60.5	53.8 J
trans-1,2-Dichloroethene	11,000	<0.35	<0.23	<0.23	<0.34	<0.34	0.44 I	0.30 I	0.33 J	<0.21
Trichloroethene	8.07	<0.26	<0.31	<0.31	<0.30	<0.30	<0.30	<0.22	<0.22	<0.22
Vinyl Chloride	2.4	**22.6**	**18.6**	**20.3**	**17.9**	**16**	**15.4**	**12.5**	**17.8**	**17.3**

FIGURE 3-1
ANALYTICAL RESULTS MAP
OU8, SITE 3
FORMER NAS CECIL FIELD
JACKSONVILLE, FLORIDA

Legend

- Monitoring Well
- Well Point Monitoring Location
- Creek
- LUC Boundary

Sample Location ID — **CEF-003-WP4**
Unit — *ug/L*
Analyte — 1,1-Dichloroethene
SWCTL Value — 3.2 (Surface Water Cleanup Target Level)
Result — 44 (Red indicates exceedance of SWCTL)
Sample Date — 7/2012

0 100 200 Feet

NAVFAC Naval Facilities Engineering Command
RESOLUTION CONSULTANTS

REQUESTED BY: D. Myers	DATE: 7/30/2015
DRAWN BY: kburnum	TASK ORDER NUMBER: JM76

Service Layer Credits: City of Jacksonville

X:\Navy\NAS_CecilField\Site 3\Figure 3-1 WP Result Map.mxd

Table 3-1
Analytical Results

Well ID	Sample Date	Volatile Organic Compounds (µg/L)						
		1,1-Dichloroethane	1,1-Dichloroethene	Benzene	*cis*-1,2-Dichloroethene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
GCTL (µg/L)		70	7	1	70	100	3	1
MCL (µg/L)		NE	7	5	70	100	5	2
CEF-003-31S	July 2012 (baseline)	**54.7**	**40.9**	**1.9**	**97.2**	0.35 U	0.26 U	**6.9**
	September 2012	**62.9**	**46.5**	**2.1**	**97.2**	0.35 U	0.26 U	**9.9**
	December 2012	**58.8**	**32.8**	**1.6**	**89.5**	**0.53 I**	0.31 U	**1.6**
	March 2013	**50.8**	**23.9**	**1.0**	**73.5**	**0.27 I**	0.31 U	0.44 U
	June 2013	**59.5**	**26.5**	**1.2**	**68**	**0.23**	0.31 U	**1.6**
	September 2013	**51.8**	**16.8**	**0.96 I**	**54**	**0.27 I**	0.31	0.44 U
	December 2013	**38.9**	**8.8**	**0.62 I**	**44.9**	**0.28 I**	0.31 U	**0.49 I**
	April 2014	**26.5**	**6.4**	**0.36 I**	**30.5**	0.34 U	0.30 U	0.33 U
	September 2014	**38.3**	**14.1**	**0.95 I**	**51.0**	**0.66 I**	0.30 U	**1.5**
CEF-003-40S	July 2012 (baseline)	**38.5**	**30**	**1.3**	**83.9**	0.35 U	0.26 U	0.22 U
	December 2012	**27**	**14.3**	**0.87 I**	**44.9**	**0.60 I**	NA	0.44 U
	March 2013	**24.6**	**8**	**0.45 I**	**30.7**	0.23 U	NA	**0.84 I**
	June 2013	**22.7**	**10.4**	**0.61 I**	**40.4**	**0.53 I**	NA	**0.76 I**
	September 2013	**31.8**	**11.2**	**0.72 I**	**44.9**	**0.73 I**	0.31 U	**1.0**
	December 2013	**34.1**	**11.1**	**0.78 I**	**48.1**	0.23 U	0.31 U	**5.2**
	April 2014	**42.2**	**17.6**	**1.2**	**59.6**	0.34 U	0.30 U	**18.6**
	September 2014	**45.4**	**5.9**	**1.4**	**41.9**	**0.35 I**	0.30 U	**41.9**
CEF-003-41S	July 2012 (baseline)	**30.6**	**20.2**	**1.4**	**37.6**	0.35 U	0.26 U	0.22 U
	December 2012	**25.7**	**12.7**	**1.1**	**28**	0.23 U	0.32 U	0.44 U
	March 2013	**19.9**	**2.9**	**0.41 I**	**8.9**	0.23 U	0.31 U	0.44 U
	June 2013	**16.8**	**2.3**	**0.31 I**	**5.2**	0.23 U	0.31 U	0.44 U
	September 2013	**16.6**	**3.1**	**0.39 I**	**7.1**	0.23 U	0.31 U	0.44 U
	December 2013	**11.4**	**2**	<0.21	**5.6**	0.23 U	0.31 U	0.44 U
	April 2014	**13.1**	**4.1**	<0.24	**6.0**	0.34 U	0.30 U	0.33 U
	September 2014	**17.1**	**4.7**	**0.49 I**	**18.5**	**0.35 I**	0.30 U	0.33 U

Table 3-1
Analytical Results

Well ID	Sample Date	Volatile Organic Compounds (µg/L)						
		1,1-Dichloroethane	1,1-Dichloroethene	Benzene	*cis*-1,2-Dichloroethene	*trans*-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
SWCTL (µg/L)		NE	3.2	71.28	NE	11,000	8.07	2.4
CEF-003-WP2	July 2012 (baseline)	**82.5**	0.23 U	**2.7**	**0.62 I**	0.35 U	0.26 U	**21.6**
	September 2013	**60.6**	0.20 U	**1.8**	**1.3**	0.23 U	0.31 U	**25.7**
	December 2013	**42.2**	0.20 U	**0.92 I**	**0.79 I**	0.23 U	0.31 U	**23.5**
	March 2014	**36.6**	**0.43 I**	**0.83 I**	**2.3**	0.34 U	0.30 U	**16.6**
	June 2014	**37.7**	**1**	**0.82 I**	**5**	0.34 U	0.30 U	**12.2**
	September 2014	**28**	**0.96 I**	**0.64 I**	**6.8**	0.34 U	0.30 U	**8.3**
	January 2015	**30**	**2.6**	**0.65 I**	**17.9**	0.21 U	0.22 U	**3.9**
	April 2015	**30.1**	**2.9**	**0.67 J**	**21.1**	**0.23 J**	**0.86 J**	**4.0**
	June 2015	**29.1**	**3.0**	**0.63 J**	**20.6**	**0.25 J**	**0.82 J**	**4.1**
CEF-003-WP3	July 2012 (baseline)	**41.4**	**1.5**	**1.5**	**9.6**	0.35 U	0.26 U	**98.1**
	September 2013	**49.2**	**4.5**	**1.3**	**17**	**0.36 I**	0.31 U	**78.8**
	December 2013	**38.8**	**4**	**0.91 I**	**15.6**	**0.29 I**	0.31 U	**73.6**
	March 2014	**31.1**	**4.9**	**0.74 I**	**22.3**	0.34 U	0.30 U	**39.2**
	June 2014	**31.2**	**6.3**	**0.80 I**	**27.1**	**0.46 I**	0.30 U	**34.5**
	September 2014	**32.3**	**6.7**	**0.88 I**	**28.2**	**0.57 I**	0.30 U	**40.2**
	January 2015	**31.9**	**10.5**	**0.64 I**	**39.4**	**0.56 I**	0.22 U	**17.9**
	April 2015	**25.8**	**10.2**	**0.60 J**	**38.3**	**0.50 J**	0.22 U	**11.0**
	June 2015	**25.1**	**10.3**	**0.63 J**	**37.3**	**0.52 J**	0.22 U	**8.1**
CEF-003-WP4	July 2012 (baseline)	**34.6**	**44**	**0.9 I**	**101**	0.35 U	0.26 U	**22.6**
	September 2013	**26.5**	**6.3**	**0.74 I**	**98.2**	0.23 U	0.31 U	**18.6**
	December 2013	**22.8**	**9.9**	**0.52 I**	**71.9**	0.23 U	0.31 U	**20.3**
	March 2014	**20.3**	**8.9**	**0.43 I**	**86.2**	0.34 U	0.30 U	**17.9**
	June 2014	**19.6**	**5.1**	**0.42 I**	**71**	0.34 U	0.30 U	**16**
	September 2014	**17.3**	**3.7**	**0.43 I**	**56.6**	**0.44 I**	0.30 U	**15.4**
	January 2015	**18.2**	**14.3**	**0.20 U**	**66.2**	**0.30 I**	0.22 U	**12.5**
	April 2015	**18.8**	**13.9**	**0.43 J**	**60.5**	**0.33 J**	0.22 U	**17.8**
	June 2015	**19.3**	**10.0**	**0.39 J**	**53.8 J**	**0.21 U**	0.22 U	**17.3**

Notes:

µg/L	=	Micrograms per liter
GCTL	=	Florida Department of Environmental Protection Groundwater Cleanup Target Level, Chapter 62-777, F.A.C.
MCL	=	Environmental Protection Agency Maximum Contaminant Level
SWCTL	=	Florida Department of Environmental Protection Surface Water Cleanup Target Level, FDEP Criteria for Surface Water Classifications for Class III water, Chapter 62-302.530, F.A.C. and Table 1, Groundwater and Surface Water Cleanup Target Levels, Chapter 62-777, F.A.C.
NE	=	Not established
	=	Highlighting indicates values greater than the GCTL (monitor wells) or SWCTL (well points)
Bold	=	Bold indicates values above the method detection limit
I	=	Indicates values that are greater than the method detection limit but less than the lab reporting limit
J	=	Indicates estimated values
U	=	Chemical not detected
Rounding Rule	=	"Rounding Analytical Data for Site Rehabilitation Completion Nov 17, 2011", referencing Chapter 62-780, FAC, states exceedances are determined using the same number of significant figures as the respective regulatory limit — effective Nov 2011

4.0 CONCLUSIONS

This Technical Memorandum for the Site 3 SPAS system includes a summary of the decisions and actions associated with the system, Conceptual Site Model and associated cross-section, and sample results for the periodic groundwater monitoring efforts completed between July 2012 and September 2014 and corresponding well point monitoring completed through June 2015. Based on this information, the following conclusions can be made:

- Monitoring wells associated with the SPAS system, including CEF-003-31S and CEF-003-41S, have generally shown declines in COC concentrations since July 2012; however, 1,1-DCE and vinyl chloride remain above FDEP GCTLs per Chapter 62-777, F.A.C. in CEF-003-31S.

- Monitoring well CEF-003-40S located just north of the SPAS system has shown increases in vinyl chloride and benzene. Additional optimization of the SPAS system in the vicinity of CEF-003-40S may be warranted in the event COCs at CEF-003-40S continue to increase. Vinyl chloride was detected at the highest recorded concentration in CEF-003-40S in the most recent groundwater sampling event in September 2014.

- Well points associated with the SPAS system, including CEF-003-WP2, CEF-003-WP3, and CEF-003-WP4, have shown declines in COC concentrations since July 2012 through September 2014; however, the June 2015 results show increases in 1,1-DCA (except at CEF-003-WP3), 1,1-DCE, and cis-1,2-DCE (except at CEF-003-WP4). In addition, 1,1-DCE and vinyl chloride continue to remain above FDEP SWCTLs.

5.0 REFERENCES

ABB Environmental Services. *Baseline Risk Assessment, Operable Unit 8, Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. September 1997.

— *Feasibility Study, Operable Unit 8. Naval Air Station Cecil Field, Jacksonville, Florida.* Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. October 1997.

Base Realignment and Closure Program Management. *Record of Decision, Operable Unit 8. Naval Air Station Cecil Field, Jacksonville, Florida.* August 1998.

— *Declaration for the Explanation of Significant Differences, Naval Air Station Cecil Field, Jacksonville, Florida.* November 2003.

Florida Department of Environmental Protection. *Contaminant Target Levels Rule, Groundwater and Surface Water Target Cleanup Levels, Florida Administrative Code Chapter 62-777.* August 1999.

Resolution Consultants. Cecil Field BRAC Cleanup Team Meeting, February 2015. Prepared for Former NAS Cecil Field BCT. February 2015.

Tetra Tech NUS. *Third Five-Year Review Report, Naval Air Station Cecil Field, Jacksonville, Florida.* April 2011.

— *Pilot Study Work Plan for Solar Powered Low Volume Air Sparging Treatment Curtain, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. September 2012.*

— *Site 3 Update, Cecil Field, January 2014 BCT Telecon.* Prepared for Former NAS Cecil Field BCT. January 2014.

U.S. Geological Survey. *Ground-Water Flow in The Surficial Aquifer System and Potential Movement of Contaminants from Selected Waste Disposal Sites at Cecil Field Naval Air Station, Jacksonville, Florida.* 1998.

Field Notes and Sampling Forms for Rowell Creek
Surface Water Sampling

Cecil Field Site 3 Sampling 18 Dec 12

Personnel: Jeff Krone
Truck: F-250
PPE: Level D
Weather: Partly Cloudy 60°
Objective: Groundwater and Surface water sampling

0715 Departed home for Cecil Field
0810 Arrived on site, began calibration
0920 Completed calibration, commenced sampling event. See table below for details.

Well ID	Sample ID	Start	Stop	Sample Time	Analysis
003-40$	CEF-003-40$-GW-L85 **	0900	0941	0946	VOCs *
003-31$	CEF-003-31$-GW-L85 ***	0955	1021	1024	VOCs *
003-41$	CEF-003-41$-GW-L85	1010	1051	1057	VOCs *
003-WP4	CEF-003-WP4-SW-L85 ****	N/A	N/A	1200	VOCs *
003-WP2	CEF-003-WP2-SW-L85	N/A	N/A	1215	VOCs *
003-WP3	CEF-003-WP3-SW-L85	N/A	N/A	1250	VOCs *

* Indicates Select VOCs
** Indicates MS/MSD
*** Indicates DUP 01 GW
**** Indicates DUP 01 SW

1330 Completed sampling, packed samples for transport.
1400 Restarted system and began evaluation
1430 Completed system evaluation and departed site
1520 Transferred IDW to drum 003-048, pH 6.9
1545 Departed Cecil Field
1640 Arrived at office

JC

Tetra Tech NUS, Inc.

YSI EQUIPMENT CALIBRATION SHEET

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: YSI 556 MPS

SITE NAME: Site 3

MANUFACTURER: YSI

PROJECT No.: 112G02267

SERIAL NUMBER: 11E100179

		Date of Calibration (mm/dd/yy)	Person Performing Calibration (Name)	Machine Serial No.	Machine Settings	Instrument Readings Pre-cal	Instrument Readings Post-cal	Calibration Standard (Lot#/Expiration Date)	Comments
pH (7)	(S.U.)	12/18/12	JK	11E100179		6.97	7.00	Lot# 9886 Exp.Date: 9/13	
pH (10)	(S.U.)		JK			10.03	10.00	Lot# 2208410 Exp.Date: 9/13	
D.O.	%					91.1%	99.9%	Lot# Exp.Date:	
Cond.	(mS/cm)					1454	1413	Lot# 9710 Exp.Date: 5/13	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)					244.9	240.0	Lot# 4116 Exp.Date: 6/17	
								Lot# Exp.Date:	
pH (7)	(S.U.)							Lot# Exp.Date:	
pH (10)	(S.U.)							Lot# Exp.Date:	
D.O.	%							Lot# Exp.Date:	
Cond.	(mS/cm)							Lot# Exp.Date:	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)							Lot# Exp.Date:	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: Lamotte 2020 Turbidimeter

SITE NAME: Site 3

MANUFACTURER: Lamotte

PROJECT No.: 112G02267

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
12/18/12	12950	JK	1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	8.33	10.00		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	1.47	1.00		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP2-SW-L85
Sample Location: WP 2
Sampled By: JC
C.O.C. No.: 2560

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 12/18/12								
Time: 1215								
Depth: 0-1"								
Method: grab	grey	7.00	125	18.08	~~7.77~~ 19.6	7.71	0.06	

SAMPLE COLLECTION INFORMATION:

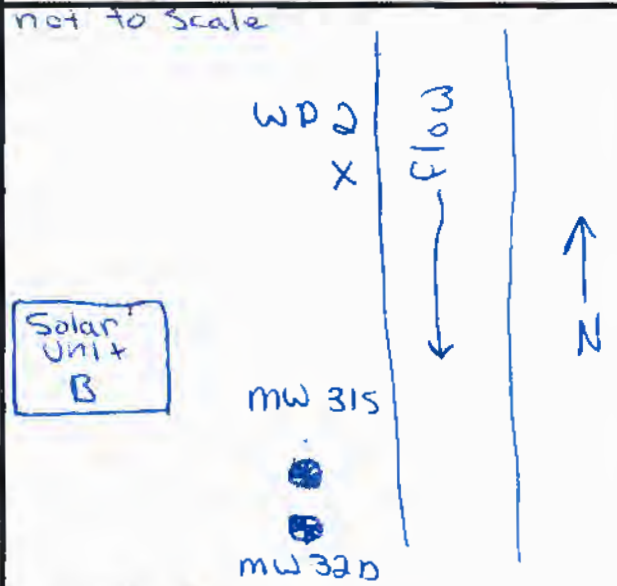
Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCL	03 40ml VOAs	

OBSERVATIONS / NOTES:

Creek depth 0-4'
Light rain within past 24 hours from passing cold front
normal creek flow

MAP:

not to Scale



Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP3-SW-L85
Sample Location: WP 3
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 12/18/12								
Time: 1250								
Depth: 6-8"								
Method: grab	grey	7.01	125	18.28	13.8	6.93	0.06	

SAMPLE COLLECTION INFORMATION:

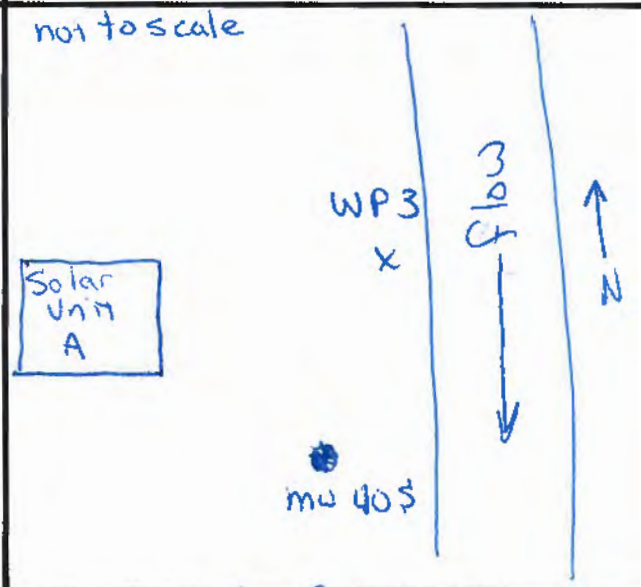
Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

creek depth 0-4'
Light rain within last 24 hours from passing cold front
normal creek flow

MAP:

not to scale



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP4-SW-L85
Sample Location: WP 4
Sampled By: K
C.O.C. No.: 2560

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 12/13/12								
Time: 1200								
Depth: 0-6"								
Method: grab	grey	6.99	125	17.96	13.6	8.04	0.06	

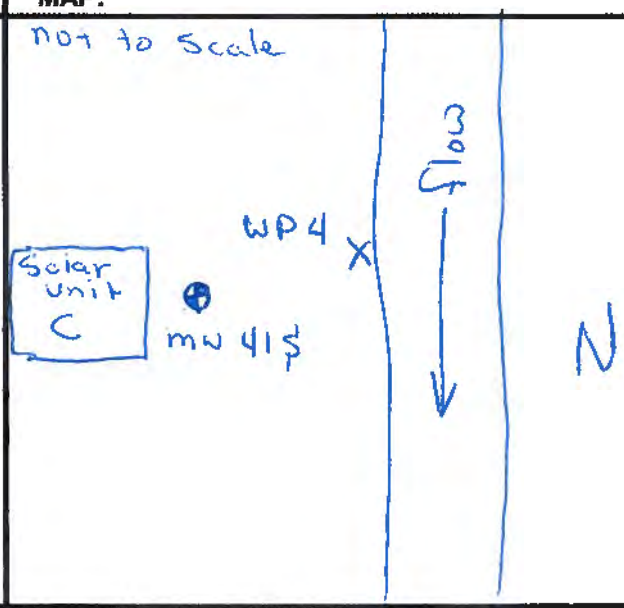
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOC (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

Creek depth 00-03'
Light rain in past 24 hrs with passing cold front
normal creek flow

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.: CEF-003-DUP01-SW-L85

Signature(s):

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER 2560 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G0 2067	Cecil Field Site 3	Rob Sumsik		Accutest
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: Jeff Krone	PHONE NUMBER: 904 699 7473	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE: Orlando, Fl

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

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

DATE YEAR 2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Select VOCs 8260 See attached								COMMENTS
12/8	0946	CEF-003-405-GW-L85				GW	G	9	X								
12/8	0000	CEF-003-DUP01-GW-L85				GW	G	3	X								
12/8	1024	CEF-003-315-GW-L85				GW	G	3	X								
12/8	1057	CEF-003-415-GW-L85				GW	G	3	X								
12/8	0000	CEF-003-DUP01-SW-L85				SW ~~GW~~	G	3	X								
12/8	1200	CEF-003-WP4-SW-L85				SW	G	3	X								
12/8	1215	CEF-003-WP2-SW-L85				SW	G	3	X								
12/8	1250	CEF-003-WP3-SW-L85				SW	G	3	X								
		Trip Blank						2	X								

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
[illegible] TT	12/17/2012	1:33PM			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

Cecil Field Site 3 Sampling 112608267 18 Mar 13

Personnel: Jeff Krone
Truck: F-250
PPE: Level D
Weather: Partly Cloudy 75°
Objective: Groundwater and Surface water Sampling

0920 Arrived on site, shut down systems. Noted that System B had staining on concrete pad

0940 Began calibration and water level measurements

1100 completed water levels and calibration, commenced sampling event. See table below for details.

Well ID	Sample ID	Start	Stop	Sample time	Analysis
003 40$	CEF-003-40S-GW-L88 *	1105	1126	1130	VOCs *
003-31$	CEF-003-31$-GW-88 * *	1155	1216	1220	VOCs
003-41$	CEF-003-41$-GW-88	1240	1301	1306	VOCs
003-SW4	CEF-003-WP4-SW-88 * Dup			1330	VOCs
003-SW2	CEF-003-WP2-SW-88			1345	VOCs
003-SW3	CEF-003-WP3-SW-88			1400	VOCs

* Indicates Duplicate sample * * Indicates MS/MSD

1415 Completed sampling event, conducted system evaluation after restarting

1450 Packed equipment for travel and departed Cecil Field.

1615 Arrived at office.

1630 Relinquished Samples to Accutest Courier

~~1715 AF~~

Tetra Tech NUS, Inc.

YSI EQUIPMENT CALIBRATION SHEET

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: YSI 556 MPS

SITE NAME: Site 3

MANUFACTURER: YSI

PROJECT No.: 112G02267

SERIAL NUMBER: 11B100642

		Date of Calibration (mm/dd/yy)	Person Performing Calibration (Name)	Machine Serial No.	Machine Settings	Instrument Readings Pre-cal	Instrument Readings Post-cal	Calibration Standard (Lot#/Expiration Date)	Comments
pH (7)	(S.U.)	3/18/13	K		6.96	7.00	7.03	Lot# 1209172 Exp.Date: 9/14	
pH (10)	(S.U.)							Lot# 2221639 Exp.Date: 5/14	
D.O.	%			100%	137.5	100.5	101.2	Lot# Exp.Date:	
Cond.	(mS/cm)			1.413	1.448	1.413	1.422	Lot# 10115 Exp.Date: 1/14	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)			240	240.5	240.0	241.3	Lot# 4761 Exp.Date: 7/17	
								Lot# Exp.Date:	
pH (7)	(S.U.)							Lot# Exp.Date:	
pH (10)	(S.U.)							Lot# Exp.Date:	
D.O.	%							Lot# Exp.Date:	
Cond.	(mS/cm)							Lot# Exp.Date:	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)							Lot# Exp.Date:	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: Lamotte 2020 Turbidimeter

SITE NAME: Site 3

MANUFACTURER: Lamotte

PROJECT No.: 112G02267

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
3/18/13	12950	JK	1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	8.84	10.21		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	0.96	1.02		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP2-SW-L88
Sample Location: WP 2
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 3/18/13								
Time: 1345								
Depth: 1.5'								
Method: grab	brown	7.11	0.117	18.08	9.91	9.03	0.06	

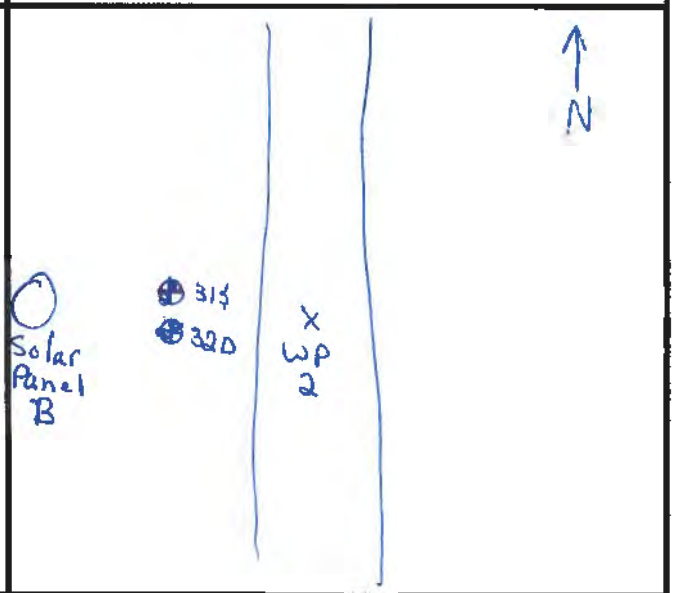
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCL	03 40ml VOAs	

OBSERVATIONS / NOTES:

water level slightly below norm
low flow velocity

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP3-SW-L88
Sample Location: WP 3
Sampled By:
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 3/18/13								
Time: 1400								
Depth: 1.5 ft								
Method: grab	brown	7.15	0.119	18.02	~~8.03~~	8.03	0.06	

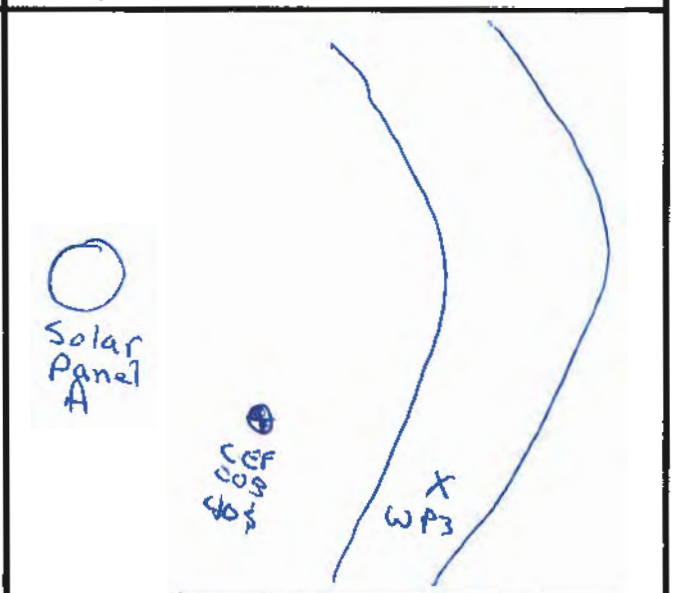
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

low flow velocity
creek level slightly low

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP4-SW-L88
Sample Location: WP 4
Sampled By: JK
C.O.C. No.: 2759

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 3/18/13								
Time: 1330								
Depth: 1.5'								
Method: grab	brown	7.12	0.178	18.13	10.13	7.96	0.06	

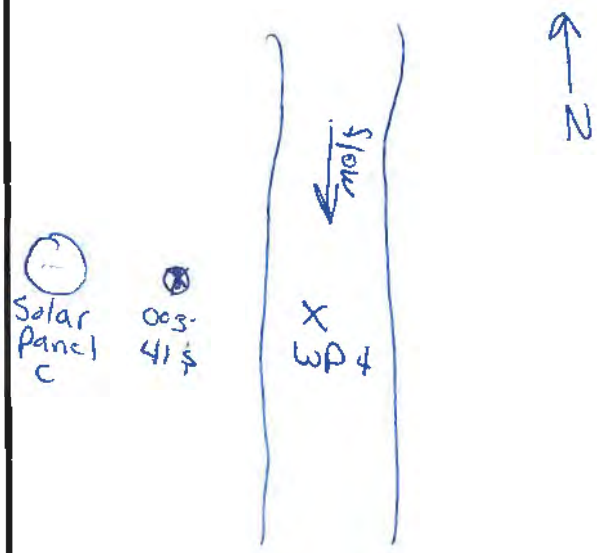
SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOC (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

low flow velocity
water level slightly below normal

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.: DUP 01 SW

Signature(s):

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 2759 | PAGE 1 OF 1

PROJECT NO: 112602267	FACILITY: Cecil Field Site 3	PROJECT MANAGER Rob Simcik	PHONE NUMBER 412 921 8163	LABORATORY NAME AND CONTACT: Accutest / Andrea Colby
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER Jeff Kane	PHONE NUMBER 904 699 7473	ADDRESS 4405 Vineland Road
		CARRIER/WAYBILL NUMBER Courier		CITY, STATE Orlando, Fl 32811

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

CONTAINER TYPE PLASTIC (P) or GLASS (G)

PRESERVATIVE USED

TYPE OF ANALYSIS: Select VOCs *

DATE YEAR 2013	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	Select VOCs *								COMMENTS
3/18	1130	CEF-003-405-GW-L88				GW	G	3	X								cool to 4°C
3/18	1220	CEF-003-315-GW-88				GW	G	9	X								ms/msd
3/18	0000	CEF-003-DUP01-GW-L88				GW	G	3	X								
3/18	1306	CEF-003-415-GW-88				GW	G	3	X								
3/18	1330	CEF-003-WP4SW-L88				SW	G	3	X								
3/18	0000	CEF-003-DUP01-SW-L88				SW	G	3	X								
3/18	1345	CEF-003-WP2-SW-L88				SW	G	3	X								
3/18	1400	CEF-003-WP3-SW-L88				SW	G	3	X								
		Trip Blank				QC		2	X								

1. RELINQUISHED BY	DATE 3/18/13	TIME 1620	1. RECEIVED BY	DATE 3-18-13	TIME 1615
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS * See attached list

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

4/02R
FORM NO. TINUS-001

Cecil Field Site 3 Sampling 12 Nov 13

Personnel: Jeff Krone
Truck: F-250
PPE: Level D
Objective: Collect creek samples
Weather: Cloudy 75°

0815 Departed office for Cecil Field
0920 on site, Calibrated instruments.
0945 Collected WP 4 after decon of collection cup, decon of cup
0950 Collected WP 2 and decon cup
0955 Collected WP 3 and decon cup
1010 Packed samples for transportation
1020 Departed Cecil Field
1105 Arrived at office
1115 Relinquished Samples to Accutest courier.

JK

Tetra Tech NUS, Inc.

DOCUMENTATION OF FIELD CALIBRATION

PROJECT NAME : Site 3

SITE NAME: Cecil Field

PROJECT No.: 112G02267

INSTRUMENT NAME/MODEL: See Below

MANUFACTURER: See Below

SERIAL NUMBER: See Below

Date of Calibration	Instrument Name and Model	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
				Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		exp
11/12/13	457 556 mps	10310058	K	7.00 pH	6.94	7.00		2304659	3/15
				4.00 pH	3.97	4.00			
				cond 1.413	1.398	1.413			
				240 ORP	239.7	240			
				DO 100%	98.3%	100.1%			

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP3-SW-L90
Sample Location: WP 3
Sampled By: X
C.O.C. No.: 2783

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

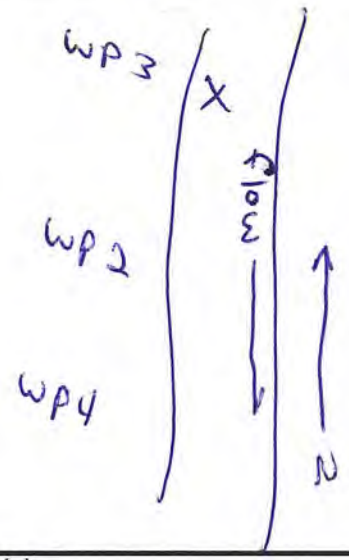
	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 11/12/13 Time: 0950 Depth: 0.1' Method: grab	yellow	6.41	92	19.98	13.65	10.62	–	–

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP2-SW-L90
Sample Location: WP 2
Sampled By: JS
C.O.C. No.: 2783

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

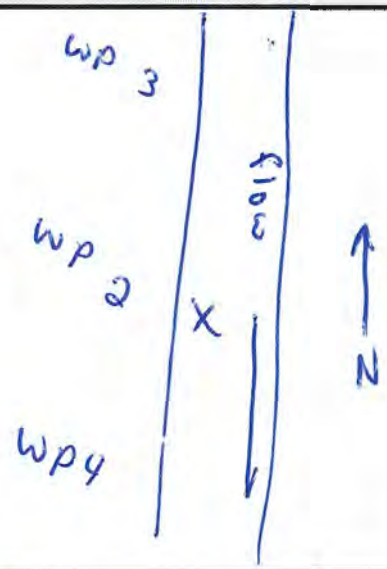
	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 11/12/13								
Time: 0945								
Depth: 0-1								
Method: grab	yellow	6.35	92	19.9	28.14	10.08		

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOCs (see sample analysis plan)	HCL	03 40ml VOAs	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD

Duplicate ID No.: Dup01

Signature(s):

Tetra Tech

SURFACE WATER SAMPLE LOG SHEET

Page___ of ___

Project Site Name: Cecil Field Site 3
Project No.: 112G02267

[] Stream
[] Spring
[] Pond
[] Lake
[] Other: Creek
[] QA Sample Type:

Sample ID No.: CEF-003-WP4-SW-L90
Sample Location: WP 4
Sampled By: JS
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (^{0}C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 11/12/13								
Time: ~~[illegible]~~ 0940								
Depth: 2'								
Method: grab	yellow	6.27	92	19.87	12.17	11.13	–	–

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
Select VOC (see sample analysis plan)	HCl	03 40ml VOAs	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER № 2783

PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112602867	Cecil Field Site 3	Rob Simcik		Accutest / Andrea Colby
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: Jeff Krone	PHONE NUMBER: 904 699 7473	ADDRESS: 4405 Vineland Road Suite C-15
		CARRIER/WAYBILL NUMBER: Accutest Courier		CITY, STATE: Orlando, Fl 32811

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

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

DATE YEAR 2013	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Select VOCs (8260) See List	COMMENTS
11/12	~~1100~~ 0915	CEF-003-WP2-SW-90				SW	G	3	X	Cool to 4° C
11/12	~~1105~~ 0920	CEF-003-WP3-SW-90				SW	G	3	X	
11/12	~~1110~~ 0940	CEF-003-WP4-SW-90				SW	G	3	X	
11/12	0000	CEF-003-DUP01-SW-90				SW	G	3	X	
		Trip Blank				QC	G	2	X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	11/12/13	1110	1. RECEIVED BY	11-12-13	11:10
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001