

*Prepared for:*



**Tampa, Florida**

**ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT**

**Big Bend Power Station  
Economizer Ash and Pyrite Pond System  
13031 Wyandotte Road  
Gibson, FL 33572**

*Prepared by:*



13101 Telecom Drive  
Suite 120  
Temple Terrace, FL 33637

Project Number: FR2814  
January 2018

## TABLE OF CONTENTS

1.	BACKGROUND .....	1
2.	SITE DESCRIPTION .....	3
2.1	Site Setting .....	3
2.2	CCR Units .....	3
2.3	Summary of Site Geology and Hydrogeology .....	4
2.4	Aquifer System Description .....	4
2.4.1	Identification of Uppermost Aquifer .....	4
2.4.2	Groundwater Flow Direction .....	5
2.4.3	Groundwater Flow Rates .....	5
3.	GROUNDWATER MONITORING SYSTEM .....	6
3.1	Status of the Groundwater Monitoring and Corrective Action Program .....	6
3.2	Identification of Monitoring Wells Installed, Abandoned, or Decommissioned - 257.90 (E)(2) .....	6
4.	SUMMARY OF 2015-2017 CCR RULE ACTIVITIES COMPLETED.....	7
4.1	Requirements Completed .....	7
4.2	Completion of Required Reports.....	7
4.3	Problems Encountered and Resolution.....	8
5.	GROUNDWATER MONITORING DATA - 257.90(E)(3).....	9
5.1	Baseline Sampling.....	9
5.2	Detection Monitoring .....	9
5.2.1	Alternative Monitoring Frequency – 257.94(d)(3) .....	9
5.2.2	Identification of Appendix III Constituents Detected at SSI Over Background – 257.94(e) .....	9
5.2.3	Alternative Source Demonstration – 257.94(e)(2).....	9
5.2.4	Transition from Detection to Assessment Monitoring – 257.90(e)(4) .....	9
5.3	Assessment Monitoring.....	9
6.	DATA USABILITY EVALUATION .....	10
7.	DETECTION MONITORING STATISTICAL ANALYSIS .....	11

8.	ASSESSMENT MONITORING STATISTICAL ANALYSIS.....	12
9.	ACTIVITIES PLANNED FOR 2018.....	13
10.	CORRECTIVE MEASURES.....	14
11.	REMEDY SELECTION .....	15
12.	CORRECTIVE ACTION.....	16
13.	REFERENCES .....	17

### **LIST OF TABLES**

Table 1.	CCR Monitoring Well Construction Details
Table 2.	Summary of Detection and Assessment Monitoring Constituents Under the CCR Rule
Table 3.	Summary of Baseline Groundwater Monitoring Analytical Results

### **LIST OF FIGURES**

Figure 1.	Economizer Ash and Pyrite Pond System Location Map
Figure 2.	CCR Monitoring Well Locations

### **LIST OF APPENDICES**

Appendix A	Laboratory Analytical Data Reports
Appendix B	Geosyntec Data Validation Reports

## ACRONYMS

BBS	Big Bend Power Station
CCR	Coal Combustion Residuals
CCR Rule	Coal Combustion Residuals Rule
CFR	Code of Federal Regulations
EAPPS	Economizer Ash and Pyrite Pond System
GWPS	Groundwater Protection Standard
PE	Professional Engineer
RCRA	Resource Conservation and Recovery Act
SP	Statistical Analysis Plan
SSI	Statistically Significant Increase
TEC	Tampa Electric Company
USEPA	United States Environmental Protection Agency

## 1. BACKGROUND

On April 17, 2015, the United States Environmental Protection Agency (USEPA) published 40 Code of Federal Regulations (CFR) Parts 257 and 261: Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (USEPA, 2015). This regulation addresses the safe disposal of coal combustion residuals (CCR) as solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) and is referred to herein as the CCR Rule. The CCR Rule became effective on October 14, 2015. The rule provides national minimum criteria for “the safe disposal of CCR in new and existing CCR landfills, surface impoundments, and lateral expansions, design and operating criteria, groundwater monitoring and corrective action, closure requirements and post closure care, and recordkeeping, notification, and internet posting requirements.” The groundwater monitoring requirements of the CCR Rule apply to the economizer ash and pyrite pond system (EAPPS) at Tampa Electric Company’s (TEC) Big Bend Power Station (BBS) in southeast Hillsborough County in Gibsonton, Florida (**Figure 1**).

This document has been prepared to meet the requirements found in 40 CFR 257.90(e) concerning the Annual Groundwater Monitoring and Corrective Action reporting required by the CCR Rule for the EAPPS and BBS. At a minimum, the annual groundwater monitoring and corrective action report must contain the information described below and the information required by 257.90(e)(1) through (5), to the extent available:

*“For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility’s operating record as required by § 257.105(h)(1)”*

This annual report covers the period January 1, 2017 through December 31, 2017. Since this is the first CCR Annual Report, activities conducted in 2016 are also included. Sections of this report that are required by the CCR Rule, but are not applicable during the reporting period, contain the text “Not applicable for this annual reporting period”.

Site features/geology/lithology, design of the CCR monitoring well network, the Sampling and Analysis Plan including requirements, procedures, documentation, laboratory analytical procedures and quality control, and the Quality Assurance Plan are provided in the *CCR Rule Groundwater Monitoring Program Plan (GWMP), Big Bend Power Station*, (October 2016).

## 2. SITE DESCRIPTION

### 2.1 Site Setting

The BBS is located on the eastern shore of Tampa Bay in Sections 9, 10, 15, and 16, Township 31, Range 19 East of the Gibsonton Quadrangle, with the center of the facility at approximately 27°47'36" north latitude and 82°24'16" west longitude and encompasses approximately 1,492 acres. Topography at the Site ranges from approximately sea level (along the western portion of the BBS) to approximately 10 feet mean sea level (MSL) near the eastern portions of the property along U.S. Highway 41. The location of the BBS and the components of the EAPPS, namely the north and south economizer ash ponds and the suction pond, are shown on **Figure 1** and **Figure 2**.

Construction of BBS began in the late 1960s on two dredge/fill peninsulas. Four coal-fired power generating units are present at the BBS and were placed into service in 1970, 1973, 1976, and 1985. Units 1, 2, and 3 are wet-bottom slag-tap type units that originally used saltwater slag-handling systems and electrostatic precipitators for stack gas emissions control. However, these units are now operating as freshwater systems, subsequently allowing more internal water recycling. Unit 4 is a dry-bottom unit with a closed-loop freshwater bottom ash-slucie system. All units are equipped with electrostatic precipitators and stack gasses are treated with limestone flue gas desulfurization (FGD) and selective catalytic reduction (SCR) systems.

### 2.2 CCR Units

The EAPPS was built in the early 1980s to support the operation of Big Bend Unit 4 and consists of three lined ponds. The EAPPS is considered one CCR unit by 40 CFR 257.53 and is located approximately 1,000 feet southeast of the active power generating units (**Figure 1**). The north economizer ash pond and economizer ash suction pond are still in operation. The south economizer ash pond has been converted to dry storage of material excavated from the south recycle pond when it was reconstructed and lined in 2010.

The pond bottom and dike crest elevations for each pond are reportedly 5.5 ft NGVD and 31 ft, NGVD respectively. The South Economizer Ash Pond contains an estimated 337,400 cubic yards (cy) of CCR material over a surface area of 7.2 acres. The north pond contains an estimated 90,000 cy of CCR material (Geosyntec, 2016) over a surface area of 5.4 acres. The suction pond has a surface area of 1.6 acres, receives decant water from the north and south economizer ash ponds, and contains only minor amounts of settleable CCR fines material.

## **2.3 Summary of Site Geology and Hydrogeology**

The units that form the hydrogeologic framework in the region include the surficial aquifer system (SAS), the Intermediate Confining Unit (ICU), and the upper Floridan aquifer system (UFAS). Based on Site-specific data as well as hydrogeologic studies of west-central Florida, the intermediate aquifer system has not been identified as being present at this location (Tihanksy and Knochenmus, 2001).

The SAS sediments consist of Pleistocene shell deposits and terrace sands; due to the irregular surface of the underlying limestone, the SAS varies in thicknesses but typically ranges between 20 and 30 feet (ft) thick in the area of the Site (SWFWMD, 2010). The water table across the Site resides in the SAS. The groundwater flow direction in the SAS is generally towards Tampa Bay as the discharge point; however, flow direction is influenced by various surface water features including ponds, drainage ditches, canals, and small creeks locally. Upward vertical flow gradients from the UFAS to the SAS are common based on historical data trends, and in certain cases can lead to artesian conditions (ECT, 2003; 2007).

The ICU resides within the undifferentiated Hawthorn Group. Due to the absence of the intermediate aquifer system, the permeable strata are absent and consequently the less permeable, fine grained clastic clay units are generally more prevalent. These clay units with varying silt, sand content, and marls comprise the semi-confining unit that separates the SAS and the UFAS.

The UFAS consists of a continuous series of carbonate units and is composed of the limestone sequences that occur in the Tampa Member of the Arcadia Formation of the Hawthorn Group as well as the underlying Suwannee Limestone and other carbonate strata. The Tampa Member encompasses sandy limestone containing varying amounts of clays and marls. The thickness of the UFAS may exceed 1,200 ft beneath the facility. Groundwater in the UFAS generally flows regionally from northeast to southwest towards Tampa Bay.

The *GWMP* may be consulted for additional details regarding the regional and Site-specific geology and hydrogeology.

## **2.4 Aquifer System Description**

### **2.4.1 Identification of Uppermost Aquifer**

The uppermost aquifer is defined by 40 CFR 257.53 as the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. The uppermost aquifer at the Site is the SAS.



### **2.4.2 Groundwater Flow Direction**

A surface water feature, Jackson Branch, to the north/northeast of the EAPPS appears to influence local groundwater flow toward the stream in contrast to the general groundwater flow direction at the BBS, which is east to west. The groundwater flow direction near the EAPPS is generally north/northeast.

### **2.4.3 Groundwater Flow Rates**

As described in the *GWMP*, the average linear velocity of groundwater in the SAS ranges from 0.2 to 0.6 ft/day. This flow velocity corresponds to a potential range of flow velocities from approximately 7 to 22 feet per year.

### 3. GROUNDWATER MONITORING SYSTEM

The groundwater monitoring system (GMS) installed at the EAPPS was designed to monitor the water quality in the SAS downgradient of the EAPPS. The documentation for the design, installation, and development of these wells is found in *Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report, October 2017*. The GMS consists of two background monitoring wells (identified as BBS-CCR-BW1 and BBS-CCR-BW2) located hydraulically upgradient of EAPPS. The background monitoring wells will be used to derive background concentrations for Appendix III constituents. Three monitoring wells (identified as BBS-CCR1, BBS-CCR-2, and BBS-CCR-3) are located at the waste boundary and at the “hydraulically downgradient perimeter (i.e., the edge) of the CCR unit or at the closest practical distance from this location” [80 FR 21400]. The screen intervals are at or below the actual depth of CCR material in the upper portion of the SAS and therefore meet the performance standards specified in 257.91(a) through (d). The locations of the monitoring wells comprising the GMS are shown on **Figure 2**.

#### 3.1 Status of the Groundwater Monitoring and Corrective Action Program

Groundwater monitoring was initiated at the EAPPS in June 2016 as part of the groundwater monitoring and corrective action program in accordance with the requirements of 40 CFR 257.90(b). Ten sampling events were conducted as part of baseline monitoring between June 2016 and August 2017. The first detection monitoring event was conducted in October 2017.

#### 3.2 Identification of Monitoring Wells Installed, Abandoned, or Decommissioned - 257.90 (E)(2)

The monitoring wells comprising the GMS for compliance with the CCR Rule were installed in May 2016 to meet the groundwater monitoring system requirements in 257.91. A monitoring well construction summary is provided in **Table 1**.

## 4. SUMMARY OF 2015-2017 CCR RULE ACTIVITIES COMPLETED

### 4.1 Requirements Completed

The key actions completed during this reporting period are summarized below.

- The required groundwater monitoring system wells were installed in compliance with §257.91. The well locations are depicted in **Figure 2**.
- The groundwater sampling and analysis program was developed and conducted in accordance with §257.93. The statistical procedures to be used for evaluating groundwater monitoring data were also selected as required by §257.93.
- The detection (baseline) monitoring program complying with §257.94(b) was initiated and exceeded the minimum requirement of eight independent samples for each background and downgradient well.
- The design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices was placed in the operating record as required by §§257.91(e)(1) and 257.105(h)(2), respectively.
- A certification from a qualified professional engineer stating that the groundwater monitoring system was designed and constructed to meet the requirements of the CCR rule was obtained, placed in the operating record, and posted on the publicly accessible Internet site pursuant to the requirements of §§257.91(f), 257.105(h)(3), and 257.107(h)(2), respectively.
- A certification from a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area to meet the requirements of the CCR rule including a narrative description of the statistical method selected was obtained, placed in the operating record, and posted on the publicly accessible Internet site pursuant to the requirements of §§257.93(f)(6), 257.105(h)(4), and 257.107(h)(3), respectively.
- As required by §257.94, the evaluation of the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in Appendix III was initiated no later than October 17, 2017.

### 4.2 Completion of Required Reports

The following reports were completed during the reporting period:

- *CCR Rule Groundwater Monitoring Program Plan*, Big Bend Power Station – Economizer Ash and Pyrite Pond System, October 2016.
- *Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report*, Big Bend Station – Economizer Ash and Pyrite Pond System, October 2017, as required by §257.91(e)(1).
- *Statistical Analysis Plan*, October 2017, as required by §257.93.
- *Groundwater Monitoring System Design and Construction Report*, Big Bend Station – Economizer Ash and Pyrite Pond System, October 2017.

#### **4.3 Problems Encountered and Resolution**

No problems were encountered during the reporting period.

## **5. GROUNDWATER MONITORING DATA - 257.90(E)(3)**

### **5.1 Baseline Sampling**

TEC conducted ten baseline groundwater sampling events from the GMS between June 2016 and October 2017 and analyzed the samples for Appendix III and Appendix IV constituents as required in 40 CFR 257.93. Background monitoring results were used to establish background constituent concentrations for use in detection and (if necessary) assessment monitoring [40 CFR 257.91(a)(1)]. The analytical results from the 10 sampling events are provided in **Table 3**. The laboratory analytical reports for each event are compiled in **Appendix A**.

### **5.2 Detection Monitoring**

During detection monitoring, indicator (Appendix III) parameters (**Table 2**) were monitored to assess potential releases from the CCR unit into groundwater. Detection monitoring samples must be collected semi-annually from each background and compliance well and analyzed for Appendix III constituents.

The first semi-annual, detection monitoring event was conducted in October 2017. The analytical results are included in **Table 3**, and the laboratory analytical reports are included in **Appendix A**.

#### **5.2.1 Alternative Monitoring Frequency – 257.94(d)(3)**

Not applicable for this annual reporting period.

#### **5.2.2 Identification of Appendix III Constituents Detected at SSI Over Background – 257.94(e)**

Not applicable for this annual reporting period.

#### **5.2.3 Alternative Source Demonstration – 257.94(e)(2)**

Not applicable for this annual reporting period.

#### **5.2.4 Transition from Detection to Assessment Monitoring – 257.90(e)(4)**

Not applicable for this annual reporting period.

### **5.3 Assessment Monitoring**

None of the provisions of 40 CFR 257.95 are applicable for this annual reporting period.

## 6. DATA USABILITY EVALUATION

The inorganic data were reviewed based on the following: *CCR Groundwater Monitoring Program Plan*, Big Bend Power Station, Apollo Beach, Florida, September 2016; USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001); the applicability and appropriateness of the analytical methods referenced by the data package; and professional and technical judgment by the data validation team. A Stage 2A data validation report evaluating the quality control (QC) parameters was generated for each detection monitoring event. Additional data qualifiers generated from the data validation were applied where appropriate. The groundwater data generated from each detection monitoring event was deemed usable for meeting the project objectives.

The data validation reports are provided in **Appendix B**.

## **7. DETECTION MONITORING STATISTICAL ANALYSIS**

Not applicable for this annual reporting period.

**8. ASSESSMENT MONITORING STATISTICAL ANALYSIS**

Not applicable for this annual reporting period.



## 9. ACTIVITIES PLANNED FOR 2018

The projected key activities for the upcoming year include the following:

- Two semi-annual detection monitoring events will be conducted, and statistical analyses performed.
- The statistical evaluation of groundwater data for statistically significant increases over background for Appendix III constituents for the reporting period was completed by January 15, 2018 in accordance with 257.93.

## **10. CORRECTIVE MEASURES**

Not applicable for this annual reporting period.

## **11. REMEDY SELECTION**

Not applicable for this annual reporting period.

## **12. CORRECTIVE ACTION**

Not applicable for this annual reporting period.

### 13. REFERENCES

- Environmental Consulting & Technology (ECT). 2003. Supplemental Assessment Report, Tampa Electric Company, Big Bend Station. Tampa, Florida.
- Environmental Consulting & Technology. 2007. Sodium Ground Water Quality Exemption Application for the TECO Big Bend Station. Tampa, Florida.
- Geosyntec Consultants, Inc. 2016. Basins of Design and Preliminary Closure Evaluation Report; Economizer Ash and Pyrite Ponds; Big Bend Power Station, September 2016.
- Geosyntec Consultants, Inc. 2017. Big Bend Power Station Groundwater Monitoring Well Design, Installation, Development, and Decommissioning Report, September 2017.
- Southwest Florida Water Management District, 2010. 2010 Regional Water Supply Plan, Tampa Bay Planning Region. Brooksville, Florida.
- Tihansky, A.B. and L.A. Knochenmus. 2001. Karst Features and Hydrogeology in West-central Florida-A Field Perspective. US Geological Survey-Water-Resources Investigations Report 01-4011.
- USEPA, April 2015. 40 CFR Part 257, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, EPA-HQ-RCRA-2009-0640.

# **TABLES**

**Table 1: CCR Monitoring Well Construction Details**

TEC Big Bend Station Economizer Ash and Pyrite Pond System  
Gibson, FL

Well ID	Diameter (in)	Designation	Northing (NAD 1983)	Easting (NAD 1983)	Ground Surface Elevation (ft NAVD)	TOC Elevation* (ft NAVD)	Total Depth (ft bls)	Screen Interval (ft bls)	Top of Screen Elevation (ft NAVD)	Bottom of Screen Elevation (ft NAVD)
BBS-CCR-BW1	2	Background	1256638.34	528461.95	29.10	33.40	40	30-40	-0.90	-10.90
BBS-CCR-BW2	2	Background	1256966.67	527897.28	7.70	12.54	19	9-19	-1.30	-11.30
BBS-CCR-1	2	Detection	1257433.85	528211.74	5.00	9.82	17.5	7.5-17.5	-2.50	-12.50
BBS-CCR-2	2	Detection	1257429.29	528769.31	5.00	9.34	17.5	7.5-17.5	-2.50	-12.50
BBS-CCR-3	2	Detection	1257154.61	529023.26	4.90	9.20	18.5	8.5-18.5	-3.60	-13.60

**Notes**

1. in = Inches
2. ft bls = Feet Below Land Surface
3. Horizontal datum surveyed to the North American Datum (NAD) of 1983 US State Plane Florida West.
4. Vertical datum surveyed to the North American Vertical Datum (NAVD) of 1988.
5. \*Top of casing elevations were revised in September 2016 during final aboveground well completions. The additional PVC stickup was measured in the field and added to the surveyed top of casing elevation.

**Table 2: Summary of Detection and Assessment Monitoring Constituents**  
**TEC Big Bend Station Economizer Ash and Pyrite Pond System**  
**Gibsonton, FL**

Constituent	Constituent Reference		Analytical Methods(s)	EPA Primary or Secondary MCL (ug/L)
	40 CFR 257 Appendix III	40 CFR 257 Appendix IV		
Arsenic (Total)		X	EPA 200.8 or 6020	10
Antimony (Total)		X	EPA 200.8 or 6020	6
Barium (Total)		X	EPA 6010	2,000
Beryllium (Total)		X	EPA 6010	4
Boron (Total)	X		EPA 6010	NA
Cadmium (Total)		X	EPA 200.8 or 6020	5
Calcium (Total)	X		EPA 6010	NA
Chloride	X		EPA 300.0	250,000
Chromium (Total)		X	EPA 6010	100
Cobalt (Total)		X	EPA 6010	NA
Fluoride	X		EPA 300.0	4,000
Lead (Total)		X	EPA 200.8	15
Lithium (Total)		X	EPA 6010	NA
Mercury (Total)		X	EPA 7470	2
Molybdenum (Total)		X	EPA 6010	NA
pH	X		Field	6.5-8.5 (STD Units)
Radium 226 and 228 (Total)		X	EPA 903	5 (pCi/L)
Selenium (Total)		X	EPA 200.8 or 6020	50
Sulfate	X		EPA 300.0	250,000
TDS	X		SM2540C	500,000
Thallium (Total)		X	EPA 6020	2

**Notes.**

1. EPA = US Environmental Protection Agency
2. MCL = Maximum Contaminant Level
3. ug/L = Micrograms per liter
4. STD Units = Standard Units
5. pCi/L = picoCuries per liter



**Table 3: Summary of Baseline Groundwater Monitoring Analytical Results**

TEC Big Bend Economizer Ash and Pyrite Pond System  
Gibsonton, Florida

Well ID			BBS-CCR-BW1										
Sample Date			6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
Top of Casing Elevation	ft NAVD 88	--	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13	30.13
Depth to Water	ft BTOC	--	25.37	26.19	25.78	29.42	29.84	30.49	30.71	29.92	28.89	28.74	30.41
Groundwater Elevation	ft NAVD 88	--	4.76	3.94	4.35	0.71	0.29	-0.36	-0.58	0.21	1.24	1.39	-0.28
Temperature	C	NA	27.84	28.25	28.11	27.46	27.50	26.98	27.20	27.72	27.89	28.08	27.86
Specific Conductivity (field)	umhos/cm	NA	5620	5420	5140	4860	5000	4940	1580	5010	4960	5000	4570
pH (field)	SU	6.5 - 8.5	6.51	6.38	6.41	6.50	6.52	6.46	6.49	6.47	6.49	6.52	6.55
Dissolved Oxygen	mg/L	NA	0.18	0.17	0.12	0.13	0.13	0.20	0.14	0.42	0.60	0.45	0.40
Redox Potential	mV	NA	-8.60	-7.3	-22.8	-76.2	-71.1	-20.2	-114	-11.4	-23.0	3.6	-18.4
Turbidity (field)	NTU	NA	5.14	7.10	6.47	4.08	1.77	2.04	4.22	0.69	2.38	6.03	2.51
<b>Appendix III Parameters</b>													
Boron	mg/L	1.4**	<b>59.1</b>	<b>56.9</b>	<b>53.7 V</b>	<b>51.4</b>	<b>49.7</b>	<b>45.9</b>	<b>49.0</b>	<b>51.7</b>	<b>47.0</b>	<b>48.0</b>	<b>44.2</b>
Calcium	mg/L	NA	<b>781</b>	<b>737</b>	<b>729</b>	<b>675 V</b>	<b>692</b>	<b>728</b>	<b>693</b>	<b>781</b>	<b>744 V</b>	<b>743</b>	<b>691</b>
Chloride	mg/L	250	<b>1140 J-</b>	<b>1120</b>	<b>1030</b>	<b>939 V</b>	<b>993 V</b>	<b>942 V</b>	<b>934</b>	<b>995</b>	<b>915 V</b>	<b>793</b>	<b>809</b>
Fluoride	mg/L	4***	<b>0.199</b>	<b>0.110</b>	<b>0.180</b>	<b>0.194</b>	<b>0.261</b>	<b>0.315</b>	<b>0.256</b>	<b>0.298</b>	<b>0.255 J</b>	0.0100 U	<b>0.334</b>
Sulfate	mg/L	250	<b>1440 J-</b>	<b>1510</b>	<b>1420</b>	<b>1400</b>	<b>1440</b>	<b>1520</b>	<b>1550</b>	<b>1510</b>	<b>1470</b>	<b>1320</b>	<b>217</b>
Total Dissolved Solids	mg/L	500	<b>5050 J-</b>	<b>4190 J-</b>	<b>4290</b>	<b>4120 J-</b>	<b>4170 J-</b>	<b>4510 J</b>	<b>4060 J</b>	<b>4430</b>	<b>4160 J</b>	<b>4340</b>	<b>3890</b>
<b>Appendix IV Parameters</b>													
Antimony	ug/L	6	0.600 U	0.600 U	<b>1.77 I</b>	6.00 U	0.600 U	0.600 U	0.600 U	0.600 U	6.00 U	0.600 U	0.6 U
Arsenic	ug/L	10	<b>10.2</b>	<b>8.10</b>	<b>8.89</b>	3.20 U	<b>8.49</b>	0.320 U	<b>8.61</b>	<b>7.68</b>	<b>8.48 I</b>	<b>6.60</b>	<b>9.06</b>
Barium	ug/L	2000	<b>72.9</b>	<b>68.2</b>	<b>61.4</b>	<b>60.0</b>	<b>61.2</b>	<b>54.6</b>	<b>53.6</b>	<b>55.4</b>	<b>51.7</b>	<b>55.6</b>	<b>55.8</b>
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U	<b>0.108 I</b>	<b>0.124 I</b>	1.00 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	<b>3.23 I</b>	<b>2.29 I</b>	<b>2.16 I</b>	<b>2.48 J</b>	1.6 U
Cobalt	ug/L	140**	<b>1.40 I</b>	<b>1.33 I</b>	<b>1.52 I</b>	<b>0.963 I</b>	<b>1.45 I</b>	<b>1.50 I</b>	2.0 U	<b>1.71 I</b>	<b>1.97 I</b>	<b>1.66 J</b>	<b>1.86 J</b>
Lead	ug/L	15	0.0800 U	<b>0.200 I</b>	<b>0.111 I</b>	0.800 U	<b>0.102 I</b>	<b>0.113 I</b>	<b>0.129 I</b>	0.0800 U	0.800 U	<b>0.291 J</b>	<b>0.103 J</b>
Lithium	ug/L	140**	<b>8.9 I</b>	<b>20 I</b>	<b>7.4 I</b>	<b>11 I</b>	<b>10 I</b>	<b>18 I</b>	<b>39.7</b>	<b>15 U</b>	<b>17 I</b>	0.050 U	0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	<b>4.46 I</b>	<b>2.88 I</b>	<b>11.1 I</b>	<b>6.00 I</b>	<b>6.58 I</b>	<b>7.16 I</b>	<b>15.6 I</b>	16.3 U	<b>13.6 I</b>	<b>1.43 J</b>	<b>4.27 J</b>
Radium 226/228	pCi/L	1	<b>38</b>	<b>35</b>	<b>31</b>	<b>32.3</b>	<b>29.9</b>	<b>32.5</b>	<b>39.7</b>	<b>37.8</b>	<b>37.2</b>	<b>30.1</b>	<b>22.1</b>
Selenium	ug/L	50	<b>2.09</b>	<b>1.92 I</b>	<b>1.73 I</b>	2.00 U	<b>2.51</b>	0.200 U	<b>1.62 I</b>	<b>1.81 I</b>	2.00 U	<b>1.76 J</b>	<b>2.14</b>
Thallium	ug/L	2	<b>0.118 I</b>	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U

Notes and Abbreviations provided on Page 6.

**Table 3: Summary of Baseline Groundwater Monitoring Analytical Results**

TEC Big Bend Economizer Ash and Pyrite Pond System  
Gibsonton, Florida

Well ID			BBS-CCR-BW2										
Sample Date			6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q
Top of Casing Elevation	ft NAVD 88	--	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81	9.81
Depth to Water	ft BTOC	--	4.72	5.52	5.22	8.06	8.45	9.13	9.24	8.53	7.45	7.33	7.38
Groundwater Elevation	ft NAVD 88	--	5.09	4.29	4.59	1.75	1.36	0.68	0.57	1.28	2.36	2.48	2.43
Temperature	C	NA	26.42	27.56	27.74	27.22	27.10	25.25	30.71	26.69	27.20	27.69	27.98
Specific Conductivity (field)	umhos/cm	NA	1640	1500	1380	1340	1400	1460	1480	1538	1540	1580	1699
pH (field)	SU	6.5 - 8.5	6.53	6.48	6.48	6.67	6.68	6.62	6.67	6.64	6.66	6.68	6.70
Dissolved Oxygen	mg/L	NA	0.37	0.15	0.10 U	0.37	0.20	0.30	1.32	0.19	0.33	0.43	0.28
Redox Potential	mV	NA	-59.4	-84.1	-59.5	-91.5	-73.8	-74.1	-42.0	-82.4	-94.0	-53.3	-72.1
Turbidity (field)	NTU	NA	6.70	4.86	1.73	3.99	5.86	16.4	19.0	6.1	5.3	3.66	3.96
<b>Appendix III Parameters</b>													
Boron	mg/L	1.4**	<b>3.89</b>	<b>4.25</b>	<b>3.70 V</b>	<b>3.90</b>	<b>3.75</b>	<b>3.27</b>	<b>4.08</b>	<b>4.54 J-</b>	<b>4.57</b>	<b>4.39</b>	<b>4.08</b>
Calcium	mg/L	NA	<b>313</b>	<b>271</b>	<b>237</b>	<b>238 J-,V</b>	<b>243</b>	<b>240</b>	<b>260</b>	<b>290 J-</b>	<b>278 V</b>	<b>287</b>	<b>321</b>
Chloride	mg/L	250	<b>123</b>	<b>116</b>	<b>116</b>	<b>125 V</b>	<b>129 V</b>	<b>145 V</b>	<b>140</b>	<b>135</b>	<b>123 V</b>	<b>117</b>	<b>84.9</b>
Fluoride	mg/L	4***	<b>0.409</b>	<b>0.432</b>	<b>0.455</b>	<b>0.440</b>	<b>0.464</b>	<b>0.472</b>	<b>0.478</b>	<b>0.559</b>	<b>0.319 J</b>	<b>0.352</b>	<b>0.513</b>
Sulfate	mg/L	250	<b>414</b>	<b>341</b>	<b>276</b>	<b>246</b>	<b>255</b>	<b>255</b>	<b>323</b>	<b>402</b>	<b>41.7</b>	<b>462</b>	<b>632</b>
Total Dissolved Solids	mg/L	500	<b>1230</b>	<b>1060</b>	<b>980</b>	<b>1010</b>	<b>966 J-</b>	<b>1140</b>	<b>1120</b>	<b>1170</b>	<b>1200</b>	<b>1180 J</b>	<b>1330</b>
<b>Appendix IV Parameters</b>													
Antimony	ug/L	6	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	6.000 U	0.600 U	0.600 U
Arsenic	ug/L	10	<b>2.65</b>	<b>1.75 I</b>	<b>2.03</b>	<b>1.62 I</b>	<b>2.59</b>	<b>0.709 I</b>	<b>1.45 I</b>	<b>1.68 I</b>	3.20 U	<b>1.80 J</b>	<b>2.01</b>
Barium	ug/L	2000	<b>51.3</b>	<b>49.8</b>	<b>43.2</b>	<b>46.3</b>	<b>45.8</b>	<b>38.8</b>	<b>42.7</b>	<b>48.8</b>	<b>47.7</b>	<b>49.9</b>	<b>56.2</b>
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.220 U	0.200 U	<b>0.254 J</b>
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	<b>1.68 I</b>	<b>2.26 I</b>	1.60 U	1.60 U
Cobalt	ug/L	140**	1.00 U	<b>0.14 I</b>	<b>0.153 I</b>	<b>0.151 I</b>	<b>0.157 I</b>	<b>0.136 I</b>	2.0 U	<b>0.0959 I</b>	0.400 U	<b>0.110 J</b>	<b>0.129 J</b>
Lead	ug/L	15	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.800 U	<b>0.101 J</b>	0.0800 U
Lithium	ug/L	140**	<b>3.8 I</b>	<b>9.1 I</b>	<b>2.0 I</b>	<b>3.8 I</b>	<b>1.7 I</b>	<b>5.2 I</b>	<b>3.4</b>	<b>5.2 I</b>	<b>5.9 I</b>	0.050 U	0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	<b>2.40 I</b>	1.00 U	<b>7.57</b>	<b>1.42 I</b>	1.00 U	<b>2.56 I</b>	<b>9.65 I</b>	10.2 U	<b>8.9 I</b>	<b>4.08 J</b>	<b>2.51 J</b>
Radium 226/228	pCi/L	1	<b>4.8</b>	<b>5.1 J</b>	<b>4.0</b>	<b>4.8</b>	<b>8.0</b>	<b>4.8 J</b>	<b>4.5</b>	<b>4.8</b>	<b>4.4</b>	<b>4.9</b>	<b>4.9</b>
Selenium	ug/L	50	<b>0.722 I</b>	<b>0.760 I</b>	<b>0.577 I</b>	<b>0.489 I</b>	<b>0.485 I</b>	<b>0.260 I</b>	<b>0.539 I</b>	<b>0.386 I</b>	2.00 U	<b>0.420 J</b>	<b>0.523 J</b>
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	1.00 U	0.100 U	0.100 U

Notes and Abbreviations provided on Page 6.

**Table 3: Summary of Baseline Groundwater Monitoring Analytical Results**

TEC Big Bend Economizer Ash and Pyrite Pond System  
Gibsonton, Florida

Well ID			BBS-CCR-1										
Sample Date			6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q
Top of Casing Elevation	ft NAVD 88	--	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79	7.79
Depth to Water	ft BTOC	--	3.51	5.00	5.06	6.78	7.38	7.46	7.64	7.41	5.86	7.03	7.32
Groundwater Elevation	ft NAVD 88	--	4.28	2.79	2.73	1.01	0.41	0.33	0.15	0.38	1.93	0.76	0.47
Temperature	C	NA	25.48	26.41	27.05	25.78	25.70	24.03	23.70	25.54	25.81	25.80	26.57
Specific Conductivity (field)	umhos/cm	NA	3940	4180	4000	4060	4290	4320	4170	4063	3960	4110	4258
pH (field)	SU	6.5 - 8.5	6.80	6.67	6.71	6.83	6.82	6.79	6.84	6.78	6.81	6.82	6.83
Dissolved Oxygen	mg/L	NA	0.10	0.22	0.14	0.10 U	0.10 U	0.10 U	0.10 U	0.27	0.10	0.28	0.24
Redox Potential	mV	NA	-49.1	-74.1	-34.8	-107.0	-136	-110	-80.4	-80.6	-122.0	-109.0	-83.3
Turbidity (field)	NTU	NA	8.01	3.88	2.08	3.22	0.890	1.99	4.12	3.63	1.58	1.88	0.89
<b>Appendix III Parameters</b>													
Boron	mg/L	1.4**	14.4	0.306	11.4	15.7	16.2	15.5 J-	16.4	16.5	16	17	19.9
Calcium	mg/L	NA	541	227	556	556 V	606	579 J-	555	569	576 V	572	596
Chloride	mg/L	250	619	742 J-	695	743 J-	817 V	820 V	124	720	694 J-, V	710	716
Fluoride	mg/L	4***	0.211	0.128	0.454	0.104	0.0871	0.184	0.170	0.208	0.157 J	0.200	0.201
Sulfate	mg/L	250	1240	1320 J-	1240	1230 J-	1290	1350	443	1120	1390	1240	1230
Total Dissolved Solids	mg/L	500	3060 J	3140	2980	3170 J-	3470 J-	3670 J	3110 J	3140	3400 J	2960 J	3470
<b>Appendix IV Parameters</b>													
Antimony	ug/L	6	0.600 U	1.03 I	0.600 U	0.600 U	0.600 U	0.602 I	0.600 U	0.600 U	3.00 U	0.600 U	0.600 U
Arsenic	ug/L	10	8.74	7.38	7.94	8.30	8.93	9.04	10.5	9.76	10.3	9.33	9.03
Barium	ug/L	2000	122	30.8	115	122	129	115	116 I	113	112	122	129
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	2.00 U	0.200 U	0.200 U	0.200 U	0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.93 I	1.62 I	1.60 U	1.60 U
Cobalt	ug/L	140**	1.00 U	0.450 I	0.485	0.507 I	0.519 I	0.489 I	2.0 U	0.484 I	0.495 I	0.473 J	0.453 J
Lead	ug/L	15	0.0800 U	0.110 I	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.0979 I	0.0800 U	0.400 U	0.080 U	0.080 U
Lithium	ug/L	140**	8.3 I	15 I	7.4 I	12 I	8.4 I	14 I	10 I	13 I	14 I, J3	0.050 U	0.050 U
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	106	105	80.3	95.5	98.4	92.4	124 I	96.5 I	99.6	86.4	82.5
Radium 226/228	pCi/L	1	39	33	15	42.6	37.3	32.5	35.8 I	41.4	34.7	33.4	35.6
Selenium	ug/L	50	0.696 I	0.960 I	0.385	0.690 I	1.04 I	0.653 I	0.937 I	0.756 I	2.25 I	0.918 J	0.99 J
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U

Notes and Abbreviations provided on Page 6.

**Table 3: Summary of Baseline Groundwater Monitoring Analytical Results**

TEC Big Bend Economizer Ash and Pyrite Pond System  
Gibsonton, Florida

Well ID			BBS-CCR-2											
Sample Date			6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017	
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Results Q	Results Q	Results Q	
Top of Casing Elevation	ft NAVD 88	--	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	8.14	
Depth to Water	ft BTOC	--	3.45	5.30	5.35	6.78	6.88	6.93	7.15	6.97	5.06	6.53	6.88	
Groundwater Elevation	ft NAVD 88	--	4.69	2.84	2.79	1.36	1.26	1.21	0.99	1.17	3.08	1.61	1.26	
Temperature	C	NA	25.62	26.42	27.35	25.64	25.66	24.27	23.95	25.12	25.74	26.43	26.46	
Specific Conductivity (field)	umhos/cm	NA	1580	1700	1570	1500	1540	1560	1540	1485	1630	1560	1350	
pH (field)	SU	6.5 - 8.5	6.80	6.68	6.74	6.87	6.89	6.89	6.93	6.87	6.97	6.92	6.87	
Dissolved Oxygen	mg/L	NA	0.10	0.13	0.100 U	0.10	0.13	0.10 U	0.10 U	0.24	0.10 U	0.25	0.20	
Redox Potential	mV	NA	-71.0	-67.4	-27.3	-183	-186	-182	-138	-131	-154	-233	-188	
Turbidity (field)	NTU	NA	4.90	7.16	3.31	3.73	7.10	4.93	3.43	4.71	4.56	3.22	3.03	
<b>Appendix III Parameters</b>														
Boron	mg/L	1.4**	<b>1.55</b>	<b>2.81</b>	<b>2.86</b>	<b>2.08</b>	<b>2.28</b>	<b>3.86</b>	<b>5.01</b>	<b>3.20</b>	<b>4.94</b>	<b>4.32</b>	<b>8.88</b>	
Calcium	mg/L	NA	<b>198</b>	<b>193</b>	<b>192</b>	<b>181 V</b>	<b>181</b>	<b>172</b>	<b>163</b>	<b>173</b>	<b>178 V</b>	<b>171</b>	<b>169</b>	
Chloride	mg/L	250	<b>118</b>	<b>140</b>	<b>124</b>	<b>112 V</b>	<b>111 V</b>	<b>115 J+</b>	<b>119</b>	<b>105</b>	<b>114 V</b>	<b>113</b>	<b>70.9</b>	
Fluoride	mg/L	4***	<b>0.148</b>	<b>0.183</b>	<b>0.150</b>	<b>0.171</b>	<b>0.168</b>	<b>0.248 J+</b>	<b>0.237</b>	<b>0.214</b>	<b>0.166 J</b>	<b>0.155</b>	<b>0.182</b>	
Sulfate	mg/L	250	<b>471</b>	<b>542</b>	<b>484</b>	<b>468</b>	<b>468</b>	<b>490 J-</b>	<b>485 J-</b>	<b>415 J-</b>	<b>481</b>	<b>459</b>	<b>432</b>	
Total Dissolved Solids	mg/L	500	<b>1170 J-</b>	<b>1170</b>	<b>1120</b>	<b>1130</b>	<b>1110</b>	<b>1140</b>	<b>1150</b>	<b>1080</b>	<b>1140</b>	<b>1080</b>	<b>1030</b>	
<b>Appendix IV Parameters</b>														
Antimony	ug/L	6	0.600 U	<b>0.830 I</b>	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	1.20 U	0.600 U	
Arsenic	ug/L	10	<b>1.83 I</b>	<b>0.990 I</b>	<b>1.25</b>	<b>1.16 I</b>	<b>1.37 I</b>	<b>1.09 I</b>	<b>2.64</b>	<b>1.01 I</b>	<b>0.974 I</b>	<b>1.02 J</b>	<b>1.14 J</b>	
Barium	ug/L	2000	<b>65.0</b>	<b>64.8</b>	<b>61.4</b>	<b>60.6</b>	<b>62.4</b>	<b>54.6</b>	<b>55.8</b>	<b>54.6</b>	<b>54.6</b>	<b>56.8</b>	<b>53.3</b>	
Beryllium	ug/L	4	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.423 U	0.200 U	0.200 U	
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.200 U	
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	<b>2.29 I</b>	<b>1.96 I</b>	<b>3.11 I</b>	1.60 U	1.60 U	
Cobalt	ug/L	140**	1.00 U	<b>0.0900 I</b>	<b>0.0776</b>	<b>0.107 I</b>	<b>0.105 I</b>	<b>0.0902 I</b>	2.0 U	<b>0.0875 I</b>	<b>0.0857 I</b>	<b>0.150 J</b>	<b>0.115 J</b>	
Lead	ug/L	15	0.0800 U	<b>0.110 I</b>	0.0800 U	0.129 I	<b>0.0955 I</b>	0.0800 U	<b>0.176 I</b>	<b>0.144 I</b>	<b>0.127 I</b>	<b>0.244 J</b>	<b>0.15 J</b>	
Lithium	ug/L	140**	<b>10 I</b>	<b>17 I</b>	<b>11 I</b>	<b>14 I</b>	<b>11 I</b>	<b>13 I</b>	<b>13 I</b>	<b>14 I</b>	<b>16 I</b>	0.050 U	0.050 U	
Mercury	ug/L	2	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	
Molybdenum	ug/L	35**	<b>1.73 I</b>	1.00 U	<b>7.78</b>	<b>1.00 U</b>	<b>1.43 I</b>	<b>2.52 I</b>	<b>9.82 I</b>	9.59 U	<b>9.88 I</b>	<b>3.02 J</b>	<b>1.99 J</b>	
Radium 226/228	pCi/L	1	<b>15.0</b>	<b>13.2</b>	<b>32</b>	<b>14.9</b>	<b>14.8</b>	<b>13.9</b>	<b>14.2</b>	<b>14.7</b>	<b>14.4</b>	<b>12.1</b>	<b>13.5</b>	
Selenium	ug/L	50	<b>0.376 I</b>	<b>0.280 I</b>	0.200 U	<b>0.333 I</b>	<b>0.259 I</b>	0.200 U	0.200 U	0.200 U	<b>0.474 I</b>	<b>0.662 J</b>	<b>0.474 J</b>	
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.200 U	0.100 U	

Notes and Abbreviations provided on Page 6.

**Table 3: Summary of Baseline Groundwater Monitoring Analytical Results**

TEC Big Bend Economizer Ash and Pyrite Pond System  
Gibsonton, Florida

Well ID			BBS-CCR-3										
Sample Date			6/24/2016	7/27/2016	8/26/2016	10/28/2016	11/10/2016	1/26/2017	4/13/2017	6/28/2017	7/20/2017	8/16/2017	10/13/2017
Parameter	Units	MCL	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
Top of Casing Elevation	ft NAVD 88	--	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78	6.78
Depth to Water	ft BTOC	--	1.51	3.60	3.48	6.54	6.77	6.81	7.13	6.64	4.77	6.04	6.52
Groundwater Elevation	ft NAVD 88	--	5.27	3.18	3.30	0.24	0.01	-0.03	-0.35	0.14	2.01	0.74	0.26
Temperature	C	NA	26.62	27.28	27.07	26.20	26.10	24.25	24.27	26.15	26.73	26.86	27.18
Specific Conductivity (field)	umhos/cm	NA	1580	1740	1690	1640	1650	1510	1580	1755	1750	1790	1747
pH (field)	SU	6.5 - 8.5	6.42	6.19	6.29	6.42	6.46	6.42	6.49	6.38	6.36	6.42	6.44
Dissolved Oxygen	mg/L	NA	0.54	0.100 U	0.15	0.10 U	0.10 U	0.11	0.14	0.28	0.17	0.29	0.37
Redox Potential	mV	NA	-145	-74.4	-155	-266	-239	-168	-114	-125	-122	-206	-249
Turbidity (field)	NTU	NA	11.5	8.04	6.35	3.26	1.18	1.79	4.22	0.94	0.51	0.47	2.39
<b>Appendix III Parameters</b>													
Boron	mg/L	1.4**	<b>0.662</b>	<b>13.2</b>	<b>0.540 V</b>	<b>0.532</b>	<b>0.502</b>	<b>0.381</b>	<b>0.385</b>	<b>0.184</b>	<b>0.211</b>	<b>0.266</b>	<b>0.373</b>
Calcium	mg/L	NA	<b>187</b>	<b>196</b>	<b>200</b>	<b>201 V</b>	<b>200</b>	<b>176</b>	<b>176</b>	<b>192</b>	<b>205 J-, V</b>	<b>187</b>	<b>190</b>
Chloride	mg/L	250	<b>88.9</b>	<b>140</b>	<b>136</b>	<b>140 V</b>	<b>129 V</b>	<b>129 V</b>	<b>124</b>	<b>168</b>	<b>158 V</b>	<b>156</b>	<b>153</b>
Fluoride	mg/L	4***	<b>0.313</b>	<b>0.262</b>	<b>0.286</b>	<b>0.299</b>	<b>0.331</b>	<b>0.391</b>	<b>0.415</b>	<b>0.338</b>	<b>0.230 J</b>	<b>0.338</b>	<b>0.333</b>
Sulfate	mg/L	250	<b>474</b>	<b>516</b>	<b>517</b>	<b>541</b>	<b>492</b>	<b>454</b>	<b>443</b>	<b>493</b>	<b>506</b>	<b>484</b>	<b>503</b>
Total Dissolved Solids	mg/L	500	<b>1200</b>	<b>1220</b>	<b>1210</b>	<b>1220</b>	<b>1220</b>	<b>1200</b>	<b>1120</b>	<b>1280</b>	<b>1310</b>	<b>1290</b>	<b>1310</b>
<b>Appendix IV Parameters</b>													
Antimony	ug/L	6	0.600 U	<b>0.770 I</b>	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	0.600 U	3.00 U	0.600 U	0.600 U
Arsenic	ug/L	10	<b>1.23 I</b>	<b>0.540 I</b>	<b>0.603 I</b>	<b>0.623 I</b>	<b>0.765 I</b>	0.320 U	0.320 U	<b>0.525 I</b>	1.60 U	<b>0.536 J</b>	<b>0.665 J</b>
Barium	ug/L	2000	<b>65.3</b>	<b>67.6</b>	<b>63.6</b>	<b>66.3</b>	<b>63.0</b>	<b>56.2</b>	<b>58.6</b>	<b>61.8</b>	<b>63.4</b>	<b>59.8</b>	<b>59.3</b>
Beryllium	ug/L	4	0.200 U	0.200 U	<b>0.272 I</b>	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.356 U	0.200 U	0.200 U
Cadmium	ug/L	5	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U
Chromium	ug/L	100	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U	<b>3.12 I</b>	<b>3.43 I</b>	<b>2.02 J</b>	1.60 U
Cobalt	ug/L	140**	1.00 U	<b>0.0900 I</b>	<b>0.125 I</b>	<b>0.124 I</b>	<b>0.117 I</b>	<b>0.0989 I</b>	2.0 U	<b>0.119 I</b>	0.200 U	<b>0.123 J</b>	<b>0.155 J</b>
Lead	ug/L	15	<b>0.125 I</b>	<b>0.0800 I</b>	0.0800 U	<b>0.107 I</b>	0.0800 U	0.0800 U	0.0800 U	0.0800 U	0.400 U	0.0800 U	0.0800 U
Lithium	ug/L	140**	<b>3.7 I</b>	<b>11 I</b>	<b>6.1 I</b>	<b>8.2 I</b>	<b>6.1 I</b>	<b>7.7 I</b>	<b>6.3 I</b>	<b>5.2 I</b>	<b>10 I</b>	0.050 U	0.050 U
Mercury	ug/L	2	<b>0.0580 I</b>	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Molybdenum	ug/L	35**	<b>4.09 I</b>	<b>2.23 I</b>	<b>8.10</b>	<b>3.63 I</b>	<b>3.90 I</b>	<b>5.42 I</b>	<b>11.7 I</b>	11.9 U	<b>10.6 I</b>	<b>3.14 J</b>	<b>3.82</b>
Radium 226/228	pCi/L	1	<b>10.3</b>	<b>12.3</b>	<b>15</b>	<b>18.1</b>	<b>17.5</b>	<b>15</b>	<b>14.4</b>	<b>17.7</b>	<b>20.3</b>	<b>19.6</b>	<b>20</b>
Selenium	ug/L	50	<b>0.262 I</b>	<b>0.270 I</b>	0.200 U	0.200 U	<b>0.253 I</b>	0.200 U	0.200 U	0.200 U	1.00 U	0.200 U	<b>0.285 J</b>
Thallium	ug/L	2	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.500 U	0.100 U	0.100 U

Notes and Abbreviations provided on Page 6.

**Notes:**

1. U: Laboratory qualifier - Indicates that the compound was not detected above the reporting limit.
2. I: Laboratory qualifier - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit; estimated value
3. J(-): Laboratory qualifier - The reported value is an estimated value.
4. J: Data validation qualifier - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
5. UJ: Data validation qualifier - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
6. J- : Data validation qualifier - The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
7. J+ : Data validation qualifier: The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
8. V: Analyte detected in the method blank.
9. Q: Laboratory qualifier- Re-analysis of sample beyond the accepted holding time.
10. J3: Laboratory qualifier - Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
11. MCLs - EPA Maximum Contaminant Levels; primary enforceable standards shown unless otherwise noted. Secondary (non-enforceable) standards shown in italics.
12. Detections shown in bold text.
13. \*\* Florida GCTLs per FDEP Chapter 62-777 of the Florida Administrative Code.
14. \*\*\* Secondary MCL for fluoride is 2 mg/L but not enforceable.
15. Background / Upgradient Well shaded green.

**Abbreviations:**

- Q - Data qualifier
- C - Celsius
- ft BTOC - feet below top of well casing
- mg/L - milligrams per liter
- SU - Standard units
- ft NAVD 88 - feet elevation in North American Vertical Datum 1988
- ug/L - micrograms per liter
- umhos/cm - micromohs per centimeter
- mV - millivolts

# **FIGURES**



400 200 0 400 Feet



**Economizer Ash and Pyrite Pond System  
Location Map**


TEC Big Bend Station  
Gibsonton, FL


**Geosyntec**  
consultants

Figure

**1**

**Legend**

 Jackson Branch

 Economizer Ash and Pyrite Pond System (EAPPS)

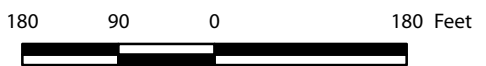
Note:  
Source of 2014 Aerials: Florida Department of Transportation, Surveying and Mapping Office.

Tampa, FL

January 2018

Path: (I:\usville-01\Draw\11\06\IS\FR2033 - TECO - Big Bend\MXDs\201607\EAPPS.mxd, 18 Jan 2018, JFB





**CCR Monitoring Well Locations  
Economizer Ash and Pyrite Pond System**

TEC Big Bend Station  
Gibson, FL





Figure  
**2**

Tampa, FL

January 2018

Path: [I:\usville-01\DATA\1\OGIS\FR2814\_2017\_Annual\_CCR\_GW\_Report\FWDX\CCR\_MW\_Loc.mxd 18 January 2018 JRB

**Legend**

-  Background Well Location
-  CCR Monitoring Well Location

Note:  
2014 Aerial Imagery source, Florida Department of Transportation  
Surveying and Mapping Office APLUS website.

**APPENDIX A**  
**Laboratory Analytical Reports**

**JUNE 2016**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 07/28/16 14:29

**Work Order - L16F174**

**Project - Economizer Ash Pond CCR**

---

## Case Narrative

---

REPORT REVISED TO ADD: Co, Ca and Rad-226/228.

8 sample(s) were received on 06/24/16 14:25.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples PZ-1, PZ-2, PZ-5 and PZ-6. The sample(s) are flagged with a J qualifier.

### EPA 300.0

The recovery of the matrix spike and spike duplicate for Chloride and Sulfate were below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

### EPA 200.8

The recovery of the matrix spike and spike duplicate for Cadmium was below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-01

Sampled By: Robert Barthelette

Sample Description: PZ1

Date and Time Collected: 6/24/16 13:32

Sample Collection Method: Grab

Date of Sample Receipt: 6/24/16 14:25

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	619	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 16:42
Specific Conductance	3940	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 13:32
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 13:32
Fluoride	0.211	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 16:26
pH	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 13:32
REDOX Potential	-49.1	mV	-999	-999		1	SM 2580B	RAB	6/24/16 13:32
Total Dissolved Solids	3060	mg/L	24.0	40.0	J-	2	SM 2540C	TMH	6/28/16 15:09
Sulfate	1240	mg/L	10.0	40.0		20	EPA 300.0	RFL	6/29/16 11:53
Turbidity	8.01	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 13:32
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:01
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:28
Arsenic	8.74	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:28
Cadmium	0.100	ug/L	0.100	0.500	J-, U	1	EPA 200.8	MCR	7/5/16 10:28
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:14
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:28
Selenium	0.696	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:28
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:28
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	122	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:14
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:14

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-01	Date and Time Collected:	6/24/16 13:32
Sample Description:	PZ1	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	14400	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:14
Calcium	541000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 10:58
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:14
Molybdenum	106	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/5/16 13:14

### KNL Laboratory

#### Radium - 226

Rad - 226	37	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	2.6	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.6	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	39	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	2.6	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0083	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:31
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-02	Date and Time Collected:	6/24/16 13:08
Sample Description:	PZ2	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	118	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 17:14
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 13:08
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 13:08
Fluoride	0.148	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 16:58
pH	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 13:08
REDOX Potential	-71.0	mV	-999	-999		1	SM 2580B	RAB	6/24/16 13:08
Total Dissolved Solids	1170	mg/L	12.0	20.0	J-	1	SM 2540C	TMH	6/28/16 15:09
Sulfate	471	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:09
Turbidity	4.90	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 13:08
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:05
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:32
Arsenic	1.83	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	7/5/16 10:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:32
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:17
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:32
Selenium	0.376	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:32
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	65.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:17
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:17

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-02	Date and Time Collected:	6/24/16 13:08
Sample Description:	PZ2	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	1550	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:17
Calcium	198000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:00
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:17
Molybdenum	1.73	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:17

### KNL Laboratory

#### Radium - 226

Rad - 226	13.4	pCi/L	0.7	0.7		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.7	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.6	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	15.0	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.7	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.010	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:35
---------	-------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-03	Date and Time Collected:	6/24/16 12:31
Sample Description:	PZ3	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	88.9	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 17:30
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 12:31
Dissolved Oxygen	0.540	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 12:31
Fluoride	0.313	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 17:30
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 12:31
REDOX Potential	-145	mV	-999	-999		1	SM 2580B	RAB	6/24/16 12:31
Total Dissolved Solids	1200	mg/L	12.0	20.0		1	SM 2540C	TMH	6/28/16 15:09
Sulfate	474	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:25
Turbidity	11.5	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 12:31
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0580	ug/L	0.0500	0.200	I	1	EPA 7470A	MCR	7/7/16 10:08
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:36
Arsenic	1.23	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:36
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:20
Lead	0.125	ug/L	0.0800	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Selenium	0.262	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:36
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:36
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	65.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:20
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:20

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-03	Date and Time Collected:	6/24/16 12:31
Sample Description:	PZ3	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	662	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:20
Calcium	187000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:03
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:20
Molybdenum	4.09	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:20

### KNL Laboratory

#### Radium - 226

Rad - 226	9.6	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.4	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	10.3	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.4	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0037	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:38
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-04	Date and Time Collected:	6/24/16 12:00
Sample Description:	PZ4	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	28.7	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 18:02
Specific Conductance	1370	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 12:00
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 12:00
Fluoride	0.151	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 18:02
pH	6.70	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 12:00
REDOX Potential	-74.9	mV	-999	-999		1	SM 2580B	RAB	6/24/16 12:00
Total Dissolved Solids	1090	mg/L	12.0	20.0		1	SM 2540C	TMH	6/28/16 15:09
Sulfate	442	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 12:41
Turbidity	5.66	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 12:00
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:12
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:40
Arsenic	48.6	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:40
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:40
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:23
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:40
Selenium	0.205	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:40
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:40
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	57.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:23
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:23

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-04	Date and Time Collected:	6/24/16 12:00
Sample Description:	PZ4	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	495	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:23
Calcium	231000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:05
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:23
Molybdenum	1.66	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:23

### KNL Laboratory

#### Radium - 226

Rad - 226	9.6	pCi/L	0.6	0.6		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	1.5	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.8	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.8	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	11.4	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	1.5	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0028	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:42
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-05	Date and Time Collected:	6/24/16 11:23
Sample Description:	PZ5	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	1140	mg/L	0.400	10.0	J-	20	EPA 300.0	RFL	6/29/16 12:56
Specific Conductance	5620	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 11:23
Dissolved Oxygen	0.180	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 11:23
Fluoride	0.199	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 19:06
pH	6.51	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 11:23
REDOX Potential	-8.60	mV	-999	-999		1	SM 2580B	RAB	6/24/16 11:23
Total Dissolved Solids	5050	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	6/28/16 15:09
Sulfate	1440	mg/L	10.0	40.0	J-	20	EPA 300.0	RFL	6/29/16 12:56
Turbidity	5.14	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 11:23
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:22
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:44
Arsenic	10.2	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:44
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:44
Cobalt	1.40	ug/L	1.00	20.0	I	1	EPA 200.7	MCR	7/5/16 13:26
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:44
Selenium	2.09	ug/L	0.200	2.00		1	EPA 200.8	MCR	7/5/16 10:44
Thallium	0.118	ug/L	0.100	0.500	I	1	EPA 200.8	MCR	7/5/16 10:44
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	72.9	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:26
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:26

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-05	Date and Time Collected:	6/24/16 11:23
Sample Description:	PZ5	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	59100	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/5/16 13:26
Calcium	781000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:08
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:26
Molybdenum	4.46	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:26

### KNL Laboratory

#### Radium - 226

Rad - 226	34	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	2.3	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	4.2	pCi/L	1.0	1.0		1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.9	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	38	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	2.3	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0089	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:45
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-06	Date and Time Collected:	6/24/16 10:50
Sample Description:	PZ6	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	123	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 19:53
Specific Conductance	1640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 10:50
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 10:50
Fluoride	0.409	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 19:37
pH	6.53	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 10:50
REDOX Potential	-59.4	mV	-999	-999		1	SM 2580B	RAB	6/24/16 10:50
Total Dissolved Solids	1230	mg/L	12.0	20.0	J-	1	SM 2540C	TMH	6/28/16 15:09
Sulfate	414	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 13:44
Turbidity	6.70	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 10:50
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:26
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 10:47
Arsenic	2.65	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 10:47
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:47
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:35
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 10:47
Selenium	0.722	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 10:47
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 10:47
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	51.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:35
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:35

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-06

Sample Description: PZ6

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 6/24/16 10:50

Date of Sample Receipt: 6/24/16 14:25

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	3890	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:51
Calcium	313000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:10
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:35
Molybdenum	2.40	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:35

### KNL Laboratory

#### Radium - 226

Rad - 226	4.2	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.9	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	4.8	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.9	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0038	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 14:49
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-07	Date and Time Collected:	6/24/16 10:19
Sample Description:	MWB-35	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	15.1	mg/L	0.0200	0.500		1	EPA 300.0	RFL	6/28/16 20:09
Specific Conductance	1520	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 10:19
Dissolved Oxygen	0.360	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 10:19
Fluoride	0.996	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 20:09
pH	6.80	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 10:19
REDOX Potential	-57.0	mV	-999	-999		1	SM 2580B	RAB	6/24/16 10:19
Total Dissolved Solids	1160	mg/L	12.0	20.0		1	SM 2540C	TMH	6/28/16 15:09
Sulfate	420	mg/L	5.00	20.0		10	EPA 300.0	RFL	6/29/16 14:32
Turbidity	1.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 10:19

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:13
---------	--------	------	--------	-------	---	---	-----------	-----	--------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 11:45
Arsenic	4.30	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 11:45
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:45
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:38
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 11:45
Selenium	0.533	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 11:45
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:45

#### Total Recoverable Metals by SW846 Method 6010B

Barium	46.0	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:38
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:38

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16F174-07

Sample Description: MWB-35

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 6/24/16 10:19

Date of Sample Receipt: 6/24/16 14:25

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	1690	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:54
Calcium	313000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:21
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:38
Molybdenum	41.0	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/5/16 13:38

### KNL Laboratory

#### Radium - 226

Rad - 226	1.7	pCi/L	0.4	0.4		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.6	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	2.2	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0056	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 15:02
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-08	Date and Time Collected:	6/24/16 9:50
Sample Description:	MWB-36	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	154	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/28/16 22:01
Specific Conductance	2640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/24/16 9:50
Dissolved Oxygen	0.710	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/24/16 9:50
Fluoride	1.07	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/28/16 21:13
pH	6.91	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/24/16 9:50
REDOX Potential	-244	mV	-999	-999		1	SM 2580B	RAB	6/24/16 9:50
Total Dissolved Solids	2330	mg/L	24.0	40.0		2	SM 2540C	TMH	6/28/16 15:09
Sulfate	1170	mg/L	10.0	40.0		20	EPA 300.0	RFL	6/29/16 16:56
Turbidity	1.70	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/24/16 9:50

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	7/7/16 10:33
---------	--------	------	--------	-------	---	---	-----------	-----	--------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	7/5/16 11:48
Arsenic	27.5	ug/L	0.320	2.00		1	EPA 200.8	MCR	7/5/16 11:48
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:48
Cobalt	1.00	ug/L	1.00	20.0	U	1	EPA 200.7	MCR	7/5/16 13:41
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	7/5/16 11:48
Selenium	0.414	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	7/5/16 11:48
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	7/5/16 11:48

#### Total Recoverable Metals by SW846 Method 6010B

Barium	87.4	ug/L	0.500	20.0		1	EPA 6010B	MCR	7/5/16 13:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/5/16 13:41

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16F174-08	Date and Time Collected:	6/24/16 9:50
Sample Description:	MWB-36	Date of Sample Receipt:	6/24/16 14:25
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	4380	ug/L	10.0	50.0		1	EPA 6010B	MCR	7/7/16 14:56
Calcium	554000	ug/L	30.0	1000		1	EPA 6010B	MCR	7/8/16 11:23
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	7/5/16 13:41
Molybdenum	12.8	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/5/16 13:41

### KNL Laboratory

#### Radium - 226

Rad - 226	3.0	pCi/L	0.5	0.5		1	EPA 903.0	KL1	7/1/16 13:23
Rad - 226 Counting Error +/-	0.7	pCi/L				1	EPA 903.0	KL1	7/1/16 13:23

#### Radium - 228

Rad - 228	1.0	pCi/L	1.0	1.0	U	1	EPA Ra-05	KL1	7/5/16 11:17
Rad - 228 Counting Error +/-	0.7	pCi/L				1	EPA Ra-05	KL1	7/5/16 11:17

#### Radium-226/228

Rad-226/228	3.0	pCi/L	1.0	1.0		1	Calc	KL1	7/5/16 11:17
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	7/5/16 11:17

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0043	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	7/1/16 15:05
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

### Subcontract Laboratories:

KNL Laboratory E84025

TestAmerica Pensacola E81010

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

A handwritten signature in black ink, appearing to read "Peggy Penner".

---

Peggy Penner, Manager, Laboratory Services

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend** Date: **06/24/15** File Name: **062415\_Wells\_RAB** Weather: **PTLY CLOUDY & HOT** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color SCOLOR-W	Odor SODOR-W	NGVD Time LEVEL	
L16F174-01	CCR-PZ-1	13:32		6.8	25.5	3945	0.1	8.0	-49.1		LT. YELLOW	NONE		
L16F074-02	CCR-PZ-2	13:08		6.8	25.6	1576	0.1	4.9	-71.0		LT. YELLOW	NONE		
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16F174-01	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
L16F074-02	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(1) 1L plastic (PP)		(2) 500ml plastic (PP)		(3) 250ml plastic (PP)		(4) 100ml coliform bottle		(5) 1L amber glass (AG)		(6) 40ml VOA vial (CG)		Samples On Ice		Sample Receipt
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Time 14:25

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2		L 011663 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2		L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12		L <input type="checkbox"/>	0.8
500 ml bottles (metals): 2 ml HNO3 to pH <2		L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2		L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12		L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2		L 011663 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2		L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2			

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 015169A	7	7.02	8:05			7.04	14:30	Meter ID:	8:00	27.4	226.1	228.4
FDEP FT 1100	L 015170	10	10.05	8:05	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				MPM08	14:30	21.1	236.4	236.2	
Units: SU	L 015083A	4	3.98	8:05	A checked box indicates ICV / CCV passed				Zobell Sol ID:					
Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 014277				
Meter ID:	MPM08	L 014668A	1000	1000	8:15					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: µMHOS	L 013576A	10000				10023	8:15	10041	14:20	Meter ID:	7:55	21.1	8.96	8.915
Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range		ICV	Time	CCV	Time	MPM08	15:05	20.9	9.02	8.950
Meter ID:	TM07	L 013677	5.40	4.86	5.94	5.68	7:40			Barom. Pres				
FDEP FT 1600, Units: NTU	L 013678	53.40	49.93	56.87				53.80	14:00	760				
Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct.(%)	DO (mg/l)	Redox (mv)	
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10	

Purging Information Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026, 3/8" = 0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity x Tubing Length ) + Pump Volume + Cell Volume = 1 Eqpt Volume (gal)					
CCR-PZ-1	2	10	15.29	20.29	5.14	15.15	0.16	2.42	( 0.0026 x 21.3 ) + 0 + 0.06 = 0.12					
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	13:23	700	1.29	1.29	5.34	6.84	25.50	3946	0.12	9.33	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	13:25	700	0.37	1.66	5.35	6.79	25.47	3946	0.10	5.72	Temp C +/- 0.2	STABLE	Pump:	PP
13:16	13:27	700	0.37	2.03	5.37	6.80	25.48	3945	0.09	8.01	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	13:27										DO % Sat < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At 13:17		Gallons to Purge 0.12		Stability Values =		6.80	25.48	3945	0.09	8.01				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity x Tubing Length ) + Pump Volume + Cell Volume = 1 Eqpt Volume (gal)					
CCR-PZ-2	2	10	15.64	20.64	5.40	15.24	0.16	2.44	( 0.0026 x 21.64 ) + 0 + 0.06 = 0.12					
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	12:58	540	0.86	0.86	5.55	6.81	25.62	1540	0.12	8.17	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	13:00	540	0.29	1.15	5.54	6.76	25.67	1561	0.11	6.52	Temp C +/- 0.2	STABLE	Pump:	PP
12:52	13:02	540	0.29	1.44	5.53	6.75	25.62	1576	0.10	4.86	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	13:02										DO % Sat < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At 12:53		Gallons to Purge 0.12		Stability Values =		6.75	25.62	1576	0.10	4.86				

Comments: Total Time Total Miles

Site: **Big Bend** Date: **06/24/15** File Name: **062415\_Wells\_RAB** Weather: **PTLY CLOUDY & HOT** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color SCOLOR-W	Odor \$ODOR-W	NGVD	
													Time	LEVEL
L16F174-03	CCR-PZ-3	12:31		6.4	26.6	1577	0.5	11.5	-145		YELLOW	MILD		
L16F174-04	CCR-PZ-4	12:00		6.7	26.6	1372	0.2	5.7	-74.9		CLEAR	MILD		

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16F174-03	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
L16F174-04	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID
1L bottles (rads): 5 ml HNO3 to pH <2	L 011663 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 011663 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2	

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 015169A	7	7.02	8:05			7.04	14:30	Meter ID: MPM08	8:00	27.4	226.1	228.4
FDEP FT 1100	L 015170	10	10.05	8:05	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				14:30		21.1	236.4	236.2
Units: SU	L 015083A	4	3.98	8:05	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 014668A	1000	1000	8:15					Meter ID: MPM08	7:55	21.1	8.96	8.915
FDEP FT 1200, Units: uMHOS	L 013576A	10000			10023	8:15	10041	14:20	7:55		20.9	9.02	8.950

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Therm ID	pH	Conduct.(%)	DO (mg/l)	Redox (mv)
Meter ID: TM07	L 013677	5.40	4.86 - 5.94	5.68	7:40			MPM08	0.2	5	0.3	10
FDEP FT 1600, Units: NTU	L 013678	53.40	49.93 - 56.87			53.80	14:00	760				

Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID Iodate/Iodide ID Therm ID pH Conduct.(%) DO (mg/l) Redox (mv)

QC Std: 5ml (NaThio)/500ml DI=10mg/L

Purging Information Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" = 0.0026 3/8" = 0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt Volume (gal)
CCR-PZ-3	2	10	15.38	20.38	3.46	16.92	0.16	2.71	0.0026	21.38	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	12:18	330	0.78	0.78	4.92	6.47	26.62	1617	0.79	13.00	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	12:20	330	0.17	0.95	4.90	6.41	26.69	1596	0.62	15.10	Temp°C +/- 0.2	STABLE	Pump:	PP
	12:09	12:22	330	0.17	1.12	4.90	26.62	1577	0.54	11.50	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	12:22										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No

Purge Complete At	Gallons to Purge	Stability Values =	6.42	26.62	1577	0.54	11.50
-------------------	------------------	--------------------	------	-------	------	------	-------

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt Volume (gal)
CCR-PZ-4	2	10	14	18	3.28	14.72	0.16	2.36	0.0026	47.03	0	0.06	0.18

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:43	340	0.99	0.99	3.52	6.68	26.49	1412	0.32	4.64	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:45	350	0.18	1.17	3.53	6.65	26.64	1387	0.18	4.87	Temp°C +/- 0.2	STABLE	Pump:	PP
	11:32	11:47	350	0.18	1.35	6.70	26.64	1372	0.15	5.66	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	11:47										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **06/24/15** File Name: **062415\_Wells\_RAB** Weather: **PTLY CLOUDY & HOT** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color SCOLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16F174-05	CCR-PZ-5	11:23		6.5	27.8	5616	0.2	5.1	-8.6		CLEAR	MILD		
L16F174-06	CCR-PZ-6	10:50		6.5	26.4	1638	0.4	6.7	-59.4		CLEAR	MILD		

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16F174-05	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
L16F174-06	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sample Receipt Time 14:25
---------------------	------------------------	------------------------	---------------------------	-------------------------	------------------------	---	------------------------------

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 011663 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>	0.8
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 011663 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 015169A	7	7.02	8:05			7.04	14:30	Meter ID: MPM08	8:00	27.4	226.1	228.4
FDEP FT 1100	L 015170	10	10.05	8:05	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	14:30	21.1	236.4	236.2
Units: SU	L 015083A	4	3.98	8:05	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 014668A	1000	1000	8:15					Meter ID: MPM08	7:55	21.1	8.96	8.915
FDEP FT 1200, Units: uMHOS	L 013576A	10000			10023	8:15	10041	14:20	Meter ID: MPM08	15:05	20.9	9.02	8.950

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
Meter ID: TM07	SF- 013677	5.40	4.86 - 5.94	5.68	7:40			MPM08	0.2	5	0.3	10
FDEP FT 1600, Units: NTU	SF- 013678	53.40	49.93 - 56.87			53.80	14:00	760				

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titration ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information	Well Capacities (gallons/ ft): 2" = 0.16 4" =0.65	Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006							
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft) X Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)
CCR-PZ-5	2	10	36.03	41.03	25.85	15.18	0.16	2.43	0.016 47.03 0 0.06 0.81

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:16	1940	7.69	7.69	26.88	6.51	27.85	5585	0.20	11.30	ph:+/- 0.2	STABLE	Level Meter: WLM08	
Purge Start:	11:18	1970	1.04	8.73	26.86	6.51	27.86	5598	0.19	7.72	Temp°C +/- 0.2	STABLE	Pump: ESP	
	11:01	11:20	1.05	9.78	26.85	6.51	27.84	5616	0.18	5.14	Cond % +/- 5	STABLE	Tubing: PE	
Purge End:	11:20										DO % Sat < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	

<b>Purge Complete At 11:03</b>	<b>Gallons to Purge 0.81</b>	Stability Values =		6.51	27.84	5616	0.18	5.14						
--------------------------------	------------------------------	--------------------	--	------	-------	------	------	------	--	--	--	--	--	--

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft) X Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.21	15.90	0.16	2.54	0.0026 47.03 0 0.06 0.18

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:38	490	0.78	0.78	5.45	6.55	26.54	1639	0.30	9.78	ph:+/- 0.2	STABLE	Level Meter: WLM08	
Purge Start:	10:40	500	0.26	1.04	5.46	6.52	26.53	1639	0.31	8.22	Temp°C +/- 0.2	STABLE	Pump: PP	
	10:32	10:42	490	0.26	1.30	5.48	6.53	26.42	0.37	6.70	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:	10:42										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	

<b>Purge Complete At 10:33</b>	<b>Gallons to Purge 0.18</b>	Stability Values =		6.53	26.42	1638	0.37	6.70						
--------------------------------	------------------------------	--------------------	--	------	-------	------	------	------	--	--	--	--	--	--

Comments:

Total Time Total Miles



Site: **Big Bend** Date: **06/24/15** File Name: **062415\_Wells\_RAB** Weather: **PTLY CLOUDY & HOT** Sampler(s)/Initial(s): **RAB /TECO** Initials: **RAV**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16F174-07	MWB-35	10:19		6.8	26.8	1516	0.4	1.2	-57		LT. YELLOW	NONE		-7.05
L16F174-08	MWB-36	9:50		6.9	27.8	2641	0.7	1.7	-244		LT. YELLOW	MODERATE		-7.78

LIMS #	250ml Cyan (3)	.50	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16F174-07	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8
L16F174-08	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)		(2) 500ml plastic (PP)		(3) 250ml plastic (PP)		(4) 100ml coliform bottle		(5) 1L amber glass (AG)		(6) 40ml VOA vial (CG)		Samples On Ice <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Sample Receipt Time 14:25
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS				

Preservation				Pres ID	Preservation				Pres ID	Preservation				Pres ID	Temp 0.8 °C
1L bottles (rads): 5 ml HNO3 to pH <2				L 011663 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2				L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12				L <input type="checkbox"/>	
500 ml bottles (metals): 2 ml HNO3 to pH <2				L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2				L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12				L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2				L 011663 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2				L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2					

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 015169A	7	7.02	8:05			7.04	14:30	Meter ID:	8:00	27.4	226.1	228.4
FDEP FT 1100		L 015170	10	10.05	8:05	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				MPM08	14:30	21.1	236.4	236.2
Units: SU		L 015083A	4	3.98	8:05	A checked box indicates ICV / CCV passed and Exp. Dates Valid				Zobell Sol ID:				

Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID:	MPM08	L 014668A	1000	1000	8:15					Meter ID:	7:55	21.1	8.96	8.915
FDEP FT 1200, Units: µMHOS		L 013576A	10000			10023	8:15	10041	14:20					

Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Barom. Pres	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID:	TM07	L 013677	5.40	4.86 - 5.94	5.68	7:40			760	15:05	20.9	9.02	8.950
FDEP FT 1600, Units: NTU		L 013678	53.40	49.93 - 56.87			53.80	14:00					

Sulfite info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10

Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65		Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026 3/8" = 0.006											
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	=	Water Column (ft)	X	Well Capacity (gal)	=	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)	
MWB-35	2	5	15	18.71	7.05	=	11.66	X	0.16	=	1.87	( 0.0026 X 21 ) + 0 + 0.06 = 0.11	

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:04	445	0.82	0.82	7.36	6.80	26.50	1584	0.38	0.94	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:06	450	0.24	1.06	7.40	6.80	26.59	1567	0.36	1.46	Temp°C +/- 0.2	STABLE	Pump:	PP
	9:57	10:08	450	0.24	1.30	7.42	26.72	1544	0.34	1.59	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	10:10	450	0.24	1.54	7.43	6.80	26.77	1516	0.36	1.22	DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No

Purge Complete At 9:58		Gallons to Purge 0.11	Stability Values =		6.80	26.77	1516	0.36	1.22
------------------------	--	-----------------------	--------------------	--	------	-------	------	------	------

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	=	Water Column (ft)	X	Well Capacity (gal)	=	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)
MWB-36	2	5	15	18.73	7.78	=	10.95	X	0.16	=	1.75	( 0.0026 X 21 ) + 0 + 0.06 = 0.11

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:38	430	1.36	1.36	8.37	6.94	27.84	2644	0.75	3.00	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:40	430	0.23	1.59	8.38	6.92	27.76	2630	0.71	2.01	Temp°C +/- 0.2	STABLE	Pump:	PP
	9:26	9:42	430	0.23	1.82	6.91	27.82	2641	0.71	1.70	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	9:42										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No

Purge Complete At 9:27		Gallons to Purge 0.11	Stability Values =		6.91	27.82	2641	0.71	1.70
------------------------	--	-----------------------	--------------------	--	------	-------	------	------	------

Comments: \_\_\_\_\_

Total Time \_\_\_\_\_ Total Miles \_\_\_\_\_

## GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

Date: 06/24/15 Sampler(s): RAB

Initials *RAB*

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	COV	Time	Pass/Fail
Meter ID:	MPM08	L 015169A	7	7.02	8:05	7.04	14:30	Pass
FDEP FT 1100		L 015170	10	10.05	8:05	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)		
Units: SU		L 015083A	4	3.98	8:05	ICV	Time	Pass/Fail
ICV Check		L 014565J	7			7.06	8:10	Pass
Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	Pass/Fail
Meter ID:	MPM08	L 014568A	1000	1000	8:15			
FDEP FT 1200, Units: uMHOS		L 013576A	10000			10023	8:15	Pass
Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	COV	Time	Pass/Fail	COV
Meter ID:	TM07	L 013677	5.40	4.86 - 5.94	5.68	7:40	Pass	
FDEP FT 1600, Units: NTU		L 013678	53.40	49.93 - 56.87				53.80
Sulfite info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO-3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L
Redox Cal		Time	Temp °C	Reading mv	Theo Value mv	Pass / Fail	DO Meter Cal	Time
							FDEP FT: 1500	
Meter ID:	8:00	27.4	226.1	228.4	Pass		Meter ID:	7:55
MPM08	14:30	21.1	236.4	236.2	Pass		MPM08	15:05
Zobell Sol ID:							Barom. Pres	
L 014277							760	
Therm ID		pH	Conduct. %	DO mg/l	Redox mv	CL2	Calibration Criterion	Ferrous Iron Comparator ID:
MPM08		0.2	5	0.3	10	0.2		Reagent ID: L-
ClO <sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4.				Glycine check should read < 0.10 mg/l ClO <sub>2</sub> .				
Chlorine Dioxide (mg/l)		Std. Conc. (mg/l)	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Glycine Check	Time
			1.0	100				
Meter ID:								
				DPD ID: L			Glycine ID: L	
A checked box indicates reagent expiration date has been verified.								

COMMENTS: CL2 Std. ID: L

Method 10128\*  
\*Equivalent to Standard Methods, 4500 ClO<sub>2</sub> D.









DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-5</b>	SAMPLE ID: <b>L16F174-05</b> DATE: <b>6/24/15</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>5/8</b>	WELL SCREEN INTERVAL DEPTH <b>31.03</b> feet to <b>41.03</b> (feet)	STATIC DEPTH TO WATER (feet): <b>25.85</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.0</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.0</b>	PURGING INITIATED AT: <b>11:01</b>	PURGING ENDED AT: <b>11:20</b>	TOTAL VOLUME PURGED (gallons): <b>9.78</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:16	7.69	7.69	0.51	26.88	6.51	27.85	5585	0.20	11.30	CLEAR	MILD
11:18	1.04	8.73	0.52	26.86	6.51	27.86	5598	0.19	7.72	CLEAR	MILD
11:20	1.05	9.78	0.53	26.85	6.51	27.84	5616	0.18	5.14	CLEAR	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>11:20</b>		SAMPLING ENDED AT: <b>11:23</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>36.0</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1963</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	1	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

**REMARKS:**

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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





DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Hardee</b>	SITE LOCATION: <b>Bowling Green, Fl.</b>
WELL NO: <b>MWB-35</b>	SAMPLE ID: <b>L16F174-07</b>
DATE: <b>6/24/15</b>	

**PURGING DATA**

WELL DIAMETER (inches)	0.0	TUBING DIAMETER (inches)	1/4	WELL SCREEN INTERVAL DEPTH	13.71 feet to 18.71 (feet)	STATIC DEPTH TO WATER (feet):	7.05	PURGE PUMP TYPE OR BAILER:	PP
WELL VOLUME PURGE: (only filter out if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$									

EQUIPMENT VOLUME PURGE: (only filter out if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$									
---	--	--	--	--	--	--	--	--	--

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	16.2	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	16.2	PURGING INITIATED AT:	9:57	PURGING ENDED AT:	10:10	TOTAL VOLUME PURGED (gallons):	1.54
--	------	--	------	-----------------------	------	-------------------	-------	--------------------------------	------

TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:04	0.82	0.82	0.12	7.36	6.80	26.50	1584	0.38	0.94	LT. YELLOW	NONE
10:06	0.24	1.06	0.12	7.40	6.80	26.59	1567	0.36	1.46	LT. YELLOW	NONE
10:08	0.24	1.30	0.12	7.42	6.80	26.72	1544	0.34	1.59	LT. YELLOW	NONE
10:10	0.24	1.54	0.12	7.43	6.80	26.77	1516	0.36	1.22	LT. YELLOW	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION:	RAB <b>TECO</b>	SAMPLER (S) SIGNATURES:	<i>M. Scully</i>	SAMPLING INITIATED AT:	10:10	SAMPLING ENDED AT:	10:19
-----------------------------------	-----------------	-------------------------	------------------	------------------------	-------	--------------------	-------

PUMP OR TUBING DEPTH IN WELL (feet):	16.2	SAMPLE PUMP FLOW RATE (mL per minute):	449	TUBING MATERIAL CODE:	PE/S
--------------------------------------	------	--	-----	-----------------------	------

FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FILTER SIZE:	µm	DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
---	--	--------------	----	---

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH		
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP
@Met-250	1	PE	250ml	HNO3	1ml	<2	Metals	PP
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
 SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Hardee</b>	SITE LOCATION: <b>Bowling Green, Fl.</b>
WELL NO: <b>MWB-36</b>	SAMPLE ID: <b>L16F174-08</b> DATE: <b>6/24/15</b>

**PURGING DATA**

WELL DIAMETER (inches): <b>0.0</b>	TUBING DIAMETER (inches): <b>1/4</b>	WELL SCREEN INTERVAL DEPTH: <b>13.73</b> feet to <b>18.73</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.78</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot x                      21                      feet ) +                      0.06                      gallons =                      0.11                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.2</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.2</b>	PURGING INITIATED AT: <b>9:26</b>	PURGING ENDED AT: <b>9:42</b>	TOTAL VOLUME PURGED (gallons): <b>1.82</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:38	1.36	1.36	0.11	8.37	6.94	27.84	2644	0.75	3.00	LT. YELLOW	MODERATE
9:40	0.23	1.59	0.12	8.38	6.92	27.76	2630	0.71	2.01	LT. YELLOW	MODERATE
9:42	0.23	1.82	0.12	8.38	6.91	27.82	2641	0.71	1.70	LT. YELLOW	MODERATE
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER(S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>9:42</b>		SAMPLING ENDED AT: <b>9:50</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.2</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>430</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	1	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES:

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

**JULY 2016**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 08/18/16 15:52

**Work Order - L16G005**

**Project - CCR Wells Economizer Ash Pond**

## Case Narrative

8 sample(s) were received on 07/27/16 15:50.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### EPA 6010

The recovery of the matrix spike and spike duplicate could not be accurately determined due to the amount of target analyte in the sample matrix.

The Parent sample is flagged with a J qualifier.

### EPA 300.0

The recovery of the matrix spike and spike duplicate for Chloride and Sulfate is below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

### EPA 200.8

The recovery of the matrix spike and spike duplicate for Selenium is below the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for sample PZ-2. The sample(s) are flagged with a J qualifier.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-01	Date and Time Collected:	7/27/16 13:45
Sample Description:	PZ1	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	742	mg/L	2.00	50.0	J-	100	EPA 300.0	TMH	8/11/16 10:29
Specific Conductance	4180	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 13:45
Dissolved Oxygen	0.220	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 13:45
Fluoride	0.128	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/10/16 18:40
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 13:45
REDOX Potential	-74.1	mV	-999	-999		1	SM 2580B	RAB	7/27/16 13:45
Total Dissolved Solids	3140	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	1320	mg/L	50.0	200	J-	100	EPA 300.0	TMH	8/11/16 10:29
Turbidity	3.88	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 13:45
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:08
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	1.03	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Arsenic	7.38	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:09
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:15
Cobalt	0.450	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Lead	0.110	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:15
Selenium	0.960	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:09
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:15
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	30.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:05
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:05

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-01</b>	Date and Time Collected:	7/27/16 13:45
Sample Description:	PZ1	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	<b>306</b>	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:05
Calcium	<b>227000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:42
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:05
Molybdenum	<b>105</b>	ug/L	1.00	20.0		1	EPA 6010B	MCR	8/3/16 17:05

### KNL Laboratory

#### Radium - 226

Rad - 226	<b>31</b>	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	<b>1.6</b>	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46

#### Radium - 228

Rad - 228	<b>1.7</b>	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	<b>0.6</b>	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	<b>33</b>	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	<b>1.6</b>	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	<b>0.015</b>	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:14
---------	--------------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-02</b>	Date and Time Collected:	7/27/16 13:16
Sample Description:	PZ2	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	<b>140</b>	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 11:30
Specific Conductance	<b>1700</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 13:16
Dissolved Oxygen	<b>0.130</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 13:16
Fluoride	<b>0.183</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 10:59
pH	<b>6.68</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 13:16
REDOX Potential	<b>-67.4</b>	mV	-999	-999		1	SM 2580B	RAB	7/27/16 13:16
Total Dissolved Solids	<b>1170</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	<b>542</b>	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 11:30
Turbidity	<b>7.16</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 13:16

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:11
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	<b>0.830</b>	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Arsenic	<b>0.990</b>	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:19
Cobalt	<b>0.0900</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Lead	<b>0.110</b>	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:19
Selenium	<b>0.280</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:13
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:19

#### Total Recoverable Metals by SW846 Method 6010B

Barium	<b>64.8</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:08
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:08

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-02

Sample Description: PZ2

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 7/27/16 13:16

Date of Sample Receipt: 7/27/16 15:50

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	2810	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:08
Calcium	193000	ug/L	30.0	1000	J-	1	EPA 6010B	MCR	8/4/16 11:45
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:08
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:08

### KNL Laboratory

#### Radium - 226

Rad - 226	12.8	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	1.1	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46

#### Radium - 228

Rad - 228	0.9	pCi/L	0.9	0.9	U	1	EPA Ra-05	KL1	8/4/16 10:47
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/4/16 10:47

#### Radium-226/228

Rad-226/228	13.2	pCi/L	0.9	0.9		1	Calc	KL1	8/4/16 10:47
Rad-226/228 Counting Error +/-	1.1	pCi/L				1	Calc	KL1	8/4/16 10:47

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.017	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:31
---------	-------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-03</b>	Date and Time Collected:	7/27/16 12:45
Sample Description:	PZ3	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	<b>140</b>	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 11:50
Specific Conductance	<b>1740</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 12:45
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	7/27/16 12:45
Fluoride	<b>0.262</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 11:40
pH	<b>6.19</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 12:45
REDOX Potential	<b>-74.4</b>	mV	-999	-999		1	SM 2580B	RAB	7/27/16 12:45
Total Dissolved Solids	<b>1220</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	<b>516</b>	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 11:50
Turbidity	<b>8.04</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 12:45

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:15
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	<b>0.770</b>	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Arsenic	<b>0.540</b>	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:23
Cobalt	<b>0.0900</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Lead	<b>0.0800</b>	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:23
Selenium	<b>0.270</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:16
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:23

#### Total Recoverable Metals by SW846 Method 6010B

Barium	<b>67.6</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:10
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:10

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-03</b>	Date and Time Collected:	7/27/16 12:45
Sample Description:	PZ3	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	<b>13200</b>	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:10
Calcium	<b>196000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:47
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:10
Molybdenum	<b>2.23</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:10

### KNL Laboratory

#### Radium - 226

Rad - 226	<b>10.9</b>	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/2/16 11:46
Rad - 226 Counting Error +/-	<b>0.9</b>	pCi/L				1	EPA 903.0	KL1	8/2/16 11:46

#### Radium - 228

Rad - 228	<b>1.4</b>	pCi/L	0.9	0.9		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	<b>0.6</b>	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	<b>12.3</b>	pCi/L	0.9	0.9		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	<b>0.9</b>	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	<b>0.011</b>	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:34
---------	--------------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-04	Date and Time Collected:	7/27/16 12:00
Sample Description:	PZ4	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	35.8	mg/L	0.0200	0.500		1	EPA 300.0	TMH	8/11/16 12:00
Specific Conductance	1450	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 12:00
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 12:00
Fluoride	0.0900	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:00
pH	6.55	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 12:00
REDOX Potential	-71.7	mV	-999	-999		1	SM 2580B	RAB	7/27/16 12:00
Total Dissolved Solids	1080	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	499	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 12:10
Turbidity	3.21	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 12:00
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:18
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.730	ug/L	0.600	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Arsenic	46.7	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:20
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:26
Cobalt	0.0500	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:26
Selenium	0.260	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:26
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	61.7	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:13
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:13

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-04

Sample Description: PZ4

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 7/27/16 12:00

Date of Sample Receipt: 7/27/16 15:50

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	13500	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:13
Calcium	237000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:50
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:13
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:13

### KNL Laboratory

#### Radium - 226

Rad - 226	10.8	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	1.0	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25

#### Radium - 228

Rad - 228	2.1	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.6	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	12.9	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	1.0	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0077	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:37
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-05	Date and Time Collected:	7/27/16 11:18
Sample Description:	PZ5	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	1120	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 12:30
Specific Conductance	5420	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 11:18
Dissolved Oxygen	0.170	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 11:18
Fluoride	0.110	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:20
pH	6.38	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 11:18
REDOX Potential	-7.30	mV	-999	-999		1	SM 2580B	RAB	7/27/16 11:18
Total Dissolved Solids	4190	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	8/3/16 12:00
Sulfate	1510	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 12:30
Turbidity	7.10	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 11:18

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:22
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:32
Arsenic	8.10	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:40
Cobalt	1.33	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:32
Lead	0.200	ug/L	0.0800	2.00	I	1	EPA 200.8	RC	8/3/16 11:40
Selenium	1.92	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:40

#### Total Recoverable Metals by SW846 Method 6010B

Barium	68.2	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:16
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:16

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-05</b>	Date and Time Collected:	7/27/16 11:18
Sample Description:	PZ5	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	<b>56900</b>	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:16
Calcium	<b>737000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 11:52
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:16
Molybdenum	<b>2.88</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:16

### KNL Laboratory

#### Radium - 226

Rad - 226	<b>31</b>	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	<b>1.6</b>	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25

#### Radium - 228

Rad - 228	<b>4.5</b>	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	<b>0.8</b>	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	<b>35</b>	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	<b>1.6</b>	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	<b>0.020</b>	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:41
---------	--------------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-06	Date and Time Collected:	7/27/16 10:15
Sample Description:	PZ6	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	116	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 12:50
Specific Conductance	1500	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 10:15
Dissolved Oxygen	0.150	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 10:15
Fluoride	0.432	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 12:40
pH	6.48	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 10:15
REDOX Potential	-84.1	mV	-999	-999		1	SM 2580B	RAB	7/27/16 10:15
Total Dissolved Solids	1060	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	341	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 12:50
Turbidity	4.86	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 10:15

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:25
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:36
Arsenic	1.75	ug/L	0.320	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:44
Cobalt	0.140	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:44
Selenium	0.760	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:36
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:44

#### Total Recoverable Metals by SW846 Method 6010B

Barium	49.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:18
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:18

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16G005-06

Sample Description: PZ6

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 7/27/16 10:15

Date of Sample Receipt: 7/27/16 15:50

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	4250	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:18
Calcium	271000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:02
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:18
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	8/3/16 17:18

### KNL Laboratory

#### Radium - 226

Rad - 226	4.6	pCi/L	0.4	0.4		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	0.7	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25

#### Radium - 228

Rad - 228	0.8	pCi/L	0.8	0.8	U	1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.5	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	5.1	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.7	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0091	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:44
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: **L16G005-07**  
 Sample Description: MWB-35  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 7/27/16 10:42  
 Date of Sample Receipt: 7/27/16 15:50

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	<b>15.4</b>	mg/L	0.0200	0.500		1	EPA 300.0	TMH	8/11/16 13:00
Specific Conductance	<b>1310</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 10:42
Dissolved Oxygen	<b>0.160</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 10:42
Fluoride	<b>0.933</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 13:00
pH	<b>6.64</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 10:42
REDOX Potential	<b>-77.9</b>	mV	-999	-999		1	SM 2580B	RAB	7/27/16 10:42
Total Dissolved Solids	<b>856</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	<b>211</b>	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 13:31
Turbidity	<b>1.15</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 10:42

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:37
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:40
Arsenic	<b>2.92</b>	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:40
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:47
Cobalt	<b>0.0500</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:40
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:47
Selenium	<b>0.460</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RC	8/2/16 10:40
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:47

#### Total Recoverable Metals by SW846 Method 6010B

Barium	<b>43.2</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:27
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:27

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-07	Date and Time Collected:	7/27/16 10:42
Sample Description:	MWB-35	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	2260	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:27
Calcium	231000	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:04
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:27
Molybdenum	11.8	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:27

### KNL Laboratory

#### Radium - 226

Rad - 226	1.6	pCi/L	0.5	0.5		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	0.5	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25

#### Radium - 228

Rad - 228	0.8	pCi/L	0.8	0.8	U	1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	0.5	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	1.9	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	0.5	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	0.0080	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 16:57
---------	--------	------	--------	-------	---	---	-------------------	------	--------------

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16G005-08	Date and Time Collected:	7/27/16 9:47
Sample Description:	MWB-36	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	105	mg/L	2.00	50.0		100	EPA 300.0	TMH	8/11/16 13:51
Specific Conductance	2050	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/27/16 9:47
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/27/16 9:47
Fluoride	0.756	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/11/16 13:41
pH	6.90	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/27/16 9:47
REDOX Potential	-157	mV	-999	-999		1	SM 2580B	RAB	7/27/16 9:47
Total Dissolved Solids	1530	mg/L	24.0	40.0		2	SM 2540C	RFL	8/3/16 12:00
Sulfate	767	mg/L	50.0	200		100	EPA 300.0	TMH	8/11/16 13:51
Turbidity	4.09	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/27/16 9:47

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/5/16 9:41
---------	--------	------	--------	-------	---	---	-----------	-----	-------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RC	8/2/16 10:44
Arsenic	17.3	ug/L	0.320	2.00		1	EPA 200.8	RC	8/2/16 10:44
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:51
Cobalt	0.0600	ug/L	0.0400	2.00	I	1	EPA 200.8	RC	8/2/16 10:44
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RC	8/3/16 11:51
Selenium	0.580	ug/L	0.200	2.00	J-,I	1	EPA 200.8	RC	8/2/16 10:44
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RC	8/3/16 11:51

#### Total Recoverable Metals by SW846 Method 6010B

Barium	69.9	ug/L	0.500	20.0		1	EPA 6010B	MCR	8/3/16 17:30
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	8/3/16 17:30

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16G005-08</b>	Date and Time Collected:	7/27/16 9:47
Sample Description:	MWB-36	Date of Sample Receipt:	7/27/16 15:50
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifer:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
Boron	<b>4680</b>	ug/L	10.0	50.0		1	EPA 6010B	MCR	8/3/16 17:30
Calcium	<b>344000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	8/4/16 12:07
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	8/3/16 17:30
Molybdenum	<b>11.5</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	8/3/16 17:30

### KNL Laboratory

#### Radium - 226

Rad - 226	<b>3.2</b>	pCi/L	0.3	0.3		1	EPA 903.0	KL1	8/8/16 11:25
Rad - 226 Counting Error +/-	<b>0.6</b>	pCi/L				1	EPA 903.0	KL1	8/8/16 11:25

#### Radium - 228

Rad - 228	<b>0.9</b>	pCi/L	0.8	0.8		1	EPA Ra-05	KL1	8/8/16 11:15
Rad - 228 Counting Error +/-	<b>0.5</b>	pCi/L				1	EPA Ra-05	KL1	8/8/16 11:15

#### Radium-226/228

Rad-226/228	<b>4.1</b>	pCi/L	0.8	0.8		1	Calc	KL1	8/8/16 11:15
Rad-226/228 Counting Error +/-	<b>0.6</b>	pCi/L				1	Calc	KL1	8/8/16 11:15

### TestAmerica Pensacola

#### Metals (ICP)

Lithium	<b>0.0081</b>	mg/L	0.0010	0.050	I	1	200.7 Rev 4.4 Z01	GESP	8/3/16 17:01
---------	---------------	------	--------	-------	---	---	-------------------	------	--------------

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- I The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.

### Subcontract Laboratories:

KNL Laboratory	E84025
TestAmerica Pensacola	E81010

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

A handwritten signature in black ink, appearing to read "Peggy Penner".

---

Peggy Penner, Manager, Laboratory Services

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend** Date: **07/27/16** File Name: **072716\_Wells\_RAB** Weather: **PTLY CLOUDY HOT** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD	
L16G005-01	CCR-PZ-1	13:45		6.67	26.41	4185	0.22	3.88	-74.10		CLEAR	NONE	Time	LEVEL
L16G005-02	CCR-PZ-2	13:16		6.68	26.42	1697	0.13	7.16	-67.40		LT YELLOW	NONE		

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16G005-01	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16G005-02	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Preservation Pres ID 011663 250ml bottles (nuts): 1 ml H2SO4 to pH <2

500 ml bottles (metals): 2 ml HNO3 to pH <2 40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2 250 ml bottles (Cyan) 1g NaOH to pH >12

250 ml bottles (metal): 1 ml HNO3 to pH <2 1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2

pH Meter Calibration Buffer ID 015169J Buffer Value 7 Cal 7.02 Time 8:25 ICV 7.02 Time 16:05 CCV 7.02 Time 16:05

Meter ID: MPM08 FDEP FT 1100 Units: SU

Conductivity Meter Calib. Standard ID 014668B Std Value 1000 Cal 1000 Time 8:05 ICV 10263 Time 8:15 CCV 10326 Time 16:00

Meter ID: MPM08 FDEP FT 1200, Units: µMHOS

Turbidity Meter Calibration Standard ID 013677 Std Value 5.40 Acceptability Range 4.86-5.94 Cal 5.49 Time 7:50 ICV 5.49 Time 7:50 CCV 53.40 Time 16:10

Meter ID: TM07 FDEP FT 1600, Units: NTU

Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID Iodate/Iodide ID Therm ID pH 0.2 Conduct.(%) 5 DO (mg/l) 0.3 Redox (mv) 10

Purging Information Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026, 3/8" = 0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
CCR-PZ-1	2	10	15.29	20.29	5.00	15.29	0.16	2.45	0.0026	21.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	13:29	390	0.82	0.82	5.11	6.67	26.37	4186	0.36	5.13	ph: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	13:31	400	0.21	1.03	5.11	6.65	26.39	4187	0.37	3.63	Temp°C +/- 0.2	STABLE	Pump:	PP
	13:21	13:33	400	0.21	1.24	6.67	26.41	4185	0.22	3.88	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	13:33										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At 13:22 Gallons to Purge 0.12 Stability Values = 6.67 26.41 4185 0.22 3.88

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
CCR-PZ-2	2	10	15.64	20.64	5.30	15.34	0.16	2.45	0.0026	21.64	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	13:02	340	0.54	0.54	5.38	6.70	26.45	1677	0.25	11.30	ph: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	13:04	350	0.18	0.72	5.38	6.68	26.42	1698	0.15	8.49	Temp°C +/- 0.2	STABLE	Pump:	PP
	12:56	13:06	350	0.18	0.90	6.68	26.42	1697	0.13	7.16	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	13:06										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At 12:57 Gallons to Purge 0.12 Stability Values = 6.68 26.42 1697 0.13 7.16

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **07/27/16** File Name: **072716 Wells RAB** Weather: **PTLY CLOUDY HOT** Sampler(s) / Initials: **RAB /TECO** Initials: 

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL						
L16G005-03	CCR-PZ-3	12:45		6.19	27.28	1744	0.09	8.04	-74.40		YELLOW	MODERATE							
L16G005-04	CCR-PZ-4	12:00		6.55	27.60	1446	0.15	3.21	-71.70		LT YELLOW	MILD							
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers					
L16G005-03	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10					
L16G005-04	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
(1) 1L plastic (PP)			(2) 500ml plastic (PP)			(3) 250ml plastic (PP)			(4) 100ml coliform bottle			(5) 1L amber glass (AG)			(6) 40ml VOA vial (CG)			Samples On Ice	Sample Receipt
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Time 15:50				

Preservation				Pres ID	Preservation				Pres ID	Preservation				Pres ID	Temp		
1L bottles (rads): 5 ml HNO3 to pH <2				L	011663	250ml bottles (nuts): 1 ml H2SO4 to pH <2				L		500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12				L	
500 ml bottles (metals): 2 ml HNO3 to pH <2				L		40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2				L		250 ml bottles (Cyan) 1g NaOH to pH >12				L	
250 ml bottles (metal): 1 ml HNO3 to pH <2				L	011663	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2				L		A checked box indicates that the sample was verified to a pH of <2					

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L	015169J	7	7.02	8:25		7.02	16:05	Meter ID:	8:30	22.1	236.0	234.9
FDEP FT 1100	L	015170	10	10.04	8:25	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				MPM08	16:10	21.0	235.3	236.2
Units: SU	L	015083A	4	4.01	8:25	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID:	MPM08	L	014668B	1000	1000	8:05				Meter ID:	7:55	21.0	8.90	8.915
FDEP FT 1200, Units: uMHOS	L	013457B	10000		10263	8:15		10326	16:00					

Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range		ICV	Time	CCV	Time	Barom. Pres				
Meter ID:	TM07	L	013677	5.40	4.86	5.94	5.49	7:50		MPM08	16:50	20.4	9.22	9.021
FDEP FT 1600, Units: NTU	L	013678	53.40	49.93	56.87			53.40	16:10	760				

Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID Iodate/Iodide ID Therm ID pH Conduct.(%) DO (mg/l) Redox (mv)

QC Std: 5ml (NaThio)/500ml DI=10mg/L

Purging Information		Well Capacities (gallons/ft): 2" = 0.16 4" = 0.65				Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026 3/8" = 0.006			
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) x Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)
CCR-PZ-3	2	10	15.38	20.38	3.60	16.78	0.16	2.68	( 0.0026 x 21.38 ) + 0 + 0.06 = 0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	12:27	240	0.51	0.51	4.76	6.23	27.31	1756	0.11	7.58	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	12:29	240	0.13	0.64	4.77	6.20	27.25	1751	0.10	6.83	Temp°C+/- 0.2	STABLE	Pump:	PP
	12:19	12:31	240	0.13	0.77	4.78	6.19	1744	0.09	8.04	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	12:31										DO % Sat < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
Purge Complete At	12:21	Gallons to Purge	0.12	Stability Values =	6.19	27.28	1744	0.09	8.04					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) x Tubing Length (ft) ) + Pump Volume (gal) + Cell Volume (gal) = 1 Eqpt. Volume (gal)					
CCR-PZ-4	2	10	14	18	3.24	14.76	0.16	2.36	( 0.0026 x 47.03 ) + 0 + 0.06 = 0.18					
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:38	230	0.49	0.49	3.46	6.53	27.55	1447	0.35	4.10	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:40	230	0.12	0.61	3.47	6.54	27.54	1445	0.22	3.83	Temp°C+/- 0.2	STABLE	Pump:	PP
	11:30	11:42	230	0.12	0.73	3.47	6.55	1446	0.15	3.21	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	11:42										DO % Sat < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
Purge Complete At	11:33	Gallons to Purge	0.18	Stability Values =	6.55	27.60	1446	0.15	3.21					

Comments: Total Time Total Miles

Site: **Big Bend** Date: **07/27/16** File Name: **072716\_Wells\_RAB** Weather: **PTLY CLOUDY HOT** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16G005-05	CCR-PZ-5	11:18		6.38	28.25	5424	0.2	7.10	-7.30		CLOUDY	NONE		
L16G005-06	CCR-PZ-6	10:15		6.48	27.56	1500	0.2	4.86	-84.10		LT YELLOW	MILD		

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16G005-05	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16G005-06	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Preservation Pres ID 011663 250ml bottles (nuts): 1 ml H2SO4 to pH <2

Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
MPM08	015169J	7	7.02	8:25		7.02	16:05	MPM08	8:30	22.1	236.0	234.9

Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
MPM08	014668B	1000	1000	8:05				MPM08	7:55	21.0	8.90	8.915

Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	Time	Temp °C	Reading mg/l	Theo Value mg/l
TM07	013677	5.40	4.86	5.94	5.49	7:50	MPM08	16:50	20.4	9.22	9.021

Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	Time	Temp °C	Reading mg/l	Theo Value mg/l
SF- 013678	53.40	49.93	56.87		53.40	16:10	MPM08	7:55	21.0	8.90	8.915

QC Std: 5ml (NaThio)/500ml DI=10mg/L	QC Result mg/l	Time	Titratior ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct.(%)	DO (mg/l)	Redox (mv)
								MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
CCR-PZ-5	2	10	36.03	41.03	26.19	14.84	0.16	2.37	0.0026	47.03	0	0.06	0.18

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:09	1500	5.94	5.94	26.94	6.38	28.24	5389	0.19	16.20	ph:+/- 0.2	STABLE	Level Meter:	WLM08

Purge Start:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
10:54	11:11	1500	0.79	6.73	26.93	6.38	28.28	5410	0.18	8.47	Temp°C +/- 0.2	STABLE	Pump:	ESP

Purge End:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
11:13	11:13	1500	0.79	7.52	26.94	6.38	28.25	5424	0.17	7.10	Cond % +/- 5	STABLE	Tubing:	PE

Purge Complete At **10:54** Gallons to Purge **0.18** Stability Values = 6.38 28.25 5424 0.17 7.10

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.52	15.59	0.16	2.49	0.0026	47.03	0	0.06	0.18

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:00	420	0.78	0.78	5.71	6.46	27.47	1500	0.21	4.91	ph:+/- 0.2	STABLE	Level Meter:	WLM08

Purge Start:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
9:53	10:02	420	0.22	1.00	5.70	6.47	27.56	1501	0.18	3.31	Temp°C +/- 0.2	STABLE	Pump:	PP

Purge End:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH(SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
10:04	10:04	420	0.22	1.22	5.68	6.48	27.56	1500	0.15	4.86	Cond % +/- 5	STABLE	Tubing:	PE/S

Purge Complete At **9:55** Gallons to Purge **0.18** Stability Values = 6.48 27.56 1500 0.15 4.86

Comments: Total Time Total Miles



Site: **Big Bend** Date: **07/27/16** File Name: **072716 Wells\_RAB** Weather: **PTLY CLOUDY HOT** Sampler(s)/Initial(s): **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16G005-07	MWB-35	10:42		6.64	27.94	1309	0.16	1.15	-77.90		CLEAR	MILD		-7.34
L16G005-08	MWB-36	9:47		6.90	29.67	2051	0.28	4.09	-157.40		LT YELLOW	MODERATE		-7.99

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16G005-07	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16G005-08	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS		ESS		ESS			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sample Receipt
-----	----------	-----	----------	-----	----------	-----	--	-----	--	-----	--	--	---	----------------

Preservation				Pres ID	Preservation				Pres ID	Preservation				Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2				L 011663	250ml bottles (nuts): 1 ml H2SO4 to pH <2				L	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12				L	0.4
500 ml bottles (metals): 2 ml HNO3 to pH <2				L	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2				L	250 ml bottles (Cyan) 1g NaOH to pH >12				L	
250 ml bottles (metal): 1 ml HNO3 to pH <2				L 011663	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2				L	A checked box indicates that the sample was verified to a pH of <2					

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID:	MPM08	L 015169J	7	7.02	8:25			7.02	16:05	Meter ID:	8:30	22.1	236.0	234.9
FDEP FT 1100		L 015170	10	10.04	8:25	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				MPM08	16:10	21.0	235.3	236.2
Units: SU		L 015083A	4	4.01	8:25	A checked box indicates ICV / CCV passed and Exp. Dates Valid				Zobell Sol ID:				

Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 222A	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID:	MPM08	L 014668B	1000	1000	8:05						Meter ID:	7:55	21.0	8.90	8.915
FDEP FT 1200, Units: µMHOS		L 013457B	10000			10263	8:15	10326	16:00						

Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	16:50	20.4	9.22	9.021
Meter ID:	TM07	L 013677	5.40	4.86	5.94	5.49	7:50						
FDEP FT 1600, Units: NTU		L 013678	53.40	49.93	56.87			53.40	16:10				

Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titralor ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026 3/8" = 0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
MWB-35	2	5	15	18.71	7.34	11.37	0.16	1.82	0.006	21	0	0.06	0.19

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:28	360	0.57	0.57	7.58	6.70	27.81	1310	0.20	0.57	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:30	360	0.19	0.76	7.58	6.63	27.85	1309	0.17	0.66	Temp°C +/- 0.2	STABLE	Pump:	PP
	10:22	10:32	360	0.19	0.95	6.64	27.94	1309	0.16	1.15	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	10:32										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At **10:24** Gallons to Purge **0.19** Stability Values = 6.64 27.94 1309 0.16 1.15

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
MWB-36	2	5	15	18.73	7.99	10.74	0.16	1.72	0.006	21	0	0.06	0.19

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:30	260	0.69	0.69	8.27	6.90	29.64	2083	0.33	4.37	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:32	250	0.13	0.82	8.26	6.90	29.69	2065	0.26	4.46	Temp°C +/- 0.2	STABLE	Pump:	PP
	9:20	9:34	250	0.13	0.95	8.27	29.67	2051	0.28	4.09	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	9:34										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At **9:23** Gallons to Purge **0.19** Stability Values = 6.90 29.67 2051 0.28 4.09

Comments: Total Time Total Miles

## GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

Date: 07/27/16 Sampler(s): RAB

Initials *RAB*

pH Meter Calibration		Buffer ID:	Buffer Value:	Cal	Time				CCV	Time	Pass/Fail	
Meter ID:	MPM08	L 015169J	7	7.02	8:25				7.02	16:05	Pass	
FDEP FT 1100		L 015170	10	10.04	8:25				QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)			
Units: SU		L 015083A	4	4.01	8:25	ICV	Time	Pass/Fail	A checked box indicates ICV / CCV passed			
ICV Check		L 014565K	7			7.02	8:25	Pass				
Conductivity Meter Calib		Standard ID	Std Value	Cal	Time	ICV	Time	Pass/Fail	CCV	Time	Pass/Fail	
Meter ID:	MPM08	L 014668B	1000	1000	8:05							
FDEP FT 1200, Units: uMHOS		L 013457B	10000			10263	8:15	Pass	10326	16:00	Pass	
Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	CCV	Time	Pass/Fail	CCV	Time	Pass/Fail		
Meter ID:	TM07	L 013677	5.40	4.86 - 5.94	5.49	7:50	Pass					
FDEP FT 1600, Units: NTU		L 013678	53.40	49.93 - 56.87				53.40	16:10	Pass		
Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID				
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L				
Redox Cal		Time	Temp °C	Reading mv	Theo Value mv	Pass / Fail	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l	Pass / Fail
							FDEP FT 1500					
Meter ID:		8:30	22.1	236.0	234.9	Pass	Meter ID:	7:55	21.0	8.90	8.915	Pass
	MPM08	16:10	21.0	235.3	236.2	Pass	MPM08	16:50	20.4	9.22	9.021	Pass
Zobell Sol ID:												
L 015222A		Barom. Pres 760										
Therm ID:	pH	Conduct %	DO mg/l	Redox mv	CL2	Calibration Criterion	Ferrous Iron					
MPM08	0.2	5	0.3	10	0.2		Comparator ID:	Reagent ID: L-				

ClO<sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4. Glycine check should read < 0.10 mg/l ClO<sub>2</sub>.

Chlorine Dioxide (mg/l)	Std. Conc (mg/l)	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc. (mg/l)	Initial Calibration Verification ICV			Continuous Calibration Verification CCV			Method 10128* *Equivalent to Standard Methods, 4500 ClO <sub>2</sub> D.	
					DPD Check (mg/l)	Glycine Check	Time	Pass/Fail	DPD Check (mg/l)	Time		Pass/Fail
Meter ID:		1.0	100									
					DPD ID: L	Glycine ID: L		A checked box indicates reagent expiration date has been verified.				

COMMENTS: CL2 Std. ID: L

DEP-SOP-001/01  
 FS 2200 Groundwater Sampling  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-1</b>	SAMPLE ID: <b>L16G005-01</b> DATE: <b>7/27/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>10.29</b> feet to <b>20.29</b> (feet)	STATIC DEPTH TO WATER (feet): <b>5.00</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
$1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
$1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot x                      21.3                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.29</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.29</b>	PURGING INITIATED AT: <b>13:21</b>	PURGING ENDED AT: <b>13:33</b>	TOTAL VOLUME PURGED (gallons): <b>1.24</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
13:29	0.82	0.82	0.10	5.11	6.67	26.37	4186	0.36	5.13	CLEAR	NONE
13:31	0.21	1.03	0.11	5.11	6.65	26.39	4187	0.37	3.63	CLEAR	NONE
13:33	0.21	1.24	0.11	5.11	6.67	26.41	4185	0.22	3.88	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>	SAMPLER(S) SIGNATURES: <i>RAB</i>	SAMPLING INITIATED AT: <b>13:33</b>	SAMPLING ENDED AT: <b>13:45</b>																																																																																								
PUMP OR TUBING DEPTH IN WELL (feet): <b>15.3</b>	SAMPLE PUMP FLOW RATE (mL per minute): <b>397</b>	TUBING MATERIAL CODE: <b>PE/S</b>																																																																																									
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FILTRATION EQUIPMENT TYPE:                      µm	Duplicate: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>																																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">SAMPLE CONTAINER SPECIFICATION</th> <th colspan="3" style="text-align: center;">SAMPLE PRESERVATION</th> <th rowspan="2" style="text-align: center;">INTENDED ANALYSIS AND/OR METHOD</th> <th rowspan="2" style="text-align: center;">SAMPLING EQUIPMENT CODE</th> </tr> <tr> <th style="text-align: center;">SAMPLE ID CODE</th> <th style="text-align: center;"># CONTAINERS</th> <th style="text-align: center;">MATERIAL CODE</th> <th style="text-align: center;">VOLUME</th> <th style="text-align: center;">PRESERVATIVE USED</th> <th style="text-align: center;">TOTAL VOL. ADDED IN FIELD (ml) (1)</th> <th style="text-align: center;">FINAL pH</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">@Ino-500</td> <td style="text-align: center;">1</td> <td style="text-align: center;">PE</td> <td style="text-align: center;">500ml</td> <td style="text-align: center;">NONE</td> <td style="text-align: center;">NONE</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">Inorganics</td> <td style="text-align: center;">PP</td> </tr> <tr> <td style="text-align: center;">@Met-250</td> <td style="text-align: center;">2</td> <td style="text-align: center;">PE</td> <td style="text-align: center;">250ml</td> <td style="text-align: center;">HNO3</td> <td style="text-align: center;">1ml</td> <td style="text-align: center;">&lt;2</td> <td style="text-align: center;">Metals</td> <td style="text-align: center;">PP</td> </tr> <tr> <td style="text-align: center;">@Rad-1L</td> <td style="text-align: center;">2</td> <td style="text-align: center;">PE</td> <td style="text-align: center;">1L</td> <td style="text-align: center;">HNO3</td> <td style="text-align: center;">5ml</td> <td style="text-align: center;">&lt;2</td> <td style="text-align: center;">Radiologicals</td> <td style="text-align: center;">PP</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>				SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH	@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP	@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP	@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP																																													
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE																																																																																			
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH																																																																																					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP																																																																																			
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP																																																																																			
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP																																																																																			
REMARKS: <b>(1) Sample bottles pre-preserved at laboratory prior to sample collection.</b>																																																																																											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)																																																																																											
SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)																																																																																											

NOTES:

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



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-3</b>	SAMPLE ID: <b>L16G005-03</b>
DATE: <b>7/27/16</b>	

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>10.38</b> feet to <b>20.38</b> (feet)	STATIC DEPTH TO WATER (feet): <b>3.60</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot X                      21.38                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.38</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.38</b>	PURGING INITIATED AT: <b>12:19</b>	PURGING ENDED AT: <b>12:31</b>	TOTAL VOLUME PURGED (gallons): <b>0.77</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:27	0.51	0.51	0.06	4.76	6.23	27.31	1756	0.11	7.58	YELLOW	MODERATE
12:29	0.13	0.64	0.07	4.77	6.20	27.25	1751	0.10	6.83	YELLOW	MODERATE
12:31	0.13	0.77	0.07	4.78	6.19	27.28	1744	0.09	8.04	YELLOW	MODERATE
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>12:31</b>		SAMPLING ENDED AT: <b>12:45</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>15.4</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>240</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:                      µm				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
<b>@Ino-500</b>	<b>1</b>	<b>PE</b>	<b>500ml</b>	<b>NONE</b>	<b>NONE</b>	<b>N/A</b>	<b>Inorganics</b>		<b>PP</b>		
<b>@Met-250</b>	<b>2</b>	<b>PE</b>	<b>250ml</b>	<b>HNO3</b>	<b>1ml</b>	<b>&lt;2</b>	<b>Metals</b>		<b>PP</b>		
<b>@Rad-1L</b>	<b>2</b>	<b>PE</b>	<b>1L</b>	<b>HNO3</b>	<b>5ml</b>	<b>&lt;2</b>	<b>Radiologicals</b>		<b>PP</b>		

REMARKS  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailor; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-4</b>	SAMPLE ID: <b>L16G005-04</b>
DATE: <b>7/27/16</b>	

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>8.00</b> feet to <b>18.00</b> (feet)	STATIC DEPTH TO WATER (feet): <b>3.24</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable)											
1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY = (          feet -          feet ) x          gallons/foot =          gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable)											
1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME = (          0          gallons + (          0.0026          gallons/foot X          47.03          feet ) +          0.06          gallons =          0.18          gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>14.00</b>		FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>14.00</b>		TOTAL VOLUME PURGED (gallons): <b>0.73</b>							
PURGING INITIATED AT: <b>11:30</b>											
PURGING ENDED AT: <b>11:42</b>											
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:38	0.49	0.49	0.06	3.46	6.53	27.55	1447	0.35	4.10	LT YELLOW	MILD
11:40	0.12	0.61	0.06	3.47	6.54	27.54	1445	0.22	3.83	LT YELLOW	MILD
11:42	0.12	0.73	0.06	3.47	6.55	27.60	1446	0.15	3.21	LT YELLOW	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                                  TECO</b>				SAMPLER (S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>11:42</b>		SAMPLING ENDED AT: <b>12:00</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>14.0</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>230</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:          µm				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		
REMARKS:											
(1) Sample bottles pre-preserved at laboratory prior to sample collection.											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)											
SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)											
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)											

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-5</b>	SAMPLE ID: <b>L16G005-05</b> DATE: <b>7/27/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>31.03</b> feet to <b>41.03</b> (feet)	STATIC DEPTH TO WATER (feet): <b>26.19</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
WELL VOLUME PURGE: (only filout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only filout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.03</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.03</b>	PURGING INITIATED AT: <b>10:54</b>	PURGING ENDED AT: <b>11:13</b>	TOTAL VOLUME PURGED (gallons): <b>7.52</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:09	5.94	5.94	0.40	26.94	6.38	28.24	5389	0.19	16.20	CLOUDY	NONE
11:11	0.79	6.73	0.40	26.93	6.38	28.28	5410	0.18	8.47	CLOUDY	NONE
11:13	0.79	7.52	0.40	26.94	6.38	28.25	5424	0.17	7.10	CLOUDY	NONE
WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.18; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88 TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>M.B. Kelly</i>				SAMPLING INITIATED AT: <b>11:13</b>		SAMPLING ENDED AT: <b>11:18</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>36.0</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1500</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (mL)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-6</b>	SAMPLE ID: <b>L16G005-06</b>
	DATE: <b>7/27/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.11</b> feet to <b>21.11</b> (feet)	STATIC DEPTH TO WATER (feet): <b>5.52</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fitout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                          feet -                          feet ) x                          gallons/foot =                          gallons											
EQUIPMENT VOLUME PURGE: (only fitout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                          0                          gallons + (                          0.0026                          gallons/foot x                          47.03                          feet ) +                          0.06                          gallons =                          0.18                          gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.11</b>		FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.11</b>		PURGING INITIATED AT: <b>9:53</b>							
				PURGING ENDED AT: <b>10:04</b>							
TOTAL VOLUME PURGED (gallons): <b>1.22</b>											
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:00	0.78	0.78	0.11	5.71	6.46	27.47	1500	0.21	4.91	LT YELLOW	MILD
10:02	0.22	1.00	0.11	5.70	6.47	27.56	1501	0.18	3.31	LT YELLOW	MILD
10:04	0.22	1.22	0.11	5.68	6.48	27.56	1500	0.15	4.86	LT YELLOW	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                          TECO</b>			SAMPLER(S) SIGNATURES:			SAMPLING INITIATED AT: <b>10:04</b>		SAMPLING ENDED AT: <b>10:15</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.1</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>420</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FILTER SIZE:                          µm		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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) <sub>10</sub>	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (ubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

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



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>MWB-35</b>	SAMPLE ID: <b>L16G005-07</b> DATE: <b>7/27/16</b>

**PURGING DATA**

WELL DIAMETER (inches): <b>0.0</b>	TUBING DIAMETER (inches): <b>3/8</b>	WELL SCREEN INTERVAL DEPTH: <b>13.71</b> feet to <b>18.71</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.34</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only if out if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (      feet -      feet ) x      gallons/foot =      gallons											
EQUIPMENT VOLUME PURGE: (only if out if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (      0      gallons + (      0.006      gallons/foot X      21      feet ) +      0.06      gallons =      0.19      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.00</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.00</b>	PURGING INITIATED AT: <b>10:22</b>	PURGING ENDED AT: <b>10:32</b>	TOTAL VOLUME PURGED (gallons): <b>0.95</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle) (mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:28	0.57	0.57	0.10	7.58	6.70	27.81	1310	0.20	0.57	CLEAR	MILD
10:30	0.19	0.76	0.10	7.58	6.63	27.85	1309	0.17	0.66	CLEAR	MILD
10:32	0.19	0.95	0.10	7.59	6.64	27.94	1309	0.16	1.15	CLEAR	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB      TECO</b>			SAMPLER(S) SIGNATURES: <i>RABalley</i>			SAMPLING INITIATED AT: <b>10:32</b>		SAMPLING ENDED AT: <b>10:42</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>15.0</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>360</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:      µm			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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>MWB-36</b>	SAMPLE ID: <b>L16G005 08</b> DATE: <b>7/27/16</b>

**PURGING DATA**

WELL DIAMETER (inches): <b>0.0</b>	TUBING DIAMETER (inches): <b>3/8</b>	WELL SCREEN INTERVAL DEPTH <b>13.73</b> feet to <b>18.73</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.99</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \text{feet} - \text{feet} ) \times \text{gallons/foot} = \text{gallons}$				
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( 0 \text{ gallons} + ( 0.006 \text{ gallons/foot} \times 21 \text{ feet} ) + 0.06 \text{ gallons} = 0.19 \text{ gallons}$				
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.00</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.00</b>	PURGING INITIATED AT: <b>9:20</b>	PURGING ENDED AT: <b>9:34</b>	TOTAL VOLUME PURGED (gallons): <b>0.95</b>

TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:30	0.69	0.69	0.07	8.27	6.90	29.64	2083	0.33	4.37	LT YELLOW	MODERATE
9:32	0.13	0.82	0.07	8.26	6.90	29.69	2065	0.26	4.46	LT YELLOW	MODERATE
9:34	0.13	0.95	0.07	8.27	6.90	29.67	2051	0.28	4.09	LT YELLOW	MODERATE

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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>9:34</b>		SAMPLING ENDED AT: <b>9:47</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>15.0</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>253</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (ml) (1)	FINAL pH		
<b>@Ino-500</b>	<b>1</b>	<b>PE</b>	<b>500ml</b>	<b>NONE</b>	<b>NONE</b>	<b>N/A</b>	<b>Inorganics</b>	<b>PP</b>
<b>@Met-250</b>	<b>2</b>	<b>PE</b>	<b>250ml</b>	<b>HNO3</b>	<b>1ml</b>	<b>&lt;2</b>	<b>Metals</b>	<b>PP</b>
<b>@Rad-1L</b>	<b>2</b>	<b>PE</b>	<b>1L</b>	<b>HNO3</b>	<b>5ml</b>	<b>&lt;2</b>	<b>Radiologicals</b>	<b>PP</b>

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
 SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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)

**AUGUST 2016**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

**Report Date:** 09/15/16 15:45

**Work Order - L16H075**

**Project - CCR Wells Economizer Ash Pond**

---

## Case Narrative

---

6 sample(s) were received on 08/26/16 14:38.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

The Radiological analysis was subcontracted to KNL Laboratories. The report is attached.

Lithium analysis was subcontracted to TestAmerica Labs. The report is attached.

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16H075-01	Date and Time Collected:	8/26/16 12:52
Sample Description:	PZ1	Date of Sample Receipt:	8/26/16 14:38
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	695	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 17:35
Specific Conductance	4000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 12:52
Dissolved Oxygen	0.140	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 12:52
Fluoride	0.454	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 17:25
pH	6.71	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 12:52
REDOX Potential	-34.8	mV	-999	-999		1	SM 2580B	RAB	8/26/16 12:52
Total Dissolved Solids	2980	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	1240	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 17:35
Turbidity	2.08	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 12:52
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:05
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:25
Arsenic	7.94	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:25
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:25
Cobalt	0.485	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:25
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:25
Selenium	0.385	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:25
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:25
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	115	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:45
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:45
Boron	11400	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:04
Calcium	556000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:08
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:45
Molybdenum	80.3	ug/L	1.00	20.0		1	EPA 6010B	RLC	8/30/16 12:04

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L16H075-02

Sampled By: Robert Barthelette

Sample Description: PZ2

Date and Time Collected: 8/26/16 12:23

Sample Collection Method: Grab

Date of Sample Receipt: 8/26/16 14:38

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	124	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 17:55
Specific Conductance	1570	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 12:23
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	8/26/16 12:23
Fluoride	0.150	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 17:45
pH	6.74	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 12:23
REDOX Potential	-27.3	mV	-999	-999		1	SM 2580B	RAB	8/26/16 12:23
Total Dissolved Solids	1120	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	484	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 17:55
Turbidity	3.31	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 12:23
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:27
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29
Arsenic	1.25	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/30/16 11:29
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:29
Cobalt	0.0776	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:29
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/30/16 11:29
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:29
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	61.4	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:48
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:48
Boron	2860	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:06
Calcium	192000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:10
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:48
Molybdenum	7.78	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:06

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16H075-03</b>	Date and Time Collected:	8/26/16 11:33
Sample Description:	PZ3	Date of Sample Receipt:	8/26/16 14:38
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	<b>136</b>	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 18:16
Specific Conductance	<b>1690</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 11:33
Dissolved Oxygen	<b>0.150</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 11:33
Fluoride	<b>0.286</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:06
pH	<b>6.29</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 11:33
REDOX Potential	<b>-155</b>	mV	-999	-999		1	SM 2580B	RAB	8/26/16 11:33
Total Dissolved Solids	<b>1210</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	<b>517</b>	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 18:16
Turbidity	<b>6.35</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 11:33
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:12
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Arsenic	<b>0.603</b>	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/30/16 11:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:32
Cobalt	<b>0.125</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:32
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/30/16 11:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:32
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	<b>63.6</b>	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:50
Beryllium	<b>0.272</b>	ug/L	0.200	2.00	I	1	EPA 6010B	RLC	8/29/16 11:50
Boron	<b>540</b>	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:09
Calcium	<b>200000</b>	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:13
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:50
Molybdenum	<b>8.10</b>	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:09

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16H075-05	Date and Time Collected:	8/26/16 10:56
Sample Description:	PZ5	Date of Sample Receipt:	8/26/16 14:38
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	1030	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 18:36
Specific Conductance	5140	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 10:56
Dissolved Oxygen	0.120	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/26/16 10:56
Fluoride	0.180	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:26
pH	6.41	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 10:56
REDOX Potential	-22.8	mV	-999	-999		1	SM 2580B	RAB	8/26/16 10:56
Total Dissolved Solids	4290	mg/L	120	200		10	SM 2540C	RFL	8/31/16 11:00
Sulfate	1420	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 18:36
Turbidity	6.47	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 10:56
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:15
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	1.77	ug/L	1.20	4.00	I	2	EPA 200.8	MCR	8/30/16 12:26
Arsenic	8.89	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:37
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:37
Cobalt	1.52	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Lead	0.111	ug/L	0.0800	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Selenium	1.73	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:37
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:37
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	61.4	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:56
Boron	53700	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:11
Calcium	729000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:15
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:56
Molybdenum	11.1	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:11

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16H075-06	Date and Time Collected:	8/26/16 10:10
Sample Description:	PZ6	Date of Sample Receipt:	8/26/16 14:38
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	116	mg/L	0.400	10.0		20	EPA 300.0	TMH	8/29/16 19:16
Specific Conductance	1380	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/26/16 10:10
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	8/26/16 10:10
Fluoride	0.455	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	8/29/16 18:46
pH	6.48	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/26/16 10:10
REDOX Potential	-59.5	mV	-999	-999		1	SM 2580B	RAB	8/26/16 10:10
Total Dissolved Solids	980	mg/L	24.0	40.0		2	SM 2540C	RFL	8/31/16 11:00
Sulfate	276	mg/L	10.0	40.0		20	EPA 300.0	TMH	8/29/16 19:16
Turbidity	1.73	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/26/16 10:10
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	8/30/16 15:19
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/30/16 11:40
Arsenic	2.03	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/30/16 11:40
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:40
Cobalt	0.153	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/30/16 11:40
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	MCR	8/30/16 11:40
Selenium	0.577	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/30/16 11:40
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/30/16 11:40
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	43.2	ug/L	0.500	20.0		1	EPA 6010B	RLC	8/29/16 11:59
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/29/16 11:59
Boron	3700	ug/L	10.0	50.0	V	1	EPA 6010B	RLC	8/30/16 12:14
Calcium	237000	ug/L	30.0	1000		1	EPA 6010B	RLC	8/30/16 9:18
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/29/16 11:59
Molybdenum	7.57	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/30/16 12:14

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16H0239 - EPA 6010B</b>											
<b>Blank (16H0239-BLK1)</b>					Prepared & Analyzed: 08/29/16						
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
<b>LCS (16H0239-BS1)</b>					Prepared & Analyzed: 08/29/16						
Barium	969	0.500	20.0	ug/L	1000.0		96.9	80-120			
Beryllium	1010	0.200	2.00	ug/L	1000.0		101	80-120			
Chromium	998	1.60	12.0	ug/L	1000.0		99.8	80-120			
<b>Matrix Spike (16H0239-MS1)</b>					<b>Source: L16H075-06</b>		Prepared & Analyzed: 08/29/16				
Barium	962	0.500	20.0	ug/L	1000.0	43.2	91.9	75-125			
Beryllium	954	0.200	2.00	ug/L	1000.0	U	95.4	75-125			
Chromium	946	1.60	12.0	ug/L	1000.0	U	94.6	75-125			
<b>Matrix Spike Dup (16H0239-MSD1)</b>					<b>Source: L16H075-06</b>		Prepared & Analyzed: 08/29/16				
Barium	1000	0.500	20.0	ug/L	1000.0	43.2	95.7	75-125	3.90	20	
Beryllium	993	0.200	2.00	ug/L	1000.0	U	99.3	75-125	4.02	20	
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	3.81	20	
<b>Batch 16H0254 - EPA 6010B</b>											
<b>Blank (16H0254-BLK1)</b>					Prepared: 08/29/16 Analyzed: 08/30/16						
Boron	47.3	10.0	50.0	ug/L							I
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (16H0254-BS1)</b>					Prepared: 08/29/16 Analyzed: 08/30/16						
Boron	1050	10.0	50.0	ug/L	1000.0		105	80-120			V
Molybdenum	955	1.00	20.0	ug/L	1000.0		95.5	80-120			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16H0254 - EPA 6010B

<b>Matrix Spike (16H0254-MS1)</b>		<b>Source: L16H177-02</b>			<b>Prepared: 08/29/16 Analyzed: 08/30/16</b>						
Boron	4580	10.0	50.0	ug/L	1000.0	3330	126	75-125			J-,V
Molybdenum	1020	1.00	20.0	ug/L	1000.0	15.1	101	75-125			

<b>Matrix Spike Dup (16H0254-MSD1)</b>		<b>Source: L16H177-02</b>			<b>Prepared: 08/29/16 Analyzed: 08/30/16</b>						
Boron	4550	10.0	50.0	ug/L	1000.0	3330	123	75-125	0.687	20	V
Molybdenum	1000	1.00	20.0	ug/L	1000.0	15.1	98.8	75-125	1.69	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16H0256 - EPA 7470A</b>											
<b>Blank (16H0256-BLK1)</b>					Prepared & Analyzed: 08/30/16						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (16H0256-BS1)</b>					Prepared & Analyzed: 08/30/16						
Mercury	0.946	0.0500	0.200	ug/L	1.0000		94.6	80-120			
<b>Matrix Spike (16H0256-MS1)</b>					Source: L16H075-05		Prepared & Analyzed: 08/30/16				
Mercury	0.838	0.0500	0.200	ug/L	1.0000	U	83.8	75-125			
<b>Matrix Spike Dup (16H0256-MSD1)</b>					Source: L16H075-05		Prepared & Analyzed: 08/30/16				
Mercury	0.866	0.0500	0.200	ug/L	1.0000	U	86.6	75-125	3.33	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16H0242 - EPA 200.8

#### Blank (16H0242-BLK1)

Prepared: 08/29/16 Analyzed: 08/30/16

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (16H0242-BS1)

Prepared: 08/29/16 Analyzed: 08/30/16

Antimony	95.8	0.600	2.00	ug/L	100.00		95.8	85-115			
Arsenic	94.7	0.320	2.00	ug/L	100.00		94.7	85-115			
Cadmium	92.4	0.100	0.500	ug/L	100.00		92.4	85-115			
Cobalt	95.2	0.0400	2.00	ug/L	100.00		95.2	85-115			
Lead	97.0	0.0800	2.00	ug/L	100.00		97.0	85-115			
Selenium	94.4	0.200	2.00	ug/L	100.00		94.4	85-115			
Thallium	96.6	0.100	0.500	ug/L	100.00		96.6	85-115			

#### Matrix Spike (16H0242-MS1)

Source: L16H168-01

Prepared: 08/29/16 Analyzed: 08/30/16

Antimony	97.5	3.00	10.0	ug/L	100.00	1.04	97.5	70-130			
Arsenic	107	1.60	10.0	ug/L	100.00	10.3	97.0	70-130			
Cadmium	87.4	0.500	2.50	ug/L	100.00	U	87.4	70-130			
Cobalt	93.1	0.200	10.0	ug/L	100.00	0.368	92.7	70-130			
Lead	87.9	0.400	10.0	ug/L	100.00	0.469	87.4	70-130			
Selenium	92.3	1.00	10.0	ug/L	100.00	0.773	92.3	70-130			
Thallium	88.8	0.500	2.50	ug/L	100.00	U	88.8	70-130			

#### Matrix Spike Dup (16H0242-MSD1)

Source: L16H168-01

Prepared: 08/29/16 Analyzed: 08/30/16

Antimony	98.5	3.00	10.0	ug/L	100.00	1.04	98.5	70-130	1.03	20	
Arsenic	109	1.60	10.0	ug/L	100.00	10.3	98.9	70-130	1.78	20	
Cadmium	87.5	0.500	2.50	ug/L	100.00	U	87.5	70-130	0.122	20	
Cobalt	96.4	0.200	10.0	ug/L	100.00	0.368	96.0	70-130	3.47	20	
Lead	87.6	0.400	10.0	ug/L	100.00	0.469	87.1	70-130	0.334	20	
Selenium	94.0	1.00	10.0	ug/L	100.00	0.773	94.0	70-130	1.82	20	
Thallium	88.3	0.500	2.50	ug/L	100.00	U	88.3	70-130	0.611	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16H0250 - EPA 300.0</b>											
<b>Blank (16H0250-BLK1)</b>					Prepared & Analyzed: 08/29/16						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (16H0250-BS1)</b>					Prepared & Analyzed: 08/29/16						
Chloride	5.26	0.0200	0.500	mg/L	5.0000		105	90-110			
Fluoride	5.20	0.0100	0.0500	mg/L	5.0000		104	90-110			
Sulfate	5.01	0.500	2.00	mg/L	5.0000		100	90-110			
<b>Matrix Spike (16H0250-MS1)</b>					Source: L16H174-01		Prepared & Analyzed: 08/29/16				
Chloride	456	0.400	10.0	mg/L	100.00	353	103	90-110			
Fluoride	107	0.200	1.00	mg/L	100.00	0.967	106	90-110			
Sulfate	757	10.0	40.0	mg/L	100.00	666	91.8	90-110			
<b>Matrix Spike Dup (16H0250-MSD1)</b>					Source: L16H174-01		Prepared & Analyzed: 08/29/16				
Chloride	452	0.400	10.0	mg/L	100.00	353	99.3	90-110	0.803	20	
Fluoride	106	0.200	1.00	mg/L	100.00	0.967	105	90-110	0.953	20	
Sulfate	753	10.0	40.0	mg/L	100.00	666	87.8	90-110	0.535	20	J-
<b>Batch 16H0279 - SM 2540C</b>											
<b>Blank (16H0279-BLK1)</b>					Prepared & Analyzed: 08/31/16						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (16H0279-BS1)</b>					Prepared & Analyzed: 08/31/16						
Total Dissolved Solids	996	12.0	20.0	mg/L	1000.0		99.6	80-120			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16H0279 - SM 2540C

Duplicate (16H0279-DUP1)

Source: L16H067-01

Prepared & Analyzed: 08/31/16

Total Dissolved Solids	12.0	12.0	20.0	mg/L		U				10	U
------------------------	------	------	------	------	--	---	--	--	--	----	---

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



Site: **Big Bend** Date: **08/25/16** File Name: **082516 Wells RAB** Weather: **PTYLY CLOUDY & HOT** Initials: **RAB** NGVD

Well #	Location Code	Time	FE <sub>2</sub> mg/l	pH (SU)	Temp °C	Cond(μMhos)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	Time	LEVEL	
L16H075-01	CCR-PZ-1	12:52		6.71	27.05	3995	0.14	2.08	-34.8	SO <sub>3</sub> -TR	CLEAR	NONE			
L16H075-02	CCR-PZ-2	12:23		6.74	27.35	1570	0.07	3.31	-27.3	LT. YELLOW	NONE			Total Containers	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Ndis (3)	40ml Vial (6)	500 ml Ndis (2)	1L Rads Diss. (1)	Total Containers	
L16H075-01			1			2	2								
L16H075-02			1			2	2								
(1) 1L Plastic (PP)	(2) 500ml Plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml collform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice									Sample Receipt
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	
Preservation	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	
1L bottles (rad/s): 5 ml HNO <sub>3</sub> to pH <2	L 013189	250ml bottles (rad/s): 1 ml H <sub>2</sub> SO <sub>4</sub> to pH <2	L 013189	40 ml vial (TOC): 0.5 ml H <sub>2</sub> SO <sub>4</sub> to pH <2	L 013189	1L bottles (diss. rad/s): filtered with 0.45μm, 5 ml HNO <sub>3</sub> to pH <2	L 013189	A checked box indicates that the sample was verified to a pH of <2	L 013189	500 ml bottles/Sulfide) 2ml NaOH-Zinc Acet. to pH >12	L 013189	250 ml bottles (Cyan) 1g NaOH to pH >12	L 013189		
pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Readox Cal	Time	Temp °C	Reading mv	Time	Theo Value mv	
Meter ID: MPM08	L 015189J	7	7.01	8:26		8:26	7.09	14:05	Meter ID: MPM08	8:15	21.2	237.0	236.2		
FDEP FT 1100	L 015171C	10	10.05	8:26	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)	8:26		14:10	Meter ID: MPM08	14:10	29.0	221.0	225.8		
Units: SU	L 015083D	4	4.01	8:26	A checked box indicates ICV / CCV passed	8:26		14:11	Zobell Sol ID:						
Conductivity Meter Calib.	Standard ID	Sid Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Time	Theo Value mg/l	
Meter ID: MPM08	L 014689C	1000	1000	8:44		8:44	9833	14:00	Meter ID: MPM08	8:20	21.3	8.90	8.880		
FDEP FT 1200, Units: μMhos	L 014215A	10000	10000	8:48	Acceptability Range	8:48		14:00	Meter ID: MPM08	14:45	20.9	9.13	8.932		
Turbidity Meter Calibration	Standard ID	Sid Value	Acceptability Range	Time	ICV	Time	CCV	Time	Barom. Pres	Time	Temp °C	Reading mg/l	Time	Theo Value mg/l	
Meter ID: TM07	L 013167	5.40	4.86	5:94	5.45	7:53	CCV	Time	Barom. Pres	7:60					
FDEP FT 1600, Units: NTU	L 013168	53.30	49.84	56.76	53.40	14:12	53.40	14:12	Therm ID	Therm ID	pH	Conduct(%)	DO (mg/l)	Redox (mv)	
Sulfate Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	49.84	56.76	53.40	14:12	53.40	14:12	Therm ID	Therm ID	pH	Conduct(%)	DO (mg/l)	Redox (mv)	
QC Std: 5ml (NaThio)/500ml DI=10mg/L	QC Result mg/l	Time	49.84	56.76	53.40	14:12	53.40	14:12	Meter ID: MPM08	8:20	21.3	8.90	8.880		
Well Capacities (gallons/ft): 2"=0.16 4"=0.65	Well Depth (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal)	Turbidity (NTU)	Purge Criteria	Status	Cell Volume (gal)	1 Econ Volume (gal)		
Well #	Dam Comp	2	10	15.29	20.29	5.06	15.23	0.16	21.3	0	0.06	0.12	0.12		
CCR-PZ-1	Dam Comp	2	10	15.29	20.29	5.06	15.23	0.16	21.3	0	0.06	0.12	0.12		
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (μMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID		
1A	12:36	380	0.80	0.80	5.19	6.70	26.89	3997	0.08	3.14	pH +/- 0.2	STABLE	Level Meter: WILM08		
Purge Start:	12:38	380	0.20	1.00	5.20	6.71	27.02	3998	0.20	2.26	Temp +/- 0.2	STABLE	Pump: PP		
12:28	12:40	380	0.20	1.20	5.22	6.71	27.05	3995	0.14	2.08	Cond +/- 5	STABLE	Tubing: PE/S		
Purge End:	12:40										DO % Sat < 20	STABLE	Dedicated		
Purge Complete At	12:29	Saltons to Purge	0.12	Stability Values =	6.71	27.05	3995	0.14	2.08		DO % Sat < 20	STABLE	Tubing?		
Well #	Dam Comp	2	10	15.64	20.64	5.35	15.29	0.16	21.64	0	0.06	0.12	0.12		
CCR-PZ-2	Dam Comp	2	10	15.64	20.64	5.35	15.29	0.16	21.64	0	0.06	0.12	0.12		
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (μMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID		
1A	12:01	280	0.59	0.59	5.42	6.73	27.37	1550	0.31	10.00	pH +/- 0.2	STABLE	Level Meter: WILM08		
Purge Start:	12:03	300	0.16	0.75	5.43	6.72	27.50	1552	0.30	5.55	Temp +/- 0.2	STABLE	Pump: PP		
1:15:3	12:05	300	0.16	0.91	5.43	6.74	27.35	1570	0.07	3.31	Cond +/- 5	STABLE	Tubing: PE/S		
Purge End:	12:05										DO % Sat < 20	STABLE	Dedicated		
Purge Complete At	11:55	Gallons to Purge	0.12	Stability Values =	6.74	27.35	1570	0.07	3.31		DO % Sat < 20	STABLE	Tubing?		
Comments:	Total Time Total Miles														

Site: **Big Bend** Date: **08/25/16** File Name: **082516 Wells\_RAB** Weather: **PLY CLOUDY & HOT** Sampler(s) / **RAB / TECO** Initials **Initials** NGVD **Initials**

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Cond(µMHO/S)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	Time	LEVEL
L16H075-03	CCR-PZ-3	11:33		6.29	27.07	1692	0.15	6.35	-155	SO <sub>3</sub> -TR	SCOLOR-W	SODOR-W		MILD
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuis (3)	40ml Vial (6)	500 ml Nuis (2)	1L Rads Diss. (1)	Total Containers
L16H075-03			1			2	2							5
(1) 1L plastic (PP)		(2) 500ml plastic (PP)		(3) 250ml plastic (PP)		(4) 100ml coliform bottle		(5) 1L amber glass (AG)		(6) 40ml VOA vial (CG)				Sample Receipt
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	Temp 2.1
1L bottles (radst); 5 ml HNO <sub>3</sub> to pH <2														
500 ml bottles (metast); 2 ml HNO <sub>3</sub> to pH <2														
250 ml bottles (metals); 1 ml HNO <sub>3</sub> to pH <2														
pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	Time	OCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 015169J	7	7.01	8:26	8:26	7.09	14:05	Meter ID: MPM08	8:15	21.2	237.0	236.2		
FDEP FT 1100	L 015177C	10	10.05	8:26	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)	14:10	29.0	225.8						
Units: SU	L 015083C	4	4.01	8:26	A checked box indicates ICV / CCV passed	Zobell Sol ID:								
Conductivity Meter Calib.	Standard ID	Sid Value	Cal	Time	ICV	Time	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 014669C	1000	1000	8:44	9833	8:48	14:00	Meter ID: MPM08	8:20	21.3	8.90	8.860		
FDEP FT 1200, Units: µMHO/S	L 014215A	10000	10000	8:44	Acceptability Range	Time	Time	CCV	Time	Barom. Pres	760	14:45	20.9	8.932
Turbidity Meter Calibration	Standard ID	Sid Value	Acceptability Range	Time	ICV	Time	Time	CCV	Time	Meter ID: MPM08	760	14:45	20.9	8.932
Meter ID: TM07	L 013167	5.40	4.86	5:94	5.45	7:53								
FDEP FT 1600, Units: NTU	L 013168	53.30	49.84	56.76	53.40	14:12								
Sulfite Info (QC Check) (EPA 377.1)			QC Result mg/l	Time	Titrator ID	DO 3 Pillow ID	Starch Ind. ID	Iodide/Iodide ID	Therm ID	Meter ID: MPM08	760	14:45	20.9	8.932
QC Std: 5ml (NaThio)/5000ml DI=10mg/L														

Purging Information: Well Capacities (gallons): r1= 0.16 4" = -0.55 Tubing Inside Diam. Capacities (gallons): r1= -0.0026 3/8" = -0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Water Depth (ft)	Water Column (ft)	Water Capacity (gpi)	1 Well Volume (gpi)	Tubing Capacity (gpi)	Tubing Length (ft)	Pump Volume (gpi)	Cal Volume (gpi)	1 Stick Volume (gpi)
CCR-PZ-3	2	10	15.38	20.38	3.48	16.90	0.16	2.70	0.0026	21.38	0	0.06	0.12
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHO/S)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
1A	11:12	300	0.71	0.71	3.79	6.32	27.09	1717	0.06	2.80	pH +/- 0.2	STABLE	Level Meter: WILM08
Purge Start:	11:14	310	0.16	0.87	3.81	6.29	27.02	1705	0.07	3.49	Temp +/- 0.2	STABLE	Pump: PP
11:03	11:16	300	0.16	1.03	3.81	6.29	27.07	1692	0.15	6.35	Cond +/- 5	STABLE	Tubing: PE/S
Purge End:	11:16										DO % Sat < 20	STABLE	Dedicated
Purge Complete At	11:04	Gallons to Purge	0.12	Stability Values =	6.29	27.07	1692	0.15	6.35		Turb NTU < 20	STABLE	Tubing?
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Water Depth (ft)	Water Column (ft)	Water Capacity (gpi)	1 Well Volume (gpi)	Tubing Capacity (gpi)	Tubing Length (ft)	Pump Volume (gpi)	Cal Volume (gpi)	1 Stick Volume (gpi)
0	2	10	14	18		18.00	0.16	2.88	0.0026	47.03	0	0.06	0.18
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHO/S)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
Purge Start:											pH +/- 0.2	STABLE	Level Meter: WILM08
Purge End:											Temp +/- 0.2	STABLE	Pump: PP
Purge Complete At		Gallons to Purge	0.18	Stability Values =							Cond +/- 5	STABLE	Tubing: PE/S
Comments:											DO % Sat < 20	STABLE	Dedicated

Total Time: \_\_\_\_\_ Total Miles: \_\_\_\_\_

Site: **Big Bend** Date: **08/25/16** File Name: **082516 Wells\_RAB** Weather: **PLY CLOUDY & HOT** Sampler(s) / **RAB/TECO** Initials **PP** NGVD **LEVEL**

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Condu(µMhos)	COND-F	DO mg/L	Turbidity(NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	Time	LEVEL
L16H075-02	CCR-PZ-5	10:56	6.41	6.41	28.11	5140	0.12	0.09	6.47	-22.8	SO <sub>4</sub> -TR	CLEAR	NONE		
L16H075-01	CCR-PZ-6	10:10	6.48	6.48	27.74	1381	0.09	0.09	1.73	-59.5	CLEAR	NONE			
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Val (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers	
L16H075-02			1			2	2							10	
L16H075-01			1			2	2							10	
(1) 1L plastic (PP)		(2) 500ml plastic (PP)		(3) 250ml plastic (PP)		(4) 100ml coliform bottle		(5) 1L amber glass (AG)		(6) 40ml VOA vial (CG)				Samples On Ice Time 14:38	
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	Pres ID Time 2.1 C	

Preservation	Pres ID	Time	Reading mv	Theo Value mv
1L bottles (rad): 5 ml HNO3 to pH <2	L 013189	250ml bottles (mvs): 1 ml H2SO4 to pH <2	237.0	236.2
500 ml bottles (metals): 2 ml HNO3 to pH <2	L	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	221.0	225.8
250 ml bottles (metals): 1 ml HNO3 to pH <2	L 013189	1L bottles (diss. rad): filtered with 0.45µm, 5 ml HNO3 to pH <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 015189	7	7.01	8:26							8:15	21.2	237.0
FDEP FT 1100	L 015177C	10	10.05	8:26	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)						8:20	21.3	8.90
Units: SU	L 015083D	4	4.01	8:26	A checked box indicates ICV / CCV passed						9:13	20.9	8.932

Meter ID:	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 014688C	1000	1000	8:44							8:20	21.3	8.880
FDEP FT 1200, Units: µMhos	L 014215A	10000		8:48	9833						8:20	21.3	8.880

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	OCV	Time	MPM08	Baron Pres	Therm ID	pH	Conduct (%)	DO (mg/l)	Redox (mv)
Meter ID: TM07	SF- 013167	5.40	4.86	5.94	7:53						0.2	5	0.3	10
FDEP FT 1600, Units: NTU	SF- 013168	53.30	49.84	56.76		53.40	14:12							

Sulfate Info (QC Check) (EPA 377-1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DOC 3 Pallow ID	Starch Ind ID	Iodate/Iodide ID	Therm ID	pH	Conduct (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)500ml Di=10mg/L												

Purging Information	Well Capacities (gallons/ft): 2" = 0.16, 4" = 0.65	Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026, 3/8" = 0.006
Well #	2	2
CCR-PZ-5	10	10
1A	1500	1500
10:34	1500	1500
10:51	1500	1500
10:51		

Well #	Dam/ Camp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Sept Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.22	15.89	0.16	2.54	0.0026	47.03	0	0.06	0.18
1A	10:47	1500	5.15	5.15	26.62	6.41	28.13	5024	0.14	17.20	0.2	STABLE	Eqpt. Table
10:49	1500	0.79	5.94	26.60	6.41	28.14	5066	0.13	9.08	0.2	STABLE	Level Meter: WLM08	
10:54	1500	0.79	6.73	26.58	6.41	28.11	5140	0.12	6.47	5	STABLE	Pump: ESP	
10:51											DO % Sat < 20	STABLE	Tubing: PE
10:51											DO % Sat < 20	STABLE	Dedicated Tubing: Yes
10:51											Tub NTU < 20	STABLE	Dedicated Tubing: No

Purge Complete At	10:34	Gallons to Purge	0.18	Stability Values =	6.41	28.11	5140	0.12	6.47
-------------------	-------	------------------	------	--------------------	------	-------	------	------	------

Well #	Dam/ Camp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Sept Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.22	15.89	0.16	2.54	0.0026	47.03	0	0.06	0.18
1A	9:58	560	1.33	1.33	5.48	6.50	27.61	1383	0.13	3.02	0.2	STABLE	Eqpt. Table
10:00	550	0.29	1.62	5.49	6.47	27.67	1383	0.09	2.09	0.2	STABLE	Level Meter: WLM08	
10:02	550	0.29	1.91	5.50	6.48	27.74	1381	0.09	1.73	5	STABLE	Pump: PP	
10:02											DO % Sat < 20	STABLE	Tubing: P/S
10:02											Tub NTU < 20	STABLE	Dedicated Tubing: Yes

Purge Complete At	9:50	Gallons to Purge	0.18	Stability Values =	6.48	27.74	1381	0.09	1.73
-------------------	------	------------------	------	--------------------	------	-------	------	------	------

Well #	Dam/ Camp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Sept Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.22	15.89	0.16	2.54	0.0026	47.03	0	0.06	0.18
1A	9:58	560	1.33	1.33	5.48	6.50	27.61	1383	0.13	3.02	0.2	STABLE	Eqpt. Table
10:00	550	0.29	1.62	5.49	6.47	27.67	1383	0.09	2.09	0.2	STABLE	Level Meter: WLM08	
10:02	550	0.29	1.91	5.50	6.48	27.74	1381	0.09	1.73	5	STABLE	Pump: PP	
10:02											DO % Sat < 20	STABLE	Tubing: P/S
10:02											Tub NTU < 20	STABLE	Dedicated Tubing: Yes

Purge Complete At	9:50	Gallons to Purge	0.18	Stability Values =	6.48	27.74	1381	0.09	1.73
-------------------	------	------------------	------	--------------------	------	-------	------	------	------

Well #	Dam/ Camp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Sept Volume (gal)
CCR-PZ-6	2	10	16.11	21.11	5.22	15.89	0.16	2.54	0.0026	47.03	0	0.06	0.18
1A	9:58	560	1.33	1.33	5.48	6.50	27.61	1383	0.13	3.02	0.2	STABLE	Eqpt. Table
10:00	550	0.29	1.62	5.49	6.47	27.67	1383	0.09	2.09	0.2	STABLE	Level Meter: WLM08	
10:02	550	0.29	1.91	5.50	6.48	27.74	1381	0.09	1.73	5	STABLE	Pump: PP	
10:02											DO % Sat < 20	STABLE	Tubing: P/S
10:02											Tub NTU < 20	STABLE	Dedicated Tubing: Yes

Comments: Total Time Total Miles

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

Date: 08/25/16 Sampler(s): RAB

Initials: *RAB*

Buffer ID	Buffer Value	Cal	Time	Pass/Fail	Initials	CCV	Time	Pass/Fail			
Meier ID: MPM08	0151691	7	8:26	Pass		7.09	14:05	Pass			
FDEP FT 1100	015171C	10	8:26	Pass		CCV (pH ±0.2) (Cond. ±.5%) (DO ±0.3mg/L) (Redox ±.1mv)					
Units: SU	0150830	4	8:26	Pass		A checked box indicates ICV/CCV passed					
ICV Check	014568L	7	7:05	Pass							
Conductivity Meter Calib	Standard ID	Std Value	Cal	Time		ICV	Time	Pass/Fail			
Meier ID: MPM08	014698C	1000	1000	8:44							
FDEP FT 1200, Units: uM-HOS	014215A	21	10000	8:48		9833	8:48	Pass			
Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	Time		CCV	Time	Pass/Fail			
Meier ID: MPM08	013167	5.40	4.86 - 5.94	5:45			7:53	Pass			
FDEP FT 1600, Units: NTU	013168	53.30	49.84 - 56.76	5:45			53.40	Pass			
Sulfite Infr (QC Check) (EPA 327.1)		QC Result (mg/l)	Time	Titrator ID	No. Tins ID	DDO 3 Filter ID	Standard ID	Indicator ID			
QC Std: 5ml (Natho)/500ml DI=10mg/L											
Redox Cal	Temp °C	Reading mv	Theo Value mv	Pass/Fail	DO Meter Cal	FDEP FT 1500	Time	Temp °C			
Meier ID: MPM08	21.2	237.0	236.2	Pass			8:20	21.3			
Meier ID: MPM08	29.0	221.0	225.8	Pass			14:45	20.9			
Zobell Sol ID: L	0152228			Barom Pres	760						
Therm ID: MPM08	pH	Conduct %	DO mg/l	Redox mv	CL2	Calibration	Ferrous Iron	Comparator ID:			
	0.2	5	0.3	10	0.2	Calibration		Reagent ID: L			
CO <sub>2</sub> DPD Check must read 4/-10% of the Calculated Std. Concentration multiplied by 2.4. Glycine check should read < 0.10 mg/l ClO <sub>2</sub> . Glycine check should read < 0.10 mg/l ClO <sub>2</sub> .											
Chlorine Dioxide (mg/l)	Std. Conc. (mg/l)	Std. Spike Volume (ml)	Cal. Sample Volume (ml)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Glycine Check	Time	Pass/Fail	DPD Check (mg/l)	Time	Pass/Fail
Meier ID: MPM08		1.0	100								
COMMENTS: CL2 Std. ID: L Glycine ID: L A checked box indicates reagent expiration date has been verified											
										Method 10126* Equivalent to Standard Methods, 4500 ClO <sub>2</sub> D.	

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-1</b>	SAMPLE ID: <b>L16H075-01</b> DATE: <b>8/25/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>10.29</b> feet to <b>20.29</b> (feet)	STATIC DEPTH TO WATER (feet): <b>5.06</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fitout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fitout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.29</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.29</b>	PURGING INITIATED AT: <b>12:28</b>	PURGING ENDED AT: <b>12:40</b>	TOTAL VOLUME PURGED (gallons): <b>1.20</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:36	0.80	0.80	0.10	5.19	6.70	26.89	3997	0.08	3.14	CLEAR	NONE
12:38	0.20	1.00	0.10	5.20	6.71	27.02	3998	0.20	2.26	CLEAR	NONE
12:40	0.20	1.20	0.10	5.22	6.71	27.05	3995	0.14	2.08	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0028; 5/16" = 0.004; 3/8" = 0.008; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>12:40</b>		SAMPLING ENDED AT: <b>12:52</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>15.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>380</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-2</b>	SAMPLE ID: <b>L16H075-02</b> DATE: <b>8/25/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>10.64</b> feet to <b>20.64</b> (feet)	STATIC DEPTH TO WATER (feet): <b>5.35</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>
WELL VOLUME PURGE: (only filout if applicable) <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY				

EQUIPMENT VOLUME PURGE: (only filout if applicable) <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME				
= ( <b>0</b> gallons + ( <b>0.0026</b> gallons/foot X <b>21.64</b> feet ) + <b>0.06</b> gallons = <b>0.12</b> gallons				

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.64</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>15.64</b>	PURGING INITIATED AT: <b>11:53</b>	PURGING ENDED AT: <b>12:05</b>	TOTAL VOLUME PURGED (gallons): <b>0.91</b>
---	---	------------------------------------	--------------------------------	--

TIME	VOLUME PURGED (GALLONS)	CUMUL VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:01	0.59	0.59	0.07	5.42	6.73	27.37	1550	0.31	10.00	LT. YELLOW	NONE
12:03	0.16	0.75	0.08	5.43	6.72	27.50	1552	0.30	5.55	LT. YELLOW	NONE
12:05	0.16	0.91	0.08	5.43	6.74	27.35	1570	0.07	3.31	LT. YELLOW	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB                      TECO</b>	SAMPLER(S) SIGNATURES: <i>RAB cccccc</i>	SAMPLING INITIATED AT: <b>12:05</b>	SAMPLING ENDED AT: <b>12:23</b>
--	---	-------------------------------------	---------------------------------

PUMP OR TUBING DEPTH IN WELL (feet): <b>15.6</b>	SAMPLE PUMP FLOW RATE (mL per minute): <b>293</b>	TUBING MATERIAL CODE: <b>PE/S</b>
--	---	-----------------------------------

FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>	DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
---	---	---

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH		
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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

DEP-SOP-001/01  
 FS 2200 Groundwater Sampling  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-3</b>	SAMPLE ID: <b>L16H075-03</b>
	DATE: <b>8/25/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches)	1/4	WELL SCREEN INTERVAL DEPTH	10.38	feet to	20.38	STATIC DEPTH TO WATER (feet):	3.48	PURGE PUMP TYPE OR BAILER:	PP
------------------------	--------------------------	-----	----------------------------	-------	---------	-------	-------------------------------	------	----------------------------	----

WELL VOLUME PURGE: (only fitout if applicable)  
**1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY**  
 = (      feet -      feet ) x      gallons/foot =      gallons

EQUIPMENT VOLUME PURGE: (only fitout if applicable)  
**1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME**  
 = (      0      gallons + (      0.0026      gallons/foot X      21.38      feet ) +      0.06      gallons =      0.12      gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet):	15.38	FINAL PUMP OR TUBING DEPTH IN WELL (feet):	15.38	PURGING INITIATED AT:	11:03	PURGING ENDED AT:	11:16	TOTAL VOLUME PURGED (gallons):	1.03
--	-------	--	-------	-----------------------	-------	-------------------	-------	--------------------------------	------

TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:12	0.71	0.71	0.08	3.79	6.32	27.09	1717	0.06	2.80	YELLOW	MILD
11:14	0.16	0.87	0.08	3.81	6.29	27.02	1705	0.07	3.49	YELLOW	MILD
11:16	0.16	1.03	0.08	3.81	6.29	27.07	1692	0.15	6.35	YELLOW	MILD

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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION:	RAB TECO	SAMPLER(S) SIGNATURES:	<i>RAB</i>	SAMPLING INITIATED AT:	11:16	SAMPLING ENDED AT:	11:33
-----------------------------------	-------------	------------------------	------------	------------------------	-------	--------------------	-------

PUMP OR TUBING DEPTH IN WELL (feet):	15.4	SAMPLE PUMP FLOW RATE (mL per minute):	303	TUBING MATERIAL CODE:	PE/S
--------------------------------------	------	--	-----	-----------------------	------

FIELD DECONTAMINATION: Y  N  FIELD FILTERED:  N   
 Filtration Equipment Type:  N  FILTER SIZE:      µm      DUPLICATE: Y  N

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH		
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP

REMARKS  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
 SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO.: <b>CCR-PZ-5</b>	SAMPLE ID: <b>L16H075-02</b> DATE: <b>8/25/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>31.03</b> feet to <b>41.03</b> (feet)	STATIC DEPTH TO WATER (feet): <b>25.78</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
WELL VOLUME PURGE: (only fitout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fitout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.03</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>36.03</b>	PURGING INITIATED AT: <b>10:34</b>	PURGING ENDED AT: <b>10:51</b>	TOTAL VOLUME PURGED (gallons): <b>6.73</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:47	5.15	5.15	0.40	26.62	6.41	28.13	5024	0.14	17.20	CLEAR	NONE
10:49	0.79	5.94	0.40	26.60	6.41	28.14	5066	0.13	9.08	CLEAR	NONE
10:51	0.79	6.73	0.40	26.58	6.41	28.11	5140	0.12	6.47	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>RAB</i>				SAMPLING INITIATED AT: <b>10:51</b>		SAMPLING ENDED AT: <b>10:56</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>36.0</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1500</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>CCR-PZ-6</b>	SAMPLE ID: <b>L16H075-01</b> DATE: <b>8/25/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.11</b> feet to <b>21.11</b> (feet)	STATIC DEPTH TO WATER (feet): <b>5.22</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fitout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fitout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      47.03                      feet ) +                      0.06                      gallons =                      0.18                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.11</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.11</b>	PURGING INITIATED AT: <b>9:49</b>	PURGING ENDED AT: <b>10:02</b>	TOTAL VOLUME PURGED (gallons): <b>1.91</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:58	1.33	1.33	0.15	5.48	6.50	27.61	1383	0.13	3.02	CLEAR	NONE
10:00	0.29	1.62	0.15	5.49	6.47	27.67	1383	0.09	2.09	CLEAR	NONE
10:02	0.29	1.91	0.15	5.50	6.48	27.74	1381	0.09	1.73	CLEAR	NONE
WELL CAPACITY (Gallons Per Foot): <b>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</b>											
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): <b>1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016</b>											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>			SAMPLER(S) SIGNATURES: 				SAMPLING INITIATED AT: <b>10:02</b>		SAMPLING ENDED AT: <b>10:10</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.1</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>553</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FIELD FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>			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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH				
<b>@Ino-500</b>	<b>1</b>	<b>PE</b>	<b>500ml</b>	<b>NONE</b>	<b>NONE</b>	<b>N/A</b>	<b>Inorganics</b>		<b>PP</b>	
<b>@Met-250</b>	<b>2</b>	<b>PE</b>	<b>250ml</b>	<b>HNO3</b>	<b>1ml</b>	<b>&lt;2</b>	<b>Metals</b>		<b>PP</b>	
<b>@Rad-1L</b>	<b>2</b>	<b>PE</b>	<b>1L</b>	<b>HNO3</b>	<b>5ml</b>	<b>&lt;2</b>	<b>Radiologicals</b>		<b>PP</b>	

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

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



Report Date: September 7, 2016

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L16H075-01  
 Sample Collection: 8-26-16/1252  
 Lab ID No: 16.9238  
 Lab Custody Date: 8-31-16/1415  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0 ± 1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.7 ± 1.1	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	1.3 ± 0.5	9-6-16/1039	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16H075-02  
Sample Collection: 8-26-16/1223  
Lab ID No: 16.9239  
Lab Custody Date: 8-31-16/1415  
Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	32 ± 1.6	Calc	Calc	0.7
Radium-226	pCi/l	31 ± 1.6	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	1.2 ± 0.5	9-6-16/1039	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16H075-03  
Sample Collection: 8-26-16/1133  
Lab ID No: 16.9240  
Lab Custody Date: 8-31-16/1415  
Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0 ± 1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.6 ± 1.1	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	1.4 ± 0.5	9-6-16/1039	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16H075-05  
Sample Collection: 8-26-16/1056  
Lab ID No: 16.9241  
Lab Custody Date: 8-31-16/1415  
Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	31 ± 1.4	Calc	Calc	0.7
Radium-226	pCi/l	27 ± 1.4	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	3.7 ± 0.6	9-6-16/1039	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: September 7, 2016

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L16H075-06  
 Sample Collection: 8-26-16/1010  
 Lab ID No: 16.9242  
 Lab Custody Date: 8-31-16/1415  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.0 ± 0.5	Calc	Calc	0.7
Radium-226	pCi/l	3.4 ± 0.5	9-6-16/1114	EPA 903.0	0.3
Radium-228	pCi/l	0.6 ± 0.4	9-6-16/1039	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L16H075

SENDING LABORATORY:

Tampa Electric Company, Laboratory Services
5012 Causeway Blvd
Tampa, FL 33619
Phone: (813) 630-7490
Fax: (813) 630-7360
Project Manager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services
3202 N. Florida Ave.
Tampa, FL 33603
Phone : (813) 229-2879
Fax: -

Due Date: 09/12/16 16:00

Table with 4 columns: Analysis, Expires, Laboratory ID, Comments. Contains three sample entries (L16H075-01, L16H075-02, L16H075-03, L16H075-05) with associated analysis details and container information.

Handwritten signature and date: 9-8-16

Released By: [Signature] 8-31-16 1415
Received By: [Signature] 08/31/16 1415

Released By: \_\_\_\_\_ Date & Time: \_\_\_\_\_ Received By: \_\_\_\_\_ Date & Time: \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L16H075**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L16H075-06      PZ6		Water	16 9242
Sampled: 08/26/16 10:10			
Radium 228 Ra-05	02/22/17 10:10		
Radium 226 EPA 903.0	02/22/17 10:10		
Radium 226+228, Total	02/22/17 10:10		
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)		RAD Poly HNO3 - 1000mL (D)	

*JA*  
*9-8-16*

<i>[Signature]</i>	8-31-16 1415	<i>KNL [Signature]</i>	08/16 1415
Released By	Date & Time	Received By	Date & Time

Released By	Date & Time	Received By	Date & Time
-------------	-------------	-------------	-------------





FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L16H075

Analysis Completion Date: 9 1 6 1 16

Precision Data:

Sample #: 16.9242

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>2.1</u>	<u>4.7</u>	<u>2.6</u>	<u>—</u>

Spike Data:

Sample #: 16.9242

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>0.6</u>	<u>4.0</u>	<u>4.7</u>	<u>103%</u>

LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.6</u>	<u>4.4</u>	<u>105%</u>

Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.0 +/- 0.2</u>	<u>9 1 6 1 16</u>



## FL DOH Certification # E84025

QC Summary: **Radium 226 Analysis**

Client Project #: L16H075

Analysis Completion Date: 9/16/16

### Precision Data:

Sample #: 16.9144

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>11.1</u>	<u>12.4</u>	<u>1.3</u>	<u>-</u>

### Spike Data:

Sample #: 16.9144

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>7.3</u>	<u>4.5</u>	<u>12.4</u>	<u>113%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.1</u>	<u>10.1</u>	<u>100%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.1</u>	<u>9/16/16</u>

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427

TestAmerica Job ID: 660-75848-1

Client Project/Site: L16H075

For:

Tampa Electric Company  
5010 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by:

9/9/2016 11:31:10 AM

Haukur Gudnason, Project Manager II  
(813)280-8342

[haukur.gudnason@testamericainc.com](mailto:haukur.gudnason@testamericainc.com)

Designee for

Keaton Conner, Project Mgmt. Assistant  
(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-75848-1	L16H075-01	Water	08/26/16 12:52	08/31/16 14:00
660-75848-2	L16H075-02	Water	08/26/16 12:23	08/31/16 14:00
660-75848-3	L16H075-03	Water	08/26/16 11:33	08/31/16 14:00
660-75848-4	L16H075-05	Water	08/26/16 10:56	08/31/16 14:00
660-75848-5	L16H075-06	Water	08/26/16 10:10	08/31/16 14:00

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

---

**Job ID: 660-75848-1**

---

**Laboratory: TestAmerica Tampa**

---

**Narrative**

**Job Narrative  
660-75848-1**

**Comments**

No additional comments.

**Receipt**

The samples were received on 8/31/2016 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

**Metals**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## Client Sample ID: L16H075-01

## Lab Sample ID: 660-75848-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0074	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16H075-02

## Lab Sample ID: 660-75848-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.011	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16H075-03

## Lab Sample ID: 660-75848-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0061	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16H075-05

## Lab Sample ID: 660-75848-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0074	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16H075-06

## Lab Sample ID: 660-75848-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0020	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa



# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

**Client Sample ID: L16H075-01**

Date Collected: 08/26/16 12:52

Date Received: 08/31/16 14:00

**Lab Sample ID: 660-75848-1**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0074	I	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 16:34	1

**Client Sample ID: L16H075-02**

Date Collected: 08/26/16 12:23

Date Received: 08/31/16 14:00

**Lab Sample ID: 660-75848-2**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.011	I	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 17:00	1

**Client Sample ID: L16H075-03**

Date Collected: 08/26/16 11:33

Date Received: 08/31/16 14:00

**Lab Sample ID: 660-75848-3**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0061	I	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 17:03	1

**Client Sample ID: L16H075-05**

Date Collected: 08/26/16 10:56

Date Received: 08/31/16 14:00

**Lab Sample ID: 660-75848-4**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0074	I	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 17:07	1

**Client Sample ID: L16H075-06**

Date Collected: 08/26/16 10:10

Date Received: 08/31/16 14:00

**Lab Sample ID: 660-75848-5**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0020	I	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 17:10	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-321282/1-A**  
**Matrix: Water**  
**Analysis Batch: 321733**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 321282**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		09/03/16 09:37	09/07/16 16:27	1

**Lab Sample ID: LCS 400-321282/2-A**  
**Matrix: Water**  
**Analysis Batch: 321733**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 321282**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	0.986		mg/L		99	85 - 115

**Lab Sample ID: 660-75848-1 MS**  
**Matrix: Water**  
**Analysis Batch: 321733**

**Client Sample ID: L16H075-01**  
**Prep Type: Total/NA**  
**Prep Batch: 321282**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.0074	I	1.00	1.15		mg/L		114	70 - 130

**Lab Sample ID: 660-75848-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 321733**

**Client Sample ID: L16H075-01**  
**Prep Type: Total/NA**  
**Prep Batch: 321282**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.0074	I	1.00	1.15		mg/L		114	70 - 130	0	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## Metals

### Prep Batch: 321282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75848-1	L16H075-01	Total/NA	Water	200.7	
660-75848-2	L16H075-02	Total/NA	Water	200.7	
660-75848-3	L16H075-03	Total/NA	Water	200.7	
660-75848-4	L16H075-05	Total/NA	Water	200.7	
660-75848-5	L16H075-06	Total/NA	Water	200.7	
MB 400-321282/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-321282/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-75848-1 MS	L16H075-01	Total/NA	Water	200.7	
660-75848-1 MSD	L16H075-01	Total/NA	Water	200.7	

### Analysis Batch: 321733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-75848-1	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-2	L16H075-02	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-3	L16H075-03	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-4	L16H075-05	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-5	L16H075-06	Total/NA	Water	200.7 Rev 4.4	321282
MB 400-321282/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	321282
LCS 400-321282/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-1 MS	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282
660-75848-1 MSD	L16H075-01	Total/NA	Water	200.7 Rev 4.4	321282

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

**Client Sample ID: L16H075-01**

**Date Collected: 08/26/16 12:52**

**Date Received: 08/31/16 14:00**

**Lab Sample ID: 660-75848-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 16:34	JMH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16H075-02**

**Date Collected: 08/26/16 12:23**

**Date Received: 08/31/16 14:00**

**Lab Sample ID: 660-75848-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:00	JMH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16H075-03**

**Date Collected: 08/26/16 11:33**

**Date Received: 08/31/16 14:00**

**Lab Sample ID: 660-75848-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:03	JMH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16H075-05**

**Date Collected: 08/26/16 10:56**

**Date Received: 08/31/16 14:00**

**Lab Sample ID: 660-75848-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:07	JMH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16H075-06**

**Date Collected: 08/26/16 10:10**

**Date Received: 08/31/16 14:00**

**Lab Sample ID: 660-75848-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	321282	09/03/16 09:37	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			321733	09/07/16 17:10	JMH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Certification Summary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

## Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E84282	06-30-17

## Laboratory: TestAmerica Pensacola

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E81010	06-30-17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L16H075

TestAmerica Job ID: 660-75848-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L16H075**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone: (813) 885-7427  
 Fax: -

**Due Date: 09/12/16 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L16H075-01</b> <b>PZ1</b> <b>Sampled: 08/26/16 12:52</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	02/22/17 12:52	Water	
<b>Sample ID: L16H075-02</b> <b>PZ2</b> <b>Sampled: 08/26/16 12:23</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	02/22/17 12:23	Water	
<b>Sample ID: L16H075-03</b> <b>PZ3</b> <b>Sampled: 08/26/16 11:33</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	02/22/17 11:33	Water	
<b>Sample ID: L16H075-05</b> <b>PZ5</b> <b>Sampled: 08/26/16 10:56</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	02/22/17 10:56	Water	
<b>Sample ID: L16H075-06</b> <b>PZ6</b> <b>Sampled: 08/26/16 10:10</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	02/22/17 10:10	Water	



660-75848 Chain of Custody

Loc: 860  
**75848**

0.8/1.0 w-09

*Released By* [Signature] 8-26-16 1455  
 Released By      Date & Time

*Received By* [Signature] 8-31-16 20945  
 Received By      Date & Time

*Released By* [Signature] 8-31-16@1400  
 Released By      Date & Time

*Received By* [Signature] 8/31/16 1400  
 Received By      Date & Time

Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b> Client Contact: Shipping/Receiving Company: TestAmerica Laboratories, Inc. Address: 3355 McLemore Drive, Pensacola, FL 32514 Phone: 850-474-1001 (Tel) 850-478-2671 (Fax) Email: Project Name: L16H075 Site:		Lab PVI: Conner, Keaton E-Mail: keaton.conner@testamericainc.com Carrier Tracking No(s): COC No: 660-901611 Page: Page 1 of 1 Job #: 660-75848-1	
Due Date Requested: 9/8/2016 TAT Requested (days): PO #: WO #: Project #: 66004821 SOW#:		<b>Analysis Requested</b> Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
<b>Sample Identification - Client ID (Lab ID)</b> L16H075-01 (660-75848-1) L16H075-02 (660-75848-2) L16H075-03 (660-75848-3) L16H075-05 (660-75848-4) L16H075-06 (660-75848-5)		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> X Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> X Total Number of Containers <input checked="" type="checkbox"/> X Special Instructions/Note:	
Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil)
8/26/16	12:52 Eastern	Water	Water
8/26/16	12:23 Eastern	Water	Water
8/26/16	11:33 Eastern	Water	Water
8/26/16	10:56 Eastern	Water	Water
8/26/16	10:10 Eastern	Water	Water
<b>Possible Hazard Identification</b> Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Relinquished by: <i>[Signature]</i> Relinquished by: <i>[Signature]</i> Relinquished by:		Received by: <i>[Signature]</i> Received by: <i>[Signature]</i> Received by:	
Date/Time: 9/1/16 1700 Date/Time:		Date/Time: 9/2/16 0908 Date/Time:	
Company: TA-TA Company:		Company: <i>[Signature]</i> Company:	
Date:		Method of Shipment:	
Custody Seal No.: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks: 299 9.02 All <i>[Signature]</i>	





# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-75848-1

**Login Number: 75848**

**List Source: TestAmerica Tampa**

**List Number: 1**

**Creator: Southers, Kristin B**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-75848-1

**Login Number: 75848**

**List Number: 2**

**Creator: Johnson, Jeremy N**

**List Source: TestAmerica Pensacola**

**List Creation: 09/02/16 11:57 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**OCTOBER 2016**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 11/17/16 15:52

Work Order - L16J027

Project - CCR Wells Economizer Ash Pond

---

## Case Narrative

---

5 sample(s) were received on 10/28/16 12:45.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### EPA 300.0

The recovery of the matrix spike for Chloride and Sulfate was just below the control limits. The parent sample is flagged with a J qualifier.

### EPA 6010

The recovery of the matrix spike and spike duplicate for Calcium could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW-1. The sample(s) are flagged with a J qualifier.

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
Lab Sample ID: L16J027-01  
Sample Description: BBS-CCR-1  
Sample Collection Method: Grab

Sampled By: Robert Barthelette  
Date and Time Collected: 10/28/16 11:42  
Date of Sample Receipt: 10/28/16 12:45

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	743	mg/L	0.400	10.0	J-,V	20	EPA 300.0	TMH	11/1/16 16:05
Specific Conductance	4060	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 11:42
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	10/28/16 11:42
Fluoride	0.104	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 15:55
pH	6.83	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 11:42
REDOX Potential	-107	mV	-999	-999		1	SM 2580B	RAB	10/28/16 11:42
Total Dissolved Solids	3170	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	10/31/16 12:40
Sulfate	1230	mg/L	10.0	40.0	J-	20	EPA 300.0	TMH	11/1/16 16:05
Turbidity	3.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 11:42
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:47
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:35
Arsenic	8.30	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/2/16 9:35
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:35
Cobalt	0.507	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:35
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/2/16 9:35
Selenium	0.690	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:35
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:35
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	122	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 9:59
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 9:59
Boron	15700	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:23
Calcium	556000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:22
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 9:59
Molybdenum	95.5	ug/L	1.00	20.0		1	EPA 6010B	MCR	11/1/16 9:59

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16J027-02	Date and Time Collected:	10/28/16 11:15
Sample Description:	BBS-CCR-2	Date of Sample Receipt:	10/28/16 12:45
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	112	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 16:45
Specific Conductance	1500	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 11:15
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 11:15
Fluoride	0.171	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 16:35
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 11:15
REDOX Potential	-183	mV	-999	-999		1	SM 2580B	RAB	10/28/16 11:15
Total Dissolved Solids	1130	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40
Sulfate	468	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 16:45
Turbidity	3.73	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 11:15
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:50
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:39
Arsenic	1.16	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:39
Cobalt	0.107	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Lead	0.129	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Selenium	0.333	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:39
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:39
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	60.6	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:02
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:02
Boron	2080	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:25
Calcium	181000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:25
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:02
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	11/1/16 10:02

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16J027-03	Date and Time Collected:	10/28/16 10:50
Sample Description:	BBS-CCR-3	Date of Sample Receipt:	10/28/16 12:45
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	140	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 17:26
Specific Conductance	1640	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 10:50
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	10/28/16 10:50
Fluoride	0.299	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:15
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 10:50
REDOX Potential	-266	mV	-999	-999		1	SM 2580B	RAB	10/28/16 10:50
Total Dissolved Solids	1220	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40
Sulfate	541	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 17:26
Turbidity	3.26	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 10:50
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:54
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:43
Arsenic	0.623	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:43
Cobalt	0.124	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43
Lead	0.107	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/2/16 9:43
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	11/2/16 9:43
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:43
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	66.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:04
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:04
Boron	532	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:28
Calcium	201000	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:27
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:04
Molybdenum	3.63	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:04

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16J027-04</b>	Date and Time Collected:	10/28/16 10:14
Sample Description:	BBS-CCR-BW-1	Date of Sample Receipt:	10/28/16 12:45
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	<b>939</b>	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 17:46
Specific Conductance	<b>4860</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 10:14
Dissolved Oxygen	<b>0.130</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 10:14
Fluoride	<b>0.194</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:36
pH	<b>6.50</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 10:14
REDOX Potential	<b>-76.2</b>	mV	-999	-999		1	SM 2580B	RAB	10/28/16 10:14
Total Dissolved Solids	<b>4120</b>	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	10/31/16 12:40
Sulfate	<b>1400</b>	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 17:46
Turbidity	<b>4.08</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 10:14
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 9:57
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17
Arsenic	3.20	ug/L	3.20	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	11/2/16 11:17
Cobalt	<b>0.963</b>	ug/L	0.400	20.0	I	10	EPA 200.8	RLC	11/2/16 11:17
Lead	0.800	ug/L	0.800	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	11/2/16 11:17
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	11/2/16 11:17
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	<b>60.0</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:07
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:07
Boron	<b>51400</b>	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:31
Calcium	<b>675000</b>	ug/L	30.0	1000	V	1	EPA 6010B	MCR	11/1/16 11:30
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:07
Molybdenum	<b>6.00</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:07

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16J027-05	Date and Time Collected:	10/28/16 9:42
Sample Description:	BBS-CCR-BW-2	Date of Sample Receipt:	10/28/16 12:45
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	125	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/1/16 18:06
Specific Conductance	1340	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/28/16 9:42
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/28/16 9:42
Fluoride	0.440	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/1/16 17:56
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/28/16 9:42
REDOX Potential	-91.5	mV	-999	-999		1	SM 2580B	RAB	10/28/16 9:42
Total Dissolved Solids	1010	mg/L	24.0	40.0		2	SM 2540C	RFL	10/31/16 12:40
Sulfate	246	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/1/16 18:06
Turbidity	3.99	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/28/16 9:42
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/4/16 10:27
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/2/16 9:50
Arsenic	1.62	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:50
Cobalt	0.151	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/2/16 9:50
Selenium	0.489	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/2/16 9:50
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/2/16 9:50
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	46.3	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/1/16 10:10
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/1/16 10:10
Boron	3900	ug/L	10.0	50.0		1	EPA 6010B	MCR	11/2/16 11:33
Calcium	238000	ug/L	30.0	1000	J-,V	1	EPA 6010B	MCR	11/1/16 11:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/1/16 10:10
Molybdenum	1.42	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/1/16 10:10

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16J0236 - EPA 6010B</b>											
<b>Blank (16J0236-BLK1)</b>					Prepared: 10/31/16 Analyzed: 11/01/16						
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	10.0	10.0	50.0	ug/L							U
Calcium	38.1	30.0	1000	ug/L							I
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (16J0236-BS1)</b>					Prepared: 10/31/16 Analyzed: 11/01/16						
Barium	1030	0.500	20.0	ug/L	1000.0		103	80-120			
Beryllium	1060	0.200	2.00	ug/L	1000.0		106	80-120			
Boron	1070	10.0	50.0	ug/L	1000.0		107	80-120			
Chromium	1040	1.60	12.0	ug/L	1000.0		104	80-120			
Molybdenum	978	1.00	20.0	ug/L	1000.0		97.8	80-120			
<b>Matrix Spike (16J0236-MS1)</b>					<b>Source: L16J027-05</b>		Prepared: 10/31/16 Analyzed: 11/01/16				
Barium	1050	0.500	20.0	ug/L	1000.0	46.3	99.9	75-125			
Beryllium	1030	0.200	2.00	ug/L	1000.0	U	103	75-125			
Boron	4890	10.0	50.0	ug/L	1000.0	3900	98.6	75-125			
Chromium	1000	1.60	12.0	ug/L	1000.0	U	100	75-125			
Molybdenum	970	1.00	20.0	ug/L	1000.0	1.42	96.8	75-125			
<b>Matrix Spike Dup (16J0236-MSD1)</b>					<b>Source: L16J027-05</b>		Prepared: 10/31/16 Analyzed: 11/01/16				
Barium	1080	0.500	20.0	ug/L	1000.0	46.3	104	75-125	3.62	20	
Beryllium	1060	0.200	2.00	ug/L	1000.0	U	106	75-125	2.92	20	
Boron	4950	10.0	50.0	ug/L	1000.0	3900	105	75-125	1.32	20	
Chromium	1040	1.60	12.0	ug/L	1000.0	U	104	75-125	3.52	20	
Molybdenum	1020	1.00	20.0	ug/L	1000.0	1.42	102	75-125	5.04	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0037 - EPA 7470A</b>											
<b>Blank (16K0037-BLK1)</b>					Prepared: 11/03/16 Analyzed: 11/04/16						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (16K0037-BS1)</b>					Prepared: 11/03/16 Analyzed: 11/04/16						
Mercury	1.04	0.0500	0.200	ug/L	1.0000		104	80-120			
<b>Matrix Spike (16K0037-MS1)</b>					Source: L16K028-03		Prepared: 11/03/16 Analyzed: 11/04/16				
Mercury	0.893	0.0500	0.200	ug/L	1.0000	U	89.3	75-125			
<b>Matrix Spike Dup (16K0037-MSD1)</b>					Source: L16K028-03		Prepared: 11/03/16 Analyzed: 11/04/16				
Mercury	0.922	0.0500	0.200	ug/L	1.0000	U	92.2	75-125	3.22	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16J0235 - EPA 200.8

#### Blank (16J0235-BLK1)

Prepared: 10/31/16 Analyzed: 11/02/16

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (16J0235-BS1)

Prepared: 10/31/16 Analyzed: 11/02/16

Antimony	103	0.600	2.00	ug/L	100.00		103	85-115			
Arsenic	98.4	0.320	2.00	ug/L	100.00		98.4	85-115			
Cadmium	102	0.100	0.500	ug/L	100.00		102	85-115			
Cobalt	104	0.0400	2.00	ug/L	100.00		104	85-115			
Lead	106	0.0800	2.00	ug/L	100.00		106	85-115			
Selenium	95.2	0.200	2.00	ug/L	100.00		95.2	85-115			
Thallium	106	0.100	0.500	ug/L	100.00		106	85-115			

#### Matrix Spike (16J0235-MS1)

Source: L16J027-01

Prepared: 10/31/16 Analyzed: 11/02/16

Antimony	99.1	0.600	2.00	ug/L	100.00	U	99.1	70-130			
Arsenic	92.9	0.320	2.00	ug/L	100.00	8.30	84.6	70-130			
Cadmium	77.6	0.100	0.500	ug/L	100.00	U	77.6	70-130			
Cobalt	85.1	0.0400	2.00	ug/L	100.00	0.507	84.6	70-130			
Lead	88.4	0.0800	2.00	ug/L	100.00	U	88.4	70-130			
Selenium	82.3	0.200	2.00	ug/L	100.00	0.690	81.6	70-130			
Thallium	92.1	0.100	0.500	ug/L	100.00	U	92.1	70-130			

#### Matrix Spike Dup (16J0235-MSD1)

Source: L16J027-01

Prepared: 10/31/16 Analyzed: 11/02/16

Antimony	99.3	0.600	2.00	ug/L	100.00	U	99.3	70-130	0.240	20	
Arsenic	94.6	0.320	2.00	ug/L	100.00	8.30	86.3	70-130	1.88	20	
Cadmium	78.8	0.100	0.500	ug/L	100.00	U	78.8	70-130	1.46	20	
Cobalt	88.2	0.0400	2.00	ug/L	100.00	0.507	87.6	70-130	3.47	20	
Lead	88.2	0.0800	2.00	ug/L	100.00	U	88.2	70-130	0.156	20	
Selenium	84.6	0.200	2.00	ug/L	100.00	0.690	83.9	70-130	2.73	20	
Thallium	92.3	0.100	0.500	ug/L	100.00	U	92.3	70-130	0.295	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16J0241 - SM 2540C</b>											
<b>Blank (16J0241-BLK1)</b>					Prepared & Analyzed: 10/31/16						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (16J0241-BS1)</b>					Prepared & Analyzed: 10/31/16						
Total Dissolved Solids	1020	12.0	20.0	mg/L	1000.0		102	80-120			
<b>Duplicate (16J0241-DUP1)</b>					Source: L16J027-01		Prepared & Analyzed: 10/31/16				
Total Dissolved Solids	3200	24.0	40.0	mg/L		3170			1.01	10	J-
<b>Duplicate (16J0241-DUP2)</b>					Source: L16J141-02		Prepared & Analyzed: 10/31/16				
Total Dissolved Solids	135	12.0	20.0	mg/L		128			5.32	10	
<b>Batch 16K0007 - EPA 300.0</b>											
<b>Blank (16K0007-BLK1)</b>					Prepared & Analyzed: 11/01/16						
Chloride	0.101	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (16K0007-BS1)</b>					Prepared & Analyzed: 11/01/16						
Chloride	4.88	0.0200	0.500	mg/L	5.0000		97.5	90-110			V
Fluoride	4.76	0.0100	0.0500	mg/L	5.0000		95.2	90-110			
Sulfate	5.12	0.500	2.00	mg/L	5.0000		102	90-110			
<b>Matrix Spike (16K0007-MS1)</b>					Source: L16J027-01		Prepared & Analyzed: 11/01/16				
Chloride	831	0.400	10.0	mg/L	100.00	743	87.9	90-110			J-,V
Fluoride	105	0.200	1.00	mg/L	100.00	0.104	105	90-110			
Sulfate	1310	10.0	40.0	mg/L	100.00	1230	80.7	90-110			J-

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16K0007 - EPA 300.0

Matrix Spike Dup (16K0007-MSD1)	Source: L16J027-01				Prepared & Analyzed: 11/01/16						
Chloride	836	0.400	10.0	mg/L	100.00	743	93.4	90-110	0.659	20	V
Fluoride	106	0.200	1.00	mg/L	100.00	0.104	106	90-110	0.900	20	
Sulfate	1320	10.0	40.0	mg/L	100.00	1230	90.2	90-110	0.726	20	

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend** Date: **10/28/116** File Name: **10/28/116\_Wells\_RAB** Weather: **PTLY CLOUDY & WARM** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16J027-01	BBS-CCR-1	11:42		6.83	25.78	4064	0.04	3.22	-106.80		CLEAR	NONE	11:47	
L16J027-02	BBS-CCR-2	11:15		6.87	25.64	1505	0.10	3.73	-183.20		LT YELLOW	NONE	10:58	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16J027-01	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16J027-02	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 01073001Y ESS 0218201Y ESS 0307301Y ESS

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID
1L bottles (rads): 5 ml HNO3 to pH <2	L 010688 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 010688 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2	

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016047E	7	7.02	8:20			7.09	12:37	Meter ID: MPM08	8:36	21.7	236.0	236.2
FDEP FT 1100	L 016500A	10	10.05	8:20	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	12:32	21.8	232.5	236.2
Units: SU	L 015514B	4	3.99	8:20	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 013847E	1000	1000	8:29					Meter ID: MPM08	8:12	21.6	8.86	8.829
FDEP FT 1200, Units: uMHOS	L 015370B	10000			9760	8:31	9720	12:28					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TMO7	L 013677	5.28	4.75	5.81	5.35	7:55		Barom. Pres				
FDEP FT 1600, Units: NTU	L 013678	52.20	48.81	55.59			52.30	12:35	760			

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026, 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	6.78	15.54	0.16	2.49	0.0026	23.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:14	700	1.29	1.29	6.94	6.84	25.82	4056	0.05	4.74	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:16	700	0.37	1.66	6.94	6.83	25.80	4067	0.04	3.65	Temp°C+/- 0.2	STABLE	Pump:	PP
11:07	11:18	700	0.37	2.03	6.92	6.83	25.78	4064	0.04	3.22	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
11:18											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At	11:08	Gallons to Purge	0.12	Stability Values =	6.83	25.78	4064	0.04	3.22					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-2	2	10	16.84	21.84	6.78	15.06	0.16	2.41	0.0026	22.84	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:04	720	0.95	0.95	6.92	6.85	25.64	1467	0.08	6.03	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:06	700	0.37	1.32	6.92	6.86	25.62	1485	0.09	3.88	Temp°C+/- 0.2	STABLE	Pump:	PP
10:59	11:08	700	0.37	1.69	6.92	6.87	25.64	1505	0.10	3.73	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
11:08											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At	11:00	Gallons to Purge	0.12	Stability Values =	6.87	25.64	1505	0.10	3.73					

Comments:

Total Time Total Miles



Site: **Big Bend** Date: **10/28/116** File Name: **10/28/116 Wells\_RAB** Weather: **PTLY CLOUDY & WARM** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16J027-03	BBS-CCR-3 CCR-PZ-4	10:50		6.42	26.20	1645	0.03	3.26	-265.90		YELLOW	STRONG	10:27	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16J027-03	<input type="checkbox"/>		<b>1</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>2</b>	<input checked="" type="checkbox"/>	<b>2</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>5</b>

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 01073001Y ESS 0218201Y ESS 0307301Y ESS

Samples On Ice  Yes  No Time 12:45

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	<input type="checkbox"/>	L 010688 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	<input type="checkbox"/>	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	<input type="checkbox"/>	L <input type="checkbox"/>	2.7
500 ml bottles (metals): 2 ml HNO3 to pH <2	<input type="checkbox"/>	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	<input type="checkbox"/>	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	<input type="checkbox"/>	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	<input type="checkbox"/>	L 010688 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	<input type="checkbox"/>	L <input type="checkbox"/>	<b>A checked box indicates that the sample was verified to a pH of &lt;2</b>			

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016047E	7	7.02	8:20			7.09	12:37	Meter ID: MPM08	8:36	21.7	236.0	236.2
FDEP FT 1100	L 016500A	10	10.05	8:20	<b>QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)</b>				8:36	21.8	232.5	236.2	
Units: SU	L 015514B	4	3.99	8:20	<b>A checked box indicates ICV / CCV passed</b>				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 013847E	1000	1000	8:29					Meter ID: MPM08	8:12	21.6	8.86	8.829
FDEP FT 1200, Units: uMHOS	L 015370B	10000			9760	8:31	9720	12:28	8:12	21.8	8.83	8.777	

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
Meter ID: TM07	L 013677	5.28	4.75 - 5.81	5.35	7:55			MPM08	12:35	21.8	8.83	8.777
FDEP FT 1600, Units: NTU	L 013678	52.20	48.81 - 55.59			52.30	12:35	760				

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026 3/8" = 0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-3	2	10	18.23	23.23	6.54	16.69	0.16	2.67	0.0026	24.23	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:35	340	0.72	0.72	6.98	6.41	26.08	1685	0.04	5.33	ph:+/- 0.2	STABLE	Level Meter: WLM08	
Purge Start:	10:37	340	0.18	0.90	6.98	6.41	26.19	1660	0.04	4.23	Temp°C+/- 0.2	STABLE	Pump: PP	
	10:27	10:39	340	0.18	1.08	6.42	26.20	1645	0.03	3.26	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:	10:39										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
<b>Purge Complete At 10:28</b>		<b>Gallons to Purge 0.12</b>		Stability Values =		6.42	26.20	1645	0.03	3.26				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
CCR-PZ-4	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
											ph:+/- 0.2		Level Meter: WLM08	
Purge Start:											Temp°C+/- 0.2		Pump: PP	
											Cond % +/- 5		Tubing: PE/S	
Purge End:											DO % Sat. < 20		Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20		Tubing? <input type="checkbox"/> No	
<b>Purge Complete At</b>		<b>Gallons to Purge 0.32</b>		Stability Values =										

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **10/28/116** File Name: **10/28/116 Wells\_RAB** Weather: **PTLY CLOUDY & WARM** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16J027-04	BBS-CCR-BW-1	10:14		6.50	27.46	4858	0.13	4.08	-76.20		CLEAR	MILD	9:51	
L16J027-05	BBS-CCR-BW-2	9:42		6.67	27.22	1345	0.37	3.99	-91.5		LT. YELLOW	MILD	9:17	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16J027-04	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16J027-05	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice	Sample Receipt
ESS	01073001Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS
						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Time 12:45

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	<input checked="" type="checkbox"/>	010688	250ml bottles (nuts): 1 ml H2SO4 to pH <2	<input type="checkbox"/>		500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	<input type="checkbox"/>		2.7
500 ml bottles (metals): 2 ml HNO3 to pH <2	<input type="checkbox"/>		40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	<input type="checkbox"/>		250 ml bottles (Cyan) 1g NaOH to pH >12	<input type="checkbox"/>		
250 ml bottles (metal): 1 ml HNO3 to pH <2	<input checked="" type="checkbox"/>	010688	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2	<input type="checkbox"/>		<b>A checked box indicates that the sample was verified to a pH of &lt;2</b>			

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016047E	7	7.02	8:20			7.09	12:37	Meter ID: MPM08	8:36	21.7	236.0	236.2
FDEP FT 1100	L 016500A	10	10.05	8:20	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	12:32	21.8	232.5	236.2
Units: SU	L 015514B	4	3.99	8:20	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L	016396	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 013847E	1000	1000	8:29					<input type="checkbox"/>		Meter ID:	8:12	21.6	8.86	8.829
FDEP FT 1200, Units: µMHOS	L 015370B	10000			9760	8:31	9720	12:28	<input type="checkbox"/>						

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Meter ID	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TM07	SF- 013677	5.28	4.75 - 5.81	5.35	7:55			Meter ID: MPM08	12:35	21.8	8.83	8.777
FDEP FT 1600, Units: NTU	SF- 013678	52.20	48.81 - 55.59			52.30	12:35	Barom. Pres				

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titratior ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-BW-1	2	10	39.3	44.3	29.42	14.88	0.16	2.38	0.0026	100	0.32

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:06	1600	5.92	5.92	30.33	6.51	27.47	4790	0.14	13.30	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:08	1600	0.85	6.77	30.33	6.51	27.44	4838	0.14	7.31	Temp°C +/- 0.2	STABLE	Pump:	ESP
	9:52	10:10	1600	0.85	7.62	30.33	27.46	4858	0.13	4.08	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:											DO % Sat. < 20	STABLE	Dedicated	<input type="checkbox"/> Yes
	10:10										Turb. NTU < 20	STABLE	Tubing?	<input checked="" type="checkbox"/> No
Purge Complete At		9:53	Gallons to Purge 0.32		Stability Values =		6.50	27.46	4858	0.13	4.08			

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-BW-2	2	10	18.49	23.84	8.06	15.78	0.16	2.52	0.0026	24.64	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:30	500	0.66	0.66	8.28	6.67	27.27	1346	0.19	5.36	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:32	500	0.26	0.92	8.29	6.67	27.25	1346	0.17	4.39	Temp°C +/- 0.2	STABLE	Pump:	PP
	9:25	9:34	480	0.25	1.17	8.29	27.22	1345	0.37	3.99	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
	9:34										Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
Purge Complete At		9:26	Gallons to Purge 0.12		Stability Values =		6.67	27.22	1345	0.37	3.99			

Comments: Total Time Total Miles

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-1</b>	SAMPLE ID: <b>L16J027-01</b>
DATE: <b>10/28/116</b>	

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>12.32</b> feet to <b>22.32</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.78</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= (\text{feet} - \text{feet}) \times \text{gallons/foot} = \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= (0 \text{ gallons}) + (0.0026 \text{ gallons/foot} \times 23.3 \text{ feet}) + 0.06 \text{ gallons} = 0.12 \text{ gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	PURGING INITIATED AT: <b>11:07</b>	PURGING ENDED AT: <b>11:18</b>	TOTAL VOLUME PURGED (gallons): <b>2.03</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. ( $\mu\text{mhos/cm}$ OR $\mu\text{S/cm}$ )	DISSOLVED OXYGEN ( $\text{mg/l}$ or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:14	1.29	1.29	0.18	6.94	6.84	25.82	4056	0.05	4.74	CLEAR	NONE
11:16	0.37	1.66	0.19	6.94	6.83	25.80	4067	0.04	3.65	CLEAR	NONE
11:18	0.37	2.03	0.19	6.92	6.83	25.78	4064	0.04	3.22	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:18</b>		SAMPLING ENDED AT: <b>11:42</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>17.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>700</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE: $\mu\text{m}$				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		
REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.											
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)											
SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)											

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L16J027-02</b> DATE: <b>10/28/116</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.78</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>10:59</b>	PURGING ENDED AT: <b>11:08</b>	TOTAL VOLUME PURGED (gallons): <b>1.69</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:04	0.95	0.95	0.19	6.92	6.85	25.64	1467	0.08	6.03	LT YELLOW	NONE
11:06	0.37	1.32	0.19	6.92	6.86	25.62	1485	0.09	3.88	LT YELLOW	NONE
11:08	0.37	1.69	0.19	6.92	6.87	25.64	1505	0.10	3.73	LT YELLOW	NONE
<b>WELL CAPACITY</b> (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 <b>TUBING INSIDE DIA. CAPACITY</b> (Gal./Ft.): 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:08</b>		SAMPLING ENDED AT: <b>11:15</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>707</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RPPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    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)

**DEP-SOP-001/01**  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-3</b>	SAMPLE ID: <b>L16J027-03</b> DATE: <b>10/28/116</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.23</b> feet to <b>23.23</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.54</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.23                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>		FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>		PURGING INITIATED AT: <b>10:27</b>	PURGING ENDED AT: <b>10:39</b>	TOTAL VOLUME PURGED (gallons): <b>1.08</b>					
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:35	0.72	0.72	0.09	6.98	6.41	26.08	1685	0.04	5.33	YELLOW	STRONG
10:37	0.18	0.90	0.09	6.98	6.41	26.19	1660	0.04	4.23	YELLOW	STRONG
10:39	0.18	1.08	0.09	6.99	6.42	26.20	1645	0.03	3.26	YELLOW	STRONG
<b>WELL CAPACITY</b> (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 <b>TUBING INSIDE DIA. CAPACITY</b> (Gal./Ft.): 1/8" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:39</b>		SAMPLING ENDED AT: <b>10:50</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.2</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>340</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Filtration Equipment Type: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:      µm				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		
REMARKS:											
(1) Sample bottles pre-preserved at laboratory prior to sample collection.											

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L16J027-04</b> DATE: <b>10/28/116</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> (feet) to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>29.42</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>9:52</b>	PURGING ENDED AT: <b>10:10</b>	TOTAL VOLUME PURGED (gallons): <b>7.62</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:06	5.92	5.92	0.42	30.33	6.51	27.47	4790	0.14	13.30	CLEAR	MILD
10:08	0.85	6.77	0.43	30.33	6.51	27.44	4838	0.14	7.31	CLEAR	MILD
10:10	0.85	7.62	0.43	30.33	6.50	27.46	4858	0.13	4.08	CLEAR	MILD
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:10</b>		SAMPLING ENDED AT: <b>10:14</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1600</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L16J027-05</b> DATE: <b>10/28/116</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>8.06</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:25</b>	PURGING ENDED AT: <b>9:34</b>	TOTAL VOLUME PURGED (gallons): <b>1.17</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:30	0.66	0.66	0.13	8.28	6.67	27.27	1346	0.19	5.36	LT. YELLOW	MILD
9:32	0.26	0.92	0.13	8.29	6.67	27.25	1346	0.17	4.39	LT. YELLOW	MILD
9:34	0.25	1.17	0.13	8.29	6.67	27.22	1345	0.37	3.99	LT. YELLOW	MILD
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>9:34</b>		SAMPLING ENDED AT: <b>9:42</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>493</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427

TestAmerica Job ID: 660-77026-1

Client Project/Site: L16J027

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by:  
11/8/2016 3:31:26 PM

Keaton Conner, Project Mgmt. Assistant  
(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14





# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-77026-1	L16J027-01	Water	10/28/16 11:42	11/02/16 10:40
660-77026-2	L16J027-02	Water	10/28/16 11:15	11/02/16 10:40
660-77026-3	L16J027-03	Water	10/28/16 10:50	11/02/16 10:40
660-77026-4	L16J027-04	Water	10/28/16 10:14	11/02/16 10:40
660-77026-5	L16J027-05	Water	10/28/16 09:42	11/02/16 10:40

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

---

**Job ID: 660-77026-1**

---

**Laboratory: TestAmerica Tampa**

---

**Narrative**

**Job Narrative  
660-77026-1**

**Receipt**

The samples were received on 11/2/2016 10:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.4° C.

**Metals**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

## Client Sample ID: L16J027-01

## Lab Sample ID: 660-77026-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.012	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16J027-02

## Lab Sample ID: 660-77026-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.014	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16J027-03

## Lab Sample ID: 660-77026-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0082	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16J027-04

## Lab Sample ID: 660-77026-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.011	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16J027-05

## Lab Sample ID: 660-77026-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0038	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

**Client Sample ID: L16J027-01**

Date Collected: 10/28/16 11:42

Date Received: 11/02/16 10:40

**Lab Sample ID: 660-77026-1**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.012	I	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 18:37	1

**Client Sample ID: L16J027-02**

Date Collected: 10/28/16 11:15

Date Received: 11/02/16 10:40

**Lab Sample ID: 660-77026-2**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.014	I	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 18:40	1

**Client Sample ID: L16J027-03**

Date Collected: 10/28/16 10:50

Date Received: 11/02/16 10:40

**Lab Sample ID: 660-77026-3**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0082	I	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 18:44	1

**Client Sample ID: L16J027-04**

Date Collected: 10/28/16 10:14

Date Received: 11/02/16 10:40

**Lab Sample ID: 660-77026-4**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.011	I	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 18:47	1

**Client Sample ID: L16J027-05**

Date Collected: 10/28/16 09:42

Date Received: 11/02/16 10:40

**Lab Sample ID: 660-77026-5**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0038	I	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 18:51	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-329861/1-A**  
**Matrix: Water**  
**Analysis Batch: 329960**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 329861**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		11/05/16 10:24	11/06/16 17:08	1

**Lab Sample ID: LCS 400-329861/2-A**  
**Matrix: Water**  
**Analysis Batch: 329960**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 329861**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.07		mg/L		107	85 - 115

**Lab Sample ID: 400-129289-A-3-B MS**  
**Matrix: Water**  
**Analysis Batch: 329960**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 329861**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.020	I	1.00	1.12		mg/L		110	70 - 130

**Lab Sample ID: 400-129289-A-3-C MSD**  
**Matrix: Water**  
**Analysis Batch: 329960**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 329861**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.020	I	1.00	1.13		mg/L		111	70 - 130	2	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

## Metals

### Prep Batch: 329861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77026-1	L16J027-01	Total/NA	Water	200.7	
660-77026-2	L16J027-02	Total/NA	Water	200.7	
660-77026-3	L16J027-03	Total/NA	Water	200.7	
660-77026-4	L16J027-04	Total/NA	Water	200.7	
660-77026-5	L16J027-05	Total/NA	Water	200.7	
MB 400-329861/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-329861/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-129289-A-3-B MS	Matrix Spike	Total/NA	Water	200.7	
400-129289-A-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### Analysis Batch: 329960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77026-1	L16J027-01	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-2	L16J027-02	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-3	L16J027-03	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-4	L16J027-04	Total/NA	Water	200.7 Rev 4.4	329861
660-77026-5	L16J027-05	Total/NA	Water	200.7 Rev 4.4	329861
MB 400-329861/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	329861
LCS 400-329861/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	329861
400-129289-A-3-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	329861
400-129289-A-3-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	329861



# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

**Client Sample ID: L16J027-01**

**Date Collected: 10/28/16 11:42**

**Date Received: 11/02/16 10:40**

**Lab Sample ID: 660-77026-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:37	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16J027-02**

**Date Collected: 10/28/16 11:15**

**Date Received: 11/02/16 10:40**

**Lab Sample ID: 660-77026-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:40	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16J027-03**

**Date Collected: 10/28/16 10:50**

**Date Received: 11/02/16 10:40**

**Lab Sample ID: 660-77026-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:44	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16J027-04**

**Date Collected: 10/28/16 10:14**

**Date Received: 11/02/16 10:40**

**Lab Sample ID: 660-77026-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:47	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16J027-05**

**Date Collected: 10/28/16 09:42**

**Date Received: 11/02/16 10:40**

**Lab Sample ID: 660-77026-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	329861	11/05/16 10:24	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			329960	11/06/16 18:51	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Certification Summary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

## Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E84282	06-30-17

## Laboratory: TestAmerica Pensacola

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E81010	06-30-17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L16J027

TestAmerica Job ID: 660-77026-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L16J027

SENDING LABORATORY:

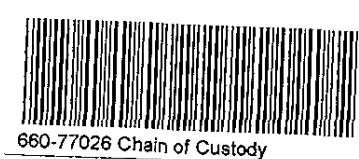
Tampa Electric Company, Laboratory Services  
5012 Causeway Blvd  
Tampa, FL 33619  
Phone: (813) 630-7490  
Fax: (813) 630-7360  
Project Manager: Peggy Penner

RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa  
6712 Benjamin Rd., Suite 100  
Tampa, FL 33634  
Phone : (813) 885-7427  
Fax: -

**Due Date:** 11/11/16 16:00

Analysis	Expires	Laboratory ID	Comments
Sample ID: L16J027-01 Sampled: 10/28/16 11:42 Lithium, Total EPA 6010 Containers Supplied: Poly HNO3 - 250mL (A)	BBS-CCR-1 04/26/17 11:42	Water	
Sample ID: L16J027-02 Sampled: 10/28/16 11:15 Lithium, Total EPA 6010 Containers Supplied: Poly HNO3 - 250mL (A)	BBS-CCR-2 04/26/17 11:15	Water	
Sample ID: L16J027-03 Sampled: 10/28/16 10:50 Lithium, Total EPA 6010 Containers Supplied: Poly HNO3 - 250mL (A)	BBS-CCR-3 04/26/17 10:50	Water	
Sample ID: L16J027-04 Sampled: 10/28/16 10:14 Lithium, Total EPA 6010 Containers Supplied: Poly HNO3 - 250mL (A)	BBS-CCR-BW-1 04/26/17 10:14	Water	
Sample ID: L16J027-05 Sampled: 10/28/16 09:42 Lithium, Total EPA 6010 Containers Supplied: Poly HNO3 - 250mL (A)	BBS-CCR-BW-2 04/26/17 09:42	Water	



Loc: 660  
77026

0.2/0.4 w-09

*[Signature]*  
Released By Date & Time 10-28-16 13:00

*[Signature]*  
Received By Date & Time 11-2-16 @ 1040

Released By Date & Time Received By Date & Time

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Lab PM:	Conner, Keaton	Carrier Tracking No(s):	COC No:
Shipping/Receiving		Phone:	keaton.conner@testamericainc.com	State of Origin:	660-91575.1
Company:		TestAmerica Laboratories, Inc.		Page 1 of 1	
Address:		3355 McLemore Drive,		Job #:	660-77026-1
City:		Pensacola		<b>Preservation Codes:</b>	
State, Zip:		FL 32514		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Phone:		850-474-1001(Tel) 850-478-2671(Fax)		M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Z - other (specify)	
Email:					
Project Name:		L16J027			
SSOW#:					
Due Date Requested:		11/9/2016			
TAT Requested (days):					
PO #:					
WO #:					
Project #:		66004821			
Sample Identification - Client ID (Lab ID)					
Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, G=grab)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)
10/28/16	11:42 Eastern		Water	X	X
10/28/16	11:15 Eastern		Water	X	X
10/28/16	10:50 Eastern		Water	X	X
10/28/16	10:14 Eastern		Water	X	X
10/28/16	08:42 Eastern		Water	X	X
Total Number of Containers					
Special Instructions/Note:					

Note: Since laboratory accreditation are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_

Relinquished by: *ATL Barb* Date/Time: 11-2-16 @ 1700 Company: TAT-TRA

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seals Intact: \_\_\_\_\_ Custody Seal No.: \_\_\_\_\_

Δ Yes Δ No

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Special Instructions/QC Requirements:

Method of Shipment: \_\_\_\_\_ Date/Time: 11-3-16 0916 Company: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Cooler Temperature(s) °C and Other Remarks: 4.2°C IAS



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-77026-1

**Login Number: 77026**

**List Source: TestAmerica Tampa**

**List Number: 1**

**Creator: Southers, Kristin B**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-77026-1

**Login Number: 77026**  
**List Number: 2**  
**Creator: Franklin, Justin H**

**List Source: TestAmerica Pensacola**  
**List Creation: 11/03/16 05:21 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.2°C IR-5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





Report Date: November 15, 2016

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L16J027-01  
 Sample Collection: 10-28-16/1142  
 Lab ID No: 16.12668  
 Lab Custody Date: 11-2-16/1610  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	42.6 ± 2.3	Calc	Calc	0.7
Radium-226	pCi/l	40.5 ± 2.3	11-9-16/1420	EPA 903.0	0.5
Radium-228	pCi/l	2.1 ± 0.5	11-10-16/1714	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





Report Date: November 15, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16J027-02  
Sample Collection: 10-28-16/1115  
Lab ID No: 16.12669  
Lab Custody Date: 11-2-16/1610  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.9 ± 1.3	Calc	Calc	0.7
Radium-226	pCi/l	13.8 ± 1.3	11-9-16/1420	EPA 903.0	0.5
Radium-228	pCi/l	1.1 ± 0.5	11-10-16/1714	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: November 15, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16J027-03  
Sample Collection: 10-28-16/1050  
Lab ID No: 16.12670  
Lab Custody Date: 11-2-16/1610  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	18.1 ± 1.4	Calc	Calc	0.7
Radium-226	pCi/l	17.3 ± 1.4	11-9-16/1420	EPA 903.0	0.3
Radium-228	pCi/l	0.8 ± 0.5	11-10-16/1714	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



DOH Certification #E84025  
DEP COMPQAP # 870251

Report Date: November 15, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16J027-04

Sample Collection: 10-28-16/1014

Lab ID No: 16.12671  
Lab Custody Date: 11-2-16/1610  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.3 ± 2.0	Calc	Calc	0.6
Radium-226	pCi/l	29.0 ± 2.0	11-9-16/1420	EPA 903.0	0.5
Radium-228	pCi/l	3.3 ± 0.6	11-11-16/1033	EPA Ra-05	0.6

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L16J027**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
 3202 N. Florida Ave.  
 Tampa, FL 33603  
 Phone : (813) 229-2879  
 Fax: -

**Due Date: 11/11/16 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L16J027-01</b> <b>BBS-CCR-1</b> <b>Sampled: 10/28/16 11:42</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/26/17 11:42 04/26/17 11:42 04/26/17 11:42	Water 16.12668	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L16J027-02</b> <b>BBS-CCR-2</b> <b>Sampled: 10/28/16 11:15</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/26/17 11:15 04/26/17 11:15 04/26/17 11:15	Water 16.12669	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L16J027-03</b> <b>BBS-CCR-3</b> <b>Sampled: 10/28/16 10:50</b> Radium 226+228, Total Radium 226 EPA 903.0 Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/26/17 10:50 04/26/17 10:50 04/26/17 10:50	Water 16.12670	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L16J027-04</b> <b>BBS-CCR-BW-1</b> <b>Sampled: 10/28/16 10:14</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/26/17 10:14 04/26/17 10:14 04/26/17 10:14	Water 16.12671	Level 2 Data required Level 2 Data required Level 2 Data required 9/11-17-16

Released By: *[Signature]*      Date & Time: 10-28-16 1300

Received By: *[Signature]*      Date & Time: 11-2-16 / 1610

Released By:      Date & Time:      Received By:      Date & Time:



Report Date: November 14, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16J027-05  
Sample Collection: 10-28-16/0942  
Lab ID No: 16.12672  
Lab Custody Date: 11-2-16/1610  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8 ± 0.6	Calc	Calc	0.7
Radium-226	pCi/l	3.4 ± 0.6	11-9-16/1420	EPA 903.0	0.3
Radium-228	pCi/l	1.4 ± 0.5	11-10-16/1714	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L16J027

---

Analysis	Expires	Laboratory ID	Comments
Sample ID: L16J027-05      BBS-CCR-BW-2      Water		16-1267Z	
Sampled: 10/28/16 09:42			
Radium 228 Ra-05	04/26/17 09:42		Level 2 Data required
Radium 226 EPA 903.0	04/26/17 09:42		Level 2 Data required
Radium 226+228, Total	04/26/17 09:42		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

---

11-15-16

---

Released By *[Signature]* 10-28-16 1300      Received By *[Signature]*      Date & Time 11-2-16/1610

---

Released By      Date & Time      Received By      Date & Time



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project # : 2165027

Analysis Completion Date: 11 / 9 / 16

### Precision Data:

Sample #: 14.12629

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>5.5</u>	<u>4.8</u>	<u>0.7</u>	<u>        </u>

### Spike Data:

Sample #: 14.12629

<u>Sample Analysis (pCi)</u>	<u>Spike Added (pCi)</u>	<u>Analytical Result (pCi)</u>	<u>Spike Rec (%)</u>
<u>0.7</u>	<u>4.5</u>	<u>5.5</u>	<u>107%</u>

### LCS Data:

<u>Analytical Result (pCi)</u>	<u>True Value (pCi)</u>	<u>% Recovery</u>
<u>10.7</u>	<u>10.1</u>	<u>106</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.3</u> +/- <u>0.2</u>	<u>11 / 9 / 16</u>



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L16J027

Analysis Completion Date: 11 / 10 / 16

### Precision Data:

Sample #: 16-12634

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>4.2</u>	<u>3.8</u>	<u>0.4</u>	

### Spike Data:

Sample #: 16-12634

<u>Sample Analysis (pCi)<sup>L</sup></u>	<u>Spike Added (pCi)<sup>L</sup></u>	<u>Analytical Result (pCi)<sup>L</sup></u>	<u>Spike Rec (%)</u>
<u>0.4</u>	<u>3.87</u>	<u>4.2</u>	<u>90%</u>

### LCS Data:

<u>Analytical Result (pCi)<sup>L</sup></u>	<u>True Value (pCi)<sup>L</sup></u>	<u>% Recovery</u>
<u>4.5</u>	<u>4.3</u>	<u>105</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.1 +/- 0.2</u>	<u>11 / 10 / 16</u>



**NOVEMBER 2016**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 12/15/16 15:17

Work Order - **L16K034**

Project - **CCR Wells Economizer Ash Pond**

---

## Case Narrative

---

5 sample(s) were received on 11/10/16 13:32.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples CCR-1, CCR-BW1 and CCR-BW2. The sample(s) are flagged with a J qualifier.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: **L16K034-01**  
 Sample Description: BBS-CCR-1  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 11/10/16 11:53  
 Date of Sample Receipt: 11/10/16 13:32

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	<b>817</b>	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/29/16 21:32
Specific Conductance	<b>4290</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:53
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	11/10/16 11:53
Fluoride	<b>0.0871</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 21:21
pH	<b>6.82</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:53
REDOX Potential	<b>-136</b>	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:53
Total Dissolved Solids	<b>3470</b>	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20
Sulfate	<b>1290</b>	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/29/16 21:32
Turbidity	<b>0.890</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:53

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:19
---------	--------	------	--------	-------	---	---	-----------	-----	----------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:13
Arsenic	<b>8.93</b>	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:13
Boron	<b>16200</b>	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:34
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:13
Cobalt	<b>0.519</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:13
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:13
Selenium	<b>1.04</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:13
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:13

#### Total Recoverable Metals by SW846 Method 6010B

Barium	<b>129</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:34
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:34
Calcium	<b>606000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:30
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:34
Molybdenum	<b>98.4</b>	ug/L	1.00	20.0		1	EPA 6010B	MCR	11/14/16 10:34

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16K034-02</b>	Date and Time Collected:	11/10/16 11:27
Sample Description:	BBS-CCR-2	Date of Sample Receipt:	11/10/16 13:32
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	<b>111</b>	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 21:52
Specific Conductance	<b>1540</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:27
Dissolved Oxygen	<b>0.130</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 11:27
Fluoride	<b>0.168</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 21:42
pH	<b>6.89</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:27
REDOX Potential	<b>-186</b>	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:27
Total Dissolved Solids	<b>1110</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	11/14/16 13:20
Sulfate	<b>468</b>	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 21:52
Turbidity	<b>7.10</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:27
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:22
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:17
Arsenic	<b>1.37</b>	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Boron	<b>2280</b>	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:36
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:17
Cobalt	<b>0.105</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Lead	<b>0.0955</b>	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Selenium	<b>0.259</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:17
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:17
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	<b>62.4</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:36
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:36
Calcium	<b>181000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:33
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:36
Molybdenum	<b>1.43</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:36

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16K034-03</b>	Date and Time Collected:	11/10/16 11:05
Sample Description:	BBS-CCR-3	Date of Sample Receipt:	11/10/16 13:32
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	<b>129</b>	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 22:12
Specific Conductance	<b>1650</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 11:05
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	11/10/16 11:05
Fluoride	<b>0.331</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:02
pH	<b>6.46</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 11:05
REDOX Potential	<b>-239</b>	mV	-999	-999		1	SM 2580B	RAB	11/10/16 11:05
Total Dissolved Solids	<b>1220</b>	mg/L	24.0	40.0		2	SM 2540C	RFL	11/14/16 13:20
Sulfate	<b>492</b>	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 22:12
Turbidity	<b>1.18</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 11:05
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:26
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:20
Arsenic	<b>0.765</b>	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Boron	<b>502</b>	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:39
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:20
Cobalt	<b>0.117</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:20
Selenium	<b>0.253</b>	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:20
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	<b>63.0</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:39
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:39
Calcium	<b>200000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:35
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:39
Molybdenum	<b>3.90</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:39

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	<b>L16K034-04</b>	Date and Time Collected:	11/10/16 10:20
Sample Description:	BBS-CCR-BW1	Date of Sample Receipt:	11/10/16 13:32
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	<b>993</b>	mg/L	0.400	10.0	V	20	EPA 300.0	TMH	11/29/16 22:32
Specific Conductance	<b>5000</b>	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 10:20
Dissolved Oxygen	<b>0.130</b>	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 10:20
Fluoride	<b>0.261</b>	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:22
pH	<b>6.52</b>	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 10:20
REDOX Potential	<b>-71.1</b>	mV	-999	-999		1	SM 2580B	RAB	11/10/16 10:20
Total Dissolved Solids	<b>4170</b>	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20
Sulfate	<b>1440</b>	mg/L	10.0	40.0		20	EPA 300.0	TMH	11/29/16 22:32
Turbidity	<b>1.77</b>	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 10:20
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:29
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:51
Arsenic	<b>8.49</b>	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:51
Boron	<b>49700</b>	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:41
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:51
Cobalt	<b>1.45</b>	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:51
Lead	<b>0.102</b>	ug/L	0.0800	2.00	I	1	EPA 200.8	RLC	11/11/16 12:51
Selenium	<b>2.51</b>	ug/L	0.200	2.00		1	EPA 200.8	RLC	11/11/16 12:51
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:51
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	<b>61.2</b>	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:41
Calcium	<b>692000</b>	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:38
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:41
Molybdenum	<b>6.58</b>	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	11/14/16 10:41

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L16K034-05	Date and Time Collected:	11/10/16 9:49
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	11/10/16 13:32
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	129	mg/L	0.200	5.00	V	10	EPA 300.0	TMH	11/29/16 23:13
Specific Conductance	1400	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	11/10/16 9:49
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	11/10/16 9:49
Fluoride	0.464	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	11/29/16 22:42
pH	6.68	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	11/10/16 9:49
REDOX Potential	-73.8	mV	-999	-999		1	SM 2580B	RAB	11/10/16 9:49
Total Dissolved Solids	966	mg/L	24.0	40.0	J-	2	SM 2540C	RFL	11/14/16 13:20
Sulfate	255	mg/L	5.00	20.0		10	EPA 300.0	TMH	11/29/16 23:13
Turbidity	5.86	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	11/10/16 9:49
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	11/15/16 12:33
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	11/11/16 12:54
Arsenic	2.59	ug/L	0.320	2.00		1	EPA 200.8	RLC	11/11/16 12:54
Boron	3750	ug/L	10.0	50.0		1	EPA 200.7	MCR	11/14/16 10:53
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:54
Cobalt	0.157	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	11/11/16 12:54
Lead	0.0800	ug/L	0.0800	2.00	U	1	EPA 200.8	RLC	11/11/16 12:54
Selenium	0.485	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	11/11/16 12:54
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	11/11/16 12:54
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	45.8	ug/L	0.500	20.0		1	EPA 6010B	MCR	11/14/16 10:53
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	11/14/16 10:53
Calcium	243000	ug/L	30.0	1000		1	EPA 6010B	MCR	11/14/16 13:40
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	11/14/16 10:53
Molybdenum	1.00	ug/L	1.00	20.0	U	1	EPA 6010B	MCR	11/14/16 10:53

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0104 - EPA 6010B</b>											
<b>Blank (16K0104-BLK1)</b>					Prepared: 11/11/16 Analyzed: 11/14/16						
Barium	0.500	0.500	20.0	ug/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (16K0104-BS1)</b>					Prepared: 11/11/16 Analyzed: 11/14/16						
Barium	1050	0.500	20.0	ug/L	1000.0		105	80-120			
Beryllium	1030	0.200	2.00	ug/L	1000.0		103	80-120			
Chromium	1040	1.60	12.0	ug/L	1000.0		104	80-120			
Molybdenum	995	1.00	20.0	ug/L	1000.0		99.5	80-120			
<b>Matrix Spike (16K0104-MS1)</b>					<b>Source: L16K029-01</b>		Prepared: 11/11/16 Analyzed: 11/14/16				
Barium	1100	0.500	20.0	ug/L	1000.0	7.45	109	75-125			
Beryllium	1080	0.200	2.00	ug/L	1000.0	0.622	108	75-125			
Chromium	1070	1.60	12.0	ug/L	1000.0	U	107	75-125			
Molybdenum	1610	1.00	20.0	ug/L	1000.0	567	104	75-125			
<b>Matrix Spike Dup (16K0104-MSD1)</b>					<b>Source: L16K029-01</b>		Prepared: 11/11/16 Analyzed: 11/14/16				
Barium	1070	0.500	20.0	ug/L	1000.0	7.45	107	75-125	2.23	20	
Beryllium	1050	0.200	2.00	ug/L	1000.0	0.622	105	75-125	2.88	20	
Chromium	1040	1.60	12.0	ug/L	1000.0	U	104	75-125	2.94	20	
Molybdenum	1550	1.00	20.0	ug/L	1000.0	567	97.8	75-125	3.82	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0106 - EPA 7470A</b>											
<b>Blank (16K0106-BLK1)</b>					Prepared & Analyzed: 11/15/16						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (16K0106-BS1)</b>					Prepared & Analyzed: 11/15/16						
Mercury	1.00	0.0500	0.200	ug/L	1.0000		100	80-120			
<b>Matrix Spike (16K0106-MS1)</b>					Source: L16K034-01		Prepared & Analyzed: 11/15/16				
Mercury	0.799	0.0500	0.200	ug/L	1.0000	U	79.9	75-125			
<b>Matrix Spike Dup (16K0106-MSD1)</b>					Source: L16K034-01		Prepared & Analyzed: 11/15/16				
Mercury	0.808	0.0500	0.200	ug/L	1.0000	U	80.8	75-125	1.09	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 16K0095 - EPA 200.8

#### Blank (16K0095-BLK1)

Prepared: 11/10/16 Analyzed: 11/11/16

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	0.0800	0.0800	2.00	ug/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (16K0095-BS1)

Prepared: 11/10/16 Analyzed: 11/11/16

Antimony	103	0.600	2.00	ug/L	100.00		103	85-115			
Arsenic	103	0.320	2.00	ug/L	100.00		103	85-115			
Cadmium	103	0.100	0.500	ug/L	100.00		103	85-115			
Cobalt	102	0.0400	2.00	ug/L	100.00		102	85-115			
Lead	104	0.0800	2.00	ug/L	100.00		104	85-115			
Selenium	101	0.200	2.00	ug/L	100.00		101	85-115			
Thallium	105	0.100	0.500	ug/L	100.00		105	85-115			

#### Matrix Spike (16K0095-MS1)

Source: L16K084-01

Prepared: 11/10/16 Analyzed: 11/11/16

Antimony	118	6.00	20.0	ug/L	100.00	7.54	111	70-130			
Arsenic	108	3.20	20.0	ug/L	100.00	U	108	70-130			
Cadmium	99.3	1.00	5.00	ug/L	100.00	1.73	97.6	70-130			
Cobalt	108	0.400	20.0	ug/L	100.00	18.3	89.9	70-130			
Lead	95.7	0.800	20.0	ug/L	100.00	1.05	94.6	70-130			
Selenium	159	2.00	20.0	ug/L	100.00	125	34.4	70-130			J-
Thallium	99.5	1.00	5.00	ug/L	100.00	2.59	96.9	70-130			

#### Matrix Spike Dup (16K0095-MSD1)

Source: L16K084-01

Prepared: 11/10/16 Analyzed: 11/11/16

Antimony	119	6.00	20.0	ug/L	100.00	7.54	111	70-130	0.290	20	
Arsenic	110	3.20	20.0	ug/L	100.00	U	110	70-130	2.01	20	
Cadmium	101	1.00	5.00	ug/L	100.00	1.73	98.8	70-130	1.19	20	
Cobalt	111	0.400	20.0	ug/L	100.00	18.3	92.4	70-130	2.33	20	
Lead	95.5	0.800	20.0	ug/L	100.00	1.05	94.5	70-130	0.172	20	
Selenium	161	2.00	20.0	ug/L	100.00	125	35.7	70-130	0.829	20	J-
Thallium	99.9	1.00	5.00	ug/L	100.00	2.59	97.4	70-130	0.409	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0104 - EPA 200.7</b>											
<b>Blank (16K0104-BLK1)</b>					Prepared: 11/11/16 Analyzed: 11/14/16						
Boron	10.0	10.0	50.0	ug/L							U
<b>LCS (16K0104-BS1)</b>					Prepared: 11/11/16 Analyzed: 11/14/16						
Boron	1040	10.0	50.0	ug/L	1000.0		104	85-115			
<b>Matrix Spike (16K0104-MS1)</b>					Source: L16K029-01		Prepared: 11/11/16 Analyzed: 11/14/16				
Boron	3950	10.0	50.0	ug/L	1000.0	2660	129	70-130			
<b>Matrix Spike Dup (16K0104-MSD1)</b>					Source: L16K029-01		Prepared: 11/11/16 Analyzed: 11/14/16				
Boron	3820	10.0	50.0	ug/L	1000.0	2660	116	70-130	3.35	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0112 - SM 2540C</b>											
<b>Blank (16K0112-BLK1)</b>					Prepared & Analyzed: 11/14/16						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (16K0112-BS1)</b>					Prepared & Analyzed: 11/14/16						
Total Dissolved Solids	1010	12.0	20.0	mg/L	1000.0		101	80-120			
<b>Duplicate (16K0112-DUP1)</b>					Source: L16K034-01		Prepared & Analyzed: 11/14/16				
Total Dissolved Solids	3530	24.0	40.0	mg/L		3470			1.71	10	J-
<b>Duplicate (16K0112-DUP2)</b>					Source: L16K059-02		Prepared & Analyzed: 11/14/16				
Total Dissolved Solids	95.0	12.0	20.0	mg/L		104			9.05	10	
<b>Batch 16K0150 - EPA 300.0</b>											
<b>Blank (16K0150-BLK1)</b>					Prepared & Analyzed: 11/29/16						
Chloride	0.0961	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (16K0150-BS1)</b>					Prepared & Analyzed: 11/29/16						
Chloride	4.96	0.0200	0.500	mg/L	5.0000		99.2	90-110			V
Fluoride	4.93	0.0100	0.0500	mg/L	5.0000		98.6	90-110			
Sulfate	4.99	0.500	2.00	mg/L	5.0000		99.8	90-110			
<b>Matrix Spike (16K0150-MS1)</b>					Source: L16K002-01		Prepared & Analyzed: 11/29/16				
Chloride	481	0.200	5.00	mg/L	50.000	430	101	90-110			V
Fluoride	53.2	0.100	0.500	mg/L	50.000	1.12	104	90-110			
Sulfate	713	5.00	20.0	mg/L	50.000	672	82.7	90-110			J-

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 16K0150 - EPA 300.0</b>											
<b>Matrix Spike (16K0150-MS2)</b>		<b>Source: L16K116-01</b>			<b>Prepared &amp; Analyzed: 11/30/16</b>						
Chloride	105	0.200	5.00	mg/L	50.000	54.4	101	90-110			V
Fluoride	50.9	0.100	0.500	mg/L	50.000	U	102	90-110			
Sulfate	122	5.00	20.0	mg/L	50.000	75.3	94.0	90-110			
<b>Matrix Spike Dup (16K0150-MSD1)</b>		<b>Source: L16K002-01</b>			<b>Prepared &amp; Analyzed: 11/29/16</b>						
Chloride	478	0.200	5.00	mg/L	50.000	430	95.3	90-110	0.597	20	V
Fluoride	53.4	0.100	0.500	mg/L	50.000	1.12	105	90-110	0.336	20	
Sulfate	709	5.00	20.0	mg/L	50.000	672	74.6	90-110	0.564	20	J-
<b>Matrix Spike Dup (16K0150-MSD2)</b>		<b>Source: L16K116-01</b>			<b>Prepared &amp; Analyzed: 11/30/16</b>						
Chloride	106	0.200	5.00	mg/L	50.000	54.4	103	90-110	1.32	20	V
Fluoride	51.6	0.100	0.500	mg/L	50.000	U	103	90-110	1.39	20	
Sulfate	123	5.00	20.0	mg/L	50.000	75.3	96.0	90-110	0.780	20	

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend** Date: **11/10/16** File Name: **111016\_Wells\_RAB** Weather: **CLEAR & MILD** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16K034-01	BBS-CCR-1	11:53		6.82	25.70	4290	0.08	0.89	-135.5		LT. YELLOW	NONE	11:33	
L16K034-02	BBS-CCR-2	11:27		6.89	25.66	1542	0.13	7.10	-185.6		LT. YELLOW	NONE	11:11	
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mtls (1)	250ml Mtls (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mtls (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16K034-01	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16K034-02	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Samples On Ice  Yes  No Time 13:32

Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	<input checked="" type="checkbox"/> 010688	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	1.1
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	<input checked="" type="checkbox"/> 010688	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	

A checked box indicates that the sample was verified to a pH of <2

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016047H	7	7.02	8:32			7.07	13:25	Meter ID: MPM08	8:39	21.6	235.7	236.2
FDEP FT 1100	L 016500A	10	10.05	8:32	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	13:18	21.7	232.3	236.2
Units: SU	L 015514B	4	4.00	8:32	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 015981A	1000	1000	8:41					Meter ID: MPM08	8:18	21.9	8.80	8.761
FDEP FT 1200, Units: uMHOS	L 015370B	10000			9930	8:45	9815	13:15					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TMO7	L 013677	5.28	4.75	5.81	5.37	8:00	5.31	13:14	Barom. Pres			
FDEP FT 1600, Units: NTU	L L#?								760			

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026, 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	7.38	14.94	0.16	2.39	0.0026	23.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:40	500	0.92	0.92	7.50	6.82	25.71	4286	0.08	1.13	ph: +/- 0.2	STABLE	Level Meter: wlm08	
Purge Start:	11:42	480	0.25	1.17	7.50	6.83	25.74	4290	0.07	0.75	Temp C +/- 0.2	STABLE	Pump: PP	
11:33	11:44	480	0.25	1.42	7.50	6.82	25.70	4290	0.08	0.89	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:											DO % Sat < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
11:44											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
Purge Complete At	11:34	Gallons to Purge	0.12	Stability Values =	6.82	25.70	4290	0.08	0.89					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-2	2	10	16.84	21.84	6.88	14.96	0.16	2.39	0.0026	22.84	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:17	660	0.70	0.70	7.00	6.89	25.64	1515	0.20	5.92	ph: +/- 0.2	STABLE	Level Meter: wlm08	
Purge Start:	11:19	660	0.35	1.05	7.00	6.89	25.61	1540	0.15	6.92	Temp C +/- 0.2	STABLE	Pump: PP	
11:13	11:21	660	0.35	1.40	7.00	6.89	25.66	1542	0.13	7.10	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:											DO % Sat < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
11:21											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
Purge Complete At	11:14	Gallons to Purge	0.12	Stability Values =	6.89	25.66	1542	0.13	7.10					

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **11/10/16** File Name: **111016 Wells\_RAB** Weather: **CLEAR & MILD** Sampler(s)/Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16K034-03	BBS-CCR-3	11:05		6.46	26.10	1646	0.05	1.18	-239.20		YELLOW	MODERATE	10:33	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16K034-03	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Samples On Ice  Yes  No Time 13:32

Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 010688 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	1.1 °C

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016047H	7	7.02	8:32			7.07	13:25	Meter ID: MPM08	8:39	21.6	235.7	236.2

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	Zobell Sol ID:
Meter ID: MPM08	L 015981A	1000	1000	8:41					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Meter ID:	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TM07	L 013677	5.28	4.75 - 5.81	5.37	8:00	5.31	13:14	Meter ID: MPM08	13:20	21.8	8.75	8.777

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-3	2	10	18.23	23.23	6.77	16.46	0.16	2.63	0.0026	24.23	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:45	260	0.76	0.76	7.08	6.43	26.04	1693	0.11	1.42	ph:+/- 0.2	STABLE	Level Meter: wlm08	
Purge Start:	10:47	260	0.14	0.90	7.10	6.45	26.10	1663	0.06	1.67	Temp°C+/- 0.2	STABLE	Pump: PP	
	10:34	10:49	260	0.14	1.04	7.08	6.46	1646	0.05	1.18	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:	10:49										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
Purge Complete At		10:36	Gallons to Purge 0.12		Stability Values =		6.46	26.10	1646	0.05	1.18			

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
0	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
											ph:+/- 0.2		Level Meter: wlm08	
Purge Start:											Temp°C+/- 0.2		Pump: PP	
											Cond % +/- 5		Tubing: PE/S	
Purge End:											DO % Sat. < 20		Dedicated <input type="checkbox"/> Yes	
											Turb. NTU < 20		Tubing? <input type="checkbox"/> No	
Purge Complete At			Gallons to Purge 0.32		Stability Values =									

Comments:

Total Time Total Miles



Site: **Big Bend** Date: **11/10/16** File Name: **111016 Wells\_RAB** Weather: **CLEAR & MILD** Sampler(s)/Initials: **RAB /TECO** Initials:

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L16K034-04	BBS-CCR-BW-1	10:20		6.52	27.50	4996	0.13	1.77	-71.10		CLEAR	NONE	9:58	
L16K034-05	BBS-CCR-BW-2	9:49		6.68	27.10	1397	0.20	5.86	-73.80		LT. YELLOW	NONE	9:28	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L16K034-04	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L16K034-05	<input type="checkbox"/>		1		<input type="checkbox"/>	2	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Samples On Ice  Yes  No Time 13:32

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2		L 010688 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2		L	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12		L	1.1 °C
500 ml bottles (metals): 2 ml HNO3 to pH <2		L	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2		L	250 ml bottles (Cyan) 1g NaOH to pH >12		L	
250 ml bottles (metal): 1 ml HNO3 to pH <2		L 010688 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2		L	A checked box indicates that the sample was verified to a pH of <2			

pH Meter Calibration		Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08		L 016047H	7	7.02	8:32			7.07	13:25	Meter ID: MPM08	8:39	21.6	235.7	236.2
FDEP FT 1100		L 016500A	10	10.05	8:32	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	13:18	21.7	232.3	236.2
Units: SU		L 015514B	4	4.00	8:32	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.		Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 016396
Meter ID: MPM08		L 015981A	1000	1000	8:41					
FDEP FT 1200, Units: µMHOS		L 015370B	10000			9930	8:45	9815	13:15	

Turbidity Meter Calibration		Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	13:20	21.8	8.75	8.777
Meter ID: TM07		SF- 013677	5.28	4.75 - 5.81	5.37	8:00	5.31	13:14	Barom. Pres				
FDEP FT 1600, Units: NTU		SF- L#?							760				

Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information		Well Capacities (gallons/ft): 2" = 0.16 4" =0.65					Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006							
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)			
BBS-CCR-BW-1	2	10	39.3	44.3	29.84	14.46	0.16	2.31	0.0026	100	0	0.06	0.32	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:13	2300	7.90	7.90	31.02	6.52	27.50	4927	0.14	6.86	ph:+/- 0.2	STABLE	Level Meter: wlm08	
<b>Purge Start:</b>	10:15	2200	1.16	9.06	30.99	6.52	27.42	4962	0.13	2.66	Temp°C+/- 0.2	STABLE	Pump: ESP	
10:00	10:17	2200	1.16	10.22	30.96	6.52	27.50	4996	0.13	1.77	Cond % +/- 5	STABLE	Tubing: PE	
<b>Purge End:</b>	10:17										DO % Sat. < 20	STABLE	Dedicated <input type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input checked="" type="checkbox"/> No	
<b>Purge Complete At</b>	<b>10:01</b>	<b>Gallons to Purge 0.32</b>	Stability Values =			6.52	27.50	4996	0.13	1.77				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	( Tubing Capacity (gal/ft.) X Tubing Length (ft) ) + Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)			
BBS-CCR-BW-2	2	10	18.49	23.84	8.45	15.39	0.16	2.46	0.0026	24.64	0	0.06	0.12	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:36	700	1.29	1.29	8.76	6.68	27.04	1397	0.33	2.96	ph:+/- 0.2	STABLE	Level Meter: wlm08	
<b>Purge Start:</b>	9:38	700	0.37	1.66	8.76	6.68	27.08	1396	0.22	3.45	Temp°C+/- 0.2	STABLE	Pump: PP	
9:29	9:40	700	0.37	2.03	8.76	6.68	27.10	1397	0.20	5.86	Cond % +/- 5	STABLE	Tubing: PE/S	
<b>Purge End:</b>	9:40										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
<b>Purge Complete At</b>	<b>9:30</b>	<b>Gallons to Purge 0.12</b>	Stability Values =			6.68	27.10	1397	0.20	5.86				

Comments:

Total Time                      Total Miles



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L16K034-02</b> DATE: <b>11/10/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.88</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>11:13</b>	PURGING ENDED AT: <b>11:21</b>	TOTAL VOLUME PURGED (gallons): <b>1.40</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:17	0.70	0.70	0.18	7.00	6.89	25.64	1515	0.20	5.92	LT. YELLOW	NONE
11:19	0.35	1.05	0.18	7.00	6.89	25.61	1540	0.15	6.92	LT. YELLOW	NONE
11:21	0.35	1.40	0.18	7.00	6.89	25.66	1542	0.13	7.10	LT. YELLOW	NONE
<b>WELL CAPACITY</b> (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 <b>TUBING INSIDE DIA. CAPACITY</b> (Gal./Ft.): 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:21</b>		SAMPLING ENDED AT: <b>11:27</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>660</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RPPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    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)

**DEP-SOP-001/01**  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-3</b>	SAMPLE ID: <b>L16K034-03</b> DATE: <b>11/10/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches)	1/4	WELL SCREEN INTERVAL DEPTH	13.23	feet to	23.23	(feet)	STATIC DEPTH TO WATER (feet):	6.77			PURGE PUMP TYPE OR BAILER:	PP									
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                                  feet -                                  feet ) x                                  gallons/foot =                                  gallons																						
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                                  0                                  gallons + (                                  0.0026                                  gallons/foot X                                  24.23                                  feet ) +                                  0.06                                  gallons =                                  0.12                                  gallons																						
INITIAL PUMP OR TUBING DEPTH IN WELL (feet):			18.23			FINAL PUMP OR TUBING DEPTH IN WELL (feet):			18.23			PURGING INITIATED AT:		10:34		PURGING ENDED AT:		10:49		TOTAL VOLUME PURGED (gallons):	1.04	
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)											
10:45	0.76	0.76	0.07	7.08	6.43	26.04	1693	0.11	1.42	YELLOW	MODERATE											
10:47	0.14	0.90	0.07	7.10	6.45	26.10	1663	0.06	1.67	YELLOW	MODERATE											
10:49	0.14	1.04	0.07	7.08	6.46	26.10	1646	0.05	1.18	YELLOW	MODERATE											
<b>WELL CAPACITY</b> (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																						
<b>TUBING INSIDE DIA. CAPACITY</b> (Gal./Ft.): 1/8" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016																						

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION:			RAB                                  TECO			SAMPLER (S) SIGNATURES:			SAMPLING INITIATED AT:		10:49		SAMPLING ENDED AT:		11:05		
PUMP OR TUBING DEPTH IN WELL (feet):			18.2			SAMPLE PUMP FLOW RATE (mL per minute):			260		TUBING MATERIAL CODE:					PE/S	
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			Filtration Equipment Type: <input type="checkbox"/> N <input checked="" type="checkbox"/>			FILTER SIZE: µm		DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>						
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD			SAMPLING EQUIPMENT CODE						
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH											
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics			PP							
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals			PP							
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals			PP							
REMARKS:																	
(1) Sample bottles pre-preserved at laboratory prior to sample collection.																	

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L16K034-04</b> DATE: <b>11/10/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> (feet) to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>29.84</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>10:00</b>	PURGING ENDED AT: <b>10:17</b>	TOTAL VOLUME PURGED (gallons): <b>10.22</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:13	7.90	7.90	0.61	31.02	6.52	27.50	4927	0.14	6.86	CLEAR	NONE
10:15	1.16	9.06	0.58	30.99	6.52	27.42	4962	0.13	2.66	CLEAR	NONE
10:17	1.16	10.22	0.58	30.96	6.52	27.50	4996	0.13	1.77	CLEAR	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:17</b>		SAMPLING ENDED AT: <b>10:20</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>2233</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L16K034-05</b> DATE: <b>11/10/16</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>8.45</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:29</b>	PURGING ENDED AT: <b>9:40</b>	TOTAL VOLUME PURGED (gallons): <b>2.03</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:36	1.29	1.29	0.18	8.76	6.68	27.04	1397	0.33	2.96	LT. YELLOW	NONE
9:38	0.37	1.66	0.19	8.76	6.68	27.08	1396	0.22	3.45	LT. YELLOW	NONE
9:40	0.37	2.03	0.19	8.76	6.68	27.10	1397	0.20	5.86	LT. YELLOW	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>9:40</b>		SAMPLING ENDED AT: <b>9:49</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>700</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427


TestAmerica Job ID: 660-77306-1

Client Project/Site: L16K034

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by:  
11/21/2016 1:39:36 PM

Keaton Conner, Project Mgmt. Assistant  
(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15



# Sample Summary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-77306-1	L16K034-01	Water	11/10/16 11:53	11/15/16 13:55
660-77306-2	L16K034-02	Water	11/10/16 11:27	11/15/16 13:55
660-77306-3	L16K034-03	Water	11/10/16 11:05	11/15/16 13:55
660-77306-4	L16K034-04	Water	11/10/16 10:20	11/15/16 13:55
660-77306-5	L16K034-05	Water	11/10/16 09:49	11/15/16 13:55

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

---

**Job ID: 660-77306-1**

---

**Laboratory: TestAmerica Tampa**

---

## Narrative

### Job Narrative 660-77306-1

#### Receipt

The samples were received on 11/15/2016 1:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

## Client Sample ID: L16K034-01

## Lab Sample ID: 660-77306-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0084	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16K034-02

## Lab Sample ID: 660-77306-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.011	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16K034-03

## Lab Sample ID: 660-77306-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0061	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16K034-04

## Lab Sample ID: 660-77306-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.010	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L16K034-05

## Lab Sample ID: 660-77306-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0017	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

**Client Sample ID: L16K034-01**

Date Collected: 11/10/16 11:53

Date Received: 11/15/16 13:55

**Lab Sample ID: 660-77306-1**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0084	I	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 15:54	1

**Client Sample ID: L16K034-02**

Date Collected: 11/10/16 11:27

Date Received: 11/15/16 13:55

**Lab Sample ID: 660-77306-2**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.011	I	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 15:58	1

**Client Sample ID: L16K034-03**

Date Collected: 11/10/16 11:05

Date Received: 11/15/16 13:55

**Lab Sample ID: 660-77306-3**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0061	I	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 16:01	1

**Client Sample ID: L16K034-04**

Date Collected: 11/10/16 10:20

Date Received: 11/15/16 13:55

**Lab Sample ID: 660-77306-4**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.010	I	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 16:05	1

**Client Sample ID: L16K034-05**

Date Collected: 11/10/16 09:49

Date Received: 11/15/16 13:55

**Lab Sample ID: 660-77306-5**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0017	I	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 16:08	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-331677/1-A**  
**Matrix: Water**  
**Analysis Batch: 331888**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 331677**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		11/18/16 11:14	11/19/16 14:33	1

**Lab Sample ID: LCS 400-331677/2-A**  
**Matrix: Water**  
**Analysis Batch: 331888**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 331677**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.11		mg/L		111	85 - 115

**Lab Sample ID: 400-129934-G-4-B MS**  
**Matrix: Water**  
**Analysis Batch: 331888**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 331677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.014	I	1.00	1.14		mg/L		112	70 - 130

**Lab Sample ID: 400-129934-G-4-C MSD**  
**Matrix: Water**  
**Analysis Batch: 331888**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 331677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.014	I	1.00	1.20		mg/L		118	70 - 130	5	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

## Metals

### Prep Batch: 331677

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77306-1	L16K034-01	Total/NA	Water	200.7	
660-77306-2	L16K034-02	Total/NA	Water	200.7	
660-77306-3	L16K034-03	Total/NA	Water	200.7	
660-77306-4	L16K034-04	Total/NA	Water	200.7	
660-77306-5	L16K034-05	Total/NA	Water	200.7	
MB 400-331677/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-331677/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-129934-G-4-B MS	Matrix Spike	Total/NA	Water	200.7	
400-129934-G-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### Analysis Batch: 331888

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-77306-1	L16K034-01	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-2	L16K034-02	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-3	L16K034-03	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-4	L16K034-04	Total/NA	Water	200.7 Rev 4.4	331677
660-77306-5	L16K034-05	Total/NA	Water	200.7 Rev 4.4	331677
MB 400-331677/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	331677
LCS 400-331677/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	331677
400-129934-G-4-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	331677
400-129934-G-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	331677

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

**Client Sample ID: L16K034-01**

**Date Collected: 11/10/16 11:53**

**Date Received: 11/15/16 13:55**

**Lab Sample ID: 660-77306-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 15:54	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16K034-02**

**Date Collected: 11/10/16 11:27**

**Date Received: 11/15/16 13:55**

**Lab Sample ID: 660-77306-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 15:58	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16K034-03**

**Date Collected: 11/10/16 11:05**

**Date Received: 11/15/16 13:55**

**Lab Sample ID: 660-77306-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:01	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16K034-04**

**Date Collected: 11/10/16 10:20**

**Date Received: 11/15/16 13:55**

**Lab Sample ID: 660-77306-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:05	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L16K034-05**

**Date Collected: 11/10/16 09:49**

**Date Received: 11/15/16 13:55**

**Lab Sample ID: 660-77306-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	331677	11/18/16 11:14	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			331888	11/19/16 16:08	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001



# Certification Summary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

## Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E84282	06-30-17

## Laboratory: TestAmerica Pensacola

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E81010	06-30-17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L16K034

TestAmerica Job ID: 660-77306-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L16K034

SENDING LABORATORY:

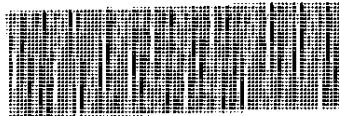
Tampa Electric Company, Laboratory Services
5012 Causeway Blvd
Tampa, FL 33619
Phone: (813) 630-7490
Fax: (813) 630-7360
Project Manager: Peggy Penner

RECEIVING LABORATORY:

TestAmerica Laboratories, Inc. - Tampa
6712 Benjamin Rd., Suite 100
Tampa, FL 33634
Phone: (813) 885-7427
Fax: -

Due Date: 11/28/16 16:00

Table with 4 columns: Analysis, Expires, Laboratory ID, Comments. Contains 5 sample entries for Lithium, Total EPA 6010, with sample IDs L16K034-01 through L16K034-05 and various BBS-CCR codes.



660-77306 Chain of Custody

Loc: 660
77306

Released By: [Signature] 11-10-16 14:12

Received By: [Signature] 11-15-16 @ HSS

Handwritten notes: 1355A, 1555 SA, 11-15-16

Released By: \_\_\_\_\_ Date & Time

Received By: \_\_\_\_\_ Date & Time

TestAmerica Tampa  
6712 Benjamin Road Suite 100  
Tampa, FL 33634  
Phone (813) 895-7427 Fax (813) 885-7049

Chain of Custody Record

TestAmerica  
THE CHAIN OF CUSTODY RECORD

<b>Client Information (Sub Contract Lab)</b> Company: TestAmerica Laboratories, Inc. Address: 3355 McLemore Drive, Pensacola, FL 32514 Phone: 850-474-1001 (Tel) 850-478-2671 (Fax) Email:		Lab P/N: Connor, Keaton E-Mail: keaton.connor@testamericainc.com Accreditations Required (See note): NELAP - Florida; NELAP - Texas		Carrier Tracking No(s): State of Origin: Florida		COC No: 660-81891.1 Page: Page 1 of 1 Job #: 660-77306-1	
Due Date Requested: 11/22/2016 TAT Requested (days):		Analysis Requested		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Project #: 66004821 SSOW#:		Matrix (w/water, solid, on-wastewater, A=ALT) Sample Type (C=comp, G=grab) Preservation Code		Field Filtered Sample (Yes or No) Param MS/MSD (Yes or No)		Total Number of Containers Special Instructions/Note:	
Sample Date Sample Time Sample Date Sample Time Sample Date Sample Time Sample Date Sample Time		Water Water Water Water Water		X X X X X		X X X X X	
Sample Identification - Client ID (Lab ID) L16K034-01 (660-77306-1) L16K034-02 (660-77306-2) L16K034-03 (660-77306-3) L16K034-04 (660-77306-4) L16K034-05 (660-77306-5)		11/10/16 11:53 Eastern 11/10/16 11:27 Eastern 11/10/16 11:05 Eastern 11/10/16 10:20 Eastern 11/10/16 09:49 Eastern		200.7/200.7_P_TOT Lithium		1 1 1 1 1	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis, the sample must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.							
<b>Possible Hazard Identification</b> Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)							
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Special Instructions/QC Requirements:							
Primary Deliverable Rank: 2							
Date:							
Relinquished by: <i>Miguel Ruiz</i> Date/Time: 11/15/16 17:00 Company:		Received by: <i>Keaton Connor</i> Date/Time: 11/16/16 09:17 Company:		Relinquished by:		Received by:	
Relinquished by:		Relinquished by:		Relinquished by:		Relinquished by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.08 / 18.5		Date/Time:	



# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-77306-1

**Login Number: 77306**

**List Number: 1**

**Creator: Redding, Charles S**

**List Source: TestAmerica Tampa**

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-77306-1

**Login Number: 77306**  
**List Number: 2**  
**Creator: Chambers, Cheryle A**

**List Source: TestAmerica Pensacola**  
**List Creation: 11/16/16 12:08 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR5
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Report Date: December 8, 2016

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L16K034-01  
 Sample Collection: 11-10-16/1153  
 Lab ID No: 16.13251  
 Lab Custody Date: 11-14-16/1510  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.3 ± 1.8	Calc	Calc	0.9
Radium-226	pCi/l	35.0 ± 1.8	11-28-16/1317	EPA 903.0	0.4
Radium-228	pCi/l	2.3 ± 0.7	11-21-16/1207	EPA Ra-05	0.9

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16K034-02

Sample Collection: 11-10-16/1127

Lab ID No: 16.13252  
Lab Custody Date: 11-14-16/1510  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.8 ± 1.1	Calc	Calc	0.8
Radium-226	pCi/l	13.9 ± 1.1	11-28-16/1213	EPA 903.0	0.3
Radium-228	pCi/l	0.9 ± 0.6	11-21-16/1207	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





Report Date: December 8, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16K034-03  
Sample Collection: 11-10-16/1105  
Lab ID No: 16.13253  
Lab Custody Date: 11-14-16/1510  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	17.5 ± 1.2	Calc	Calc	0.8
Radium-226	pCi/l	15.6 ± 1.2	11-28-16/1317	EPA 903.0	0.4
Radium-228	pCi/l	1.9 ± 0.6	11-21-16/1207	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16K034-04

Sample Collection: 11-10-16/1020

Lab ID No: 16.13254  
Lab Custody Date: 11-14-16/1510  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	29.9 ± 1.6	Calc	Calc	0.9
Radium-226	pCi/l	26.3 ± 1.6	11-28-16/1317	EPA 903.0	0.3
Radium-228	pCi/l	3.6 ± 0.8	11-21-16/1207	EPA Ra-05	0.9

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: December 8, 2016

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L16K034-05

Sample Collection: 11-10-16/0949

Lab ID No: 16.13255  
Lab Custody Date: 11-14-16/1510  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	8.0 ± 0.8	Calc	Calc	0.8
Radium-226	pCi/l	3.5 ± 0.6	11-28-16/1317	EPA 903.0	0.4
Radium-228	pCi/l	4.5 ± 0.8	11-21-16/1207	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed.  
Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**

**Tampa Electric Company, Laboratory Services**

**L16K034**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
 3202 N. Florida Ave.  
 Tampa, FL 33603  
 Phone : (813) 229-2879  
 Fax: -

**Due Date: 11/28/16 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L16K034-01      BBS-CCR-1</b>		Water	1613251
<b>Sampled: 11/10/16 11:53</b>			
Radium 226 EPA 903.0	05/09/17 11:53		Level 2 Data required
Radium 226+228, Total	05/09/17 11:53		Level 2 Data required
Radium 228 Ra-05	05/09/17 11:53		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L16K034-02      BBS-CCR-2</b>		Water	1613252
<b>Sampled: 11/10/16 11:27</b>			
Radium 226 EPA 903.0	05/09/17 11:27		Level 2 Data required
Radium 226+228, Total	05/09/17 11:27		Level 2 Data required
Radium 228 Ra-05	05/09/17 11:27		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L16K034-03      BBS-CCR-3</b>		Water	1613253
<b>Sampled: 11/10/16 11:05</b>			
Radium 226+228, Total	05/09/17 11:05		Level 2 Data required
Radium 226 EPA 903.0	05/09/17 11:05		Level 2 Data required
Radium 228 Ra-05	05/09/17 11:05		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L16K034-04      BBS-CCR-BW1</b>		Water	1613254
<b>Sampled: 11/10/16 10:20</b>			
Radium 226 EPA 903.0	05/09/17 10:20		Level 2 Data required
Radium 226+228, Total	05/09/17 10:20		Level 2 Data required
Radium 228 Ra-05	05/09/17 10:20		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

*JPB  
12-9-16*

*Released By: [Signature] 11-10-16 1412      Received By: KNL 11/14/16 1510*

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L16K034**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L16K034-05      BBS-CCR-BW2		Water	16.13255
Sampled: 11/10/16 09:49			
Radium 228 Ra-05	05/09/17 09:49		Level 2 Data required
Radium 226 EPA 903.0	05/09/17 09:49		Level 2 Data required
Radium 226+228, Total	05/09/17 09:49		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)		RAD Poly HNO3 - 1000mL (D)	

# 12-9-16

<i>RA B...</i>	11-10-16 1412		
Released By	Date & Time	Received By	Date & Time

*KNL 11/14/16 1510*

Released By	Date & Time	Received By	Date & Time



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L16K034

Analysis Completion Date: 111 211 16

### Precision Data:

Sample #: 16.13254

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>11.2</u>	<u>10.4</u>	<u>0.8</u>	<u>—</u>

### Spike Data:

Sample #: 16.13254

<u>Sample Analysis (pCi/L)</u>	<u>Spike Added (pCi/L)</u>	<u>Analytical Result (pCi/L)</u>	<u>Spike Rec (%)</u>
<u>3.6</u>	<u>7.56</u>	<u>11.2</u>	<u>101%</u>

### LCS Data:

<u>Analytical Result (pCi/L)</u>	<u>True Value (pCi/L)</u>	<u>% Recovery</u>
<u>3.7</u>	<u>4.3</u>	<u>86%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.4 +/- 0.3</u>	<u>111 211 16</u>



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L16K034

Analysis Completion Date: 11/28/16

### Precision Data:

Sample #: 16.13174

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>6.1</u>	<u>5.5</u>	<u>0.6</u>	<u>—</u>

### Spike Data:

Sample #: 16.13174

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>1.4</u>	<u>4.5</u>	<u>6.1</u>	<u>104%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>8.4</u>	<u>10.1</u>	<u>83%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.3 +/- 0.2</u>	<u>11/28/16</u>

**JANUARY 2017**





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 04/25/17 15:40

Work Order - **L17A041**

Project - **CCR Wells Economizer Ash Pond**

---

## Case Narrative

---

REPORT REVISED 4/25/2017 to add Beryllium to sample CCR -1

5 sample(s) were received on 01/26/17 14:15.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium was subcontracted to TestAmerica Labs. The report is attached.

Rad 226/228 was subcontracted to KNL Laboratory. The report is attached.

### **SM 2540C**

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples CCR 1 and CCR-BW-1. The sample(s) are flagged with a J qualifier.

### **EPA 300.0**

The recovery of the matrix spike and spike duplicate for Chloride, Fluoride and Sulfate were above the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

### **EPA 6010**

The recovery of the matrix spike and spike duplicate for Calcium and Boron could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17A041-01	Date and Time Collected:	1/26/17 12:02
Sample Description:	BBS-CCR-1	Date of Sample Receipt:	1/26/17 14:15
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	820	mg/L	2.00	50.0	V	100	EPA 300.0	RFL	1/27/17 16:05
Specific Conductance	4320	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 12:02
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	1/26/17 12:02
Fluoride	0.184	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 15:55
pH	6.79	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 12:02
REDOX Potential	-110	mV	-999	-999		1	SM 2580B	RAB	1/26/17 12:02
Total Dissolved Solids	3670	mg/L	24.0	40.0	J-	2	SM 2540C	TMH	1/31/17 15:45
Sulfate	1350	mg/L	50.0	200		100	EPA 300.0	RFL	1/27/17 16:05
Turbidity	1.99	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 12:02
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:15
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.602	ug/L	0.600	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Arsenic	9.04	ug/L	0.320	2.00		1	EPA 200.8	RLC	1/27/17 12:04
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:04
Cobalt	0.489	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:04
Selenium	0.653	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	1/27/17 12:04
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:04
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	0.115	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 9:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 9:56
Boron	15.5	mg/L	0.0100	0.0500	J-	1	EPA 6010B	MCR	1/31/17 9:56
Calcium	579000	ug/L	30.0	1000	J-	1	EPA 6010B	MCR	1/31/17 11:14
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 9:56
Molybdenum	92.4	ug/L	1.00	20.0		1	EPA 6010B	MCR	1/31/17 9:56

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17A041-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 1/26/17 11:35  
 Date of Sample Receipt: 1/26/17 14:15

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	115	mg/L	0.200	5.00	J-,V	10	EPA 300.0	RFL	1/27/17 16:25
Specific Conductance	1560	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:35
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	1/26/17 11:35
Fluoride	0.248	mg/L	0.0100	0.0500	J-	1	EPA 300.0	RFL	1/27/17 16:15
pH	6.89	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:35
REDOX Potential	-182	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:35
Total Dissolved Solids	1140	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	490	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	1/27/17 16:25
Turbidity	4.93	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:35

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:19
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:08
Arsenic	1.09	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	1/27/17 12:08
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:08
Cobalt	0.0902	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:08
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:08
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:08
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:08

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 9:59
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 9:59
Boron	3.86	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 9:59
Calcium	172000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:17
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 9:59
Molybdenum	2.52	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 9:59

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17A041-03  
 Sample Description: BBS-CCR-3  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 1/26/17 11:04  
 Date of Sample Receipt: 1/26/17 14:15

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	129	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	1/27/17 17:06
Specific Conductance	1510	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:04
Dissolved Oxygen	0.110	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 11:04
Fluoride	0.391	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 16:56
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:04
REDOX Potential	-168	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:04
Total Dissolved Solids	1200	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	454	mg/L	5.00	20.0		10	EPA 300.0	RFL	1/27/17 17:06
Turbidity	1.79	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:04
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:23
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:11
Cobalt	0.0989	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:11
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:11
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:11
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:11
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0562	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:01
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:01
Boron	0.381	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:01
Calcium	176000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:19
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:01
Molybdenum	5.42	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:01

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17A041-04  
 Sample Description: BBS-CCR-BW1  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 1/26/17 10:32  
 Date of Sample Receipt: 1/26/17 14:15

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	942	mg/L	2.00	50.0	V	100	EPA 300.0	RFL	1/27/17 17:46
Specific Conductance	4940	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 10:32
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 10:32
Fluoride	0.315	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 17:16
pH	6.46	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 10:32
REDOX Potential	-20.2	mV	-999	-999		1	SM 2580B	RAB	1/26/17 10:32
Total Dissolved Solids	4510	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	1/31/17 15:45
Sulfate	1520	mg/L	50.0	200		100	EPA 300.0	RFL	1/27/17 17:46
Turbidity	2.04	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 10:32
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:27
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:15
Cobalt	1.50	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:15
Lead	0.000113	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	1/27/17 12:15
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	1/27/17 12:15
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:15
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:04
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:04
Boron	45.9	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:04
Calcium	728000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:22
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:04
Molybdenum	7.16	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:04

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17A041-05	Date and Time Collected:	1/26/17 10:02
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	1/26/17 14:15
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	145	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	1/27/17 18:06
Specific Conductance	1460	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	1/26/17 11:22
Dissolved Oxygen	0.300	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	1/26/17 11:22
Fluoride	0.472	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	1/27/17 17:56
pH	6.62	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	1/26/17 11:22
REDOX Potential	-74.1	mV	-999	-999		1	SM 2580B	RAB	1/26/17 11:22
Total Dissolved Solids	1140	mg/L	12.0	20.0		1	SM 2540C	TMH	1/31/17 15:45
Sulfate	255	mg/L	5.00	20.0		10	EPA 300.0	RFL	1/27/17 18:06
Turbidity	16.4	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	1/26/17 11:22
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	1/31/17 14:30
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	1/27/17 12:19
Arsenic	0.709	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:19
Cobalt	0.136	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	1/27/17 12:19
Selenium	0.260	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	1/27/17 12:19
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	1/27/17 12:19
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0388	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	1/31/17 10:06
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	1/31/17 10:06
Boron	3.27	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	1/31/17 10:06
Calcium	240000	ug/L	30.0	1000		1	EPA 6010B	MCR	1/31/17 11:24
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	MCR	1/31/17 10:06
Molybdenum	2.56	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	1/31/17 10:06

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17A0279 - EPA 6010B</b>											
<b>Blank (17A0279-BLK1)</b>					Prepared: 01/30/17 Analyzed: 01/31/17						
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (17A0279-BS1)</b>					Prepared: 01/30/17 Analyzed: 01/31/17						
Barium	0.922	0.000500	0.0200	mg/L	1.0000		92.2	80-120			
Beryllium	961	0.200	2.00	ug/L	1000.0		96.1	80-120			
Boron	0.948	0.0100	0.0500	mg/L	1.0000		94.8	80-120			
Chromium	925	1.60	12.0	ug/L	1000.0		92.5	80-120			
Molybdenum	934	1.00	20.0	ug/L	1000.0		93.4	80-120			
<b>Matrix Spike (17A0279-MS1)</b>					<b>Source: L17A041-01</b>		Prepared: 01/30/17 Analyzed: 01/31/17				
Barium	0.986	0.000500	0.0200	mg/L	1.0000	0.115	87.1	75-125			
Beryllium	908	0.200	2.00	ug/L	1000.0	U	90.8	75-125			
Boron	16.4	0.0100	0.0500	mg/L	1.0000	15.5	93.3	75-125			
Chromium	885	1.60	12.0	ug/L	1000.0	U	88.5	75-125			
Molybdenum	1010	1.00	20.0	ug/L	1000.0	92.4	92.1	75-125			
<b>Matrix Spike Dup (17A0279-MSD1)</b>					<b>Source: L17A041-01</b>		Prepared: 01/30/17 Analyzed: 01/31/17				
Barium	1.14	0.000500	0.0200	mg/L	1.0000	0.115	103	75-125	14.9	20	
Beryllium	1080	0.200	2.00	ug/L	1000.0	U	108	75-125	17.2	20	
Boron	16.9	0.0100	0.0500	mg/L	1.0000	15.5	139	75-125	2.78	20	J-
Chromium	1050	1.60	12.0	ug/L	1000.0	U	105	75-125	17.0	20	
Molybdenum	1030	1.00	20.0	ug/L	1000.0	92.4	93.9	75-125	1.69	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17A0273 - EPA 7470A</b>											
<b>Blank (17A0273-BLK1)</b>					Prepared & Analyzed: 01/31/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17A0273-BS1)</b>					Prepared & Analyzed: 01/31/17						
Mercury	1.02	0.0500	0.200	ug/L	1.0000		102	80-120			
<b>Matrix Spike (17A0273-MS1)</b>					Source: L17A041-02		Prepared & Analyzed: 01/31/17				
Mercury	1.01	0.0500	0.200	ug/L	1.0000	U	101	75-125			
<b>Matrix Spike Dup (17A0273-MSD1)</b>					Source: L17A041-02		Prepared & Analyzed: 01/31/17				
Mercury	1.01	0.0500	0.200	ug/L	1.0000	U	101	75-125	0.0476	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17A0263 - EPA 200.8

#### Blank (17A0263-BLK1)

Prepared: 01/26/17 Analyzed: 01/27/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17A0263-BS1)

Prepared: 01/26/17 Analyzed: 01/27/17

Antimony	102	0.600	2.00	ug/L	100.00		102	85-115			
Arsenic	97.7	0.320	2.00	ug/L	100.00		97.7	85-115			
Cadmium	104	0.100	0.500	ug/L	100.00		104	85-115			
Cobalt	98.7	0.0400	2.00	ug/L	100.00		98.7	85-115			
Lead	0.102	8.00E-5	0.00200	mg/L	0.10000		102	85-115			
Selenium	98.5	0.200	2.00	ug/L	100.00		98.5	85-115			
Thallium	98.5	0.100	0.500	ug/L	100.00		98.5	85-115			

#### Matrix Spike (17A0263-MS1)

Source: L17A041-01

Prepared: 01/26/17 Analyzed: 01/27/17

Antimony	97.5	0.600	2.00	ug/L	100.00	0.602	96.9	70-130			
Arsenic	93.9	0.320	2.00	ug/L	100.00	9.04	84.9	70-130			
Cadmium	93.9	0.100	0.500	ug/L	100.00	U	93.9	70-130			
Cobalt	96.2	0.0400	2.00	ug/L	100.00	0.489	95.7	70-130			
Lead	0.0914	8.00E-5	0.00200	mg/L	0.10000	U	91.4	70-130			

#### Matrix Spike Dup (17A0263-MSD1)

Source: L17A041-01

Prepared: 01/26/17 Analyzed: 01/27/17

Antimony	100	0.600	2.00	ug/L	100.00	0.602	99.4	70-130	2.52	20	
Arsenic	91.1	0.320	2.00	ug/L	100.00	9.04	82.1	70-130	3.02	20	
Cadmium	97.1	0.100	0.500	ug/L	100.00	U	97.1	70-130	3.36	20	
Cobalt	93.0	0.0400	2.00	ug/L	100.00	0.489	92.5	70-130	3.47	20	
Lead	0.0935	8.00E-5	0.00200	mg/L	0.10000	U	93.5	70-130	2.29	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17A0275 - EPA 300.0</b>											
<b>Blank (17A0275-BLK1)</b>					Prepared & Analyzed: 01/27/17						
Chloride	0.123	0.0200	0.500	mg/L							I
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17A0275-BS1)</b>					Prepared & Analyzed: 01/27/17						
Chloride	4.82	0.0200	0.500	mg/L	5.0000		96.4	90-110			V
Fluoride	4.73	0.0100	0.0500	mg/L	5.0000		94.7	90-110			
Sulfate	4.91	0.500	2.00	mg/L	5.0000		98.3	90-110			
<b>Matrix Spike (17A0275-MS1)</b>					Source: L17A041-02		Prepared & Analyzed: 01/27/17				
Chloride	189	0.200	5.00	mg/L	50.000	115	148	90-110			J-,V
Fluoride	77.9	0.100	0.500	mg/L	50.000	0.248	155	90-110			J-
Sulfate	557	5.00	20.0	mg/L	50.000	490	133	90-110			J-
<b>Matrix Spike Dup (17A0275-MSD1)</b>					Source: L17A041-02		Prepared & Analyzed: 01/27/17				
Chloride	189	0.200	5.00	mg/L	50.000	115	148	90-110	0.147	20	J-,V
Fluoride	78.2	0.100	0.500	mg/L	50.000	0.248	156	90-110	0.295	20	J-
Sulfate	556	5.00	20.0	mg/L	50.000	490	132	90-110	0.0667	20	J-
<b>Batch 17A0291 - SM 2540C</b>											
<b>Blank (17A0291-BLK1)</b>					Prepared & Analyzed: 01/31/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17A0291-BS1)</b>					Prepared & Analyzed: 01/31/17						
Total Dissolved Solids	1030	12.0	20.0	mg/L	1000.0		103	80-120			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17A0291 - SM 2540C</b>											
<b>Duplicate (17A0291-DUP1)</b>		<b>Source: L17A041-01</b>				<b>Prepared &amp; Analyzed: 01/31/17</b>					
Total Dissolved Solids	3480	24.0	40.0	mg/L		3670			5.43	10	J-

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

**DEP-SOP-001/01**  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-1</b>	SAMPLE ID: <b>L17A041-01</b> DATE: <b>1/16/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>12.32</b> feet to <b>22.32</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.46</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot x                      23.3                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	PURGING INITIATED AT: <b>11:42</b>	PURGING ENDED AT: <b>11:56</b>	TOTAL VOLUME PURGED (gallons): <b>3.10</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:52	2.22	2.22	0.22	7.69	6.78	24.06	4319	0.07	2.63	CLEAR	NONE
11:54	0.44	2.66	0.22	7.68	6.79	24.05	4324	0.07	1.09	CLEAR	NONE
11:56	0.44	3.10	0.22	7.68	6.79	24.03	4324	0.07	1.99	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:56</b>		SAMPLING ENDED AT: <b>12:02</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>17.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>840</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Filtration Equipment Type <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
 SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L17A041-02</b> DATE: <b>1/16/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.93</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>11:12</b>	PURGING ENDED AT: <b>11:31</b>	TOTAL VOLUME PURGED (gallons): <b>4.23</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:27	3.33	3.33	0.22	7.12	6.89	24.26	1549	0.09	4.51	LT. YELLOW	MILD
11:29	0.45	3.78	0.23	7.13	6.89	24.17	1551	0.08	3.98	LT. YELLOW	MILD
11:31	0.45	4.23	0.23	7.13	6.89	24.27	1556	0.08	4.93	LT. YELLOW	MILD
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:31</b>		SAMPLING ENDED AT: <b>11:35</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>847</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RPPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-3</b>	SAMPLE ID: <b>L17A041-03</b>
	DATE: <b>1/16/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.23</b> feet to <b>23.23</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.81</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>
------------------------	-------------------------------------	---	---	--------------------------------------

**WELL VOLUME PURGE:** (only fillout if applicable)  
**1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY**  
 = (                      feet -                      feet ) x                      gallons/foot =                      gallons

**EQUIPMENT VOLUME PURGE:** (only fillout if applicable)  
**1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME**  
 = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.23                      feet ) +                      0.06                      gallons =                      0.12                      gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	PURGING INITIATED AT: <b>10:42</b>	PURGING ENDED AT: <b>10:55</b>	TOTAL VOLUME PURGED (gallons): <b>1.37</b>
---	---	------------------------------------	--------------------------------	--

TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:51	0.95	0.95	0.11	7.32	6.42	24.20	1629	0.13	1.85	YELLOW	MILD
10:53	0.21	1.16	0.11	7.31	6.42	24.21	1620	0.12	1.89	YELLOW	MILD
10:55	0.21	1.37	0.11	7.32	6.42	24.25	1512	0.11	1.79	YELLOW	MILD

**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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>	SAMPLER (S) SIGNATURES:	SAMPLING INITIATED AT: <b>10:55</b>	SAMPLING ENDED AT: <b>11:04</b>
---	-------------------------	--	------------------------------------

PUMP OR TUBING DEPTH IN WELL (feet): <b>18.2</b>	SAMPLE PUMP FLOW RATE (mL per minute): <b>400</b>	TUBING MATERIAL CODE: <b>PE/S</b>
--	---	-----------------------------------

FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>	FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:                      µm	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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH		
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP

REMARKS:  
**(1) Sample bottles pre-preserved at laboratory prior to sample collection.**

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump  
 RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

- 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)

**DEP-SOP-001/01**  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME:	SITE LOCATION:
WELL NO:	SAMPLE ID: <span style="float: right;">DATE: <b>1/16/17</b></span>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>8.00</b> feet to <b>18.00</b> (feet)	STATIC DEPTH TO WATER (feet):	PURGE PUMP TYPE OR BAILER: <b>PP</b>
------------------------	-------------------------------------	--	-------------------------------	--------------------------------------

**WELL VOLUME PURGE:** (only fillout if applicable)  
**1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY**  
= (                      feet -                      feet ) x                      gallons/foot =                      gallons

**EQUIPMENT VOLUME PURGE:** (only fillout if applicable)  
**1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME**  
= (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>14.00</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>14.00</b>	PURGING INITIATED AT:	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):
---	---	-----------------------	-------------------	--------------------------------

TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle(mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)

**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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>	SAMPLER (S) SIGNATURES:	SAMPLING INITIATED AT:	SAMPLING ENDED AT:
---	-------------------------	------------------------	--------------------

PUMP OR TUBING DEPTH IN WELL (feet):	SAMPLE PUMP FLOW RATE (mL per minute):	TUBING MATERIAL CODE: <b>PE/S</b>
--------------------------------------	--	-----------------------------------

FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE: µm	DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
---	--	---

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH		
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics	PP
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals	PP
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals	PP

REMARKS:  
(1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:** AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L17A041-04</b> DATE: <b>1/16/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> (feet) to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>30.49</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>10:15</b>	PURGING ENDED AT: <b>10:29</b>	TOTAL VOLUME PURGED (gallons): <b>6.09</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:25	4.39	4.39	0.44	31.32	6.46	26.99	4897	0.21	7.46	CLEAR	NONE
10:27	0.85	5.24	0.43	31.31	6.46	26.99	4999	0.20	2.79	CLEAR	NONE
10:29	0.85	6.09	0.43	31.30	6.46	26.98	4944	0.20	2.04	CLEAR	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:29</b>		SAMPLING ENDED AT: <b>10:32</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1620</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L17A041-05</b> DATE: <b>1/16/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>9.13</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:38</b>	PURGING ENDED AT: <b>9:57</b>	TOTAL VOLUME PURGED (gallons): <b>2.98</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:53	2.38	2.38	0.16	9.40	6.62	25.22	1455	0.46	14.80	CLEAR	NONE
9:55	0.30	2.68	0.15	9.39	6.62	25.29	1456	0.33	13.60	CLEAR	NONE
9:57	0.30	2.98	0.15	9.40	6.62	25.25	1457	0.30	16.40	CLEAR	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>9:57</b>		SAMPLING ENDED AT: <b>10:02</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>580</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

Site: **Big Bend** Date: **01/16/17** File Name: **011617\_Wells\_RAB** Weather: **OVERCAST & MILD** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17A041-01	BBS-CCR-1	12:02		6.79	24.03	4324	0.07	1.99	-110.4		CLEAR	NONE	11:42	
L17A041-02	BBS-CCR-2	11:35		6.89	24.27	1556	0.08	4.93	-182.0		LT. YELLOW	MILD	11:12	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17A041-01	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L17A041-02	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	<input checked="" type="checkbox"/> 012554	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L	1.5
500 ml bottles (metals): 2 ml HNO3 to pH <2	<input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L	
250 ml bottles (metal): 1 ml HNO3 to pH <2	<input checked="" type="checkbox"/> 012554	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L	

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID: MPM08	8:50	24.3	232.1	232.3
FDEP FT 1100	L 016778B	10	10.05	8:40	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	14:17	21.5	233.4	236.2
Units: SU	L 016917D	4	3.99	8:40	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 015981D	1000	1000	9:00					Meter ID: MPM08	8:30	21.9	8.73	8.777
FDEP FT 1200, Units: uMHOS	L 016236A	10000			9889	9:05	9896	14:03					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
Meter ID: TM07	L 016722	4.76	4.28 5.24	4.77	8:05			Meter ID: MPM08	14:53	21.4	8.85	8.846
FDEP FT 1600, Units: NTU	L 016723	52.10	48.71 55.49			51.70	14:37	Barom. Pres	760			

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	Meter ID: MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026, 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	7.46	14.86	0.16	2.38	0.0026	23.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:52	840	2.22	2.22	7.69	6.78	24.06	4319	0.07	2.63	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:54	840	0.44	2.66	7.68	6.79	24.05	4324	0.07	1.09	Temp°C +/- 0.2	STABLE	Pump:	PP
11:42	11:56	840	0.44	3.10	7.68	6.79	24.03	4324	0.07	1.99	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
11:56											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At 11:43 Gallons to Purge 0.12 Stability Values = 6.79 24.03 4324 0.07 1.99

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-2	2	10	16.84	21.84	6.93	14.91	0.16	2.39	0.0026	22.84	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:27	840	3.33	3.33	7.12	6.89	24.26	1549	0.09	4.51	ph:+/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:29	850	0.45	3.78	7.13	6.89	24.17	1551	0.08	3.98	Temp°C +/- 0.2	STABLE	Pump:	PP
11:12	11:31	850	0.45	4.23	7.13	6.89	24.27	1556	0.08	4.93	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
11:31											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No

Purge Complete At 11:13 Gallons to Purge 0.12 Stability Values = 6.89 24.27 1556 0.08 4.93

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **01/16/17** File Name: **011617\_Wells\_RAB** Weather: **OVERCAST & MILD** Sampler(s)/Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17A041-03	BBS-CCR-3	11:04		6.42	24.25	1512	0.11	1.79	-168.4		YELLOW	MILD	10:42	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17A041-03	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)

ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS

Samples On Ice  Yes  No Time 14:15

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID
1L bottles (rads): 5 ml HNO3 to pH <2	L 012554 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID: MPM08	8:50	24.3	232.1	232.3

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	Zobell Sol ID:
Meter ID: MPM08	L 015981D	1000	1000	9:00					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Meter ID	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TM07	L 016722	4.76	4.28 - 5.24	4.77	8:05			MPM08	14:53	21.4	8.85	8.846

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-3	2	10	18.23	23.23	6.81	16.42	0.16	2.63	0.0026	24.23	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table	
1A	10:51	400	0.95	0.95	7.32	6.42	24.20	1629	0.13	1.85	ph:+/- 0.2	STABLE	Level Meter: WLM08		
Purge Start:	10:53	400	0.21	1.16	7.31	6.42	24.21	1620	0.12	1.89	Temp°C+/- 0.2	STABLE	Pump: PP		
	10:42	10:55	400	0.21	1.37	7.32	6.42	24.25	1512	0.11	1.79	Cond % +/- 5		Tubing: PE/S	
Purge End:	10:55										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No	
Purge Complete At	10:43	Gallons to Purge	0.12	Stability Values =	6.42	24.25	1512	0.11	1.79						

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
											ph:+/- 0.2		Level Meter: WLM08	
Purge Start:											Temp°C+/- 0.2		Pump: PP	
											Cond % +/- 5		Tubing: PE/S	
Purge End:											DO % Sat. < 20		Dedicated <input checked="" type="checkbox"/>	Yes
											Turb. NTU < 20		Tubing? <input type="checkbox"/>	No
Purge Complete At		Gallons to Purge	0.32	Stability Values =										

Comments:

Total Time Total Miles

Site: **Big Bend** Date: **01/16/17** File Name: **011617\_Wells\_RAB** Weather: **OVERCAST & MILD** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup>	pH (SU)	Temp °C	Cond(uMHOS)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	NGVD	
			mg/l	PH	TEMP-C	COND-F	DO	TURB-N-F	REDOX	SO3-TR	\$COLOR-W	\$ODOR-W	Time	LEVEL
L17A041-04	BBS-CCR-BW-1	10:32		6.46	26.98	4944	0.20	2.04	-20.2		CLEAR	NONE	10:15	
L17A041-05	BBS-CCR-BW-2	10:02		6.62	25.25	1457	0.30	16.40	-74.1		CLEAR	NONE	9:37	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17A041-04	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L17A041-05	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice	Sample Receipt
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Time 14:15

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID
1L bottles (rads): 5 ml HNO3 to pH <2	L 012554 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 012554 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2	

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 016987H	7	7.01	8:40	7.02	8:42	7.06	14:36	Meter ID: MPM08	8:50	24.3	232.1	232.3
FDEP FT 1100	L 016778B	10	10.05	8:40	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	14:17	21.5	233.4	236.2
Units: SU	L 016917D	4	3.99	8:40	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 017384A
Meter ID: MPM08	L 015981D	1000	1000	9:00					
FDEP FT 1200, Units: uMHOS	L 016236A	10000			9889	9:05	9896	14:03	

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	14:53	21.4	8.85	8.846
Meter ID: TM07	SF- 016722	4.76	4.28	5.24	4.77	8:05		Barom. Pres				
FDEP FT 1600, Units: NTU	SF- 016723	52.10	48.71	55.49			51.70	14:37	760			

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titratior ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	30.49	13.81	0.16	2.21	0.0026	100	0	0.06	0.32	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:25	1660	4.39	4.39	31.32	6.46	26.99	4897	0.21	7.46	ph: +/- 0.2	STABLE	Level Meter: WLM08	
<b>Purge Start:</b>	10:27	1600	0.85	5.24	31.31	6.46	26.99	4999	0.20	2.79	Temp°C +/- 0.2	STABLE	Pump: ESP	
	10:15	10:29	1600	0.85	6.09	31.30	26.98	4944	0.20	2.04	Cond % +/- 5	STABLE	Tubing: PE	
<b>Purge End:</b>	10:29										DO % Sat. < 20	STABLE	Dedicated <input type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input checked="" type="checkbox"/> No	
<b>Purge Complete At</b>	<b>10:16</b>	<b>Gallons to Purge 0.32</b>	Stability Values =		6.46	26.98	4944	0.20	2.04					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-BW-2	2	10	18.49	23.84	9.13	14.71	0.16	2.35	0.0026	24.64	0	0.06	0.12	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:53	600	2.38	2.38	9.40	6.62	25.22	1455	0.46	14.80	ph: +/- 0.2	STABLE	Level Meter: WLM08	
<b>Purge Start:</b>	9:55	570	0.30	2.68	9.39	6.62	25.29	1456	0.33	13.60	Temp°C +/- 0.2	STABLE	Pump: PP	
	9:38	9:57	570	0.30	2.98	9.40	25.25	1457	0.30	16.40	Cond % +/- 5	STABLE	Tubing: PE/S	
<b>Purge End:</b>	9:57										DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
<b>Purge Complete At</b>	<b>9:39</b>	<b>Gallons to Purge 0.12</b>	Stability Values =		6.62	25.25	1457	0.30	16.40					

Comments: Total Time Total Miles

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427

TestAmerica Job ID: 660-78617-1

Client Project/Site: L17A041

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



Authorized for release by:

1/31/2017 3:25:18 PM

Haukur Gudnason, Project Manager II

(813)280-8342

[haukur.gudnason@testamericainc.com](mailto:haukur.gudnason@testamericainc.com)

Designee for

Keaton Conner, Project Mgmt. Assistant

(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through

**TotalAccess**

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-78617-1	L17A041-01	Water	01/25/17 12:02	01/27/17 09:02
660-78617-2	L17A041-02	Water	01/25/17 11:35	01/27/17 09:02
660-78617-3	L17A041-03	Water	01/25/17 11:04	01/27/17 09:02
660-78617-4	L17A041-04	Water	01/25/17 10:32	01/27/17 09:02
660-78617-5	L17A041-05	Water	01/25/17 10:02	01/27/17 09:02

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

---

**Job ID: 660-78617-1**

---

**Laboratory: TestAmerica Tampa**

---

**Narrative**

**Job Narrative  
660-78617-1**

**Comments**

No additional comments.

**Receipt**

The samples were received on 1/27/2017 9:02 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 15.0° C.

**Metals**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## Client Sample ID: L17A041-01

## Lab Sample ID: 660-78617-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.014	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17A041-02

## Lab Sample ID: 660-78617-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.013	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17A041-03

## Lab Sample ID: 660-78617-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0077	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17A041-04

## Lab Sample ID: 660-78617-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.018	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17A041-05

## Lab Sample ID: 660-78617-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0052	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

**Client Sample ID: L17A041-01**

Date Collected: 01/25/17 12:02

Date Received: 01/27/17 09:02

**Lab Sample ID: 660-78617-1**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.014	I	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 20:11	1

**Client Sample ID: L17A041-02**

Date Collected: 01/25/17 11:35

Date Received: 01/27/17 09:02

**Lab Sample ID: 660-78617-2**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.013	I	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 20:14	1

**Client Sample ID: L17A041-03**

Date Collected: 01/25/17 11:04

Date Received: 01/27/17 09:02

**Lab Sample ID: 660-78617-3**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0077	I	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 20:18	1

**Client Sample ID: L17A041-04**

Date Collected: 01/25/17 10:32

Date Received: 01/27/17 09:02

**Lab Sample ID: 660-78617-4**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.018	I	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 20:31	1

**Client Sample ID: L17A041-05**

Date Collected: 01/25/17 10:02

Date Received: 01/27/17 09:02

**Lab Sample ID: 660-78617-5**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0052	I	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 20:34	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-340211/1-A**  
**Matrix: Water**  
**Analysis Batch: 340400**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 340211**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		01/29/17 10:39	01/30/17 19:32	1

**Lab Sample ID: LCS 400-340211/2-A**  
**Matrix: Water**  
**Analysis Batch: 340400**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 340211**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.06		mg/L		106	85 - 115

**Lab Sample ID: 400-133205-A-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 340400**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 340211**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.0031	I	1.00	1.10		mg/L		110	70 - 130

**Lab Sample ID: 400-133205-A-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 340400**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 340211**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.0031	I	1.00	1.09		mg/L		109	70 - 130	1	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## Metals

### Prep Batch: 340211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-78617-1	L17A041-01	Total/NA	Water	200.7	
660-78617-2	L17A041-02	Total/NA	Water	200.7	
660-78617-3	L17A041-03	Total/NA	Water	200.7	
660-78617-4	L17A041-04	Total/NA	Water	200.7	
660-78617-5	L17A041-05	Total/NA	Water	200.7	
MB 400-340211/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-340211/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-133205-A-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-133205-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### Analysis Batch: 340400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-78617-1	L17A041-01	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-2	L17A041-02	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-3	L17A041-03	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-4	L17A041-04	Total/NA	Water	200.7 Rev 4.4	340211
660-78617-5	L17A041-05	Total/NA	Water	200.7 Rev 4.4	340211
MB 400-340211/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	340211
LCS 400-340211/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	340211
400-133205-A-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	340211
400-133205-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	340211

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

**Client Sample ID: L17A041-01**

**Date Collected: 01/25/17 12:02**

**Date Received: 01/27/17 09:02**

**Lab Sample ID: 660-78617-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:11	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17A041-02**

**Date Collected: 01/25/17 11:35**

**Date Received: 01/27/17 09:02**

**Lab Sample ID: 660-78617-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:14	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17A041-03**

**Date Collected: 01/25/17 11:04**

**Date Received: 01/27/17 09:02**

**Lab Sample ID: 660-78617-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:18	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17A041-04**

**Date Collected: 01/25/17 10:32**

**Date Received: 01/27/17 09:02**

**Lab Sample ID: 660-78617-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:31	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17A041-05**

**Date Collected: 01/25/17 10:02**

**Date Received: 01/27/17 09:02**

**Lab Sample ID: 660-78617-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	340211	01/29/17 10:39	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			340400	01/30/17 20:34	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Certification Summary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

## Laboratory: TestAmerica Tampa

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E84282	06-30-17

## Laboratory: TestAmerica Pensacola

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Florida	NELAP	4	E81010	06-30-17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Method Summary

Client: Tampa Electric Company  
Project/Site: L17A041

TestAmerica Job ID: 660-78617-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**

Tampa Electric Company, Laboratory Services

**L17A041**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone : (813) 885-7427  
 Fax: -

**Due Date: 02/09/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17A041-01</b> <b>BBS-CCR-1</b> <b>Sampled: 01/26/17 12:02</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	07/25/17 12:02	Water	
<b>Sample ID: L17A041-02</b> <b>BBS-CCR-2</b> <b>Sampled: 01/26/17 11:35</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	07/25/17 11:35	Water	
<b>Sample ID: L17A041-03</b> <b>BBS-CCR-3</b> <b>Sampled: 01/26/17 11:04</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	07/25/17 11:04	Water	
<b>Sample ID: L17A041-04</b> <b>BBS-CCR-BW1</b> <b>Sampled: 01/26/17 10:32</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	07/25/17 10:32	Water	
<b>Sample ID: L17A041-05</b> <b>BBS-CCR-BW2</b> <b>Sampled: 01/26/17 10:02</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	07/25/17 10:02	Water	

15.2 / 15.0



Loc: 860  
78617

660-78617 Chain of Custody

<i>[Signature]</i>	12617 1530	<i>[Signature]</i>	1-27-16 9:02
Released By	Date & Time	Received By	Date & Time
Released By	Date & Time	Received By	Date & Time

**Chain of Custody Record**

<b>Client Information (Sub Contract Lab)</b>		Lab P/N: Conner, Keaton	Carrier Tracking No(s): 660-93674-1						
Shipping/Receiving		E-Mail: keaton.conner@testamericainc.com	State of Origin: Florida						
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Florida; NELAP - Texas							
Address: 3355 McLemore Drive, Pensacola, FL 32514		Job #: 660-78617-1							
Phone: 850-474-1001 (Tel) 850-478-2671 (Fax)		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:							
Due Date Requested: 2/3/2017		Analysis Requested:							
TAT Requested (days):		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
PO #:		Total Number of Containers: <input checked="" type="checkbox"/>							
WO #:		Special Instructions/Note:							
Project #: 66004821		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/>							
SSON#:		Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/>							
<b>Sample Identification - Client ID (Lab ID)</b>		200.7/200.7_P_TOT Lithium							
Sample ID	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Overwater, etc)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of Containers	Special Instructions/Note
L17A041-01 (660-78617-1)	1/25/17	12:02 Eastern	Water	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
L17A041-02 (660-78617-2)	1/25/17	11:35 Eastern	Water	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
L17A041-03 (660-78617-3)	1/25/17	11:04 Eastern	Water	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
L17A041-04 (660-78617-4)	1/25/17	10:32 Eastern	Water	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
L17A041-05 (660-78617-5)	1/25/17	10:02 Eastern	Water	Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Unconfirmed  
 Return To Client  
 Disposal By Lab  
 Archive For \_\_\_\_\_ Months

Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_  
 Primary Deliverable Rank: 2

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_  
 Relinquished by: *[Signature]* Date/Time: 1/27/17 1620 Company: TATPA  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seals Intact:  Yes  No  
 Cooler Temperature(s) °C and Other Remarks: 0.0°C ID-2



# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-78617-1

**Login Number: 78617**

**List Number: 1**

**Creator: Moccia, Vanessa M**

**List Source: TestAmerica Tampa**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-78617-1

**Login Number: 78617**  
**List Number: 2**  
**Creator: Franklin, Justin H**

**List Source: TestAmerica Pensacola**  
**List Creation: 01/28/17 02:04 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





Report Date: February 14, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17A041-01

Sample Collection: 1-26-17/1202

Lab ID No: 17.1131  
Lab Custody Date: 2-1-17/1130  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis		Method	Detection Limit
			Date			
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.5 ± 1.6	Calc		Calc	0.6
Radium-226	pCi/l	30.5 ± 1.6	2-6-17/1114		EPA 903.0	0.3
Radium-228	pCi/l	2.0 ± 0.7	2-9-17/1408		EPA Ra-05	0.6

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: February 14, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17A041-02  
Sample Collection: 1-26-17/1135  
Lab ID No: 17.1132  
Lab Custody Date: 2-1-17/1130  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	13.9 ± 1.0	Calc	Calc	0.6
Radium-226	pCi/l	13.0 ± 1.0	2-6-17/1114	EPA 903.0	0.4
Radium-228	pCi/l	0.9 ± 0.6	2-9-17/1408	EPA Ra-05	0.6

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: February 14, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17A041-03  
Sample Collection: 1-26-17/1104  
Lab ID No: 17.1133  
Lab Custody Date: 2-1-17/1130  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	15.0 ± 1.1	Calc	Calc	0.6
Radium-226	pCi/l	13.8 ± 1.1	2-6-17/1114	EPA 903.0	0.3
Radium-228	pCi/l	1.2 ± 0.6	2-9-17/1408	EPA Ra-05	0.6

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





Report Date: February 14, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17A041-04  
Sample Collection: 1-26-17/1032  
Lab ID No: 17.1134  
Lab Custody Date: 2-1-17/1130  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	32.5 ± 1.5	Calc	Calc	0.6
Radium-226	pCi/l	28.4 ± 1.5	2-6-17/1114	EPA 903.0	0.3
Radium-228	pCi/l	4.1 ± 0.8	2-9-17/1408	EPA Ra-05	0.6

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: February 14, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17A041-05  
Sample Collection: 1-26-17/1002  
Lab ID No: 17.1135  
Lab Custody Date: 2-1-17/1130  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8 ± 0.6	Calc	Calc	0.6
Radium-226	pCi/l	3.7 ± 0.6	2-6-17/1114	EPA 903.0	0.4
Radium-228	pCi/l	1.1 ± 0.6	2-9-17/1408	EPA Ra-05	0.6

Alpha Standard: Th-230

J = The reported value failed to meet the established quality control criteria for either precision or accuracy. Sample matrix interference.

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L17A041

SENDING LABORATORY:

Tampa Electric Company, Laboratory Services  
5012 Causeway Blvd  
Tampa, FL 33619  
Phone: (813) 630-7490  
Fax: (813) 630-7360  
Project Manager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services  
3202 N. Florida Ave.  
Tampa, FL 33603  
Phone : (813) 229-2879  
Fax: -

**Due Date: 02/09/17 16:00**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17A041-01      BBS-CCR-1		Water	17.1131
Sampled: 01/26/17 12:02			
Radium 226 EPA 903.0	07/25/17 12:02		Level 2 Data required
Radium 226+228, Total	07/25/17 12:02		Level 2 Data required
Radium 228 Ra-05	07/25/17 12:02		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17A041-02      BBS-CCR-2		Water	17.1132
Sampled: 01/26/17 11:35			
Radium 226 EPA 903.0	07/25/17 11:35		Level 2 Data required
Radium 226+228, Total	07/25/17 11:35		Level 2 Data required
Radium 228 Ra-05	07/25/17 11:35		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17A041-03      BBS-CCR-3		Water	17.1133
Sampled: 01/26/17 11:04			
Radium 226+228, Total	07/25/17 11:04		Level 2 Data required
Radium 226 EPA 903.0	07/25/17 11:04		Level 2 Data required
Radium 228 Ra-05	07/25/17 11:04		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17A041-04      BBS-CCR-BW1		Water	17.1134
Sampled: 01/26/17 10:32			
Radium 226 EPA 903.0	07/25/17 10:32		Level 2 Data required
Radium 226+228, Total	07/25/17 10:32		Level 2 Data required
Radium 228 Ra-05	07/25/17 10:32		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

OK 2-15-17

Released By: *[Signature]*      Date & Time: 2-1-17 1132      Received By: *[Signature]*      Date & Time: 02-01-17 / 1130

Released By: \_\_\_\_\_      Date & Time: \_\_\_\_\_      Received By: \_\_\_\_\_      Date & Time: \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17A041**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17A041-05      BBS-CCR-BW2	Water	17. 1135	
<b>Sampled: 01/26/17 10:02</b>			
Radium 228 Ra-05	07/25/17 10:02	Level 2 Data required	
Radium 226 EPA 903.0	07/25/17 10:02	Level 2 Data required	
Radium 226+228, Total	07/25/17 10:02	Level 2 Data required	
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

*QR  
2-17-17*

<i>RB</i>	2-17 1130	<i>KVL BT</i>	0201-17/1130
Released By	Date & Time	Received By	Date & Time
Released By	Date & Time	Received By	Date & Time



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: 217 4041

Analysis Completion Date: 21 9 1 17

### Precision Data:

Sample #: 17,1134

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>7.9</u>	<u>8.2</u>	<u>0.3</u>	<u>3.73</u>

### Spike Data:

Sample #: 17,1134

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>4.1</u>	<u>3.89</u>	<u>7.9</u>	<u>98%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>5.2</u>	<u>4.32</u>	<u>120%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.1 +/- 0.3</u>	<u>21 9 1 17</u>



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L17A041

Analysis Completion Date: 21 6 17

### Precision Data:

Sample #: 17.1213

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>5.0</u>	<u>5.6</u>	<u>0.6</u>	<u>11.32</u>

### Spike Data:

Sample #: 17.1213

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>0.8</u>	<u>4.5</u>	<u>5.0</u>	<u>93%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>11.2</u>	<u>10.1</u>	<u>110%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.5 +/- 0.2</u>	<u>21 6 17</u>

**APRIL 2017**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 05/02/17 15:48

Work Order - L17D013

Project - CCR Wells Economizer Ash Pond

---

## Case Narrative

---

5 sample(s) were received on 04/13/17 13:42.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium analysis was subcontracted to TestAmerica. The report is attached.

Radiologicals (Rad 226-228) were subcontracted to KNL Laboratories. The report is attached.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW. The sample(s) are flagged with a J qualifier.

### EPA 300.0

The recovery of the matrix spike and spike duplicate was below the control limits for Sulfate due to matrix interference. The parent sample is flagged with a J qualifier.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L17D013-01

Sample Description: BBS-CCR-1

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 4/13/17 12:05

Date of Sample Receipt: 4/13/17 13:42

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	124	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:40
Specific Conductance	4170	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 12:05
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	4/13/17 12:05
Fluoride	0.171	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 10:30
pH	6.84	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 12:05
REDOX Potential	-80.4	mV	-999	-999		1	SM 2580B	RAB	4/13/17 12:05
Total Dissolved Solids	3110	mg/L	24.0	40.0	J-	2	SM 2540C	TMH	4/18/17 14:10
Sulfate	443	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 11:40
Turbidity	4.12	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 12:05

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:25
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:17
Arsenic	10.5	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:17
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:17
Cobalt	0.505	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:17
Lead	9.79E-5	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:17
Selenium	0.937	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:17
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:17

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.116	mg/L	0.00500	0.200	I	10	EPA 6010B	RLC	4/19/17 9:31
Beryllium	2.00	ug/L	2.00	20.0	U	10	EPA 6010B	RLC	4/19/17 9:31
Boron	16.4	mg/L	0.100	0.500		10	EPA 6010B	RLC	4/19/17 9:31
Calcium	555000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:19
Chromium	16.0	ug/L	16.0	120	U	10	EPA 6010B	RLC	4/19/17 9:31
Molybdenum	124	ug/L	10.0	200	I	10	EPA 6010B	RLC	4/19/17 9:31

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17D013-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 4/13/17 11:33  
 Date of Sample Receipt: 4/13/17 13:42

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	119	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:00
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 11:33
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	4/13/17 11:33
Fluoride	0.237	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 10:50
pH	6.93	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 11:33
REDOX Potential	-138	mV	-999	-999		1	SM 2580B	RAB	4/13/17 11:33
Total Dissolved Solids	1150	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	485	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	4/17/17 11:00
Turbidity	3.43	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 11:33
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:28
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:21
Arsenic	2.64	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:21
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:21
Cobalt	0.114	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:21
Lead	0.000176	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:21
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	4/18/17 15:21
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:21
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0558	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:41
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:41
Boron	5.01	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:41
Calcium	163000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:21
Chromium	2.29	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	4/19/17 9:41
Molybdenum	9.82	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:41

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17D013-03  
 Sample Description: BBS-CCR-3  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 4/13/17 11:11  
 Date of Sample Receipt: 4/13/17 13:42

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	124	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 11:30
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 11:11
Dissolved Oxygen	0.140	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 11:11
Fluoride	0.415	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 11:30
pH	6.49	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 11:11
REDOX Potential	-114	mV	-999	-999		1	SM 2580B	RAB	4/13/17 11:11
Total Dissolved Solids	1120	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	443	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 11:30
Turbidity	4.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 11:11
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:32
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Arsenic	0.320	ug/L	0.320	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:24
Cobalt	0.110	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:24
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	4/18/17 15:24
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	4/18/17 15:24
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:24
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0586	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:44
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:44
Boron	0.385	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:44
Calcium	176000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:24
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	4/19/17 9:44
Molybdenum	11.7	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:44

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17D013-04	Date and Time Collected:	4/13/17 10:32
Sample Description:	BBS-CCR-BW1	Date of Sample Receipt:	4/13/17 13:42
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	934	mg/L	2.00	50.0		100	EPA 300.0	RFL	4/17/17 12:21
Specific Conductance	5000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 10:32
Dissolved Oxygen	0.410	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 10:32
Fluoride	0.256	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 11:50
pH	6.50	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 10:32
REDOX Potential	9.00	mV	-999	-999		1	SM 2580B	RAB	4/13/17 10:32
Total Dissolved Solids	4060	mg/L	48.0	80.0	J-	4	SM 2540C	TMH	4/18/17 14:10
Sulfate	1550	mg/L	50.0	200		100	EPA 300.0	RFL	4/17/17 12:21
Turbidity	3.60	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 10:32
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:35
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:28
Arsenic	8.61	ug/L	0.320	2.00		1	EPA 200.8	MCR	4/18/17 15:28
Cadmium	0.108	ug/L	0.100	0.500	I	1	EPA 200.8	MCR	4/18/17 15:28
Cobalt	1.69	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:28
Lead	0.000129	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	4/18/17 15:28
Selenium	1.62	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:28
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:28
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0536	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:25
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:25
Boron	49.0	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:25
Calcium	693000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:27
Chromium	3.23	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	4/19/17 9:25
Molybdenum	15.6	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:25

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17D013-05	Date and Time Collected:	4/13/17 10:06
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	4/13/17 13:42
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	140	mg/L	0.200	5.00		10	EPA 300.0	RFL	4/17/17 12:41
Specific Conductance	1480	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	4/13/17 10:06
Dissolved Oxygen	1.32	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	4/13/17 10:06
Fluoride	0.478	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	4/17/17 12:31
pH	6.67	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	4/13/17 10:06
REDOX Potential	-42.0	mV	-999	-999		1	SM 2580B	RAB	4/13/17 10:06
Total Dissolved Solids	1120	mg/L	12.0	20.0		1	SM 2540C	TMH	4/18/17 14:10
Sulfate	323	mg/L	5.00	20.0		10	EPA 300.0	RFL	4/17/17 12:41
Turbidity	19.0	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	4/13/17 10:06
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	4/18/17 11:39
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	4/18/17 15:32
Arsenic	1.45	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	4/18/17 15:32
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:32
Cobalt	0.129	ug/L	0.0400	2.00	I,V	1	EPA 200.8	MCR	4/18/17 15:32
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	4/18/17 15:32
Selenium	0.539	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	4/18/17 15:32
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	4/18/17 15:32
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0427	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	4/19/17 9:28
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	4/19/17 9:28
Boron	4.08	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	4/19/17 9:28
Calcium	260000	ug/L	30.0	1000		1	EPA 6010B	RLC	4/20/17 10:29
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	4/19/17 9:28
Molybdenum	9.65	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	4/19/17 9:28

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17D0115 - EPA 6010B</b>											
<b>Blank (17D0115-BLK1)</b>					Prepared: 04/17/17 Analyzed: 04/19/17						
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	30.0	30.0	1000	ug/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (17D0115-BS1)</b>					Prepared: 04/17/17 Analyzed: 04/19/17						
Barium	0.944	0.000500	0.0200	mg/L	1.0000		94.4	80-120			
Beryllium	968	0.200	2.00	ug/L	1000.0		96.8	80-120			
Boron	1.02	0.0100	0.0500	mg/L	1.0000		102	80-120			
Chromium	987	1.60	12.0	ug/L	1000.0		98.7	80-120			
Molybdenum	957	1.00	20.0	ug/L	1000.0		95.7	80-120			
<b>Matrix Spike (17D0115-MS1)</b>					<b>Source: L17D085-03</b>		Prepared: 04/17/17 Analyzed: 04/19/17				
Barium	0.928	0.000500	0.0200	mg/L	1.0000	0.0146	91.4	75-125			
Beryllium	942	0.200	2.00	ug/L	1000.0	U	94.2	75-125			
Boron	4.88	0.0100	0.0500	mg/L	1.0000	4.05	83.0	75-125			
Chromium	972	1.60	12.0	ug/L	1000.0	4.76	96.7	75-125			
Molybdenum	988	1.00	20.0	ug/L	1000.0	24.4	96.4	75-125			
<b>Matrix Spike Dup (17D0115-MSD1)</b>					<b>Source: L17D085-03</b>		Prepared: 04/17/17 Analyzed: 04/19/17				
Barium	0.882	0.000500	0.0200	mg/L	1.0000	0.0146	86.8	75-125	5.09	20	
Beryllium	891	0.200	2.00	ug/L	1000.0	U	89.1	75-125	5.55	20	
Boron	4.69	0.0100	0.0500	mg/L	1.0000	4.05	63.8	75-125	4.00	20	J-
Chromium	920	1.60	12.0	ug/L	1000.0	4.76	91.6	75-125	5.41	20	
Molybdenum	937	1.00	20.0	ug/L	1000.0	24.4	91.3	75-125	5.28	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17D0122 - EPA 7470A</b>											
<b>Blank (17D0122-BLK1)</b>					Prepared: 04/17/17 Analyzed: 04/18/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17D0122-BS1)</b>					Prepared: 04/17/17 Analyzed: 04/18/17						
Mercury	1.01	0.0500	0.200	ug/L	1.0000		101	80-120			
<b>Post Spike (17D0122-PS1)</b>					Source: L17D013-01 Prepared: 04/17/17 Analyzed: 04/18/17						
Mercury	0.928			ug/L	1.0000	-0.134	92.8	0-200			
<b>Post Spike (17D0122-PS2)</b>					Source: L17D013-01 Prepared: 04/17/17 Analyzed: 04/18/17						
Mercury	0.949			ug/L	1.0000	-0.134	94.9	0-200			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17D0123 - EPA 200.8

#### Blank (17D0123-BLK1)

Prepared & Analyzed: 04/18/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.269	0.0400	2.00	ug/L							I
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17D0123-BS1)

Prepared & Analyzed: 04/18/17

Antimony	102	0.600	2.00	ug/L	100.00		102	85-115			
Arsenic	99.6	0.320	2.00	ug/L	100.00		99.6	85-115			
Cadmium	100	0.100	0.500	ug/L	100.00		100	85-115			
Cobalt	102	0.0400	2.00	ug/L	100.00		102	85-115			V
Lead	0.0997	8.00E-5	0.00200	mg/L	0.10000		99.7	85-115			
Selenium	99.5	0.200	2.00	ug/L	100.00		99.5	85-115			
Thallium	100	0.100	0.500	ug/L	100.00		100	85-115			

#### Matrix Spike (17D0123-MS1)

Source: L17D013-05

Prepared & Analyzed: 04/18/17

Antimony	103	0.600	2.00	ug/L	100.00	U	103	70-130			
Arsenic	101	0.320	2.00	ug/L	100.00	1.45	99.2	70-130			
Cadmium	90.9	0.100	0.500	ug/L	100.00	U	90.9	70-130			
Cobalt	93.2	0.0400	2.00	ug/L	100.00	0.129	93.1	70-130			V
Lead	0.0942	8.00E-5	0.00200	mg/L	0.10000	U	94.2	70-130			
Selenium	89.3	0.200	2.00	ug/L	100.00	0.539	88.7	70-130			
Thallium	96.5	0.100	0.500	ug/L	100.00	U	96.5	70-130			

#### Matrix Spike Dup (17D0123-MSD1)

Source: L17D013-05

Prepared & Analyzed: 04/18/17

Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	3.20	20	
Arsenic	97.5	0.320	2.00	ug/L	100.00	1.45	96.1	70-130	3.17	20	
Cadmium	87.6	0.100	0.500	ug/L	100.00	U	87.6	70-130	3.71	20	
Cobalt	92.5	0.0400	2.00	ug/L	100.00	0.129	92.3	70-130	0.803	20	V
Lead	0.0910	8.00E-5	0.00200	mg/L	0.10000	U	91.0	70-130	3.51	20	
Selenium	86.8	0.200	2.00	ug/L	100.00	0.539	86.3	70-130	2.80	20	
Thallium	92.4	0.100	0.500	ug/L	100.00	U	92.4	70-130	4.32	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17D0124 - EPA 300.0</b>											
<b>Blank (17D0124-BLK1)</b>					Prepared & Analyzed: 04/17/17						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17D0124-BS1)</b>					Prepared & Analyzed: 04/17/17						
Chloride	5.08	0.0200	0.500	mg/L	5.0000		102	90-110			
Fluoride	4.98	0.0100	0.0500	mg/L	5.0000		99.5	90-110			
Sulfate	5.04	0.500	2.00	mg/L	5.0000		101	90-110			
<b>Matrix Spike (17D0124-MS1)</b>					Source: L17D013-02		Prepared & Analyzed: 04/17/17				
Chloride	168	0.200	5.00	mg/L	50.000	119	98.5	90-110			
Fluoride	51.5	0.100	0.500	mg/L	50.000	0.237	103	90-110			
Sulfate	527	5.00	20.0	mg/L	50.000	485	83.7	90-110			J-
<b>Matrix Spike Dup (17D0124-MSD1)</b>					Source: L17D013-02		Prepared & Analyzed: 04/17/17				
Chloride	167	0.200	5.00	mg/L	50.000	119	96.3	90-110	0.655	20	
Fluoride	51.4	0.100	0.500	mg/L	50.000	0.237	102	90-110	0.150	20	
Sulfate	525	5.00	20.0	mg/L	50.000	485	80.4	90-110	0.307	20	J-
<b>Batch 17D0140 - SM 2540C</b>											
<b>Blank (17D0140-BLK1)</b>					Prepared & Analyzed: 04/18/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17D0140-BS1)</b>					Prepared & Analyzed: 04/18/17						
Total Dissolved Solids	1020	12.0	20.0	mg/L	1000.0		102	80-120			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17D0140 - SM 2540C

Duplicate (17D0140-DUP1)

Source: L17D013-01

Prepared & Analyzed: 04/18/17

Total Dissolved Solids	3090	24.0	40.0	mg/L		3110			0.709	10	J-
------------------------	------	------	------	------	--	------	--	--	-------	----	----

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Conduct (uMhos)	DO Mg/L	Turbidity (NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	Time	Level
L17D013-01	BBS-CCR-1	12:05	6.84	23.70	23.70	4169.0	0.08	4.12	-80.40	SO <sub>3</sub> -R	SCOLOR-W	NONE	11:47	LEV/EL
L17D013-02	BBS-CCR-2	11:33	6.93	23.95	23.95	1543.0	0.04	3.43	-137.70	YELLOW	YELLOW	NONE	11:17	
LIMS #	250ml Cyan (3)	-1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Misc (1)	250ml Misc (3)	1L Reas (1)	500ml Sulfide (2)	500ml Misc (2)	250ml Nds (3)	40ml Vial (6)	500 ml Nds (2)	-1L Reas Dss. (1)	Total Containers
L17D013-01	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L17D013-02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice								
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS
<p><b>Preservation</b></p> <p>1L bottles (reast): 5 ml HNO3 to pH &lt;2</p> <p>500 ml bottles (reast): 2 ml HNO3 to pH &lt;2</p> <p>250 ml bottles (reast): 1 ml HNO3 to pH &lt;2</p> <p>pH Meter Calibration: MPM08 Buffer ID: 018378 Buffer Value: 7.01 Cal: 7.01 ICV: 8.14 Time: 8:14</p> <p>pH Meter ID: MPM08 018378 7 7.01 8:14</p> <p>FDEP FT 1100 017288D 10 10.05 8:14 QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)</p> <p>Units: SU 017385C 4 3.99 8:14 A checked box indicates ICV / CCV passed</p> <p>Conductivity Meter Calib.: MPM08 Standard ID: 016919C Sid Value: 1000 Cal: 1000 ICV: 8.24 Time: 8:30</p> <p>FDEP FT 1200, Units: uMhos 016779A 10000 9850 8:30</p> <p>Turbidity Meter Calibration: Standard ID: 016722 Sid Value: 4.28 Acceptably Range: 4.79 ICV: 7.33 Time: 7:56</p> <p>Meter ID: TM07 016722 4.76 5.24 5:24 5:24 53.00 7:32 7:32 13:20</p> <p>FDEP FT 1600, Units: NTU 016723 52.10 48.71 55.49 52.70 760</p> <p>Sulfide Int (QC Check) (EPA 377.1) QC Result mg/l Titrator ID: No This ID: DO 3 Pellow ID: Sulfide ID: Therm ID: MPM08</p> <p>QC Std: 5ml (Na2S2O3)/500ml DI=10mg/L</p>														
<p><b>Well Capacities (gallons/ft): 2" = 0.15 4" = 0.65</b></p> <p><b>Tubing Inside Diam. Capacities (Gallons/ft): 1/4" = 0.0026, 3/8" = 0.006</b></p>														
Well #	Diam/Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Purge Volume (gal)	Purge Criteria	Equip. ID	Equip. Table
BBS-CCR-1	2	10	17.32	22.32	7.64	14.68	0.16	2.35	0.0026	23.3	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equip. ID	Equip. Table
1A	11:54	720	1.33	1.33	7.86	6.84	23.89	4166	0.05	5.30	pH +/- 0.2	STABLE	Level Meter	WILM08
Purge Start:	11:56	730	0.39	1.72	7.86	6.83	23.82	4185	0.10	3.46	Temp +/- 0.2	STABLE	Pump	PP
Purge End:	11:58	730	0.39	2.11	7.87	6.84	23.70	4169	0.08	4.12	Cond +/- 5	STABLE	Tubing	PEIS
<p>DO % Sat &lt; 20</p> <p>Turb. NTU &lt; 20</p>														
<p><b>Purge Complete At 11:48 Gallons to Purge 0.12</b></p> <p>Stability Values = 6.84 23.70 4169 0.08 4.12</p>														
Well #	Diam/Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Purge Volume (gal)	Purge Criteria	Equip. ID	Equip. Table
BBS-CCR-2	2	10	16.84	21.84	7.15	14.69	0.16	2.35	0.0026	22.84	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equip. ID	Equip. Table
1A	11:23	600	0.95	0.95	7.28	6.92	23.89	1514	0.10	2.52	pH +/- 0.2	STABLE	Level Meter	WILM08
Purge Start:	11:25	580	0.31	1.26	7.29	6.94	23.96	1531	0.08	3.08	Temp +/- 0.2	STABLE	Pump	PP
Purge End:	11:17	600	0.32	1.58	7.30	6.93	23.95	1543	0.04	3.43	Cond +/- 5	STABLE	Tubing	PEIS
<p>DO % Sat &lt; 20</p> <p>Turb. NTU &lt; 20</p>														
<p><b>Purge Complete At 11:18 Gallons to Purge 0.12</b></p> <p>Stability Values = 6.93 23.95 1543 0.04 3.43</p>														
<p>Comments: Total Time Total Miles</p>														

Site: **Big Bend** Date: **04/13/17** File Name: **041317\_Wells\_RAB** Weather: **PLY CLOUDY & MILD** Sampler(s) / Initials: **RAB/TECO** Initials: **RAB**

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Cond(uMhos)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	NGVD
L17D013-03	BBS-CCR-3	11:11		6.49	24.27	1585.0	0.14	4.22	-114.30	SO <sub>4</sub> -TR	LT. YELLOW	MODERATE	10:45
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)
L17D013-03			1			2	2						5
(1) 1L plastic (pp)	(2) 500ml plastic (pp)	(3) 250ml plastic (pp)	(4) 100ml colliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)								
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS							
Preservation													
TL bottles (rads): 5 ml HNO <sub>3</sub> to pH <2		Pres ID	013820	250ml bottles (rads): 1 ml H <sub>2</sub> SO <sub>4</sub> to pH <2									
500 ml bottles (metals): 2 ml HNO <sub>3</sub> to pH <2				40 ml Vial (TOC): 0.5 ml H <sub>2</sub> SO <sub>4</sub> to pH <2									
250 ml bottles (metals): 1 ml HNO <sub>3</sub> to pH <2				1L bottles (obs rads): filtered with 0.45um, 5 ml HNO <sub>3</sub> to pH <2									
pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Temp °C
Meter ID: MPM08	L 018377B	7	7	8:14	8:14	7:08	13:45	8:21	21.6	236.0	236.2	236.2	236.2
FDEP FT 1100	L 017288D	10	10	8:14	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)	9850	13:28	13:50	22.0	233.5	234.9	234.9	234.9
Units: SU	L 017385C	4	4	8:14	A checked box indicates ICV / CCV passed								
Conductivity Meter Calib:	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Temp °C
Meter ID: MPM08	L 016918C	1000	1000	8:24	9850	8:30	9813	13:28	7:56	21.8	8.80	8.794	8.727
FDEP FT 1200, Units: uMhos	L 016779A	10000			ICV	Time	CCV	Time	Meter ID: MPM08	13:47	22.1	8.48	8.727
Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	Time	ICV	Time	CCV	Time	Barom. Pres	760			
Meter ID: TMO7	L 016722	4.76	4.28	5:24	4.79	7:32	4.77	13:21	Therm ID	MPM08	0.2	5	0.3
FDEP FT 1600, Units: NTU	L 016723	52.10	48.71	55.49	53.00	7:32	52.70	13:20	pH				
Sulfate Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Tho ID	DO 3 Pillow ID	Search Ind ID	iodate/iodide ID	Therm ID	Conductivity (%)	DO (mg/l)	Redox (mv)		10
QC Std 5ml (NaItho)/500ml DI=10mg/L													
Purging Information													
Well Capacities (gallons/ft): Z = 0.16 4" = 0.85													
Tubing Inside Diam. Capacities Gallons/ft: 1/4" = 0.0026 3/8" = 0.006													
Well #	Diam Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cal Volume (gal)	1 Egpt Volume (gal)
BBS-CCR-3	2	10	18.23	23.23	7.13	16.10	0.16	2.58	0.0026	24.23	0	0.06	0.12
Purge Meth:													
1A	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equip. Table
	10:54	400	0.85	7.62	6.48	24.31	1632	0.11	4.98	4.98	pH +/- 0.2	STABLE	WLM08
	10:56	400	0.21	1.06	7.61	24.34	1622	0.13	4.47	4.47	Temp C +/- 0.2	STABLE	PP
	11:00	390	0.41	1.47	7.61	24.27	1585	0.14	4.22	4.22	Cond % +/- 5	STABLE	PE/S
											DO % Sat < 20	STABLE	Dedicated Tubing?
											Tub NTU < 20	STABLE	Tubing?
Purge Complete At 10:47 Gallons to Purge 0.12													
Stability Values =													
Well #	Diam Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cal Volume (gal)	1 Egpt Volume (gal)
							6.49	24.27	1585	0.14	4.22		
Purge Meth:													
	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equip. Table
Purge Start:													
Purge End:													
Purge Complete At Gallons to Purge 0.00													
Stability Values =													
Comments:													
Total Time Total Miles													

Site: **Big Bend** Date: **04/13/17** File Name: **041317 Wells\_RAB** Weather: **PTLY CLOUDY & MILD** Sampler(s) / Initials: **RAB/TECO** Initials: **RSB**

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Cond(µMhos)	DO MgrL	Turbidity(NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	Time	Level	
L17D013-04	BBS-CCR-BW-1	10:32	6.50	6.50	27.20	5005.0	0.41	3.60	9.00	SO <sub>2</sub> -IR	CLEAR	NONE	10:13		
L17D013-05	BBS-CCR-BW-2	10:06	6.67	6.67	24.81	1476.0	1.32	19.00	-42.00	LT YELLOW	NONE	9:32			
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers	
L17D013-04														10	
L17D013-05															
(1) 1L Plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml bottom bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CS)										
ESS	0107301Y	ESS	0218201Y	ESS	0307301Y	ESS									
Preservation															
TL bottles (rad): 5 ml HNO <sub>3</sub> to pH <2		Pres ID	013820	250ml bottles (rad): 1 ml H <sub>2</sub> SO <sub>4</sub> to pH <2		Pres ID		500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12		Pres ID		Temp °C	13.42		
500 ml bottles (metals): 2 ml HNO <sub>3</sub> to pH <2				40 ml Vial (TOC): 0.5 ml H <sub>2</sub> SO <sub>4</sub> to pH <2				250 ml bottles (Cyan) 1g NaOH to pH >12				Temp °C	1.2		
250 ml bottles (metals): 1 ml HNO <sub>3</sub> to pH <2				TL bottles (diss. rad): filtered with 0.45um 5 ml HNO <sub>3</sub> to pH <2				A checked box indicates that the sample was verified to a pH of <2				Temp °C			
pH Meter Calibration	MPM08	Buffer ID	018377B	ICV	Time	7:08	13:45	Redox Cal	Time	8:21	Temp °C	21.6	Reading mv	236.0	
Meter ID:	MPM08	Buffer Value	7	ICV	Time	8:14		Meter ID:	MPM08	8:21	Temp °C	21.6	Reading mv	236.2	
FDEP FT 1100			10	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID:	MPM08	13:50	Temp °C	22.0	Reading mv	233.5	
Units: SU			4	A checked box indicates ICV / CCV passed				Zobell Sol ID:						234.9	
Conductivity Meter Calib:	MPM08	Std Value	1000	ICV	Time	8:24		CCV	Time						
Meter ID:	MPM08	Std Value	1000	ICV	Time	8:30		CCV	Time						
FDEP FT 1200, Units: µMhos			10000	9850	8:30	9813	13:28	DO Meter Cal	Time	7:56	Temp °C	21.8	Reading mv	8.80	
Turbidity Meter Calibration	TM07	Std Value	4.76	Acceptability Range	Time	7:33	13:21	Meter ID:	MPM08	13:47	Temp °C	22.1	Reading mv	8.48	
Meter ID:	TM07	Std Value	4.76	ICV	Time	7:33	13:21	Barom. Pres	Time					8.727	
FDEP FT 1600, Units: NTU			52.10	55.49	7:32	52.70	13:20	Therm ID	MPM08	0.2	Conduct. (%)	5	DO (mg/l)	0.3	
Sulfide Info (QC Check) (EPA 377.1)		QC Result mg/l		Na Thio ID	DO 3 Pillow ID	Starch Ind ID	Iodide/Iodide ID	Therm ID	MPM08	0.2	pH	Conduct. (%)	5	DO (mg/l)	10
QC Slat 5ml (Katho)/500ml DI=10mg/L															
Purging Information															
Well Capacities (gallons/ft): Z = 0.16 4" = 0.65 Tubing Inside Diam. Capacities Gallons(ft): 1/4" = 0.0026 3/8" = 0.006															
Well #	Diam Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal)	Tubing Length (ft)	Pump Volume (gal)	Cal Volume (gal)	1 Eqt. Volume (gal)		
BBS-CCR-BW-1	2	10	39.3	44.3	30.71	13.59	0.16	2.17	0.0026	100	0	0.06	0.32		
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egdl. Table	
1A	10:25	2550	6.06	6.06	31.68	6.50	27.27	4967	0.48	5.48	pH +/- 0.2	STABLE	WLM08		
Purge Start:	10:27	2500	1.32	7.38	31.69	6.50	27.21	4989	0.45	3.81	Temp/Cat. 0.2	STABLE	Pump:	ESP	
Purge End:	10:29	2500	1.32	8.70	31.70	6.50	27.20	5005	0.41	3.60	Cond % +/- 5	STABLE	Tubing:	PE	
10:29											DO % Sat. < 20	STABLE	Dedicated	Yes	
Purge Complete At	10:16	Gallons to Purge	0.32	Stability Values =	6.50	27.20	5005	0.41	3.60		Tub. NTU < 20	STABLE	Tubing?	No	
Well #	Diam Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal)	Tubing Length (ft)	Pump Volume (gal)	Cal Volume (gal)	1 Eqt. Volume (gal)		
BBS-CCR-BW-2	2	10	18.49	23.84	9.24	14.60	0.16	2.34	0.0026	24.64	0	0.06	0.12		
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMhos)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Egdl. Table	
1A	9:53	400	2.01	2.01	9.40	6.67	24.83	1475	1.41	14.70	pH +/- 0.2	STABLE	WLM08		
Purge Start:	9:55	400	0.21	2.22	9.41	6.67	24.88	1475	1.37	12.70	Temp/Cat. 0.2	STABLE	Pump:	PP	
Purge End:	9:57	410	0.22	2.44	9.42	6.67	24.81	1476	1.32	19.00	Cond % +/- 5	STABLE	Tubing:	PE/S	
9:57											DO % Sat. < 20	STABLE	Dedicated	Yes	
Purge Complete At	9:35	Gallons to Purge	0.12	Stability Values =	6.67	24.81	1476	1.32	19.00		Tub. NTU < 20	STABLE	Tubing?	No	
Comments:															
Total Time															
Total Millis															

**GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION**

Date: 04/13/17 Sampler(s): RAB

Initials



Buffer ID	Buffer Value	Cal	Time	Pass/Fail	Temp °C	Reading mg/l	Theo Value mg/l	Pass/Fail	Temp °C	Reading mg/l	Theo Value mg/l	Pass/Fail
MPM08	016377B	7	8:14	Pass	7.08	7.01	7.01	Pass	8.80	8.80	8.794	Pass
FDEP FT 1100	017288D	10	8:14	Pass/Fail	13:45	10.05	10.05	Pass	8.48	8.48	8.727	Pass
Unit: SU	017385C	4	8:14	Pass/Fail	CC (ppt ± 0.2) (Cond ± 5%) (DO ± 0.3mg/l) (Redox ± 10mv) A checked box indicates ICV/CCV passed							
ICV Check	016987L	7	7:03	Pass	8:17	3.99	3.99	Pass				
Conductivity Meter Calib:	Standard ID	Sst Value	ICV	Time	Pass/Fail	CCV	Time	Pass/Fail				
Meter ID:	MPM08	016918C	1000	8:24	Pass	9850	8:30	Pass	9813	9813	13:28	Pass
FDEP FT 1200, Unit: uMHOS	016779A	10000	9850	8:30	Pass	9813	13:28	Pass				
Titrability Meter Calibration:	Standard ID	Sst Value	Acceptability Range	Time	Pass/Fail	CCV	Time	Pass/Fail				
Meter ID:	TM07	016722	4.76	5:24	Pass	4.77	4:77	Pass	52.70	52.70	13:20	Pass
FDEP FT 1600, Unit: NTU	016723	52.10	48.71	55.49	53.00	7:32	7:32	Pass				
Sulfite Info (QC Check) (EPA 377.3)	QC Result (mg/l)	Time	Titrator ID	No. Tit ID	DO 3 Pklow ID	Standard ID	Isolator/Kit ID					
QC Std: sml (NaThio)/500ml D=10mg/l												
Redox Cal:	Time	Temp °C	Reading mv	Theo Value mv	Pass/Fail	DO Meter Cal	FDEP FT: 1900	Time	Temp °C	Reading mg/l	Theo Value mg/l	Pass/Fail
Meter ID:	8:21	21.6	236.0	236.2	Pass	Meter ID:	7:56	21.8	8.80	8.80	8.794	Pass
MPM08	13:50	22.0	233.5	234.9	Pass	MPM08	13:47	22.1	8.48	8.48	8.727	Pass
Zobell Sol ID:					Barom. Pres	760						
L 017105A					760							
Therm ID:	pH	Conduct %	DO (mg/l)	Redox mv	Cl2	Calibration	Ferrous Iron	Comparator ID:	Reagent ID:			
MPM08	0.2	5	0.3	10	0.2	Criterion			L			
ClO <sub>2</sub> DPD Check must read +/- 10% of the Calculated Std Concentration, multiplied by 2.4. Glycine check should read < 0.10 mg/l ClO <sub>2</sub> . Glycine check should read < 0.10 mg/l ClO <sub>2</sub> .												
Chlorine Dioxide (mg/l)	Std. Conc (mg/l)	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc (mg/l)	DPD Check (mg/l)	Glycine Check	Initial Calibration Verification: ICV	Time	Pass/Fail	Continuous Calibration Verification: CCV	Time	Pass/Fail
Meter ID:	1.0		100									

COMMENTS: Cl2 Std. ID: L

DPD ID: L Glycine ID: L

Checked box indicates reagent expiration date has been verified.

Method 10128\*  
Equivalent to Standard Methods, 4500 ClO<sub>2</sub> D.

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-1</b>	SAMPLE ID: <b>L17D013-01</b> DATE: <b>4/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>12.32</b> feet to <b>22.32</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.64</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \text{feet} - \text{feet} ) \times \text{gallons/foot} = \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( 0 \text{ gallons} + ( 0.0026 \text{ gallons/foot} \times 23.3 \text{ feet} ) + 0.06 \text{ gallons} = 0.12 \text{ gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	PURGING INITIATED AT: <b>11:47</b>	PURGING ENDED AT: <b>11:58</b>	TOTAL VOLUME PURGED (gallons): <b>2.11</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:54	1.33	1.33	0.19	7.86	6.84	23.89	4166	0.05	5.30	LT. YELLOW	NONE
11:56	0.39	1.72	0.20	7.86	6.83	23.82	4165	0.10	3.46	LT. YELLOW	NONE
11:58	0.39	2.11	0.20	7.87	6.84	23.70	4169	0.08	4.12	LT. YELLOW	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:58</b>		SAMPLING ENDED AT: <b>12:05</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>17.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>727</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

**REMARKS:**

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

**NOTES:**

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



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L17D013-02</b> DATE: <b>4/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.15</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b>											
= (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b>											
= (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>11:17</b>	PURGING ENDED AT: <b>11:27</b>	TOTAL VOLUME PURGED (gallons): <b>1.58</b>							
TIME	VOLUME PURGED (GALLONS)	COMOL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/L) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:23	0.95	0.95	0.16	7.28	6.92	23.89	1514	0.10	2.52	YELLOW	NONE
11:25	0.31	1.26	0.16	7.29	6.94	23.96	1531	0.08	3.08	YELLOW	NONE
11:27	0.32	1.58	0.16	7.30	6.93	23.95	1543	0.04	3.43	YELLOW	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" = 5.68											
TUBING INSIDE DIA. CAPACITY (Gal./ft.): 1/8" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB                      TECO</b>			SAMPLER(S) SIGNATURES:			SAMPLING INITIATED AT: <b>11:27</b>		SAMPLING ENDED AT: <b>11:33</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>593</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:                      µm			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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS: (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-3</b>	SAMPLE ID: <b>L17D013-03</b>
DATE: <b>4/13/17</b>	

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.23</b> feet to <b>23.23</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.13</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fitout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= (\quad \text{feet} - \quad \text{feet}) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fitout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= (\quad \quad \quad \text{gallons}) + (\quad \text{gallons/foot} \times \quad \text{feet}) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	PURGING INITIATED AT: <b>10:46</b>	PURGING ENDED AT: <b>11:00</b>	TOTAL VOLUME PURGED (gallons): <b>1.47</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:54	0.85	0.85	0.11	7.62	6.48	24.31	1632	0.11	4.98	LT. YELLOW	MODERATE
10:56	0.21	1.06	0.11	7.61	6.46	24.34	1622	0.13	4.47	LT. YELLOW	MODERATE
11:00	0.41	1.47	0.10	7.61	6.49	24.27	1585	0.14	4.22	LT. YELLOW	MODERATE
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.): 3/8" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB</b> <b>TECO</b>			SAMPLER(S) SIGNATURES:			SAMPLING INITIATED AT: <b>11:00</b>		SAMPLING ENDED AT: <b>11:11</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.2</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>397</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			FIELD-FILTERED: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			FILTER SIZE: <b>µm</b>		DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>		
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

- NOTES:
- The above do not constitute all of the information required by Chapter 62-160, F.A.C.
  - 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  $10\%$  (whichever is greater)

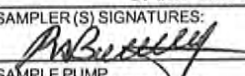
DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L17D013-04</b> DATE: <b>4/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> feet to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>30.71</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
WELL VOLUME PURGE: (only filout if applicable) <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY = (      feet -      feet ) x      gallons/foot =      gallons											
EQUIPMENT VOLUME PURGE: (only filout if applicable) <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME = (      0      gallons + (      0.0026      gallons/foot X      100      feet ) +      0.06      gallons =      0.32      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>10:16</b>	PURGING ENDED AT: <b>10:29</b>	TOTAL VOLUME PURGED (gallons): <b>8.70</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:25	6.06	6.06	0.67	31.68	6.50	27.27	4967	0.48	5.48	CLEAR	NONE
10:27	1.32	7.38	0.66	31.69	6.50	27.21	4989	0.45	3.81	CLEAR	NONE
10:29	1.32	8.70	0.66	31.70	6.50	27.20	5005	0.41	3.60	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT)/ AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: 				SAMPLING INITIATED AT: <b>10:29</b>		SAMPLING ENDED AT: <b>10:32</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>2517</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:      µm				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L17D013-05</b> DATE: <b>4/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>9.24</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b>											
= (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b>											
= (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:34</b>	PURGING ENDED AT: <b>9:57</b>	TOTAL VOLUME PURGED (gallons): <b>2.44</b>							
TIME	VOLUME PURGED (GALLONS)	VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/L or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:53	2.01	2.01	0.11	9.40	6.67	24.83	1475	1.41	14.70	LT. YELLOW	NONE
9:55	0.21	2.22	0.11	9.41	6.67	24.88	1475	1.37	12.70	LT. YELLOW	NONE
9:57	0.22	2.44	0.11	9.42	6.67	24.81	1476	1.32	19.00	LT. YELLOW	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.008; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB      TECO</b>			SAMPLER SIGNATURES:			SAMPLING INITIATED AT: <b>9:57</b>		SAMPLING ENDED AT: <b>10:06</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>403</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>			FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>			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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS:

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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)

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427

TestAmerica Job ID: 660-80222-1

Client Project/Site: L17D013

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



---

Authorized for release by:  
4/28/2017 12:33:58 PM

Keaton Conner, Project Mgmt. Assistant  
(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-80222-1	L17D013-01	Water	04/13/17 12:05	04/19/17 13:30
660-80222-2	L17D013-02	Water	04/13/17 11:33	04/19/17 13:30
660-80222-3	L17D013-03	Water	04/13/17 11:11	04/19/17 13:30
660-80222-4	L17D013-04	Water	04/13/17 10:32	04/19/17 13:30
660-80222-5	L17D013-05	Water	04/13/17 10:06	04/19/17 13:30

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

---

**Job ID: 660-80222-1**

---

**Laboratory: TestAmerica Tampa**

## Narrative

---

### Job Narrative 660-80222-1

#### Receipt

The samples were received on 4/19/2017 1:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## Client Sample ID: L17D013-01

## Lab Sample ID: 660-80222-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.010	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17D013-02

## Lab Sample ID: 660-80222-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.013	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17D013-03

## Lab Sample ID: 660-80222-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0063	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17D013-04

## Lab Sample ID: 660-80222-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.012	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17D013-05

## Lab Sample ID: 660-80222-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0034	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

**Client Sample ID: L17D013-01**

Date Collected: 04/13/17 12:05

Date Received: 04/19/17 13:30

**Lab Sample ID: 660-80222-1**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.010	I	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 10:53	1

**Client Sample ID: L17D013-02**

Date Collected: 04/13/17 11:33

Date Received: 04/19/17 13:30

**Lab Sample ID: 660-80222-2**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.013	I	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 11:07	1

**Client Sample ID: L17D013-03**

Date Collected: 04/13/17 11:11

Date Received: 04/19/17 13:30

**Lab Sample ID: 660-80222-3**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0063	I	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 11:10	1

**Client Sample ID: L17D013-04**

Date Collected: 04/13/17 10:32

Date Received: 04/19/17 13:30

**Lab Sample ID: 660-80222-4**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.012	I	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 11:13	1

**Client Sample ID: L17D013-05**

Date Collected: 04/13/17 10:06

Date Received: 04/19/17 13:30

**Lab Sample ID: 660-80222-5**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0034	I	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 11:17	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-350739/1-A**  
**Matrix: Water**  
**Analysis Batch: 351616**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 350739**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		04/21/17 10:59	04/27/17 10:01	1

**Lab Sample ID: LCS 400-350739/2-A**  
**Matrix: Water**  
**Analysis Batch: 351616**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 350739**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.11		mg/L		111	85 - 115

**Lab Sample ID: 400-136677-D-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 351616**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 350739**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.0021	I	1.00	1.08		mg/L		107	70 - 130

**Lab Sample ID: 400-136677-D-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 351616**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 350739**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.0021	I	1.00	1.06		mg/L		106	70 - 130	1	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## Metals

### Prep Batch: 350739

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-80222-1	L17D013-01	Total/NA	Water	200.7	
660-80222-2	L17D013-02	Total/NA	Water	200.7	
660-80222-3	L17D013-03	Total/NA	Water	200.7	
660-80222-4	L17D013-04	Total/NA	Water	200.7	
660-80222-5	L17D013-05	Total/NA	Water	200.7	
MB 400-350739/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-350739/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-136677-D-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-136677-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### Analysis Batch: 351616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-80222-1	L17D013-01	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-2	L17D013-02	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-3	L17D013-03	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-4	L17D013-04	Total/NA	Water	200.7 Rev 4.4	350739
660-80222-5	L17D013-05	Total/NA	Water	200.7 Rev 4.4	350739
MB 400-350739/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	350739
LCS 400-350739/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	350739
400-136677-D-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	350739
400-136677-D-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	350739

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

**Client Sample ID: L17D013-01**

**Date Collected: 04/13/17 12:05**

**Date Received: 04/19/17 13:30**

**Lab Sample ID: 660-80222-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 10:53	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17D013-02**

**Date Collected: 04/13/17 11:33**

**Date Received: 04/19/17 13:30**

**Lab Sample ID: 660-80222-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:07	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17D013-03**

**Date Collected: 04/13/17 11:11**

**Date Received: 04/19/17 13:30**

**Lab Sample ID: 660-80222-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:10	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17D013-04**

**Date Collected: 04/13/17 10:32**

**Date Received: 04/19/17 13:30**

**Lab Sample ID: 660-80222-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:13	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17D013-05**

**Date Collected: 04/13/17 10:06**

**Date Received: 04/19/17 13:30**

**Lab Sample ID: 660-80222-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	350739	04/21/17 10:59	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			351616	04/27/17 11:17	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Accreditation/Certification Summary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

## Laboratory: TestAmerica Tampa

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-17

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E81010	06-30-17

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L17D013

TestAmerica Job ID: 660-80222-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17D013**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone : (813) 885-7427  
 Fax: -

**Due Date: 04/28/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17D013-01</b> <b>BBS-CCR-1</b> <b>Sampled: 04/13/17 12:05</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	10/10/17 12:05	Water	
<b>Sample ID: L17D013-02</b> <b>BBS-CCR-2</b> <b>Sampled: 04/13/17 11:33</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	10/10/17 11:33	Water	
<b>Sample ID: L17D013-03</b> <b>BBS-CCR-3</b> <b>Sampled: 04/13/17 11:11</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	10/10/17 11:11	Water	
<b>Sample ID: L17D013-04</b> <b>BBS-CCR-BW1</b> <b>Sampled: 04/13/17 10:32</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i>	10/10/17 10:32	Water	
<b>Sample ID: L17D013-05</b> <b>BBS-CCR-BW2</b> <b>Sampled: 04/13/17 10:06</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	10/10/17 10:06	Water	

Loc: 660  
**80222**



2.8/2.4w-09

*AW Baerney*      4-13-17 @ 1426  
 Released By                      Date & Time

*At Perd*      4-19-17 @ 1330  
 Received By                      Date & Time

Released By                      Date & Time                      Received By                      Date & Time

**TestAmerica Tampa**  
 6712 Benjamin Road Suite 100  
 Tampa, FL 33634  
 Phone (813) 885-7427 Fax (813) 885-7049

# Chain of Custody Record



**Client Information (Sub Contract Lab)**

Shipping/Receiving  
 Company: TestAmerica Laboratories, Inc.  
 Address: 3355 McLemore Drive, Pensacola, FL, 32514  
 Phone: 850-474-1001 (Tel) 850-478-2671 (Fax)  
 Email:

Lab PIJ (Commer, Keaton)  
 E-Mail: keaton\_commer@testamericainc.com  
 State of Origin: Florida

Carrier Tracking No(s): 660-958961  
 Page: Page 1 of 1  
 Job #: 660-80222-1

Accreditations Required (See note): NELAP - Florida; NELAP - Texas

**Due Date Requested:** 4/26/2017  
**TAT Requested (days):**

PO #: WO #:  
 Project #: 66004821  
 Site: S50W#:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=organic)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of Containers	Special Instructions/Note:
L17D013-01 (660-80222-1)	4/13/17	12:05 Eastern		Water	X	X	1	
L17D013-02 (660-80222-2)	4/13/17	11:33 Eastern		Water	X	X	1	
L17D013-03 (660-80222-3)	4/13/17	11:11 Eastern		Water	X	X	1	
L17D013-04 (660-80222-4)	4/13/17	10:32 Eastern		Water	X	X	1	
L17D013-05 (660-80222-5)	4/13/17	10:06 Eastern		Water	X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_  
 Primary Deliverable Rank: 2

Special Instructions/QC Requirements: \_\_\_\_\_

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	4/19/17 1700	TA TPA Company		4/20/17 943	Company
		Company			Company

Custody Seals Intact: Yes  No

Custody Seal No. \_\_\_\_\_

Cooler Temperature(s) \_\_\_\_\_



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-80222-1

**Login Number: 80222**

**List Number: 1**

**Creator: Moccia, Vanessa M**

**List Source: TestAmerica Tampa**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-80222-1

**Login Number: 80222**

**List Number: 2**

**Creator: Johnson, Jeremy N**

**List Source: TestAmerica Pensacola**

**List Creation: 04/20/17 11:17 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





Report Date: May 1, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17D013-01  
BBS-CCR-1  
Sample Collection: 4-13-17/1205  
Lab ID No: 17.4338  
Lab Custody Date: 4-18-17/1100  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	35.8 ± 1.7	Calc	Calc	0.7
Radium-226	pCi/l	33.3 ± 1.7	4-25-17/1157	EPA 903.0	0.4
Radium-228	pCi/l	2.5 ± 0.6	4-26-17/1145	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: May 1, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619  
 Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17D013-02  
 BBS-CCR-2  
 Sample Collection: 4-13-17/1133  
 Lab ID No: 17.4339  
 Lab Custody Date: 4-18-17/1100  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.2 ± 1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.8 ± 1.1	4-25-17/1157	EPA 903.0	0.3
Radium-228	pCi/l	0.4 ± 0.5	5-1-17/1153	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: May 1, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619  
  
Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17D013-03  
BBS-CCR-3  
Sample Collection: 4-13-17/1111  
  
Lab ID No: 17.4340  
Lab Custody Date: 4-18-17/1100  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.4 ± 1.1	Calc	Calc	0.7
Radium-226	pCi/l	13.3 ± 1.1	4-25-17/1157	EPA 903.0	0.3
Radium-228	pCi/l	1.1 ± 0.6	5-1-17/1153	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: May 1, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17D013-04  
BBS-CCR-4  
Sample Collection: 4-13-17/1032  
Lab ID No: 17.4341  
Lab Custody Date: 4-18-17/1100  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	39.7 ± 1.9	Calc	Calc	0.8
Radium-226	pCi/l	35.9 ± 1.9	4-27-17/1048	EPA 903.0	0.3
Radium-228	pCi/l	3.8 ± 0.7	5-1-17/1153	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





Report Date: May 1, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17D013-05  
BBS-CCR-BW2  
Sample Collection: 4-13-17/1006  
Lab ID No: 17.4342  
Lab Custody Date: 4-18-17/1100  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.5 ± 0.7	Calc	Calc	0.7
Radium-226	pCi/l	3.9 ± 0.7	4-27-17/1048	EPA 903.0	0.4
Radium-228	pCi/l	0.6 ± 0.5	5-1-17/1153	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17D013**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
 3202 N. Florida Ave.  
 Tampa, FL 33603  
 Phone : (813) 229-2879  
 Fax: -

**Due Date: 04/28/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17D013-01</b> <b>BBS-CCR-1</b> <b>Sampled: 04/13/17 12:05</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	10/10/17 12:05 10/10/17 12:05 10/10/17 12:05	Water 17.4338	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L17D013-02</b> <b>BBS-CCR-2</b> <b>Sampled: 04/13/17 11:33</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	10/10/17 11:33 10/10/17 11:33 10/10/17 11:33	Water 17.4339	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L17D013-03</b> <b>BBS-CCR-3</b> <b>Sampled: 04/13/17 11:11</b> Radium 226+228, Total Radium 226 EPA 903.0 Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	10/10/17 11:11 10/10/17 11:11 10/10/17 11:11	Water 17.4340	Level 2 Data required Level 2 Data required Level 2 Data required
<b>Sample ID: L17D013-04</b> <b>BBS-CCR-BW1</b> <b>Sampled: 04/13/17 10:32</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	10/10/17 10:32 10/10/17 10:32 10/10/17 10:32	Water 17.4341	Level 2 Data required Level 2 Data required Level 2 Data required

 4-18-17 1100     
  04-18-17 1100  
 Released By      Date & Time      Received By      Date & Time

Released By      Date & Time      Received By      Date & Time

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17D013**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17D013-05      BBS-CCR-BW2		Water	
Sampled: 04/13/17 10:06		17.4342	
Radium 228 Ra-05	10/10/17 10:06		Level 2 Data required
Radium 226 EPA 903.0	10/10/17 10:06		Level 2 Data required
Radium 226+228, Total	10/10/17 10:06		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)		RAD Poly HNO3 - 1000mL (D)	

<i>R. Beckett</i>	4-18-17 1100	<i>KAL DRJ</i>	04/18/17 1100
Released By	Date & Time	Received By	Date & Time
Released By	Date & Time	Received By	Date & Time



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L17D013

Analysis Completion Date: 41 251 17

### Precision Data:

Sample #: 17,4250

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>4.7</u>	<u>4.1</u>	<u>0.4</u>	<u>13.64</u>

### Spike Data:

Sample #: 17,4250

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>0.4</u>	<u>4.5</u>	<u>4.7</u>	<u>96%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>11.4</u>	<u>10.1</u>	<u>113%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.1</u>	<u>41 251 17</u>



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L17D013

Analysis Completion Date: 4/27/17

### Precision Data:

Sample #: 17.4342

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>9.6</u>	<u>9.6</u>	<u>0.0</u>	<u>0.0</u>

### Spike Data:

Sample #: 17.4342

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>3.9</u>	<u>4.5</u>	<u>9.6</u>	<u>127%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.2</u>	<u>10.1</u>	<u>101%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.3 +/- 0.1</u>	<u>4/27/17</u>



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L17D013

Analysis Completion Date: 41 261 17

### Precision Data:

Sample #: 17.4251

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>4.5</u>	<u>3.8</u>	<u>0.7</u>	<u>16.87</u>

### Spike Data:

Sample #: 17.4251

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>0.0</u>	<u>4.0</u>	<u>3.8</u>	<u>95%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.3</u>	<u>4.44</u>	<u>97%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.1 +/- 0.2</u>	<u>41 261 17</u>



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L170013

Analysis Completion Date: 5/1/17

### Precision Data:

Sample #: 17.4341

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>8.8</u>	<u>8.8</u>	<u>0.0</u>	<u>0.0</u>

### Spike Data:

Sample #: 17.4341

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>3.8</u>	<u>3.95</u>	<u>8.8</u>	<u>127%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.2</u>	<u>4.39</u>	<u>96%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.0 +/- 0.2</u>	<u>5/1/17</u>

**JUNE 2017**





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 07/17/17 11:04

Work Order - L17F009

Project - CCR Wells Economizer Ash Pond

---

## Case Narrative

---

5 sample(s) were received on 06/28/17 15:12.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium was subcontracted to TestAmerica Labs. The report is attached.

Rad 226/228 was subcontracted to KNL Laboratories, the report is attached.

### EPA 300.0

The recovery of the matrix spike and spike duplicate for Sulfate was above the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

### EPA 6010

The recovery of the matrix spike and/or spike duplicate for Calcium and Boron could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17F009-01  
 Sample Description: BBS-CCR-1  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 6/28/17 12:45  
 Date of Sample Receipt: 6/28/17 15:12

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	720	mg/L	2.00	50.0		100	EPA 300.0	RFL	6/29/17 17:33
Specific Conductance	4060	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 12:45
Dissolved Oxygen	0.270	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 12:45
Fluoride	0.208	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 17:23
pH	6.78	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 12:45
REDOX Potential	-80.6	mV	-999	-999		1	SM 2580B	RAB	6/28/17 12:45
Total Dissolved Solids	3140	mg/L	24.0	40.0		2	SM 2540C	TMH	7/3/17 13:19
Sulfate	1120	mg/L	50.0	200		100	EPA 300.0	RFL	7/10/17 13:29
Turbidity	3.63	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 12:45

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:04
---------	--------	------	--------	-------	---	---	-----------	-----	--------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:49
Arsenic	9.76	ug/L	0.320	2.00		1	EPA 200.8	RLC	6/29/17 14:49
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:49
Cobalt	0.484	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:49
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 14:49
Selenium	0.756	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 14:49
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:49

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.113	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:46
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:46
Boron	16.5	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:46
Calcium	569	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:49
Chromium	1.93	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:46
Molybdenum	96.5	ug/L	1.00	20.0	V	1	EPA 6010B	RLC	6/30/17 12:58

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17F009-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 6/28/17 11:27  
 Date of Sample Receipt: 6/28/17 15:12

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	105	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 17:53
Specific Conductance	1480	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 11:27
Dissolved Oxygen	0.240	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 11:27
Fluoride	0.214	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 17:43
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 11:27
REDOX Potential	-131	mV	-999	-999		1	SM 2580B	RAB	6/28/17 11:27
Total Dissolved Solids	1080	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	415	mg/L	5.00	20.0	J-	10	EPA 300.0	RFL	7/10/17 13:39
Turbidity	4.71	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 11:27
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:08
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:53
Arsenic	1.01	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 14:53
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:53
Cobalt	0.0875	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:53
Lead	0.000144	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	6/29/17 14:53
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	6/29/17 14:53
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:53
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:49
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:49
Boron	3.20	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:49
Calcium	173	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:51
Chromium	1.96	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:49
Molybdenum	9.59	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:00

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17F009-03	Date and Time Collected:	6/28/17 11:00
Sample Description:	BBS-CCR-3	Date of Sample Receipt:	6/28/17 15:12
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	168	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 18:54
Specific Conductance	1760	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 11:00
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 11:00
Fluoride	0.338	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 18:24
pH	6.38	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 11:00
REDOX Potential	-125	mV	-999	-999		1	SM 2580B	RAB	6/28/17 11:00
Total Dissolved Solids	1280	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	493	mg/L	5.00	20.0		10	EPA 300.0	RFL	7/10/17 14:09
Turbidity	0.940	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 11:00
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:11
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 14:57
Arsenic	0.525	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 14:57
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:57
Cobalt	0.119	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 14:57
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 14:57
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	RLC	6/29/17 14:57
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 14:57
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0618	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:51
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:51
Boron	0.184	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:51
Calcium	192	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:54
Chromium	3.12	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:51
Molybdenum	11.9	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:03

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17F009-04	Date and Time Collected:	6/28/17 10:28
Sample Description:	BBS-CCR-BW1	Date of Sample Receipt:	6/28/17 15:12
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	995	mg/L	2.00	50.0		100	EPA 300.0	RFL	6/29/17 19:14
Specific Conductance	5010	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 10:28
Dissolved Oxygen	0.420	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 10:28
Fluoride	0.298	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 19:04
pH	6.47	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 10:28
REDOX Potential	-11.4	mV	-999	-999		1	SM 2580B	RAB	6/28/17 10:28
Total Dissolved Solids	4430	mg/L	48.0	80.0		4	SM 2540C	TMH	7/3/17 13:19
Sulfate	1510	mg/L	50.0	200		100	EPA 300.0	RFL	7/10/17 14:19
Turbidity	0.690	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 10:28
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:22
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 15:00
Arsenic	7.68	ug/L	0.320	2.00		1	EPA 200.8	RLC	6/29/17 15:00
Cadmium	0.124	ug/L	0.100	0.500	I	1	EPA 200.8	RLC	6/29/17 15:00
Cobalt	1.71	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 15:00
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 15:00
Selenium	1.81	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 15:00
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:00
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0554	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:54
Boron	51.7	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	6/30/17 8:54
Calcium	781	mg/L	0.0300	1.00		1	EPA 6010B	RLC	6/29/17 13:56
Chromium	2.29	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:54
Molybdenum	16.3	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:06

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17F009-05	Date and Time Collected:	6/28/17 10:02
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	6/28/17 15:12
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	135	mg/L	0.200	5.00		10	EPA 300.0	RFL	6/29/17 19:34
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	6/28/17 10:02
Dissolved Oxygen	0.190	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	6/28/17 10:02
Fluoride	0.559	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	6/29/17 19:24
pH	6.64	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	6/28/17 10:02
REDOX Potential	-82.4	mV	-999	-999		1	SM 2580B	RAB	6/28/17 10:02
Total Dissolved Solids	1170	mg/L	12.0	20.0		1	SM 2540C	TMH	7/3/17 13:19
Sulfate	402	mg/L	5.00	20.0		10	EPA 300.0	RFL	7/10/17 14:29
Turbidity	6.09	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	6/28/17 10:02
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/5/17 14:25
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	6/29/17 15:04
Arsenic	1.68	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:04
Cobalt	0.0959	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	RLC	6/29/17 15:04
Selenium	0.386	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	6/29/17 15:04
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	6/29/17 15:04
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0488	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	6/30/17 8:56
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	6/30/17 8:56
Boron	4.54	mg/L	0.0100	0.0500	J-	1	EPA 6010B	RLC	6/30/17 8:56
Calcium	290	mg/L	0.0300	1.00	J-	1	EPA 6010B	RLC	6/29/17 13:59
Chromium	1.68	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	6/30/17 8:56
Molybdenum	10.2	ug/L	1.00	20.0	I,V	1	EPA 6010B	RLC	6/30/17 13:08

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



## Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17F0185 - EPA 6010B</b>											
<b>Blank (17F0185-BLK1)</b>					Prepared: 06/29/17 Analyzed: 06/30/17						
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Chromium	1.60	1.60	12.0	ug/L							U
<b>LCS (17F0185-BS1)</b>					Prepared: 06/29/17 Analyzed: 06/30/17						
Barium	0.997	0.000500	0.0200	mg/L	1.0000		99.7	80-120			
Beryllium	1030	0.200	2.00	ug/L	1000.0		103	80-120			
Boron	1.05	0.0100	0.0500	mg/L	1.0000		105	80-120			
Chromium	996	1.60	12.0	ug/L	1000.0		99.6	80-120			
<b>Matrix Spike (17F0185-MS1)</b>					<b>Source: L17F009-05</b>		Prepared: 06/29/17 Analyzed: 06/30/17				
Barium	1.01	0.000500	0.0200	mg/L	1.0000	0.0488	96.2	75-125			
Beryllium	994	0.200	2.00	ug/L	1000.0	U	99.4	75-125			
Boron	5.44	0.0100	0.0500	mg/L	1.0000	4.54	90.6	75-125			
Chromium	977	1.60	12.0	ug/L	1000.0	1.68	97.5	75-125			
<b>Matrix Spike Dup (17F0185-MSD1)</b>					<b>Source: L17F009-05</b>		Prepared: 06/29/17 Analyzed: 06/30/17				
Barium	0.983	0.000500	0.0200	mg/L	1.0000	0.0488	93.4	75-125	2.84	20	
Beryllium	982	0.200	2.00	ug/L	1000.0	U	98.2	75-125	1.28	20	
Boron	5.23	0.0100	0.0500	mg/L	1.0000	4.54	69.7	75-125	3.93	20	J-
Chromium	960	1.60	12.0	ug/L	1000.0	1.68	95.8	75-125	1.77	20	
<b>Batch 17F0216 - EPA 6010B</b>											
<b>Blank (17F0216-BLK1)</b>					Prepared & Analyzed: 06/30/17						
Molybdenum	1.12	1.00	20.0	ug/L							I

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17F0216 - EPA 6010B</b>											
<b>LCS (17F0216-BS1)</b>					Prepared & Analyzed: 06/30/17						
Molybdenum	1020	1.00	20.0	ug/L	1000.0		102	80-120			V
<b>Matrix Spike (17F0216-MS1)</b>					Source: L17F081-01RE1 Prepared & Analyzed: 06/30/17						
Molybdenum	1080	1.00	20.0	ug/L	1000.0	71.6	101	75-125			V
<b>Matrix Spike Dup (17F0216-MSD1)</b>					Source: L17F081-01RE1 Prepared & Analyzed: 06/30/17						
Molybdenum	1080	1.00	20.0	ug/L	1000.0	71.6	101	75-125	0.0171	20	V

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0011 - EPA 7470A</b>											
<b>Blank (17G0011-BLK1)</b>					Prepared & Analyzed: 07/05/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17G0011-BS1)</b>					Prepared & Analyzed: 07/05/17						
Mercury	1.02	0.0500	0.200	ug/L	1.0000		102	80-120			
<b>Matrix Spike (17G0011-MS1)</b>					Source: L17F009-03		Prepared & Analyzed: 07/05/17				
Mercury	0.956	0.0500	0.200	ug/L	1.0000	U	95.6	75-125			
<b>Matrix Spike Dup (17G0011-MSD1)</b>					Source: L17F009-03		Prepared & Analyzed: 07/05/17				
Mercury	0.993	0.0500	0.200	ug/L	1.0000	U	99.3	75-125	3.83	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17F0201 - EPA 200.8

#### Blank (17F0201-BLK1)

Prepared & Analyzed: 06/29/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17F0201-BS1)

Prepared & Analyzed: 06/29/17

Antimony	101	0.600	2.00	ug/L	100.00		101	85-115			
Arsenic	105	0.320	2.00	ug/L	100.00		105	85-115			
Cadmium	107	0.100	0.500	ug/L	100.00		107	85-115			
Cobalt	107	0.0400	2.00	ug/L	100.00		107	85-115			
Lead	0.105	8.00E-5	0.00200	mg/L	0.10000		105	85-115			
Selenium	107	0.200	2.00	ug/L	100.00		107	85-115			
Thallium	103	0.100	0.500	ug/L	100.00		103	85-115			

#### Matrix Spike (17F0201-MS1)

Source: L17F009-01

Prepared & Analyzed: 06/29/17

Antimony	101	0.600	2.00	ug/L	100.00	U	101	70-130			
Arsenic	102	0.320	2.00	ug/L	100.00	9.76	92.0	70-130			
Cadmium	84.4	0.100	0.500	ug/L	100.00	U	84.4	70-130			
Cobalt	90.3	0.0400	2.00	ug/L	100.00	0.484	89.8	70-130			
Lead	0.0858	8.00E-5	0.00200	mg/L	0.10000	U	85.8	70-130			
Selenium	88.0	0.200	2.00	ug/L	100.00	0.756	87.3	70-130			
Thallium	88.5	0.100	0.500	ug/L	100.00	U	88.5	70-130			

#### Matrix Spike Dup (17F0201-MSD1)

Source: L17F009-01

Prepared & Analyzed: 06/29/17

Antimony	101	0.600	2.00	ug/L	100.00	U	101	70-130	0.0197	20	
Arsenic	102	0.320	2.00	ug/L	100.00	9.76	92.5	70-130	0.487	20	
Cadmium	81.2	0.100	0.500	ug/L	100.00	U	81.2	70-130	3.86	20	
Cobalt	90.3	0.0400	2.00	ug/L	100.00	0.484	89.8	70-130	0.0252	20	
Lead	0.0877	8.00E-5	0.00200	mg/L	0.10000	U	87.7	70-130	2.16	20	
Selenium	90.1	0.200	2.00	ug/L	100.00	0.756	89.4	70-130	2.37	20	
Thallium	89.8	0.100	0.500	ug/L	100.00	U	89.8	70-130	1.47	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17F0214 - EPA 300.0</b>											
<b>Blank (17F0214-BLK1)</b>					Prepared & Analyzed: 06/29/17						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
<b>LCS (17F0214-BS1)</b>					Prepared & Analyzed: 06/29/17						
Chloride	4.90	0.0200	0.500	mg/L	5.0000		97.9	90-110			
Fluoride	4.90	0.0100	0.0500	mg/L	5.0000		98.1	90-110			
<b>Matrix Spike (17F0214-MS1)</b>					Source: L17F009-02		Prepared & Analyzed: 06/29/17				
Chloride	155	0.200	5.00	mg/L	50.000	105	99.9	90-110			
Fluoride	54.1	0.100	0.500	mg/L	50.000	0.214	108	90-110			
<b>Matrix Spike Dup (17F0214-MSD1)</b>					Source: L17F009-02		Prepared & Analyzed: 06/29/17				
Chloride	155	0.200	5.00	mg/L	50.000	105	98.5	90-110	0.457	20	
Fluoride	54.0	0.100	0.500	mg/L	50.000	0.214	108	90-110	0.168	20	
<b>Batch 17G0002 - SM 2540C</b>											
<b>Blank (17G0002-BLK1)</b>					Prepared & Analyzed: 07/03/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17G0002-BS1)</b>					Prepared & Analyzed: 07/03/17						
Total Dissolved Solids	999	12.0	20.0	mg/L	1000.0		99.9	80-120			
<b>Duplicate (17G0002-DUP1)</b>					Source: L17F009-01		Prepared & Analyzed: 07/03/17				
Total Dissolved Solids	3110	24.0	40.0	mg/L		3140			1.15	10	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0008 - EPA 300.0</b>											
<b>Blank (17G0008-BLK1)</b>					Prepared & Analyzed: 07/03/17						
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17G0008-BS1)</b>					Prepared & Analyzed: 07/03/17						
Sulfate	4.94	0.500	2.00	mg/L	5.0000		98.7	90-110			
<b>Batch 17G0042 - EPA 300.0</b>											
<b>Blank (17G0042-BLK1)</b>					Prepared & Analyzed: 07/10/17						
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17G0042-BS1)</b>					Prepared & Analyzed: 07/10/17						
Sulfate	4.68	0.500	2.00	mg/L	5.0000		93.7	90-110			
<b>Matrix Spike (17G0042-MS1)</b>					<b>Source: L17F009-02RE1</b>		Prepared & Analyzed: 07/10/17				
Sulfate	476	5.00	20.0	mg/L	50.000	415	122	90-110			J-
<b>Matrix Spike Dup (17G0042-MSD1)</b>					<b>Source: L17F009-02RE1</b>		Prepared & Analyzed: 07/10/17				
Sulfate	493	5.00	20.0	mg/L	50.000	415	155	90-110	3.44	20	J-

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend** Date: **06/28/17** File Name: **062817\_Wells\_RAB** Weather: **Ptly Cloudy & Hot** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color SCOLOR-W	Odor SODOR-W	NGVD	
													Time	LEVEL
L17F009-01	BBS-CCR-1	12:45		6.78	25.54	4063.00	0.27	3.63	-80.60		LT. YELLOW	NONE	12:27	
L17F009-02	BBS-CCR-2	11:27		6.87	25.12	1485.00	0.24	4.71	-131.30		YELLOW	MILD	11:09	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17F009-01	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L17F009-02	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice	Sample Receipt
ESS	0107301Y	ESS 0218201Y	ESS 0307031Y	ESS	ESS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Time 15:12

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>	2.0 C
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019075A	7	7.01	8:51			7.10	14:58	MPM08	9:00	20.1	236.9	237.5
FDEP FT 1100	L 018611B	10	10.04	8:51	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)			MPM08	15:09	21.2		233.1	236.2
Units: SU	L 018737A	4	3.99	8:51	A checked box indicates ICV / CCV passed			Zobell Sol ID:					

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L	019150A			
Meter ID: MPM08	L 017987C	1000	1000	9:04					DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
FDEP FT 1200, Units: µMHOS	L 018416B	10000			9792	9:09	9830	14:48	Meter ID:	8:42	21.7	8.84	8.812

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08 <th>15:19</th> <th>20.9</th> <th>9.06</th> <th>8.932</th>	15:19	20.9	9.06	8.932
Meter ID: TM07	L 106722	4.76	4.28 - 5.24	4.83	8:50			Barom. Pres				
FDEP FT 1600, Units: NTU	L 106723	52.10	48.71 - 55.49			52.20	14:49	760				

Sulfite Info (QC Check) (EPA 377.1) QC Result mg/l Time Titrator ID Na Thio ID DO 3 Pillow ID Starch Ind. ID Iodate/Iodide ID Therm ID pH Conduct(%) DO (mg/l) Redox (mv)

QC Std: 5ml (NaThio)/500ml DI=10mg/L

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	7.41	14.91	0.16	2.39	0.0026	23.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	12:34	550	0.87	0.87	7.58	6.78	25.48	4063	0.38	6.42	pH: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	12:36	550	0.29	1.16	7.57	6.77	25.51	4063	0.28	4.58	Temp C +/- 0.2	STABLE	Pump:	PP
12:28	12:38	550	0.29	1.45	7.57	6.78	25.54	4063	0.27	3.63	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	12:38										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
Purge Complete At	12:29	Gallons to Purge	0.12	Stability Values =	6.78	25.54	4063	0.27	3.63					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-2	2	10	16.84	21.84	6.97	14.87	0.16	2.38	0.0026	22.84	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:15	680	1.08	1.08	7.11	6.91	25.15	1478	0.23	7.90	pH: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:17	700	0.37	1.45	7.11	6.87	25.07	1493	0.26	5.74	Temp C +/- 0.2	STABLE	Pump:	PP
11:09	11:19	700	0.37	1.82	7.10	6.87	25.12	1485	0.24	4.71	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	11:19										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
Purge Complete At	11:10	Gallons to Purge	0.12	Stability Values =	6.87	25.12	1485	0.24	4.71					

Comments:

Total Time      Total Miles

Site: **Big Bend** Date: **06/28/17** File Name: **062817\_Wells\_RAB** Weather: **Ptly Cloudy & Hot** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17F009-03	BBS-CCR-3	11:00		6.38	26.15	1755.00	0.28	0.94	-124.70		YELLOW	MODERATE	10:36	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17F009-03	<input type="checkbox"/>		1	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sample Receipt Time 15:12
ESS 0107301Y	ESS 0218201Y	ESS 0307031Y	ESS	ESS	ESS		

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>	2
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019075A	7	7	8:51			7.10	14:58	Meter ID: MPM08	15:09	20.1	236.9	237.5
FDEP FT 1100	L 018611B	10	10	8:51	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)						21.2	233.1	236.2
Units: SU	L 018737A	4	4	8:51	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 50A	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 017987C	1000	1000	9:04						Meter ID: MPM08	15:19	20.9	9.06	8.932
FDEP FT 1200, Units: µMHOS	L 018416B	10000			9792	9:09	9830	14:48		Barom. Pres			8.84	8.812

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titralor ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L								MPM08	0.2	5	0.3	10

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-3	2	10	18.23	23.23	6.64	16.59	0.16	2.65	0.0026	24.23	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:43	300	0.48	0.48	7.00	6.40	26.43	1781	0.20	1.00	ph: +/- 0.2	STABLE	Level Meter: WLM08	
Purge Start:	10:45	300	0.16	0.64	7.01	6.39	26.23	1770	0.27	0.85	Temp C +/- 0.2	STABLE	Pump: PP	
	10:37	300	0.16	0.80	7.02	6.38	26.21	1764	0.30	1.39	Cond % +/- 5	STABLE	Tubing: PE/S	
Purge End:	10:49	300	0.16	0.96	7.04	6.38	26.15	1755	0.28	0.94	DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
	10:49										Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
Purge Complete At	10:39	Gallons to Purge	0.12	Stability Values =	6.38	26.15	1755	0.28	0.94					

Comments: \_\_\_\_\_ Total Time \_\_\_\_\_ Total Miles \_\_\_\_\_

Site: **Big Bend** Date: **06/28/17** File Name: **062817\_Wells\_RAB** Weather: **Ptly Cloudy & Hot** Sampler(s) / Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17F009-04	BBS-CCR-BW-1	10:28		6.47	27.72	5010.00	0.42	0.69	-11.40		CLEAR	NONE	10:09	
L17F009-05	BBS-CCR-BW-2	10:02		6.64	26.69	1538.00	0.19	6.09	-82.40		LT. YELLOW	NONE	9:40	

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17F009-04	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10
L17F009-05	<input type="checkbox"/>		1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	<input checked="" type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sample Receipt Time 15:12
---------------------	------------------------	------------------------	---------------------------	-------------------------	------------------------	---	------------------------------

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L <input type="checkbox"/>	500 ml bottles (Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L <input type="checkbox"/>	2
500 ml bottles (metals): 2 ml HNO3 to pH <2	L <input type="checkbox"/>	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L <input type="checkbox"/>	250 ml bottles (Cyan) 1g NaOH to pH >12	L <input type="checkbox"/>	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 012553 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2	L <input type="checkbox"/>	A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019075A	7	7	8:51			7.10	14:58	Meter ID: MPM08	9:00	20.1	236.9	237.5
FDEP FT 1100	L 018611B	10	10	8:51	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				15:09	21.2		233.1	236.2
Units: SU	L 018737A	4	4	8:51	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 017987C	1000	1000	9:04					Meter ID: MPM08	8:42	21.7	8.84	8.812
FDEP FT 1200, Units: µMHOS	L 018416B	10000			9792	9:09	9830	14:48	15:19	20.9		9.06	8.932

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Barom. Pres
Meter ID: TM07	L 106722	4.76	4.28 - 5.24	4.83	8:50			760
FDEP FT 1600, Units: NTU	L 106723	52.10	48.71 - 55.49			52.20	14:49	

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct(%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)500ml DI=10mg/L								MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-BW-1	2	10	39.3	44.3	29.92	14.38	0.16	2.30	0.0026	100	0	0.06	0.32

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:21	2200	4.65	4.65	31.10	6.48	27.70	4954	0.39	1.88	pH: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:23	2200	1.16	5.81	31.10	6.48	27.70	4972	0.45	1.08	Temp: C +/- 0.2	STABLE	Pump:	ESP
10:13	10:25	2200	1.16	6.97	31.10	6.47	27.72	5010	0.42	0.69	Cond % +/- 5	STABLE	Tubing:	PE
Purge End:	10:25										DO % Sat. < 20	STABLE	Dedicated	<input type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input checked="" type="checkbox"/> No
<b>Purge Complete At</b>	<b>10:14</b>	<b>Gallons to Purge 0.32</b>		<b>Stability Values =</b>		6.47	27.72	5010	0.42	0.69				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-BW-2	2	10	18.49	23.84	8.53	15.31	0.16	2.45	0.0026	24.64	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:49	570	1.36	1.36	8.78	6.64	26.67	1537	0.18	11.20	pH: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	9:51	550	0.29	1.65	8.77	6.64	26.66	1538	0.18	12.20	Temp: C +/- 0.2	STABLE	Pump:	PP
9:40	9:53	550	0.29	1.94	8.78	6.64	26.69	1538	0.19	6.09	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	9:53										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No
<b>Purge Complete At</b>	<b>9:41</b>	<b>Gallons to Purge 0.12</b>		<b>Stability Values =</b>		6.64	26.69	1538	0.19	6.09				

Comments: Total Time Total Miles



## GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

Date: 06/28/17 Sampler(s): RAB

Initials *RAB*

pH Meter Calibration		Buffer ID	Buffer Value	Cal.	Time	CCV		Time	Pass/Fail		
Meter ID:	MPM08	L 019075A	7	7.01	8:51		7.10	14:58	Pass		
FDEP FT 1100		L 018611B	10	10.04	8:51	QC (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)					
Units: SU		L 018737A	4	3.99	8:51	ICV	Time	Pass/Fail	A checked box indicates ICV / CCV passed		
	ICV Check	L 018377I	7			7.03	857	Pass			
Conductivity Meter Calib.		Standard ID	Std. Value	Cal.	Time	ICV	Time	Pass/Fail	CCV	Time	Pass/Fail
Meter ID:	MPM08	L 017987C	1000	1000	9:04						
FDEP FT 1200, Units: uMHOS		L 018416B	10000			9792	9:09	Pass	9830	14:48	Pass
Turbidity Meter Calibration		Standard ID	Std. Value	Acceptability Range	CCV	Time	Pass/Fail	CCV	Time	Pass/Fail	
Meter ID:	TM07	L 106722	4.76	4.28 - 5.24	4.83	8:50	Pass				
FDEP FT 1600, Units: NTU		L 106723	52.10	48.71 - 55.49				52.20	14:49	Pass	
Sulfite Info (QC Check) (EPA 377.1)		QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID			
QC Std: 5ml (NaThio)/500ml DI=10mg/L					L	L	L	L			
Redox Cal	Time	Temp °C	Reading mv	Theo. Value mv	Pass / Fail	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo. Value mg/l	Pass / Fail
						FDEP FT 1500					
Meter ID:	9:00	20.1	236.9	237.5	Pass	Meter ID:	8:42	21.7	8.84	8.812	Pass
MPM08	15:09	21.2	233.1	236.2	Pass	MPM08	15:19	20.9	9.06	8.932	Pass
Zobell Sol ID:						Barom. Pres					
L 019150A						760					
Therm. ID	pH	Conduct. %	DO mg/l	Redox mv	CL2	Calibration Criterion	Ferrous Iron Comparator ID:	Reagent ID:			
MPM08	0.2	5	0.3	10	0.2			L-			

ClO<sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4.

Glycene check should read < 0.10 mg/l ClO<sub>2</sub>.

Chlorine Dioxide (mg/l)	Std. Conc (mg/l)	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Calc. Std. Conc. (mg/l)	Initial Calibration Verification ICV			Continuous Calibration Verification CCV			Method 10128* *Equivalent to Standard Methods, 4500 ClO <sub>2</sub> D.	
					DPD Check (mg/l)	Glycene Check	Time	Pass/Fail	DPD Check (mg/l)	Time		Pass/Fail
Meter ID:		1.0	100									
DPD ID: L					Glycene ID: L			A checked box indicates reagent expiration date has been verified.				

COMMENTS:

CL2 Std. ID: L

**DEP-SOP-001/01**  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

FACILITY NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-1</b>	SAMPLE ID: <b>L17F009-01</b> DATE: <b>6/28/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL (NGVD) DEPTH <b>12.32</b> feet to <b>22.32</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.41</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot x                      23.3                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>17.32</b>	PURGING INITIATED AT: <b>12:28</b>	PURGING ENDED AT: <b>12:38</b>	TOTAL VOLUME PURGED (gallons): <b>1.45</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:34	0.87	0.87	0.15	7.58	6.78	25.48	4063	0.38	6.42	LT. YELLOW	NONE
12:36	0.29	1.16	0.15	7.57	6.77	25.51	4063	0.28	4.58	LT. YELLOW	NONE
12:38	0.29	1.45	0.15	7.57	6.78	25.54	4063	0.27	3.63	LT. YELLOW	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>12:38</b>		SAMPLING ENDED AT: <b>12:45</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>17.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>550</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Filtration Equipment Type <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)  
 SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L17F009-02</b> DATE: <b>6/28/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.97</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>11:09</b>	PURGING ENDED AT: <b>11:19</b>	TOTAL VOLUME PURGED (gallons): <b>1.82</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:15	1.08	1.08	0.18	7.11	6.91	25.15	1478	0.23	7.90	YELLOW	MILD
11:17	0.37	1.45	0.19	7.11	6.87	25.07	1493	0.26	5.74	YELLOW	MILD
11:19	0.37	1.82	0.19	7.10	6.87	25.12	1485	0.24	4.71	YELLOW	MILD
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:19</b>		SAMPLING ENDED AT: <b>11:27</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>693</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RPPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    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)



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L17F009-04</b> DATE: <b>6/28/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> (feet) to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>29.92</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>10:13</b>	PURGING ENDED AT: <b>10:25</b>	TOTAL VOLUME PURGED (gallons): <b>6.97</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:21	4.65	4.65	0.58	31.10	6.48	27.70	4954	0.39	1.88	CLEAR	NONE
10:23	1.16	5.81	0.58	31.10	6.48	27.70	4972	0.45	1.08	CLEAR	NONE
10:25	1.16	6.97	0.58	31.10	6.47	27.72	5010	0.42	0.69	CLEAR	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:25</b>		SAMPLING ENDED AT: <b>10:28</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>2200</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L17F009-05</b> DATE: <b>6/28/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>8.53</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:40</b>	PURGING ENDED AT: <b>9:53</b>	TOTAL VOLUME PURGED (gallons): <b>1.94</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:49	1.36	1.36	0.15	8.78	6.64	26.67	1537	0.18	11.20	LT. YELLOW	NONE
9:51	0.29	1.65	0.15	8.77	6.64	26.66	1538	0.18	12.20	LT. YELLOW	NONE
9:53	0.29	1.94	0.15	8.78	6.64	26.69	1538	0.19	6.09	LT. YELLOW	NONE
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.00014;    1/4" = 0.00026;    5/16" = 0.0004;    3/8" = 0.0006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>9:53</b>		SAMPLING ENDED AT: <b>10:02</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>557</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427


TestAmerica Job ID: 660-81511-1

Client Project/Site: L17F009

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



---

Authorized for release by:  
7/5/2017 1:02:55 PM

Keaton Conner, Project Manager I  
(813)885-7427  
[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15



# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-81511-1	L17F009-01	Water	06/28/17 12:45	06/29/17 12:40
660-81511-2	L17F009-02	Water	06/28/17 11:27	06/29/17 12:40
660-81511-3	L17F009-03	Water	06/28/17 11:00	06/29/17 12:40
660-81511-4	L17F009-04	Water	06/28/17 10:28	06/29/17 12:40
660-81511-5	L17F009-05	Water	06/28/17 10:02	06/29/17 12:40

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

---

**Job ID: 660-81511-1**

---

**Laboratory: TestAmerica Tampa**

---

## Narrative

### Job Narrative 660-81511-1

#### Receipt

The samples were received on 6/29/2017 12:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

## Client Sample ID: L17F009-01

## Lab Sample ID: 660-81511-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.013	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17F009-02

## Lab Sample ID: 660-81511-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.014	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17F009-03

## Lab Sample ID: 660-81511-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0093	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17F009-04

## Lab Sample ID: 660-81511-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.015	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17F009-05

## Lab Sample ID: 660-81511-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0052	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

**Client Sample ID: L17F009-01**

Date Collected: 06/28/17 12:45

Date Received: 06/29/17 12:40

**Lab Sample ID: 660-81511-1**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.013	I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:10	1

**Client Sample ID: L17F009-02**

Date Collected: 06/28/17 11:27

Date Received: 06/29/17 12:40

**Lab Sample ID: 660-81511-2**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.014	I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:24	1

**Client Sample ID: L17F009-03**

Date Collected: 06/28/17 11:00

Date Received: 06/29/17 12:40

**Lab Sample ID: 660-81511-3**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0093	I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:27	1

**Client Sample ID: L17F009-04**

Date Collected: 06/28/17 10:28

Date Received: 06/29/17 12:40

**Lab Sample ID: 660-81511-4**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.015	I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:30	1

**Client Sample ID: L17F009-05**

Date Collected: 06/28/17 10:02

Date Received: 06/29/17 12:40

**Lab Sample ID: 660-81511-5**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0052	I	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 13:34	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-359159/1-A**  
**Matrix: Water**  
**Analysis Batch: 359305**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 359159**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		07/02/17 10:47	07/03/17 12:41	1

**Lab Sample ID: LCS 400-359159/2-A**  
**Matrix: Water**  
**Analysis Batch: 359305**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 359159**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.06		mg/L		106	85 - 115

**Lab Sample ID: 400-139832-A-1-B MS**  
**Matrix: Water**  
**Analysis Batch: 359305**

**Client Sample ID: Matrix Spike**  
**Prep Type: Total/NA**  
**Prep Batch: 359159**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.047	I	1.00	1.13		mg/L		108	70 - 130

**Lab Sample ID: 400-139832-A-1-C MSD**  
**Matrix: Water**  
**Analysis Batch: 359305**

**Client Sample ID: Matrix Spike Duplicate**  
**Prep Type: Total/NA**  
**Prep Batch: 359159**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.047	I	1.00	1.18		mg/L		113	70 - 130	4	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

## Metals

### Prep Batch: 359159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81511-1	L17F009-01	Total/NA	Water	200.7	
660-81511-2	L17F009-02	Total/NA	Water	200.7	
660-81511-3	L17F009-03	Total/NA	Water	200.7	
660-81511-4	L17F009-04	Total/NA	Water	200.7	
660-81511-5	L17F009-05	Total/NA	Water	200.7	
MB 400-359159/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-359159/2-A	Lab Control Sample	Total/NA	Water	200.7	
400-139832-A-1-B MS	Matrix Spike	Total/NA	Water	200.7	
400-139832-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7	

### Analysis Batch: 359305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81511-1	L17F009-01	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-2	L17F009-02	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-3	L17F009-03	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-4	L17F009-04	Total/NA	Water	200.7 Rev 4.4	359159
660-81511-5	L17F009-05	Total/NA	Water	200.7 Rev 4.4	359159
MB 400-359159/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	359159
LCS 400-359159/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	359159
400-139832-A-1-B MS	Matrix Spike	Total/NA	Water	200.7 Rev 4.4	359159
400-139832-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	200.7 Rev 4.4	359159

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

**Client Sample ID: L17F009-01**

**Date Collected: 06/28/17 12:45**

**Date Received: 06/29/17 12:40**

**Lab Sample ID: 660-81511-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:10	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17F009-02**

**Date Collected: 06/28/17 11:27**

**Date Received: 06/29/17 12:40**

**Lab Sample ID: 660-81511-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:24	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17F009-03**

**Date Collected: 06/28/17 11:00**

**Date Received: 06/29/17 12:40**

**Lab Sample ID: 660-81511-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:27	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17F009-04**

**Date Collected: 06/28/17 10:28**

**Date Received: 06/29/17 12:40**

**Lab Sample ID: 660-81511-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:30	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17F009-05**

**Date Collected: 06/28/17 10:02**

**Date Received: 06/29/17 12:40**

**Lab Sample ID: 660-81511-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	359159	07/02/17 10:47	DN1	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			359305	07/03/17 13:34	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001



# Accreditation/Certification Summary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

## Laboratory: TestAmerica Tampa

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E81010	06-30-18

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L17F009

TestAmerica Job ID: 660-81511-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17F009**


**SENDING LABORATORY:**



Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone : (813) 885-7427  
 Fax: -

**Due Date: 07/13/17 16:00**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17F009-01 Sampled: 06/28/17 12:45 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	BBS-CCR-1 12/25/17 12:45	Water	660-81511 Chain of Custody  Loc: 660 81511
Sample ID: L17F009-02 Sampled: 06/28/17 11:27 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	BBS-CCR-2 12/25/17 11:27	Water	
Sample ID: L17F009-03 Sampled: 06/28/17 11:00 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	BBS-CCR-3 12/25/17 11:00	Water	
Sample ID: L17F009-04 Sampled: 06/28/17 10:28 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	BBS-CCR-BW1 12/25/17 10:28	Water	
Sample ID: L17F009-05 Sampled: 06/28/17 10:02 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	BBS-CCR-BW2 12/25/17 10:02	Water	

	6-28-17 1605		6-29-17 01240
Released By	Date & Time	Received By	Date & Time
Released By	Date & Time	Received By	Date & Time

# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler		Lab PM:		Carrier Tracking No(s):		COC No:	
Client Contact: Shipping/Receiving		Phone		Conner, Keaton		State of Origin: Florida		660-97633-1	
Company: TestAmerica Laboratories, Inc.		Address: 3355 McLemore Drive, Pensacola, FL, 32514		E-Mail: keaton.conner@testamericainc.com		Accreditations Required (See note): NELAP - Florida; NELAP - Texas		Page 1 of 1	
Due Date Requested: 7/7/2017		TAT Requested (days):		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Job #: 660-81511-1	
City: Pensacola		State: FL, Zip: 32514		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)	
Phone: 850-474-1001(Tel) 850-478-2671(Fax)		Email:		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)	
Project Name: L17F009		Project #: 66004821		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)	
Site:		SSOW#:		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)	
<b>Sample Identification - Client ID (Lab ID)</b>		Preservation Code		Matrix (W=water, S=solid, O=waste/oil, BT=issue, A=air)		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)	
L17F009-01 (660-81511-1)		Water		12:45 Eastern		X		X	
L17F009-02 (660-81511-2)		Water		11:27 Eastern		X		X	
L17F009-03 (660-81511-3)		Water		11:00 Eastern		X		X	
L17F009-04 (660-81511-4)		Water		10:28 Eastern		X		X	
L17F009-05 (660-81511-5)		Water		10:02 Eastern		X		X	
Special Instructions/Note:		Total Number of containers		1		1		1	
Preservation Codes:		M - Hexane		N - None		O - AsNaO2		P - Na2O4S	
A - HCL		B - NaOH		C - Zn Acetate		D - Nitric Acid		E - NaHSO4	
F - MeOH		G - Amchlor		H - Ascorbic Acid		I - Ice		J - DI Water	
K - EDTA		L - EDA		Other:		T - TSP Dodecylhydrate		U - Acetone	
V - MCAA		W - pH 4.5		Z - other (specify)					

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**

Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/OC Requirements:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Relinquished by: <i>[Signature]</i>	Date/Time: 6/29/17 17:00	Company: TA	Received by: <i>[Signature]</i>	Date/Time: 6/30/17 08:24	Company: TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Cooler Temperature(s): 2°C and Other Remarks: *[Signature]*



# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-81511-1

**Login Number: 81511**

**List Number: 1**

**Creator: Moccia, Vanessa M**

**List Source: TestAmerica Tampa**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-81511-1

**Login Number: 81511**  
**List Number: 2**  
**Creator: Edwards, Robin S**

**List Source: TestAmerica Pensacola**  
**List Creation: 06/30/17 10:50 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





Report Date: July 11, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17F009-05  
BBS-CCR-BW2  
Sample Collection: 6-28-17/1002  
Lab ID No: 17.7747  
Lab Custody Date: 6-29-17/1450  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.8 ± 0.7	Calc	Calc	0.7
Radium-226	pCi/l	4.4 ± 0.7	7-5-17/1227	EPA 903.0	0.3
Radium-228	pCi/l	0.4 ± 0.5	7-11-17/0952	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17F009-04  
 BBS-CCR-BW1  
 Sample Collection: 6-28-17/1028  
 Lab ID No: 17.7746  
 Lab Custody Date: 6-29-17/1450  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.8 ± 1.7	Calc	Calc	0.7
Radium-226	pCi/l	34.4 ± 1.7	7-5-17/1227	EPA 903.0	0.4
Radium-228	pCi/l	3.4 ± 0.6	7-11-17/0952	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed.  
 Contact person: Jim Hayes (813) 229-2879.





Report Date: July 11, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17F009-03  
BBS-CCR-3  
Sample Collection: 6-28-17/1100  
Lab ID No: 17.7745  
Lab Custody Date: 6-29-17/1450  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	17.7 ± 1.2	Calc	Calc	0.7
Radium-226	pCi/l	15.9 ± 1.2	7-5-17/1227	EPA 903.0	0.4
Radium-228	pCi/l	1.8 ± 0.6	7-11-17/0952	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17F009-02  
BBS-CCR-2  
Sample Collection: 6-28-17/1127  
Lab ID No: 17.7744  
Lab Custody Date: 6-29-17/1450  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis		Method	Detection Limit
			Date			
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.7 ± 1.1		Calc	Calc	0.7
Radium-226	pCi/l	13.7 ± 1.1	7-5-17/1227	EPA 903.0		0.4
Radium-228	pCi/l	1.0 ± 0.5	7-11-17/0952	EPA Ra-05		0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: July 11, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17F009-01  
 BBS-CCR-1  
 Sample Collection: 6-28-17/1245  
 Lab ID No: 17.7743  
 Lab Custody Date: 6-29-17/1450  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	41.4 ± 1.9	Calc	Calc	0.7
Radium-226	pCi/l	39.7 ± 1.9	7-5-17/1227	EPA 903.0	0.4
Radium-228	pCi/l	1.7 ± 0.6	7-11-17/0952	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L17F009

SENDING LABORATORY:


Tampa Electric Company, Laboratory Services  
5012 Causeway Blvd  
Tampa, FL 33619  
Phone: (813) 630-7490  
Fax: (813) 630-7360  
Project Manager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services  
3202 N. Florida Ave.  
Tampa, FL 33603  
Phone :(813) 229-2879  
Fax: -

**Due Date: 07/13/17 16:00**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17F009-01      BBS-CCR-1		Water	17.7743
Sampled: 06/28/17 12:45			
Radium 226 EPA 903.0	12/25/17 12:45		Level 2 Data required
Radium 226+228, Total	12/25/17 12:45		Level 2 Data required
Radium 228 Ra-05	12/25/17 12:45		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17F009-02      BBS-CCR-2		Water	17.7744
Sampled: 06/28/17 11:27			
Radium 226 EPA 903.0	12/25/17 11:27		Level 2 Data required
Radium 226+228, Total	12/25/17 11:27		Level 2 Data required
Radium 228 Ra-05	12/25/17 11:27		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17F009-03      BBS-CCR-3		Water	17.7745
Sampled: 06/28/17 11:00			
Radium 226+228, Total	12/25/17 11:00		Level 2 Data required
Radium 226 EPA 903.0	12/25/17 11:00		Level 2 Data required
Radium 228 Ra-05	12/25/17 11:00		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17F009-04      BBS-CCR-BW1		Water	17.7746
Sampled: 06/28/17 10:28			
Radium 226 EPA 903.0	12/25/17 10:28		Level 2 Data required
Radium 226+228, Total	12/25/17 10:28		Level 2 Data required
Radium 228 Ra-05 *	12/25/17 10:28		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

Released By  6/29/17 1450 Date & Time

Received By  6/29/17 1450 Date & Time

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17F009**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17F009-05      BBS-CCR-BW2		Water	17.7747
Sampled: 06/28/17 10:02			
Radium 228 Ra-05	12/25/17 10:02		Level 2 Data required
Radium 226 EPA 903.0	12/25/17 10:02		Level 2 Data required
Radium 226+228, Total	12/25/17 10:02		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)		RAD Poly HNO3 - 1000mL (D)	

6/27/17 1450
KNL      D. Kelly
6/29/17 1450

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L17F009

Analysis Completion Date: 7/11/17

### Precision Data:

Sample #: 17.7746

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>8.1</u>	<u>6.9</u>	<u>1.2</u>	<u>16.0%</u>

### Spike Data:

Sample #: 17.7746

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>3.4</u>	<u>3.85</u>	<u>6.9</u>	<u>91%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.4</u>	<u>4.28</u>	<u>103%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.3 +/- 0.2</u>	<u>7/11/17</u>



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L17F009

Analysis Completion Date: 7/5/17

### Precision Data:

Sample #: 17.7744

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>18.7</u>	<u>17.6</u>	<u>1.1</u>	<u>6.06</u>

### Spike Data:

Sample #: 17.7744

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>13.7</u>	<u>4.5</u>	<u>17.6</u>	<u>87%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.8</u>	<u>10.1</u>	<u>107%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.1</u>	<u>7/5/17</u>

**JULY 2017**





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 08/22/17 15:12

Work Order - L17G024

Project - CCR Wells Economizer Ash Pond

---

## Case Narrative

---

5 sample(s) were received on 07/20/17 13:30.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### SM2540C TDS

When reviewing the data, it was noticed that sample BBS-CCR-1 results was 1/2 of the expected range. In addition, the water quality comparison was outside of expected ranges. The sample was reanalyzed past the EPA recommended hold time. The result was within the expected historical and water quality comparison ranges. The re-analysis is reported with a Q qualifier.

A constant weight could not be achieved after three consecutive weighing and drying cycles for sample CCR-BW-1. The sample(s) are flagged with a J qualifier.

### EPA 300.0

The recovery of the matrix spike and/or spike duplicate for Chloride and Fluoride were outside the control limits due to matrix interference. The parent sample is flagged with a J qualifier.

The CCV for Fluoride was above the control limits. Review of historical data showed that all results were comparable to historical values, therefore the results were reported. The samples are flagged with a J qualifier.

### EPA 200.7

The recovery of the matrix spike and spike duplicate for Calcium could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17G024-01	Date and Time Collected:	7/20/17 12:25
Sample Description:	BBS-CCR-1	Date of Sample Receipt:	7/20/17 13:30
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	694	mg/L	2.00	50.0	J-,V	100	EPA 300.0	RFL	8/14/17 16:32
Specific Conductance	3960	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 12:25
Dissolved Oxygen	0.100	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 12:25
Fluoride	0.157	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 16:22
pH	6.81	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 12:25
REDOX Potential	-122	mV	-999	-999		1	SM 2580B	RAB	7/20/17 12:25
Total Dissolved Solids	3400	mg/L	12.0	20.0	Q	1	SM 2540C	RFL	8/18/17 15:25
Sulfate	1390	mg/L	50.0	200		100	EPA 300.0	RFL	8/9/17 22:43
Turbidity	1.58	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 12:25
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:46
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	3.00	ug/L	3.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:08
Arsenic	10.3	ug/L	1.60	10.0		5	EPA 200.8	RLC	8/3/17 8:08
Cadmium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:08
Cobalt	0.495	ug/L	0.200	10.0	I	5	EPA 200.8	RLC	8/3/17 8:08
Lead	0.000400	mg/L	0.000400	0.0100	U	5	EPA 200.8	RLC	8/3/17 8:08
Selenium	2.25	ug/L	1.00	10.0	I	5	EPA 200.8	RLC	8/3/17 8:08
Thallium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:08
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	0.112	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:53
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/27/17 12:53
Boron	16.0	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:53
Calcium	576	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:24
Chromium	1.62	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:53
Molybdenum	99.6	ug/L	1.00	20.0		1	EPA 6010B	MCR	7/28/17 14:54

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17G024-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 7/20/17 12:56  
 Date of Sample Receipt: 7/20/17 13:30

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	114	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 17:13
Specific Conductance	1630	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 12:56
Dissolved Oxygen	0.100	mg/L	0.100	0.100	U	1	FDEP SOP FT 1500	RAB	7/20/17 12:56
Fluoride	0.166	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 16:43
pH	6.97	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 12:56
REDOX Potential	-154	mV	-999	-999		1	SM 2580B	RAB	7/20/17 12:56
Total Dissolved Solids	1140	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	481	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/9/17 23:03
Turbidity	4.56	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 12:56
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:49
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	RLC	7/31/17 9:49
Arsenic	0.974	ug/L	0.320	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	7/31/17 9:49
Cobalt	0.0857	ug/L	0.0400	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Lead	0.000127	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	RLC	7/31/17 9:49
Selenium	0.474	ug/L	0.200	2.00	I	1	EPA 200.8	RLC	7/31/17 9:49
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	RLC	7/31/17 9:49
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0546	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:56
Beryllium	0.423	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 12:56
Boron	4.94	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:56
Calcium	178	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:26
Chromium	3.11	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:56
Molybdenum	9.88	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 14:57

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17G024-03  
 Sample Description: BBS-CCR-3  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 7/20/17 11:56  
 Date of Sample Receipt: 7/20/17 13:30

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	158	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 17:33
Specific Conductance	1750	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 11:56
Dissolved Oxygen	0.170	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 11:56
Fluoride	0.230	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 17:23
pH	6.36	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 11:56
REDOX Potential	-122	mV	-999	-999		1	SM 2580B	RAB	7/20/17 11:56
Total Dissolved Solids	1310	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	506	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/9/17 23:24
Turbidity	0.510	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 11:56
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:53
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	3.00	ug/L	3.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Arsenic	1.60	ug/L	1.60	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Cadmium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:11
Cobalt	0.200	ug/L	0.200	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Lead	0.000400	mg/L	0.000400	0.0100	U	5	EPA 200.8	RLC	8/3/17 8:11
Selenium	1.00	ug/L	1.00	10.0	U	5	EPA 200.8	RLC	8/3/17 8:11
Thallium	0.500	ug/L	0.500	2.50	U	5	EPA 200.8	RLC	8/3/17 8:11
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0634	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 12:59
Beryllium	0.356	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 12:59
Boron	0.211	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 12:59
Calcium	205	mg/L	0.0300	1.00	J-,V	1	EPA 6010B	MCR	7/31/17 11:29
Chromium	3.43	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 12:59
Molybdenum	10.6	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 14:59

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17G024-04	Date and Time Collected:	7/20/17 11:01
Sample Description:	BBS-CCR-BW1	Date of Sample Receipt:	7/20/17 13:30
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	915	mg/L	4.00	100	V	200	EPA 300.0	RFL	8/14/17 17:53
Specific Conductance	4960	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 11:01
Dissolved Oxygen	0.600	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 11:01
Fluoride	0.255	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 17:43
pH	6.49	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 11:01
REDOX Potential	-23.0	mV	-999	-999		1	SM 2580B	RAB	7/20/17 11:01
Total Dissolved Solids	4160	mg/L	48.0	80.0	J-	4	SM 2540C	RFL	7/24/17 17:30
Sulfate	1470	mg/L	100	400		200	EPA 300.0	RFL	8/14/17 17:53
Turbidity	2.38	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 11:01
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:56
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:06
Arsenic	8.48	ug/L	3.20	20.0	I	10	EPA 200.8	RLC	7/31/17 10:06
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:06
Cobalt	1.97	ug/L	0.400	20.0	I	10	EPA 200.8	RLC	7/31/17 10:06
Lead	0.000800	mg/L	0.000800	0.0200	U	10	EPA 200.8	RLC	7/31/17 10:06
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:06
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:06
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0517	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 13:01
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	MCR	7/27/17 13:01
Boron	47.0	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 13:01
Calcium	744	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:31
Chromium	2.16	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 13:01
Molybdenum	13.6	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 15:02

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L17G024-05

Sample Description: BBS-CCR-BW2

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 7/20/17 10:29

Date of Sample Receipt: 7/20/17 13:30

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	123	mg/L	0.200	5.00	V	10	EPA 300.0	RFL	8/14/17 18:13
Specific Conductance	1540	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	7/20/17 10:29
Dissolved Oxygen	0.330	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	7/20/17 10:29
Fluoride	0.319	mg/L	0.0100	0.0500	J-,V	1	EPA 300.0	RFL	8/14/17 18:03
pH	6.66	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	7/20/17 10:29
REDOX Potential	-94.0	mV	-999	-999		1	SM 2580B	RAB	7/20/17 10:29
Total Dissolved Solids	1200	mg/L	24.0	40.0		2	SM 2540C	RFL	7/24/17 17:30
Sulfate	41.7	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/10/17 0:24
Turbidity	5.27	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	7/20/17 10:29
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	RLC	7/26/17 14:59
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	6.00	ug/L	6.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Arsenic	3.20	ug/L	3.20	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Cadmium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:09
Cobalt	0.400	ug/L	0.400	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Lead	0.000800	mg/L	0.000800	0.0200	U	10	EPA 200.8	RLC	7/31/17 10:09
Selenium	2.00	ug/L	2.00	20.0	U	10	EPA 200.8	RLC	7/31/17 10:09
Thallium	1.00	ug/L	1.00	5.00	U	10	EPA 200.8	RLC	7/31/17 10:09
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0477	mg/L	0.000500	0.0200		1	EPA 6010B	MCR	7/27/17 13:04
Beryllium	0.220	ug/L	0.200	2.00	I,V	1	EPA 6010B	MCR	7/27/17 13:04
Boron	4.57	mg/L	0.0100	0.0500		1	EPA 6010B	MCR	7/27/17 13:04
Calcium	278	mg/L	0.0300	1.00	V	1	EPA 6010B	MCR	7/31/17 11:34
Chromium	2.26	ug/L	1.60	12.0	I	1	EPA 6010B	MCR	7/27/17 13:04
Molybdenum	8.90	ug/L	1.00	20.0	I	1	EPA 6010B	MCR	7/28/17 15:04

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

---

## Comments

---

- U Indicates that the compound was analyzed for but not detected.
- Q Sample held beyond the accepted holding time.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value
- V Analyte detected in the method blank

### Subcontract Laboratories:

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0203 - EPA 6010B</b>											
<b>Blank (17G0203-BLK1)</b>					Prepared: 07/25/17 Analyzed: 07/27/17						
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.556	0.200	2.00	ug/L							I
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0511	0.0300	1.00	mg/L							I
Chromium	1.60	1.60	12.0	ug/L							U
<b>LCS (17G0203-BS1)</b>					Prepared: 07/25/17 Analyzed: 07/27/17						
Barium	0.963	0.000500	0.0200	mg/L	1.0000		96.3	80-120			
Beryllium	962	0.200	2.00	ug/L	1000.0		96.2	80-120			V
Boron	0.991	0.0100	0.0500	mg/L	1.0000		99.1	80-120			
Chromium	963	1.60	12.0	ug/L	1000.0		96.3	80-120			
<b>Matrix Spike (17G0203-MS1)</b>					<b>Source: L17G024-03</b>		Prepared: 07/25/17 Analyzed: 07/27/17				
Barium	1.01	0.000500	0.0200	mg/L	1.0000	0.0634	95.0	75-125			
Beryllium	957	0.200	2.00	ug/L	1000.0	0.356	95.7	75-125			V
Boron	1.21	0.0100	0.0500	mg/L	1.0000	0.211	100	75-125			
Chromium	958	1.60	12.0	ug/L	1000.0	3.43	95.5	75-125			
<b>Matrix Spike Dup (17G0203-MSD1)</b>					<b>Source: L17G024-03</b>		Prepared: 07/25/17 Analyzed: 07/27/17				
Barium	0.985	0.000500	0.0200	mg/L	1.0000	0.0634	92.2	75-125	2.83	20	
Beryllium	938	0.200	2.00	ug/L	1000.0	0.356	93.7	75-125	2.10	20	V
Boron	1.18	0.0100	0.0500	mg/L	1.0000	0.211	96.6	75-125	3.09	20	
Chromium	936	1.60	12.0	ug/L	1000.0	3.43	93.2	75-125	2.36	20	
<b>Batch 17G0232 - EPA 6010B</b>											
<b>Blank (17G0232-BLK1)</b>					Prepared: 07/27/17 Analyzed: 07/28/17						
Molybdenum	1.00	1.00	20.0	ug/L							U

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0232 - EPA 6010B</b>											
<b>LCS (17G0232-BS1)</b>					Prepared: 07/27/17 Analyzed: 07/28/17						
Molybdenum	920	1.00	20.0	ug/L	1000.0		92.0	80-120			
<b>Matrix Spike (17G0232-MS1)</b>					Source: L17G024-01 Prepared: 07/27/17 Analyzed: 07/28/17						
Molybdenum	943	1.00	20.0	ug/L	1000.0	99.6	84.3	75-125			
<b>Matrix Spike Dup (17G0232-MSD1)</b>					Source: L17G024-01 Prepared: 07/27/17 Analyzed: 07/28/17						
Molybdenum	957	1.00	20.0	ug/L	1000.0	99.6	85.8	75-125	1.54	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0170 - EPA 7470A</b>											
<b>Blank (17G0170-BLK1)</b>					Prepared & Analyzed: 07/26/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17G0170-BS1)</b>					Prepared & Analyzed: 07/26/17						
Mercury	0.995	0.0500	0.200	ug/L	1.0000		99.5	80-120			
<b>Matrix Spike (17G0170-MS1)</b>					Source: L17G024-04		Prepared & Analyzed: 07/26/17				
Mercury	1.00	0.0500	0.200	ug/L	1.0000	U	100	75-125			
<b>Matrix Spike Dup (17G0170-MSD1)</b>					Source: L17G024-04		Prepared & Analyzed: 07/26/17				
Mercury	1.00	0.0500	0.200	ug/L	1.0000	U	100	75-125	0.390	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17G0141 - EPA 200.8

#### Blank (17G0141-BLK1)

Prepared: 07/20/17 Analyzed: 07/31/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17G0141-BS1)

Prepared: 07/20/17 Analyzed: 07/31/17

Antimony	106	0.600	2.00	ug/L	100.00		106	85-115			
Arsenic	99.9	0.320	2.00	ug/L	100.00		99.9	85-115			
Cadmium	104	0.100	0.500	ug/L	100.00		104	85-115			
Cobalt	94.5	0.0400	2.00	ug/L	100.00		94.5	85-115			
Lead	0.103	8.00E-5	0.00200	mg/L	0.10000		103	85-115			
Selenium	105	0.200	2.00	ug/L	100.00		105	85-115			
Thallium	108	0.100	0.500	ug/L	100.00		108	85-115			

#### Matrix Spike (17G0141-MS1)

Source: L17G013-03

Prepared: 07/20/17 Analyzed: 08/03/17

Antimony	117	3.00	10.0	ug/L	100.00	14.5	102	70-130			
Arsenic	108	1.60	10.0	ug/L	100.00	2.89	105	70-130			
Cadmium	97.8	0.500	2.50	ug/L	100.00	0.746	97.1	70-130			
Cobalt	99.1	0.200	10.0	ug/L	100.00	3.49	95.6	70-130			
Lead	0.0943	0.000400	0.0100	mg/L	0.10000	U	94.3	70-130			
Selenium	278	1.00	10.0	ug/L	100.00	173	105	70-130			
Thallium	97.4	0.500	2.50	ug/L	100.00	1.93	95.5	70-130			

#### Matrix Spike (17G0141-MS2)

Source: L17G024-01

Prepared: 07/20/17 Analyzed: 08/03/17

Antimony	107	3.00	10.0	ug/L	100.00	U	107	70-130			
Arsenic	119	1.60	10.0	ug/L	100.00	10.3	108	70-130			
Cadmium	97.1	0.500	2.50	ug/L	100.00	U	97.1	70-130			
Cobalt	96.3	0.200	10.0	ug/L	100.00	0.495	95.8	70-130			
Lead	0.0932	0.000400	0.0100	mg/L	0.10000	U	93.2	70-130			
Selenium	113	1.00	10.0	ug/L	100.00	2.25	111	70-130			
Thallium	95.3	0.500	2.50	ug/L	100.00	U	95.3	70-130			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17G0141 - EPA 200.8

<b>Matrix Spike Dup (17G0141-MSD1)</b>	<b>Source: L17G013-03</b>				<b>Prepared: 07/20/17 Analyzed: 08/03/17</b>						
Antimony	119	3.00	10.0	ug/L	100.00	14.5	105	70-130	1.83	20	
Arsenic	114	1.60	10.0	ug/L	100.00	2.89	111	70-130	5.95	20	
Cadmium	103	0.500	2.50	ug/L	100.00	0.746	102	70-130	5.13	20	
Cobalt	99.8	0.200	10.0	ug/L	100.00	3.49	96.3	70-130	0.700	20	
Lead	0.0982	0.000400	0.0100	mg/L	0.10000	U	98.2	70-130	4.13	20	
Selenium	300	1.00	10.0	ug/L	100.00	173	126	70-130	7.42	20	
Thallium	102	0.500	2.50	ug/L	100.00	1.93	100	70-130	4.83	20	

<b>Matrix Spike Dup (17G0141-MSD2)</b>	<b>Source: L17G024-01</b>				<b>Prepared: 07/20/17 Analyzed: 08/03/17</b>						
Antimony	106	3.00	10.0	ug/L	100.00	U	106	70-130	0.540	20	
Arsenic	119	1.60	10.0	ug/L	100.00	10.3	109	70-130	0.633	20	
Cadmium	95.1	0.500	2.50	ug/L	100.00	U	95.1	70-130	2.04	20	
Cobalt	94.5	0.200	10.0	ug/L	100.00	0.495	94.0	70-130	1.87	20	
Lead	0.0915	0.000400	0.0100	mg/L	0.10000	U	91.5	70-130	1.87	20	
Selenium	107	1.00	10.0	ug/L	100.00	2.25	104	70-130	6.18	20	
Thallium	94.4	0.500	2.50	ug/L	100.00	U	94.4	70-130	0.965	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17G0187 - SM 2540C</b>											
<b>Blank (17G0187-BLK1)</b>					Prepared & Analyzed: 07/24/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17G0187-BS1)</b>					Prepared & Analyzed: 07/24/17						
Total Dissolved Solids	1000	12.0	20.0	mg/L	1000.0		100	80-120			
<b>Duplicate (17G0187-DUP1)</b>					Source: L17G003-01 Prepared & Analyzed: 07/24/17						
Total Dissolved Solids	193	12.0	20.0	mg/L		187			3.16	10	
<b>Duplicate (17G0187-DUP2)</b>					Source: L17G013-03 Prepared & Analyzed: 07/24/17						
Total Dissolved Solids	721	12.0	20.0	mg/L		724			0.415	10	
<b>Batch 17H0076 - EPA 300.0</b>											
<b>Blank (17H0076-BLK1)</b>					Prepared & Analyzed: 08/09/17						
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17H0076-BS1)</b>					Prepared & Analyzed: 08/09/17						
Sulfate	4.58	0.500	2.00	mg/L	5.0000		91.6	90-110			
<b>Matrix Spike (17H0076-MS1)</b>					Source: L17G003-01 Prepared & Analyzed: 08/09/17						
Sulfate	33.9	0.500	2.00	mg/L	5.0000	28.5	107	90-110			
<b>Matrix Spike (17H0076-MS2)</b>					Source: L17G010-01 Prepared & Analyzed: 08/09/17						
Sulfate	6.81	0.500	2.00	mg/L	5.0000	2.16	93.0	90-110			
<b>Matrix Spike Dup (17H0076-MSD1)</b>					Source: L17G003-01 Prepared & Analyzed: 08/09/17						
Sulfate	35.7	0.500	2.00	mg/L	5.0000	28.5	143	90-110	5.12	20	J-

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17H0076 - EPA 300.0</b>											
<b>Matrix Spike Dup (17H0076-MSD2)</b>		<b>Source: L17G010-01</b>			<b>Prepared &amp; Analyzed: 08/09/17</b>						
Sulfate	6.99	0.500	2.00	mg/L	5.0000	2.16	96.7	90-110	2.69	20	
<b>Batch 17H0125 - EPA 300.0</b>											
<b>Blank (17H0125-BLK1)</b>		<b>Prepared &amp; Analyzed: 08/14/17</b>									
Chloride	0.631	0.0200	0.500	mg/L							
Fluoride	0.0688	0.0100	0.0500	mg/L							
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17H0125-BS1)</b>		<b>Prepared &amp; Analyzed: 08/14/17</b>									
Chloride	4.67	0.0200	0.500	mg/L	5.0000		93.5	90-110			V
Fluoride	4.93	0.0100	0.0500	mg/L	5.0000		98.6	90-110			V
Sulfate	4.83	0.500	2.00	mg/L	5.0000		96.5	90-110			
<b>Matrix Spike (17H0125-MS1)</b>		<b>Source: L17G015-01</b>			<b>Prepared &amp; Analyzed: 08/14/17</b>						
Chloride	339	0.200	5.00	mg/L	50.000	296	86.1	90-110			J-,V
Fluoride	59.6	0.100	0.500	mg/L	50.000	0.918	117	90-110			J-,V
Sulfate	483	5.00	20.0	mg/L	50.000	440	84.9	90-110			J-
<b>Matrix Spike Dup (17H0125-MSD1)</b>		<b>Source: L17G015-01</b>			<b>Prepared &amp; Analyzed: 08/14/17</b>						
Chloride	343	0.200	5.00	mg/L	50.000	296	93.3	90-110	1.05	20	V
Fluoride	60.7	0.100	0.500	mg/L	50.000	0.918	120	90-110	1.82	20	J-,V
Sulfate	486	5.00	20.0	mg/L	50.000	440	92.7	90-110	0.812	20	

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.

Site: **Big Bend**

Date: **07/20/17** File Name: **072017\_Wells\_RAB**

Weather: **CLOUDY & HOT**

Sampler(s)/Initials: **RAB /TECO** Initials: **RS**

LIMS #	Loction Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	COND(uMHOs)	DO Mg/L	Turbidity(NTU)	REDOX (mv)	Sulfite (mg/L)	Color	Odor	NGVD
L17G024-01 A	BBS-CCR-1	12:25		6.8	25.8	3965	0.1	1.6	-122	SO3-TR	SOLOOR-W	SOLOOR-W	Time
L17G024-02 A	BBS-CCR-2	12:56		7.0	25.7	1629	0.1	4.6	-154		CLEAR	NONE	LEVEL
L17G024-01 A	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	LT. YELLOW	250ml Nuis (3)	40ml Vial (6)	500 ml Nuis (2)	1L Rads Diss. (1)
L17G024-02 A	(2) 500ml plastic (PP)		1		2	2	2						Total Containers
	(2) 500ml plastic (PP)		1		2	2	2						10
ESS	0107301Y	ESS	0218201Y	ESS	0307031Y	ESS		ESS		(6) 40ml VOA vial (CG)			Sample Receipt
	Preservation	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID	Pres ID
	1L bottles (rads): 5 ml HNO3 to pH <2	L 011664	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L	500 ml bottles (metals): 2 ml HNO3 to pH <2	L	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L	250 ml bottles (Cyan) 1g NaOH to pH >12	L	500 ml bottles (Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L	Temp 1.3
	250 ml bottles (metal): 1 ml HNO3 to pH <2	L 011664	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L	QC: [pH +/- 0.2] (Cond +/- 5%) [DO +/- 0.3mg/L] [Redox +/- 10mv]	L	A checked box indicates ICV / CCV passed	L	A checked box indicates that the sample was verified to a pH of <2	L			Temp 1.3
	pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv
	FDEP FT 1100	MPM08	7	7.02	8:45		7:00	7.00	13:30	Meter ID:	9:10	21.5	236.0
	Units: SU	L 018611D	10	10.02	8:45		QC: [pH +/- 0.2] (Cond +/- 5%) [DO +/- 0.3mg/L] [Redox +/- 10mv]		Meter ID:	MPM08	13:33	21.3	237.5
	Conductivity Meter Calib.	L 018737A	4	4.01	8:45		A checked box indicates ICV / CCV passed		Zobell Sol ID:				236.2
	Meter ID:	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time				
	FDEP FT 1200, Units: uMHOs	L 017987D	1000	1000	9:00				DO Meter Cal				Theo Value mg/l
	Turbidity Meter Calibration	L 018416C	10000		9:06	9715	9:06	9686	13:20	Meter ID:	8:24	21.5	8.86
	Units: TM07	Standard ID	Std Value	Acceptability Range	Time	ICV	Time	CCV	Time	MPM08	13:40	21.2	9.00
	FDEP FT 1600, Units: NTU	L 016723	52.10	48.71	55.49	53.00	8:13	52.10	13:12	Barom. Pres	760		8.880
	Sulfite Info (QC Check) (EPA 377.1)	Time	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodide/Iodide ID	Therm ID	pH	Conduct(%)	DO (mg/l)
	OC Std: 5ml (NaThio)/500ml DI=10mg/L									MPM08	0.2	5	0.3

Well #	Diam/ Comp	Screen Interval (ft)	Inlets Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Purge Volume (gal)	Call Volume (gal)	1 Egt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	5.86	16.46	0.16	2.63	0.0026	23.3	0	0.06	0.12
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
1A	12:14	560	1.33	1.33	6.03	6.82	25.82	3962	0.11	5.99	ph +/- 0.2	STABLE	Level Meter: WLM08
Purge Start:	12:16	550	0.29	1.62	6.03	6.81	25.80	3965	0.10	1.62	Temp +/- 0.2	STABLE	Pump: PP
Purge End:	12:18	550	0.29	1.91	6.02	6.81	25.81	3965	0.10	1.58	Cond +/- 5	STABLE	Tubing: PE/S
Purge Complete At	12:06	Gallons to Purge	0.12	Stability Values =	6.81	6.81	25.81	3965	0.10	1.58	DO % Sat. < 20	STABLE	Dedicated Tubing?
BBS-CCR-2	2	10	16.84	21.84	5.06	16.78	0.16	2.68	0.0026	22.84	0	0.06	0.12
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
1A	12:40	540	1.43	1.43	5.18	6.98	25.74	1569	0.06	2.52	ph +/- 0.2	STABLE	Level Meter: WLM08
Purge Start:	12:42	550	0.29	1.72	5.18	6.97	25.71	1628	0.04	4.04	Transcl. 0.2	STABLE	Pump: PP
Purge End:	12:30	550	0.29	2.01	5.19	6.97	25.74	1629	0.05	4.56	Cond +/- 5	STABLE	Tubing: PE/S
Purge Complete At	12:31	Gallons to Purge	0.12	Stability Values =	6.97	6.97	25.74	1629	0.05	4.56	DO % Sat. < 20	STABLE	Dedicated Tubing?
Comments:													
Total Time												Total Miles	

LIMS #	Loction Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Cond(µMHO/S)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor						
L17G024-03 A	BBS-CCR-3	11:56		6.4	26.7	COND-F 1749	DO 0.2	TURB-N-F 0.5	REDOX -123	SOS-TR	\$COLOR-W YELLOW	\$ODOR-W MILD						
L17G024-03 A	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfite (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)						
(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml colliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Preservation (3) 250ml plastic (PP) ESS 0307031Y (4) 100ml colliform bottle ESS (5) 1L amber glass (AG) (6) 40ml VOA vial (CG) ESS 500 ml bottles (rads): 5 ml HNO3 to pH <2 500 ml bottles (metals): 2 ml HNO3 to pH <2 250 ml bottles (metals): 1 ml HNO3 to pH <2 1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2 A checked box indicates that the sample was verified to a pH of <2												
ESS	0107301Y	ESS	0218201Y	ESS	0307031Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS						
Meter ID:	MIPM08	Buffer ID	7	Cal	7	ICV	Time	8:45	CCV	7:00	Time	9:10	Temp °C	21.5	Reading mv	236.0	Theo Value mv	236.2
FDEP FT 1100	Meter ID: MIPM08	Standard ID	10	Cal	10	ICV	Time	8:45	CCV	13:30	Time	13:33	Temp °C	21.3	Reading mv	237.5	Theo Value mv	236.2
Units: SU	Units: uMHO/S	Standard ID	4	Cal	4	ICV	Time	8:45	CCV	760	Time	760	Temp °C		Reading mg/l		Theo Value mg/l	8.846
Conductivity Meter Calib.	MIPM08	Standard ID	1000	Cal	1000	ICV	Time	9:00	CCV	13:12	Time	13:12	Temp °C	21.2	Reading mg/l	9.00	Theo Value mg/l	8.880
FDEP FT 1200, Units: uMHO/S	Meter ID: MIPM08	Standard ID	10000	Cal	10000	ICV	Time	9:06	CCV	760	Time	760	Temp °C		Reading mg/l		Theo Value mg/l	8.846
Turbidity Meter Calibration	Meter ID: MIPM08	Standard ID	52.10	Cal	52.10	ICV	Time	8:13	CCV	13:12	Time	13:12	Temp °C	21.2	Reading mg/l	9.00	Theo Value mg/l	8.880
FDEP FT 1600, Units: NTU	Meter ID: MIPM08	Standard ID	0	Cal	0	ICV	Time	8:13	CCV	760	Time	760	Temp °C		Reading mg/l		Theo Value mg/l	8.880
Sulfite Info (QC Check) (EPA 377.1)	Meter ID: MIPM08	Standard ID	0	Cal	0	ICV	Time	8:13	CCV	760	Time	760	Temp °C		Reading mg/l		Theo Value mg/l	8.880
QC Std: 5ml (NaTheo)/500ml DI=10mg/L	Meter ID: MIPM08	Standard ID	0	Cal	0	ICV	Time	8:13	CCV	760	Time	760	Temp °C		Reading mg/l		Theo Value mg/l	8.880

Well #	Diam/Comp	Screen Interval (ft)	Intake Depth (ft)	Depth to Water (ft)	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Stability Values =	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Stability Values =
BBS-CCR-3	2	10	18.23	4.77	18.46	6.36	1749	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Water Depth (ft)	pH (SU)	Cond (uMHO/S)	Temp °C	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
1A	11:39	340	2.69	5.19	6.40	1762	26.84	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
Purge Start:	11:41	340	0.18	5.20	6.36	1753	26.80	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
11:09	11:43	350	0.18	5.21	6.36	1749	26.73	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
Purge End:	11:43							Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
Purge Complete At	11:10	Gallons to Purge	0.12	Stability Values =	6.36	26.73	1749	Well Capacity (gal) = 18.46	Water Column (ft) = 6.36	Well Volume (gal) = 1749	Stability Values = 0.16	Well Capacity (gal) = 18.46
Well #	Diam/Comp	Screen Interval (ft)	Intake Depth (ft)	Depth to Water (ft)	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Stability Values =	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Stability Values =
0	2	10	14	18	18.00	18.00	2.88	Well Capacity (gal) = 18.00	Water Column (ft) = 18.00	Well Volume (gal) = 2.88	Stability Values = 0.16	Well Capacity (gal) = 18.00
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Water Depth (ft)	pH (SU)	Cond (uMHO/S)	Temp °C	Well Capacity (gal) = 18.00	Water Column (ft) = 18.00	Well Volume (gal) = 2.88	Stability Values = 0.16	Well Capacity (gal) = 18.00
Purge Start:								Well Capacity (gal) = 18.00	Water Column (ft) = 18.00	Well Volume (gal) = 2.88	Stability Values = 0.16	Well Capacity (gal) = 18.00
Purge End:								Well Capacity (gal) = 18.00	Water Column (ft) = 18.00	Well Volume (gal) = 2.88	Stability Values = 0.16	Well Capacity (gal) = 18.00
Purge Complete At		Gallons to Purge	0.32	Stability Values =				Well Capacity (gal) = 18.00	Water Column (ft) = 18.00	Well Volume (gal) = 2.88	Stability Values = 0.16	Well Capacity (gal) = 18.00

Comments: Total Miles Total Time



LIMS #	Loction Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Cond(µMHOs)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	NGVD
L17G024-04 A	BBS-CCR-BW-1	11:01		6.5	27.9	4961	0.6	2.4	-23	SO <sub>3</sub> -TR	SCOLOR-W	SODOR-W	LEVEL
L17G024-05 A	BBS-CCR-BW2	10:29		6.7	27.2	1539	0.3	5.3	-94		CLEAR	NONE	
L17G024-04 A	250ml Inorg (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Rads (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Milk (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	Total Containers
L17G024-05 A	(2) 500ml plastic (PP)		1			2	2						10
ESS	0107301Y	0218201Y	0307031Y	ESS	0307031Y	ESS	(4) 100ml colliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	ESS			Sample Receipt
Preservation (1) 1L plastic (PP) 250ml bottles (nuts): 1 ml H <sub>2</sub> SO <sub>4</sub> to pH <2 40 ml Vial (TOC): 0.5 ml H <sub>2</sub> SO <sub>4</sub> to pH <2 1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO <sub>3</sub> to pH <2 QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv) A checked box indicates ICV / CCV passed													
pH Meter Calibration Buffer ID: MPM08 Buffer Value: 7 Std Value: 10 Meter ID: 018611D FDEP FT 1100 Units: SU Standard ID: 018737A Call: 4 Time: 8:45 ICV: 1000 CCV: 9715 Time: 9:06 Acceptability Range: 48.71 55.49													
Conductivity Meter Calib. Meter ID: MPM08 FDEP FT 1200, Units: µMHOs Standard ID: 018416C Std Value: 10000 Time: 9:00 Call: 1000 Turbidity Meter Calibration Meter ID: TM07 Std Value: 52.10 FDEP FT 1600, Units: NTU Time: 8:13 ICV: 53.00 CCV: 52.10 Time: 13:12 Barom. Pres: 760													
Sulfite Info (QC Check) (EPA 377.1) QC Std: 5ml (NaThio)/500ml DI=10mg/L Thermo ID: MPM08 pH: 0.2 Conduct( %): 5 DO (mg/l): 0.3 Redox (mv): 10													

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Water Column (ft)	Well Capacity (gal)	Well Volume (gal)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	Equipment ID	
BBS-CCR-BW-1	2	10	39.3	44.3	28.89	15.41	0.16	2.47	0	0.06	0.32	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status
1A	10:53	1600	4.65	4.65	29.81	6.49	27.84	4959	0.60	9.53	pH +/- 0.2	STABLE
Purge Start:	10:55	1600	0.85	5.50	29.82	6.49	27.86	4953	0.69	3.46	Temp +/- 0.2	STABLE
10:42	10:57	1600	0.85	6.35	29.80	6.49	27.89	4961	0.60	2.38	Cond +/- 5	STABLE
Purge End:	10:57										DO % Sat. < 20	STABLE
Purge Complete At	10:43	Gallons to Purge	0.32	Stability Values =							Turb. NTU < 20	STABLE
Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Water Column (ft)	Well Capacity (gal)	Well Volume (gal)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	Equipment ID	
BBS-CCR-BW2	2	10	18.49	23.84	7.45	16.39	0.16	2.62	0	0.06	0.12	
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status
1A	10:19	720	5.90	5.90	7.87	6.65	27.19	1542	0.50	6.32	pH +/- 0.2	STABLE
Purge Start:	10:21	720	0.38	6.28	7.89	6.65	27.22	1540	0.40	4.65	Temp +/- 0.2	STABLE
9:48	10:23	720	0.38	6.66	7.88	6.66	27.20	1539	0.33	5.27	Cond +/- 5	STABLE
Purge End:	10:23										DO % Sat. < 20	STABLE
Purge Complete At	9:49	Gallons to Purge	0.12	Stability Values =							Turb. NTU < 20	STABLE

Comments:

Total Time: \_\_\_\_\_ Total Miles: \_\_\_\_\_

# GROUNDWATER WELL SAMPLING EQUIPMENT CALIBRATION

Date: 07/20/17		Sampler(s): RAB		Initials: <b>RAB</b>	
pH Meter Calibration	Buffer ID	Cal	Time	CCV	Time
Meter ID: MPM08	L 019075D	7.02	8:45	7.00	13:30
FDEP FT 1100	L 018811D	10.02	8:45		Pass
Units: SU	L 018737A	4.01	8:45		Pass
ICV Check	L 018377J				Pass
Conductivity Meter Calib.	Standard ID	Cal	Time	ICV	Time
Meter ID: MPM08	L 017987D	1000	9:00	7.01	8:53
FDEP FT 1200, Units: uMHOS	L 018416C			9715	9:06
Turbidity Meter Calibration	Standard ID	Acceptability Range	CCV	Pass/Fail	Time
Meter ID: TM07	L 016723	52.10	53.00	Pass	8:13
FDEP FT 1600, Units: NTU	L			52.10	13:12
Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID
QC Std: 5ml (NaThio)/500ml DI=10mg/L					
Redox Cal	Reading mv	Theo Value mv	Pass / Fail	DO Meter Cal	Temp °C
Meter ID: MPM08	236.0	236.2	Pass	FDEP FT: 1500	21.49
Zobell sol ID:	237.5	236.2	Pass	Meter ID: MPM08	21.22
L 019150A				Barom. Pres	9.00
Therm ID: MPM08	pH	Conduct %	CL2	Calibration	Reagent ID: L-
	0.2	5	0.2	Criterion	
ClO <sub>2</sub> DPD Check must read +/- 10% of the Calculated Std. Concentration, multiplied by 2.4.					
Chlorine Dioxide (mg/l)	Std. Conc. (mg/l)	Calc. Std. Conc. (mg/l)	DPD Check (mg/l)	Initial Calibration Verification ICV	
	Std. Spike Volume (ml)	Cal Sample Volume (ml)	Glycine Check (mg/l)	Time	Time
Meter ID:	1.0	100			
DPD ID: L			Glycine ID: L		
COMMENTS: CL2 Std. ID: L					
A checked box indicates reagent expiration date has been verified.					
				Method 10126*	
				*Equivalent to Standard Methods, 4500 ClO <sub>2</sub> D.	



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L17G024-02 A</b> DATE: <b>7/20/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet) <b>5.06</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>12:30</b>	PURGING ENDED AT: <b>12:44</b>	TOTAL VOLUME PURGED (gallons): <b>2.01</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
12:40	1.43	1.43	0.14	5.18	6.98	25.74	1569	0.06	2.52	LT. YELLOW	MILD
12:42	0.29	1.72	0.15	5.18	6.97	25.71	1628	0.04	4.04	LT. YELLOW	MILD
12:44	0.29	2.01	0.15	5.19	6.97	25.74	1629	0.05	4.56	LT. YELLOW	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>[Signature]</i>				SAMPLING INITIATED AT: <b>12:44</b>		SAMPLING ENDED AT: <b>12:56</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>547</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED: Filtration Equipment Type: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES:

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-3</b>	SAMPLE ID: <b>L17G024-03 A</b> DATE: <b>7/20/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.23</b> feet to <b>23.23</b> (feet)	STATIC DEPTH TO WATER (feet): <b>4.77</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.23                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.23</b>	PURGING INITIATED AT: <b>11:09</b>	PURGING ENDED AT: <b>11:43</b>	TOTAL VOLUME PURGED (gallons): <b>3.05</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
11:39	2.69	2.69	0.09	5.19	6.40	26.84	1762	0.16	0.69	YELLOW	MILD
11:41	0.18	2.87	0.09	5.20	6.36	26.80	1753	0.16	0.73	YELLOW	MILD
11:43	0.18	3.05	0.09	5.21	6.36	26.73	1749	0.17	0.51	YELLOW	MILD
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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.015											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>			SAMPLER (S) SIGNATURES:			SAMPLING INITIATED AT: <b>11:43</b>		SAMPLING ENDED AT: <b>11:56</b>		
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.2</b>			SAMPLE PUMP FLOW RATE (mL per minute): <b>343</b>			TUBING MATERIAL CODE: <b>PE/S</b>				
FIELD DECONTAMINATION: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			FIELD-FILTERED: Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTRATION EQUIPMENT TYPE:      FILTER SIZE:      µm			DUPLICATE: Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH				
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP	
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP	
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP	

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L17G024-04 A</b> DATE: <b>7/20/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> feet to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>28.89</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
WELL VOLUME PURGE: (only fillout if applicable) $1 \text{ WELL VOLUME} = (\text{TOTAL WELL DEPTH} - \text{STATIC DEPTH TO WATER}) \times \text{WELL CAPACITY}$ $= ( \quad \text{feet} - \quad \text{feet} ) \times \quad \text{gallons/foot} = \quad \text{gallons}$											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) $1 \text{ EQUIPMENT VOL.} = \text{PUMP VOLUME} + (\text{TUBING CAPACITY} \times \text{TUBING LENGTH}) + \text{FLOW CELL VOLUME}$ $= ( \quad \text{gallons} + ( \quad \text{gallons/foot} \times \quad \text{feet} ) + \quad \text{gallons} = \quad \text{gallons}$											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>10:42</b>	PURGING ENDED AT: <b>10:57</b>	TOTAL VOLUME PURGED (gallons): <b>6.35</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:53	4.65	4.65	0.42	29.81	6.49	27.84	4959	0.60	9.53	CLEAR	NONE
10:55	0.85	5.50	0.43	29.82	6.49	27.86	4953	0.69	3.46	CLEAR	NONE
10:57	0.85	6.35	0.43	29.80	6.49	27.89	4961	0.60	2.38	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB      TECO</b>				SAMPLER(S) SIGNATURES: <i>R. B. ...</i>				SAMPLING INITIATED AT: <b>10:57</b>		SAMPLING ENDED AT: <b>11:01</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>1600</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE: <b>µm</b>				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:

(1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

NOTES:

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
 Form FD 9000-24  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW2</b>	SAMPLE ID: <b>L17G024-05 A</b> DATE: <b>7/20/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.45</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
WELL VOLUME PURGE: (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b>											
= (                      feet -                      feet ) x                      gallons/foot =                      gallons											
EQUIPMENT VOLUME PURGE: (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b>											
= (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:48</b>	PURGING ENDED AT: <b>10:23</b>	TOTAL VOLUME PURGED (gallons): <b>6.66</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:19	5.90	5.90	0.19	7.87	6.65	27.19	1542	0.50	6.32	CLEAR	NONE
10:21	0.38	6.28	0.19	7.89	6.65	27.22	1540	0.40	4.65	CLEAR	NONE
10:23	0.38	6.66	0.19	7.88	6.66	27.20	1539	0.33	5.27	CLEAR	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" = 0.00006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES: <i>Rab...</i>				SAMPLING INITIATED AT: <b>10:23</b>		SAMPLING ENDED AT: <b>10:29</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>720</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/>				FIELD-FILTERED: <b>Y</b> <input type="checkbox"/> <b>N</b> <input checked="" type="checkbox"/> FILTER SIZE:      µm				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 ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RPPP = Reverse Flow Peristaltic Pump; SM = Straw Method (tubing Gravity Drain); VT = Vacuum Trap; 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)

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427


TestAmerica Job ID: 660-81885-1

Client Project/Site: L17G024

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



---

Authorized for release by:  
7/28/2017 7:53:53 AM

Keaton Conner, Project Manager I  
(813)885-7427  
[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14





# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	15

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-81885-1	L17G024-01	Water	07/20/17 12:25	07/21/17 07:55
660-81885-2	L17G024-02	Water	07/20/17 12:56	07/21/17 07:55
660-81885-3	L17G024-03	Water	07/20/17 11:56	07/21/17 07:55
660-81885-4	L17G024-04	Water	07/20/17 11:01	07/21/17 07:55
660-81885-5	L17G024-05	Water	07/20/17 10:29	07/21/17 07:55

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

---

**Job ID: 660-81885-1**

---

**Laboratory: TestAmerica Tampa**

## Narrative

---

### Job Narrative 660-81885-1

#### Receipt

The samples were received on 7/21/2017 7:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

#### Metals

Method 200.7 Rev 4.4: Spike compounds were inadvertently omitted during the extraction process for the matrix spike (MS); therefore, matrix spike recoveries are unavailable for preparation batch 400-361570 and analytical batch 400-361867. Since the spike compound was omitted, the RPD calculations will not pass criteria. The associated laboratory control sample (LCS) met acceptance criteria. The post-digestion spike (PDS) recoveries also met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

## Client Sample ID: L17G024-01

## Lab Sample ID: 660-81885-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.014	I J3	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17G024-02

## Lab Sample ID: 660-81885-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.016	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17G024-03

## Lab Sample ID: 660-81885-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.010	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17G024-04

## Lab Sample ID: 660-81885-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.017	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17G024-05

## Lab Sample ID: 660-81885-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0059	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

**Client Sample ID: L17G024-01**

Date Collected: 07/20/17 12:25

Date Received: 07/21/17 07:55

**Lab Sample ID: 660-81885-1**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.014	I J3	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 13:50	1

**Client Sample ID: L17G024-02**

Date Collected: 07/20/17 12:56

Date Received: 07/21/17 07:55

**Lab Sample ID: 660-81885-2**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.016	I	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 14:08	1

**Client Sample ID: L17G024-03**

Date Collected: 07/20/17 11:56

Date Received: 07/21/17 07:55

**Lab Sample ID: 660-81885-3**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.010	I	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 14:11	1

**Client Sample ID: L17G024-04**

Date Collected: 07/20/17 11:01

Date Received: 07/21/17 07:55

**Lab Sample ID: 660-81885-4**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.017	I	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 14:15	1

**Client Sample ID: L17G024-05**

Date Collected: 07/20/17 10:29

Date Received: 07/21/17 07:55

**Lab Sample ID: 660-81885-5**

Matrix: Water

Method: 200.7 Rev 4.4 - Metals (ICP)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0059	I	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 14:18	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-361570/1-A**  
**Matrix: Water**  
**Analysis Batch: 361867**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 361570**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0010	U	0.050	0.0010	mg/L		07/25/17 09:29	07/26/17 13:04	1

**Lab Sample ID: LCS 400-361570/2-A**  
**Matrix: Water**  
**Analysis Batch: 361867**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 361570**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.04		mg/L		104	85 - 115

**Lab Sample ID: 660-81885-1 MS**  
**Matrix: Water**  
**Analysis Batch: 361867**

**Client Sample ID: L17G024-01**  
**Prep Type: Total/NA**  
**Prep Batch: 361570**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.014	I J3	1.00	0.0147	I J3	mg/L		0.1	70 - 130

**Lab Sample ID: 660-81885-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 361867**

**Client Sample ID: L17G024-01**  
**Prep Type: Total/NA**  
**Prep Batch: 361570**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.014	I J3	1.00	1.16	J3	mg/L		115	70 - 130	195	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

## Metals

### Prep Batch: 361570

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81885-1	L17G024-01	Total/NA	Water	200.7	
660-81885-2	L17G024-02	Total/NA	Water	200.7	
660-81885-3	L17G024-03	Total/NA	Water	200.7	
660-81885-4	L17G024-04	Total/NA	Water	200.7	
660-81885-5	L17G024-05	Total/NA	Water	200.7	
MB 400-361570/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-361570/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-81885-1 MS	L17G024-01	Total/NA	Water	200.7	
660-81885-1 MSD	L17G024-01	Total/NA	Water	200.7	

### Analysis Batch: 361867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-81885-1	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-2	L17G024-02	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-3	L17G024-03	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-4	L17G024-04	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-5	L17G024-05	Total/NA	Water	200.7 Rev 4.4	361570
MB 400-361570/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	361570
LCS 400-361570/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-1 MS	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570
660-81885-1 MSD	L17G024-01	Total/NA	Water	200.7 Rev 4.4	361570



# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

**Client Sample ID: L17G024-01**

**Date Collected: 07/20/17 12:25**

**Date Received: 07/21/17 07:55**

**Lab Sample ID: 660-81885-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 13:50	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17G024-02**

**Date Collected: 07/20/17 12:56**

**Date Received: 07/21/17 07:55**

**Lab Sample ID: 660-81885-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:08	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17G024-03**

**Date Collected: 07/20/17 11:56**

**Date Received: 07/21/17 07:55**

**Lab Sample ID: 660-81885-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:11	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17G024-04**

**Date Collected: 07/20/17 11:01**

**Date Received: 07/21/17 07:55**

**Lab Sample ID: 660-81885-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:15	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17G024-05**

**Date Collected: 07/20/17 10:29**

**Date Received: 07/21/17 07:55**

**Lab Sample ID: 660-81885-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	361570	07/25/17 09:29	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			361867	07/26/17 14:18	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Accreditation/Certification Summary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

## Laboratory: TestAmerica Tampa

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E81010	06-30-18

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L17G024

TestAmerica Job ID: 660-81885-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**  
 Tampa Electric Company, Laboratory Services  
**L17G024**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone: (813) 885-7427  
 Fax: -

**Due Date: 08/03/17 16:00**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17G024-01    BBS-CCR-1 Sampled: 07/20/17 12:25 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	01/16/18 12:25	Water	
Sample ID: L17G024-02    BBS-CCR-2 Sampled: 07/20/17 12:56 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	01/16/18 12:56	Water	
Sample ID: L17G024-03    BBS-CCR-3 Sampled: 07/20/17 11:56 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	01/16/18 11:56	Water	
Sample ID: L17G024-04    BBS-CCR-BW1 Sampled: 07/20/17 11:01 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	01/16/18 11:01	Water	
Sample ID: L17G024-05    BBS-CCR-BW2 Sampled: 07/20/17 10:29 Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (A)	01/16/18 10:29	Water	

Loc: 660  
**81885**



3,2/3,4 CW-09

Released By: *[Signature]*    Date & Time: 7-20-17 1400    Received By: *[Signature]*    Date & Time: 7-21-17 0755

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_

# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:				
Client Contact:		Commer, Keaton	Commer, Keaton		660-98130-1				
Shipping/Receiving:		Phone:	E-Mail:	State of Origin:	Page:				
Company:			keaton.commer@testamericainc.com	Florida	Page 1 of 1				
Address:		Accreditations Required (See note):		Job #:	660-81885-1				
3355 McLemore Drive,		NELAP - Florida, NELAP - Texas		Preservation Codes:					
City:	Pensacola	Due Date Requested:	7/28/2017	A - HCL	M - Hexane				
State, Zip:	FL, 32514	TAT Requested (days):		B - NaOH	N - None				
Phone:	850-474-1001(Tel) 850-478-2671(Fax)	PO #:		C - Zn Acetate	O - AsNaO2				
Email:		WO #:		D - Nitric Acid	P - Na2O4S				
Project Name:		Project #:	66004821	E - NaHSO4	Q - Na2SO3				
Site:		SSOW#:		F - MeOH	R - Na2S2O3				
				G - Amchlor	S - H2SO4				
				H - Ascorbic Acid	T - TSP Dodecahydrate				
				I - Ice	U - Acetone				
				J - DI Water	V - MCAA				
				K - EDTA	W - pH 4-5				
				L - EDA	Z - other (specify)				
				Other:					
<b>Sample Identification - Client ID (Lab ID)</b>		<b>Sample Date</b>	<b>Sample Time</b>	<b>Sample Type (C=comp, G=grab)</b>	<b>Matrix (W=water, G=solid, O=water/soil, BT=TRIAXIS, A=Air)</b>	<b>Field Filtered Sample (Yes or No)</b>	<b>Form MS/MSD (Yes or No)</b>	<b>Total Number of Containers</b>	<b>Special Instructions/Note:</b>
L17G024-01 (660-81885-1)	7/20/17	12:25 Eastern	Water	X	X	1			
L17G024-02 (660-81885-2)	7/20/17	12:56 Eastern	Water	X	X	1			
L17G024-03 (660-81885-3)	7/20/17	11:56 Eastern	Water	X	X	1			
L17G024-04 (660-81885-4)	7/20/17	11:01 Eastern	Water	X	X	1			
L17G024-05 (660-81885-5)	7/20/17	10:29 Eastern	Water	X	X	1			
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte &amp; accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>									
<b>Possible Hazard Identification</b>									
Unconfirmed									
Deliverable Requested: I, II, III, IV, Other (specify)									
Primary Deliverable Rank: 2									
Empty Kit Relinquished by:									
Date:									
Relinquished by: <i>[Signature]</i>									
Date/Time: 7/21/17									
Company: TA JPA									
Relinquished by: <i>[Signature]</i>									
Date/Time: 7/21/17									
Company: JPA									
Relinquished by:									
Date/Time:									
Company:									
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No									
Custody Seal No. <i>[Signature]</i>									
Cooler Temperature(s) °C and Other Remarks:									



# Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-81885-1

**Login Number: 81885**

**List Source: TestAmerica Tampa**

**List Number: 1**

**Creator: Moccia, Vanessa M**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-81885-1

**Login Number: 81885**

**List Number: 2**

**Creator: Johnson, Jeremy N**

**List Source: TestAmerica Pensacola**

**List Creation: 07/22/17 12:00 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.9°C IR2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Report Date: August 2, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Field Custody: Client  
Client/Field ID: L17G024-01

Sample Collection: 7-20-17/1225

Lab ID No: 17.8608  
Lab Custody Date: 7-21-17/0925  
Sample description: w

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	34.7 ± 1.8	Calc	Calc	0.7
Radium-226	pCi/l	33.1 ± 1.8	7-31-17/1406	EPA 903.0	0.4
Radium-228	pCi/l	1.6 ± 0.6	8-1-17/1103	EPA Ra-05	0.7

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





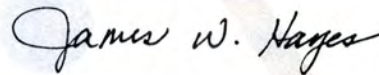
Report Date: August 2, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Field Custody: Client  
Client/Field ID: L17G024-02  
Sample Collection: 7-20-17/1256  
Lab ID No: 17.8609  
Lab Custody Date: 7-21-17/0925  
Sample description: w

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	14.4 ± 1.1	Calc	Calc	0.8
Radium-226	pCi/l	13.6 ± 1.1	7-31-17/1406	EPA 903.0	0.4
Radium-228	pCi/l	0.8 ± 0.5	8-1-17/1103	EPA Ra-05	0.8



James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



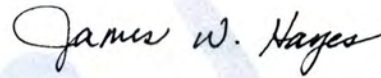
Report Date: August 3, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Field Custody: Client  
Client/Field ID: L17G024-03  
Sample Collection: 7-20-17/1156  
Lab ID No: 17.8610  
Lab Custody Date: 7-21-17/0925  
Sample description: w

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results			Analysis	Method	Detection Limit
					Date		
Combined Radium (Radium-226 + Radium 228)	pCi/l	20.3	±	1.3	Calc	Calc	0.8
Radium-226	pCi/l	18.6	±	1.3	7-31-17/1406	EPA 903.0	0.4
Radium-228	pCi/l	1.7	±	0.6	8-2-17/1145	EPA Ra-05	0.8



James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



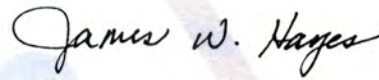
Report Date: August 3, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Field Custody: Client  
Client/Field ID: L17G024-04  
Sample Collection: 7-20-17/1101  
Lab ID No: 17.8611  
Lab Custody Date: 7-21-17/0925  
Sample description: w

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	37.2 ± 1.8	Calc	Calc	0.7
Radium-226	pCi/l	33.8 ± 1.8	8-1-17/1154	EPA 903.0	0.4
Radium-228	pCi/l	3.4 ± 0.7	8-2-17/1145	EPA Ra-05	0.7



James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



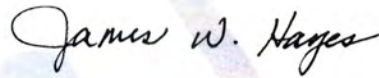
Report Date: August 3, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Field Custody: Client  
Client/Field ID: L17G024-05  
Sample Collection: 7-20-17/1029  
Lab ID No: 17.8612  
Lab Custody Date: 7-21-17/0925  
Sample description: w

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results			Analysis	Method	Detection Limit
					Date		
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.4	±	0.6	Calc	Calc	0.8
Radium-226	pCi/l	3.9	±	0.6	8-1-17/1154	EPA 903.0	0.5
Radium-228	pCi/l	0.5	±	0.5	8-2-17/1145	EPA Ra-05	0.8



James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L17G024

**SENDING LABORATORY:**


Tampa Electric Company, Laboratory Services  
5012 Causeway Blvd  
Tampa, FL 33619  
Phone: (813) 630-7490  
Fax: (813) 630-7360  
Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
3202 N. Florida Ave.  
Tampa, FL 33603  
Phone : (813) 229-2879  
Fax: -

**Due Date: 08/03/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17G024-01</b> <b>BBS-CCR-1</b>		Water	17.8608
<b>Sampled: 07/20/17 12:25</b>			
Radium 226 EPA 903.0	01/16/18 12:25		Level 2 Data required
Radium 226+228, Total	01/16/18 12:25		Level 2 Data required
Radium 228 Ra-05	01/16/18 12:25		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L17G024-02</b> <b>BBS-CCR-2</b>		Water	17.8609
<b>Sampled: 07/20/17 12:56</b>			
Radium 226 EPA 903.0	01/16/18 12:56		Level 2 Data required
Radium 226+228, Total	01/16/18 12:56		Level 2 Data required
Radium 228 Ra-05	01/16/18 12:56		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L17G024-03</b> <b>BBS-CCR-3</b>		Water	17.8610
<b>Sampled: 07/20/17 11:56</b>			
Radium 226+228, Total	01/16/18 11:56		Level 2 Data required
Radium 226 EPA 903.0	01/16/18 11:56		Level 2 Data required
Radium 228 Ra-05	01/16/18 11:56		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
<b>Sample ID: L17G024-04</b> <b>BBS-CCR-BWI</b>		Water	17.8611
<b>Sampled: 07/20/17 11:01</b>			
Radium 226 EPA 903.0	01/16/18 11:01		Level 2 Data required
Radium 226+228, Total	01/16/18 11:01		Level 2 Data required
Radium 228 Ra-05	01/16/18 11:01		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

 7-21-17 0925                      KNL LRT 072117@0925  
 Released By                      Date & Time                      Received By                      Date & Time

Released By                      Date & Time                      Received By                      Date & Time

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L17G024

---

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17G024-05    BBS-CCR-BW2		Water	178612
Sampled: 07/20/17 10:29			
Radium 228 Ra-05	01/16/18 10:29		Level 2 Data required
Radium 226 EPA 903.0	01/16/18 10:29		Level 2 Data required
Radium 226+228, Total	01/16/18 10:29		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

---

---

*ABULLERY* 7-21-17 0925                      *KUL RL*                      07-21-17@0925  
Released By                      Date & Time                      Received By                      Date & Time

---

Released By                      Date & Time                      Received By                      Date & Time



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L176024

Analysis Completion Date: 8/1/17

### Precision Data:

Sample #: 17.8611

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>38.6</u>	<u>38.1</u>	<u>0.5</u>	<u>1.30</u>

### Spike Data:

Sample #: 17.8611

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>33.8</u>	<u>4.5</u>	<u>38.1</u>	<u>96%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>9.5</u>	<u>10.1</u>	<u>94%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.1</u>	<u>8/1/17</u>



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L176024

Analysis Completion Date: 71 311 17

### Precision Data:

Sample #: 17.8609

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>19.1</u>	<u>18.6</u>	<u>0.5</u>	<u>2.65%</u>

### Spike Data:

Sample #: 17.8609

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>13.4</u>	<u>4.5</u>	<u>18.6</u>	<u>111%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.6</u>	<u>10.1</u>	<u>105%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.6 +/- 0.2</u>	<u>7131117</u>





## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L176024

Analysis Completion Date: 8/21/17

### Precision Data:

Sample #: 17.8650

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>4.8</u>	<u>4.7</u>	<u>0.1</u>	<u>2.1%</u>

### Spike Data:

Sample #: 17.8650

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>0.2</u>	<u>3.85</u>	<u>4.7</u>	<u>117%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.1</u>	<u>4.28</u>	<u>96%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.1 +/- 0.3</u>	<u>8/21/17</u>



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L176024

Analysis Completion Date: 8/1/17

### Precision Data:

Sample #: 17,8608

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>5.9</u>	<u>6.0</u>	<u>0.1</u>	<u>1.7%</u>

### Spike Data:

Sample #: 17,8608

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>1.6</u>	<u>3.85</u>	<u>5.9</u>	<u>112%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.1</u>	<u>4.28</u>	<u>96%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.3</u>	<u>8/1/17</u>

**AUGUST 2017**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station  
Terry Eastley  
13031 Wyandott Rd  
Apollo Beach, FL 33572  
tleastley@tecoenergy.com

Report Date: 09/01/17 15:20

Work Order - L17H005

Project - CCR Wells Economizer Ash Pond

---

## Case Narrative

---

5 sample(s) were received on 08/16/17 13:43.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

### SM 2540C

A constant weight could not be achieved after three consecutive weighing and drying cycles for samples BBS-CCR-1 and BBS-CCR-BW2. The sample(s) are flagged with a J qualifier.

### EPA 200.7

The recovery of the matrix spike and spike duplicate for Boron and Calcium could not be accurately determined due to the amount of target analyte in the sample matrix. The parent sample is flagged with a J qualifier.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L17H005-01

Sample Description: BBS-CCR-1

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 8/16/17 11:24

Date of Sample Receipt: 8/16/17 13:43

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	710	mg/L	2.00	50.0		100	EPA 300.0	RFL	8/24/17 16:41
Specific Conductance	4110	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 11:24
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 11:24
Fluoride	0.200	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 16:31
pH	6.82	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 11:24
REDOX Potential	-109	mV	-999	-999		1	SM 2580B	RAB	8/16/17 11:24
Total Dissolved Solids	2960	mg/L	24.0	40.0	J-	2	SM 2540C	NLT	8/18/17 15:35
Sulfate	1240	mg/L	50.0	200		100	EPA 300.0	RFL	8/24/17 16:41
Turbidity	1.88	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 11:24

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:22
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:03
Arsenic	9.33	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/18/17 12:03
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:03
Cobalt	0.473	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:03
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	8/18/17 12:03
Selenium	0.918	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:03
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:03

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.122	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:46
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:46
Boron	17.0	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:46
Calcium	572	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:29
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 9:46
Molybdenum	86.4	ug/L	1.00	20.0		1	EPA 6010B	RLC	8/18/17 9:46

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17H005-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 8/16/17 10:55  
 Date of Sample Receipt: 8/16/17 13:43

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	113	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 17:01
Specific Conductance	1560	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 10:55
Dissolved Oxygen	0.250	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 10:55
Fluoride	0.155	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 16:51
pH	6.92	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 10:55
REDOX Potential	-233	mV	-999	-999		1	SM 2580B	RAB	8/16/17 10:55
Total Dissolved Solids	1080	mg/L	24.0	40.0		2	SM 2540C	NLT	8/18/17 15:35
Sulfate	459	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 17:01
Turbidity	3.22	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 10:55

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:25
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	1.20	ug/L	1.20	4.00	U	2	EPA 200.8	MCR	8/18/17 12:38
Arsenic	1.02	ug/L	0.640	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Cadmium	0.200	ug/L	0.200	1.00	U	2	EPA 200.8	MCR	8/18/17 12:38
Cobalt	0.150	ug/L	0.0800	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Lead	0.000244	mg/L	0.000160	0.00400	I	2	EPA 200.8	MCR	8/18/17 12:38
Selenium	0.662	ug/L	0.400	4.00	I	2	EPA 200.8	MCR	8/18/17 12:38
Thallium	0.200	ug/L	0.200	1.00	U	2	EPA 200.8	MCR	8/18/17 12:38

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.0568	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:48
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:48
Boron	4.32	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:48
Calcium	171	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 9:48
Molybdenum	3.02	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:48

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17H005-03  
 Sample Description: BBS-CCR-3  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 8/16/17 10:27  
 Date of Sample Receipt: 8/16/17 13:43

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	156	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 17:22
Specific Conductance	1790	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 10:27
Dissolved Oxygen	0.290	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 10:27
Fluoride	0.338	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 17:11
pH	6.42	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 10:27
REDOX Potential	-206	mV	-999	-999		1	SM 2580B	RAB	8/16/17 10:27
Total Dissolved Solids	1290	mg/L	24.0	40.0		2	SM 2540C	NLT	8/18/17 15:35
Sulfate	484	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 17:22
Turbidity	0.470	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 10:27

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:29
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:09
Arsenic	0.536	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/18/17 12:09
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:09
Cobalt	0.123	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:09
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	8/18/17 12:09
Selenium	0.200	ug/L	0.200	2.00	U	1	EPA 200.8	MCR	8/18/17 12:09
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:09

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.0598	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:52
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:52
Boron	0.266	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 9:52
Calcium	187	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:34
Chromium	2.02	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	8/18/17 9:52
Molybdenum	3.14	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:52

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17H005-04	Date and Time Collected:	8/16/17 9:52
Sample Description:	BBS-CCR-BW1	Date of Sample Receipt:	8/16/17 13:43
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b><u>General Chemistry Parameters</u></b>									
Chloride	793	mg/L	4.00	100		200	EPA 300.0	RFL	8/24/17 18:02
Specific Conductance	5000	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 9:52
Dissolved Oxygen	0.450	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 9:52
Fluoride	0.0100	mg/L	0.0100	0.0500	U	1	EPA 300.0	RFL	8/24/17 17:32
pH	6.52	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 9:52
REDOX Potential	3.60	mV	-999	-999		1	SM 2580B	RAB	8/16/17 9:52
Total Dissolved Solids	4340	mg/L	48.0	80.0		4	SM 2540C	NLT	8/18/17 15:35
Sulfate	1320	mg/L	100	400		200	EPA 300.0	RFL	8/24/17 18:02
Turbidity	6.03	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 9:52
<b><u>Total Mercury by SW846 Method 7470/7471</u></b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:32
<b><u>Total Recoverable Metals by 200 Series</u></b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:12
Arsenic	6.60	ug/L	0.320	2.00		1	EPA 200.8	MCR	8/18/17 12:12
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:12
Cobalt	1.66	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:12
Lead	0.000291	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	8/18/17 12:12
Selenium	1.76	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:12
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:12
<b><u>Total Recoverable Metals by SW846 Method 6010B</u></b>									
Barium	0.0556	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 9:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 9:54
Boron	48.0	mg/L	0.0100	0.0500	J-	1	EPA 6010B	RLC	8/18/17 9:54
Calcium	743	mg/L	0.0300	1.00	J-	1	EPA 6010B	RLC	8/18/17 8:36
Chromium	2.48	ug/L	1.60	12.0	I	1	EPA 6010B	RLC	8/18/17 9:54
Molybdenum	1.43	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 9:54

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17H005-05	Date and Time Collected:	8/16/17 9:18
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	8/16/17 13:43
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	117	mg/L	0.200	5.00		10	EPA 300.0	RFL	8/24/17 18:23
Specific Conductance	1580	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	8/16/17 9:18
Dissolved Oxygen	0.430	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	8/16/17 9:18
Fluoride	0.352	mg/L	0.0100	0.0500		1	EPA 300.0	RFL	8/24/17 18:13
pH	6.68	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	8/16/17 9:18
REDOX Potential	-53.3	mV	-999	-999		1	SM 2580B	RAB	8/16/17 9:18
Total Dissolved Solids	1180	mg/L	24.0	40.0	J-	2	SM 2540C	NLT	8/18/17 15:35
Sulfate	462	mg/L	5.00	20.0		10	EPA 300.0	RFL	8/24/17 18:23
Turbidity	3.66	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	8/16/17 9:18
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	8/18/17 10:36
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	8/18/17 12:20
Arsenic	1.80	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:20
Cobalt	0.110	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Lead	0.000101	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	8/18/17 12:20
Selenium	0.420	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	8/18/17 12:20
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	8/18/17 12:20
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0499	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	8/18/17 10:03
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	8/18/17 10:03
Boron	4.39	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	8/18/17 10:03
Calcium	287	mg/L	0.0300	1.00		1	EPA 6010B	RLC	8/18/17 8:43
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	8/18/17 10:03
Molybdenum	4.08	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	8/18/17 10:03

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value

### Subcontract Laboratories:

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17H0161 - EPA 6010B

#### Blank (17H0161-BLK1)

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U

#### LCS (17H0161-BS1)

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	1.01	0.000500	0.0200	mg/L	1.0000		101	80-120			
Beryllium	1010	0.200	2.00	ug/L	1000.0		101	80-120			
Boron	1.02	0.0100	0.0500	mg/L	1.0000		102	80-120			
Chromium	1010	1.60	12.0	ug/L	1000.0		101	80-120			
Molybdenum	991	1.00	20.0	ug/L	1000.0		99.1	80-120			

#### Matrix Spike (17H0161-MS1)

Source: L17H005-04

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0556	99.1	75-125			
Beryllium	973	0.200	2.00	ug/L	1000.0	U	97.3	75-125			
Boron	51.0	0.0100	0.0500	mg/L	1.0000	48.0	297	75-125			J-
Chromium	972	1.60	12.0	ug/L	1000.0	2.48	97.0	75-125			
Molybdenum	1020	1.00	20.0	ug/L	1000.0	1.43	102	75-125			

#### Matrix Spike (17H0161-MS2)

Source: L17H025-01

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	1.02	0.000500	0.0200	mg/L	1.0000	0.00457	101	75-125			
Beryllium	1010	0.200	2.00	ug/L	1000.0	U	101	75-125			
Boron	1.15	0.0100	0.0500	mg/L	1.0000	0.0474	110	75-125			
Chromium	1010	1.60	12.0	ug/L	1000.0	U	101	75-125			
Molybdenum	1000	1.00	20.0	ug/L	1000.0	2.21	100	75-125			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17H0161 - EPA 6010B

#### Matrix Spike Dup (17H0161-MSD1)

Source: L17H005-04

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0556	99.7	75-125	0.598	20	
Beryllium	972	0.200	2.00	ug/L	1000.0	U	97.2	75-125	0.0458	20	
Boron	50.5	0.0100	0.0500	mg/L	1.0000	48.0	249	75-125	0.961	20	J-
Chromium	980	1.60	12.0	ug/L	1000.0	2.48	97.7	75-125	0.792	20	
Molybdenum	1030	1.00	20.0	ug/L	1000.0	1.43	102	75-125	0.636	20	

#### Matrix Spike Dup (17H0161-MSD2)

Source: L17H025-01

Prepared: 08/17/17 Analyzed: 08/18/17

Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.00457	104	75-125	2.79	20	
Beryllium	1030	0.200	2.00	ug/L	1000.0	U	103	75-125	2.06	20	
Boron	1.14	0.0100	0.0500	mg/L	1.0000	0.0474	109	75-125	1.08	20	
Chromium	1030	1.60	12.0	ug/L	1000.0	U	103	75-125	2.24	20	
Molybdenum	1020	1.00	20.0	ug/L	1000.0	2.21	102	75-125	2.00	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17H0163 - EPA 7470A</b>											
<b>Blank (17H0163-BLK1)</b>					Prepared: 08/17/17 Analyzed: 08/18/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17H0163-BS1)</b>					Prepared: 08/17/17 Analyzed: 08/18/17						
Mercury	0.893	0.0500	0.200	ug/L	1.0000	U	89.3	80-120			
<b>Matrix Spike (17H0163-MS1)</b>					Source: L17H005-05		Prepared: 08/17/17 Analyzed: 08/18/17				
Mercury	0.966	0.0500	0.200	ug/L	1.0000	U	96.6	75-125			
<b>Matrix Spike Dup (17H0163-MSD1)</b>					Source: L17H005-05		Prepared: 08/17/17 Analyzed: 08/18/17				
Mercury	0.976	0.0500	0.200	ug/L	1.0000	U	97.6	75-125	1.08	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17H0157 - EPA 200.8

#### Blank (17H0157-BLK1)

Prepared: 08/16/17 Analyzed: 08/18/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17H0157-BS1)

Prepared: 08/16/17 Analyzed: 08/18/17

Antimony	104	0.600	2.00	ug/L	100.00		104	85-115			
Arsenic	103	0.320	2.00	ug/L	100.00		103	85-115			
Cadmium	102	0.100	0.500	ug/L	100.00		102	85-115			
Cobalt	95.8	0.0400	2.00	ug/L	100.00		95.8	85-115			
Lead	0.0977	8.00E-5	0.00200	mg/L	0.10000		97.7	85-115			
Selenium	107	0.200	2.00	ug/L	100.00		107	85-115			
Thallium	100	0.100	0.500	ug/L	100.00		100	85-115			

#### Matrix Spike (17H0157-MS1)

Source: L17H027-01

Prepared: 08/16/17 Analyzed: 08/18/17

Antimony	107	0.600	2.00	ug/L	100.00	0.827	106	70-130			
Arsenic	96.5	0.320	2.00	ug/L	100.00	1.14	95.4	70-130			
Cadmium	87.0	0.100	0.500	ug/L	100.00	0.154	86.8	70-130			
Cobalt	91.7	0.0400	2.00	ug/L	100.00	0.223	91.5	70-130			
Lead	0.0890	8.00E-5	0.00200	mg/L	0.10000	0.000269	88.7	70-130			
Selenium	93.8	0.200	2.00	ug/L	100.00	0.208	93.6	70-130			
Thallium	94.3	0.100	0.500	ug/L	100.00	0.203	94.1	70-130			

#### Matrix Spike (17H0157-MS2)

Source: L17H005-01

Prepared: 08/16/17 Analyzed: 08/18/17

Antimony	95.9	0.600	2.00	ug/L	100.00	U	95.9	70-130			
Arsenic	91.9	0.320	2.00	ug/L	100.00	9.33	82.6	70-130			
Cadmium	73.5	0.100	0.500	ug/L	100.00	U	73.5	70-130			
Cobalt	77.4	0.0400	2.00	ug/L	100.00	0.473	76.9	70-130			
Lead	0.0769	8.00E-5	0.00200	mg/L	0.10000	U	76.9	70-130			
Selenium	80.7	0.200	2.00	ug/L	100.00	0.918	79.8	70-130			
Thallium	82.4	0.100	0.500	ug/L	100.00	U	82.4	70-130			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17H0157 - EPA 200.8

<b>Matrix Spike Dup (17H0157-MSD1)</b>	<b>Source: L17H027-01</b>				<b>Prepared: 08/16/17 Analyzed: 08/18/17</b>						
Antimony	104	0.600	2.00	ug/L	100.00	0.827	103	70-130	3.02	20	
Arsenic	95.8	0.320	2.00	ug/L	100.00	1.14	94.7	70-130	0.752	20	
Cadmium	84.3	0.100	0.500	ug/L	100.00	0.154	84.1	70-130	3.14	20	
Cobalt	87.2	0.0400	2.00	ug/L	100.00	0.223	86.9	70-130	5.08	20	
Lead	0.0859	8.00E-5	0.00200	mg/L	0.10000	0.000269	85.6	70-130	3.53	20	
Selenium	93.6	0.200	2.00	ug/L	100.00	0.208	93.4	70-130	0.244	20	
Thallium	90.4	0.100	0.500	ug/L	100.00	0.203	90.2	70-130	4.23	20	

<b>Matrix Spike Dup (17H0157-MSD2)</b>	<b>Source: L17H005-01</b>				<b>Prepared: 08/16/17 Analyzed: 08/18/17</b>						
Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	4.65	20	
Arsenic	98.7	0.320	2.00	ug/L	100.00	9.33	89.4	70-130	7.10	20	
Cadmium	76.0	0.100	0.500	ug/L	100.00	U	76.0	70-130	3.33	20	
Cobalt	79.7	0.0400	2.00	ug/L	100.00	0.473	79.2	70-130	2.88	20	
Lead	0.0794	8.00E-5	0.00200	mg/L	0.10000	U	79.4	70-130	3.21	20	
Selenium	86.2	0.200	2.00	ug/L	100.00	0.918	85.3	70-130	6.63	20	
Thallium	86.1	0.100	0.500	ug/L	100.00	U	86.1	70-130	4.43	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17H0172 - SM 2540C</b>											
<b>Blank (17H0172-BLK1)</b>					Prepared & Analyzed: 08/18/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17H0172-BS1)</b>					Prepared & Analyzed: 08/18/17						
Total Dissolved Solids	1000	12.0	20.0	mg/L	1000.0		100	80-120			
<b>Duplicate (17H0172-DUP1)</b>					Source: L17H005-01		Prepared & Analyzed: 08/18/17				
Total Dissolved Solids	2970	24.0	40.0	mg/L		2960			0.270	10	J-
<b>Batch 17H0209 - EPA 300.0</b>											
<b>Blank (17H0209-BLK1)</b>					Prepared & Analyzed: 08/24/17						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17H0209-BS1)</b>					Prepared & Analyzed: 08/24/17						
Chloride	4.68	0.0200	0.500	mg/L	5.0000		93.7	90-110			
Fluoride	4.65	0.0100	0.0500	mg/L	5.0000		93.0	90-110			
Sulfate	4.91	0.500	2.00	mg/L	5.0000		98.2	90-110			
<b>Matrix Spike (17H0209-MS1)</b>					Source: L17H012-01		Prepared & Analyzed: 08/24/17				
Chloride	14.6	0.0200	0.500	mg/L	5.0000	9.91	93.9	90-110			
Fluoride	5.53	0.0100	0.0500	mg/L	5.0000	0.364	103	90-110			
Sulfate	36.6	0.500	2.00	mg/L	5.0000	32.1	90.6	90-110			
<b>Matrix Spike (17H0209-MS2)</b>					Source: L17H022-01		Prepared & Analyzed: 08/24/17				
Chloride	2820	2.00	50.0	mg/L	500.00	2370	91.3	90-110			
Fluoride	510	1.00	5.00	mg/L	500.00	2.66	101	90-110			
Sulfate	2000	50.0	200	mg/L	500.00	1460	108	90-110			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17H0209 - EPA 300.0

#### Matrix Spike Dup (17H0209-MSD1)

Source: L17H012-01

Prepared & Analyzed: 08/24/17

Chloride	14.8	0.0200	0.500	mg/L	5.0000	9.91	97.4	90-110	1.21	20	
Fluoride	5.65	0.0100	0.0500	mg/L	5.0000	0.364	106	90-110	2.19	20	
Sulfate	36.8	0.500	2.00	mg/L	5.0000	32.1	93.3	90-110	0.380	20	

#### Matrix Spike Dup (17H0209-MSD2)

Source: L17H022-01

Prepared & Analyzed: 08/24/17

Chloride	2850	2.00	50.0	mg/L	500.00	2370	97.1	90-110	1.02	20	
Fluoride	524	1.00	5.00	mg/L	500.00	2.66	104	90-110	2.75	20	
Sulfate	2020	50.0	200	mg/L	500.00	1460	111	90-110	0.694	20	J-

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





Site: **Big Bend**

Date: **08/16/17** File Name: **081617**

Sampler(s)/Initials: **RAB /TECO** Initials: **MB**

Weather: **Partly Cloudy & Hot**

LIMS # **L17H005-03 A** LIMS # **L17H005-03 A**

LIMS #	Location Code	Time	FE <sup>2+</sup> mg/l	pH (SU)	Temp °C	Conduct (uMHOs)	DO Mg/L	Turbidity (NTU)	Redox (mv)	Sulfide (mg/L)	Color	Odor	NGVD
L17H005-03 A	BBS-CCR-3	10:27		6.42	26.86	1788	0.29	0.47	-206.30	SO <sub>3</sub> -TR	YELLOW	MILD	LEVEL
L17H005-03 A	250ml Cyan (3)		1	250ml Inorg (2)	1L Inorg (1)	250ml Mills (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mills (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)
	(2) 500ml plastic (PP)			(3) 250ml plastic (PP)		(4) 100ml coliform bottle	2	(5) 1L amber glass (AG)		(6) 40ml VOA vial (CG)			5
	ESS 0107301Y	ESS 0218201Y	ESS 0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS	ESS
<p>Preservation</p> <p>1L bottles (rads): 5 ml HNO<sub>3</sub> to pH &lt;2</p> <p>500 ml bottles (metals): 2 ml HNO<sub>3</sub> to pH &lt;2</p> <p>250 ml bottles (metals): 1 ml HNO<sub>3</sub> to pH &lt;2</p> <p>1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO<sub>3</sub> to pH &lt;2</p> <p>250ml bottles (nuts): 1 ml H<sub>2</sub>SO<sub>4</sub> to pH &lt;2</p> <p>40 ml Vial (TOC): 0.5 ml H<sub>2</sub>SO<sub>4</sub> to pH &lt;2</p> <p>1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO<sub>3</sub> to pH &lt;2</p> <p>QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)</p> <p>A checked box indicates the sample was verified to a pH of &lt;2</p>													
<p>pH Meter Calibration</p> <p>Buffer ID: 019075D Cal: 7 Time: 8:07 ICV: 7.05 CCV: 7.04 Time: 13:15</p> <p>Meter ID: MPM08</p> <p>FDEP FT 1100</p> <p>Units: SU</p> <p>Standard ID: 018611D Cal: 10 Time: 8:07 ICV: 53.50 CCV: 0.00 Time: 12:57</p> <p>018737D Cal: 4 Time: 8:07 ICV: 4.28 CCV: 4.78 Time: 12:59</p> <p>Conductivity Meter Calib.</p> <p>Meter ID: MPM08</p> <p>FDEP FT 1200, Units: uMHOs</p> <p>Turbidity Meter Calibration</p> <p>Meter ID: TM07</p> <p>FDEP FT 1600, Units: NTU</p> <p>Sulfite Info (QC Check) (EPA 377.1)</p> <p>QC Std: 5ml (NaThio)/500ml DI=10mg/L</p>													

Well #	Diarm/Comp	Screen Interval (ft)	Intake Depth (ft)	Depth to Water (ft)	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Tubing Length (ft)	Tubing Capacity (gals)	Purge Volume (gal)	Purge Criteria	Status	Equipment ID
BBS-CCR-3	2	10	18.23	23.23	6.04	17.19	2.75	24.23	0.0026	0	0.06	STABLE	Eqpt. Table
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Water Depth (ft)	Temp °C	pH (SU)	Cond (uMHOs)	Turbidity (NTU)	DO (mg/L)	DO % Sat. < 20	Temp % +/- 5	DO % Sat. < 20	Level Meter:
1A	10:09	300	0.63	6.39	26.83	6.42	1811	0.51	0.37	0.2	0.2	20	WLM08
Purge Start:	10:11	310	0.16	6.40	26.88	6.42	1801	0.76	0.37	0.2	5	20	PP
Purge End:	10:13	300	0.16	6.42	26.86	6.42	1788	0.47	0.29	0.2	20	20	PE/S
Purge Complete At	10:03	Gallons to Purge	0.12	Stability Values =	26.86	6.42	1788	0.47	0.29	0.2	20	20	PE/S
Well #	Diarm/Comp	Screen Interval (ft)	Intake Depth (ft)	Depth to Water (ft)	Well Capacity (gal)	Water Column (ft)	Well Volume (gal)	Tubing Length (ft)	Tubing Capacity (gals)	Purge Volume (gal)	Purge Criteria	Status	Equipment ID
1A													
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Water Depth (ft)	Temp °C	pH (SU)	Cond (uMHOs)	Turbidity (NTU)	DO (mg/L)	DO % Sat. < 20	Temp % +/- 5	DO % Sat. < 20	Level Meter:
1A													WLM08
Purge Start:													PP
Purge End:													PE/S
Purge Complete At		Gallons to Purge		Stability Values =									Yes
Comments:													Total Miles

Site: **Big Bend**

Date: **08/16/17** File Name: **081617**

Weather: **Partly Cloudy & Hot**

Sampler(s) / Initials: **RAB /TECO**

Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU)	Temp °C	Conc(uMHOs)	DO Mg/L	Turbidity(NTU)	Redox (mv)	Sulfite (mg/L)	Color	Odor	NGVD LEVEL
L17H005-04 A	BBS-CCR-BW-1	9:52	6.52	6.52	28.08	COND-F 4995	0.45	6.03	3.60	SO3-TR	SOLODR-W	SOLODR-W	TIME
L17H005-05 A	BBS-CCR-BW-2	9:18	6.68	6.68	27.69	1585	0.43	3.66	-53.50		CLEAR	NONE	#VALUE!
L17H005-04 A	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (3)	250ml Inorg (2)	1L Mils (1)	250ml Mils (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mils (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)
L17H005-05 A			1		2	2	2						10
	(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coriform bottle	(5) 1L amber glass (AG)	ESS	ESS	ESS	ESS	ESS	(6) 40ml VOA vial (CG)	ESS	Sample Receipt
	0107301Y	0218201Y	0307301Y	0307301Y	0307301Y	ESS	ESS	ESS	ESS	ESS	ESS	ESS	Time 13:43
	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Preservation	Temp 0.8
	1L bottles (rads): 5 ml HNO3 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	250ml bottles (nuts): 1 ml H2SO4 to pH <2	Temp 0.8
	500 ml bottles (metals): 2 ml HNO3 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	Temp 0.8
	250 ml bottles (metals): 1 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	Temp 0.8
	pH Meter Calibration	Buffer Value	Cal	Time	ICV	CCV	Time	CCV	Time	Redox Cal	Time	Temp °C	Theo Value mv
Meter ID:	MPM08	0190750	7	8:07	7.05	7.04	8:11	7.04	13:15	Meter ID:	8:15	21.3	236.2
FDEP FT 1100	018611D	10	10	8:07	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)					MPM08	13:22	21.8	236.2
Units: SU	018737D	4	4	8:07	A checked box indicates ICV / CCV passed					Zobell Sol ID:			
Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	CCV	Time	CCV	Time	Redox Cal	Time	Temp °C	Theo Value mg/l
Meter ID:	MPM08	1000	1000	8:17						DO Meter Cal	Time	Temp °C	8.915
FDEP FT 1200, Units: uMHOs	018416C	10000	10000	8:21	9869	9865	12:57	9865	12:57	Meter ID:	7:53	21.0	8.915
Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	Time	ICV	CCV	Time	CCV	Time	Barom. Pres	13:00	22.1	8.727
Meter ID:	TM07	52.10	48.71	55.49	53.50	7.44	4.78	4.78	12:59				
FDEP FT 1600, Units: NTU	016722	4.76	4.28	5.24									
Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	0	0	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	iodate/iodide ID	Therm ID	pH	Conduct( %)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L										MPM08	0.2	5	10

Well #	Diam/Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gall)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Egt. Volume (gal)
BBS-CCR-BW-1	2	10	39.3	44.3	28.74	15.56	0.16	2.49	0.0026	100	0	0.06	0.32
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
1A	9:44	1800	4.76	4.76	29.58	6.52	28.03	4920	0.55	7.98	ph +/- 0.2	STABLE	Level Meter: WLM08
Purge Start:	9:46	1800	0.95	5.71	29.57	6.52	28.04	4996	0.47	7.49	Temp +/- 0.2	STABLE	Pump: ESP
Purge End:	9:48	1800	0.95	6.66	29.56	6.52	28.08	4995	0.45	6.03	Cond +/- 5	STABLE	Tubing: PE
Purge Complete At	9:35	Gallons to Purge	0.32	Stability Values =	28.08	6.52	28.08	4995	0.45	6.03	DO % Sat < 20	STABLE	Dedicated Tubing? Yes
BBS-CCR-BW-2	2	10	18.49	23.84	7.33	16.51	0.16	2.64	0.0026	24.64	0	0.06	0.12
Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOs)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID
1A	9:05	460	0.85	0.85	7.53	6.66	27.81	1587	0.44	5.18	ph +/- 0.2	STABLE	Level Meter: WLM08
Purge Start:	9:07	450	0.24	1.09	7.53	6.67	27.74	1587	0.42	4.74	Temp +/- 0.2	STABLE	Pump: PP
Purge End:	8:58	450	0.36	1.45	7.54	6.68	27.69	1585	0.43	3.66	Cond +/- 5	STABLE	Tubing: PE/S
Purge Complete At	8:59	Gallons to Purge	0.12	Stability Values =	27.69	6.68	27.69	1585	0.43	3.66	DO % Sat < 20	STABLE	Dedicated Tubing? Yes

Comments: Total Time Total Miles

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427

TestAmerica Job ID: 660-82456-1

Client Project/Site: L17H005

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



---

Authorized for release by:  
8/29/2017 9:14:38 AM

Keaton Conner, Project Manager I  
(813)885-7427  
[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

1

2

3

4

5

6

7

8

9

10

11

12

13

14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	16

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-82456-1	L17H005-01	Water	08/16/17 11:24	08/22/17 12:15
660-82456-2	L17H005-02	Water	08/16/17 10:55	08/22/17 12:15
660-82456-3	L17H005-03	Water	08/16/17 10:27	08/22/17 12:15
660-82456-4	L17H005-04	Water	08/16/17 09:52	08/22/17 12:15
660-82456-5	L17H005-05	Water	08/16/17 09:18	08/22/17 12:15

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

---

**Job ID: 660-82456-1**

---

**Laboratory: TestAmerica Tampa**

---

**Narrative**

**Job Narrative  
660-82456-1**

**Receipt**

The samples were received on 8/22/2017 12:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6° C.

**Metals**

Method 200.7 Rev 4.4: The method blank for preparation batch 400-365468 and analytical batch 400-365789 contained Lithium above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

## Client Sample ID: L17H005-01

## Lab Sample ID: 660-82456-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.013	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17H005-02

## Lab Sample ID: 660-82456-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.016	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17H005-03

## Lab Sample ID: 660-82456-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.011	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17H005-04

## Lab Sample ID: 660-82456-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.017	I	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17H005-05

## Lab Sample ID: 660-82456-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0062	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa

# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

**Client Sample ID: L17H005-01**

**Date Collected: 08/16/17 11:24**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-1**

**Matrix: Water**

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.013	I	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:21	1

**Client Sample ID: L17H005-02**

**Date Collected: 08/16/17 10:55**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-2**

**Matrix: Water**

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.016	I	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:48	1

**Client Sample ID: L17H005-03**

**Date Collected: 08/16/17 10:27**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-3**

**Matrix: Water**

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.011	I	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:52	1

**Client Sample ID: L17H005-04**

**Date Collected: 08/16/17 09:52**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-4**

**Matrix: Water**

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.017	I	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:55	1

**Client Sample ID: L17H005-05**

**Date Collected: 08/16/17 09:18**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-5**

**Matrix: Water**

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0062	IV	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 16:59	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-365468/1-A**  
**Matrix: Water**  
**Analysis Batch: 365789**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 365468**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.00100	I	0.050	0.0010	mg/L		08/24/17 10:11	08/25/17 15:58	1

**Lab Sample ID: LCS 400-365468/2-A**  
**Matrix: Water**  
**Analysis Batch: 365789**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 365468**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.04		mg/L		104	85 - 115

**Lab Sample ID: 660-82456-1 MS**  
**Matrix: Water**  
**Analysis Batch: 365789**

**Client Sample ID: L17H005-01**  
**Prep Type: Total/NA**  
**Prep Batch: 365468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.013	I	1.00	1.20		mg/L		118	70 - 130

**Lab Sample ID: 660-82456-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 365789**

**Client Sample ID: L17H005-01**  
**Prep Type: Total/NA**  
**Prep Batch: 365468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.013	I	1.00	1.17		mg/L		116	70 - 130	2	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

## Metals

### Prep Batch: 365468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-82456-1	L17H005-01	Total/NA	Water	200.7	
660-82456-2	L17H005-02	Total/NA	Water	200.7	
660-82456-3	L17H005-03	Total/NA	Water	200.7	
660-82456-4	L17H005-04	Total/NA	Water	200.7	
660-82456-5	L17H005-05	Total/NA	Water	200.7	
MB 400-365468/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-365468/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-82456-1 MS	L17H005-01	Total/NA	Water	200.7	
660-82456-1 MSD	L17H005-01	Total/NA	Water	200.7	

### Analysis Batch: 365789

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-82456-1	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-2	L17H005-02	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-3	L17H005-03	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-4	L17H005-04	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-5	L17H005-05	Total/NA	Water	200.7 Rev 4.4	365468
MB 400-365468/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	365468
LCS 400-365468/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-1 MS	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468
660-82456-1 MSD	L17H005-01	Total/NA	Water	200.7 Rev 4.4	365468

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

**Client Sample ID: L17H005-01**

**Date Collected: 08/16/17 11:24**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:21	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17H005-02**

**Date Collected: 08/16/17 10:55**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:48	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17H005-03**

**Date Collected: 08/16/17 10:27**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:52	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17H005-04**

**Date Collected: 08/16/17 09:52**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:55	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17H005-05**

**Date Collected: 08/16/17 09:18**

**Date Received: 08/22/17 12:15**

**Lab Sample ID: 660-82456-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	365468	08/24/17 10:11	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			365789	08/25/17 16:59	SEH	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Accreditation/Certification Summary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

## Laboratory: TestAmerica Tampa

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E81010	06-30-18

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L17H005

TestAmerica Job ID: 660-82456-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17H005**

**SENDING LABORATORY:**

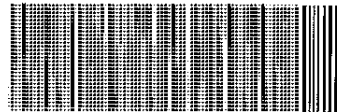
Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone : (813) 885-7427  
 Fax: -


**Due Date: 08/30/17 16:00**

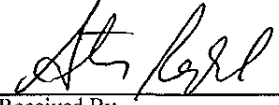
Analysis	Expires	Laboratory ID	Comments
Sample ID: L17H005-01      BBS-CCR-1		Water	
Sampled: 08/16/17 11:24			
Lithium, Total EPA 6010	02/12/18 11:24		
<i>Containers Supplied:</i>			
Poly HNO3 - 250mL (A)			
Sample ID: L17H005-02      BBS-CCR-2		Water	
Sampled: 08/16/17 10:55			
Lithium, Total EPA 6010	02/12/18 10:55		
<i>Containers Supplied:</i>			
Poly HNO3 - 250mL (A)			
Sample ID: L17H005-03      BBS-CCR-3		Water	
Sampled: 08/16/17 10:27			
Lithium, Total EPA 6010	02/12/18 10:27		
<i>Containers Supplied:</i>			
Poly HNO3 - 250mL (A)			
Sample ID: L17H005-04      BBS-CCR-BW1		Water	
Sampled: 08/16/17 09:52			
Lithium, Total EPA 6010	02/12/18 09:52		
<i>Containers Supplied:</i>			
Poly HNO3 - 250mL (A)			
Sample ID: L17H005-05      BBS-CCR-BW2		Water	
Sampled: 08/16/17 09:18			
Lithium, Total EPA 6010	02/12/18 09:18		
<i>Containers Supplied:</i>			
Poly HNO3 - 250mL (A)			



660-82456 Chain of Custody

Loc: 660  
**82456**


  
 Released By \_\_\_\_\_ Date & Time 8-16-17 1400
 


  
 Received By \_\_\_\_\_ Date & Time 8-22-17 @ 1215

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_





estAmerica  
LEADER IN ENVIRONMENTAL TESTING

Controlled

IF THIS SHIPMENT IS DELAYED IN TRANSIT,  
STORE REFRIGERATED (2° TO 8° C / 36° TO 47° F)

TAL-0090(1/16)

ORIGIN ID:TPFA (813) 865-7427  
CUSTODY  
TESTAMERICA TAMPA  
6712 BENJAMIN ROAD  
SUITE 100  
TAMPA, FL 33634  
UNITED STATES US

SHIP DATE: 22AUG17  
ACTWGT: 60.95 LB  
CAD: 545549/CAFE3107  
DIMS: 24X14X13 IN  
BILL RECEIPT#

TO SAMPLE CONTROL

TEST AMERICA P

3355 MC LEMORE

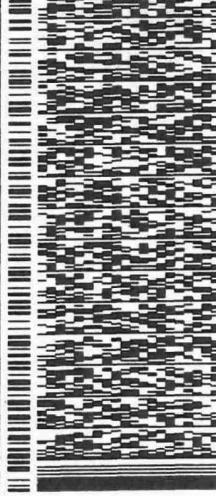
RT 574

A  
1 15:00 4731  
08.23

PENSACOLA FL 32 FZ

(850) 474-1001

DEPT: WORKSHARE SAMPLES



FedEx  
Express



WED - 23 AUG 3:00P  
STANDARD OVERNIGHT

2 of 2

MPS# 6526 3852 4737

0263

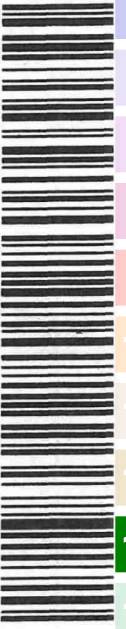
Mstr# 6526 3852 4726

0201

XH PNSA

32514

FL-US BFM



- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-82456-1

**Login Number: 82456**

**List Source: TestAmerica Tampa**

**List Number: 1**

**Creator: Edwards, Erricka**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	





DOH Certification #E84025  
DEP COMPQAP # 870251

Report Date: August 24, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17H005-01  
BBS-CCR-1  
Sample Collection: 08-16-17/1124  
Lab ID No: 17.9669  
Lab Custody Date: 8-17-17/1010  
Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	33.4 ± 1.7	Calc	Calc	0.7
Radium-226	pCi/l	32.0 ± 1.7	8-22-17/1128	EPA 903.0	0.4
Radium-228	pCi/l	1.4 ± 0.5	8-23-17/1218	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



DOH Certification #E84025  
 DEP COMPQAP # 870251

Report Date: August 24, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619  
  
 Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17H005-02  
 BBS-CCR-2  
 Sample Collection: 08-16-17/1055  
 Lab ID No: 17.9670  
 Lab Custody Date: 8-17-17/1010  
 Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	12.1 ± 0.9	Calc	Calc	0.7
Radium-226	pCi/l	11.7 ± 0.9	8-22-17/1128	EPA 903.0	0.4
Radium-228	pCi/l	0.4 ± 0.5	8-23-17/1218	EPA Ra-05	0.7

Alpha Standard: TR-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



DOH Certification #E84025  
DEP COMPQAP # 870251

Report Date: August 24, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619  
  
Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17H005-03  
BBS-CCR-3  
Sample Collection: 08-16-17/1027  
Lab ID No: 17.9671  
Lab Custody Date: 8-17-17/1010  
Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis		Method	Detection Limit
			Date			
Combined Radium (Radium-226 + Radium 228)	pCi/l	19.6 ± 1.2		Calc	Calc	0.7
Radium-226	pCi/l	18.0 ± 1.2	8-22-17/1128		EPA 903.0	0.4
Radium-228	pCi/l	1.6 ± 0.5	8-23-17/1218		EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed.  
Contact person: Jim Hayes (813) 229-2879.



DOH Certification #E84025  
 DEP COMPQAP # 870251

Report Date: August 24, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619  
 Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17H005-04  
 BBS-CCR-BW1  
 Sample Collection: 08-16-17/0952  
 Lab ID No: 17.9672  
 Lab Custody Date: 8-17-17/1010  
 Sample description: Water

CERTIFICATE OF ANALYSIS

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	30.1 ± 1.4	Calc	Calc	0.7
Radium-226	pCi/l	26.9 ± 1.4	8-22-17/1128	EPA 903.0	0.3
Radium-228	pCi/l	3.2 ± 0.6	8-23-17/1218	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17H005**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
 3202 N. Florida Ave.  
 Tampa, FL 33603  
 Phone : (813) 229-2879  
 Fax: -

17.9669  
TO  
17.9672

**Due Date: 08/30/17 16:00**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17H005-01      BBS-CCR-1		Water	
Sampled: 08/16/17 11:24		17.9669	
Radium 226 EPA 903.0	02/12/18 11:24		Level 2 Data required
Radium 226+228, Total	02/12/18 11:24		Level 2 Data required
Radium 228 Ra-05	02/12/18 11:24		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17H005-02      BBS-CCR-2		Water	
Sampled: 08/16/17 10:55		17.9670	
Radium 226 EPA 903.0	02/12/18 10:55		Level 2 Data required
Radium 226+228, Total	02/12/18 10:55		Level 2 Data required
Radium 228 Ra-05	02/12/18 10:55		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17H005-03      BBS-CCR-3		Water	
Sampled: 08/16/17 10:27		17.9671	
Radium 226+228, Total	02/12/18 10:27		Level 2 Data required
Radium 226 EPA 903.0	02/12/18 10:27		Level 2 Data required
Radium 228 Ra-05	02/12/18 10:27		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17H005-04      BBS-CCR-BW1		Water	
Sampled: 08/16/17 09:52		17.9672	
Radium 226 EPA 903.0	02/12/18 09:52		Level 2 Data required
Radium 226+228, Total	02/12/18 09:52		Level 2 Data required
Radium 228 Ra-05	02/12/18 09:52		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

	8-17-17 Date & Time	KNL DUDR Received By	8/17/17 1010 Date & Time
--	------------------------	-------------------------	-----------------------------

Released By	Date & Time	Received By	Date & Time
-------------	-------------	-------------	-------------





Report Date: August 24, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619  
  
 Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17H005-05  
 BBS-CCR-BW2  
 Sample Collection: 08-16-17/0918  
 Lab ID No: 17.9673  
 Lab Custody Date: 8-17-17/1010  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.9 ± 0.6	Calc	Calc	0.7
Radium-226	pCi/l	4.5 ± 0.6	8-22-17/1128	EPA 903.0	0.3
Radium-228	pCi/l	0.4 ± 0.5	8-23-17/1218	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17H005**

*17-9673*

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17H005-05      BBS-CCR-BW2		Water	
Sampled: 08/16/17 09:18		<i>17-9673</i>	
Radium 228 Ra-05	02/12/18 09:18		Level 2 Data required
Radium 226 EPA 903.0	02/12/18 09:18		Level 2 Data required
Radium 226+228, Total	02/12/18 09:18		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)		RAD Poly HNO3 - 1000mL (D)	

<i>E. W. ...</i>	<i>8-17-17</i>	<i>KNL</i>	<i>D. Vely</i>
Released By	Date & Time	Received By	Date & Time
Released By	Date & Time	Received By	Date & Time



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L1714005

Analysis Completion Date: 8/23/17

### Precision Data:

Sample #: 17.9672

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>8.0</u>	<u>8.0</u>	<u>0</u>	<u>0.0</u>

### Spike Data:

Sample #: 17.9672

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>3.2</u>	<u>3.81</u>	<u>8.0</u>	<u>126%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.3</u>	<u>4.23</u>	<u>102%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.0 +/- 0.2</u>	<u>8/23/17</u>



## FL DOH Certification # E84025

### QC Summary: Total Radium Analysis

Client Project #: L17H005

Analysis Completion Date: 8/22/17

### Precision Data:

Sample #: 17.9670

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>22.8</u>	<u>20.8</u>	<u>2.0</u>	<u>9.2%</u>

### Spike Data:

Sample #: 17.9670

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>11.7</u>	<u>9.0</u>	<u>20.8</u>	<u>101%</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.5</u>	<u>10.1</u>	<u>104%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.1 +/- 0.1</u>	<u>8/22/17</u>

**OCTOBER 2017**



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

Big Bend Power Station

Report Date:

11/13/17 10:59

Terry Eastley

13031 Wyandott Rd

Apollo Beach, FL 33572

tleastley@tecoenergy.com

**Work Order - L17J115**

**Project - CCR Wells Economizer Ash Pond**

---

## Case Narrative

---

5 sample(s) were received on 10/13/17 14:18.

There were no issues noted with the sample(s) associated with this workorder unless noted below.

Lithium was subcontracted to Test America Labs. The report is attached.

Radiological analysis was subcontracted to KNL Labs. The report is attached.

---

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17J115-01  
 Sample Description: BBS-CCR-1  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 10/13/17 11:50  
 Date of Sample Receipt: 10/13/17 14:18

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
-----------	--------	-------	-----	-----	----------------	-----	-------------	---------	----------------------

### Tampa Electric Company, Laboratory Services

#### General Chemistry Parameters

Chloride	716	mg/L	2.00	50.0		100	EPA 300.0	TMH	10/24/17 18:51
Specific Conductance	4260	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 11:50
Dissolved Oxygen	0.240	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 11:50
Fluoride	0.201	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 18:42
pH	6.83	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 11:50
REDOX Potential	-83.3	mV	-999	-999		1	SM 2580B	RAB	10/13/17 11:50
Total Dissolved Solids	3470	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	1230	mg/L	50.0	200		100	EPA 300.0	TMH	10/24/17 18:51
Turbidity	0.890	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 11:50

#### Total Mercury by SW846 Method 7470/7471

Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:34
---------	--------	------	--------	-------	---	---	-----------	-----	---------------

#### Total Recoverable Metals by 200 Series

Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:23
Arsenic	9.03	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:23
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:23
Cobalt	0.453	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:23
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:23
Selenium	0.990	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:23
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:23

#### Total Recoverable Metals by SW846 Method 6010B

Barium	0.129	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:44
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:44
Boron	19.9	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:44
Calcium	596	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:25
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:44
Molybdenum	82.5	ug/L	1.00	20.0		1	EPA 6010B	RLC	10/16/17 16:44

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station  
 Lab Sample ID: L17J115-02  
 Sample Description: BBS-CCR-2  
 Sample Collection Method: Grab

Sampled By: Robert Barthelette  
 Date and Time Collected: 10/13/17 11:10  
 Date of Sample Receipt: 10/13/17 14:18

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	70.9	mg/L	0.0200	0.500		1	EPA 300.0	TMH	10/24/17 19:10
Specific Conductance	1350	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 11:10
Dissolved Oxygen	0.200	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 11:10
Fluoride	0.182	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:10
pH	6.87	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 11:10
REDOX Potential	-188	mV	-999	-999		1	SM 2580B	RAB	10/13/17 11:10
Total Dissolved Solids	1030	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	432	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 19:10
Turbidity	3.03	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 11:10
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:38
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:27
Arsenic	1.14	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:27
Cobalt	0.115	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Lead	0.000150	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	10/16/17 12:27
Selenium	0.474	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:27
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:27
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0533	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:47
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:47
Boron	0.888	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:47
Calcium	169	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:28
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:47
Molybdenum	1.99	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:47

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17J115-03	Date and Time Collected:	10/13/17 10:42
Sample Description:	BBS-CCR-3	Date of Sample Receipt:	10/13/17 14:18
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	153	mg/L	0.200	5.00		10	EPA 300.0	TMH	10/24/17 20:08
Specific Conductance	1750	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 10:42
Dissolved Oxygen	0.370	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 10:42
Fluoride	0.333	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:58
pH	6.44	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 10:42
REDOX Potential	-249	mV	-999	-999		1	SM 2580B	RAB	10/13/17 10:42
Total Dissolved Solids	1310	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	503	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 20:08
Turbidity	2.39	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 10:42
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:41
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:30
Arsenic	0.665	ug/L	0.320	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:30
Cobalt	0.155	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:30
Selenium	0.285	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:30
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:30
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0593	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:50
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:50
Boron	0.373	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:50
Calcium	190	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:30
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:50
Molybdenum	3.82	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:50

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client: Big Bend Power Station

Lab Sample ID: L17J115-04

Sample Description: BBS-CCR-BW1

Sample Collection Method: Grab

Sampled By: Robert Barthelette

Date and Time Collected: 10/13/17 10:04

Date of Sample Receipt: 10/13/17 14:18

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	809	mg/L	0.200	5.00		10	EPA 300.0	TMH	10/24/17 19:49
Specific Conductance	4570	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 10:04
Dissolved Oxygen	0.400	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 10:04
Fluoride	0.334	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 19:49
pH	6.55	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 10:04
REDOX Potential	-18.4	mV	-999	-999		1	SM 2580B	RAB	10/13/17 10:04
Total Dissolved Solids	3890	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	217	mg/L	50.0	200		100	EPA 300.0	TMH	10/25/17 16:30
Turbidity	2.51	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 10:04
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:45
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:34
Arsenic	9.06	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:34
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:34
Cobalt	1.86	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:34
Lead	0.000103	mg/L	8.00E-5	0.00200	I	1	EPA 200.8	MCR	10/16/17 12:34
Selenium	2.14	ug/L	0.200	2.00		1	EPA 200.8	MCR	10/16/17 12:34
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:34
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0558	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:54
Beryllium	0.200	ug/L	0.200	2.00	U	1	EPA 6010B	RLC	10/16/17 16:54
Boron	44.2	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:54
Calcium	691	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:32
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:54
Molybdenum	4.27	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:54

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Sample Information

Client:	Big Bend Power Station	Sampled By:	Robert Barthelette
Lab Sample ID:	L17J115-05	Date and Time Collected:	10/13/17 9:40
Sample Description:	BBS-CCR-BW2	Date of Sample Receipt:	10/13/17 14:18
Sample Collection Method:	Grab		

## Laboratory Results

### Sample Qualifier:

Parameter	Result	Units	MDL	PQL	Qualifier Code	Dil	Test Method	Analyst	Analysis Date & Time
<b>Tampa Electric Company, Laboratory Services</b>									
<b>General Chemistry Parameters</b>									
Chloride	84.9	mg/L	0.0200	0.500		1	EPA 300.0	TMH	10/24/17 20:17
Specific Conductance	1700	umhos/cm	100	100		1	FDEP SOP FT 1200	RAB	10/13/17 9:40
Dissolved Oxygen	0.280	mg/L	0.100	0.100		1	FDEP SOP FT 1500	RAB	10/13/17 9:40
Fluoride	0.513	mg/L	0.0100	0.0500		1	EPA 300.0	TMH	10/24/17 20:17
pH	6.70	pH Units	1.00	1.00		1	FDEP SOP FT 1100	RAB	10/13/17 9:40
REDOX Potential	-72.1	mV	-999	-999		1	SM 2580B	RAB	10/13/17 9:40
Total Dissolved Solids	1330	mg/L	24.0	40.0		2	SM 2540C	RFL	10/18/17 15:55
Sulfate	632	mg/L	5.00	20.0		10	EPA 300.0	TMH	10/24/17 20:27
Turbidity	3.96	NTU	0.100	0.100		1	FDEP SOP FT 1600	RAB	10/13/17 9:40
<b>Total Mercury by SW846 Method 7470/7471</b>									
Mercury	0.0500	ug/L	0.0500	0.200	U	1	EPA 7470A	MCR	10/19/17 9:48
<b>Total Recoverable Metals by 200 Series</b>									
Antimony	0.600	ug/L	0.600	2.00	U	1	EPA 200.8	MCR	10/16/17 12:38
Arsenic	2.01	ug/L	0.320	2.00		1	EPA 200.8	MCR	10/16/17 12:38
Cadmium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:38
Cobalt	0.129	ug/L	0.0400	2.00	I	1	EPA 200.8	MCR	10/16/17 12:38
Lead	8.00E-5	mg/L	8.00E-5	0.00200	U	1	EPA 200.8	MCR	10/16/17 12:38
Selenium	0.523	ug/L	0.200	2.00	I	1	EPA 200.8	MCR	10/16/17 12:38
Thallium	0.100	ug/L	0.100	0.500	U	1	EPA 200.8	MCR	10/16/17 12:38
<b>Total Recoverable Metals by SW846 Method 6010B</b>									
Barium	0.0562	mg/L	0.000500	0.0200		1	EPA 6010B	RLC	10/16/17 16:57
Beryllium	0.254	ug/L	0.200	2.00	I	1	EPA 6010B	RLC	10/16/17 16:57
Boron	4.08	mg/L	0.0100	0.0500		1	EPA 6010B	RLC	10/16/17 16:57
Calcium	321	mg/L	0.0300	1.00		1	EPA 6010B	RLC	10/17/17 9:35
Chromium	1.60	ug/L	1.60	12.0	U	1	EPA 6010B	RLC	10/16/17 16:57
Molybdenum	2.51	ug/L	1.00	20.0	I	1	EPA 6010B	RLC	10/16/17 16:57

## Comments

- U Indicates that the compound was analyzed for but not detected.
- J- The reported value is an estimated value, see the case narrative for specifics.
- I Estimated value

### Subcontract Laboratories:

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17J0144 - EPA 6010B</b>											
<b>Blank (17J0144-BLK1)</b>					Prepared & Analyzed: 10/16/17						
Barium	0.000500	0.000500	0.0200	mg/L							U
Beryllium	0.200	0.200	2.00	ug/L							U
Boron	0.0100	0.0100	0.0500	mg/L							U
Calcium	0.0300	0.0300	1.00	mg/L							U
Chromium	1.60	1.60	12.0	ug/L							U
Molybdenum	1.00	1.00	20.0	ug/L							U
<b>LCS (17J0144-BS1)</b>					Prepared & Analyzed: 10/16/17						
Barium	0.993	0.000500	0.0200	mg/L	1.0000		99.3	80-120			
Beryllium	959	0.200	2.00	ug/L	1000.0		95.9	80-120			
Boron	1.00	0.0100	0.0500	mg/L	1.0000		100	80-120			
Chromium	984	1.60	12.0	ug/L	1000.0		98.4	80-120			
Molybdenum	963	1.00	20.0	ug/L	1000.0		96.3	80-120			
<b>Matrix Spike (17J0144-MS1)</b>					<b>Source: L17J013-01</b>		Prepared & Analyzed: 10/16/17				
Barium	1.05	0.000500	0.0200	mg/L	1.0000	0.0677	97.8	75-125			
Beryllium	949	0.200	2.00	ug/L	1000.0	U	94.9	75-125			
Boron	1.03	0.0100	0.0500	mg/L	1.0000	0.0247	101	75-125			
Chromium	965	1.60	12.0	ug/L	1000.0	U	96.5	75-125			
Molybdenum	973	1.00	20.0	ug/L	1000.0	9.51	96.4	75-125			
<b>Matrix Spike (17J0144-MS2)</b>					<b>Source: L17J116-02</b>		Prepared & Analyzed: 10/16/17				
Barium	1.02	0.000500	0.0200	mg/L	1.0000	0.0420	97.7	75-125			
Beryllium	949	0.200	2.00	ug/L	1000.0	U	94.9	75-125			
Boron	1.09	0.0100	0.0500	mg/L	1.0000	0.0552	103	75-125			
Chromium	964	1.60	12.0	ug/L	1000.0	U	96.4	75-125			
Molybdenum	971	1.00	20.0	ug/L	1000.0	1.46	97.0	75-125			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by SW846 Method 6010B - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17J0144 - EPA 6010B

#### Matrix Spike Dup (17J0144-MSD1)

Source: L17J013-01

Prepared & Analyzed: 10/16/17

Barium	1.06	0.000500	0.0200	mg/L	1.0000	0.0677	99.3	75-125	1.40	20
Beryllium	979	0.200	2.00	ug/L	1000.0	U	97.9	75-125	3.10	20
Boron	1.05	0.0100	0.0500	mg/L	1.0000	0.0247	103	75-125	1.64	20
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	1.85	20
Molybdenum	983	1.00	20.0	ug/L	1000.0	9.51	97.3	75-125	0.967	20

#### Matrix Spike Dup (17J0144-MSD2)

Source: L17J116-02

Prepared & Analyzed: 10/16/17

Barium	1.03	0.000500	0.0200	mg/L	1.0000	0.0420	99.2	75-125	1.43	20
Beryllium	957	0.200	2.00	ug/L	1000.0	U	95.7	75-125	0.889	20
Boron	1.10	0.0100	0.0500	mg/L	1.0000	0.0552	105	75-125	1.53	20
Chromium	983	1.60	12.0	ug/L	1000.0	U	98.3	75-125	1.94	20
Molybdenum	995	1.00	20.0	ug/L	1000.0	1.46	99.4	75-125	2.44	20

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Mercury by SW846 Method 7470/7471 - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17J0184 - EPA 7470A</b>											
<b>Blank (17J0184-BLK1)</b>					Prepared: 10/18/17 Analyzed: 10/19/17						
Mercury	0.0500	0.0500	0.200	ug/L							U
<b>LCS (17J0184-BS1)</b>					Prepared: 10/18/17 Analyzed: 10/19/17						
Mercury	0.976	0.0500	0.200	ug/L	1.0000	U	97.6	80-120			
<b>Matrix Spike (17J0184-MS1)</b>					Source: L17J115-02		Prepared: 10/18/17 Analyzed: 10/19/17				
Mercury	0.790	0.0500	0.200	ug/L	1.0000	U	79.0	75-125			
<b>Matrix Spike Dup (17J0184-MSD1)</b>					Source: L17J115-02		Prepared: 10/18/17 Analyzed: 10/19/17				
Mercury	0.764	0.0500	0.200	ug/L	1.0000	U	76.4	75-125	3.26	20	

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17J0116 - EPA 200.8

#### Blank (17J0116-BLK1)

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	0.600	0.600	2.00	ug/L							U
Arsenic	0.320	0.320	2.00	ug/L							U
Cadmium	0.100	0.100	0.500	ug/L							U
Cobalt	0.0400	0.0400	2.00	ug/L							U
Lead	8.00E-5	8.00E-5	0.00200	mg/L							U
Selenium	0.200	0.200	2.00	ug/L							U
Thallium	0.100	0.100	0.500	ug/L							U

#### LCS (17J0116-BS1)

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	96.0	0.600	2.00	ug/L	100.00		96.0	85-115			
Arsenic	101	0.320	2.00	ug/L	100.00		101	85-115			
Cadmium	102	0.100	0.500	ug/L	100.00		102	85-115			
Cobalt	98.6	0.0400	2.00	ug/L	100.00		98.6	85-115			
Lead	0.0958	8.00E-5	0.00200	mg/L	0.10000		95.8	85-115			
Selenium	108	0.200	2.00	ug/L	100.00		108	85-115			
Thallium	95.9	0.100	0.500	ug/L	100.00		95.9	85-115			

#### Matrix Spike (17J0116-MS1)

Source: L17J002-01

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	103	3.00	10.0	ug/L	100.00	U	103	70-130			
Arsenic	96.3	1.60	10.0	ug/L	100.00	U	96.3	70-130			
Cadmium	99.5	0.500	2.50	ug/L	100.00	U	99.5	70-130			
Cobalt	96.2	0.200	10.0	ug/L	100.00	U	96.2	70-130			
Lead	0.0906	0.000400	0.0100	mg/L	0.10000	U	90.6	70-130			
Selenium	98.1	1.00	10.0	ug/L	100.00	U	98.1	70-130			
Thallium	90.3	0.500	2.50	ug/L	100.00	U	90.3	70-130			

#### Matrix Spike (17J0116-MS2)

Source: L17J115-01

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	98.6	0.600	2.00	ug/L	100.00	U	98.6	70-130			
Arsenic	95.6	0.320	2.00	ug/L	100.00	9.03	86.6	70-130			
Cadmium	80.5	0.100	0.500	ug/L	100.00	U	80.5	70-130			
Cobalt	89.4	0.0400	2.00	ug/L	100.00	0.453	89.0	70-130			
Lead	0.0837	8.00E-5	0.00200	mg/L	0.10000	U	83.7	70-130			
Selenium	81.0	0.200	2.00	ug/L	100.00	0.990	80.0	70-130			
Thallium	87.7	0.100	0.500	ug/L	100.00	U	87.7	70-130			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## Total Recoverable Metals by 200 Series - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
---------	--------	-----	-----	-------	-------------	---------------	------	-------------	-----	-----------	-----------

### Batch 17J0116 - EPA 200.8

#### Matrix Spike Dup (17J0116-MSD1)

Source: L17J002-01

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	100	3.00	10.0	ug/L	100.00	U	100	70-130	2.63	20
Arsenic	98.4	1.60	10.0	ug/L	100.00	U	98.4	70-130	2.14	20
Cadmium	103	0.500	2.50	ug/L	100.00	U	103	70-130	3.64	20
Cobalt	101	0.200	10.0	ug/L	100.00	U	101	70-130	4.37	20
Lead	0.0959	0.000400	0.0100	mg/L	0.10000	U	95.9	70-130	5.68	20
Selenium	103	1.00	10.0	ug/L	100.00	U	103	70-130	4.36	20
Thallium	95.3	0.500	2.50	ug/L	100.00	U	95.3	70-130	5.33	20

#### Matrix Spike Dup (17J0116-MSD2)

Source: L17J115-01

Prepared: 10/13/17 Analyzed: 10/16/17

Antimony	100	0.600	2.00	ug/L	100.00	U	100	70-130	1.91	20
Arsenic	96.8	0.320	2.00	ug/L	100.00	9.03	87.8	70-130	1.30	20
Cadmium	80.2	0.100	0.500	ug/L	100.00	U	80.2	70-130	0.392	20
Cobalt	91.4	0.0400	2.00	ug/L	100.00	0.453	90.9	70-130	2.19	20
Lead	0.0830	8.00E-5	0.00200	mg/L	0.10000	U	83.0	70-130	0.740	20
Selenium	83.1	0.200	2.00	ug/L	100.00	0.990	82.1	70-130	2.51	20
Thallium	87.2	0.100	0.500	ug/L	100.00	U	87.2	70-130	0.629	20

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.





# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17J0212 - SM 2540C</b>											
<b>Blank (17J0212-BLK1)</b>					Prepared & Analyzed: 10/18/17						
Total Dissolved Solids	12.0	12.0	20.0	mg/L							U
<b>LCS (17J0212-BS1)</b>					Prepared & Analyzed: 10/18/17						
Total Dissolved Solids	994	12.0	20.0	mg/L	1000.0		99.4	80-120			
<b>Duplicate (17J0212-DUP1)</b>					Source: L17J013-01		Prepared & Analyzed: 10/18/17				
Total Dissolved Solids	202	12.0	20.0	mg/L		201			0.496	10	
<b>Duplicate (17J0212-DUP2)</b>					Source: L17J014-01		Prepared & Analyzed: 10/18/17				
Total Dissolved Solids	3740	120	200	mg/L		3860			3.16	10	
<b>Batch 17J0255 - EPA 300.0</b>											
<b>Blank (17J0255-BLK1)</b>					Prepared & Analyzed: 10/24/17						
Chloride	0.0200	0.0200	0.500	mg/L							U
Fluoride	0.0100	0.0100	0.0500	mg/L							U
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17J0255-BS1)</b>					Prepared & Analyzed: 10/24/17						
Chloride	4.96	0.0200	0.500	mg/L	5.0000		99.3	90-110			
Fluoride	5.00	0.0100	0.0500	mg/L	5.0000		100	90-110			
Sulfate	5.15	0.500	2.00	mg/L	5.0000		103	90-110			
<b>Matrix Spike (17J0255-MS1)</b>					Source: L17J013-04		Prepared & Analyzed: 10/24/17				
Chloride	2660	2.00	50.0	mg/L	500.00	2070	119	90-110			J-
Fluoride	560	1.00	5.00	mg/L	500.00	3.03	111	90-110			J-
Sulfate	3250	50.0	200	mg/L	500.00	2750	99.5	90-110			

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



# Tampa Electric Laboratory Services

5012 Causeway Blvd Tampa Fl. 33619 \* Ph (813)630-7490 \* Fax (813)630-7360 \* DOH #E54272

## General Chemistry Parameters - Quality Control

Analyte	Result	MDL	PQL	Units	Spike Level	Source Result	%Rec	%Rec Limits	RPD	RPD Limit	Qualifier
<b>Batch 17J0255 - EPA 300.0</b>											
<b>Matrix Spike (17J0255-MS2)</b>		<b>Source: L17J026-04</b>			<b>Prepared &amp; Analyzed: 10/24/17</b>						
Chloride	74.7	0.0200	0.500	mg/L	5.0000	73.8	18.8	90-110			J-
Fluoride	5.44	0.0100	0.0500	mg/L	5.0000	0.395	101	90-110			
Sulfate	5.26	0.500	2.00	mg/L	5.0000	U	105	90-110			
<b>Matrix Spike Dup (17J0255-MSD1)</b>		<b>Source: L17J013-04</b>			<b>Prepared &amp; Analyzed: 10/24/17</b>						
Chloride	2630	2.00	50.0	mg/L	500.00	2070	112	90-110	1.25	20	J-
Fluoride	557	1.00	5.00	mg/L	500.00	3.03	111	90-110	0.528	20	J-
Sulfate	3210	50.0	200	mg/L	500.00	2750	92.6	90-110	1.08	20	
<b>Matrix Spike Dup (17J0255-MSD2)</b>		<b>Source: L17J026-04</b>			<b>Prepared &amp; Analyzed: 10/24/17</b>						
Chloride	74.7	0.0200	0.500	mg/L	5.0000	73.8	18.7	90-110	0.00695	20	J-
Fluoride	5.52	0.0100	0.0500	mg/L	5.0000	0.395	102	90-110	1.37	20	
Sulfate	5.30	0.500	2.00	mg/L	5.0000	U	106	90-110	0.661	20	
<b>Batch 17J0272 - EPA 300.0</b>											
<b>Blank (17J0272-BLK1)</b>									<b>Prepared &amp; Analyzed: 10/25/17</b>		
Sulfate	0.500	0.500	2.00	mg/L							U
<b>LCS (17J0272-BS1)</b>									<b>Prepared &amp; Analyzed: 10/25/17</b>		
Sulfate	5.06	0.500	2.00	mg/L	5.0000		101	90-110			
<b>Matrix Spike (17J0272-MS1)</b>		<b>Source: L17J002-11</b>			<b>Prepared &amp; Analyzed: 10/25/17</b>						
Sulfate	1320	5.00	20.0	mg/L	50.000		NR	90-110			J-
<b>Matrix Spike Dup (17J0272-MSD1)</b>		<b>Source: L17J002-11</b>			<b>Prepared &amp; Analyzed: 10/25/17</b>						
Sulfate	1390	5.00	20.0	mg/L	50.000		NR	90-110	5.13	20	J-

Tampa Electric Company, Laboratory Services

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Peggy Penner, Manager, Laboratory Services

Laboratory Services certifies that the test result in this report meet all requirements of the NELAC standards, unless indicated otherwise in the body of the report. Unless otherwise noted, all methods followed are per the most current published version of 40 CFR Part 136, Table B. Results reported on this report pertain to the above referenced sample only.



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-2</b>	SAMPLE ID: <b>L17J115-02 A</b> DATE: <b>10/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>11.84</b> feet to <b>21.84</b> (feet)	STATIC DEPTH TO WATER (feet): <b>6.88</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      22.84                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>16.84</b>	PURGING INITIATED AT: <b>10:48</b>	PURGING ENDED AT: <b>11:00</b>	TOTAL VOLUME PURGED (gallons): <b>1.20</b>							
TIME	VOLUME PURGED (GALLONS)	CUMUL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
10:56	0.80	0.80	0.10	6.94	6.87	26.44	1348	0.19	3.18	Lt. Yellow	None
10:58	0.20	1.00	0.10	6.94	6.86	26.45	1350	0.16	2.80	Lt. Yellow	None
11:00	0.20	1.20	0.10	6.95	6.87	26.46	1350	0.20	3.03	Lt. Yellow	None
<b>WELL CAPACITY</b> (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 <b>TUBING INSIDE DIA. CAPACITY</b> (Gal./Ft.):    1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>11:00</b>		SAMPLING ENDED AT: <b>11:10</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>16.8</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>380</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input checked="" type="checkbox"/> N <input type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RPPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    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)



DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-1</b>	SAMPLE ID: <b>L17J115-04 A</b> DATE: <b>10/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>34.30</b> (feet) to <b>44.30</b> (feet)	STATIC DEPTH TO WATER (feet): <b>29.60</b>	PURGE PUMP TYPE OR BAILER: <b>ESP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      100                      feet ) +                      0.06                      gallons =                      0.32                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>39.30</b>	PURGING INITIATED AT: <b>9:49</b>	PURGING ENDED AT: <b>10:01</b>	TOTAL VOLUME PURGED (gallons): <b>8.23</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:57	5.49	5.49	0.69	30.43	6.55	27.81	4384	0.87	7.30	Clear	None
9:59	1.37	6.86	0.69	30.42	6.55	27.81	4499	0.57	4.40	Clear	None
10:01	1.37	8.23	0.69	30.41	6.55	27.86	4570	0.40	2.51	Clear	None
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>10:01</b>		SAMPLING ENDED AT: <b>10:04</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>39.3</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>2600</b>				TUBING MATERIAL CODE: <b>PE</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		ESP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		ESP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		ESP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)

**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailer;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**NOTES:**

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

DEP-SOP-001/01  
**FS 2200 Groundwater Sampling**  
**Form FD 9000-24**  
**GROUNDWATER SAMPLING LOG**

SITE NAME: <b>Big Bend</b>	SITE LOCATION: <b>Apollo Beach, FL.</b>
WELL NO: <b>BBS-CCR-BW-2</b>	SAMPLE ID: <b>L17J115-05 A</b> DATE: <b>10/13/17</b>

**PURGING DATA**

WELL DIAMETER (inches)	TUBING DIAMETER (inches) <b>1/4</b>	WELL SCREEN INTERVAL DEPTH <b>13.64</b> feet to <b>23.34</b> (feet)	STATIC DEPTH TO WATER (feet): <b>7.38</b>	PURGE PUMP TYPE OR BAILER: <b>PP</b>							
<b>WELL VOLUME PURGE:</b> (only fillout if applicable) <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b> = (                      feet -                      feet ) x                      gallons/foot =                      gallons											
<b>EQUIPMENT VOLUME PURGE:</b> (only fillout if applicable) <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b> = (                      0                      gallons + (                      0.0026                      gallons/foot X                      24.64                      feet ) +                      0.06                      gallons =                      0.12                      gallons											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>18.49</b>	PURGING INITIATED AT: <b>9:15</b>	PURGING ENDED AT: <b>9:32</b>	TOTAL VOLUME PURGED (gallons): <b>2.27</b>							
TIME	VOLUME PURGED (GALLONS)	COMPL. VOLUME PURGED (GALLONS)	PURGE RATE (GPM)	DEPTH TO WATER (FEET)	pH (standard units)	TEMP. (°C)	COND. (µmhos/cm OR µS/cm)	DISSOLVED OXYGEN (circle (mg/l) or % saturation)	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
9:28	1.75	1.75	0.13	7.61	6.68	27.92	1706	0.39	4.98	Lt. Yellow	None
9:30	0.26	2.01	0.13	7.62	6.69	27.95	1702	0.31	6.12	Lt. Yellow	None
9:32	0.26	2.27	0.13	7.62	6.70	27.98	1699	0.28	3.96	Lt. Yellow	None
<b>WELL CAPACITY (Gallons Per Foot):</b> 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 <b>TUBING INSIDE DIA. CAPACITY (Gal./Ft.):</b> 1/8" = 0.00006;    3/16" = 0.0014;    1/4" = 0.0026;    5/16" = 0.004;    3/8" = 0.006;    1/2" = 0.010;    5/8" = 0.016											

**SAMPLING DATA**

SAMPLED BY (PRINT) / AFFILIATION: <b>RAB                      TECO</b>				SAMPLER (S) SIGNATURES:				SAMPLING INITIATED AT: <b>9:32</b>		SAMPLING ENDED AT: <b>9:40</b>	
PUMP OR TUBING DEPTH IN WELL (feet): <b>18.5</b>				SAMPLE PUMP FLOW RATE (mL per minute): <b>503</b>				TUBING MATERIAL CODE: <b>PE/S</b>			
FIELD DECONTAMINATION:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>				FIELD-FILTERED:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/> FILTER SIZE:                      µm				DUPLICATE:    Y <input type="checkbox"/> N <input checked="" type="checkbox"/>			
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE	
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL. ADDED IN FIELD (ml) (1)	FINAL pH					
@Ino-500	1	PE	500ml	NONE	NONE	N/A	Inorganics		PP		
@Met-250	2	PE	250ml	HNO3	1ml	<2	Metals		PP		
@Rad-1L	2	PE	1L	HNO3	5ml	<2	Radiologicals		PP		

REMARKS:  
 (1) Sample bottles pre-preserved at laboratory prior to sample collection.

**MATERIAL CODES:**    AG = Amber Glass;    CG = Clear Glass;    PE = Polyethylene;    PP = Polypropylene;    S = Silicone;    T = Teflon;    O = Other (Specify)  
**SAMPLING/PURGING EQUIPMENT CODES:**    APP = After Peristaltic Pump;    B = Bailor;    BP = Bladder Pump;    ESP = Electric Submersible Pump;    PP = Peristaltic Pump;    RFPP = Reverse Flow Peristaltic Pump;    SM = Straw Method (tubing Gravity Drain);    VT = Vacuum Trap;    O = Other (Specify)

**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)

Site: **Big Bend** Date: **10/13/17** File Name: **101317\_Wells\_RAB** Weather: **Partly Cloudy & Warm** Sampler(s)/Initials: **RAB /TECO** Initials: **RAB**

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL		
L17J115-01 A	BBS-CCR-1	11:50		6.83	26.57	4258	0.24	0.89	-83.3		Clear	None			
L17J115-02 A	BBS-CCR-2	11:10		6.87	26.46	1350	0.20	3.03	-188.5		Lt. Yellow	None			
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers	
L17J115-01 A	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2								10
L17J115-02 A	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2								

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)  
 ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS ESS  
 Samples On Ice  No Sample Receipt Time 14:18

Preservation	Pres ID	Preservation	Pres ID	Preservation	Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	L 012558	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L	500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L	1.4
500 ml bottles (metals): 2 ml HNO3 to pH <2	L	40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L	250 ml bottles (Cyan) 1g NaOH to pH >12	L	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L 012558	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	L	A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019949D	7	7.01	7:02	7.03	7:06	7.11	14:29	Meter ID: MPM08	7:10	21.5	236.0	236.2
FDEP FT 1100	L 019074C	10	10.05	7:02					Meter ID: MPM08	14:33	21.1	233.5	236.2
Units: SU	L 019303D	4	4.00	7:02					Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 018805E	1000	1000	7:14					Meter ID: MPM08	6:54	21.4	8.90	8.863
FDEP FT 1200, Units: uMHOS	L 019100B	10000			9830	7:18	9791	14:01					

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)	
Meter ID: TMO7	L 019883	5.56	5.00	6.12	5.60	6:43	5.61	13:59	MPM08	14:42	20.8	8.97	8.950
FDEP FT 1600, Units: NTU	L 0								Barom. Pres				
									760				

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L								MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026, 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-1	2	10	17.32	22.32	7.32	15.00	0.16	2.40	0.0026	23.3	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	11:28	380	1.10	1.10	7.41	6.83	26.47	4268	0.20	1.86	ph: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	11:30	390	0.21	1.31	7.40	6.83	26.53	4261	0.24	0.97	Temp°C +/- 0.2	STABLE	Pump:	PP
11:17	11:32	380	0.20	1.51	7.41	6.83	26.57	4258	0.24	0.89	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
11:32											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At	11:18	Gallons to Purge	0.12	Stability Values =	6.83	26.57	4258	0.24	0.89					

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-2	2	10	16.84	21.84	6.88	14.96	0.16	2.39	0.0026	22.84	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	10:56	380	0.80	0.80	6.94	6.87	26.44	1348	0.19	3.18	ph: +/- 0.2	STABLE	Level Meter:	WLM08
Purge Start:	10:58	380	0.20	1.00	6.94	6.86	26.45	1350	0.16	2.80	Temp°C +/- 0.2	STABLE	Pump:	PP
10:48	11:00	380	0.20	1.20	6.95	6.87	26.46	1350	0.20	3.03	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:											DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/>	Yes
11:00											Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/>	No
Purge Complete At	10:49	Gallons to Purge	0.12	Stability Values =	6.87	26.46	1350	0.20	3.03					

Comments: Total Time Total Miles



Site: **Big Bend** Date: **10/13/17** File Name: **101317\_Wells\_RAB** Weather: **Partly Cloudy & Warm** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(µMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17J115-03 A	BBS-CCR-3 CCR-PZ-4	10:42		6.44	27.18	1747	0.37	2.39	-249.3		Yellow	Mild		
LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17J115-03 A	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5

(1) 1L plastic (PP) (2) 500ml plastic (PP) (3) 250ml plastic (PP) (4) 100ml coliform bottle (5) 1L amber glass (AG) (6) 40ml VOA vial (CG)  
 ESS 0107301Y ESS 0218201Y ESS 0307301Y ESS ESS  
 Yes  No Samples On Ice Sample Receipt Time 14:18

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID
1L bottles (rads): 5 ml HNO3 to pH <2	L	012558	250ml bottles (nuts): 1 ml H2SO4 to pH <2	L		500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	L	
500 ml bottles (metals): 2 ml HNO3 to pH <2	L		40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	L		250 ml bottles (Cyan) 1g NaOH to pH >12	L	
250 ml bottles (metal): 1 ml HNO3 to pH <2	L	012558	1L bottles (diss. rads): filtered with 0.45µm, 5 ml HNO3 to pH <2	L		A checked box indicates that the sample was verified to a pH of <2		

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019949D	7	7	7:02	7.03	7:06	7.11	14:29	Meter ID: MPM08	7:10	21.5	236.0	236.2
FDEP FT 1100	L 019074C	10	10	7:02	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				14:33	21.1	233.5	236.2	
Units: SU	L 019303D	4	4	7:02	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L 50B
Meter ID: MPM08	L 018805E	1000	1000	7:14					
FDEP FT 1200, Units: µMHOS	L 019100B	10000			9830	7:18	9791	14:01	

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	MPM08	14:42	20.8	8.97	8.950
Meter ID: TM07	L 019883	5.56	5.00	6.12	5.60	6:43	5.61	13:59	Barom. Pres			
FDEP FT 1600, Units: NTU	L	0							760			

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft: 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
BBS-CCR-3	2	10	18.23	23.23	6.52	16.71	0.16	2.67	0.0026	24.23	0	0.06	0.12

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table	
1A	10:22	180	0.43	0.43	6.72	6.47	27.31	1785	0.36	1.59	ph:+/- 0.2	STABLE	Level Meter:	WLM08	
Purge Start:	10:24	190	0.10	0.53	6.72	6.45	27.20	1763	0.50	1.13	Temp°C+/- 0.2	STABLE	Pump:	PP	
	10:13	10:26	190	0.10	0.63	6.71	6.44	27.18	1747	0.37	2.39	Cond % +/- 5	STABLE	Tubing:	PE/S
Purge End:	10:26										DO % Sat. < 20	STABLE	Dedicated	<input checked="" type="checkbox"/> Yes	
											Turb. NTU < 20	STABLE	Tubing?	<input type="checkbox"/> No	
Purge Complete At		10:16	Gallons to Purge 0.12		Stability Values =		6.44	27.18	1747	0.37	2.39				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)
	2	10	14	18		18.00	0.16	2.88	0.0026	100	0	0.06	0.32

Purge Meth:	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (µMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
											ph:+/- 0.2		Level Meter:	WLM08
Purge Start:											Temp°C+/- 0.2		Pump:	PP
											Cond % +/- 5		Tubing:	PE/S
Purge End:											DO % Sat. < 20		Dedicated	<input type="checkbox"/> Yes
											Turb. NTU < 20		Tubing?	<input type="checkbox"/> No
Purge Complete At			Gallons to Purge 0.32		Stability Values =									

Comments: Total Time Total Miles

Site: **Big Bend** Date: **10/13/17** File Name: **101317\_Wells\_RAB** Weather: **Partly Cloudy & Warm** Sampler(s) / Initials: **RAB /TECO** Initials

LIMS #	Loction Code	Time	FE <sup>2</sup> mg/l	pH (SU) PH	Temp °C TEMP-C	Cond(uMHOS) COND-F	DO Mg/L DO	Turbidity(NTU) TURB-N-F	Redox (mv) REDOX	Sulfite (mg/L) SO3-TR	Color \$COLOR-W	Odor \$ODOR-W	NGVD Time LEVEL	
L17J115-04 A	BBS-CCR-BW-1	10:04		6.6	27.9	4570	0.4	2.5	-18.4		Clear	None		
L17J115-05 A	BBS-CCR-BW-2	9:40		6.7	28.0	1699	0.3	4.0	-72.1		Lt. Yellow	None		

LIMS #	250ml Cyan (3)	1L Inorg (1)	500ml Inorg (2)	250ml Inorg (3)	1L Mts (1)	250ml Mts (3)	1L Rads (1)	500ml Sulfide (2)	500ml Mts (2)	250ml Nuts (3)	40ml Vial (6)	500 ml Nuts (2)	1L Rads Diss. (1)	Total Containers
L17J115-04 A	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2							10
L17J115-05 A	<input type="checkbox"/>		1		<input type="checkbox"/>	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 2							

(1) 1L plastic (PP)	(2) 500ml plastic (PP)	(3) 250ml plastic (PP)	(4) 100ml coliform bottle	(5) 1L amber glass (AG)	(6) 40ml VOA vial (CG)	Samples On Ice <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Sample Receipt Time 14:18
---------------------	------------------------	------------------------	---------------------------	-------------------------	------------------------	---	------------------------------

Preservation		Pres ID	Preservation		Pres ID	Preservation		Pres ID	Temp
1L bottles (rads): 5 ml HNO3 to pH <2	<input type="checkbox"/>	012558 <input checked="" type="checkbox"/>	250ml bottles (nuts): 1 ml H2SO4 to pH <2	<input type="checkbox"/>		500 ml bottles(Sulfide) 2ml NaOH/Zinc Acet. to pH >12	<input type="checkbox"/>		1.4
500 ml bottles (metals): 2 ml HNO3 to pH <2	<input type="checkbox"/>		40 ml Vial (TOC): 0.5 ml H2SO4 to pH <2	<input type="checkbox"/>		250 ml bottles (Cyan) 1g NaOH to pH >12	<input type="checkbox"/>		
250 ml bottles (metal): 1 ml HNO3 to pH <2	<input type="checkbox"/>	012558 <input checked="" type="checkbox"/>	1L bottles (diss. rads): filtered with 0.45um, 5 ml HNO3 to pH <2	<input type="checkbox"/>		A checked box indicates that the sample was verified to a pH of <2			

pH Meter Calibration	Buffer ID	Buffer Value	Cal	Time	ICV	Time	CCV	Time	Redox Cal	Time	Temp °C	Reading mv	Theo Value mv
Meter ID: MPM08	L 019949D	7	7	7:02	7.03	7:06	7.11	14:29	Meter ID: MPM08	7:10	21.5	236.0	236.2
FDEP FT 1100	L 019074C	10	10	7:02	QC: (pH +/- 0.2) (Cond +/- 5%) (DO +/- 0.3mg/L) (Redox +/- 10mv)				Meter ID: MPM08	14:33	21.1	233.5	236.2
Units: SU	L 019303D	4	4	7:02	A checked box indicates ICV / CCV passed				Zobell Sol ID:				

Conductivity Meter Calib.	Standard ID	Std Value	Cal	Time	ICV	Time	CCV	Time	L	019150B	DO Meter Cal	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: MPM08	L 018805E	1000	1000	7:14							Meter ID: MPM08	6:54	21.4	8.90	8.863
FDEP FT 1200, Units: uMHOS	L 019100B	10000			9830	7:18	9791	14:01							

Turbidity Meter Calibration	Standard ID	Std Value	Acceptability Range	ICV	Time	CCV	Time	Meter ID	Time	Temp °C	Reading mg/l	Theo Value mg/l
Meter ID: TM07	L 019883	5.56	5.00	6.12	5.60	6:43	5.61	13:59	14:42	20.8	8.97	8.950
FDEP FT 1600, Units: NTU	L	0						Barom. Pres				
								760				

Sulfite Info (QC Check) (EPA 377.1)	QC Result mg/l	Time	Titrator ID	Na Thio ID	DO 3 Pillow ID	Starch Ind. ID	Iodate/Iodide ID	Therm ID	pH	Conduct. (%)	DO (mg/l)	Redox (mv)
QC Std: 5ml (NaThio)/500ml DI=10mg/L				L	L	L	L	MPM08	0.2	5	0.3	10

Purging Information Well Capacities (gallons/ft): 2" = 0.16 4" =0.65 Tubing Inside Diam. Capacities Gallons/ft): 1/4" =0.0026 3/8" =0.006

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-BW-1	2	10	39.3	44.3	29.60	14.70	0.16	2.35	0.0026	100	0	0.06	0.32	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:57	2600	5.49	5.49	30.43	6.55	27.81	4384	0.87	7.30	ph: +/- 0.2	STABLE	Level Meter: WLM08	
<b>Purge Start:</b>	9:59	2600	1.37	6.86	30.42	6.55	27.81	4499	0.57	4.40	Temp °C +/- 0.2	STABLE	Pump: ESP	
	9:49	10:01	2600	1.37	8.23	30.41	27.86	4570	0.40	2.51	Cond % +/- 5	STABLE	Tubing: PE	
<b>Purge End:</b>											DO % Sat. < 20	STABLE	Dedicated <input type="checkbox"/> Yes	
	10:01										Turb. NTU < 20	STABLE	Tubing? <input checked="" type="checkbox"/> No	
<b>Purge Complete At</b>	<b>9:49</b>	<b>Gallons to Purge 0.32</b>	Stability Values =			6.55	27.86	4570	0.40	2.51				

Well #	Diam/ Comp	Screen Interval (ft)	Intake Depth (ft)	Well Depth (ft)	Depth to Water (ft)	Water Column (ft)	Well Capacity (gal)	1 Well Volume (gal)	Tubing Capacity (gal/ft.)	Tubing Length (ft)	Pump Volume (gal)	Cell Volume (gal)	1 Eqpt. Volume (gal)	
BBS-CCR-BW-2	2	10	18.49	23.84	7.38	16.46	0.16	2.63	0.0026	24.64	0	0.06	0.12	
<b>Purge Meth:</b>	Time	Rate (ml/min)	Volume (gal)	Total Vol. (gal)	Water Depth (ft)	pH (SU)	Temp °C	Cond (uMHOS)	DO (mg/L)	Turbidity (NTU)	Purge Criteria	Status	Equipment ID	Eqpt. Table
1A	9:28	510	1.75	1.75	7.61	6.68	27.92	1706	0.39	4.98	ph: +/- 0.2	STABLE	Level Meter: WLM08	
<b>Purge Start:</b>	9:30	500	0.26	2.01	7.62	6.69	27.95	1702	0.31	6.12	Temp °C +/- 0.2	STABLE	Pump: PP	
	9:15	9:32	500	0.26	2.27	7.62	27.98	1699	0.28	3.96	Cond % +/- 5	STABLE	Tubing: PE/S	
<b>Purge End:</b>											DO % Sat. < 20	STABLE	Dedicated <input checked="" type="checkbox"/> Yes	
	9:32										Turb. NTU < 20	STABLE	Tubing? <input type="checkbox"/> No	
<b>Purge Complete At</b>	<b>9:16</b>	<b>Gallons to Purge 0.12</b>	Stability Values =			6.70	27.98	1699	0.28	3.96				

Comments: Total Time Total Miles

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Tampa  
6712 Benjamin Road  
Suite 100  
Tampa, FL 33634  
Tel: (813)885-7427


TestAmerica Job ID: 660-83441-1

Client Project/Site: L17J115

For:

Tampa Electric Company  
5012 Causeway Boulevard  
Tampa, Florida 33619

Attn: Ms. Peggy Penner



---

Authorized for release by:  
10/23/2017 3:29:41 PM

Keaton Conner, Project Manager I  
(813)885-7427

[keaton.conner@testamericainc.com](mailto:keaton.conner@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Sample Summary . . . . .	3
Definitions . . . . .	4
Case Narrative . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
QC Sample Results . . . . .	8
QC Association . . . . .	9
Chronicle . . . . .	10
Certification Summary . . . . .	11
Method Summary . . . . .	12
Chain of Custody . . . . .	13
Receipt Checklists . . . . .	16

# Sample Summary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
660-83441-1	L17J115-01	Water	10/13/17 11:50	10/17/17 09:10
660-83441-2	L17J115-02	Water	10/13/17 11:10	10/17/17 09:10
660-83441-3	L17J115-03	Water	10/13/17 10:42	10/17/17 09:10
660-83441-4	L17J115-04	Water	10/13/17 10:04	10/17/17 09:10
660-83441-5	L17J115-05	Water	10/13/17 09:40	10/17/17 09:10

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Definitions/Glossary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# Case Narrative

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

**Job ID: 660-83441-1**

**Laboratory: TestAmerica Tampa**

**Narrative**

## CASE NARRATIVE

**Client: Tampa Electric Company**

**Project: L17J115**

**Report Number: 660-83441-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In the event of interference or analytes present at high concentrations, samples may be diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

### **RECEIPT**

The samples were received on 10/17/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.6 C.

### **TOTAL METALS (ICP)**

Samples L17J115-01 (660-83441-1), L17J115-02 (660-83441-2), L17J115-03 (660-83441-3), L17J115-04 (660-83441-4) and L17J115-05 (660-83441-5) were analyzed for total metals (ICP) in accordance with EPA Method 200.7. The samples were prepared on 10/19/2017 and analyzed on 10/20/2017.

The method blank for preparation batch 400-372467 and analytical batch 400-372725 contained Lithium above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

## Client Sample ID: L17J115-01

## Lab Sample ID: 660-83441-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.015	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17J115-02

## Lab Sample ID: 660-83441-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.016	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17J115-03

## Lab Sample ID: 660-83441-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.011	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17J115-04

## Lab Sample ID: 660-83441-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.017	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

## Client Sample ID: L17J115-05

## Lab Sample ID: 660-83441-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0082	IV	0.050	0.0010	mg/L	1		200.7 Rev 4.4	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Tampa



# Client Sample Results

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

**Client Sample ID: L17J115-01**

Date Collected: 10/13/17 11:50

Date Received: 10/17/17 09:10

**Lab Sample ID: 660-83441-1**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.015	IV	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:10	1

**Client Sample ID: L17J115-02**

Date Collected: 10/13/17 11:10

Date Received: 10/17/17 09:10

**Lab Sample ID: 660-83441-2**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.016	IV	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:27	1

**Client Sample ID: L17J115-03**

Date Collected: 10/13/17 10:42

Date Received: 10/17/17 09:10

**Lab Sample ID: 660-83441-3**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.011	IV	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:40	1

**Client Sample ID: L17J115-04**

Date Collected: 10/13/17 10:04

Date Received: 10/17/17 09:10

**Lab Sample ID: 660-83441-4**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.017	IV	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:43	1

**Client Sample ID: L17J115-05**

Date Collected: 10/13/17 09:40

Date Received: 10/17/17 09:10

**Lab Sample ID: 660-83441-5**

Matrix: Water

**Method: 200.7 Rev 4.4 - Metals (ICP)**

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0082	IV	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:47	1

# QC Sample Results

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

## Method: 200.7 Rev 4.4 - Metals (ICP)

**Lab Sample ID: MB 400-372467/1-A**  
**Matrix: Water**  
**Analysis Batch: 372725**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 372467**

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.00274	I	0.050	0.0010	mg/L		10/19/17 09:37	10/20/17 13:04	1

**Lab Sample ID: LCS 400-372467/2-A**  
**Matrix: Water**  
**Analysis Batch: 372725**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 372467**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	1.00	1.05		mg/L		105	85 - 115

**Lab Sample ID: 660-83441-1 MS**  
**Matrix: Water**  
**Analysis Batch: 372725**

**Client Sample ID: L17J115-01**  
**Prep Type: Total/NA**  
**Prep Batch: 372467**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Lithium	0.015	IV	1.00	1.16		mg/L		115	70 - 130

**Lab Sample ID: 660-83441-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 372725**

**Client Sample ID: L17J115-01**  
**Prep Type: Total/NA**  
**Prep Batch: 372467**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Lithium	0.015	IV	1.00	1.18		mg/L		117	70 - 130	1	20

# QC Association Summary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

## Metals

### Prep Batch: 372467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-83441-1	L17J115-01	Total/NA	Water	200.7	
660-83441-2	L17J115-02	Total/NA	Water	200.7	
660-83441-3	L17J115-03	Total/NA	Water	200.7	
660-83441-4	L17J115-04	Total/NA	Water	200.7	
660-83441-5	L17J115-05	Total/NA	Water	200.7	
MB 400-372467/1-A	Method Blank	Total/NA	Water	200.7	
LCS 400-372467/2-A	Lab Control Sample	Total/NA	Water	200.7	
660-83441-1 MS	L17J115-01	Total/NA	Water	200.7	
660-83441-1 MSD	L17J115-01	Total/NA	Water	200.7	

### Analysis Batch: 372725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
660-83441-1	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-2	L17J115-02	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-3	L17J115-03	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-4	L17J115-04	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-5	L17J115-05	Total/NA	Water	200.7 Rev 4.4	372467
MB 400-372467/1-A	Method Blank	Total/NA	Water	200.7 Rev 4.4	372467
LCS 400-372467/2-A	Lab Control Sample	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-1 MS	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467
660-83441-1 MSD	L17J115-01	Total/NA	Water	200.7 Rev 4.4	372467

# Lab Chronicle

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

**Client Sample ID: L17J115-01**

**Date Collected: 10/13/17 11:50**

**Date Received: 10/17/17 09:10**

**Lab Sample ID: 660-83441-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:10	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17J115-02**

**Date Collected: 10/13/17 11:10**

**Date Received: 10/17/17 09:10**

**Lab Sample ID: 660-83441-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:27	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17J115-03**

**Date Collected: 10/13/17 10:42**

**Date Received: 10/17/17 09:10**

**Lab Sample ID: 660-83441-3**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:40	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17J115-04**

**Date Collected: 10/13/17 10:04**

**Date Received: 10/17/17 09:10**

**Lab Sample ID: 660-83441-4**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:43	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Client Sample ID: L17J115-05**

**Date Collected: 10/13/17 09:40**

**Date Received: 10/17/17 09:10**

**Lab Sample ID: 660-83441-5**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	200.7			50 mL	50 mL	372467	10/19/17 09:37	KWN	TAL PEN
Total/NA	Analysis	200.7 Rev 4.4		1			372725	10/20/17 13:47	GESP	TAL PEN
Instrument ID: 6500 ICP Duo										

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

# Accreditation/Certification Summary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

## Laboratory: TestAmerica Tampa

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E84282	06-30-18

## Laboratory: TestAmerica Pensacola

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Florida	NELAP	4	E81010	06-30-18

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: Tampa Electric Company  
Project/Site: L17J115

TestAmerica Job ID: 660-83441-1

---

Method	Method Description	Protocol	Laboratory
200.7 Rev 4.4	Metals (ICP)	EPA	TAL PEN

---

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17J115**

**SENDING LABORATORY:**

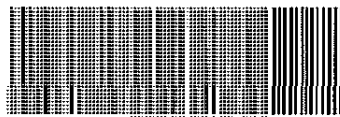
Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

TestAmerica Laboratories, Inc. - Tampa  
 6712 Benjamin Rd., Suite 100  
 Tampa, FL 33634  
 Phone: (813) 885-7427  
 Fax: -

**Due Date: 10/26/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17J115-01</b> <b>BBS-CCR-1</b> <b>Sampled: 10/13/17 11:50</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	04/11/18 11:50	Water	
<b>Sample ID: L17J115-02</b> <b>BBS-CCR-2</b> <b>Sampled: 10/13/17 11:10</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	04/11/18 11:10	Water	
<b>Sample ID: L17J115-03</b> <b>BBS-CCR-3</b> <b>Sampled: 10/13/17 10:42</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	04/11/18 10:42	Water	
<b>Sample ID: L17J115-04</b> <b>BBS-CCR-BW1</b> <b>Sampled: 10/13/17 10:04</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	04/11/18 10:04	Water	
<b>Sample ID: L17J115-05</b> <b>BBS-CCR-BW2</b> <b>Sampled: 10/13/17 09:40</b> Lithium, Total EPA 6010 <i>Containers Supplied:</i> Poly HNO3 - 250mL (B)	04/11/18 09:40	Water	



660-83441 Chain of Custody

Loc: 660  
**83441**

3.2/2.6 CU-09

Released By: *[Signature]*      Date & Time: 10-13-17 1450

Received By: *[Signature]*      Date & Time: 10-17-17 0910

Released By \_\_\_\_\_ Date & Time \_\_\_\_\_ Received By \_\_\_\_\_ Date & Time \_\_\_\_\_

### Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PW: Conner, Keaton	Carrier Tracking No(s):	COC No: 660-100268.1
Client Contact: Shipping/Receiving		Phone:	E-Mail: keaton.conner@testamericainc.com	State of Origin:	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Florida; NELAP - Texas		Job #:	660-83441-1
Address: 3355 McLemore Drive, Pensacola State, Zip: FL, 32514 Phone: 850-474-1001(Tel) 850-478-2671(Fax) Email:		Due Date Requested: 10/24/2017	<b>Analysis Requested</b>		
TAT Requested (days):		Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of Containers	
PO #:	WO #:	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, T=tissue, A=air)
Project #: 66004821	SSOW#:	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, T=tissue, A=air)
Site: L17C		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, T=tissue, A=air)
<b>Sample Identification - Client ID (Lab ID)</b>		Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, T=tissue, A=air)
L17J115-01 (660-83441-1)		10/13/17	11:50 Eastern	Water	Water
L17J115-02 (660-83441-2)		10/13/17	11:10 Eastern	Water	Water
L17J115-03 (660-83441-3)		10/13/17	10:42 Eastern	Water	Water
L17J115-04 (660-83441-4)		10/13/17	10:04 Eastern	Water	Water
L17J115-05 (660-83441-5)		10/13/17	09:40 Eastern	Water	Water
Special Instructions/Note:					

**Preservation Codes:**  
 A - HCL  
 B - NaOH  
 C - Zn Acetate  
 D - Nitric Acid  
 E - NaHSO4  
 F - MeOH  
 G - Amchlor  
 H - Ascorbic Acid  
 I - Ice  
 J - DI Water  
 K - EDTA  
 L - EDA  
 Other:  
 M - Hexane  
 N - None  
 O - AsNaO2  
 P - Na2O4S  
 Q - Na2SO3  
 R - Na2S2O3  
 S - H2SO4  
 T - TSP Dodecahydrate  
 U - Acetone  
 V - MCAA  
 W - pH 4-5  
 Z - other (specify)

**Special Instructions/Note:**

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

**Possible Hazard Identification**  
 Unconfirmed  
 Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2  
 Special Instructions/QC Requirements:  
 Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months  
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: *Erin Edwards* Date/Time: 10/17/17 1700 Company: *TH Tampa*  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Custody Seals Intact: \_\_\_\_\_ Custody Seal No.: \_\_\_\_\_  
 Δ Yes Δ No

Received by: \_\_\_\_\_ Date/Time: 10/18/17 0833 Company: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_  
 Cooler Temperature(s) °C and Other Remarks:





**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Conner, Keaton	Carrier Tracking No(s):	COC No: 660-100268.1
Client Contact: Shipping/Receiving		E-Mail: keaton.conner@testamericainc.com	State of Origin: Florida	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Job #: 660-83441-1		
Address: 3355 McLemore Drive,		Accreditations Required (See note): NELAP - Florida; NELAP - Texas		
City: Pensacola		<b>Analysis Requested</b>		
State, Zip: FL, 32514		Total Number of Containers		
Phone: 850-474-1001(Tel) 850-478-2671(Fax)		Field Filtered Sample (Yes or No)		
Email:		Perform MS/MSD (Yes or No)		
Project Name: L17C		200.7/200.7_P_TOT Lithium		
Site: L17C		Preservation Codes:		
		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		
		M - Hexana N - None O - AsNaO2 P - Na2OAS Q - Na2SC03 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)		
<b>Sample Identification - Client ID (Lab ID)</b>		<b>Special Instructions/Note:</b>		
L17J115-01 (660-83441-1)	Sample Date: 10/13/17	Sample Time: 11:50 Eastern	Sample Type (C=Comp, G=grab): Water	Matrix (W=water, B=solid, O=waste/oil, BT=Tissue, A=Air): Water
L17J115-02 (660-83441-2)	Sample Date: 10/13/17	Sample Time: 11:10 Eastern	Sample Type (C=Comp, G=grab): Water	Matrix (W=water, B=solid, O=waste/oil, BT=Tissue, A=Air): Water
L17J115-03 (660-83441-3)	Sample Date: 10/13/17	Sample Time: 10:42 Eastern	Sample Type (C=Comp, G=grab): Water	Matrix (W=water, B=solid, O=waste/oil, BT=Tissue, A=Air): Water
L17J115-04 (660-83441-4)	Sample Date: 10/13/17	Sample Time: 10:04 Eastern	Sample Type (C=Comp, G=grab): Water	Matrix (W=water, B=solid, O=waste/oil, BT=Tissue, A=Air): Water
L17J115-05 (660-83441-5)	Sample Date: 10/13/17	Sample Time: 09:40 Eastern	Sample Type (C=Comp, G=grab): Water	Matrix (W=water, B=solid, O=waste/oil, BT=Tissue, A=Air): Water
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analysis &amp; accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.</p>				
<b>Possible Hazard Identification</b>				
Unconfirmed				
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2				
Empty Kit Relinquished by: _____ Date: _____				
Relinquished by: <i>Erin Edwary</i> Date/Time: 10/17/17 1700 Company: <i>TH Tampa</i>				
Relinquished by: _____ Date/Time: _____ Company: _____				
Relinquished by: _____ Date/Time: _____ Company: _____				
Custody Seals Intact. Custody Seal No				
Δ Yes Δ No				

## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-83441-1

**Login Number: 83441**

**List Source: TestAmerica Tampa**

**List Number: 1**

**Creator: Southers, Kristin B**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Tampa Electric Company

Job Number: 660-83441-1

**Login Number: 83441**

**List Number: 2**

**Creator: Johnson, Jeremy N**

**List Source: TestAmerica Pensacola**

**List Creation: 10/18/17 10:43 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0°C IR7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Report Date: October 31, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17J115-01  
BBS-CCR-1  
Sample Collection: 10-13-17/1150  
Lab ID No: 17.12008  
Lab Custody Date: 10-19-17/0925  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	35.6 ± 1.8	Calc	Calc	0.7
Radium-226	pCi/l	33.9 ± 1.8	10-30-17/1307	EPA 903.0	0.4
Radium-228	pCi/l	1.7 ± 0.6	10-30-17/1233	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: October 31, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17J115-02  
BBS-CCR-2  
Sample Collection: 10-13-17/1110  
Lab ID No: 17.12009  
Lab Custody Date: 10-19-17/0925  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	13.5 ± 1.1	Calc	Calc	0.8
Radium-226	pCi/l	13.0 ± 1.1	10-30-17/1307	EPA 903.0	0.4
Radium-228	pCi/l	0.5 ± 0.5	10-30-17/1233	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: October 31, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17J115-03  
 BBS-CCR-3  
 Sample Collection: 10-13-17/1042  
 Lab ID No: 17.12010  
 Lab Custody Date: 10-19-17/0925  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	20.0 ± 1.3	Calc	Calc	0.7
Radium-226	pCi/l	18.1 ± 1.3	10-30-17/1307	EPA 903.0	0.3
Radium-228	pCi/l	1.9 ± 0.6	10-30-17/1233	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: October 31, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17J115-04  
BBS-CCR-BW1  
Sample Collection: 10-13-17/1004  
Lab ID No: 17.12011  
Lab Custody Date: 10-19-17/0925  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	22.1 ± 1.2	Calc	Calc	0.7
Radium-226	pCi/l	19.2 ± 1.2	10-26-17/1133	EPA 903.0	0.4
Radium-228	pCi/l	2.9 ± 0.6	10-30-17/1233	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: October 31, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17J115-05  
BBS-CCR-BW2  
Sample Collection: 10-13-17/0904  
Lab ID No: 17.12012  
Lab Custody Date: 10-19-17/0925  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	4.9 ± 0.7	Calc	Calc	0.8
Radium-226	pCi/l	4.9 ± 0.7	10-30-17/1307	EPA 903.0	0.6
Radium-228	pCi/l	0.0 ± 0.5	10-30-17/1233	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.





Report Date: October 31, 2017

TECO  
 5012 Causeway Blvd.  
 Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
 Client/Field ID: L17J116-01  
 B-4R  
 Sample Collection: 10-13-17/0858  
 Lab ID No: 17.12013  
 Lab Custody Date: 10-19-17/0925  
 Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	0.6 ± 0.4	Calc	Calc	0.8
Radium-226	pCi/l	0.6 ± 0.3	10-30-17/1307	EPA 903.0	0.4
Radium-228	pCi/l	0.0 ± 0.4	10-30-17/1233	EPA Ra-05	0.8

Alpha Standard: Th-230

James W. Hayes  
 Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.



Report Date: October 31, 2017

TECO  
5012 Causeway Blvd.  
Tampa, FL 33619

Attn: Peggy Penner

Field Custody: Client  
Client/Field ID: L17J116-02  
B-39  
Sample Collection: 10-13-17/1332  
Lab ID No: 17.12014  
Lab Custody Date: 10-19-17/0925  
Sample description: Water

**CERTIFICATE OF ANALYSIS**

Parameter	Units	Results	Analysis Date	Method	Detection Limit
Combined Radium (Radium-226 + Radium 228)	pCi/l	9.7 ± 0.8	Calc	Calc	0.7
Radium-226	pCi/l	8.9 ± 0.8	10-30-17/1307	EPA 903.0	0.4
Radium-228	pCi/l	0.8 ± 0.5	10-30-17/1233	EPA Ra-05	0.7

Alpha Standard: Th-230

James W. Hayes  
Laboratory Manager

Test results meet all requirements of the NELAC standards. Statement of estimated uncertainty available upon request. Test results refer only to sample(s) listed. Contact person: Jim Hayes (813) 229-2879.

**SUBCONTRACT ORDER**

Tampa Electric Company, Laboratory Services

**L17J115**

**SENDING LABORATORY:**

Tampa Electric Company, Laboratory Services  
 5012 Causeway Blvd  
 Tampa, FL 33619  
 Phone: (813) 630-7490  
 Fax: (813) 630-7360  
 Project Manager: Peggy Penner

**RECEIVING LABORATORY:**

KNL Laboratory Services  
 3202 N. Florida Ave.  
 Tampa, FL 33603  
 Phone : (813) 229-2879  
 Fax: -

**Due Date: 10/26/17 16:00**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: L17J115-01</b> <b>BBS-CCR-1</b> <b>Sampled: 10/13/17 11:50</b> Radium 228 Ra-05 Radium 226 EPA 903.0 Radium 226+228, Total <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/11/18 11:50 04/11/18 11:50 04/11/18 11:50	Water <del>17-12002</del>	17-12008
<b>Sample ID: L17J115-02</b> <b>BBS-CCR-2</b> <b>Sampled: 10/13/17 11:10</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/11/18 11:10 04/11/18 11:10 04/11/18 11:10	Water <del>17-12003</del>	17-12009
<b>Sample ID: L17J115-03</b> <b>BBS-CCR-3</b> <b>Sampled: 10/13/17 10:42</b> Radium 226+228, Total Radium 226 EPA 903.0 Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/11/18 10:42 04/11/18 10:42 04/11/18 10:42	Water <del>17-12004</del>	17-12010
<b>Sample ID: L17J115-04</b> <b>BBS-CCR-BW1</b> <b>Sampled: 10/13/17 10:04</b> Radium 226 EPA 903.0 Radium 226+228, Total Radium 228 Ra-05 <i>Containers Supplied:</i> RAD Poly HNO3 - 1000mL (C)      RAD Poly HNO3 - 1000mL (D)	04/11/18 10:04 04/11/18 10:04 04/11/18 10:04	Water <del>17-12005</del>	17-12011

Released By: Erin Wanner      Date & Time: 10/19/17      Received By: KNL LRL      Date & Time: 10-19-17 C925

Released By: \_\_\_\_\_ Date & Time: \_\_\_\_\_ Received By: \_\_\_\_\_ Date & Time: \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Tampa Electric Company, Laboratory Services**  
**L17J115**

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17J115-05      BBS-CCR-BW2		Water	<del>17-12006</del> 17.12012
Sampled: 10/13/17 09:40			
Radium 228 Ra-05	04/11/18 09:40		Level 2 Data required
Radium 226 EPA 903.0	04/11/18 09:40		Level 2 Data required
Radium 226+228, Total	04/11/18 09:40		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

<i>Erin Wanner</i>	<i>10/19/17</i>	<i>KWL LRT</i>	<i>10-19-17 C925</i>
Released By	Date & Time	Received By	Date & Time

Released By	Date & Time	Received By	Date & Time

SUBCONTRACT ORDER

Tampa Electric Company, Laboratory Services

L17J116

SENDING LABORATORY:

Tampa Electric Company, Laboratory Services  
5012 Causeway Blvd  
Tampa, FL 33619  
Phone: (813) 630-7490  
Fax: (813) 630-7360  
Project Manager: Peggy Penner

RECEIVING LABORATORY:

KNL Laboratory Services  
3202 N. Florida Ave.  
Tampa, FL 33603  
Phone : (813) 229-2879  
Fax: -

**Due Date:** 10/27/17 16:00

Analysis	Expires	Laboratory ID	Comments
Sample ID: L17J116-01      B-4R		Water	
Sampled: 10/13/17 08:58		17.12007	17.12013
Radium 228 Ra-05	04/11/18 08:58		Level 2 Data required
Radium 226+228, Total	04/11/18 08:58		Level 2 Data required
Radium 226 EPA 903.0	04/11/18 08:58		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		
Sample ID: L17J116-02      B-39		Water	
Sampled: 10/13/17 13:32		17.12008	17.12014
Radium 228 Ra-05	04/11/18 13:32		Level 2 Data required
Radium 226+228, Total	04/11/18 13:32		Level 2 Data required
Radium 226 EPA 903.0	04/11/18 13:32		Level 2 Data required
<i>Containers Supplied:</i>			
RAD Poly HNO3 - 1000mL (C)	RAD Poly HNO3 - 1000mL (D)		

Released By: *Erin Warner*      Date & Time: *10-19-17*      Received By: *KNL BRL*      Date & Time: *10-19-17 0925*

Released By:      Date & Time:      Received By:      Date & Time:



## FL DOH Certification # E84025

QC Summary: **Total Radium Analysis**

Client Project #: L175115

Analysis Completion Date: 101 30 1 17

### Precision Data:

Sample #: 17.12012

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>8.4</u>	<u>8.3</u>	<u>0.1</u>	<u>1.2</u>

### Spike Data:

Sample #: 17.12012

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>4.9</u>	<u>4.5</u>	<u>8.4</u>	<u>78.2</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>10.4</u>	<u>10.1</u>	<u>103.7</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.2 +/- 0.1</u>	<u>101 30 1 17</u>



## FL DOH Certification # E84025

QC Summary: **Radium 228 Analysis**

Client Project #: L17J115

Analysis Completion Date: 10/30/17

### Precision Data:

Sample #: 17,12008

<u>Sample Analysis (pCi/l)</u>	<u>Duplicate Analysis (pCi/l)</u>	<u>Range (pCi/l)</u>	<u>RPD (%)</u>
<u>5.7</u>	<u>5.5</u>	<u>0.2</u>	<u>3.6</u>

### Spike Data:

Sample #: 17,12008

<u>Sample Analysis (pCi/l)</u>	<u>Spike Added (pCi/l)</u>	<u>Analytical Result (pCi/l)</u>	<u>Spike Rec (%)</u>
<u>1.7</u>	<u>4.0</u>	<u>5.7</u>	<u>100</u>

### LCS Data:

<u>Analytical Result (pCi/l)</u>	<u>True Value (pCi/l)</u>	<u>% Recovery</u>
<u>4.3</u>	<u>4.44</u>	<u>97%</u>

### Lab Blank:

	<u>Analytical Result (pCi/l)</u>	<u>Analysis Date</u>
Lab Blank	<u>0.0 +/- 0.2</u>	<u>10/30/17</u>

## **APPENDIX B**

### **Geosyntec Data Validation Reports**



## Memorandum

Date: 13 September 2016  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
Subject: **Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L16F174 & L16G005, TestAmerica #660-74676-1 & 660-75265-1 and KNL Environmental Testing # L16F174 & L16G005**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 16 water samples, collected on 24 June 2016 and 27 July 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L16F174-01	PZ1 (6/24/2016)
L16F174-02	PZ2 (6/24/2016)
L16F174-03	PZ3 (6/24/2016)
L16F174-04	PZ4 (6/24/2016)
L16F174-05	PZ5 (6/24/2016)
L16F174-06	PZ6 (6/24/2016)
L16F174-07	MWB-35 (6/24/2016)
L16F174-08	MWB-36 (6/24/2016)

Laboratory ID	Client ID
L16G005-01	PZ1 (7/27/2016)
L16G005-02	PZ2 (7/27/2016)
L16G005-03	PZ3 (7/27/2016)
L16G005-04	PZ4 (7/27/2016)
L16G005-05	PZ5 (7/27/2016)
L16G005-06	PZ6 (7/27/2016)
L16G005-07	MWB-35 (7/27/2016)
L16G005-08	MWB-36 (7/27/2016)

The samples were received at TestAmerica Tampa outside the temperature criteria of  $4 \pm 2^{\circ}\text{C}$ ; the samples were received at  $0.0^{\circ}\text{C}$ . Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank

- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 1.1 **Overall Assessment**

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 1.2 **Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

### 1.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Seven method blanks were reported, three for the method 200.7 data (batches 16F0213, 312424, and 316923), two for the method 200.8 data (batches 16F0212 and 16H0004), and two for the method 6010B data (batches 16F0213 and 16H0014). Metals were not detected in the method blanks above the method detection limit (MDL).

### 1.4 **Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Two sample set specific MS/MSD pairs were reported for the 200.7, 200.8 and 6010B data, using samples PZ2(6/24/2016) and PZ1(7/27/2016), PZ1(6/24/2016) and MWB-36(7/27/2016), and PZ2(6/24/2016) and PZ2(7/27/2016), respectively. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of cadmium and the recoveries of selenium were low and outside of the laboratory specified acceptance criteria in the MS/MSDs using samples PZ1(6/24/2016) and MWB-36(7/27/2016), respectively. Therefore, the non-detect result for cadmium in sample PZ1(6/24/2016) was UJ qualified as estimated less than the MDL, and the concentrations of selenium in sample MWB-36(7/27/2016) was J- qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
PZ1 (6/24/2016)	Cadmium	0.10	J-,U	0.10	UJ	4
MWB-36 (7/27/2016)	Selenium	0.58	J-,I	0.58	J-	4

µg/L-micrograms per liter

J--laboratory flag indicating the MS/MSD recovery was low

U- laboratory flag indicating the compound was analyzed for but not detected

I-laboratory flag indicating an estimated concentration, less than the RL

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

One batch MS/MSD pair was also reported for the 200.7 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Seven LCSs were reported, three for the 200.7 data, two for the 200.8 data and two for the 6010B data. The recovery results were within the laboratory specified acceptance criteria.

### 1.6 Serial Dilution

Serial dilutions were not reported.

### 1.7 Equipment Blank

Equipment blanks were not reported with the sample sets.

### 1.8 Field Duplicate

Field duplicates were not reported with the sample sets.

## **1.9 Sensitivity**

The samples were reported to the MDLs. No elevated non-detect results were reported. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **1.10 Electronic Data Deliverable Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

## **2.0 MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## **2.1 Overall Assessment**

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## **2.2 Holding Times**

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding time was met for the sample analysis.

## **2.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 16G0021 and 16H0035). Mercury was not detected in the method blanks above the MDL.

## **2.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples MWB-36(6/24/2016) and PZ1(7/27/2016), were reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

## **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

## **2.6 Equipment Blank**

Equipment blanks were not reported with the sample sets.

## **2.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

## **2.8 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDLs for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **2.9 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

## **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## **3.1 Overall Assessment**

The radium-226 and radium-228 data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported for radium-226 and radium-228 data (batches L16F174 and L16G005). Radium-228 was not detected in the method blanks above the minimum detectable concentration (MDC); however, radium-226 was detected above the MDC in the method blanks associated with batch L16G005. Therefore, the detections of radium-226 and combined radium (radium-226 + radium-228) with concentrations less than 10x the blank concentration were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
PZ6 (7/27/2016)	Radium-226	4.6	NA	4.6	J	3
PZ6 (7/27/2016)	Radium-226 + Radium-228	5.1	NA	5.1	J	3
MWB-35 (7/27/2016)	Radium-226	1.6	NA	1.6	J	3
MWB-35 (7/27/2016)	Radium-226 + Radium-228	1.9	NA	1.9	J	3
MWB-36 (7/27/2016)	Radium-226	3.2	NA	3.2	J	3
MWB-36 (7/27/2016)	Radium-226 + Radium-228	4.1	NA	4.1	J	3

pCi/L-picocuries per liter  
 NA-not applicable

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS were reported for radium-226 and radium-228. The recovery results were within the laboratory specified acceptance criteria.



### **3.6 Equipment Blank**

Equipment blanks were not reported with the sample sets.

### **3.7 Laboratory Duplicate**

Two laboratory duplicates for radium-226 and radium-228 were reported with the sample sets. The RPD results were within the laboratory specified acceptance criteria.

### **3.8 Sensitivity**

The samples were reported to the MDCs. The MDCs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.9 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

## **4.0 WET CHEMISTRY PARAMETERS**

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

##### 4.1.1 Analysis Anomaly

The narrative sections of laboratory reports L16F174 and L16G005 stated that constant weight could not be achieved during the total dissolved solids analysis of samples PZ1 (6/24/2016), PZ2 (6/24/2016), PZ5 (6/24/2016), PZ6 (6/24/2016), and PZ2 (7/27/2016), respectively. Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier	Reason Code
PZ1 (6/24/2016)	Total Dissolved Solids	3060	J-	3060	J	13
PZ2 (6/24/2016)	Total Dissolved Solids	1170	J-	1170	J	13
PZ5 (6/24/2016)	Total Dissolved Solids	5050	J-	5050	J	13
PZ6 (6/24/2016)	Total Dissolved Solids	1230	J-	1230	J	13
PZ2 (7/27/2016)	Total Dissolved Solids	1170	J-	1170	J	13

mg/L-milligrams per liter

J--laboratory flag indicating the result is estimated

#### 4.2 Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

Sample set specific MS/MSD pairs were reported for chloride, fluoride, sulfate using samples PZ5 (6/24/2016), MWB-35 (6/24/2016) and PZ1 (7/27/2016). The recovery and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of chloride and sulfate were low and outside of the laboratory specified acceptance criteria in the MS/MSDs using samples PZ5 (6/24/2016) and PZ1 (7/27/2016). Therefore, the concentrations of chloride and sulfate in samples PZ5 (6/24/2016) and PZ1 (7/27/2016) were J-qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier	Reason Code
PZ1 (7/27/2016)	Chloride	742	J-	742	J-	4
PZ1 (7/27/2016)	Sulfate	1320	J-	1320	J-	4
PZ5 (6/24/2016)	Chloride	1140	J-	1140	J-	4
PZ5 (6/24/2016)	Sulfate	1440	J-	1440	J-	4

mg/L-milligrams per liter

J--laboratory flag indicating the MS/MSD recovery was low

#### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### **4.6 Laboratory Duplicate**

Two batch laboratory duplicates were reported for the total dissolved solids analyses. Since this was batch QC there was no impact on the data.

#### **4.7 Equipment Blank**

Equipment blanks were not reported with the sample sets.

#### **4.8 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **4.9 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.10 Electronic Data Deliverables Review**

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The non-detect results were reported at the MDL in the laboratory reports and reported as ND in the EDD. No other discrepancies were identified between the level II report and the EDD.

---

\* \* \* \* \*

**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Memorandum

Date: 24 October 2016  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
**Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L16H075, TestAmerica #660-75848-1 and KNL Environmental Testing # L16H075**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 5 water samples, collected on August 26, 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L16H075-01	PZ1
L16H075-02	PZ2
L16H075-03	PZ3

Laboratory ID	Client ID
L16H075-05	PZ5
L16H075-06	PZ6

The samples were received at TestAmerica Tampa outside the temperature criteria of  $4 \pm 2^{\circ}\text{C}$ ; the samples were received at  $1.0^{\circ}\text{C}$ . Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review



### **1.1 Overall Assessment**

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### **1.2 Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

### **1.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported, one for the method 200.7 data (batch 321282), one for the method 200.8 data (batch 16H0242), and two for the method 6010B data (batches 16H0239 and 16H0254). Metals were not detected in the method blanks above the method detection limit (MDL), with the following exception.

Boron was detected at an estimated concentration in the method blank associated with batch 16H0254. Since boron was detected above the reporting limit (RL) in the associated samples, no qualifications were applied to the data.

### **1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). One sample set specific MS/MSD pair was reported for the 6010B data, using samples PZ6, and one sample set specific MS/MSD pair was reported for the 200.7 data, using samples PZ1. The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

Batch MS/MSD pairs were also reported for the 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **1.5 Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four LCSs were reported, one for the 200.7 data, one for the 200.8 data

and two for the 6010B data. The recovery results were within the laboratory specified acceptance criteria.

### **1.6 Serial Dilution**

Serial dilutions were not reported.

### **1.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

### **1.8 Sensitivity**

The samples were reported to the MDLs. No elevated non-detect results were reported. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **1.9 Electronic Data Deliverable Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

## **2.0 MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity

- ✓ Electronic Data Deliverable Review

## **2.1 Overall Assessment**

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## **2.2 Holding Times**

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## **2.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 16H0256). Mercury was not detected in the method blank above the MDL.

## **2.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample PZ5, was reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

## **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The recovery results were within the laboratory specified acceptance criteria.

## **2.6 Field Duplicate**

Field duplicates were not reported with the sample sets.

## **2.7 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **2.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

## **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## **3.1 Overall Assessment**

The radium-226 and radium-228 data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values

qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported, one for the radium-226 data and one for the radium-228 data (both reported in batch L16H075). Radium-228 was not detected in the method blank above the minimum detectable concentration (MDC); however, radium-226 was detected above the MDC in the method blank associated with batch L16H075. Since, the detections of radium-226 and combined radium (radium-226 + radium-228) had concentrations greater than 10x the blank concentration no qualifications were applied to the data.

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample PZ6, was reported for the radium-228 data. The MSD recovery of radium-228 was low and outside of laboratory specified acceptance criteria in the MS/MSD pair, using sample PZ6; therefore, the non-detect result of radium-228 in sample PZ6 was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier*	Reason Code**
PZ6	Radium-228	0.7	U	0.7	UJ	4

pCi/L-picocuries per liter

U- laboratory flag indicating the analytes was not detected above the MDL in the associated sample

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

A batch MS/MSD pair was reported for the radium-226 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS were reported for radium-226 and radium-228. The recovery results were within the laboratory specified acceptance criteria.

### **3.6 Laboratory Duplicate**

A laboratory duplicate was not reported with the sample set.

### **3.7 Sensitivity**

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

## **4.0 WET CHEMISTRY PARAMETERS**

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### **4.1 Overall Assessment**

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### **4.2 Holding Times**

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

#### **4.3 Method Blanks**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

#### **4.4 Matrix Spike/Matrix Spike Duplicate**

Batch MS/MSD pairs were reported for the wet chemistry data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### **4.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### **4.6 Laboratory Duplicate**

One batch laboratory duplicate was reported for the total dissolved solids analyses. Since this was batch QC there was no impact on the data.

#### **4.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **4.8 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.9 Electronic Data Deliverables Review**

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

---

\* \* \* \* \*



**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Memorandum

Date: 17 January 2017  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
Subject: **Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L16J027 and #L16K034, TestAmerica #660-77026-1 and #660-77306-1 and KNL Environmental Testing #L16J027 and #L16K034**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on October 28, 2016 and November 10, 2016 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TestAmerica). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Method 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by SM 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, August 2014 (OSWER 9355.0-131, EPA 540-R-013-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L16J027-01	BBS-CCR-1 (10/28/16)
L16J027-02	BBS-CCR-2 (10/28/16)
L16J027-03	BBS-CCR-3 (10/28/16)
L16J027-04	BBS-CCR-BW-1 (10/28/16)
L16J027-05	BBS-CCR-BW-2 (10/28/16)

Laboratory ID	Client ID
L16K034-01	BBS-CCR-1 (11/10/16)
L16K034-02	BBS-CCR-2 (11/10/16)
L16K034-03	BBS-CCR-3 (11/10/16)
L16K034-04	BBS-CCR-BW-1 (11/10/16)
L16K034-05	BBS-CCR-BW-2 (11/10/16)

The samples collected on 10/28/2016 were received at TestAmerica Tampa outside the temperature criteria of  $4 \pm 2^{\circ}\text{C}$ ; the samples were received at  $0.4^{\circ}\text{C}$ . Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution

- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### **1.1 Overall Assessment**

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### **1.2 Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

### **1.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported, two for the method 200.7 data (batches 329861 and 331677), two for the method 200.8 data (batches 16J0235 and 16K0095), and two for the method 6010B data (batches 16J0236 and 16K0104). Metals were not detected in the method blanks above the method detection limit (MDL), with the following exception.

Calcium was detected at an estimated concentration, greater than the MDL and less than the reporting limit (RL), in the method blank associated with batch 16J0236. Since calcium was detected above the RL in the associated samples, no qualifications were applied to the data.

### **1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). One sample set specific MS/MSD pair was reported for the Method 6010B data, using sample BBS-CCR-BW-2(10/28/16), and one sample set specific MS/MSD pair was reported for the Method 200.8 data, using sample BBS-CCR-1(10/28/16). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria.

Batch MS/MSD pairs were also reported for Methods 200.7, 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **1.5 Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported, two for the Method 200.7 data, two for the Method 200.8 data and two for the Method 6010B data. The recovery results were within the laboratory specified acceptance criteria.

### **1.6 Serial Dilution**

Serial dilutions were not reported.

### **1.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

### **1.8 Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-BW-1 (10/28/16) due to the sample being analyzed at dilution. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **1.9 Electronic Data Deliverable Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

## **2.0 MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

✓ Overall Assessment

- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

## 2.1 **Overall Assessment**

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## 2.2 **Holding Times**

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## 2.3 **Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 16K0037 and 16K0106). Mercury was not detected in the method blanks above the MDL.

## 2.4 **Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS/MSD pair, using sample BBS-CCR-1(11/10/16), was reported. The recovery and RPD results were within the laboratory specified acceptance criteria.

A batch MS/MSD pair was also reported for the mercury data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

## **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

## **2.6 Field Duplicate**

Field duplicates were not reported with the sample sets.

## **2.7 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **2.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

## **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Field Blank
- ✓ Equipment Blank
- ✓ Field Duplicate



- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 3.1 Overall Assessment

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 3.2 Holding Times

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported, two for the radium-226 data and two for the radium-228 data. Radium-228 was detected in the method blank above the minimum detectable concentration (MDC) in batch L16K034 and radium-226 was detected above the MDC in the method blank associated with batches L16J027 and L16K034. Therefore, the detections of radium-228 with concentrations less than 10x the blank concentrations were J qualified as estimated. No qualifications were applied to the radium-226 and combined radium data (radium-226 + radium-228) since the concentrations were greater than 10x the blank concentration

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier*	Reason Code**
BBS-CCR-1 (11/10/16)	Radium-228	2.3	NA	2.3	J	3
BBS-CCR-2 (11/10/16)	Radium-228	0.9	NA	0.9	J	3
BBS-CCR-3 (11/10/16)	Radium-228	1.9	NA	1.9	J	3
BBS-CCR-BW1 (11/10/16)	Radium-228	3.6	NA	3.6	J	3

pCi/L-picocuries per liter

NA-not applicable

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

### **3.4 Matrix Spike**

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS, using sample BBS-CCR-BW1 (11/10/16), was reported for the radium-228 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported for radium-226 and two for radium-228. The recovery results were within the laboratory specified acceptance criteria.

### **3.6 Laboratory Duplicate**

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific laboratory duplicate, using sample BBS-CCR-BW1 (11/10/16), was reported for the radium-228 data. The RPD result was within the validation specified acceptance criteria.

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.7 Sensitivity**

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II report at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

#### **4.0 WET CHEMISTRY PARAMETERS**

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

##### **4.1 Overall Assessment**

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

##### **4.2 Holding Times**

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days. The holding times were met for the sample analyses.

##### **4.3 Method Blanks**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as

appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride was detected at estimated concentrations, greater than the MDLs and less than the RLs, in the method blanks associated with batches 16K0007 and 16K0150. Since chloride was detected above the RL in the associated samples, no qualifications were applied to the data.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate, using sample BBS-CCR-1 (10/28/16). The MS recoveries of chloride and sulfate were low and outside of laboratory specified acceptance criteria; therefore the concentrations of chloride and sulfate in sample BBS-CCR-1 (10/28/16) were J-qualified as estimated with a low bias.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (10/28/16)	Chloride	743	J-,V	743	J-	4
BBS-CCR-1 (10/28/16)	Sulfate	1230	J-	1230	J-	4

mg/L-milligrams per liter

J- laboratory flag indicating the reported value is estimated

V-laboratory flag indication the analyte was detected in the method blank

Batch MS/MSD were also reported for the wet chemistry parameters. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### 4.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates were reported for total dissolved solids using samples BBS-CCR-1 (10/28/16) and BBS-CCR-1 (11/10/16). The RPD results were within the laboratory specified acceptance criteria.

Two batch laboratory duplicates were also reported for the total dissolved solids analyses. Since these were batch QC there was no impact on the data.

#### **4.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **4.8 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.9 Electronic Data Deliverables Review**

Results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II report and the EDD.

---

\* \* \* \* \*

**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Memorandum

Date: 12 May 2017  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
**Subject: Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L17A041 and #L17D013, TestAmerica #660-78617-1 and #660-80222-1 and KNL Environmental Testing # L17A041 and # L17D013**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on January 26, 2017 and April 13, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.



Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L17A041-01	BBS-CCR-1 (1/26/17)
L17A041-02	BBS-CCR-2 (1/26/17)
L17A041-03	BBS-CCR-3 (1/26/17)
L17A041-04	BBS-CCR-BW-1 (1/26/17))
L17A041-05	BBS-CCR-BW-2 (1/26/17)

Laboratory ID	Client ID
L17D013-01	BBS-CCR-1 (4/13/17)
L17D013-02	BBS-CCR-2 (4/13/17)
L17D013-03	BBS-CCR-3 (4/13/17)
L17D013-04	BBS-CCR-BW-1 (4/13/17)
L17D013-05	BBS-CCR-BW-2 (4/13/17)

The samples collected on 1/26/2017 were received at TestAmerica Tampa outside the temperature criteria of  $4 \pm 2^{\circ}\text{C}$ ; the samples were received at  $15.0^{\circ}\text{C}$ . Based on professional and technical judgment, no qualifications were applied to the data due to the temperatures outside the criteria. No sample preservation issues were noted by the laboratories.

It was noted that the chain of custody (COC) for TA report 660-78617 listed the sample collection date as 1/25/2017, instead of the correct sample collection date of 1/26/2017. Therefore, the samples have the incorrect sampling date listed in TA report 660-78617. This did not impact the data and no qualifications were applied to the data.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times

- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

### 1.2 Holding Times

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (method 200.7 batches 340211 and 350739, method 200.8 batches 17A0263 and 17D0123, and method 6010B batches 17A0279 and 17D0115). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Cobalt was detected at an estimated concentration, greater than the MDL and less than the reporting limit (RL), in the method blank associated with batch 17D0123. Therefore, the estimated concentrations of cobalt in the associated samples were U qualified as not detected at the RL.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-1 (4/13/17)	Cobalt	0.505	I,V	2.0	U	3
BBS-CCR-2 (4/13/17)	Cobalt	0.114	I,V	2.0	U	3
BBS-CCR-3 (4/13/17)	Cobalt	0.110	I,V	2.0	U	3
BBS-CCR-BW1 (4/13/17)	Cobalt	1.69	I,V	2.0	U	3
BBS-CCR-BW2 (4/13/17)	Cobalt	0.129	I,V	2.0	U	3

µg/L-micrograms per liter

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

V- Analyte detected in the method blank

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

#### **1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for 6010B using sample BBS-CCR-1 (1/26/17) and 200.8 using samples BBS-CCR-1 (1/26/17) and BBS-CCR-BW-2 (4/13/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exception.

The recovery of boron in the MSD using sample BBS-CCR-1 (1/26/17) was high, outside the laboratory specified acceptance criteria. Since the boron concentration in sample BBS-CCR-1 (1/26/17) was greater than four times the spiked amount, no qualifications were applied to the boron data.

Batch MS/MSD pairs were also reported for Methods 200.7 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### **1.5 Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

#### **1.6 Serial Dilution**

Serial dilutions were not reported.

#### **1.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

### **1.8 Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-1(4/13/17) due to the sample being analyzed at dilution. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **1.9 Electronic Data Deliverable (EDD) Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

### **2.0 MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### **2.1 Overall Assessment**

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

## **2.2 Holding Times**

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## **2.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17A0273 and 17D0122). Mercury was not detected in the method blanks above the MDL.

## **2.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-2 (1/26/17) and BBS-CCR-1 (4/13/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

## **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

## **2.6 Field Duplicate**

Field duplicates were not reported with the sample sets.

## **2.7 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **2.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### **3.1 Overall Assessment**

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the project, is 100%.

#### **3.2 Holding Times**

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

#### **3.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (three for the radium-226 and three for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batches L17A041 and L17D013. Therefore, the detections of radium-226 and combined radium data (radium-226 + radium-228) with concentrations less than 10 times the blank concentrations were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
BBS-CCR-2 (1/26/17)	Radium-226	3.7	NA	3.7	J	3
BBS-CCR-2 (1/26/17)	Radium-226 + Radium-228	4.8	NA	4.8	J	3

pCi/L-picocuries per liter

NA-not applicable

### 3.4 Matrix Spike

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (1/26/17) and BBS-CCR-BW1 (4/13/17) for radium-228 and one sample set specific MS using sample BBS-CCR-BW2 (4/13/17) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported for radium-226 and three for radium-228. The recovery results were within the laboratory specified acceptance criteria.

### 3.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (1/26/17) and BBS-CCR-BW1 (4/13/17) for radium-228 and one sample set specific laboratory duplicate using sample BBS-CCR-BW2 (4/13/17) were reported for the radium-226 data.

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.7 Sensitivity**

The samples were reported to the MDCs. The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

## **4.0 WET CHEMISTRY PARAMETERS**

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ⊗ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

### **4.1 Overall Assessment**

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as



estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 4.1.1 Assessment Anomalies

The case narratives for laboratory reports L17A041 and L17D013 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of samples BBS-CCR-1 (1/26/17) and BBS-CCR-BW-1 (1/26/17); and BBS-CCR-1 (4/13/17) and BBS-CCR-BW-1 (4/13/17). Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (1/26/17)	Total Dissolved Solids	3670	J-	3670	J	13
BBS-CCR-BW1 (1/26/17)	Total Dissolved Solids	4510	J-	4510	J	13
BBS-CCR-1 (4/13/17)	Total Dissolved Solids	3110	J-	3110	J	13
BBS-CCR-BW1 (4/13/17)	Total Dissolved Solids	4060	J-	4060	J	13

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

#### 4.2 Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride was detected at an estimated concentration, greater than the MDL and less than the RL, in the method blank associated with batch 17A0275. Since chloride was detected above the RL in the associated samples, no qualifications were applied to the data.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate using samples BBS-CCR-2 (1/26/17) and BBS-CCR-2 (4/13/17). The recoveries and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of chloride, fluoride and sulfate were high, outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (1/26/17) and the recoveries of sulfate were low and outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (4/13/17). Therefore the concentrations of chloride and fluoride in sample BBS-CCR-2 (1/26/17) were J+ qualified as estimated with a high bias. Since the concentrations of sulfate were more than four times the spike in samples BBS-CCR-2 (1/26/17) and BBS-CCR-2 (4/13/17), no qualifications were applied to the sulfate data.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-2 (1/26/17)	Chloride	115	J-,V	115	J+	4
BBS-CCR-2 (1/26/17)	Fluoride	0.248	J-	0.248	J+	4

mg/L-milligrams per liter

J- laboratory flag indicating the reported value is estimated

V-laboratory flag indication the analyte was detected in the method blank

#### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### 4.6 Laboratory Duplicate

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates were reported for total dissolved solids using samples BBS-CCR-1 (1/26/17) and BBS-CCR-1 (4/13/17). The RPD results were within the laboratory specified acceptance criteria.

#### 4.7 Field Duplicate

Field duplicates were not reported with the sample sets.

#### **4.8 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.9 Electronic Data Deliverables Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

---

\* \* \* \* \*

**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Memorandum

Date: 25 August 2017  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
Subject: **Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L17F009 and #L17G024, TestAmerica #660-81511-1 and #660-81885-1 and KNL Environmental Testing # L17F009 and # L17G024**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on June 28, 2017 and July 20, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016 (GWMP), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L17F009-01	BBS-CCR-1 (6/28/17)
L17F009-02	BBS-CCR-2 (6/28/17)
L17F009-03	BBS-CCR-3 (6/28/17)
L17F009-04	BBS-CCR-BW-1 (6/28/17)
L17F009-05	BBS-CCR-BW-2 (6/28/17)

Laboratory ID	Client ID
L17G024-01	BBS-CCR-1 (7/20/17)
L17G024-02	BBS-CCR-2 (7/20/17)
L17G024-03	BBS-CCR-3 (7/20/17)
L17G024-04	BBS-CCR-BW-1 (7/20/17)
L17G024-05	BBS-CCR-BW-2 (7/20/17)

The samples were received at the laboratories at 1.3 °C, 2.0 °C, 2.4°C and 3.4 °C within the criteria of 0-6°C. No sample preservation or sample receipt issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity

- ✓ Electronic Data Deliverable Review

**1.1 Overall Assessment**

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

**1.2 Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

**1.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Eight method blanks were reported (method 200.7 batches 359159 and 361570, method 200.8 batches 17F0201 and 17G0141 and method 6010B batches 17F0185, 17F0216, 17G0203 and 17G0232). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Molybdenum in the method blank associated with batch 17F0216 and beryllium and calcium in the method blank associated with batch 17G0203 were detected at estimated concentrations, greater than the MDLs and less than the reporting limits (RLs). Therefore, the estimated concentrations of molybdenum and beryllium in the associated samples were U qualified as not detected at the RL. Since calcium was detected above the RL in the associated samples, no qualifications were applied to the calcium data.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-2 (6/28/17)	Molybdenum	9.59	I,V	20.0	U	3
BBS-CCR-3 (6/28/17)	Molybdenum	11.9	I,V	20.0	U	3



Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-BW1 (6/28/17)	Molybdenum	16.3	I,V	20.0	U	3
BBS-CCR-BW2 (6/28/17)	Molybdenum	10.2	I,V	20.0	U	3
BBS-CCR-2 (7/20/17)	Beryllium	0.423	I,V	2.00	U	3
BBS-CCR-3 (7/20/17)	Beryllium	0.356	I,V	2.00	U	3
BBS-CCR-BW2 (7/20/17)	Beryllium	0.220	I,V	2.00	U	3

µg/L-micrograms per liter

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

V- Analyte detected in the method blank

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

#### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for method 6010B using samples BBS-CCR-BW-2 (6/28/17), BBS-CCR-1 (7/20/17) and BBS-CCR-3 (7/20/17); for method 200.7 using sample BBS-CCR-1 (7/20/17); and for method 200.8 using samples BBS-CCR-1 (6/28/17) and BBS-CCR-1 (7/20/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The recovery of boron in the MSD using sample BBS-CCR-BW2 (6/28/17) was high, outside the laboratory specified acceptance criteria. Since the concentration of boron in sample BBS-CCR-BW2 (6/28/17) was greater than four times the spiked amount, no qualifications were applied to the boron data. Additionally, the laboratory narrative for report 660-81885-1 noted that the spiking compound was inadvertently omitted during the extraction process for the MS associated with batch 361570. Therefore, the MS recovery and RPD results for batch 361570 were not considered for this validation.

Batch MS/MSD pairs were also reported for Methods 200.7 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **1.5 Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Eight LCSs were reported; two for method 200.7, two for method 200.8 and four for method 6010B. The recovery results were within the laboratory specified acceptance criteria.

### **1.6 Serial Dilution**

Serial dilutions were not reported.

### **1.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

### **1.8 Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported for samples BBS-CCR-1 (7/20/2017), BBS-CCR-3 (7/20/2017), BBS-CCR-BW1 (7/20/2017) and BBS-CCR-BW2 (7/20/2017) due to the dilutions analyzed. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **1.9 Electronic Data Deliverable (EDD) Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

## 2.0 MERCURY

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 2.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

### 2.2 Holding Times

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17G0011 and 17G0170). Mercury was not detected in the method blanks above the MDL.

#### **2.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-3 (6/28/17) and BBS-CCR-BW1 (7/20/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

#### **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

#### **2.6 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **2.7 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **2.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times

- ✓ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### **3.1 Overall Assessment**

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

### **3.2 Holding Times**

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### **3.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (three for the radium-226 and three for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batches L17F009 and L17G024. Since the detections of radium-226 and combined radium data (radium-226 + radium-228) were greater than 10 times the blank concentrations in the associated samples, no qualifications were applied to the data.

### **3.4 Matrix Spike**

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (6/28/17) and BBS-CCR-1 (7/20/17) for radium-228 and three sample set specific MSs, using samples BBS-CCR-2 (6/28/17), BBS-CCR-2 (7/20/17) and BBS-CCR-BW1 (7/2-/2017) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

Batch MSs were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported for radium-226 and three for radium-228. The recovery results were within the laboratory specified acceptance criteria.

### **3.6 Laboratory Duplicate**

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (6/28/17) and BBS-CCR-1 (7/20/17) for radium-228 and three sample set specific laboratory duplicate using sample BBS-CCR-2 (6/28/17), BBS-CCR-2 (7/20/17) and BBS-CCR-BW1 (7/2-/2017) were reported for the radium-226 data.

Batch laboratory duplicates were also reported for the radium-226 and radium-228 data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

### **3.7 Sensitivity**

The samples were reported to the minimum detectable concentrations (MDCs). The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

## **4.0 WET CHEMISTRY PARAMETERS**

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ⊗ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the data set 100%.

##### 4.1.1 Assessment Anomalies

The case narratives for laboratory report L17G024 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of sample BBS-CCR-BW-1 (7/20/17). Therefore, the concentration of total dissolved solids in this sample was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-BW-1 (7/20/17)	Total Dissolved Solids	4160	J	4160	J	13

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

#### 4.2 Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from

sample collection to analysis. The holding times were met for the sample analyses, with the following exception.

The laboratory narrative for report L17G024 stated that the initial total dissolved solids result for sample BBS-CCR-1 (7/20/17) was below the expected result and the sample was reanalyzed outside of the method holding time. The reanalyzed total dissolved solids result was within the expected range and was reported. Since the reported total dissolved solids result for sample BBS-CCR-1 (7/20/17) was analyzed outside holding time the result was J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (7/20/17)	Total Dissolved Solids	3400	Q	3400	J	2

mg/L-milligrams per liter

Q-sample held beyond the method holding time

### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Chloride and fluoride were detected above the RL, in the method blank associated with batch 17H0125. Therefore, the concentrations of fluoride in the associated samples that were less than ten times the blank concentration were J+ qualified as estimated with a high bias. Since the concentrations of chloride in the associated samples were more than ten times the blank concentration, no qualifications were applied to the data.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (7/20/17)	Fluoride	0.157	J-, V	0.157	J	3
BBS-CCR-2 (7/20/17)	Fluoride	0.166	J-, V	0.166	J	3
BBS-CCR-3 (7/20/17)	Fluoride	0.230	J-, V	0.230	J	3
BBS-CCR-BW1 (7/20/17)	Fluoride	0.255	J-, V	0.255	J	3
BBS-CCR-BW1 (7/20/17)	Fluoride	0.319	J-, V	0.319	J	3

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

V-analyte detected in the method blank



#### **4.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were reported for the wet chemistry data. Sample set specific MS/MSD pairs were reported for chloride, fluoride and sulfate using sample BBS-CCR-2 (6/28/17). The recoveries and RPD results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of sulfate were high, outside laboratory specified acceptance criteria in the MS/MSD pair using sample BBS-CCR-2 (6/28/17). Since the concentration of sulfate in sample BBS-CCR-2 (6/28/17) was more than four times the spike amount, no qualifications were applied to the sulfate data.

Batch MS/MSD pairs were also reported for the chloride, fluoride and sulfate data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### **4.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### **4.6 Laboratory Duplicate**

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific laboratory duplicate was reported for total dissolved solids using sample BBS-CCR-1 (6/28/17). The RPD results were within the laboratory specified acceptance criteria.

#### **4.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **4.8 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.9 Electronic Data Deliverables Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

---

\* \* \* \* \*

**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other

## Memorandum

Date: 30 November 2017  
To: Todd Kafka  
From: Chris Pracheil  
CC: J. Caprio  
Subject: **Stage 2A Data Validation – Level II Data Deliverable – Tampa Electric Laboratory Services #L17H005 and L17J115, TestAmerica #660-82456-1 and #660-83441-1 and KNL Environmental Testing #L17H005 and L17J115**

**SITE: Big Bend Power Station, Apollo Beach, Florida**

### INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of 10 water samples, collected on August 16, 2017 and October 13, 2017 as part of the Big Bend Power Station coal combustion residuals (CCR) groundwater monitoring program plan. The lithium analyses were performed by TestAmerica Tampa, Tampa, Florida (TA). The radium analyses were performed by KNL Environmental Testing, Tampa, Florida (KNL). The rest of the analyses were performed by Tampa Electric Laboratory Services, Tampa, Florida (TELS). The samples were analyzed for the following:

- Metals by EPA Methods 200.7, 200.8 and 6010B
- Mercury by EPA Method 7470A
- Radium-226 by EPA Method 903.0
- Radium-228 by EPA Method Ra-05
- Chloride, Fluoride and Sulfate by EPA Method 300.0
- Total Dissolved Solids by Standard Method 2540C

### EXECUTIVE SUMMARY

The samples were handled, prepared, and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations of the qualifications.

The inorganic data were reviewed based on the following: CCR Groundwater Monitoring Program Plan, Big Bend Power Station, Apollo Beach, Florida, September 2016 (GWMP), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, January 2017 (OLEM 9355.0-135, EPA 540-R-2017-001), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

Laboratory ID	Client ID
L17H005-01	BBS-CCR-1 (8/16/17)
L17H005-02	BBS-CCR-2 (8/16/17)
L17H005-03	BBS-CCR-3 (8/16/17)
L17H005-04	BBS-CCR-BW-1 (8/16/17)
L17H005-05	BBS-CCR-BW-2 (8/16/17)

Laboratory ID	Client ID
L17J115-01	BBS-CCR-1 (10/13/17)
L17J115-02	BBS-CCR-2 (10/13/17)
L17J115-03	BBS-CCR-3 (10/13/17)
L17J115-04	BBS-CCR-BW-1 (10/13/17)
L17J115-05	BBS-CCR-BW-2 (10/13/17)

The samples were received at the laboratories at 1.6°C and 2.6 °C within the criteria of 0-6°C. No sample preservation or sample receipt issues were noted by the laboratories.

## 1.0 TOTAL METALS

The samples were analyzed for total metals per EPA Methods 200.7, 200.8 and 6010B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ⊗ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Field Duplicate
- ✓ Sensitivity

✓ Electronic Data Deliverable Review

**1.1 Overall Assessment**

The metals data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

**1.2 Holding Times**

The holding time for the metals analysis of waters is 180 days from sample collection to analysis. The holding time was met for the sample analyses.

**1.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six method blanks were reported (method 200.7 batches 365468 and 372467, method 200.8 batches 17H0157 and 17J0116 and method 6010B batches 17H0161 and 17J0144). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

Lithium was detected at an estimated concentration, greater than the MDL and less than the reporting limits (RL) in the method blanks associated with batches 365468 and 372467. Therefore, the estimated concentrations of lithium in the associated samples were U qualified as not detected at the RL.

Client Sample ID	Compound	Laboratory Result (µg/L)	Laboratory Flag	Validation Result (µg/L)	Validation Qualifier*	Reason Code**
BBS-CCR-1 (8/16/17)	Lithium	0.013	I	0.050	U	3
BBS-CCR-2 (8/16/17)	Lithium	0.016	I	0.050	U	3
BBS-CCR-3 (8/16/17)	Lithium	0.011	I	0.050	U	3
BBS-CCR-BW-1 (8/16/17)	Lithium	0.017	I	0.050	U	3
BBS-CCR-BW-2 (8/16/17)	Lithium	0.0062	I,V	0.050	U	3
BBS-CCR-1 (10/13/17)	Lithium	0.015	I,V	0.050	U	3
BBS-CCR-2 (10/13/17)	Lithium	0.016	I,V	0.050	U	3
BBS-CCR-3 (10/13/17)	Lithium	0.011	I,V	0.050	U	3
BBS-CCR-BW-1 (10/13/17)	Lithium	0.017	I,V	0.050	U	3
BBS-CCR-BW-2 (10/13/17)	Lithium	0.0082	I,V	0.050	U	3

µg/L-micrograms per liter

I- laboratory flag indicating the reported value is estimated, greater than MDL and less than RL

V- laboratory flag indicating analyte was detected in both the sample and the associated method blank and the value in the sample was less than 10 times the blank value

\* Validation qualifiers are defined in Attachment 1 at the end of this report

\*\*Reason codes are defined in Attachment 2 at the end of this report

#### **1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)**

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one pair per batch of 20 samples). Sample set specific MS/MSD pairs were reported for method 6010B using sample BBS-CCR-BW-1 (8/16/17); for method 200.7 using samples BBS-CCR-1 (8/16/17) and BBS-CCR-1 (10/13/17); and for method 200.8 using samples BBS-CCR-1 (8/16/17) and BBS-CCR-1 (10/13/17). The recovery and relative percent difference (RPD) results were within the laboratory specified acceptance criteria, with the following exceptions.

The recoveries of boron and calcium in the MS/MSD pair using sample BBS-CCR-BW-1 (8/16/17) were high, outside the laboratory specified acceptance criteria. Since the concentration of boron in sample BBS-CCR-BW-1 (8/16/17) was greater than four times the spiked amount, no qualification was applied to the boron data.

Batch MS/MSD pairs were also reported for Methods 200.8 and 6010B data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### **1.5 Laboratory Control Sample (LCS)**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Six LCSs were reported; two for method 200.7, two for method 200.8 and two for method 6010B. The recovery results were within the laboratory specified acceptance criteria.

#### **1.6 Serial Dilution**

Serial dilutions were not reported.

#### **1.7 Field Duplicate**

Field duplicates were not reported with the sample sets.



### **1.8 Sensitivity**

The samples were reported to the MDLs. Elevated non-detect results were reported for sample BBS-CCR-2 (8/16/17) due to the dilutions analyzed. The MDLs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **1.9 Electronic Data Deliverable (EDD) Review**

The results and sample identifications (IDs) in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

### **2.0 MERCURY**

The samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### **2.1 Overall Assessment**

The mercury data reported in this package are considered usable for meeting project objectives. The results are considered valid; analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

## **2.2 Holding Times**

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## **2.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 17H0163 and 17J0184). Mercury was not detected in the method blanks above the MDL.

## **2.4 Matrix Spike/Matrix Spike Duplicate**

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples BBS-CCR-BW-2 (8/16/17) and BBS-CCR-2 (10/13/17), were reported. The recoveries and RPD results were within the laboratory specified acceptance criteria.

## **2.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

## **2.6 Field Duplicate**

Field duplicates were not reported with the sample sets.

## **2.7 Sensitivity**

The samples were reported to the MDL. No elevated non-detect results were reported. The MDL for mercury met the limit listed in Table 4 of the CCR Groundwater Monitoring Plan.

## **2.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

### **3.0 RADIUM-226 AND RADIUM-228**

The samples were analyzed for radium 226 and radium 228 per EPA Methods 903.0 and RA-05, respectively.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine the impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

#### **3.1 Overall Assessment**

The radium-226 and radium-228 data reported in this package are considered usable for meeting project objectives. The results are considered valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis for the data set is 100%.

#### **3.2 Holding Times**

The holding times for radium-226 and radium-228 analysis of waters are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

#### **3.3 Method Blank**

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Four method blanks were reported (two for the radium-226 and two for the radium-228). The method blanks were within validation criteria with the following exceptions.

Radium-226 was detected at concentrations greater than 1.65 times the combined standard uncertainty (CSU) in batch L17J115. Since the detections of radium-226 and combined radium data (radium-226 + radium-228) were greater than 10 times the blank concentrations in the associated samples, no qualifications were applied to the data.

### **3.4 Matrix Spike**

MSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MSs, using samples BBS-CCR-BW1 (8/16/17) and BBS-CCR-1 (10/13/17) were reported for radium-228 and two sample set specific MSs, using samples BBS-CCR-2 (8/16/17) and BBS-CCR-BW2 (10/13/2017) were reported for the radium-226 data. The recovery results were within the laboratory specified acceptance criteria.

### **3.5 Laboratory Control Sample**

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported for radium-226 and two for radium-228. The recovery results were within the laboratory specified acceptance criteria.

### **3.6 Laboratory Duplicate**

Laboratory duplicates were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific laboratory duplicates, using samples BBS-CCR-BW1 (8/16/17) and BBS-CCR-1 (10/13/17) were reported for radium-228 and two sample set specific laboratory duplicates using samples BBS-CCR-2 (8/16/17) and BBS-CCR-BW2 (10/13/2017) were reported for the radium-226 data. The RPD results for the laboratory duplicates were within the laboratory acceptance criteria.

### **3.7 Sensitivity**

The samples were reported to the minimum detectable concentrations (MDCs). The reported MDCs met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

### **3.8 Electronic Data Deliverable Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

#### 4.0 WET CHEMISTRY PARAMETERS

The samples were analyzed for chloride, fluoride and sulfate by EPA Method 300.0 and total dissolved solids by SM 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ⊗ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

#### 4.1 Overall Assessment

The wet chemistry data reported in this package are considered usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the data set 100%.

##### 4.1.1 Analytical Anomalies

The case narratives for laboratory report L17H005 noted that a constant weight could not be achieved after three consecutive weighing and drying cycles for the total dissolved solids analysis of samples BBS-CCR-1 (8/16/17) and BBS-CCR-BW-2 (8/16/17). Therefore, the concentrations of total dissolved solids in these samples were J qualified as estimated.

Client Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
BBS-CCR-1 (8/16/17)	Total Dissolved Solids	2960	J	2960	J	13
BBS-CCR-BW-2 (8/16/17)	Total Dissolved Solids	1180	J	1180	J	13

mg/L-milligrams per liter

J-laboratory flag indicating the reported value is an estimated value

#### 4.2 Holding Times

The holding times for chloride, fluoride and sulfate by EPA method 300.0 are 28 days from sample collection to analysis and the holding time for total dissolved solids by SM 2540C is 7 days from sample collection to analysis. The holding times were met for the sample analyses.

#### 4.3 Method Blanks

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Method blanks were reported for each analysis as appropriate. The wet chemistry parameters were not detected in the method blanks above the MDLs.

#### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Batch MS/MSD pairs were reported for the chloride, fluoride and sulfate data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). LCSs were reported for each analysis as appropriate. The recovery results were within the laboratory specified acceptance criteria.

#### 4.6 Laboratory Duplicate

Laboratory duplicates were reported for the total dissolved solids data. One sample set specific laboratory duplicate was reported for total dissolved solids using sample BBS-CCR-1 (8/16/17). The RPD results were within the laboratory specified acceptance criteria.

Batch laboratory duplicates were also reported for the total dissolved solids data. Since these are batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

#### **4.7 Field Duplicate**

Field duplicates were not reported with the sample sets.

#### **4.8 Sensitivity**

The samples were reported to the MDLs. The MDLs reported met the limits listed in Table 4 of the CCR Groundwater Monitoring Plan.

#### **4.9 Electronic Data Deliverables Review**

The results and sample IDs in the EDD were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDD.

---

\* \* \* \* \*

**ATTACHMENT 1**  
**DATA VALIDATION QUALIFIER DEFINITIONS**  
**AND INTERPRETATION KEY**  
**Assigned by Geosyntec's Data Validation Team**

**DATA QUALIFIER DEFINITIONS**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The analyte was positively identified; however, the associated numerical value is likely to be higher than the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.
- J- The analyte was positively identified; however, the associated numerical value is likely to be lower than the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.
- UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.



**ATTACHMENT 2**  
**DATA VALIDATION REASON CODES**  
**Assigned by Geosyntec's Data Validation Team**

<b>Valid Value</b>	<b>Description</b>
1	Preservation requirement not met
2	Analysis holding time exceeded
3	Blank contamination (i.e., method, trip, equipment, etc.)
4	Matrix spike/matrix spike duplicate recovery or RPD outside limits
5	LCS or RPD recovery outside limits (LCS/LCSD)
6	Surrogate recovery outside limits
7	Field Duplicate RPD exceeded
8	Serial dilution percent difference exceeded
9	Calibration criteria not met
10	Linear range exceeded
11	Internal standard criteria not met
12	Lab duplicates RPD exceeded
13	Other