Prepared for

Gulf Power Company
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Pensacola, Florida 32520

ASSESSMENT OF CORRECTIVE MEASURES REPORT

GULF POWER COMPANY, PLANT SMITH ASH POND

Prepared by

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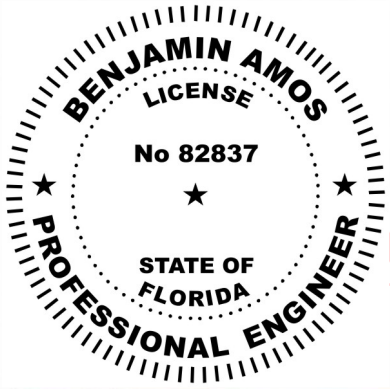
CERTIFICATION STATEMENT

This *Assessment of Corrective Measures Report, Gulf Power Company – Plant Smith – Ash Pond* has been prepared in general accordance with the requirements of the United States Environmental Protection Agency coal combustion residuals rule (40 Code of Federal Regulations [CFR] Part 257, Subpart D) under the supervision of a State of Florida licensed Professional Engineer and Professional Geologist with Geosyntec Consultants, Inc.



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1.0 INTRODUCTION

1.1 Purpose and Scope

On behalf of Gulf Power Company (Gulf Power), Geosyntec Consultants, Inc. (Geosyntec) prepared this *Assessment of Corrective Measures Report* (Report) for Gulf Power's Plant Lansing Smith (Plant Smith or Site) coal combustion residuals (CCR) unit, the Ash Pond.

Pursuant to 40 Code of Federal Regulations [CFR] §257.96) (CCR Rule), the Assessment of Corrective Measures (ACM) was initiated on January 13, 2019[1] in response to detections of two Appendix IV constituents (arsenic, lithium) at statistically significant levels (SSLs).

The purpose of this Report is to document the assessment of potential corrective measures to address the observed SSLs for arsenic and lithium at the Site.

1.2 Requirements

In accordance with the CCR Rule, this Report provides an assessment of potential corrective measures for groundwater remediation at the Plant Smith Ash Pond. The requirements of the ACM as outlined in the CCR Rule include:

(1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;

(2) The time required to begin and complete the remedy; and

(3) The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

[1] For reference, the need for a 60-day extension to complete the ACM due to site-specific considerations was documented on April 12, 2019 and will be included in the 2019 Annual Report.

2.0 SITE BACKGROUND

2.1 Site Description

Plant Smith is an electric power generating facility located at 4300 County Road 2300, Bay County, Florida. The Plant Smith property is approximately 1,560 acres, and the former operational area is approximately 730 acres. Site topography is relatively flat. The Site is bordered by undeveloped land to the north and east, Alligator Bayou to the west, and North Bay to the south. A Site location map is presented as **Figure 1**.

Plant Smith consists of two retired coal-fired units (Units 1 and 2), a natural gas combined-cycle unit (Unit 3), and an oil-fired combustion turbine used for peak generation.

2.2 CCR Unit Description

The Ash Pond is located on the southern portion of the Site near North Bay and occupies approximately 165 acres. Fly ash, bottom ash, and other low-volume waste were sluiced to the Ash Pond until March 2015. The Ash Pond has ceased receipt of CCR waste but continues to receive non-CCR wastewater. Gulf Power is preparing to close the Ash Pond in accordance with a State-approved closure plan (Gulf Power, 2016).

2.3 Hydrogeologic Site Conditions

The principal aquifers beneath Bay County include the surficial aquifer system (SAS), the intermediate aquifer system (IAS), and the Floridan Aquifer System (FAS) (Pratt, 1996). The SAS is the shallowest and is an unconfined system formed by recent terrace sands, the Citronelle Formation, and the upper portions of the Intracoastal Formation in hydraulic connection with these sediments. The general direction of flow is toward the south-southwest.

The IAS in Bay County is semi-confined and consists of the low permeability sediments of the Jackson Bluff and the Intracoastal Formations. Permeable portions of the Intracoastal Formation provide sufficient quantities of water for potable use. Overall, the IAS acts as a confining unit for the underlying FAS. The FAS is a confined aquifer and the principal water bearing unit in Bay County consistent with the Bruce Creek Formation.

The CCR monitoring wells and piezometers (MW-01 to MW-14) are screened in the uppermost water-bearing zone in the undifferentiated quaternary alluvium of the surficial aquifer system overlaying the Jackson Bluff formation. The surficial aquifer system at the Site is considered the uppermost aquifer for groundwater monitoring purposes. Site-specific lithology in the uppermost aquifer consists primarily of sand, silt, and clay mixtures. Groundwater in the surficial aquifer system at the Site is encountered in a laterally-extensive water-bearing unit of predominantly fine sand from approximately 5 to -20 ft elevation relative to the North American Vertical Datum of 1988 (NAVD88). MW-01 to MW-14 are screened in the uppermost aquifer between approximately 2 and -21 ft NAVD88.

Groundwater in the vicinity of the Ash Pond flows radially away from the CCR Unit, as evidenced by recent potentiometric surfaces documented in the *2018 Annual Groundwater Monitoring Report* (Geosyntec, 2019).

2.4 Groundwater Monitoring Activities

2.4.1 General Groundwater Conditions

Pursuant to the CCR Rule, in 2015 Gulf Power installed and certified a CCR groundwater monitoring system for the Ash Pond within the uppermost aquifer at the Site (Southern Company, 2018). Monitoring wells in the groundwater monitoring network are listed below:

- Background: MW-02, MW-03, and MW-12;
- Downgradient: MW-06, MW-07, MW-08, MW-09, MW-10, MW-11, MW-13, and MW-14; and
- Piezometers: MW-01, MW-04, and MW-05.

The locations of the CCR monitoring wells and piezometers are presented on **Figure 2**, with construction details provided in **Table 1**.

In accordance with the CCR Rule, Gulf Power initiated an assessment monitoring program for the Ash Pond in March 2018. Samples collected during the semi-annual assessment monitoring events were analyzed for all Appendix III constituents and those Appendix IV constituents detected in the March 2018 assessment monitoring event. Statistical analysis of the CCR-groundwater monitoring data identified SSLs of several

Appendix IV constituents (Geosyntec, 2019). The following SSLs were identified at the Ash Pond:

- radium 226 and 228 combined (total radium) in MW-06, MW-07, MW-08, MW-09, MW-10, MW-11, MW-13 and MW-14;
- arsenic in MW-11; and
- lithium in MW-13.

In accordance with the CCR Rule, Gulf Power conducted an alternate source demonstration (ASD) which documented that the total radium SSLs were from a source other than the Ash Pond (Geosyntec, 2019). As such, this Report focuses on evaluation of applicable remedial options for arsenic near MW-11 and lithium near MW-13.

2.4.2 Nature and Extent

Following identification of SSLs and pursuant with the CCR Rule, Gulf Power initiated characterization activities to evaluate the nature and extent of lithium and arsenic impacts.

Delineation Sampling

In March 2019, Gulf Power sampled groundwater from piezometers in the vicinity of MW-13 to delineate the nature and extent of lithium. This included shallow (PZ-14) and deep (PZ-13D) piezometers to evaluate horizontal (downgradient) and vertical impacts, respectively. Installation details for PZ-14 and PZ-13D are provided in **Table 1** and locations are shown in **Figure 3**.

To delineate the nature and extent of arsenic near MW-11, samples were collected in March 2019 from a deep piezometer (PZ-11D) and a shallow well (MWI-12A). These locations were used to evaluate vertical and horizontal (downgradient) impacts, respectively. Construction information for MWI-12A and PZ-11D are provided in **Table 1** and locations are shown in **Figure 3**.

Groundwater samples were collected in accordance with the methods described in the *2018 Annual Groundwater Monitoring Report* (Geosyntec, 2019) and analyzed for all Appendix III and those Appendix IV parameters detected in the March 2018 assessment monitoring event (Geosyntec, 2019). Laboratory analyses were performed by TestAmerica, Inc. Laboratories (TAL). TAL is accredited by the National Environmental

Laboratory Accreditation Program (NELAP) and maintains a NELAP certification for all parameters analyzed for this project. Data were validated consistent with the methods presented in the *2018 Annual Groundwater Monitoring Report* (Geosyntec, 2019). A summary of results is presented in **Table 2**. Laboratory, data validation, and field sampling reports are included in **Appendix A**.

Delineation Results

Groundwater results from PZ-14 and PZ-13D included lithium concentrations approximately 2- to 8-fold below the groundwater protection standard (GWPS) of 0.04 milligrams per liter (mg/L), indicating complete horizontal and vertical delineation of the lithium SSL at MW-13. Other detected Appendix IV constituents, with the exception of total radium, were below the applicable GWPSs. Total radium was detected at concentrations within the range observed during prior sampling events and, consistent with the ASD, the total radium detects are from a source other than the Ash Pond (Geosyntec, 2019).

Groundwater results from PZ-11D were non-detect for arsenic, and 20-fold below the GWPS of 0.01 mg/L for arsenic in MWI-12A. These results indicate complete horizontal and vertical delineation of the arsenic at MW-11. Other detected Appendix IV constituents, with the exception of total radium, were below the applicable GWPSs. Concentrations of total radium were consistent with an alternative source, as documented in the ASD.

3.0 ACM OBJECTIVES AND EVALUATION PROCEDURE

3.1 Source Control

Source control at Plant Smith will be achieved by closure of the Ash Pond in accordance with the State-approved closure plan (Gulf Power, 2016). The Ash Pond will be closed in compliance with the Florida groundwater and surface water standards as required under the current Permit No. FL0002267. The plan for closure of the Plant Smith Ash Pond was approved by the Northwest District Solid Waste Section on August 19, 2016 and includes the following:

- dewatering of all CCR material in the Ash Pond;
- transfer of the CCR from the southern portion of the Ash Pond to the dry stack area within the northern portion of the Ash Pond;
- distribution, compaction, and then capping the CCR material in the dry stack area with engineered turf; and
- construction of industrial wastewater and stormwater detention ponds in the remaining pond space.

Final closure certification is expected in 2023 (Gulf Power, 2016). This in-place closure strategy will act to contain impacted materials and minimize potential release of CCR material.

3.2 Objectives of Groundwater Remedial Technology Evaluation

The objective of the remedial technology evaluation at Plant Smith is to assess the applicability of potential remedial technologies to address lithium and arsenic concentrations above GWPSs.

3.3 Evaluation Procedure Overview

The remedial technology evaluation process involved a step-wise identification, screening, and evaluation of potentially applicable remedial technologies, culminating in development and more detailed analysis of corrective measure alternatives for groundwater. First, several remedial technologies were screened for general technology advantages, limitations, and applicability to important Site-specific conditions (see **Table 3**). Technologies retained from the initial screening level evaluation were utilized to develop groundwater corrective measure alternatives, some of which consist of a

combination of remedial technologies. The corrective measure alternatives were subject to a detailed Site-specific analysis, as summarized in **Table 4**, based on assessment of corrective measures criteria presented in 40 CFR §257.96. The remedy selection criteria in 40 CFR §257.97 were also considered as part of the ACM process, as summarized in **Table 5**.

4.0 ASSESSMENT OF CORRECTIVE MEASURES

4.1 Remedial Technology Screening Evaluation

The remedial technology screening evaluation for applicability of potential groundwater remedies at the Plant Smith Ash Pond is presented in **Table 3**. The initial screening process focused on remedial technologies that are broadly applicable to CCR-related constituents and/or applied at CCR units, including the following:

- Monitored Natural Attenuation (MNA)
- Hydraulic Containment (Pump and Treat)
- In-Situ Injection
- Permeable Reactive Barrier (PRB)
- Vertical Barrier Wall
- Phytoremediation/TreeWell® system

Table 3 provides a description of each of the above groundwater remedial technologies, advantages and limitations associated with each technology, and Site-specific considerations relevant to the potential for remedial success.

Based on the evaluation summarized in **Table 3**, three of the groundwater remedial technologies were considered to be most applicable for the Site and carried forward into the more detailed evaluation.

4.2 Development of Groundwater Corrective Measures

Groundwater corrective measures consisting of one or more technologies were assembled from the retained technologies from the initial screening evaluation discussed in Section 4.1. The range of corrective action alternatives developed for Plant Smith groundwater includes the following:

- Alternative 1: MNA
- Alternative 2: Hydraulic Containment (Pump and Treat) and MNA

- Alternative 3: Vertical Barrier Wall and MNA

As summarized in Section 3.1, the State-approved closure plan for the Ash Pond is considered a source control measure. As such, the source control measure was not included in the detailed evaluations presented in **Tables 4 and 5**.

4.3 Description of Evaluated Groundwater Alternatives

The groundwater corrective measure alternatives developed in Section 4.2 were subjected to a detailed Site-specific analysis, as summarized in **Tables 4 and 5**, relative to applicable criteria summarized in Section 3.3. A brief description of each alternative is provided in this section.

Alternative 1: MNA

MNA relies on natural attenuation processes to achieve site-specific remediation objectives within a reasonable timeframe. Under certain conditions (e.g., through sorption, mineral precipitation or oxidation-reduction reactions), MNA effectively reduces the dissolved concentrations and/or toxic forms of inorganic constituents in groundwater. Attenuation processes include mineral precipitation, sorption reactions such as adsorption on the surfaces of soil minerals, absorption into the matrix of soil minerals, or partitioning into organic matter, dilution, dispersion, and radioactive decay. Further, oxidation-reduction (redox) reactions via abiotic or biotic processes, can transform the valence states of some inorganic constituents to less soluble and thus less mobile and/or less toxic forms. The attenuation mechanisms for each constituent are often unique and/or depend on site conditions. Implementation of an MNA process requires monitoring and evaluation of these attenuation processes. The timeframe to achieve cleanup goals is highly variable (from years to decades); as such, MNA remedies often include a remedial decision framework for development of contingent remedies.

Under the right conditions, MNA can be effective as a stand-alone technology to achieve and maintain GWPS for arsenic and lithium. The effectiveness of MNA can be enhanced when coupled with source control (i.e., through Ash Pond closure and capping). Based on Site data, arsenic and lithium exceedances are spatially limited, suggesting ongoing natural attenuation. Attenuation processes for arsenic and lithium are expected to be enhanced by source control measures, which would likely reduce the time required to meet remedial objectives. Despite variable remedial timeframes, MNA is expected to be successful within a reasonable timeframe following completion of Ash Pond closure, assuming aquifer conditions that result in arsenic and lithium attenuation remain

favorable. Following source control, improving our current understanding and documentation of Site- and constituent-specific attenuation mechanisms and/or temporal concentration changes will assist in predicting long-term performance.

Alternative 2: Hydraulic Containment (Pump and Treat) and MNA

Hydraulic Containment (Pump and Treat) involves the extraction of impacted groundwater to induce artificial gradients, which prevents plume migration and facilitates removal of constituent mass. Impacted groundwater is removed through a series of extraction wells (or trenches) installed with screen intervals in the target zone, operating at design flow rates which result in capture of the groundwater plume. If needed, extracted groundwater is then treated aboveground for appropriate disposal. Hydraulic containment systems require significant capital expenditures for proper design (of both the extraction system and groundwater treatment system), construction, and operation. Hydraulic containment is an active remediation technology with a proven track record.

While an extraction well system could be designed and installed, challenges may be incurred with the design and operation of the aboveground treatment system based on the constituent mixture and/or extraction flow rates. A variety of sorption and precipitation approaches exist for the treatment of arsenic; however, challenges may be encountered in finding an appropriate and demonstrated treatment technology for lithium. Potential applications for lithium treatment include reverse osmosis and integrated precipitation/co-precipitation systems. Similar to constituent-specific considerations, a significant volume of extracted groundwater is anticipated for hydraulic containment given the Site's sandy aquifer. In addition, management of the treatment system effluent may require potential modifications to the existing National Pollutant Discharge Elimination System (NPDES) discharge permit or attainment of additional permits.

Hydraulic Containment is routinely coupled with MNA, which is a component of this alternative. MNA can occur during operation of the extraction system. In addition, once the Pump and Treat system has successfully achieved the desired level of performance, the Site can transition to an MNA-only remedy as a polishing step to further reduce concentrations and/or maintain constituents below the GWPSs. Additional discussion of MNA was provided in the above discussion for Alternative 1.

Alternative 3: Vertical Barrier Wall and MNA

Installation of a vertical barrier wall provides a physical barrier to limit migration of impacted groundwater to downgradient areas. Vertical barrier walls are placed in the

subsurface, typically surrounding the source area. The low permeability materials associated with vertical barrier wall construction serve as a barrier preventing migration of groundwater constituents. Despite well-established methods and precedent for use during CCR unit closure activities, a vertical barrier wall may require significant time and investment for proper Site-specific design and construction. Installation can be complex and requires significant staging areas, Site disruption, and construction oversight.

A vertical barrier wall, coupled with source control via capping at Plant Smith, is anticipated to be an effective short- and long-term solution for groundwater containment and mitigation of further groundwater migration. Downgradient monitoring would confirm system performance. Downgradient of the vertical barrier wall, MNA would be used to address arsenic and lithium impacts. MNA is anticipated to be effective for arsenic and lithium attenuation in downgradient areas following completion of the Ash Pond closure via capping and vertical barrier wall installation. Additional discussion of MNA was provided in the above discussion for Alternative 1.

5.0 REMEDY SELECTION PROCESS

5.1 Additional Data or Characterization Needs

The Appendix IV exceedances of GWPSs for arsenic and lithium observed at Plant Smith were successfully delineated in the vicinity of MW-11 and MW-13, respectively. Therefore, no additional Site data are needed to define the nature and extent of impacted groundwater.

Groundwater conditions will need to be monitored during and following completion of Ash Pond closure, which may influence ongoing attenuation processes. Improved understanding and documentation of Site- and constituent-specific attenuation mechanisms and/or temporal concentration changes following source control will assist in predicting long-term performance of any of the groundwater corrective measure alternatives considered herein.

In the interim, continued groundwater assessment monitoring in accordance with the CCR Rule will provide useful data to support Gulf Power's selection of a groundwater corrective measure for the Site.

5.2 Schedule for Selecting Remedy

The final groundwater remedy will be selected pursuant to the requirements identified in 40 CFR §257.97, including consideration of stakeholder input. At least 30 days prior to the selection of a final remedy, a public meeting will be held in accordance with 40 CFR §257.96(e). Depending on the timing of the public meeting and final remedy selection, semiannual report(s) will be prepared describing the progress in remedy selection. Upon selection of the final remedy, a final report describing the remedy and how it will meet the standards of 40 CFR §257.97(b) will be completed.

6.0 REFERENCES

Geosyntec, 2019. 2018 Annual Groundwater Monitoring Report. Gulf Power Company – Plant Smith Ash Pond. January 31, 2019.

Gulf Power Company, 2016. *Plant Smith Ash Pond Closure Plan*. May 26, 2016.

Pratt, Thomas R., Christopher J. Richards, Katherine A. Milla, Jeffry R. Wagner, Jay L. Johnson, and Ross J. Curry, 1996. *Hydrogeology of the Northwest Florida Water Management District.* Water Resources Special Report 96-4. October.

Southern Company, 2018. 2017 Annual Groundwater Monitoring and Corrective Action Report. Gulf Power Company – Plant Smith Ash Pond. January 31, 2018.

TABLES

TABLE 1: MONITORING WELL NETWORK SUMMARY
Plant Smith - Ash Pond, Gulf Power Company, Bay County, Florida

Well Name	Installation Date	Northing	Easting	Ground Elevation	Top of Casing Elevation	Top of Screen Elevation	Bottom of Screen Elevation	Designation
CCR Groundwater Monitoring Network								
MW-01	11/11/2015	464368.78	1589789.76	11.09	10.75	1.15	-8.85	Piezometer
MW-02	11/10/2015	464419.66	1592286.78	10.26	13.29	-2.71	-12.71	Background
MW-03	11/10/2015	464322.49	1594277.21	10.98	14.06	-8.94	-18.94	Background
MW-04	11/7/2015	464027.17	1591388.6	12	15.05	2.25	-7.75	Piezometer
MW-05	11/4/2015	463987.97	1592784.03	11.18	14.13	-1.97	-11.97	Piezometer
MW-06	11/17/2015	463858.8	1591389.13	24.18	23.82	-5.38	-15.38	Downgradient
MW-07	11/3/2015	463856.65	1592774.97	21.72	21.42	-7.88	-17.88	Downgradient
MW-08	11/17/2015	461649.15	1590479.94	21.33	24.31	-8.39	-18.39	Downgradient
MW-09	11/17/2015	460663.62	1590695.95	12.49	15.37	-6.73	-16.73	Downgradient
MW-10	11/20/2015	461234.34	1592098.52	10.94	13.93	-8.67	-18.67	Downgradient
MW-11	11/21/2015	462157.18	1593298.86	13.42	16.51	-6.49	-16.49	Downgradient
MW-12	11/11/2015	462362	1589322.96	8.21	11.14	-10.56	-20.56	Background
MW-13	11/11/2015	462676.94	1590589.33	23.53	26.54	-6.36	-16.36	Downgradient
MW-14	11/10/2015	460892.89	1590173.47	22.11	24.95	-5.69	-15.69	Downgradient
Groundwater Monitoring Location for Delineation								
MWI-12A	Unknown	461669.34	1593482.68	Unknown	9.82	4.32	-5.68	Delineation Well
PZ-11D	12/5/2018	462128.91	1593287.38	10.55	13.55	-34.45	-44.45	Delineation Piezometer
PZ-14	12/4/2018	462584.13	1590334.98	10.08	10.08	-4.92	-14.92	Delineation Piezometer
PZ-13D	12/6/2018	462700.23	1590586	23.54	26.54	-20.46	-30.46	Delineation Piezometer

Notes:

1. Northing and easting are in feet relative to the State Plane Florida North Datum of 1983.
2. Elevations are in feet relative to the North American Vertical Datum on 1988.

TABLE 2: ANALYTICAL RESULTS OF DELINEATION SAMPLING
Plant Smith - Ash Pond, Gulf Power Company, Bay County, Florida

Monitoring Well	Well Designation	Sample Date	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Combined Radium (pCi/L)	Fluoride (mg/L)	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	pH (SU)	Selenium (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Thallium (mg/L)
		GWPS	*0.006*	*0.01*	*2*	*0.004*	*NE*	*0.005*	*NE*	*NE*	*0.1*	*0.006*	*5*	*4*	*0.015*	*0.04*	*0.002*	*0.1*	*NE*	*0.05*	*NE*	*NE*	*0.002*
MWI-12A	Delineation	3/12/2019	--	0.00048 I	0.052	0.00034 U	1.7	--	38	140	0.0012 I	0.0004 U	11.3	0.06 I	--	0.0069	--	0.021	6.04	0.00071 U	75	430	--
PZ-11D	Delineation	3/11/2019	--	0.00046 U	0.098	0.00034 U	0.67	--	220	1700	0.0011 U	0.0004 U	7.44	0.2	--	0.026	--	0.002 U	6.79	0.00071 U	170	3900	--
PZ-14	Delineation	3/12/2019	--	0.0058	0.15	0.00034 U	13	--	700	3800	0.0011 U	0.0004 U	20.1	0.43	--	0.0011 U	--	0.002 U	6.38	0.00071 U	870	8500	--
PZ-13D	Delineation	3/12/2019	--	0.001 I	0.05	0.0023 I	13	--	860	4500	0.0011 U	0.0004 U	31.9	0.032 U	--	0.019	--	0.002 U	4.52	0.00071 U	1100	8100	--

Notes:

1. mg/L indicates milligrams per liter, pCi/L indicates picocuries per liter, SU indicates standard units.
2. TDS indicates Total Dissolved Solids.
3. GWPS indicates Groundwater Protection Standard as tabulated in Geosyntec (2019). NE indicates not established.
4. -- indicates that the constituent was not sampled in this monitoring event.
5. "U" indicates analyte was analyzed but not detected. "I" indicates that the reported value is between laboratory method detection limit and laboratory practical quantitation limit.
6. Data validation flags are included in Table 2. Data validation reports are included in Appendix A.

TABLE 3: REMEDIAL TECHNOLOGIES SCREENING MATRIX
Plant Smith - Ash Pond, Gulf Power Company, Bay County, Florida

Groundwater Remedial Technology	Description	Advantages	Limitations	Site-Specific Considerations
Monitored Natural Attenuation (MNA)	MNA relies on natural attenuation processes to achieve site-specific remediation objectives within a reasonable timeframe. Under certain conditions (e.g., through sorption, mineral precipitation or oxidation-reduction reactions), MNA effectively reduces the dissolved concentrations and/or toxic forms of target constituents. Natural attenuation processes include biotic and abiotic reduction of constituent concentration or toxicity, mineral precipitation, sorption reactions such as adsorption on the surfaces of soil minerals, absorption into the matrix of soil minerals, partitioning into organic matter, dilution, dispersion, and radioactive decay. Further, oxidation-reduction (redox) reactions via abiotic or biotic processes, can transform the valence states of some inorganic constituents to less soluble and thus less mobile and/or less toxic forms. Implementation of an MNA remedial technology requires monitoring and evaluation of these attenuation processes, with a timeframe for contingency planning.	-Naturally occurring process(es) -Low adverse construction-related impacts on surrounding community -Negligible physical disruption to the remediation area -Negligible operation and maintenance or oversight -Can be coupled with other technologies	-Most viable when source is controlled and plume is relatively stable or receding -May require extended sampling and reporting timeframe with framework for contingency planning -Differing natural attenuation mechanisms and effectiveness for different inorganic constituents -May require demonstration of attenuation mechanisms and the capacity of the aquifer to attenuate constituents over the long-term -Reactions are potentially reversible, which may impact long-term effectiveness	MNA would be an applicable remedy for inorganics including Arsenic (As) and Lithium (Li) at Plant Smith. Once the source control remedy (capping) is in place, MNA can be used to passively remediate the downgradient plume. The natural processes resulting in As removal include sorption to the aquifer matrix on sulfide and/or iron (oxy-) hydroxide minerals, redox reactions that reduce mobility, and dilution/dispersion of the groundwater plume. The likely process of Li attenuation via MNA is dilution/dispersion of the groundwater plume.
Hydraulic Containment (Pump and Treat)	Hydraulic containment via pump and treat (P&T) refers to the use of groundwater extraction to 1.) artificially induce a hydraulic gradient to capture groundwater constituents, and/or 2.) remove constituent mass within the plume. This approach uses extraction wells or trenches to capture groundwater, which may be treated above ground and then discharged to a water treatment plant, receiving water body, reinjected into the subsurface, or reused (e.g., land application, Coal Combustion Residual (CCR) conditioning, etc.).	-Effective for all inorganic constituents -Can provide downgradient plume containment to limit plume migration -Can be used at active facilities	-Requires sufficient extraction volume and extraction wells to create effective capture zones -Requires viable option for management or treatment of extracted groundwater -May have to operate for extended periods of time -Potential for diminishing effectiveness over time -As a mass removal strategy, there will be differing levels of effectiveness depending on adsorption of individual compounds and/or subsurface heterogeneity	P&T is applicable to a variable mix of inorganic constituents, including As and Li. At Plant Smith, the exact physical placement of the remedy would be evaluated during remedial design. Another consideration at Plant Smith would be the management of the treated groundwater and if it could be discharged in accordance with the current National Pollutant Discharge Elimination System (NPDES) permit or would require permit modification. Consideration of groundwater flow to nearby surface water bodies and wetlands may be needed if significant groundwater extraction volume is required to maintain hydraulic containment.
In-Situ Injection	Use of an injection well network to provide suitable air or liquid reagents to cause constituents within a plume to precipitate from solution or adsorb to the geologic formation under either anaerobic or aerobic conditions. Reagent selection will depend on the constituent of concern, chemical composition of groundwater, aquifer oxidation-reduction potential, and pH.	-Minimal site disruption -Can be focused to a specific treatment zone -Does not require continuous active operation -May be viable to treat high risk constituents or targeted hot spots	-Each constituent may need a specific reagent for treatment -Requires sufficiently permeable geologic media for injection -Requires detailed understanding of nature and extent of impacts -Long-term, slow release amendments preferred to reduce reinjection frequency -Reactions are potentially reversible, which may impact long-term effectiveness -Has not been widely applied at CCR sites -Requires bench- and pilot-scale studies for effective design	In-situ injection would be applicable for As remediation at Plant Smith. Under anaerobic conditions, As would be attenuated within insoluble sulfide minerals. This can be enhanced by injection of sulfate and electron donors. Under aerobic conditions, soluble iron and oxygen (either via air sparging or through a chemical oxidant) would be injected to promote the formation of iron (oxy-) hydroxides for subsequent sorption of As onto these mineral phases. If sufficient iron is present in groundwater, the use of air sparging alone may be considered to precipitate iron (oxy-) hydroxides for sorption. Currently, in-situ injection is not a demonstrated technology for certain CCR constituents including lithium.
Permeable Reactive Barrier (PRB)	A PRB is a barrier placed to intercept the groundwater plume. The PRB contains a reactive media that enhances removal of constituents by precipitation or sorption to the media and/or degradation as the plume moves through the media. Reactive media selection will depend on the constituent of concern, chemical composition of groundwater, aquifer oxidation-reduction potential, and pH.	-Provides control of specific constituents without groundwater extraction and treatment -PRBs have been successfully used for a range of inorganics in non-CCR applications (As, Chromium, Molybdenum, and Selenium)	-Each constituent may need a specific reagent for treatment -Reactive media replacement may be required -Installation generally limited to unconsolidated formations -Installation depth is limited (at least 40 ft is currently achievable), and depends on available media placement equipment -Design may require the PRB to be keyed into bedrock or confining unit to prevent groundwater flow beneath the PRB -Requires detailed site characterization and delineation of groundwater plume and flow pathway -Has not been widely applied at CCR sites -Site disruption during construction	A PRB consisting of a zero-valent iron (ZVI) matrix is applicable for the sorption and precipitation of As and is anticipated to be effective at Plant Smith. Exact placement of the PRB would be evaluated during the remedial design. The PRB would be installed to an appropriate depth to achieve remedial goals. The higher permeability/conductivity of the PRB would not be expected to impede groundwater flow. Currently, there are no known media available for Li removal in a PRB.
Vertical Barrier Wall	A vertical barrier wall is a physical barrier to groundwater flow that is placed in the subsurface, often around the source area, in order to contain the source and prevent future migration in groundwater from beneath the source to downgradient areas. Barrier walls include driven materials such as sheet pile and materials that are filled into trenches, such as a mixture of soil, cement, and/or bentonite (e.g., slurry wall).	-Can be implemented around an active facility -Effective for all inorganic constituents -Installation depths up to 200 feet -Substantially restricts groundwater flow -Well established design and construction methods -Commonly coupled with source control measures such as capping	-Additional remedies may be required for any constituent beyond the boundary of the barrier wall -Hydraulic gradient control systems (e.g., pumping) may require long-term operation -Costs can increase if depth is greater than attainable with conventional construction equipment (currently about 80-100 feet) -Large staging/construction area and site disruption during installation	A barrier wall could be installed to an appropriate depth to limit groundwater movement at the Ash Pond at Plant Smith for the containment of both As and Li.
Phytoremediation / TreeWell® System	Phytoremediation involves the use of an engineered TreeWell® system along the edge of the plume for uptake of impacted groundwater to achieve hydraulic control without the need for above-ground water treatment components. The system promotes root development to the targeted groundwater zone (depth), allowing for hydraulic control of impacted groundwater.	-Minimal adverse construction-related impacts on surrounding community (area must be cleared of above ground and below ground structures) -Minimal operation and maintenance after the first three growing seasons -Effective for all inorganic constituents -Aesthetically pleasing option and provides additional cover and habitat for wildlife -Provides hydraulic containment without the need for above-ground infrastructure or water treatment	-Requires sufficient and substantial area for planting of TreeWell® system to capture the plume -Delay of three growing seasons (minimum) for trees to become adequately sized to obtain capture -Potential seasonal impacts on tree growth and development -Limits potential future use of land where TreeWell® system has been installed -Most effective in areas where groundwater flow velocity is slow to moderate -Has not been widely applied at CCR sites -High winds can significantly impact TreeWell® system	While applicable to As and Li, the high permeability, sandy aquifer at the Site may limit use of this technology. In addition, the available space to plant trees for removal of impacted groundwater may not be sufficient between the Ash Pond and North Bay/Alligator Bayou.

Notes:
1. Italicized Groundwater Remedial Technologies were assembled into groundwater corrective measures evaluated for the Site - See Tables 3 and 4.
2. All groundwater remedial technologies assume source control via Ash Pond closure and capping as outlined in the FDEP-approved ash pond closure plan.

TABLE 4: EVALUATION OF POTENTIAL CORRECTIVE MEASURES PURSUANT TO 40 CFR §257.96
Plant Smith - Ash Pond, Gulf Power Company, Bay County, Florida

Groundwater Corrective Measure	Performance	Reliability	Ease of Implementation	Potential Impacts	Time Required to Begin and Complete Remedy	Institutional Requirements
Monitored Natural Attenuation (MNA)	Coupled with source control (closure via capping in the case of Plant Smith), MNA can be effective at achieving groundwater protection standards (GWPS). Based on site data, Lithium (Li) and Arsenic (As) impacts are spatially limited suggesting ongoing natural attenuation. Attenuation processes for As and Li are likely occurring at the site, and source control is anticipated to expedite attenuation processes. A better understanding of site-specific mechanisms of Li and As attenuation and temporal concentration changes following source control would be advantageous to predict long-term performance.	Coupled with source control, MNA is reliable as long as the aquifer conditions that result in As and Li attenuation remain favorable and/or are enhanced. MNA can be used as a polishing technology for downgradient portions of groundwater impacted by As and/or Li following source control.	Easy with respect to infrastructure, but moderate to complex with respect to predictability. MNA is a proven technology, but future data may show that the existing attenuation capacity is insufficient to meet site objectives within a reasonable timeframe. The monitoring well network already exists to implement groundwater monitoring efforts.	Limited. Although MNA remedies may take time to reach remedial goals, MNA relies on natural processes in the aquifer to reduce constituent concentrations without disturbing the surface or the subsurface. Potential exposure and safety concerns during sampling activities and generation of minimal investigation derived waste (IDW). Exposure and safety concerns can be minimized through standard engineering controls, appropriate procedures, and personal protective equipment (PPE).	The infrastructure to begin MNA is in place; however, demonstrating attenuation mechanisms and MNA effectiveness takes time. The timeline to achieve remedial objectives with an MNA-only remedy can be highly-variable (a few years to decades). However, MNA is expected to be successful within a reasonable timeframe following completion of Ash Pond closure.	An existing Site administrative measure (water use permit) limits human exposure to Site-related constituents. MNA would generate limited carbon emissions during sampling associated with performance monitoring.
Hydraulic Containment (Pump and Treat) and MNA	Pump and Treat (P&T) is effective at providing hydraulic control through extraction of impacted groundwater. Continued downgradient monitoring would confirm system performance. MNA would be utilized as a polishing technology outside the capture zone for maintenance of groundwater protection standards (GWPS). In addition, once the P&T system had successfully achieved the desired level of performance, the Site could transition to an MNA-only remedy to further reduce concentrations and/or maintain constituents below the GWPS.	P&T is generally reliable for hydraulic containment, especially when coupled with source control and a downgradient polishing technology like MNA.	Moderate. P&T is a proven approach and is fairly straightforward for installation of extraction wells/trenches in terms of design and implementation. However, the challenge lies in the above-ground treatment approach, which depends on the treated effluent management strategy and if it would be acceptable with the current National Pollutant Discharge Elimination System (NPDES) permit at the site. In addition, a large extraction volume may potentially be required to maintain containment in the sandy aquifer. A variety of sorption and precipitation approaches exist for treatment of As, however Li treatment may be challenging. Potential applications for Li treatment include reverse osmosis and integrated appropriately designed precipitation/co-precipitation systems. Operation and maintenance (O&M) requirements are expected to be substantial due to infrastructure requirements (pumps, pipes, tanks, above-ground treatment system) and handling of treatment residuals.	Moderate. The main potential impacts are related to the above-ground infrastructure to treat extracted groundwater. Unit operations in the treatment system have the potential to develop additional waste streams which must be managed. Potential exposure and safety concerns during sampling activities and generation of IDW. Exposure and safety concerns can be minimized through standard engineering controls, appropriate procedures, and PPE. Consideration of potential groundwater flow to nearby surface water bodies and wetlands may be needed if significant groundwater extraction volume is required to maintain hydraulic containment.	Installation of extraction wells and/or trenches can be accomplished relatively quickly. However, some design phase and aquifer testing will be required. Also, the initiation of the approach will be contingent on the design and start-up of the treatment system. Hydraulic containment can be achieved quickly after startup of the extraction system. MNA will be utilized for the maintenance of As and Li below the GWPS downgradient of the extraction system.	Depending on the effluent management strategy, modifications to the existing NPDES permit may be required. Additional permits may be necessary or require modifications (e.g. consumptive/water use permit, underground injection, etc.). An existing Site administrative measure (water use permit) limits human exposure to Site-related constituents. Potential monitoring of surrounding wetlands may be required if significant groundwater extraction volume is needed to maintain hydraulic containment. Above-ground treatment components may need to be present for an extended period of time, creating carbon emissions and generating residuals requiring management and disposal.
Vertical Barrier Wall and MNA	When designed and installed according to well established methods and coupled with source control, a vertical barrier wall for the Ash Pond at Plant Smith would be considered an effective and long-term solution for groundwater containment by preventing migration downgradient of the wall. Vertical barrier walls are commonly employed during ash pond closure activities with capping. Continued downgradient monitoring will confirm system performance. Downgradient of the wall boundary, MNA would be used for maintenance of GWPS at the site.	A vertical barrier wall is reliable for hydraulic containment if designed and installed properly, especially when coupled with source control and a downgradient polishing technology like MNA.	Moderate to Difficult. A vertical barrier wall is a proven approach and successful installation has been shown at ash ponds, however site-specific challenges exist in terms of design and construction implementation.	Low. The main potential impacts are short-term and related to construction activities during the installation of the vertical barrier wall. Once the vertical barrier wall is installed and heavy equipment removed, any remaining impacts are expected to be associated with the MNA remedy component as detailed above. Potential safety concerns exist with construction and installation of a vertical barrier wall. Safety concerns and exposure can be minimized through standard engineering controls and PPE.	Vertical barrier wall design and development will be required prior to construction and installation of the wall. Hydraulic containment is achieved once installation of the vertical barrier wall and the source control measure are complete. MNA would be utilized to address downgradient impacts of As and Li.	Vertical barrier wall installation may require permitting as part of closure activities. An existing Site administrative measure (water use permit) limits human exposure to Site-related constituents. Vertical barrier wall installation activities would potentially create carbon emissions and generate residuals requiring management and disposal.

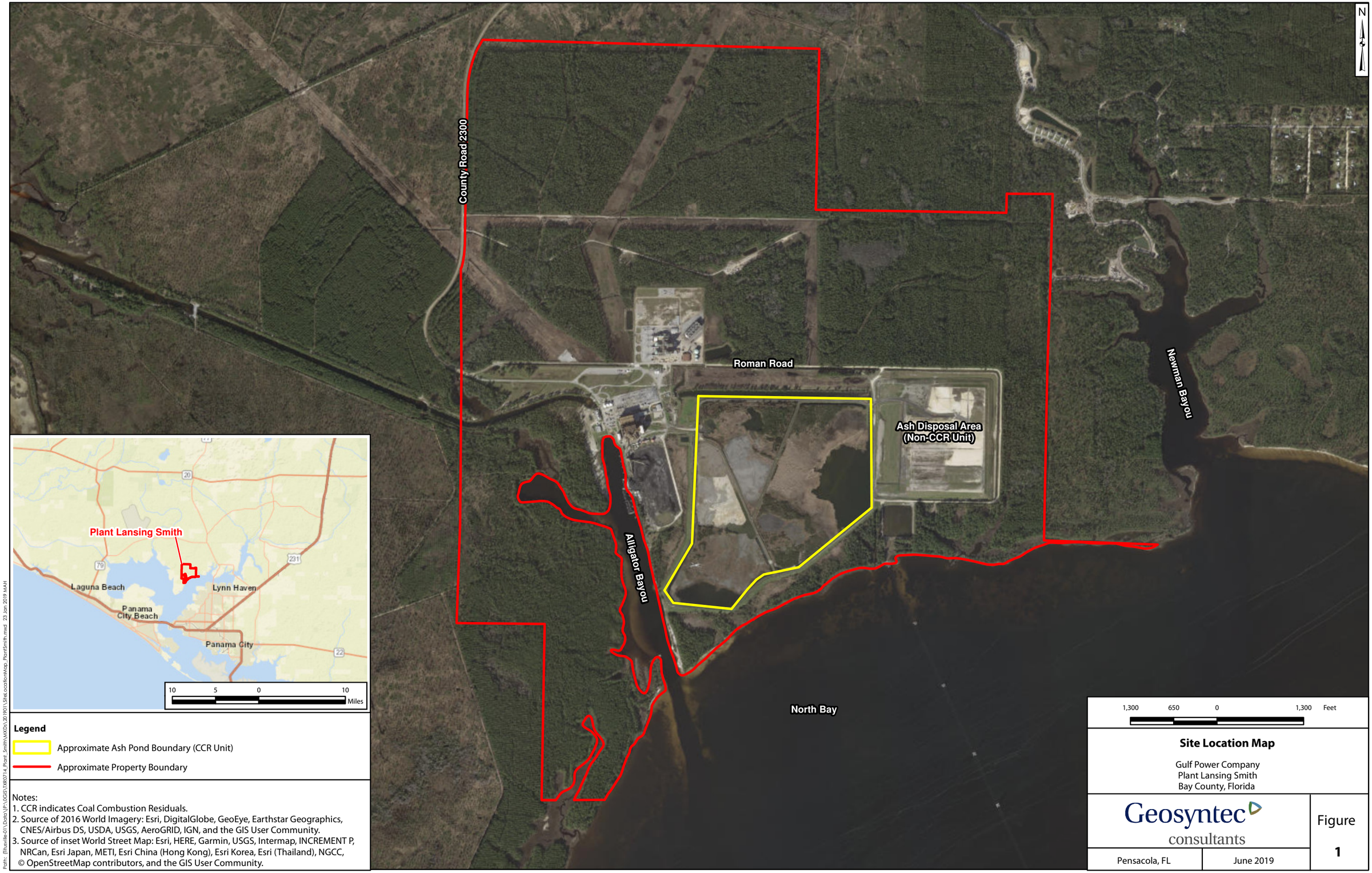
Notes:
1. All corrective measure alternatives include source control via Ash Pond closure and capping as outlined in the FDEP-approved closure plan.

TABLE 5: EVALUATION OF POTENTIAL CORRECTIVE MEASURES PURSUANT TO 40 CFR §257.97
Plant Smith - Ash Pond, Gulf Power Company, Bay County, Florida

Groundwater Corrective Measure	Protective of Human Health and the Environment	Attain the Groundwater Protection Standard (GWPS)	Control the Source(s) of Release	Removal of Material Released from the CCR Unit	Comply with Standards for Management of Waste	Long and Short-Term Effectiveness and Protectiveness of the Potential Remedy	Remedy Effectiveness in Controlling the Source to Reduce Further Releases	Ease of Implementation	Remedy Schedule
Monitored Natural Attenuation (MNA)	Coupled with source control, MNA can be protective of human health and the environment when the aquifer conditions that result in Arsenic (As) and Lithium (Li) attenuation remain favorable and/or are being enhanced. Based on site data, Li and As impacts are spatially limited suggesting ongoing natural attenuation. Attenuation processes for As and Li are likely occurring at the site, and source control is anticipated to help further attenuation. A better understanding of site-specific mechanisms of Li and As attenuation and temporal concentration changes following source control would be advantageous to predict long-term performance. An existing administrative measure (i.e., a water use permit) limits human exposure to groundwater.	Coupled with source control, MNA is anticipated to achieve GWPS when the aquifer conditions that result in As and Li attenuation remain favorable and/or are being enhanced. Additional data collection to better understand temporal attenuation mechanisms following source control will aid in predicting the time to achieve GWPS.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	MNA relies on the natural processes active in the aquifer matrix to reduce toxicity and/or mobility by reducing constituent concentrations.	Waste generation during sampling would be minimal but management would require compliance with applicable standards.	Coupled with source control, MNA can be effective in the long- and short-term when the aquifer conditions that result in As and Li attenuation remain favorable and/or are being enhanced. Based on site data, Li and As impacts are spatially limited suggesting ongoing natural attenuation. Attenuation processes for As and Li are likely occurring at the site, and source control is anticipated to help further attenuation processes. A better understanding of site-specific mechanisms of Li and As attenuation and temporal concentration changes following source control would be advantageous to predict long-term performance. An existing administrative measure (i.e., a water use permit) limits human exposure to groundwater.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	Easy with respect to infrastructure, but moderate to complex with respect to documentation. MNA is a proven approach, but future data may show that the existing attenuation capacity is insufficient to meet site objectives within a reasonable timeframe. The monitoring well network already exists to implement groundwater monitoring efforts.	The infrastructure to begin MNA is already in place; however, demonstrating attenuation mechanisms and MNA effectiveness takes time. The timeline to achieve remedial objectives with an MNA-only remedy can be highly-variable (a few years to decades). However, MNA is expected to be successful within a reasonable timeframe following completion of Ash Pond closure.
Hydraulic Containment (Pump and Treat) and MNA	Pump and Treat (P&T) is anticipated to be protective of human health and the environment through extraction and above-ground treatment of impacted groundwater. MNA would be utilized as a polishing technology outside the capture zone and is expected to be protective. Consideration of potential impacts to nearby surface water bodies and wetlands may be needed if significant groundwater extraction volume is required to maintain hydraulic containment.	P&T is anticipated to be effective in achievement of the GWPS within the capture zone by removing impacted groundwater followed by above ground treatment. Coupled with P&T and source control, MNA can be used to reduce concentrations of constituents below the GWPS outside the capture zone.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	Placement of extraction wells and/or trenches would be completed to induce hydraulic capture and extract contaminated groundwater for above-ground treatment. This is anticipated to reduce concentrations/volume of impacted groundwater and reduce toxicity with above-ground treatment. See above for processes related to MNA.	Effluent management would require compliance with applicable standards for waste management and current/modified permits. See above for waste management during groundwater sampling activities.	P&T is effective at providing hydraulic control through extraction of impacted groundwater. Continued downgradient monitoring would confirm system performance. MNA would be utilized as a polishing technology outside the capture zone for maintenance of GWPS. Long-term, once the P&T system had successfully achieved the desired level of performance, the Site could transition to an MNA-only remedy to further reduce concentrations and/or maintain constituents below the GWPS. An existing administrative measure (i.e., a water use permit) limits human exposure to groundwater.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	Moderate. P&T is a proven approach and is fairly straightforward for installation of extraction wells/trenches in terms of design and implementation. However, the challenge lies in the above-ground treatment approach, which depends on the treated effluent management strategy and if it would be acceptable with the current National Pollutant Discharge Elimination System (NPDES) permit at the site. In addition, a large extraction volume may potentially be required to maintain containment in the sandy aquifer. A variety of sorption and precipitation approaches exist for treatment of As, however challenges may be experienced in finding an appropriate demonstrated treatment for Li. Potential applications for Li treatment include reverse osmosis and integrated appropriately designed precipitation/co-precipitation systems. Operation and maintenance (O&M) requirements are expected to be substantial due to infrastructure requirements (pumps, pipes, tanks, above-ground treatment system) and handling of treatment residuals.	Installation of extraction wells and/or trenches can be accomplished relatively quickly. However, some design phase and aquifer testing will be required. Also, the initiation of the approach will be contingent on the design and start-up of the treatment system. Hydraulic containment can be achieved quickly after startup of the extraction system. MNA will be utilized for the maintenance of As and Li below the GWPS downgradient of the extraction system.
Vertical Barrier Wall and MNA	When designed and installed according to well established methods, a vertical barrier wall coupled with source control is anticipated to be protective of human health and the environment by preventing impacted groundwater migration downgradient of the wall. Vertical barrier walls are commonly employed during ash pond closure activities with capping. Continued downgradient monitoring will confirm system performance. Downgradient of the slurry wall boundary, MNA would be used to address concentrations above the GWPS.	The vertical barrier wall and MNA, coupled with source control, are anticipated to be effective in achievement and maintenance of the GWPS downgradient of the slurry wall. This would include minimizing groundwater migration as well as MNA processes discussed above.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	The vertical barrier wall is anticipated to prevent groundwater migration downgradient, thus reducing constituent mobility. See above for processes related to MNA.	Residuals and waste generated during vertical barrier wall construction and installation would require compliance with applicable standards. See above for waste management during groundwater sampling activities.	When designed and installed according to well established methods, a vertical barrier wall coupled with source control would be considered an effective short- and long-term solution for groundwater containment by preventing impacted groundwater migration downgradient of the wall. Vertical barrier walls are commonly employed during ash pond closure activities with capping. Continued downgradient monitoring will confirm system performance. Downgradient of the slurry wall boundary, MNA would be used to address concentrations above the GWPS. An existing administrative measure (i.e., a water use permit) limits human exposure to groundwater.	The capping/closure strategy is anticipated to control the source and reduce or eliminate further releases to the environment.	Moderate to Difficult. The vertical barrier wall is a proven approach and successful installation has been shown at ash ponds, however site-specific challenges exist in terms of design and construction implementation.	Vertical barrier wall design and development will be required prior to construction and installation of the wall. Hydraulic containment is achieved once installation of the vertical barrier wall and the source control measure are complete. MNA would be utilized to address downgradient impacts of As and Li.

Notes:
1. All corrective measure alternatives include source control via Ash Pond closure and capping as outlined in the FDEP-approved closure plan.
2. The 40 CFR § 257.97 criterion related to community concerns will be considered following the public meeting during remedy selection.

FIGURES



Legend

- Approximate Ash Pond Boundary (CCR Unit)
- Approximate Property Boundary

Notes:
1. CCR indicates Coal Combustion Residuals.
2. Source of 2016 World Imagery: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.
3. Source of inset World Street Map: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community.

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Site Location Map

Gulf Power Company
Plant Lansing Smith
Bay County, Florida

Geosyntec consultants

Pensacola, FL | June 2019

Figure 1

Legend

- Downgradient Well Location
- Background Well Location
- Piezometer Location
- Approximate Ash Pond Boundary (CCR Unit)
- Approximate Property Boundary

Notes:
1. CCR indicates Coal Combustion Residuals.
2. Source of 2016 World Imagery: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

500 250 0 500 Feet

CCR Groundwater Monitoring System

Gulf Power Company
Plant Lansing Smith
Bay County, Florida

Geosyntec consultants

Pensacola, FL | June 2019

Figure **2**

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Legend

- Downgradient CCR Well Location
- Background CCR Well Location
- Piezometer CCR Location
- Shallow Delineation Piezometer or Existing Well
- Deep Delineation Piezometer
- Approximate Property Boundary
- Approximate Ash Pond Boundary (CCR Unit)

Notes:
1. CCR indicates Coal Combustion Residuals.
2. Source of 2016 World Imagery: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Groundwater Monitoring Network for Delineation of Lithium and Arsenic

Plant Lansing Smith
Bay County, Florida

Geosyntec consultants

Pensacola, FL | June 2019

Figure 3

APPENDIX A

Laboratory Analytical, Data Validation, and Field Sampling Reports

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Tel: (850)474-1001

Laboratory Job ID: 400-167259-1
Client Project/Site: CCR Smith Plant Delineation

For:
Gulf Power Company
BIN 731
One Energy Place
Pensacola, Florida 32520

Attn: Kristi Mitchell

Cheyenne Whitmire

Authorized for release by:
4/9/2019 9:18:24 AM

Cheyenne Whitmire, Project Manager II
(850)471-6222
cheyenne.whitmire@testamericainc.com

Table of Contents

Job ID: 400-167259-1

Laboratory: Eurofins TestAmerica, Pensacola

Narrative

Job Narrative
400-167259-1

Metals
Method(s) 6020: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 434669 and analytical batch 434847 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 6020: The following sample was diluted to bring the concentration of target analytes within the calibration range: PZ-11D (400-167259-2). Elevated reporting limits (RLs) are provided.

General Chemistry
Method(s) SM 4500 F C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 435153 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) SM 4500 Cl- E: The following samples were diluted to bring the concentration of target analytes within the calibration range: MWI-12A (400-167259-1), PZ-11D (400-167259-2), PZ-14 (400-167259-3), PZ-13D (400-167259-4), DUP-02 (400-167259-5), (400-167259-A-1 MS), (400-167259-A-1 MSD), (400-167978-G-13), (400-167978-G-13 MS) and (400-167978-G-13 MSD). Elevated reporting limits (RLs) are provided.

Method(s) SM 4500 Cl- E: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 435592 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) SM 4500 Cl- E: Due to the concentration of chlorides in the parent sample the MS/MSD were diluted after the spike. The spike amounts were adjusted by the dilution factor. (400-167259-A-1 MS), (400-167259-A-1 MSD), (400-167978-G-13 MS) and (400-167978-G-13 MSD)

Method(s) SM 4500 SO4 E: The following samples were diluted to bring the concentration of target analytes within the calibration range: MWI-12A (400-167259-1), PZ-11D (400-167259-2), PZ-14 (400-167259-3), PZ-13D (400-167259-4), DUP-02 (400-167259-5), (400-167809-C-1), (400-167809-C-1 MS) and (400-167809-C-1 MSD). Elevated reporting limits (RLs) are provided.

Detection Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: MWI-12A — Lab Sample ID: 400-167259-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00048	I	0.0013	0.00046	mg/L	5		6020	Total Recoverable
Barium	0.052		0.0025	0.00049	mg/L	5		6020	Total Recoverable
Boron	1.7		0.050	0.021	mg/L	5		6020	Total Recoverable
Calcium	38		0.25	0.13	mg/L	5		6020	Total Recoverable
Chromium	0.0012	I	0.0025	0.0011	mg/L	5		6020	Total Recoverable
Lithium	0.0069		0.0050	0.0011	mg/L	5		6020	Total Recoverable
Molybdenum	0.021		0.015	0.0020	mg/L	5		6020	Total Recoverable
Total Dissolved Solids	430		5.0	3.4	mg/L	1		SM 2540C	Total/NA
Chloride	140		10	7.0	mg/L	5		SM 4500 Cl- E	Total/NA
Fluoride	0.060	I	0.10	0.032	mg/L	1		SM 4500 F C	Total/NA
Sulfate	75		25	7.0	mg/L	5		SM 4500 SO4 E	Total/NA
Field pH	6.04				SU	1		Field Sampling	Total/NA
Field Temperature	18.53				Centigrade	1		Field Sampling	Total/NA
Dissolved Oxygen	0.43				mg/L	1		Field Sampling	Total/NA
Specific Conductivity	686.69				uS/cm	1		Field Sampling	Total/NA
Turbidity	1.63				NTU	1		Field Sampling	Total/NA

Client Sample ID: PZ-11D — Lab Sample ID: 400-167259-2

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.098		0.0025	0.00049	mg/L	5		6020	Total Recoverable
Boron	0.67		0.050	0.021	mg/L	5		6020	Total Recoverable
Lithium	0.026		0.0050	0.0011	mg/L	5		6020	Total Recoverable
Calcium - DL	220		2.5	1.3	mg/L	50		6020	Total Recoverable
Total Dissolved Solids	3900		50	34	mg/L	1		SM 2540C	Total/NA
Chloride	1700		120	84	mg/L	60		SM 4500 Cl- E	Total/NA
Fluoride	0.20		0.10	0.032	mg/L	1		SM 4500 F C	Total/NA
Sulfate	170		50	14	mg/L	10		SM 4500 SO4 E	Total/NA
Field pH	6.79				SU	1		Field Sampling	Total/NA
Field Temperature	22.70				Centigrade	1		Field Sampling	Total/NA
Dissolved Oxygen	0.09				mg/L	1		Field Sampling	Total/NA
Specific Conductivity	5996.08				uS/cm	1		Field Sampling	Total/NA
Turbidity	4.16				NTU	1		Field Sampling	Total/NA

Client Sample ID: PZ-14 — Lab Sample ID: 400-167259-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0058		0.0013	0.00046	mg/L	5		6020	Total Recoverable
Barium	0.15		0.0025	0.00049	mg/L	5		6020	Total Recoverable
Boron	13		1.0	0.42	mg/L	100		6020	Total Recoverable
Calcium	700		5.0	2.5	mg/L	100		6020	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

Client Sample ID: PZ-14 (Continued) — Lab Sample ID: 400-167259-3

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0011	I	0.0050	0.0011	mg/L	5		6020	Total Recoverable
Total Dissolved Solids	8500		130	85	mg/L	1		SM 2540C	Total/NA
Chloride	3800		160	110	mg/L	80		SM 4500 Cl- E	Total/NA
Fluoride	0.43		0.10	0.032	mg/L	1		SM 4500 F C	Total/NA
Sulfate	870		150	42	mg/L	30		SM 4500 SO4 E	Total/NA
Field pH	6.38				SU	1		Field Sampling	Total/NA
Field Temperature	21.18				Centigrade	1		Field Sampling	Total/NA
Dissolved Oxygen	0.16				mg/L	1		Field Sampling	Total/NA
Specific Conductivity	12766.96				uS/cm	1		Field Sampling	Total/NA
Turbidity	2.50				NTU	1		Field Sampling	Total/NA

Client Sample ID: PZ-13D — Lab Sample ID: 400-167259-4

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0010	I	0.0013	0.00046	mg/L	5		6020	Total Recoverable
Barium	0.050		0.0025	0.00049	mg/L	5		6020	Total Recoverable
Beryllium	0.0023	I	0.0025	0.00034	mg/L	5		6020	Total Recoverable
Boron	13		1.0	0.42	mg/L	100		6020	Total Recoverable
Calcium	860		5.0	2.5	mg/L	100		6020	Total Recoverable
Lithium	0.019		0.0050	0.0011	mg/L	5		6020	Total Recoverable
Total Dissolved Solids	8100		250	170	mg/L	1		SM 2540C	Total/NA
Chloride	4500		200	140	mg/L	100		SM 4500 Cl- E	Total/NA
Sulfate	1100		250	70	mg/L	50		SM 4500 SO4 E	Total/NA
Field pH	4.52				SU	1		Field Sampling	Total/NA
Field Temperature	23.59				Centigrade	1		Field Sampling	Total/NA
Dissolved Oxygen	0.11				mg/L	1		Field Sampling	Total/NA
Specific Conductivity	14056.10				uS/cm	1		Field Sampling	Total/NA
Turbidity	2.35				NTU	1		Field Sampling	Total/NA

Client Sample ID: DUP-02 — Lab Sample ID: 400-167259-5

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00059	I	0.0013	0.00046	mg/L	5		6020	Total Recoverable
Barium	0.053		0.0025	0.00049	mg/L	5		6020	Total Recoverable
Calcium	39		0.25	0.13	mg/L	5		6020	Total Recoverable
Lithium	0.0054		0.0050	0.0011	mg/L	5		6020	Total Recoverable
Molybdenum	0.021		0.015	0.0020	mg/L	5		6020	Total Recoverable
Boron - RA	1.6		0.050	0.021	mg/L	5		6020	Total Recoverable
Total Dissolved Solids	420		5.0	3.4	mg/L	1		SM 2540C	Total/NA
Chloride	140		10	7.0	mg/L	5		SM 4500 Cl- E	Total/NA
Fluoride	0.060	I	0.10	0.032	mg/L	1		SM 4500 F C	Total/NA
Sulfate	75		25	7.0	mg/L	5		SM 4500 SO4 E	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: FB-02 — Lab Sample ID: 400-167259-6

No Detections.

Client Sample ID: EB-02 — Lab Sample ID: 400-167259-7

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.0013	I	0.0050	0.0011	mg/L	5		6020	Total Recoverable

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Method	Method Description	Protocol	Laboratory
6020	Metals (ICP/MS)	SW846	TAL PEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PEN
SM 4500 Cl- E	Chloride, Total	SM	TAL PEN
SM 4500 F C	Fluoride	SM	TAL PEN
SM 4500 SO4 E	Sulfate, Total	SM	TAL PEN
Field Sampling	Field Sampling	EPA	TAL PEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PEN

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

Sample Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-167259-1	MWI-12A	Water	03/12/19 13:19	03/13/19 08:50
400-167259-2	PZ-11D	Water	03/11/19 14:05	03/13/19 08:50
400-167259-3	PZ-14	Water	03/12/19 15:40	03/13/19 08:50
400-167259-4	PZ-13D	Water	03/12/19 12:25	03/13/19 08:50
400-167259-5	DUP-02	Water	03/12/19 07:00	03/13/19 08:50
400-167259-6	FB-02	Water	03/12/19 14:35	03/13/19 08:50
400-167259-7	EB-02	Water	03/12/19 14:45	03/13/19 08:50

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: MWI-12A

Date Collected: 03/12/19 13:19
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-1

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00048	I	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 22:56	5
Barium	0.052		0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 22:56	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 22:56	5
Boron	1.7		0.050	0.021	mg/L		03/26/19 10:52	03/26/19 22:56	5
Calcium	38		0.25	0.13	mg/L		03/26/19 10:52	03/26/19 22:56	5
Chromium	0.0012	I	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 22:56	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 22:56	5
Lithium	0.0069		0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 22:56	5
Molybdenum	0.021		0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 22:56	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 22:56	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	430		5.0	3.4	mg/L			03/19/19 13:25	1
Chloride	140		10	7.0	mg/L			04/02/19 12:47	5
Fluoride	0.060	I	0.10	0.032	mg/L			03/29/19 10:36	1
Sulfate	75		25	7.0	mg/L			03/27/19 16:02	5

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	6.04				SU			03/12/19 13:19	1
Field Temperature	18.53				Centigrade			03/12/19 13:19	1
Dissolved Oxygen	0.43				mg/L			03/12/19 13:19	1
Specific Conductivity	686.69				uS/cm			03/12/19 13:19	1
Turbidity	1.63				NTU			03/12/19 13:19	1

Client Sample Results

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: PZ-11D

Date Collected: 03/11/19 14:05
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-2

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00046	U	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:00	5
Barium	**0.098**		0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:00	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:00	5
Boron	**0.67**		0.050	0.021	mg/L		03/26/19 10:52	03/26/19 23:00	5
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:00	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:00	5
Lithium	**0.026**		0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:00	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:00	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:00	5

Method: 6020 - Metals (ICP/MS) - Total Recoverable - DL

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	**220**		2.5	1.3	mg/L		03/26/19 10:52	03/27/19 15:51	50

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**3900**		50	34	mg/L			03/14/19 13:45	1
Chloride	**1700**		120	84	mg/L			04/02/19 12:49	60
Fluoride	**0.20**		0.10	0.032	mg/L			03/29/19 10:32	1
Sulfate	**170**		50	14	mg/L			03/27/19 16:02	10

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	**6.79**				SU			03/11/19 14:05	1
Field Temperature	**22.70**				Centigrade			03/11/19 14:05	1
Dissolved Oxygen	**0.09**				mg/L			03/11/19 14:05	1
Specific Conductivity	**5996.08**				uS/cm			03/11/19 14:05	1
Turbidity	**4.16**				NTU			03/11/19 14:05	1

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: PZ-14

Date Collected: 03/12/19 15:40
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-3

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0058		0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:03	5
Barium	0.15		0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:03	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:03	5
Boron	13		1.0	0.42	mg/L		03/26/19 10:52	03/27/19 08:57	100
Calcium	700		5.0	2.5	mg/L		03/26/19 10:52	03/27/19 08:57	100
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:03	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:03	5
Lithium	0.0011	I	0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:03	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:03	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:03	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	8500		130	85	mg/L			03/19/19 13:25	1
Chloride	3800		160	110	mg/L			04/02/19 13:33	80
Fluoride	0.43		0.10	0.032	mg/L			03/29/19 10:24	1
Sulfate	870		150	42	mg/L			03/27/19 16:02	30

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	6.38				SU			03/12/19 15:40	1
Field Temperature	21.18				Centigrade			03/12/19 15:40	1
Dissolved Oxygen	0.16				mg/L			03/12/19 15:40	1
Specific Conductivity	12766.96				uS/cm			03/12/19 15:40	1
Turbidity	2.50				NTU			03/12/19 15:40	1

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: PZ-13D

Date Collected: 03/12/19 12:25
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-4

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0010**	**I**	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:07	5
Barium	**0.050**		0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:07	5
Beryllium	**0.0023**	**I**	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:07	5
Boron	**13**		1.0	0.42	mg/L		03/26/19 10:52	03/27/19 09:00	100
Calcium	**860**		5.0	2.5	mg/L		03/26/19 10:52	03/27/19 09:00	100
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:07	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:07	5
Lithium	**0.019**		0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:07	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:07	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:07	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**8100**		250	170	mg/L			03/19/19 13:25	1
Chloride	**4500**		200	140	mg/L			04/02/19 13:33	100
Fluoride	0.032	U	0.10	0.032	mg/L			03/29/19 10:12	1
Sulfate	**1100**		250	70	mg/L			03/27/19 16:25	50

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Field pH	**4.52**				SU			03/12/19 12:25	1
Field Temperature	**23.59**				Centigrade			03/12/19 12:25	1
Dissolved Oxygen	**0.11**				mg/L			03/12/19 12:25	1
Specific Conductivity	**14056.10**				uS/cm			03/12/19 12:25	1
Turbidity	**2.35**				NTU			03/12/19 12:25	1

Client Sample Results

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: DUP-02

Date Collected: 03/12/19 07:00
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-5

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00059**	**I**	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:11	5
Barium	**0.053**		0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:11	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:11	5
Calcium	**39**		0.25	0.13	mg/L		03/26/19 10:52	03/26/19 23:11	5
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:11	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:11	5
Lithium	**0.0054**		0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:11	5
Molybdenum	**0.021**		0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:11	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:11	5

Method: 6020 - Metals (ICP/MS) - Total Recoverable - RA

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.6**		0.050	0.021	mg/L		03/26/19 10:52	03/27/19 09:08	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**420**		5.0	3.4	mg/L			03/19/19 13:25	1
Chloride	**140**		10	7.0	mg/L			04/02/19 12:49	5
Fluoride	**0.060**	**I**	0.10	0.032	mg/L			03/29/19 10:40	1
Sulfate	**75**		25	7.0	mg/L			03/27/19 16:34	5

Client Sample Results

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: FB-02

Date Collected: 03/12/19 14:35
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-6

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00046	U	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:14	5
Barium	0.00049	U	0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:14	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:14	5
Calcium	0.13	U	0.25	0.13	mg/L		03/26/19 10:52	03/26/19 23:14	5
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:14	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:14	5
Lithium	0.0011	U	0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:14	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:14	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:14	5

Method: 6020 - Metals (ICP/MS) - Total Recoverable - RA

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.021	U	0.050	0.021	mg/L		03/26/19 10:52	03/27/19 09:04	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3.4	U	5.0	3.4	mg/L			03/19/19 13:25	1
Chloride	1.4	U	2.0	1.4	mg/L			04/02/19 12:00	1
Fluoride	0.032	U	0.10	0.032	mg/L			03/29/19 10:44	1
Sulfate	1.4	U	5.0	1.4	mg/L			04/01/19 14:42	1

Client Sample Results

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: EB-02

Date Collected: 03/12/19 14:45
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-7

Matrix: Water

Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00046	U	0.0013	0.00046	mg/L		03/26/19 10:52	03/26/19 23:37	5
Barium	0.00049	U	0.0025	0.00049	mg/L		03/26/19 10:52	03/26/19 23:37	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/26/19 23:37	5
Boron	0.021	U	0.050	0.021	mg/L		03/26/19 10:52	03/26/19 23:37	5
Calcium	0.13	U	0.25	0.13	mg/L		03/26/19 10:52	03/26/19 23:37	5
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/26/19 23:37	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/26/19 23:37	5
Lithium	**0.0013**	**I**	0.0050	0.0011	mg/L		03/26/19 10:52	03/26/19 23:37	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/26/19 23:37	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/26/19 23:37	5

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3.4	U	5.0	3.4	mg/L			03/19/19 13:25	1
Chloride	1.4	U	2.0	1.4	mg/L			04/02/19 12:00	1
Fluoride	0.032	U	0.10	0.032	mg/L			03/29/19 10:48	1
Sulfate	1.4	U	5.0	1.4	mg/L			04/01/19 14:42	1

Definitions/Glossary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

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.

General Chemistry

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.
¤	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)

Lab Chronicle

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: MWI-12A
Date Collected: 03/12/19 13:19
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 22:56	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		5	435592	04/02/19 12:47	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:36	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		5	434937	03/27/19 16:02	RRC	TAL PEN
Total/NA	Analysis	Field Sampling		1	434567	03/12/19 13:19	AW	TAL PEN

Client Sample ID: PZ-11D
Date Collected: 03/11/19 14:05
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:00	DRE	TAL PEN
Total Recoverable	Prep	3005A	DL		434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020	DL	50	435022	03/27/19 15:51	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433367	03/14/19 13:45	CLB	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		60	435592	04/02/19 12:49	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:32	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		10	434937	03/27/19 16:02	RRC	TAL PEN
Total/NA	Analysis	Field Sampling		1	434567	03/11/19 14:05	AW	TAL PEN

Client Sample ID: PZ-14
Date Collected: 03/12/19 15:40
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:03	DRE	TAL PEN
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		100	434847	03/27/19 08:57	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		80	435592	04/02/19 13:33	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:24	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		30	434937	03/27/19 16:02	RRC	TAL PEN
Total/NA	Analysis	Field Sampling		1	434567	03/12/19 15:40	AW	TAL PEN

Lab Chronicle

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: PZ-13D

Lab Sample ID: 400-167259-4

Date Collected: 03/12/19 12:25

Matrix: Water

Date Received: 03/13/19 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:07	DRE	TAL PEN
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		100	434847	03/27/19 09:00	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		100	435592	04/02/19 13:33	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:12	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		50	434937	03/27/19 16:25	RRC	TAL PEN
Total/NA	Analysis	Field Sampling		1	434567	03/12/19 12:25	AW	TAL PEN

Client Sample ID: DUP-02

Lab Sample ID: 400-167259-5

Date Collected: 03/12/19 07:00

Matrix: Water

Date Received: 03/13/19 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:11	DRE	TAL PEN
Total Recoverable	Prep	3005A	RA		434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020	RA	5	434847	03/27/19 09:08	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		5	435592	04/02/19 12:49	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:40	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		5	434937	03/27/19 16:34	RRC	TAL PEN

Client Sample ID: FB-02

Lab Sample ID: 400-167259-6

Date Collected: 03/12/19 14:35

Matrix: Water

Date Received: 03/13/19 08:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:14	DRE	TAL PEN
Total Recoverable	Prep	3005A	RA		434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020	RA	5	434847	03/27/19 09:04	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		1	435592	04/02/19 12:00	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:44	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		1	435477	04/01/19 14:42	RRC	TAL PEN

Lab Chronicle

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-1

Client Sample ID: EB-02

Date Collected: 03/12/19 14:45
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			434669	03/26/19 10:52	KWN	TAL PEN
Total Recoverable	Analysis	6020		5	434847	03/26/19 23:37	DRE	TAL PEN
Total/NA	Analysis	SM 2540C		1	433847	03/19/19 13:25	NT	TAL PEN
Total/NA	Analysis	SM 4500 Cl- E		1	435592	04/02/19 12:00	RRC	TAL PEN
Total/NA	Analysis	SM 4500 F C		1	435153	03/29/19 10:48	BAB	TAL PEN
Total/NA	Analysis	SM 4500 SO4 E		1	435477	04/01/19 14:42	RRC	TAL PEN

Laboratory References:

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

Metals

Prep Batch: 434669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total Recoverable	Water	3005A	
400-167259-2 - DL	PZ-11D	Total Recoverable	Water	3005A	
400-167259-2	PZ-11D	Total Recoverable	Water	3005A	
400-167259-3	PZ-14	Total Recoverable	Water	3005A	
400-167259-4	PZ-13D	Total Recoverable	Water	3005A	
400-167259-5	DUP-02	Total Recoverable	Water	3005A	
400-167259-5 - RA	DUP-02	Total Recoverable	Water	3005A	
400-167259-6	FB-02	Total Recoverable	Water	3005A	
400-167259-6 - RA	FB-02	Total Recoverable	Water	3005A	
400-167259-7	EB-02	Total Recoverable	Water	3005A	
MB 400-434669/1-A ^5	Method Blank	Total Recoverable	Water	3005A	
LCS 400-434669/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
400-167537-E-1-B MS ^5	Matrix Spike	Total Recoverable	Water	3005A	
400-167537-E-1-C MSD ^5	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 434847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total Recoverable	Water	6020	434669
400-167259-2	PZ-11D	Total Recoverable	Water	6020	434669
400-167259-3	PZ-14	Total Recoverable	Water	6020	434669
400-167259-3	PZ-14	Total Recoverable	Water	6020	434669
400-167259-4	PZ-13D	Total Recoverable	Water	6020	434669
400-167259-4	PZ-13D	Total Recoverable	Water	6020	434669
400-167259-5	DUP-02	Total Recoverable	Water	6020	434669
400-167259-5 - RA	DUP-02	Total Recoverable	Water	6020	434669
400-167259-6	FB-02	Total Recoverable	Water	6020	434669
400-167259-6 - RA	FB-02	Total Recoverable	Water	6020	434669
400-167259-7	EB-02	Total Recoverable	Water	6020	434669
MB 400-434669/1-A ^5	Method Blank	Total Recoverable	Water	6020	434669
LCS 400-434669/2-A	Lab Control Sample	Total Recoverable	Water	6020	434669
400-167537-E-1-B MS ^5	Matrix Spike	Total Recoverable	Water	6020	434669
400-167537-E-1-C MSD ^5	Matrix Spike Duplicate	Total Recoverable	Water	6020	434669

Analysis Batch: 435022

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-2 - DL	PZ-11D	Total Recoverable	Water	6020	434669

General Chemistry

Analysis Batch: 433367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-2	PZ-11D	Total/NA	Water	SM 2540C	
MB 400-433367/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 400-433367/2	Lab Control Sample	Total/NA	Water	SM 2540C	
400-167255-A-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 433847

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	SM 2540C	
400-167259-3	PZ-14	Total/NA	Water	SM 2540C	
400-167259-4	PZ-13D	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 433847 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-5	DUP-02	Total/NA	Water	SM 2540C	
400-167259-6	FB-02	Total/NA	Water	SM 2540C	
400-167259-7	EB-02	Total/NA	Water	SM 2540C	
MB 400-433847/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 400-433847/2	Lab Control Sample	Total/NA	Water	SM 2540C	
400-167226-A-2 DU	Duplicate	Total/NA	Water	SM 2540C	
400-167226-A-8 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 434937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	SM 4500 SO4 E	
400-167259-2	PZ-11D	Total/NA	Water	SM 4500 SO4 E	
400-167259-3	PZ-14	Total/NA	Water	SM 4500 SO4 E	
400-167259-4	PZ-13D	Total/NA	Water	SM 4500 SO4 E	
400-167259-5	DUP-02	Total/NA	Water	SM 4500 SO4 E	
MB 400-434937/6	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 400-434937/7	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
MRL 400-434937/3	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
400-167809-C-1 MS	Matrix Spike	Total/NA	Water	SM 4500 SO4 E	
400-167809-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 435153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	SM 4500 F C	
400-167259-2	PZ-11D	Total/NA	Water	SM 4500 F C	
400-167259-3	PZ-14	Total/NA	Water	SM 4500 F C	
400-167259-4	PZ-13D	Total/NA	Water	SM 4500 F C	
400-167259-5	DUP-02	Total/NA	Water	SM 4500 F C	
400-167259-6	FB-02	Total/NA	Water	SM 4500 F C	
400-167259-7	EB-02	Total/NA	Water	SM 4500 F C	
MB 400-435153/3	Method Blank	Total/NA	Water	SM 4500 F C	
LCS 400-435153/4	Lab Control Sample	Total/NA	Water	SM 4500 F C	
660-93398-C-3 MS	Matrix Spike	Total/NA	Water	SM 4500 F C	
660-93398-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 F C	
400-167259-3 DU	PZ-14	Total/NA	Water	SM 4500 F C	

Analysis Batch: 435477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-6	FB-02	Total/NA	Water	SM 4500 SO4 E	
400-167259-7	EB-02	Total/NA	Water	SM 4500 SO4 E	
MB 400-435477/6	Method Blank	Total/NA	Water	SM 4500 SO4 E	
LCS 400-435477/7	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
MRL 400-435477/3	Lab Control Sample	Total/NA	Water	SM 4500 SO4 E	
400-167578-M-1 MS	Matrix Spike	Total/NA	Water	SM 4500 SO4 E	
400-167578-M-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM 4500 SO4 E	

Analysis Batch: 435592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	SM 4500 Cl- E	
400-167259-2	PZ-11D	Total/NA	Water	SM 4500 Cl- E	
400-167259-3	PZ-14	Total/NA	Water	SM 4500 Cl- E	

General Chemistry (Continued)

Analysis Batch: 435592 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-4	PZ-13D	Total/NA	Water	SM 4500 Cl- E	
400-167259-5	DUP-02	Total/NA	Water	SM 4500 Cl- E	
400-167259-6	FB-02	Total/NA	Water	SM 4500 Cl- E	
400-167259-7	EB-02	Total/NA	Water	SM 4500 Cl- E	
MB 400-435592/6	Method Blank	Total/NA	Water	SM 4500 Cl- E	
LCS 400-435592/7	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
MRL 400-435592/3	Lab Control Sample	Total/NA	Water	SM 4500 Cl- E	
400-167259-1 MS	MWI-12A	Total/NA	Water	SM 4500 Cl- E	
400-167259-1 MSD	MWI-12A	Total/NA	Water	SM 4500 Cl- E	

Field Service / Mobile Lab

Analysis Batch: 434567

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	Field Sampling	
400-167259-2	PZ-11D	Total/NA	Water	Field Sampling	
400-167259-3	PZ-14	Total/NA	Water	Field Sampling	
400-167259-4	PZ-13D	Total/NA	Water	Field Sampling	

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 400-434669/1-A ^5
Matrix: Water
Analysis Batch: 434847

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 434669

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00046	U	0.0013	0.00046	mg/L		03/26/19 10:52	03/27/19 08:49	5
Barium	0.00049	U	0.0025	0.00049	mg/L		03/26/19 10:52	03/27/19 08:49	5
Beryllium	0.00034	U	0.0025	0.00034	mg/L		03/26/19 10:52	03/27/19 08:49	5
Boron	0.021	U	0.050	0.021	mg/L		03/26/19 10:52	03/27/19 08:49	5
Calcium	0.13	U	0.25	0.13	mg/L		03/26/19 10:52	03/27/19 08:49	5
Chromium	0.0011	U	0.0025	0.0011	mg/L		03/26/19 10:52	03/27/19 08:49	5
Cobalt	0.00040	U	0.0025	0.00040	mg/L		03/26/19 10:52	03/27/19 08:49	5
Lithium	0.0011	U	0.0050	0.0011	mg/L		03/26/19 10:52	03/27/19 08:49	5
Molybdenum	0.0020	U	0.015	0.0020	mg/L		03/26/19 10:52	03/27/19 08:49	5
Selenium	0.00071	U	0.0013	0.00071	mg/L		03/26/19 10:52	03/27/19 08:49	5

Lab Sample ID: LCS 400-434669/2-A
Matrix: Water
Analysis Batch: 434847

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 434669

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0500	0.0534		mg/L		107	80 - 120
Barium	0.0500	0.0482		mg/L		96	80 - 120
Beryllium	0.0500	0.0496		mg/L		99	80 - 120
Boron	0.100	0.0977		mg/L		98	80 - 120
Calcium	5.00	5.05		mg/L		101	80 - 120
Chromium	0.0500	0.0524		mg/L		105	80 - 120
Cobalt	0.0500	0.0534		mg/L		107	80 - 120
Lithium	0.0500	0.0526		mg/L		105	80 - 120
Molybdenum	0.0500	0.0514		mg/L		103	80 - 120
Selenium	0.0500	0.0483		mg/L		97	80 - 120

Lab Sample ID: 400-167537-E-1-B MS ^5
Matrix: Water
Analysis Batch: 434847

Client Sample ID: Matrix Spike
Prep Type: Total Recoverable
Prep Batch: 434669

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.00046	U	0.0500	0.0529		mg/L		106	75 - 125
Barium	0.084		0.0500	0.140		mg/L		113	75 - 125
Beryllium	0.00034	U	0.0500	0.0476		mg/L		95	75 - 125
Boron	0.021	U	0.100	0.164	J3	mg/L		164	75 - 125
Calcium	48		5.00	58.7	J3	mg/L		213	75 - 125
Chromium	0.0043		0.0500	0.0505		mg/L		92	75 - 125
Cobalt	0.00040	U	0.0500	0.0514		mg/L		103	75 - 125
Lithium	0.0064		0.0500	0.0552		mg/L		98	75 - 125
Molybdenum	0.0020	U	0.0500	0.0498		mg/L		100	75 - 125
Selenium	0.0019		0.0500	0.0490		mg/L		94	75 - 125

Lab Sample ID: 400-167537-E-1-C MSD ^5
Matrix: Water
Analysis Batch: 434847

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 434669

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.00046	U	0.0500	0.0578		mg/L		116	75 - 125	9	20

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 400-167537-E-1-C MSD ^5
Matrix: Water
Analysis Batch: 434847

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total Recoverable
Prep Batch: 434669

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Barium	0.084		0.0500	0.156	J3	mg/L		144	75 - 125	11	20
Beryllium	0.00034	U	0.0500	0.0485		mg/L		97	75 - 125	2	20
Boron	0.021	U	0.100	0.167	J3	mg/L		167	75 - 125	2	20
Calcium	48		5.00	63.0	J3	mg/L		298	75 - 125	7	20
Chromium	0.0043		0.0500	0.0550		mg/L		101	75 - 125	9	20
Cobalt	0.00040	U	0.0500	0.0570		mg/L		114	75 - 125	10	20
Lithium	0.0064		0.0500	0.0561		mg/L		100	75 - 125	2	20
Molybdenum	0.0020	U	0.0500	0.0579		mg/L		116	75 - 125	15	20
Selenium	0.0019		0.0500	0.0493		mg/L		95	75 - 125	1	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 400-433367/1
Matrix: Water
Analysis Batch: 433367

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3.4	U	5.0	3.4	mg/L			03/14/19 13:45	1

Lab Sample ID: LCS 400-433367/2
Matrix: Water
Analysis Batch: 433367

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	293	270		mg/L		92	78 - 122

Lab Sample ID: 400-167255-A-1 DU
Matrix: Water
Analysis Batch: 433367

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	72		70.0		mg/L		3	5

Lab Sample ID: MB 400-433847/1
Matrix: Water
Analysis Batch: 433847

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3.4	U	5.0	3.4	mg/L			03/19/19 13:25	1

Lab Sample ID: LCS 400-433847/2
Matrix: Water
Analysis Batch: 433847

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	293	252		mg/L		86	78 - 122

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 400-167226-A-2 DU
Matrix: Water
Analysis Batch: 433847

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	100		98.0		mg/L		2	5

Lab Sample ID: 400-167226-A-8 DU
Matrix: Water
Analysis Batch: 433847

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	110		116		mg/L		2	5

Method: SM 4500 Cl- E - Chloride, Total

Lab Sample ID: MB 400-435592/6
Matrix: Water
Analysis Batch: 435592

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.4	U	2.0	1.4	mg/L			04/02/19 11:50	1

Lab Sample ID: LCS 400-435592/7
Matrix: Water
Analysis Batch: 435592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	30.0	31.8		mg/L		106	90 - 110

Lab Sample ID: MRL 400-435592/3
Matrix: Water
Analysis Batch: 435592

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.00	1.73	I	mg/L		86	50 - 150

Lab Sample ID: 400-167259-1 MS
Matrix: Water
Analysis Batch: 435592

Client Sample ID: MWI-12A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	140		10.0	140	J3	mg/L		39	73 - 120

Lab Sample ID: 400-167259-1 MSD
Matrix: Water
Analysis Batch: 435592

Client Sample ID: MWI-12A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	140		10.0	139	J3	mg/L		33	73 - 120	0	8

Method: SM 4500 F C - Fluoride

Lab Sample ID: MB 400-435153/3
Matrix: Water
Analysis Batch: 435153

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.032	U	0.10	0.032	mg/L			03/29/19 09:19	1

Lab Sample ID: LCS 400-435153/4
Matrix: Water
Analysis Batch: 435153

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride			4.00	3.75		mg/L		94	90 - 110		

Lab Sample ID: 660-93398-C-3 MS
Matrix: Water
Analysis Batch: 435153

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Fluoride	0.20		1.00	0.750	J3	mg/L		55	75 - 125		

Lab Sample ID: 660-93398-C-3 MSD
Matrix: Water
Analysis Batch: 435153

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	0.20		1.00	0.750	J3	mg/L		55	75 - 125	0	4

Lab Sample ID: 400-167259-3 DU
Matrix: Water
Analysis Batch: 435153

Client Sample ID: PZ-14
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Fluoride	0.43			0.430		mg/L				0	4

Method: SM 4500 SO4 E - Sulfate, Total

Lab Sample ID: MB 400-434937/6
Matrix: Water
Analysis Batch: 434937

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.4	U	5.0	1.4	mg/L			03/27/19 15:05	1

Lab Sample ID: LCS 400-434937/7
Matrix: Water
Analysis Batch: 434937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			15.0	14.3		mg/L		95	90 - 110		

Method: SM 4500 SO4 E - Sulfate, Total (Continued)

Lab Sample ID: MRL 400-434937/3
Matrix: Water
Analysis Batch: 434937

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			5.00	4.09	I	mg/L		82	50 - 150		

Lab Sample ID: 400-167809-C-1 MS
Matrix: Water
Analysis Batch: 434937

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	160		10.0	157	J3	mg/L		-42	77 - 128		

Lab Sample ID: 400-167809-C-1 MSD
Matrix: Water
Analysis Batch: 434937

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	160		10.0	157	J3	mg/L		-38	77 - 128	0	5

Lab Sample ID: MB 400-435477/6
Matrix: Water
Analysis Batch: 435477

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.4	U	5.0	1.4	mg/L			04/01/19 14:01	1

Lab Sample ID: LCS 400-435477/7
Matrix: Water
Analysis Batch: 435477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			15.0	13.9		mg/L		93	90 - 110		

Lab Sample ID: MRL 400-435477/3
Matrix: Water
Analysis Batch: 435477

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate			5.00	3.84	I	mg/L		77	50 - 150		

Lab Sample ID: 400-167578-M-1 MS
Matrix: Water
Analysis Batch: 435477

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Sulfate	14		10.0	23.7		mg/L		97	77 - 128		

Lab Sample ID: 400-167578-M-1 MSD
Matrix: Water
Analysis Batch: 435477

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	14		10.0	23.2		mg/L		93	77 - 128	2	5

TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Phone (850) 474-1001 Fax (850) 478-2671

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Rick Hagendorfer / Trevor Braddock	Lab PM: Whitmire, Cheyenne R	Carrier Tracking No(s):	COC No: 400-82850-31203.1
Client Contact: Kristi Mitchell	Phone: 850-336-0192	E-Mail: cheyenne.whitmire@testamericainc.com		Page: Page 1 of 1
Company: Gulf Power Company				Job #:
Address: BIN 731 One Energy Place	Due Date Requested:			
City: Pensacola	TAT Requested (days):			
State, Zip: FL, 32520				
Phone: 850-444-6427(Tel)	PO #:			
Email: kristi.mitchell@nexteraenergy.com	WO #:			
Project Name: CCR Smith Plant Delineation Sampling Event	Project #: 40006609			
Site:	SSOW#:			

Analysis Requested

400-167259 COC

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, 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)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226, 9320_Ra228, Ra226Ra228_GFPC	SM4500_Cl_E - Chloride, SM4500_SO4_E - Sulfate, 2540C - Total Dissolved Solids, 4500_F_C - Fluoride	FieldSampling - Field Sampling Parameters	6020 - As,Ba,B,Be,Ca,Cr,Co,Li,Mo,Se	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N	N	D		
MWI-12A	3-12-19	1319	G	Water			N	N		X		
PZ-11D	3-11-19	1405	G	Water			X	X		X		
PZ-14	3-12-19	1540	G	Water			N	X		X		
PZ-13D	3-12-19	1225	G	Water			N	X		X		
Dup-02	3-12-19	0700	G	Water			X	X		X		
FB-02	3-12-19	1435	G	Water			X	X		X		
EB-02	3-12-19	1445	G	Water			X	X		X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Trevor Braddock	3/13/19 0850	RDH	Kathy R Owen	3-13-19 850	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.1c, 0.8, 0.9, 0.4c, 0.7c IR2

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Gulf Power Company

Job Number: 400-167259-1

Login Number: 167259
List Number: 1
Creator: Brown, Nathan

List Source: Eurofins TestAmerica, Pensacola

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	1.1°C, 0.8°C, 0.9°C, 0.4°C, 0.7°C IR8
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	

Accreditation/Certification Summary

Client: Gulf Power Company
Job ID: 400-167259-1
Project/Site: CCR Smith Plant Delineation

Laboratory: Eurofins TestAmerica, Pensacola

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alabama	State Program	4	40150	06-30-19
ANAB	ISO/IEC 17025		L2471	02-22-20
Arizona	State Program	9	AZ0710	01-12-20
Arkansas DEQ	State Program	6	88-0689	09-01-19
California	State Program	9	2510	06-30-19
Florida	NELAP	4	E81010	06-30-19
Georgia	State Program	4	E81010 (FL)	06-30-19
Illinois	NELAP	5	200041	10-09-19
Iowa	State Program	7	367	08-01-20
Kansas	NELAP	7	E-10253	10-31-19
Kentucky (UST)	State Program	4	53	06-30-19
Kentucky (WW)	State Program	4	98030	12-31-19
Louisiana	NELAP	6	30976	06-30-19
Louisiana (DW)	NELAP	6	LA017	12-31-19
Maryland	State Program	3	233	09-30-19
Massachusetts	State Program	1	M-FL094	06-30-19
Michigan	State Program	5	9912	06-30-19
New Jersey	NELAP	2	FL006	06-30-19
North Carolina (WW/SW)	State Program	4	314	12-31-19
Oklahoma	State Program	6	9810	08-31-19
Pennsylvania	NELAP	3	68-00467	01-31-20
Rhode Island	State Program	1	LAO00307	12-30-19
South Carolina	State Program	4	96026	06-30-19
Tennessee	State Program	4	TN02907	06-30-19
Texas	NELAP	6	T104704286-18-15	09-30-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-18-00148	05-17-21
Virginia	NELAP	3	460166	06-14-19
Washington	State Program	10	C915	05-15-19
West Virginia DEP	State Program	3	136	07-31-19

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ANALYTICAL REPORT

Eurofins TestAmerica, Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Tel: (850)474-1001

Laboratory Job ID: 400-167259-2
Client Project/Site: CCR Smith Plant Delineation

For:
Gulf Power Company
BIN 731
One Energy Place
Pensacola, Florida 32520

Attn: Kristi Mitchell

Cheyenne Whitmire

Authorized for release by:
4/26/2019 12:15:49 PM

Cheyenne Whitmire, Project Manager II
(850)471-6222
cheyenne.whitmire@testamericainc.com

Table of Contents

Job ID: 400-167259-2

Laboratory: Eurofins TestAmerica, Pensacola

Narrative

Job Narrative
400-167259-2

RAD

Method(s) 9315: Radium-226 Prep Batch 160-419788: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MWI-12A (400-167259-1), PZ-11D (400-167259-2), PZ-14 (400-167259-3), PZ-13D (400-167259-4), DUP-02 (400-167259-5), (LCS 160-419788/1-A), (MB 160-419788/24-A), (240-109108-H-9-A), (240-109108-A-9-A MS) and (240-109108-A-9-B MSD)

Method(s) 9315: Radium-226 Prep Batch 160-421329: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. EB-02 (400-167259-7), (LCS 160-421329/1-A), (MB 160-421329/24-A), (400-166992-A-6-A) and (400-166992-A-6-B DU)

Method(s) 9315: Ra-226 Prep Batch 160-420714: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. FB-02 (400-167259-6), (LCS 160-420714/1-A), (LCSD 160-420714/2-A) and (MB 160-420714/13-A)

Method(s) 9320: Ra-228 Prep Batch 160-419798: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MWI-12A (400-167259-1), PZ-11D (400-167259-2), PZ-14 (400-167259-3), PZ-13D (400-167259-4), DUP-02 (400-167259-5), (LCS 160-419798/1-A), (MB 160-419798/24-A), (240-109108-H-9-B), (240-109108-A-9-C MS) and (240-109108-A-9-D MSD)

Method(s) 9320: Ra-228 Prep Batch 160-421330: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. EB-02 (400-167259-7), (LCS 160-421330/1-A), (MB 160-421330/24-A), (400-166992-A-6-C) and (400-166992-A-6-D DU)

Method(s) 9320: Ra-228 Prep Batch 160-420719: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. FB-02 (400-167259-6), (LCS 160-420719/1-A), (LCSD 160-420719/2-A) and (MB 160-420719/13-A)

Method(s) PrecSep_0: Radium 228 Prep Batch 160-419798: The following samples produced a black precipitate after the Pb carrier was added PZ-14 (400-167259-3) and PZ-13D (400-167259-4) .The precipitate is most likely lead sulfide.

Method(s) PrecSep_0: Radium-228 Prep Batch 420719: Insufficient sample volume was available to perform a sample duplicate for the following samples: FB-02 (400-167259-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-419788: The following samples produced a black precipitate after the Pb carrier was added PZ-14 (400-167259-3) and PZ-13D (400-167259-4) . The precipitate is most likely lead sulfide.

Method(s) PrecSep-21: Radium-226 Prep Batch 420714: Insufficient sample volume was available to perform a sample duplicate for the following samples: FB-02 (400-167259-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Sample Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-167259-1	MWI-12A	Water	03/12/19 13:19	03/13/19 08:50
400-167259-2	PZ-11D	Water	03/11/19 14:05	03/13/19 08:50
400-167259-3	PZ-14	Water	03/12/19 15:40	03/13/19 08:50
400-167259-4	PZ-13D	Water	03/12/19 12:25	03/13/19 08:50
400-167259-5	DUP-02	Water	03/12/19 07:00	03/13/19 08:50
400-167259-6	FB-02	Water	03/12/19 14:35	03/13/19 08:50
400-167259-7	EB-02	Water	03/12/19 14:45	03/13/19 08:50

Client Sample ID: MWI-12A

Date Collected: 03/12/19 13:19
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-1

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	9.95		0.575	1.06	1.00	0.109	pCi/L	03/18/19 11:43	04/15/19 18:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.5*		*40 - 110*	*03/18/19 11:43*	*04/15/19 18:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.31		0.337	0.358	1.00	0.407	pCi/L	03/18/19 12:28	04/03/19 09:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.5*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:27*	*1*
Y Carrier	*89.3*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:27*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	11.3		0.666	1.12	5.00	0.407	pCi/L		04/22/19 16:39	1

Client Sample Results

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: PZ-11D

Date Collected: 03/11/19 14:05
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-2

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	6.41		0.447	0.730	1.00	0.0940	pCi/L	03/18/19 11:43	04/15/19 18:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.6*		*40 - 110*	*03/18/19 11:43*	*04/15/19 18:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.03		0.308	0.322	1.00	0.400	pCi/L	03/18/19 12:28	04/03/19 09:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.6*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*
Y Carrier	*92.7*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	7.44		0.543	0.798	5.00	0.400	pCi/L		04/22/19 16:39	1

Client Sample ID: PZ-14

Date Collected: 03/12/19 15:40
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-3

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	8.69		0.518	0.939	1.00	0.103	pCi/L	03/18/19 11:43	04/15/19 18:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.0*		*40 - 110*	*03/18/19 11:43*	*04/15/19 18:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	11.4		0.746	1.29	1.00	0.402	pCi/L	03/18/19 12:28	04/03/19 09:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.0*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*
Y Carrier	*93.8*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	20.1		0.908	1.60	5.00	0.402	pCi/L		04/22/19 16:39	1

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: PZ-13D
Date Collected: 03/12/19 12:25
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-4
Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	5.18		0.404	0.617	1.00	0.0997	pCi/L	03/18/19 11:43	04/15/19 18:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.6*		*40 - 110*	*03/18/19 11:43*	*04/15/19 18:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	26.7		1.17	2.72	1.00	0.427	pCi/L	03/18/19 12:28	04/03/19 09:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.6*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*
Y Carrier	*86.4*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	31.9		1.24	2.79	5.00	0.427	pCi/L		04/22/19 16:39	1

Client Sample ID: DUP-02

Date Collected: 03/12/19 07:00
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-5

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	8.81		0.503	0.938	1.00	0.114	pCi/L	03/18/19 11:43	04/15/19 18:57	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.2*		*40 - 110*	*03/18/19 11:43*	*04/15/19 18:57*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.41		0.315	0.341	1.00	0.358	pCi/L	03/18/19 12:28	04/03/19 09:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.2*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*
Y Carrier	*89.7*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	10.2		0.593	0.998	5.00	0.358	pCi/L		04/22/19 16:39	1

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: FB-02

Date Collected: 03/12/19 14:35
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-6

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0311	U	0.0665	0.0666	1.00	0.124	pCi/L	03/22/19 08:27	04/17/19 08:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.8*		*40 - 110*	*03/22/19 08:27*	*04/17/19 08:19*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.121	U	0.190	0.190	1.00	0.365	pCi/L	03/22/19 08:46	04/10/19 09:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.8*		*40 - 110*	*03/22/19 08:46*	*04/10/19 09:09*	*1*
Y Carrier	*93.5*		*40 - 110*	*03/22/19 08:46*	*04/10/19 09:09*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0899	U	0.201	0.201	5.00	0.365	pCi/L		04/22/19 16:39	1

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: EB-02

Date Collected: 03/12/19 14:45
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-7

Matrix: Water

Method: 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00425	U	0.0419	0.0419	1.00	0.0877	pCi/L	03/26/19 17:36	04/17/19 21:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.2*		*40 - 110*	*03/26/19 17:36*	*04/17/19 21:09*	*1*

Method: 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.104	U	0.298	0.298	1.00	0.513	pCi/L	03/26/19 18:03	04/02/19 15:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.2*		*40 - 110*	*03/26/19 18:03*	*04/02/19 15:50*	*1*
Y Carrier	*80.0*		*40 - 110*	*03/26/19 18:03*	*04/02/19 15:50*	*1*

Method: Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.108	U	0.301	0.301	5.00	0.513	pCi/L		04/22/19 16:39	1

Definitions/Glossary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

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	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)

Lab Chronicle

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: MWI-12A
Date Collected: 03/12/19 13:19
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			419788	03/18/19 11:43	LTC	TAL SL
Total/NA	Analysis	9315		1	423835	04/15/19 18:57	CDR	TAL SL
Total/NA	Prep	PrecSep_0			419798	03/18/19 12:28	LTC	TAL SL
Total/NA	Analysis	9320		1	422457	04/03/19 09:27	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Client Sample ID: PZ-11D
Date Collected: 03/11/19 14:05
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			419788	03/18/19 11:43	LTC	TAL SL
Total/NA	Analysis	9315		1	423835	04/15/19 18:57	CDR	TAL SL
Total/NA	Prep	PrecSep_0			419798	03/18/19 12:28	LTC	TAL SL
Total/NA	Analysis	9320		1	422476	04/03/19 09:28	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Client Sample ID: PZ-14
Date Collected: 03/12/19 15:40
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			419788	03/18/19 11:43	LTC	TAL SL
Total/NA	Analysis	9315		1	423835	04/15/19 18:57	CDR	TAL SL
Total/NA	Prep	PrecSep_0			419798	03/18/19 12:28	LTC	TAL SL
Total/NA	Analysis	9320		1	422476	04/03/19 09:28	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Client Sample ID: PZ-13D
Date Collected: 03/12/19 12:25
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			419788	03/18/19 11:43	LTC	TAL SL
Total/NA	Analysis	9315		1	423835	04/15/19 18:57	CDR	TAL SL
Total/NA	Prep	PrecSep_0			419798	03/18/19 12:28	LTC	TAL SL
Total/NA	Analysis	9320		1	422476	04/03/19 09:28	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Lab Chronicle

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Client Sample ID: DUP-02
Date Collected: 03/12/19 07:00
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			419788	03/18/19 11:43	LTC	TAL SL
Total/NA	Analysis	9315		1	423835	04/15/19 18:57	CDR	TAL SL
Total/NA	Prep	PrecSep_0			419798	03/18/19 12:28	LTC	TAL SL
Total/NA	Analysis	9320		1	422476	04/03/19 09:28	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Client Sample ID: FB-02
Date Collected: 03/12/19 14:35
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			420714	03/22/19 08:27	HET	TAL SL
Total/NA	Analysis	9315		1	424264	04/17/19 08:19	BLH	TAL SL
Total/NA	Prep	PrecSep_0			420719	03/22/19 08:46	HET	TAL SL
Total/NA	Analysis	9320		1	423246	04/10/19 09:09	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Client Sample ID: EB-02
Date Collected: 03/12/19 14:45
Date Received: 03/13/19 08:50

Lab Sample ID: 400-167259-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			421329	03/26/19 17:36	CLP	TAL SL
Total/NA	Analysis	9315		1	424263	04/17/19 21:09	CDR	TAL SL
Total/NA	Prep	PrecSep_0			421330	03/26/19 18:03	CLP	TAL SL
Total/NA	Analysis	9320		1	422380	04/02/19 15:50	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1	424973	04/22/19 16:39	BLH	TAL SL

Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Prep Batch: 419788

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	PrecSep-21	
400-167259-2	PZ-11D	Total/NA	Water	PrecSep-21	
400-167259-3	PZ-14	Total/NA	Water	PrecSep-21	
400-167259-4	PZ-13D	Total/NA	Water	PrecSep-21	
400-167259-5	DUP-02	Total/NA	Water	PrecSep-21	
MB 160-419788/24-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-419788/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
240-109108-A-9-A MS	Matrix Spike	Total/NA	Water	PrecSep-21	
240-109108-A-9-B MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep-21	

Prep Batch: 419798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-1	MWI-12A	Total/NA	Water	PrecSep_0	
400-167259-2	PZ-11D	Total/NA	Water	PrecSep_0	
400-167259-3	PZ-14	Total/NA	Water	PrecSep_0	
400-167259-4	PZ-13D	Total/NA	Water	PrecSep_0	
400-167259-5	DUP-02	Total/NA	Water	PrecSep_0	
MB 160-419798/24-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-419798/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
240-109108-A-9-C MS	Matrix Spike	Total/NA	Water	PrecSep_0	
240-109108-A-9-D MSD	Matrix Spike Duplicate	Total/NA	Water	PrecSep_0	

Prep Batch: 420714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-6	FB-02	Total/NA	Water	PrecSep-21	
MB 160-420714/13-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-420714/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-420714/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 420719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-6	FB-02	Total/NA	Water	PrecSep_0	
MB 160-420719/13-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-420719/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-420719/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 421329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-7	EB-02	Total/NA	Water	PrecSep-21	
MB 160-421329/24-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-421329/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
400-166992-A-6-B DU	Duplicate	Total/NA	Water	PrecSep-21	

Prep Batch: 421330

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-167259-7	EB-02	Total/NA	Water	PrecSep_0	
MB 160-421330/24-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-421330/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
400-166992-A-6-D DU	Duplicate	Total/NA	Water	PrecSep_0	

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-419788/24-A
Matrix: Water
Analysis Batch: 423899

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419788

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.004257	U	0.0314	0.0314	1.00	0.0726	pCi/L	03/18/19 11:43	04/15/19 21:33	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*03/18/19 11:43*	*04/15/19 21:33*	*1*

Lab Sample ID: LCS 160-419788/1-A
Matrix: Water
Analysis Batch: 424032

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419788

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	9.031		0.936	1.00	0.0722	pCi/L	80	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*101*		*40 - 110*

Lab Sample ID: 240-109108-A-9-A MS
Matrix: Water
Analysis Batch: 423847

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 419788

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226	0.282		11.4	9.862		1.02	1.00	0.0717	pCi/L	84	75 - 138		

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Ba Carrier	*92.6*		*40 - 110*

Lab Sample ID: 240-109108-A-9-B MSD
Matrix: Water
Analysis Batch: 423847

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 419788

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	0.282		11.3	10.14		1.06	1.00	0.0846	pCi/L	87	75 - 138	0.13	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Ba Carrier	*87.9*		*40 - 110*

Lab Sample ID: MB 160-420714/13-A
Matrix: Water
Analysis Batch: 424264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420714

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.08404	U	0.0846	0.0850	1.00	0.130	pCi/L	03/22/19 08:27	04/17/19 08:19	1

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: MB 160-420714/13-A
Matrix: Water
Analysis Batch: 424264

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420714

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110	03/22/19 08:27	04/17/19 08:19	1

Lab Sample ID: LCS 160-420714/1-A
Matrix: Water
Analysis Batch: 424313

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420714

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	10.29		1.12	1.00	0.122	pCi/L	91	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	93.8		40 - 110

Lab Sample ID: LCSD 160-420714/2-A
Matrix: Water
Analysis Batch: 424313

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 420714

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.4	11.04		1.18	1.00	0.148	pCi/L	97	75 - 125	0.33	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	99.1		40 - 110

Lab Sample ID: MB 160-421329/24-A
Matrix: Water
Analysis Batch: 424263

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421329

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.006982	U	0.0478	0.0478	1.00	0.0946	pCi/L	03/26/19 17:36	04/17/19 21:09	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110	03/26/19 17:36	04/17/19 21:09	1

Lab Sample ID: LCS 160-421329/1-A
Matrix: Water
Analysis Batch: 424264

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421329

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-226			11.4	9.558		1.00	1.00	0.0791	pCi/L	84	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	90.9		40 - 110

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: 400-166992-A-6-B DU
Matrix: Water
Analysis Batch: 424310

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 421329

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.365			0.2607		0.0955	1.00	0.0843	pCi/L			0.51	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*89.1*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-419798/24-A
Matrix: Water
Analysis Batch: 422476

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 419798

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2727	U	0.187	0.188	1.00	0.285	pCi/L	03/18/19 12:28	04/03/19 09:28	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*102*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*
Y Carrier	*93.5*		*40 - 110*	*03/18/19 12:28*	*04/03/19 09:28*	*1*

Lab Sample ID: LCS 160-419798/1-A
Matrix: Water
Analysis Batch: 422457

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 419798

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.34	8.869		1.03	1.00	0.334	pCi/L	95	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*101*		*40 - 110*
Y Carrier	*86.7*		*40 - 110*

Lab Sample ID: 240-109108-A-9-C MS
Matrix: Water
Analysis Batch: 422457

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 419798

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228	0.546		9.33	9.426		1.10	1.00	0.425	pCi/L	95	45 - 150		

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Ba Carrier	*92.6*		*40 - 110*
Y Carrier	*91.6*		*40 - 110*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: 240-109108-A-9-D MSD
Matrix: Water
Analysis Batch: 422457

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 419798

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	0.546		9.33	9.444		1.11	1.00	0.422	pCi/L	95	45 - 150	0.01	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Ba Carrier	*87.9*		*40 - 110*
Y Carrier	*90.8*		*40 - 110*

Lab Sample ID: MB 160-420719/13-A
Matrix: Water
Analysis Batch: 423245

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 420719

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1055	U	0.210	0.210	1.00	0.358	pCi/L	03/22/19 08:46	04/10/19 09:07	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*40 - 110*	*03/22/19 08:46*	*04/10/19 09:07*	*1*
Y Carrier	*94.2*		*40 - 110*	*03/22/19 08:46*	*04/10/19 09:07*	*1*

Lab Sample ID: LCS 160-420719/1-A
Matrix: Water
Analysis Batch: 423246

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 420719

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.31	8.506		1.00	1.00	0.419	pCi/L	91	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*93.8*		*40 - 110*
Y Carrier	*92.3*		*40 - 110*

Lab Sample ID: LCSD 160-420719/2-A
Matrix: Water
Analysis Batch: 423246

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 420719

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.31	8.220		0.957	1.00	0.333	pCi/L	88	75 - 125	0.15	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*99.1*		*40 - 110*
Y Carrier	*93.8*		*40 - 110*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-421330/24-A
Matrix: Water
Analysis Batch: 422380

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421330

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1904	U	0.234	0.235	1.00	0.388	pCi/L	03/26/19 18:03	04/02/19 15:51	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.1*		*40 - 110*	*03/26/19 18:03*	*04/02/19 15:51*	*1*
Y Carrier	*82.2*		*40 - 110*	*03/26/19 18:03*	*04/02/19 15:51*	*1*

Lab Sample ID: LCS 160-421330/1-A
Matrix: Water
Analysis Batch: 422416

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421330

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.34	8.726		1.09	1.00	0.461	pCi/L	93	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*90.9*		*40 - 110*
Y Carrier	*74.4*		*40 - 110*

Lab Sample ID: 400-166992-A-6-D DU
Matrix: Water
Analysis Batch: 422365

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 421330

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.487			0.4352	U	0.290	1.00	0.441	pCi/L			0.09	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*89.1*		*40 - 110*
Y Carrier	*77.4*		*40 - 110*

TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Phone (850) 474-1001 Fax (850) 478-2671

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Rick Hayesdorfer / Trevor Braddock	Lab PM: Whitmire, Cheyenne R	Carrier Tracking No(s):	COC No: 400-82850-31203.1
Client Contact: Kristi Mitchell	Phone: 850-336-0192	E-Mail: cheyenne.whitmire@testamericainc.com		Page: Page 1 of 1
Company: Gulf Power Company				Job #:
Address: BIN 731 One Energy Place	Due Date Requested:			
City: Pensacola	TAT Requested (days):			
State, Zip: FL, 32520				
Phone: 850-444-6427(Tel)	PO #:			
Email: kristi.mitchell@nexteraenergy.com	WO #:			
Project Name: CCR Smith Plant Delineation Sampling Event	Project #: 40006609			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
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:

400-167259 COC

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226, 9320_Ra228, Ra226Ra228_GFPC	SM4500_Cl_E - Chloride, SM4500_SO4_E - Sulfate, 2540C - Total Dissolved Solids, 4500_F_C - Fluoride	FieldSampling - Field Sampling Parameters	6020 - As,Ba,B,Be,Ca,Cr,Co,Li,Mo,Se	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	N	N	D		
MWI-12A	3-12-19	1319	G	Water			N	N		X		
PZ-11D	3-11-19	1405	G	Water			X	X		X		
PZ-14	3-12-19	1540	G	Water			N	X		X		
PZ-13D	3-12-19	1225	G	Water			N	X		X		
Dup-02	3-12-19	0700	G	Water			X	X		X		
FB-02	3-12-19	1435	G	Water			X	X		X		
EB-02	3-12-19	1445	G	Water			N	X		X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Trevor Braddock	3/13/19 0850	RDH	Kathy R Owen	3-13-19 850	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.1, C, 0.9, 0.4, 0.7, IR

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: Gulf Power Company

Job Number: 400-167259-2

Login Number: 167259
List Number: 1
Creator: Brown, Nathan

List Source: Eurofins TestAmerica, Pensacola

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	1.1°C, 0.8°C, 0.9°C, 0.4°C, 0.7°C IR8
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: Gulf Power Company

Job Number: 400-167259-2

Login Number: 167259
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 03/15/19 10:35 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
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?	N/A	
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.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Accreditation/Certification Summary

Client: Gulf Power Company
Job ID: 400-167259-2
Project/Site: CCR Smith Plant Delineation

Laboratory: Eurofins TestAmerica, Pensacola

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alabama	State Program	4	40150	06-30-19
ANAB	ISO/IEC 17025		L2471	02-22-20
Arizona	State Program	9	AZ0710	01-12-20
Arkansas DEQ	State Program	6	88-0689	09-01-19
California	State Program	9	2510	06-30-19
Florida	NELAP	4	E81010	06-30-19
Georgia	State Program	4	E81010 (FL)	06-30-19
Illinois	NELAP	5	200041	10-09-19
Iowa	State Program	7	367	08-01-20
Kansas	NELAP	7	E-10253	10-31-19
Kentucky (UST)	State Program	4	53	06-30-19
Kentucky (WW)	State Program	4	98030	12-31-19
Louisiana	NELAP	6	30976	06-30-19
Louisiana (DW)	NELAP	6	LA017	12-31-19
Maryland	State Program	3	233	09-30-19
Massachusetts	State Program	1	M-FL094	06-30-19
Michigan	State Program	5	9912	06-30-19
New Jersey	NELAP	2	FL006	06-30-19
North Carolina (WW/SW)	State Program	4	314	12-31-19
Oklahoma	State Program	6	9810	08-31-19
Pennsylvania	NELAP	3	68-00467	01-31-20
Rhode Island	State Program	1	LAO00307	12-30-19
South Carolina	State Program	4	96026	06-30-19
Tennessee	State Program	4	TN02907	06-30-19
Texas	NELAP	6	T104704286-18-15	09-30-19
US Fish & Wildlife	Federal		LE058448-0	07-31-19
USDA	Federal		P330-18-00148	05-17-21
Virginia	NELAP	3	460166	06-14-19
Washington	State Program	10	C915	05-15-19
West Virginia DEP	State Program	3	136	07-31-19

Accreditation/Certification Summary

Client: Gulf Power Company
Project/Site: CCR Smith Plant Delineation

Job ID: 400-167259-2

Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD / DOE		L2305	04-06-22
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19 *
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-19 *
Hawaii	State Program	9	NA	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19 *
New York	NELAP	2	11616	03-31-20
North Dakota	State Program	8	R207	06-30-19 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-13	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19 *
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Geosyntec consultants

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Memorandum

Date:	May 10, 2019
To:	Lane Dorman
From:	Jennifer Pinion
CC:	J. Caprio
Subject:	**Stage 2A Data Validations - Level II Data Deliverable – Eurofins TestAmerica Job ID 400-167259-1**

SITE: Plant Smith

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four aqueous samples, one field duplicate, one equipment blank, and one field blank collected 11-12 March 2019, as part of the Plant Smith sampling event.

The samples were analyzed at Eurofins TestAmerica, Pensacola, Florida, for the following analytical tests:

- Metals by EPA Methods 3005A/6020
- Total Dissolved Solids (TDS) by Standard Method 2540C
- Chloride by Standard Method 4500 CL-E
- Fluoride by Standard Method 4500 F C
- Sulfate by Standard Method 4500 SO^4 E

EXECUTIVE SUMMARY

Based on the Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitation of the qualification.

The data were reviewed based on the pertinent methods referenced in the laboratory reports, professional and technical judgment and the following documents:

- US EPA Region IV Data Validation Standard Operating Procedures (US EPA Region IV, September 2011);

- USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review, January 2017 (EPA 540-R-2017-001); and

- Southern Company Services, Inc., Standard Operating Procedure (hereafter referred to as the SOP) for Level 2A Verification of Coal Combustion Residuals Data, Environmental Testing Laboratory Program, Draft, November 21, 2017, Revision 0, Prepared by Environmental Standards, Inc., Valley Forge, Pennsylvania.

The following samples were analyzed and reported in the laboratory reports:

Laboratory ID	Client ID
400-167259-1	MWI-12A
400-167259-2	PZ-11D
400-167259-3	PZ-14
400-167259-4	PZ-13D

Laboratory ID	Client ID
400-167259-5	DUP-02
400-167259-6	FB-02
400-167259-7	EB-02

1.0 METALS

The samples were analyzed for metals by EPA methods 3005A/6020.

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 Time
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
⊗ Equipment Blank
✓ Field 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; 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 this analysis, for this dataset is 100%.

1.2 Holding Time

The holding time for the metals analysis of a water sample is 180 days from sample collection to analysis. The holding times were 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). One method blank was reported (batch 434669). Metals were not detected in the method blank above the method detection limits (MDLs).

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 per batch of 20 samples). One batch MS/MSD pair was reported. Since these were 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). One LCS was reported. The recovery results were within the laboratory and SOP specified acceptance criteria.

1.6 Equipment Blank

Two equipment blanks, EB-01 and EB-02, were collected with the sample set; EB-01 was reported in laboratory report 440-167250-1. Metals were not detected in the equipment blanks above the MDLs, with the following exception.

Lithium was detected in equipment blank EB-02 at an estimated concentration greater than the MDL and less than the practical quantitation limit (PQL). Therefore, the estimated lithium concentration greater than the MDL and less than the PQL was U qualified as not detected at the PQL in the associated sample.

Sample ID	Compound	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier*	Reason Code**
PZ-14	Lithium	0.0011	I	0.0050	U	BE

I – laboratory flag defined as the reported value is between the MDL and the laboratory PQL
* 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

1.7 Field Blank

Two field blanks, FB-01 and FB-02, were collected with the sample set; FB-01 was reported in laboratory report 440-167250-1. Metals were not detected in the field blanks above the MDLs.

1.8 Field Duplicate

One field duplicate, DUP-02, was collected with the sample set. Acceptable precision [relative percent difference (RPD) $\leq$ 20% or difference < PQL] was demonstrated between the field duplicate and the original sample, MWI-12A.

1.9 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

1.10 Electronic Data Deliverable (EDD) 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.

2.0 WET CHEMISTRY

The samples were analyzed for chloride by Standard Method 4500 Cl-E, fluoride by Standard Method 4500 F C, sulfate by Standard Method 4500 SO^4 E and TDS by Standard Method 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 Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

2.1 Overall Assessment

The wet chemistry 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 these analyses, for this dataset is 100%.

2.2 Holding Times

The holding time for the fluoride, chloride and sulfate analysis of a water sample is 28 days from sample collection to analysis. The holding time for TDS analysis of a water sample is 7 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). Method blanks were reported for each analysis and batch (TDS batches 433367 and 433847, chloride batch 435592, fluoride batch 435153 and sulfate batches 434937 and 435477). The wet chemistry parameters were not detected in the method blanks above the MDLs.

2.4 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 was reported for chloride using sample MWI-12A. The recovery and RPD results were within the laboratory specified acceptance criteria with the following exceptions.

The recoveries of chloride in the MS/MSD pair using sample MWI-12A were low and outside the laboratory specified acceptance criteria. Since the chloride concentration in MWI-12A was greater than four times the chloride spiked concentration, no qualifications have been applied to the data, based on professional and technical judgement.

Batch MS/MSD pair were also reported for fluoride and sulfate. Since these were 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). LCSs were reported for each analysis and batch. The recovery results were within the laboratory and SOP specified acceptance criteria.

2.6 Laboratory Duplicate

A sample set specific laboratory duplicate was reported for fluoride using sample PZ-14. The RPD result was within the laboratory and SOP specified acceptance criteria.

Batch laboratory duplicates were also reported for TDS. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

2.7 Equipment Blank

Two equipment blanks, EB-01 and EB-02, were collected with the sample set; EB-01 was reported in laboratory report 440-167250-1. The wet chemistry parameters were not detected in the equipment blanks above the MDLs.

2.8 Field Blank

Two field blanks, FB-01 and FB-02, were collected with the sample set; FB-01 was reported in laboratory report 440-167250-1. The wet chemistry parameters were not detected in the field blanks above the MDLs.

2.9 Field Duplicate

One field duplicate, DUP-02, was collected with the sample set. Acceptable precision (RPD $\leq$ 20% or difference < PQL) was demonstrated between the field duplicate and the original sample, MWI-12A.

2.10 Sensitivity

The samples were reported to the MDLs. Elevated non-detect results were reported due to dilutions analyzed.

2.11 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.

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ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team per the SOP

DATA QUALIFIER DEFINITIONS

U* This analyte should be considered "not-detected" because it was detected in an associated blank at a similar level.

UJ The analyte was analyzed for, but was not detected above the level of the reported sample reporting/method detection limit. The reported method detection limit is approximate and may be inaccurate or imprecise.

J The analyte was positively identified but the result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team per the SOP

Reason Code	Explanation
BL	Laboratory blank contamination. The result should be considered "not-detected."
BE	Equipment blank contamination. The result should be considered "not-detected."
BF	Field blank contamination. The result should be considered "not-detected."
L	LCS and LCSD recoveries outside acceptance limits, indeterminate bias
L-	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low.
L+	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high.
M-	MS and/or MSD recoveries outside of acceptance limits. The result may be biased low.

Geosyntec consultants

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Memorandum

Date: May 13, 2019

To: Lane Dorman

From: Kristoffer Henderson

CC: J. Caprio

Subject: Stage 2A Data Validation - Level II Data Deliverable – TestAmerica Job ID 400-167259-2

SITE: Plant Smith

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four aqueous samples, one field duplicate sample, one equipment blank and one field blank, collected 11-12 March 2019, as part of the Plant Smith sampling event.

The samples were analyzed at TestAmerica, St. Louis, Missouri, for the following analytical tests:

- Radium-226 by EPA Method 9315
- Radium-228 by EPA Method 9320
- Combined Radium-226 and Radium-228 by Calculation

EXECUTIVE SUMMARY

Based on the Stage 2A data validation covering the quality control (QC) parameters listed below, the data are usable for meeting project objectives.

The data were reviewed based on the pertinent methods referenced in the laboratory report, professional and technical judgment and the following documents:

- US EPA Region IV Data Validation Standard Operating Procedures (US EPA Region IV, September 2011);
- American National Standard, Verification and Validation of Radiological Data for use in Waste Management and Environmental Remediation, February 15, 2012 (ANSI/ANS-41.5-2012); and,
- Southern Company Services, Inc., Standard Operating Procedure (hereafter referred to as the SOP) for Level 2A Verification of Coal Combustion Residuals Data, Environmental

Testing Laboratory Program, Draft, November 21, 2017, Revision 0, Prepared by Environmental Standards, Inc., Valley Forge, Pennsylvania.

The following samples were analyzed and reported in the laboratory report:

Laboratory ID	Client ID
400-167259-1	MWI-12A
400-167259-2	PZ-11D
400-167259-3	PZ-14
400-167259-4	PZ-13D

Laboratory ID	Client ID
400-167259-5	DUP-02
400-167259-6	FB-02
400-167259-7	EB-02

No preservation issues were noted by the laboratory.

1.0 RADIOCHEMISTRY

The samples were analyzed for radium-226 by EPA method 9315, radium-228 by EPA method 9320 and combined radium-226 and radium-228 by calculation.

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
- ✓ Carriers
- ✓ Equipment Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

1.1 Overall Assessment

The radiochemistry 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 this analysis, for this dataset is 100%.

1.2 Holding Times

The holding time for the radium-226 and radium-228 analyses of a water sample is 180 days from sample collection to analysis. The holding times were 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). Three method blanks were reported for the radium-226 data (batches 419788, 420714 and 421329) and one method blank was reported for the radium-228 data (batches 419798, 420719 and 421330). Radium-226 and radium-228 were not detected in the method blanks above the minimum detectable concentrations (MDCs).

1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

One batch MS/MSD pair was reported for radium-226 and one batch MS/MSD pair was reported for radium-228. Since these were batch QC there was no impact on the data and qualifications were not applied.

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). Two LCSs and one LCS/laboratory control sample duplicate (LCSD) were reported for radium-226 and two LCSs and one LCS/LCSD pair were reported for radium-228. The recovery and replicate error ratio (RER) [2 sigma (2σ)] results were within the laboratory and SOP specified acceptance criteria.

1.6 Laboratory Duplicate

One batch laboratory duplicate was reported for radium-226 and one batch laboratory duplicate was reported for radium-228. Since these were batch QC there was no impact on the data and qualifications were not applied.

1.7 Carriers

Carriers were reported for the radium-226 and radium-228 analyses. The recovery results were within the laboratory and SOP specified acceptance criteria.

1.8 Equipment Blank

Two equipment blanks, EB-01 and EB-02, were collected with the sample set; EB-01 was reported in laboratory report 440-167250-1. Radium-226 and Radium-228 were not detected in the equipment blanks above the MDCs.

1.9 Field Blank

Two field blanks, FB-01 and FB-02, were collected with the sample set; FB-01 was reported in laboratory report 440-167250-1. Radium-226 and Radium-228 were not detected in the field blanks above the MDCs.

1.10 Field Duplicate

One field duplicate, DUP-02, was collected with the sample set. Acceptable precision (RER (2σ) < 3) was demonstrated between the field duplicate and the original sample MWI-12A.

1.11 Sensitivity

The samples were reported to the MDCs. No elevated non-detect results were reported.

1.12 Electronic Data Deliverable (EDD) 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 other discrepancies were identified between the level II report and the EDD.

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ATTACHMENT 1
DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
Assigned by Geosyntec's Data Validation Team per the SOP

DATA QUALIFIER DEFINITIONS

U* This analyte should be considered "not-detected" because it was detected in an associated blank at a similar level.

UJ The analyte was analyzed for, but was not detected above the level of the reported sample reporting/method detection limit. The reported method detection limit is approximate and may be inaccurate or imprecise.

J The analyte was positively identified but the result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

ATTACHMENT 2
DATA VALIDATION REASON CODES
Assigned by Geosyntec's Data Validation Team per the SOP

Reason Code	Explanation
BL	Laboratory blank contamination. The result should be considered "not-detected."
BE	Equipment blank contamination. The result should be considered "not-detected."
BF	Field blank contamination. The result should be considered "not-detected."
L	LCS and LCSD recoveries outside acceptance limits, indeterminate bias
L-	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased low.
L+	LCS and/or LCSD recoveries outside of acceptance limits. The result may be biased high.
M-	MS and/or MSD recoveries outside of acceptance limits. The result may be biased low.

Product Name: Low-Flow System

Date: 2019-03-11 14:03:55

Project Information:		Pump Information:	
Operator Name	Trevor Braddock	Pump Model/Type	PP
Company Name	RDH Environmental	Tubing Type	PE
Project Name	Smith CCR	Tubing Diameter	.17 in
Site Name	Smith Plant	Tubing Length	56 ft
Latitude	0º 0' 0"		
Longitude	0º 0' 0"		
Sonde SN	625126		
Turbidity Make/Model	2100q	Pump placement from TOC	51 ft

Well Information:		Pumping Information:	
Well ID	PZ-11D	Final Pumping Rate	400 mL/min
Well diameter	2 in	Total System Volume	0.3399517 L
Well Total Depth	56 ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	30 in
Depth to Water	7.13 ft	Total Volume Pumped	8 L

Low-Flow Sampling Stabilization Summary

	Time	Elapsed	Temp C	pH	SpCond µS/cm	Turb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.2	+/- 0.2	+/- 5%	+/- 5		+/- 0.2	+/- 10
Last 5	13:43:37	300.03	23.18	6.79	5993.69	5.56	8.95	0.42	-108.03
Last 5	13:48:37	600.02	22.87	6.79	6004.58	5.47	9.52	0.18	-117.62
Last 5	13:53:37	900.01	22.87	6.79	5982.21	4.95	9.61	0.12	-119.46
Last 5	13:58:37	1200.01	22.70	6.79	5996.08	4.16	9.62	0.09	-120.32
Last 5									
Variance 0			-0.30	0.01	10.89			-0.24	-9.59
Variance 1			-0.00	-0.00	-22.37			-0.06	-1.84
Variance 2			-0.18	-0.00	13.88			-0.03	-0.86

Notes

Sample time 1405. Cloudy 66.

Grab Samples

Product Name: Low-Flow System

Date: 2019-03-12 12:23:12

Project Information:		Pump Information:	
Operator Name	Trevor Braddock	Pump Model/Type	PP
Company Name	RDH Environmental	Tubing Type	PE
Project Name	Smith CCR	Tubing Diameter	.17 in
Site Name	Smith Plant	Tubing Length	60 ft
Latitude	0º 0' 0"		
Longitude	0º 0' 0"		
Sonde SN	625126		
Turbidity Make/Model	2100q	Pump placement from TOC	52.7 ft

Well Information:		Pumping Information:	
Well ID	PZ-13D	Final Pumping Rate	400 mL/min
Well diameter	2 in	Total System Volume	0.3578054 L
Well Total Depth	57.4 ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	30 in
Depth to Water	18.31 ft	Total Volume Pumped	26 L

Low-Flow Sampling Stabilization Summary

	Time	Elapsed	Temp C	pH	SpCond µS/cm	Turb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.2	+/- 0.2	+/- 5%	+/- 5		+/- 0.2	+/- 10
Last 5	11:58:40	2700.01	23.50	4.52	14116.45	3.56	20.70	0.13	-98.57
Last 5	12:03:41	3000.99	23.47	4.52	14074.17	3.03	20.74	0.12	-96.89
Last 5	12:08:43	3302.99	23.55	4.51	14096.42	2.66	20.78	0.12	-96.18
Last 5	12:13:44	3603.99	23.55	4.51	14068.18	2.48	20.80	0.11	-94.63
Last 5	12:18:48	3907.98	23.59	4.52	14056.10	2.35	20.83	0.11	-95.15
Variance 0			0.08	-0.01	22.25			-0.00	0.71
Variance 1			0.00	-0.00	-28.24			-0.00	1.55
Variance 2			0.04	0.01	-12.09			-0.00	-0.53

Notes

Sample time 1225. Sunny 70.

Grab Samples

Product Name: Low-Flow System

Date: 2019-03-12 13:19:00

Project Information:		Pump Information:	
Operator Name	Rick Hagendorfer	Pump Model/Type	PP
Company Name	RDH Env	Tubing Type	PE
Project Name	Smith CCR	Tubing Diameter	.17 in
Site Name	Smith Plant	Tubing Length	17 ft
Latitude	0º 0' 0"		
Longitude	0º 0' 0"		
Sonde SN	632615		
Turbidity Make/Model	Hach 2100Q	Pump placement from TOC	10.5 ft

Well Information:		Pumping Information:	
Well ID	MWI-12A	Final Pumping Rate	400 mL/min
Well diameter	2 in	Total System Volume	0.1658782 L
Well Total Depth	15.5 ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	19 in
Depth to Water	6.82 ft	Total Volume Pumped	24 L

Low-Flow Sampling Stabilization Summary

	Time	Elapsed	Temp C	pH	SpCond µS/cm	Turb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.2	+/- 0.2	+/- 5%	+/- 5		+/- 0.2	+/- 10
Last 5	12:52:45	2402.02	18.43	6.10	652.57	2.45	8.44	0.52	67.74
Last 5	12:57:45	2702.02	18.48	6.10	651.37	2.25	8.48	0.49	67.33
Last 5	13:02:45	3002.02	18.57	6.01	708.84	2.01	8.48	0.44	67.35
Last 5	13:07:45	3302.02	18.55	6.01	719.80	2.04	8.48	0.45	66.47
Last 5	13:12:45	3602.08	18.53	6.04	686.69	1.63	8.48	0.43	64.99
Variance 0			0.09	-0.09	57.47			-0.05	0.03
Variance 1			-0.01	-0.00	10.96			0.01	-0.89
Variance 2			-0.02	0.03	-33.10			-0.01	-1.48

Notes

Sample time 1319. Dup-02 fake time 0700. Sunny 75.

Grab Samples

Product Name: Low-Flow System

Date: 2019-03-12 15:38:54

Project Information:		Pump Information:	
Operator Name	Trevor Braddock	Pump Model/Type	PP
Company Name	RDH Environmental	Tubing Type	PE
Project Name	Smith CCR	Tubing Diameter	.17 in
Site Name	Smith Plant	Tubing Length	21 ft
Latitude	0º 0' 0"		
Longitude	0º 0' 0"		
Sonde SN	625126		
Turbidity Make/Model	2100q	Pump placement from TOC	19.8 ft

Well Information:		Pumping Information:	
Well ID	PZ-14	Final Pumping Rate	400 mL/min
Well diameter	2 in	Total System Volume	0.1837319 L
Well Total Depth	24.8 ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	33 in
Depth to Water	2.33 ft	Total Volume Pumped	24 L

Low-Flow Sampling Stabilization Summary

	Time	Elapsed	Temp C	pH	SpCond µS/cm	Turb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.2	+/- 0.2	+/- 5%	+/- 5		+/- 0.2	+/- 10
Last 5	15:11:45	2402.02	21.20	6.38	12755.27	5.47	5.52	0.17	-267.94
Last 5	15:16:45	2702.02	21.17	6.39	12774.53	6.56	5.54	0.19	-268.06
Last 5	15:21:45	3001.99	21.18	6.38	12774.81	3.35	5.58	0.19	-268.26
Last 5	15:26:45	3301.99	21.21	6.38	12764.30	2.40	5.59	0.17	-268.28
Last 5	15:31:45	3601.98	21.18	6.38	12766.96	2.50	5.62	0.16	-268.19
Variance 0			0.00	-0.00	0.28			-0.00	-0.20
Variance 1			0.03	0.00	-10.51			-0.02	-0.02
Variance 2			-0.03	-0.00	2.66			-0.01	0.09

Notes

Sample time 1540.sunny 70. FB-02 sample time 1435.EB-02 sample time 1445

Grab Samples