Prepared for



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2019 SEMIANNUAL GROUNDWATER MONITORING & CORRECTIVE ACTION REPORT – REVISION 01 GEORGIA POWER COMPANY

PLANT HAMMOND ASH POND 3 (AP-3)

Prepared by



engineers | scientists | innovators

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Project Number GW6581

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Geosyntec Consultants

CERTIFICATION STATEMENT

This 2019 Semiannual Groundwater Monitoring & Corrective Action Report, Georgia Power Company - Plant Hammond – Ash Pond 3 (AP-3) has been prepared in compliance with the United States Environmental Protection Agency coal combustion residual rule [40 Code of Federal Regulations (CFR) 257 Subpart D], specifically 40 CFR § 257.90(e), and the Georgia Environmental Protection Division Rules for Solid Waste Management 391-3-4-.10 by a qualified groundwater scientist or engineer with Geosyntec Consultants.



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<u>March 13, 2020</u> Date

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LIST OF ACRONYMS

AP	ash pond
CCR	coal combustion residuals
CFR	Code of Federal Regulations
CFS	Civil Field Services
cm/sec	centimeters per second
DO	dissolved oxygen
ft	feet
ft/day	feet per day
ft/ft	feet per foot
GA EPD	Georgia Environmental Protection Division
GPC	Georgia Power Company
GWPS	Groundwater Protection Standard
HAR	Hydrogeologic Assessment Report
HDPE	high density polyethylene
K _h	horizontal hydraulic conductivity
mg/L	milligram per liter
NELAP	National Environmental Laboratory Accreditation Program
NTU	Nephelometric turbidity units
Pace Analytical	Pace Analytical Services, LLC.
PE	professional engineer
PL	prediction limit
QA/QC	Quality Assurance/Quality Control
SCS	Southern Company Services
SSI	statistically significant increase
s.u.	standard unit
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency

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1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (USEPA) coal combustion residual (CCR) rule [40 Code of Federal Regulations (CFR) Part 257, Subpart D] and the Georgia Environmental Protection Division (GA EPD) Rules for Solid Waste Management 391-3-4-.10, Geosyntec Consultants (Geosyntec) has prepared this 2019 Semiannual Groundwater Monitoring & Corrective Action Report to document groundwater monitoring activities conducted at Georgia Power Company (GPC) Plant Hammond (Site) Ash Pond 3 (AP-3).

Groundwater monitoring and reporting for the CCR unit is performed in accordance with the monitoring requirements of 40 CFR § 257.90 through 257.95 of the Federal CCR rule, and GA EPD Rules for Solid Waste Management 391-3-4-.10(6). To specify groundwater monitoring requirements, GA EPD rule 391-3-4-.10(6)(a) incorporates by reference the USEPA CCR Rule. For ease of reference, the USEPA CCR rules are cited within this report.

AP-3 ceased receiving waste prior to the effective date of the CCR rule promulgated in April 2015. A notification of intent to initiate closure of the inactive CCR surface impoundment was certified on December 7, 2015 and posted to GPC's website. Groundwater monitoring and reporting for AP-3 are being completed in accordance with the alternate schedule in 40 CFR § 257.100(e)(5) of the revised CCR rule (August 5, 2016).

This report documents groundwater monitoring activities completed for AP-3 from August 2019 through December 2019. This report includes the results of the initial annual monitoring event for Appendix IV of § 257.95 conducted in August 2019 and the semiannual monitoring event conducted in October 2019.

1.1 Site Description and Background

Plant Hammond is located in Floyd County, Georgia, approximately 10 miles west of Rome and is bordered by Georgia Highway 20 (GA-20) on the north, the Coosa River on the south, Cabin Creek and industrial land on the east, and sparsely populated, forested, rural and industrial land on the west (**Figure 1**). The physical address of the plant is 5963 Alabama Highway, Rome, Georgia, 30165.

Plant Hammond is a four-unit, coal-fired electric generating facility. All four units at Plant Hammond were retired on July 29, 2019 and no longer produce electricity.

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AP-3 is a 25-acre former ash pond that was constructed in 1973 and 1974. Ash sluicing and placement operations at AP-3 commenced in June 1977. In the early 1980's, AP-3 was converted into a dry ash disposal area and in the early 1990's the pond stopped receiving CCR materials.

Closure of AP-3 commenced in 2016. As part of closure, AP-3 was dewatered sufficiently to remove the free liquids. The CCR material remaining in AP-3 was graded and a final cover system installed. The final cover was constructed to control, minimize or eliminate, to the maximum extent feasible, the infiltration of liquids into the waste by providing sufficient grades and slopes to promote surface runoff from the unit. The final cover system consists of a 60-mil high density polyethylene (HDPE) liner, geocomposite drainage media, a minimum 18-inch thick protective soil cover, and a 6-inch thick vegetative layer. Final capping of the pond with a low-permeability cover system was completed in the second quarter of 2018.

1.2 <u>Regional Geology & Hydrogeologic Setting</u>

The following section summarizes the geologic and hydrogeologic conditions at AP-3 as described in the *Hydrogeologic Assessment Report Revision 01 – Ash Pond 3* (HAR Rev 01) submitted to GA EPD in November 2019 under separate cover in support of the AP-3 closure permit application (Geosyntec, 2019b)

1.2.1 Regional and Site Geology

The Site is located within the Great Valley District of the Valley and Ridge Physiographic Province (Valley and Ridge) in northwest Georgia, which is characterized by Paleozoic sedimentary rocks that have been folded and faulted into the ridges and valleys that gave this region its name. Geologic mapping performed at the Site by Petrologic Solutions, Inc. under the direction of Golder (Golder, 2018) indicates that AP-3 is underlain by the middle units of the Cambrian age Conasauga Formation, consisting of mostly shaley limestone. Based on review of site-specific subsurface investigations, the bedrock at AP-3 was identified as limestone or shaley limestone. AP-3 is underlain primarily by five lithologic units; (i) fill material, (ii) terrace alluvium, (iii) residuum, (iv) highly weathered/fractured limestone bedrock, and (v) unweathered limestone bedrock.

Based on subsurface investigations the fill is composed of lean clay or gravelly lean clay with sand, sometimes identified by the presence of wood or roots. The terrace alluvium consists of unconsolidated sediments with high sand and gravel content associated with deposition from the Coosa River and Cabin Creek. Residual or native soils have been

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derived from the in-place weathering of the shaley limestone bedrock. The residuum is generally described as fat clay with typically only trace amounts of sand, and rarely gravel. Just below the residuum clay layer is a gradational zone of varying proportions of clayey residuum and sand, gravel, and cobble-sized angular pieces of partially weathered limestone, grading into a zone of fractured limestone, before grading into unweathered, fresh limestone. The upper highly weathered zone appears more as residuum with various sized rock fragments. The lower zone becomes less clayey with depth and is estimated to be approximately 5 feet thick. Most of the limestone is described as medium to dark gray with a slabby or flaggy habit when broken in pieces by the sonic drilling. The limestone is very finely laminated with lighter and darker gray layers, and also contains interbeds of calcareous shale.

1.2.2 Hydrogeologic Setting

The uppermost aquifer at AP-3 is a regional groundwater aquifer that occurs within the residuum and the weathered and fractured bedrock. The uppermost aquifer is considered to be unconfined; however, localized, semi-confined conditions may be encountered due to the low-permeability clayey nature of the residual soils, or as a result of perched groundwater or poorly interconnected fracture networks in the bedrock. Based on observations of soil types and horizontal conductivity values, the movement of groundwater in the soil, and to some degree the highly weathered bedrock zone, can be characterized as low-to moderate permeability, porous media flow. Groundwater flow in the more competent underlying bedrock is characterized as fracture flow. Flow direction within the area of AP-3 is generally from west to east.

1.3 <u>Groundwater Monitoring Well Network</u>

In accordance with § 257.91, a groundwater monitoring system was installed at AP-3 that (1) consists of a sufficient number of wells, (2) is installed at appropriate locations and depths to yield groundwater samples from the uppermost aquifer, and (3) represents the groundwater quality both upgradient of the units (i.e., background conditions) and passing the waste boundary of the units. The number, spacing, and depths of the groundwater monitoring wells were selected based on the characterization of site-specific hydrogeologic conditions. The well network was certified by a professional engineer (PE) on April 17, 2019; the certification is maintained in the AP-3 Operating Records.

The certified compliance monitoring well network for AP-3 consists of four monitoring wells. A network of piezometers has been installed at the Site that are used to gauge

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water levels to define groundwater flow direction and gradients. The locations of the compliance monitoring well network and secondary groundwater level monitoring piezometers associated with AP-3 are shown on Figure 2; well construction details are listed in Table 1.

2.0 GROUNDWATER MONITORING ACTIVITIES

In accordance with § 257.90(e), the following describes groundwater monitoring-related activities performed for AP-3 during the second semiannual period of 2019. All groundwater sampling was performed in accordance with § 257.93.

2.1 <u>Monitoring Well Installation and Maintenance</u>

Two additional groundwater level monitoring piezometers (MW-31 and MW-32) were installed in November 2019 to provide additional data to characterize flow conditions downgradient of AP-3. A well installation report that includes detailed boring and well construction logs for these two piezometers is provided in **Appendix A**. The locations of piezometer MW-31 and MW-32 are shown on **Figure 2** and piezometer construction details are also provided in **Table 1**.

The well and piezometer networks are inspected during each groundwater monitoring event using GA EPD-based inspection criteria. Any issues identified with the wells (e.g., clogged weep holes within the outer protective casing, faded well identification signage, rusted locks and/or latches, etc.) are addressed before the following groundwater monitoring event. The well inspection forms for the 2019 reporting period are provided in **Appendix B**.

SCS Civil Field Services (CFS) installed a dedicated QED bladder pump with dedicated tubing in wells HGWA-122, HGWC-121A, and HGWC-124 in September 2019.

2.2 Assessment Monitoring

Appendix III constituents exhibited statistically significant increases (SSIs) over background during the first detection monitoring event conducted in April 2019. Analytical results and statistical evaluation of those results were provided in the *2019 Annual Groundwater and Corrective Action Monitoring Report* (Geosyntec, 2019a). An Assessment Monitoring Program Notification was prepared for AP-3 on November 13, 2019, pursuant to 40 CFR § 257.94(e)(3) and placed in the Operating Records of the ash pond as required by 40 CFR § 257.105(h)(5).

Pursuant to \S 257.95(b), the compliance monitoring well network (**Figure 2**) was sampled for the full suite of Appendix IV parameters in August 2019, within 90 days of initiating the assessment monitoring program. Pursuant to \S 257.95(d)(1), the AP-3 compliance wells were resampled in October 2019. The groundwater samples were analyzed for

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Appendix III parameters and the following Appendix IV constituents that were detected during the August 2019 event: barium, chromium, cobalt, fluoride, lead, lithium, molybdenum, and combined radium 226/228. The October 2019 monitoring event served as the first semiannual groundwater assessment monitoring event, as required by § 257.95(d)(1). Pursuant to 40 CFR § 257.90(e)(3), laboratory and field data reports for the August and October 2019 monitoring events are included in **Appendix C**. The number of AP-3 groundwater samples collected for analysis and the sample collection dates are summarized in **Table 2**.

3.0 SAMPLING METHODOLOGY & ANALYSES

Two monitoring events were conducted during this monitoring period: (1) an initial assessment monitoring event was conducted in August 2019 as a result of statistical exceedances during the first detection monitoring event, and (2) the subsequent assessment event conducted in October 2019, which served as the semiannual compliance monitoring event for the year. The following sections describe the methods used to conduct groundwater monitoring at the Site.

3.1 Groundwater Level Measurement

Prior to each sampling event, a synoptic round of depth-to-groundwater level measurements were recorded from the AP-3 wells and piezometers and used to calculate the groundwater elevations. The calculated groundwater elevations for the August and October 2019 monitoring events are presented in **Table 3**. The groundwater elevations for the August 2019 event ranged from 575.48 feet (ft) (referenced to the North American Vertical Datum of 1988) in well MW-21 to 564.84 ft in well HGWC-124. The groundwater elevations for the October 2019 event ranged from 574.07 ft in well MW-21 to 564.21 ft in well HGWC-120. The elevations reported for these two events are representative of the prior monitoring events.

The groundwater elevation data were used to prepare potentiometric surface contour maps for the August and October 2019 monitoring events, which are presented on **Figures 3** and **4**, respectively. Groundwater in the AP-3 area flows under the influence of topography from slightly higher ground surface elevations on the western side of the Site towards lower elevations to the east of AP-3.

3.2 Groundwater Gradient and Flow Velocity

The representative groundwater hydraulic gradient within the uppermost aquifer beneath AP-3 was calculated using the August and October 2019 groundwater elevation data. Hydraulic gradients were calculated between wells MW-21 and HGWC-120. The general trajectory of the flow paths are shown on **Figures 3** and **4**. The average hydraulic gradient across AP-3 is 0.0076 feet per foot (ft/ft). The calculations are presented on **Table 4**.

The approximate horizontal flow velocity associated with AP-3 groundwater was calculated using the following derivative of Darcy's Law.

$$V = linear \ velocity = \frac{K * i}{n_e}$$

where:

$$V = \text{Groundwater flow velocity} \left(\frac{feet}{day}\right)$$
$$K = \text{Average hydraulic conductivity} \left(\frac{feet}{day}\right)$$
$$i = \text{Horizontal hydraulic gradient} \left(\frac{feet}{feet}\right)$$
$$n_e = \text{Effective porosity}$$

Aquifer testing was conducted by LETCO in 1977, SCS in 2014, and Geosyntec in 2017 to evaluate hydraulic conditions in the vicinity of AP-3. Slug testing was performed to estimate the horizontal hydraulic conductivity (K_h) for units above the top of bedrock, while single packer testing was used to estimate the K_h for the bedrock intervals. Additional details are presented in the HAR Rev 01 (Geosyntec, 2019b).

The groundwater flow velocity calculation was performed using the geometric mean value for K_h of the highly weathered/fractured rock of 9.8 x 10⁻⁴ centimeters per second (cm/sec) or 2.76 feet per day (ft/day). An estimated effective porosity of 0.15 is used to represent average lithologic conditions at AP-3, derived based on review of literature, observed site lithology, and professional judgement. With these variables determined, and accounting for the hydraulic gradient discussed above, the groundwater flow velocity underneath AP-3 was calculated to be 0.14 ft/day.

3.3 Groundwater Sampling Procedures

Groundwater samples were collected from the compliance monitoring network using low-flow sampling procedures in accordance with 40 CFR § 257.93(a). For the August 2019 event, well HGWC-120 was purged and sampled using the installed bladder pump with dedicated tubing; the remaining three wells (i.e., HGWA-122, HGWC-121A, and HGWC-124) were sampled using a peristaltic pump equipped with new disposable polyethylene tubing. For the October 2019 event, all four compliance wells were purged and sampled using installed bladder pumps with dedicated tubing. All non-disposable equipment was decontaminated before use and between well locations. A SmarTroll (In-Situ field instrument) was used to monitor and record field water quality parameters listed below during well purging to verify stabilization prior to sampling. Turbidity was measured using a LaMotte 2020we® portable turbidimeter. Groundwater samples were collected when the following stabilization criteria were met:

- $pH \pm 0.1$ Standard Units (s.u.).
- Conductivity \pm 5%.
- ±0.2 milligrams per liter (mg/L) or ±10%, whichever is greater for dissolved oxygen (DO) > 0.5 mg/L. No criterion applies if DO < 0.5 mg/L, record only.
- Turbidity measured less than 10 nephelometric turbidity units (NTU).

Following purging, and once stabilization was achieved, samples were collected into appropriately preserved laboratory-supplied sample containers. Sample bottles were placed in ice-packed coolers and submitted to Pace Analytical Services, LLC. in Norcross, Georgia following chain-of-custody protocol. The field sampling forms generated during the monitoring events conducted in August and October 2019 are provided in **Appendix C**.

3.4 <u>Laboratory Analyses</u>

Laboratory analyses were performed by Pace Analytical Services, LLC. (Pace Analytical), which is accredited by the National Environmental Laboratory Accreditation Program (NELAP). Pace Analytical maintains a NELAP certification for the Appendix III and Appendix IV parameters analyzed for this project. Analytical methods used for groundwater sample analysis are listed in the analytical laboratory reports included in **Appendix C**.

The groundwater analytical results from the August and October 2019 monitoring events are summarized in **Table 5**. The associated Pace Analytical laboratory reports are provided in **Appendix C**.

3.5 <u>Quality Assurance & Quality Control Summary</u>

Quality assurance/quality control (QA/QC) samples were collected during the groundwater monitoring events and included the following: field duplicates, equipment blanks, and field blank samples. QA/QC samples were collected in laboratory-provided

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bottles and submitted under the same chain of custody as the primary samples for analysis of the same parameters by Pace Analytical.

In addition to collecting QA/QC samples, the data were validated based on the pertinent methods referenced in the laboratory reports, professional and technical judgment and applicable federal guidance documents (USEPA, 2001, 2011, and 2017). The associated data validation report is provided in **Appendix C** with the laboratory reports.

4.0 STATISTICAL ANALYSIS

The following section summarizes the statistical analysis of Appendix III groundwater monitoring data performed pursuant to 40 CFR § 257.93 following the PE-certified statistical method for AP-3, revised January 2020. Pursuant to 40 CFR § 257.95(d)(2), GPC will establish groundwater protection standards for the Appendix IV monitoring parameters and complete statistical analysis of the Appendix IV groundwater monitoring data obtained during the first semiannual assessment monitoring event within 90 days of obtaining the results. GPC will complete the assessment monitoring and statistical analysis in accordance with 40 CFR § 257.95 and report the results in the Annual Groundwater Monitoring and Corrective Action Report, due August 1, 2020.

4.1 <u>Statistical Method</u>

Based on guidance from GA EPD, statistical tests used to evaluate the groundwater monitoring data consist of interwell prediction limits combined with a 1-of-2 verification resample plan for each of the Appendix III parameters.

Interwell PLs are constructed using data from upgradient well HGWA-122 to establish a background limit for an individual constituent. The most recent sample from each downgradient well is compared to the background limit to determine whether there are SSIs. An "initial exceedance" occurs when any downgradient well data exceed the PL. Statistical analyses of October 2019 Appendix III data are presented in **Appendix D**.

The Sanitas groundwater statistical software was used to perform the statistical analyses. Sanitas is a decision-support software package, that incorporates the statistical tests required of Subtitle C and D facilities by USEPA regulations and guidance as recommended in the USEPA document *Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance* (Unified Guidance) (USEPA, 2009).

Time series plots generated by Sanitas are used to identify suspected outliers, or extreme values that would result in limits that are not representative of the current background data population. Suspected outliers at all wells for Appendix III parameters are formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits. Background well data were updated following the Unified Guidance recommendation, evaluating recent background data using Tukey's box plot method for outliers and Sen's Slope/Mann-Kendall methods for potential trends.



4.2 Appendix III Statistical Analyses Results

Statistical analysis of the October 2019 groundwater data was performed to determine if Appendix III constituents have returned to background levels. **Table D-1** in **Appendix D** presents a summarized comparison of the interwell PLs to the October 2019 semiannual monitoring data.

No newly suspected outliers or extreme trending data were identified in the dataset for Appendix III constituents during this reporting period. Based on review of the Appendix III statistical analysis presented in **Appendix D**, the following parameters represent SSIs over background interwell PLs:

- Boron: HGWC-120, HGWC-121A, HGWC-124;
- Calcium: HGWC-120, HGWC-121A, HGWC-124;
- Chloride: HGWC-121A;
- Fluoride: HGWC-120;
- pH: HGWC-124;
- Sulfate: HGWC-120, HGWC-121A, HGWC-124;
- TDS: HGWC-120, HGWC-121A.

The October 2019 statistical evaluation results are consistent with the 2019 Annual Groundwater and Corrective Action Monitoring Report (Geosyntec, 2019a) statistical results, with the exception of a new SSI of pH at HGWC-124.

4.3 Appendix IV Statistical Analyses Results

Pursuant to 40 CFR § 257.95 and GA EPD rule 391-3-4-.10(6)(a), Appendix IV groundwater quality data will be statistically analyzed and compared to groundwater protection standards within 90 days of receiving data from the first (October 2019) semiannual assessment monitoring event. GPC will complete the assessment monitoring and statistical analysis in accordance with 40 CFR § 257.95 and report the results in the Annual Groundwater Monitoring and Corrective Action Report, due August 1, 2020.

5.0 MONITORING PROGRAM STATUS

Based on the statistical evaluation results presented, SSIs of Appendix III parameters have not returned to background levels. Pursuant to 40 CFR § 257.94(e), GPC will continue to monitor groundwater at AP-3 in accordance with the assessment monitoring program regulations of 40 CFR § 257.95. As part of the initial phases of the assessment monitoring program, GPC is currently evaluating Appendix IV data collected from AP-3 compliance wells to statistically establish GWPS for these constituents pursuant to 40 CFR § 257.95.

6.0 CONCLUSIONS & FUTURE ACTIONS

This 2019 Semiannual Groundwater Monitoring & Corrective Action Report for GPC's Plant Hammond AP-3 was prepared to fulfill the requirements of USEPA's CCR Rule and GA EPD Rules for Solid Waste Management 391-3-4-.10. Statistical evaluations of the October 2019 groundwater monitoring data identified SSIs of Appendix III groundwater monitoring parameters in wells HGWC-120, HGWC-121A, and HGWC-124.

GPC initiated assessment monitoring in accordance with the requirements of 40 CFR § 257.95. The next scheduled sampling event for AP-3 is scheduled for March 2020. During the next semiannual reporting period of 2020, GPC will establish groundwater protection standards for Appendix IV constituents in accordance with 40 CFR § 257.95 and report the results in the Annual Groundwater Monitoring and Corrective Action Report, due August 1, 2020.

7.0 **REFERENCES**

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TABLES

Table 1Monitoring Well Network SummaryPlant Hammond AP-3, Floyd County, Georgia

Well ID	Hydraulic Location	Installation Date	Northing ⁽¹⁾	Easting ⁽¹⁾	Top of Casing Elevation ⁽²⁾ (ft NAVD88)	Top of Screen Elevation (ft NAVD88)	Bottom of Screen Elevation (ft NAVD88)	Well Depth (ft BTOC) ⁽³⁾	Screen Interval Length	
Compliance Monitoring Wel	1									
HGWA-122	Upgradient	11/20/2014	1551251.86	1941888.49	588.05	569.93	559.93	28.52	10	
HGWC-120	Downgradient	6/27/2016	1551067.08	1942925.07	605.92	548.37	538.37	67.55	10	
HGWC-121A	Downgradient	5/17/2017	1550606.53	1943030.72	584.85	556.69	546.69	38.16	10	
HGWC-124	Downgradient	11/13/2014	1551624.63	1942779.73	582.64	557.52	547.52	35.52	10	
Groundwater Level Monitor	Groundwater Level Monitoring Piezometer									
MW-21	Downgradient	12/3/2014	1550268.83	1941809.72	586.39	570.01	560.01	26.78	10	
MW-23	Downgradient	11/24/2014	1551642.86	1942496.25	585.09	562.48	552.48	33.01	10	
MW-31	Downgradient	11/25/2019	1550422.94	1942688.61	611.35	552.60	542.60	66.00	10	
MW-32	Downgradient	11/22/2019	1551094.60	1943021.05	585.62	559.27	549.27	33.80	10	

Notes:

ft = feet

ft BTOC = feet below top of casing

(1) Coordinates in North American Datum (NAD) 1983, State Plane, Georgia-West, feet.

(2) Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

(3) Total well depth accounts for sump if data provided on well construction logs.

Table 2Groundwater Sampling Event SummaryPlant Hammond AP-3, Floyd County, Georgia

Well ID	Hydraulic Location	Aug 21-23, 2019	Aug 21-23, Oct 21-22, 2019 2019	
Purpose of S	ampling Event:	Initial App. IV Annual	Assessment	Monitoring Well
HGWA-122	HGWA-122 Upgradient		A01	Assessment
HGWC-120	HGWC-120 Downgradient		A01	Assessment
HGWC-121A Downgradient		S01	A01	Assessment
HGWC-124	Downgradient	S01	A01	Assessment

Notes:

S## = Initial annual Appendix IV sampling event number since initiation of the assessment monitoring program. A## = Semiannual assessment monitoring event number for given reporting year.

Table 3Summary of Groundwater ElevationsPlant Hammond AP-3, Floyd County, Georgia

	Top of Casing	Aug 2	1, 2019	Oct 21	, 2019	
Well ID	Elevation (ft NAVD88) ⁽¹⁾	Depth to Water (ft BTOC)	Groundwater Elevation (ft MSL)	Depth to Water (ft BTOC)	Groundwater Elevation (ft MSL)	
Compliance Mon	itoring Well					
HGWA-122	588.05	15.38	572.67	16.96	571.09	
HGWC-120	605.92	40.98	564.94	41.71	564.21	
HGWC-121A	584.85	18.46	566.39	19.32	565.53	
HGWC-124	582.64	17.80	564.84	17.90	564.74	
Groundwater Lev	el Monitoring Pi					
MW-21	586.39	10.91	575.48	12.32	574.07	
MW-23	585.09	15.67	569.42	16.65	568.44	

Notes:

ft = feet

ft BTOC = feet below top of casing

(1) Survey data recorded March 14, 2018. Elevations referenced to the North American Vertical Datum of 1988 (NAVD88).

Table 4
Groundwater Gradient and Flow Velocity Calculations
Plant Hammond AP-3, Floyd County, Georgia

		August 21, 2	019		October 21, 2019				
Flow Path Direction ⁽¹⁾	h ₁ (ft)	h ₂ (ft)	Δl (ft)	Δh/Δl (ft/ft)	h ₁ (ft)	h ₂ (ft)	Δl (ft)	Δh/Δl (ft/ft)	Average Δh/Δl (ft/ft)
Westerly Flow Path	575.48	564.94	1,350	0.0078	574.07	564.21	1,350	0.0073	0.0076

			Averaged f	or Fall 2019
Flow Path Direction ⁽¹⁾	K (ft/d)	n	Δh/Δl (ft/ft)	V (ft/d) ⁽²⁾
Westerly Flow Path	2.76	0.15	0.0076	0.14

Notes:

ft = feet

ft/d = feet per day

ft/ft = feet per foot

 $h_1, h_2 =$ groundwater elevation for identified location

 $\Delta h/\Delta l =$ hydraulic gradient

K = hydraulic conductivity

 Δl = distance between identified location 1 and 2

n = effective porosity

V = groundwater flow velocity

(1) Gradients calculated between wells MW-21 (h1) and HGWC-120 (h2).

(2) Groundwater flow velocity equation: $V = [K * (\Delta h / \Delta l)] / n$

Table 5 Summary of Groundwater Analytical Data Plant Hammond AP-3, Floyd County, Georgia

	Well ID:	HGWA-122	HGWA-122	HGWC-120	HGWC-120	HGWC-121A	HGWC-121A	HGWC-124	HGWC-124
	Sample Date:	8/22/2019	10/21/2019	8/22/2019	10/22/2019	8/22/2019	10/21/2019	8/23/2019	10/21/2019
	Parameter ^(1,2)								
APPENDIX III	Boron		0.25		1.0		2.4		0.50
	Calcium		80.8		171		173		96.9
	Chloride		4.5		3.4		29.9		3.6
	Fluoride	ND (0.12 J)	ND (0.15 J)	ND (0.30 J)	0.53	ND (0.20 J)	ND (0.18 J)	ND (0.11 J)	ND (0.073 J)
	рН ⁽³⁾	6.51	6.69	6.79	6.74	6.77	6.74	7.02	7.05
	Sulfate		45.6		266		238		78.5
	TDS		296		693		771		357
	Antimony	ND		ND		ND		ND	
	Arsenic	ND		ND		ND		ND	
	Barium	0.044	0.040	0.050	0.051	0.066	0.074	0.066	0.075
	Beryllium	ND		ND		ND		ND	
	Cadmium	ND		ND		ND		ND	
Ν	Chromium	ND (0.00060 J)	ND (0.00068 J)	ND (0.00072 J)	ND	ND	ND	ND	ND (0.00046 J)
IXI	Cobalt	ND	ND	ND (0.0028 J)	ND (0.0031 J)	ND	ND	ND	ND
UN	Fluoride	ND (0.12 J)	ND (0.15 J)	ND (0.30 J)	0.53	ND (0.20 J)	ND (0.18 J)	ND (0.11 J)	ND (0.073 J)
PPE	Lead	ND	ND (0.000097 J)	ND	ND	ND	ND	ND (0.000049 J)	ND (0.000049 J)
A	Lithium	ND	ND	ND (0.029 J)	ND (0.030 J)	ND (0.0084 J)	ND (0.0090 J)	ND (0.0011 J)	ND (0.0011 J)
	Mercury	ND		ND		ND		ND	
	Molybdenum	ND (0.0030 J)	ND (0.0049 J)	0.039	0.040	ND	ND	ND (0.0014 J)	ND (0.0013 J)
	Comb. Radium 226/228	1.19 U	0.772 U	1.35	0.760 U	1.30	0.393 U	0.834	1.11 U
	Selenium	ND		ND		ND		ND	
	Thallium	ND		ND		ND		ND	

Notes:

--= Parameter was not analyzed

J = Indicates the parameter was estimated and detected between the method detection limit (MDL) and the reporting limit (RL)

ND = Indicates the parameter was not detected above the analytical MDL

TDS = Total dissolved solids

U = Indicates the parameter was not detected above the minimum detection concentration (MDC, specific to combined radium)

(1) Appendix III/IV parameter per 40 CFR 257 Subpart D. Parameters are reported in units of milligrams per liter (mg/L), except for pH reported as s.u. (standard units) and combined radium reported as picocuries per liter (pCi/L).

(2) Metals were analyzed by EPA Method 6020B, anions were analyzed by EPA Method 300.0, TDS was analyzed by SM2540C, and combined radium by EPA Methods 9315/9320.

(3) The pH value presented was recorded at the time of sample collection in the field.

FIGURES















APPENDIX A

Well Design, Installation, and Development Report – Addendum No.3, Plant Hammond Ash Ponds 2 and 3 (AP-2 and AP-3)

Prepared for



Georgia Power Company 241 Ralph McGill Blvd NE Atlanta, Georgia 30308

WELL DESIGN, INSTALLATION, AND DEVELOPMENT REPORT – ADDENDUM No. 3

PLANT HAMMOND ASH PONDS 2 AND 3 (AP-2 AND AP-3)



engineers | scientists | innovators

1255 Roberts Boulevard, Suite 200 Kennesaw, Georgia 30144

Project Number GW6581B

January 2020



WELL DESIGN, INSTALLATION, AND DEVELOPMENT REPORT – ADDENDUM No. 3

Plant Hammond Ash Ponds 2 and 3 January 30, 2020

Blou

Whitney B. Law, P.E. Project Manager Geosyntec Consultants



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- Appendix C Well Development Forms



LIST OF ACRONYMS

AP	Ash Pond
ASTM	American Society for Testing and Materials
CCR	coal combustion residual
CFR	Code of Federal Regulations
CFS	Civil Field Services
DO	dissolved oxygen
ft MSL	feet mean sea level
GA EPD	Georgia Environmental Protection Division
GPC	Georgia Power Company
NAD83	North America Datum of 1983
NAVD88	North American Vertical Datum of 1988
NSF	National Sanitation Foundation
ORP	oxygen reduction potential
PVC	polyvinyl chloride
SCS	Southern Company Services
TOC	top of casing
US EPA	United States Environmental Protection Agency

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1. INTRODUCTION

This report provides details regarding the design, installation, and development of three wells to supplement the current groundwater monitoring system at Georgia Power Company (GPC) Plant Hammond (Site) Ash Ponds 2 and 3 (AP-2 and AP-3). Wells MW-31, MW-32, and MW-33 will be used as groundwater level monitoring piezometers. Wells MW-31 and MW-32 are associated with AP-3, while well MW-33 is associated with AP-2. The report was prepared as an addendum to the *Well Design, Installation, Development, and Decommissioning Report – Plant Hammond Ash Ponds 1 and 2* (ERM, 2017) and the *Well Design, Installation, and Development Report – Plant Hammond Ash Pond 3* (Geosyntec, 2019a) and meets the requirements promulgated in the United States Environmental Protection Agency (US EPA) coal combustion residual (CCR) rule [40 Code of Federal Regulations (CFR) Part 257, Subpart D], specifically 40 CFR §257.91(e)(1).

Plant Hammond is located in Floyd County, approximately 10 miles west of Rome, Georgia. The current groundwater monitoring systems at AP-2 and AP-3 includes wells associated with the certified CCR compliance monitoring well network and groundwater level monitoring piezometers. Additionally, AP-2 has a network of secondary groundwater delineation monitoring wells. The locations of these wells and piezometers are shown on **Figure 1** for AP-3 and **Figure 2** for AP-2. Details regarding the installation of the certified compliance well network are presented in the above referenced ERM and Geosyntec reports, whereas details regarding the installation of the delineation wells at AP-2 are provided in the initial addendum prepared by Geosyntec Consultants (Geosyntec) (Geosyntec, 2019b).



2. DRILLING AND WELL INSTALLATION

Well installation and development activities were performed according to accepted industry standards and following guidelines within the *Manual for Groundwater Monitoring* (GA EPD, 1991). Well drilling, installation, and surface completion activities were performed by Cascade Drilling Inc. (Cascade) of Midland, North Carolina under contact with, and the supervision of, Southern Company Services (SCS) Civil Field Services (CFS) personnel. In accordance with the Georgia Water Well Standards Act, the driller was required to have an insurance bond on file with the State of Georgia at the time of drilling. A copy of this bond is provided in **Appendix A**. A professional geologist (PG) registered to practice in the State of Georgia, and a geologist under the supervision of a PG, both employed with Geosyntec Consultants (Geosyntec), documented the drilling and installation efforts to record observations, soil and rock descriptions, subsurface stratigraphy, water elevations, and other field activities. Geosyntec was also responsible for the development of the newly installed wells.

AP-3 area wells MW-31 and MW-32, and AP-2 area well MW-33 were installed in November 2019. The locations of these wells are shown on **Figures 1** and **2**, respectively. Well construction details are provided in **Table 1**; boring and well construction logs are included in **Appendix B**.

2.1 Drilling Method

Sonic drilling method with continuous core collection was used for borehole advancement at MW-31. At MW-32 and MW-33, hollow-stem auger with 5-ft center [from 10 to 18.5 feet below ground surface (ft bgs)] and continuous (from 18.5 ft bgs to target depth or auger refusal) split spoon soil samplers were used for borehole advancement. At MW-32, a wireline rock coring method was used to advance borings to final depth into the bedrock. A truck-mounted TS-150 Sonic drill rig was used to install well MW-31; a CME-550 rubber tire ATV mounted drill rig installed MW-32 and MW-33 wells. To advance boreholes, the Sonic rig used a 6-inch sonic drill rod and the CME-550 used an 8-inch (OD) auger; a 4-inch drill rod was used for rock coring advancement. Care was taken so that the drilling methods did not introduce contamination of the groundwater from surface activities.

Drilling equipment was cleaned between each borehole.

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2.2 <u>Screened Interval</u>

The wells are screened in the uppermost water bearing unit. The three new AP-2 and AP-3 wells are screened from approximately 566 to 543 feet mean sea level (ft MSL) as surveyed relative to the North American Vertical Datum 1988 (NAVD88). All wells are constructed with 10 feet of well screen.

2.3 Well Casings and Screens

The wells are constructed of 2-inch inner diameter Schedule 40 polyvinyl chloride (PVC) casing with flush-threaded fittings. Each well was installed with a 10-foot nominal length pre-packed dual-wall well screen with 0.010-inch slots. The casings and pre-packed screens arrived pre-cleaned and packaged by the manufacturer. The pre-packed well screen was constructed onsite by packing sand between slotted PVC and the well screen. Well construction materials are sufficiently durable to resist chemical and physical degradation and not interfere with the quality of groundwater samples. Casing and screens are flush-threaded. Solvent or glue was not used to construct the wells. A threaded bottom cap was attached to the bottom of the screen. The PVC products used were American Society for Testing and Materials (ASTM) and National Sanitation Foundation (NSF) rated. Well screen interval details are provided in **Table 1**.

2.4 Well Intake Design

Wells were designed and constructed to: (1) allow sufficient groundwater flow to the well for sampling; (2) minimize the passage of formation materials (turbidity) into the wells; and (3) ensure sufficient structural integrity to prevent collapse of the well. The annular space between the face of the formation and the screen was filled to minimize passage of formation materials into the wells. A filter pack of clean, well-rounded, quartz sand was installed in each well. The 0.01-inch slot size was selected to minimize the inflow of formation material without impairing influent groundwater flow.

2.5 Filter Pack

Highly Pure Quartzite of Southern Products & Silica Co. silica sand filter pack was used as the appropriate gradation for all wells. Highly Pure Quartzite meets the ASTM D5092 uniformity coefficient specification of 2.5 or less, with a uniformity coefficient of 1.6.

Filter pack material was placed within the pre-packed dual-wall well screens and in the annular space between the outside of the pre-pack screen and borehole wall to ensure an adequate thickness of filter pack material between the well and the formation. Filter pack

material placed in the annular space outside of the well screen extended approximately 2 feet above the top of screen. No bridging occurred during filter pack placement.

Upon placement of the filter pack, each well was pumped with a submersible pump to assure settlement of the filter pack. The top of filter pack depth was measured following pumping to ensure appropriate extension of filter sand above the screen. The depth of the top of the filter pack was measured and recorded on the well construction logs provided in **Appendix B**.

2.6 <u>Annular Seal</u>

A minimum of two feet of bentonite pellets (PelPlug time-release coated 3/8" bentonite pellets) were placed immediately above the filter pack by gravity-pouring into the annular space and hydrated per manufacture's specifications. A tremie pipe was used to probe the annular space to ensure that no bridging occurred. If any new well was installed within 15 feet of an existing well, the bentonite seal was brought above the elevation corresponding to the screen top of the nearby well. This was done to prevent grout from entering the water-bearing or screen zone. The bentonite was hydrated with potable water for a duration meeting or exceeding the manufacture's specifications prior to grouting the remaining annulus.

The annulus above the bentonite seal was grouted with Aqua Guard bentonite grout placed via tremie pipe from the top of the bentonite seal. During grouting, care was taken to assure that the bentonite seal was not disturbed by locating the base of the tremie pipe approximately 2 feet above the bentonite seal and injecting grout at low pressure/velocity. A cement apron 4-feet by 4-feet by 4-inches was poured around each well. The pad is mounded slightly outward to direct surface drainage away from the well.

2.7 Cap and Protective Casing

The well risers are fitted with a locking cap and a lockable cover. A one-quarter inch vent hole in the PVC riser pipe provides an avenue for the escape of gas. The protective cap guards the casing from damage and the locking cap serves as a security device to prevent well tampering. Bollards were installed around the four corners of the concrete pad to protect the well.

Wells are clearly marked with signs with the proper designation. A weep hole was drilled in the outer protective casing near the bottom above the concrete pad. Pea gravel was placed inside the protective casing between the riser pipe and the outer casing. Wells are



clearly marked with the proper well identification number on the stand-up casing. Construction details are documented on the well construction logs provided in **Appendix B**.



3. WELL DEVELOPMENT

Wells were developed using a combination of surging and pumping to (1) restore the natural hydraulic conductivity of the formation, and (2) to remove fine-grained sediment to ensure low-turbidity groundwater samples. Wells were alternately surged and purged until visually clear of particulates. Turbidity, pH, temperature, conductivity, oxidation-reduction potential (ORP), and dissolved oxygen (DO) measurements were recorded to ensure that each well was fully developed. The development forms are included in **Appendix C**.

All equipment and tubing placed in the well was decontaminated or disposed of between wells.



4. SURVEY

Upon completion of the well installation, the horizontal locations and vertical elevations were surveyed by CFS. The survey pin installed at each well pad was surveyed to within +/- 0.5-foot horizontal accuracy. Elevations were also measured to the nearest 0.01-foot on the top of the PVC well casing [top of casing (TOC) elevation] and ground surface adjacent to the well pad. Northings and eastings were recorded in feet relative to the North America Datum of 1983 (NAD83). Top of casing and ground surface elevations are in feet relative to NAVD88. Certified survey data are provided in the well construction tables.

5. **REFERENCES**

- Environmental Resources Management (ERM), 2017. Well Design, Installation, Development, and Decommissioning Report – Plant Hammond Ash Ponds 1 and 2. October 2017.
- Georgia Environmental Protection Division (GA EPD), Georgia Department of Natural Resources, 1991. *Manual for Groundwater Monitoring*. September 1991.
- Geosyntec Consultants, 2019a. Well Design, Installation, and Development Report Addendum, Plant Hammond Ash Pond 3 (AP-3). April 2019.
- Geosyntec Consultants, 2019b. Well Design, Installation, and Development Report Addendum, Plant Hammond Ash Ponds 1 and 2 (AP-1 and AP-2). June 2019.
- United States Environmental Protection Agency. 2015a. Federal Register. Volume 80.
 No. 74. Friday April 17, 2015. Part II. Environmental Protection Agency. 40
 CFR Parts 257 and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. [EPA-HQ-RCRA-2009-0640; FRL-9919-44-OSWER]. RIN-2050-AE81, April 2015

TABLE

Table 1Summary of Well Construction DetailsPlant Hammond AP-2 and AP-3, Floyd County, Georgia

Well ID	Ash Pond	Purpose	Installation Date	Northing ⁽¹⁾	Easting ⁽¹⁾	Ground Surface Elevation ⁽²⁾ (ft MSL)	Top of Nail Elevation (ft MSL)	Top of Casing Elevation (ft MSL)	Top of Screen Elevation (ft MSL)	Bottom of Screen Elevation (ft MSL)	Well Depth (ft bgs) ⁽³⁾
MW-31	3	Water Level Monitoring	11/25/2019	1550422.94	1942688.613	608.60	608.83	611.35	552.60	542.60	66.0
MW-32	3	Water Level Monitoring	11/22/2019	1551094.60	1943021.05	583.07	583.25	585.62	559.27	549.27	33.8
MW-33	2	Water Level Monitoring	11/21/2019	1547975.23	1938411.668	591.06	591.26	593.99	566.06	556.06	35.0

Notes:

ft MSL = feet mean sea level

ft bgs = feet below ground surface

(1) Coordinates in North American Datum (NAD) 1983, State Plane, Georgia-West, feet.

(2) Elevation referenced to the North American Vertical Datum of 1988 (NAVD88).

(3) Total well depth accounts for sump if data provided on well construction logs.

FIGURES





APPENDIX A

Well Driller Performance Bonds

CONTINUATION CERTIFICATE

Atlantic Specialty	Insurance Company	, Surety upon
a certain Bond No. 8	300033976	Issued on 9/27/2017
dated effective	09/27/2017 (MONTH-DAY-YEAR)	Renewed on 3/4/2019 Expires on 6/30/2021
on behalf of	Ricky Davis / Cascade Drilling, L.P. (PRINCIPAL)	
and in favor of	Department of Natural Resources, State of Geo (OBLIGEE)	orgia
does hereby continue sa	id bond in force for the further period	
beginning on	06/30/2019 (MONTH-DAY-YEAR)	
and ending on	06/30/2021 (MONTH-DAY-YEAR)	
Amount of bond	Thirty Thousand and 00/100 Dollars (\$30,00	00.00)
Description of bond	Performance Bond for Water Well Contract	ors
Premium:	\$1200.00	
PROVIDED: That the provision that the Su not be cumulative an account of all default shall not in any event	his continuation certificate does not create a new oblig rety's liability under said bond and this and all Continu d that the said Surety's aggregate liability under said b ts committed during the period (regardless of the numb exceed the amount of said bond as hereinbefore set fort	ation and is executed upon the express condition and uation Certificates issued in connection therewith shall ond and this and all such Continuation Certificates on ber of years) said bond had been and shall be in force, th.
Signed and dated on	<u>March 4th, 2019</u> (MONTH-DAY-YEAR)	
	Atlantic Specialty Insurance Company By Attorney-in-Fact Andrew P. Larsen Parker, Smith & Feek, Inc. Agent 2233 112th Ave NE Bellevue, WA 98004 Address of Agent 425-709-3600 Telephone Number of Agent	
S-0157/GE 8/08		

XDP

APPENDIX B

Boring and Well Construction Logs

G	eosy	sultants Geosyntec	Consultants	s rd			MW-31 PAGE 1 OF 2				
engin	eers scient	sts innovators	GA 20144								
CLI	ENT _S	outhern Company Ser	/ices		PROJECT NAME Plant Hammond Well	nstallation					
PR	OJECT	NUMBER GW6581B			PROJECT LOCATION Plant Hammond						
DA	TE STA	RTED <u>11/25/19</u>	c	OMPLETED 11/26/19	NORTHING <u>1550422.94 ft</u> EASTING <u>1942688.61 ft</u>						
DR		SCS Field Services			GROUND ELEVATION 608.6 ft	BORING	DIAMETER 6 in				
		METHOD Sonic	-1 (4 !!)		TOP OF CASING ELEVATION						
BIC		Sonic TS 150	ei (4°)								
						CHECKEL					
DEPTH	(π) ELEVATION	E REMARKS	GRAPHIC LOG	MATE	RIAL DESCRIPTION		CONSTRUCTION DIAGRAM				
SCS MONITORING WELLS PLANT HAMMOND MW31 TO MW33_DECEMBER 2019.GPJ ACP GINT LIBRARY CH.GLB 1/10/20				Hydro excavation (0-10') - No s CLAY, with SAND, Light yellow grained sand, few silt, mostly cl 20': With gravel.	to brown, medium plasticity, fine to medium lay.	598.6	 Bentonite grout Schedule 40 PVC 2" 				



SCS MONITORING WELLS PLANT HAMMOND MW31 TO MW33_DECEMBER 2019.GPJ ACP GINT LIBRARY CH.GLB 1/10/20

Ge	COSYI CONSI	ultants	Geosyntec 1255 Robe Kennesaw	Consultants rts Boulevard , GA 30144					MW-32 PAGE 1 OF 2			
CLIE	NT_So	uthern C	company Se	rvices			PROJECT NAME Plant Hammond Well Installation					
PRO	JECT N	UMBER	GW6581E	3			PROJECT LOCATION Plant Hammond					
DAT		TED <u>1</u>	1/22/19		ED_11/	/26/19	NORTHING1551094.6 ft	EASTIN	ASTING 1943021.05 ft			
DRIL	LER S	CS Field	Services				GROUND ELEVATION 583.07 ft	BORING	G DIAMETER 8 in			
DRIL	LING M	ETHOD	HSA + Ro	ock Coring (NQ)			TOP OF CASING ELEVATION 585.62	ft				
SAM	PLING I	ИЕТНО	SPT				GEOPHYSICAL CONTRACTOR					
RIG 1	YPE (CME 550)				LOGGED BY N.Tilahun	CHECKED BY J. Ivanowski				
DEPTH (ft)	ELEVATION (ft)	RECOVERY %	BLOW COUNTS (N VALUE)	REMARKS	GRAPHIC LOG		MATERIAL DESCRIPTION					
	-				<u></u>	Top soil						
2019.GPJ ACP GINT LIBRARY CH.GLB 1/10/20 - 01 - 01	 	- 0-9': Hand auger. -580 -580 			GRAVELLY (grained, angu dense, moist. 3': Reddish b CLAY, Browr firm, moist. 9 - 13.5': No CLAY, Browr	-Bentonite grout						
OND MW31 TO MW33_DECEMBER	 565	89	2-2-2 (4)	18.5-20':		15 - 18.5': No	o sample. prown, high plasticity, very soft, laminated,		Schedule 40 PVC 2"			
20-	- - -	89 100	0-0-0 (-)	Weight of hammer. 20-21.5': Weight of hammer		wet.			■Bentonite 3/8" chips			
NITORING WELL	_ 560	100	3-2-2 (4)			From 21.5': I fragments, la	Dark brown, with weathered limestone minated, soft, moist to wet.		✓20/40 SilicaSand			
SCS MOI			0-1-1 (2)									

PROJECT NUMBER Company Services PROJECT NUMBER Control Network PROJECT NUMBER Company Services PROJECT NUMBER Control Network PROJECT NUMBER CONTROL NETWOR	Geosy	ntec sultants	Geosyntec 1255 Robe	Consultants rts Boulevard			MW-32 PAGE 2 OF 2
CLENT Southern Company Services PROJECT NUMBER Project LOCATION Plant Hammond Hard C VelSe1B PROJECT LOCATION Plant Hammond Hard C VelSe1B PROJECT LOCATION Plant Hammond Hard C VelSe1B PROJECT LOCATION Plant Hammond Hard C VelSe1B PROJECT LOCATION Plant Hammond Hard C VelSe1B PROJECT LOCATION Plant Hammond Project VelSe1B Project LocAtion Plant Hammond Project VelSe1B Promised Plant Hammond Project VelSe1B Plant Hammond Project VelSe2B Plant Hammond Project VelSe2B Plant Hammond Promise Promise Plant Hammond Promise Promise Plant Hammond Promise Promise Plant Hammond Promise Promise Plant Hammond <th>engineers scientis</th> <th>ts innovators</th> <th>rennesa₩,</th> <th>GA JU144</th> <th></th> <th></th> <th></th>	engineers scientis	ts innovators	rennesa₩,	GA JU144			
PROJECT NUMBER GW65815 PROJECT LOCATION Plant Hammond E g </th <th></th> <th>outhern C</th> <th>company Serv</th> <th>vices</th> <th></th> <th>PROJECT NAME Plant Hammond Well Installat</th> <th>tion</th>		outhern C	company Serv	vices		PROJECT NAME Plant Hammond Well Installat	tion
Image: State of the second	PROJECT N	UMBER	GW6581B			PROJECT LOCATION Plant Hammond	
67 30-40-30 -555 17 50/3° (-) -555 17 50/3° (-) -555 17 50/3° (-) -555 17 50/3° (-) -555 17 50/3° (-) -555 17 50/3° (-) -555 17 50/3° (-) -550 - - -550 - - -550 - - -550 - - -550 - - -550 - - -550 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	DEPTH (ft) ELEVATION	RECOVERY %	BLOW COUNTS (N VALUE)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
17 50/3" (·) From 28.3: (continued) 30 Image: Corring in the second secon		67	30-40-30 (70)			PARTIALLY WEATHERED ROCK (PWR), Gray, fine to coarse gravel sized limestone fragments, very hard, wet.	
-655 17 50/3" (-) From 28.3": Coring. LIMESTONE, Dark gray, thinly bedded, hard, slightly weathered, with light gray to white calcite filled veins. 0.010, 2" Pre U-Paci Screent 30 - - - - - 0.010, 2" Pre U-Paci Screent 32 - 32 - 37": Void. - - - - - - 0.010, 2" Pre U-Paci Screent - - - 0.010, 2" Pre U-Paci Screent - - - 0.010, 2" Pre U-Paci Screent - 0.010, 2" Pre U-Paci Screent - - 0.010, 2" Pre U-Paci Screent - 0.010, 2" Pre U-Paci Screent - - 0.010, 2" Pre U-Paci Screent - 0.010, 2" Pre U-Paci Screent - 0.010, 2" Pre U-Paci Screent - - 0.010, 2" Pre U-Paci Screent - 0.010, 2" Pre U-Paci Screent - - 0.010, 2" Pre U-Pa		17	50/3" (-)			(continued)	
Bottom of borehole at 37.0 feet.	555 30 	17	50/3" (-)	From 28.3': Coring.		LIMESTONE, Dark gray, thinly bedded, hard, slightly weathered, with light gray to white calcite filled veins.	0.010 slot size 2" Pre Pack, U-Pack Screen
Bottom of borehole at 37.0 feet.	 550 35					32 - 37': Void.	
Bottom of borehole at 37.0 feet.							
						Bottom of borehole at 37.0 feet	

Ge	osyr consu	ltants	Geosynteo 1255 Robe	Consult	tants evard			MW-33 PAGE 1 OF 2				
engineers	scientists	innovators	Kennesaw	, GA 30	144							
CLIEN	IT Sou	thern Co	ompany Ser	vices		PROJECT NAME Plant Hammond Well Installation						
PROJ	ECT NI	JMBER	GW6581	В		PROJECT LOCATION Plant Hammond						
DATE	STAR	ED <u>1</u>	1/21/19		COMPLETED 11/22/19	NORTHING 1547975.23 ft	EASTIN	G <u>1938411.67 ft</u>				
DRILL	ER S	CS Field	d Services			GROUND ELEVATION 591.06 ft BORING DIAMETER 8 in						
		ETHOD	HSA D ODT			TOP OF CASING ELEVATION _593.99 ft						
			<u> </u>			GEOPHYSICAL CONTRACTOR LOGGED BY N.Tilahun CHECKED BY J. Juano						
							CHECK	ED BYJ. Ivanowski				
DEPTH (ft)	ELEVATION (ft msl)	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATER	RIAL DESCRIPTION						
	590 585 				Hydro excavation (0-10') - No sa 10-13.5': No Sample.	ample.		 Bentonite grout 				
- - - 15—	580 	33	4-8-9 (17)	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	GRAVELLY CLAY, Brown, low to subangular, stiff, trace sand and 15-18.5': No sample.	o medium plasticity, gravel is angular to silt, moist.		Schedule 40 PVC 2"				
	575 - -	78	14-6-6 (12)		GRAVELLY CLAY, Brown, low to subangular, stiff, trace sand and SILT, Brown, low to medium plas clay, moist.	o medium plasticity, gravel is angular to silt, moist. ticity, trace fine sand, firm to stiff, with some						

(Continued Next Page)

Ge	OSYT consu	Iltants	Geosynteo 1255 Robe Kennesaw	c Consulta erts Boule , GA 3014	ints vard 14	MW-33 PAGE 2 OF 2				
CLIEN	NT Sou	thern C	ompany Ser	vices	PROJECT NAME Plant Hammond Well Installatio	n				
PROJ	ECT NU	MBER	GW6581B		PROJECT LOCATION Plant Hammond	-				
DEPTH (ft)	ELEVATION (ft msl)	RECOVERY %	BLOW COUNTS (N VALUE)	MATERIAL DESCRIPTION						
20	570	67	5-4-5 (9)		SILT, Brown, low to medium plasticity, trace fine sand, firm to stiff, with some clay, moist. <i>(continued)</i> 20': Firm to stiff.	≺Bentonite 3/8"				
-	_	100	5-4-6 (10)			chips				
-		100	3-3-3 (6)		23': Firm.					
25_	565	100	4-6-7 (13)		CLAY, Brown with black mottles, medium to high plasticity, trace silt, trace fine sand, stiff, wet.					
-	-	100	6-7-8 (15)		27.5': Firm					
-		78	2-4-4 (8)			20/40 Silica				
30—	- -	100	4-6-6 (12)			Sand 0.010 slot size 2" Pre Pack,				
-	560	89	4-5-6 (11)		30.5 : Light brown to light gray, stiff.	Screen				
-		100	4-4-7 (11)		CLAYEY SAND, Gray to brown, fine grained, poorly graded, medium dense, moist to wet.					
35		89	7-6-4 (10)		GRAVELLY CLAY, Light brown to brown, medium to high plasticity, gravel is angular to subrounded, stiff, moist to wet.					
1					Bottom of borehole at 35.0 feet.					

APPENDIX C

Well Development Forms

WELL DEVELORMENT

Geosyntec Consultants					GR	OUNDWATER SAM	IPLING LOG SF	HEET				
Client:		SCS/GA PO	wer	_		Project No.	606581		_	Sampling Date: 12/10/19		
Site:		Plant Ham	wend	-		Location	A7-3		-	Sampler's Name: 3. We'n mon		
Well ID:		MW-31		-		Pump Type/Model	Man Soon		_	Sample Collection Time: 11746		
Total Depth (ft):		66'		-		Tubing Material:	Potyethyleu	l	- Sa	ample Purge Rate (mL/min):		
Depth to Water (ft):		41.56		_	Р	ump Intake Depth (ft):		1	_	Sample ID:		
Well Diameter (in):		_		-		Start/Stop Purge Time:			_	Laboratory Analyses:		
Well Volume $(gal) = 0$	$041d^2h$			-		Purge Rate (mI/min)			-			
Well Volume $(L) = aal$	* 3 785			-	Тс	tal Purge Volume (L):			_			
wen volume $(L) = gan$	l 9.765.		(6	-		Durse Method	I El	Vall Valuma Othan	-	OA/OC Collected?		
a = well alameter (inc	nes; $n = len$	igin of water con	umn (jeet)	n (jeet) Purge Method: Low-Plow Well Volume Other: QA/QC Collected?								
well Type:	Flush	Stick Up				Sampling Method	Pump Discharg	ge Other:		QA/QC I.D.		
Well Lock:	Yés	No			All sample containers requiring chemical preservation properly preserved prior to demob from well? Ves No							
Well Cap Condition:	Good	Replace	/		All sample c	ontainers requiring c	nemical preserva	tion property preser	Yeu prior to demob from went: 1:55 1NO			
Well Tag Present:	Vell Tag Present: Yes No								-			
Time	TimepH (SU)Spec. Cond. (μ S/cm)ORP (mV)DO (mg/L) ω 7 $\overline{\omega}$ 7 $\overline{\omega}$ 6 $\overline{\omega}$ 7 $\overline{\omega}$ 7		DO (mg/L)	Temp. (°C)	Turbidity (NTUs)	DTW (ft btoc)	Purge Rate (mL/min)	Purged Volume (L)	Notes (Purge method, water clarity, odor, purge rate, issues with pump/well/weather/etc.)			
1:13	2,3%	365.0	15.5.5	2.96	14.55	10.45			356	?unp at 65'		
150	7,31	793,5	28.0	8.86	14,43	14.24			666	punpat 60'		
1:55	7,21	648.9	73.8	10,02	15.38	8.56			701	pump at 60'		
2:24	7.24	402.4	73.2	2.88	14.38	27.69			951	Purp at 55		
2,37	4.24	782.9	65.3	3.20	19.65	11.68				2-up at 55		
56;41	7,24	\$4.4.5	51,3	2.15	15.91	\$ 8.99				punp at 55		
									/	1		
		+										
								an a				
6										10 · · · · · · · · · · · · · · · · · · ·		
3										912 Y		
									c.			
Stabilizing Criteria	+/- 0.1 SU	+/- 5%		0.2 mg/L or 10% for DO > 0.5 mg/L (whichever is greater)		< 5 NTUs	< 0.3 ft	> 100 mL < 250 mL	> 3L			

WELL DEVELOPMENT

					GR	OUNDWATER SAM	IPLING LOG SH	EET					
Client:		GA Parer	-			Project No.:	96581		_	Sampling Date: <u>12/11/19</u>			
Site		Plant Ha	(maran a)	-		Location:	AR-3 Carr	oss traveles)	Sampler's Name: B. Weinmann				
Wall ID:		Aug 72	WC 00 10000	-		Pumn Tyne/Model [.]	MA NA SCIENA	/	_	Sample Collection Time:			
wen iD.		<u>Mu-32</u>		-		Tuhing Material	Palacharden		- Sample Purge Rate (mI /min):				
Total Depth (ft):		36.67		-	Tubing Materian. <u>+o/ysch/lew</u> Sample Fuge Rate (mit/min).								
Depth to Water (ft):		19.39		-	P	ump Intake Depth (ft):			-	Sample ID:			
Well Diameter (in):				-	5	Start/Stop Purge Time:			_	Laboratory Analyses:			
Well Volume $(gal) = 0$.041d ² h:					Purge Rate (mL/min):			_				
Well Volume $(L) = gal$	* 3.785:			-	Тс	tal Purge Volume (L):			_				
d = well diameter (incl	hes); h = len	gth of water col	umn (feet)	-	Purge Method: Low-Flow Well Volume Other: QA/QC Collected?								
Well Type	Flush (Stick Up	(Sampling Method: Pump Discharge Other: QA/QC I.D								
W-III - alw	Ran	No				1 0							
Well LOCK:	- Co	INU			All sample containers requiring chemical preservation properly preserved prior to demob from well? Yes No								
Well Cap Condition:	Good	Replace			An sample o	ontainers requiring c	nemicai preserva	tion property preser	rea prior to acino				
Well Tag Present:-	ent: Yes No						T			Net (Deres with a location doubt and			
Time	pH (SU)	Spec. Cond. (µS/cm)	ORP (mV)	DO (mg/L)	Temp. (°C)	Turbidity (NTUs)	DTW (ft btoc)	Purge Rate (mL/min)	Purged Volume (L)	Notes (Purge method, water clarity, odor, purge rate, issues with pump/well/weather/etc.)			
1:53	6.46	918.1	110.1	2.01	18.55	39.49			15	35', John D at start			
12:02	6.94	877.5	105.6	3.22	17.61	21.72			28	33'			
12214	6.92	874.6	104.0	2.20	17,74	13.61			43	h			
12:19	6.95	895.5	(03.1	2.16	17.08	10.17			94	"			
12:21	6.93	0,97.3	103.0	2.90	16.59	9.51			54				
12138	6.98	904.0	97.1	1.95	16.58	57,58			76	5215ec ad (1.5			
62:44	6,99	898.6	93:0	2.02	17.01	21,81			85				
12:49	6.92	9(1,3	96.5	2.19	17.21	19.96			71				
12:53	6.91	912.9	95.5	21.97	17.98	9.75	++		44	() () () () () () () () () () () () () (
1:02	6.99	932.4	94.5	3.23	15, 76	8.02			17.5	il Surger at the			
1.21	7.00	876.2	92.3	2,4~	19,00	45.00			10.	1			
1.25	4.03	911.5	92.9	5,99	16.56	17.49	<u> </u>		126	4			
1.34	7.00	Blace, L	92.7	1.33	17.7	9.49	++						
1:40	6.93	919.1	CARE 2.1		1 1.64	4.54			11-0				
1.99	6,77	713.5	41.2	2.17	10.91	2.92			14.5				
<i>i</i> .ч٦	6,70	929.5	90.1	2,1		5.03							
Stabilizing Criteria	+/- 0.1 SU	+/- 5%		0.2 mg/L or 10% for DO > 0.5 mg/L (whichever is greater)		< 5 NTUs	< 0.3 ft	> 100 mL < 250 mL	> 3L				

WELL DEVELOPMENT

										WELL
•		A C.								DEVELOPMENT
					GR	OUNDWATER SAM	IPLING LOG SH	IEET		
Client:		6A+Pouch				Project No.:				Sampling Date: r2/10/19
Site:		Plant Ham	mon)	•		Location:	Plant the AL	6-7	_	Sampler's Name: B. Weinmann
Well ID:		MW-33		•		Pump Type/Model:	MUNSCUN	T	_	Sample Collection Time: 15:30 ber: n
Total Depth (ft)		30.5'				Tubing Material:	Paulethule	nt	– Sa	imple Purge Rate (mL/min):
Depth to Water (ft):		24,73			P	ump Intake Depth (ft):			-	Sample ID:
Well Diameter (in):					\$	Start/Stop Purge Time			_	Laboratory Analyses:
Well Volume (gal) = 0	$0.41d^2h$					Purge Rate (mI /min):			_	
Well Volume (L) = col	* 2 705				Та	tal Purge Volume (L):			_	
wen volume (L) – gal	* 3.783.		(6		10	Burge Method:	Louv Flow W	all Volume Other	_	OA/OC Collected?
d = well diameter (incl	hes; $h = len$	igth of water con	imn (jeet)			Puige Method.	Low-Flow W	en volume Other.		
Well Type:	Flush (Stick Up	1.2			Sampling Method:	Pump Dischar	ge Other.		
Well Lock:	Yes	No			All	antala and acculuting a	hamiaal nuagamia	tion properly preser	read prior to doma	h from wall? Ves No
Well Cap Condition: Good Replace					All sample c	ontainers requiring c	nemical preserva	tion property preser	veu prior to demo	
Well Tag Present:	ell Tag Present: Yes No									
Time	pH (SU)	Spec. Cond. (µS/cm)	ORP (mV)	DO (mg/L)	Temp. (°C)	Turbidity (NTUs)	DTW (ft btoc)	Purge Rate (mL/min)	Purged Volume (L)	Notes (Purge method, water clarity, odor, purge rate, issues with pump/well/weather/etc.)
3:45	6.17	2967.3	77.4	7.8	14.87	17.58			~ 246	Pup at 37
3:51	5,38	2970 5	37.1	9,23	15.64	3,43			-316	V 33 Surge
4:01	5.09	2957,1	90,1	8,00	14.85	32.42			- 4 4 4	32
41.10	4.99	2943.7	94.0	5.69	15.93	29.1		e la	~ 921	37 here solding 2 mit
9:24	7.9-6	2207.7	4.4	-176	1.11		74.19		~=5L	35'
9 .50	4 91	2951.5	101.4	4.5	13.76	1442	-		341141	33' ENTED) whole screen
10:07	4.68	7929.0	144.2	3,47	14.02	19.68			601	30.
10:17	4.66	20,253 -7	145,7	3.05	15,19	7.29			FOL	36'
									-	
									- N	
					- No.					
Stabilizing Criteria	+/- 0.1 SU	+/- 5%		0.2 mg/L or 10% for DO > 0.5 mg/L (whichever is greater)		< 5 NTUs	< 0.3 ft	> 100 mL < 250 mL	> 3L	

12/11/4

W

de Sector

APPENDIX B

Well Inspection Forms

Geosyniec*				WI	ELL INSPECT	TION FORM		
Field Technician	n: Noelin	a Muskus	Site/Location	: AF	?-3			Inspection Date: 08/21/19
					Well Inspect	ion Items		
	Inspection			Prese	Comments recording well condition			
weii ID	Time	Lock	Locking Cap	Bollards	Concrete Pad	Protective Casing	Vegetation	Comments regarding wen condition
HGWC-120	08:40	Y	γ	N	Y	Y	Y	OK
AGWC-124	08:58	Y	N	Y	Y	Y	¥	OK
MW-23	09:07	Y	Y	Y	Y	Y	Ý	OK
HGWA-122	09:24	Y	Y	$ \gamma $	Y	Y	7	OK
+GW4E-1217	09:55	7	7	Y	1	7	7	Crack on casing lid (mino
APIA-1	101.13	Y	T	7	4	Y	\sim	OK
MW-21	10:23	Y	Y	7	7	Y	Y	OK
MW-1	10:45	7	Y	Y	Y	\searrow	У	lock hard to open
					2			

ж.

ite Name	AP-3			
ermit Number				
	H (5)11A-177	-		
late field conditions	0177/19 cl our 311°E	-		
	- Of oct 1: Geor 1 soning , by P		no	n/a
1 Location/I	dentification	yes	no	Π/a
a	Is the well visible and accessible?	\times		
b	Is the well properly identified with the correct well ID?	X		
С	Is the well in a high traffic area and does the well require protection from traffic?		\times	
d	Is the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path)	×	_	
2 Protostivo	Casing			
	Udsing			
a	is the protective casing nee norm apparent damage and able to be	$\mathbf{\vee}$		
h	le the easing free of degradation or deterioration?			
U O	Does the easing have a functioning ween hole?	\sim		
d	Is the appular space between casings clear of debris and water	Δ		
u	or filled with pea gravel/sand?	×		
е	Is the well locked and is the lock in good condition?	X		
3 Surface p	ad			
a	Is the well pad in good condition (not cracked or broken)?	X		
b	Is the well pad sloped away from the protective casing?	X		
С	Is the well pad in complete contact with the protective casing?	X	-	
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not			
	move when stepped on)	X		
е	Is the pad surface clean (not covered with sediment or debris)?	X	_	
4 Internal ca	asing			
- <u>internarea</u>	Does the cap prevent entry of foreign material into the well?	\checkmark		
h	Is the casing free of kinks or bends, or any obstructions from			
D D	foreign objects (such as bailers)?	X		
C	Is the well properly vented for equilibration of air pressure?			
d	Is the survey point clearly marked on the inner casing?	\rightarrow		
e	is the depth of the well consistent with the original well log?	<u>~</u>		
f	Is the casing stable? (or does the pyc move easily when touched			
·	or can it be taken apart by hand due to lack of grout or use of slip			
	couplings in construction)	\times		
5 <u>Sampling:</u>	Groundwater Wells Only:	7		
а	Does well recharge adequately when purged?	×		
b	If dedicated sampling equipment installed, is it in good condition			
	and specified in the approved groundwater plan for the facility?			
С	Does the well require redevelopment (low flow, turbid)?		\times	
6 Based on	your professional judgement, is the well construction / location			
	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory	s .		
	requirements?	<u> </u>	÷	
7 Corrective	actions as needed by date:	,		
, concouve				

Entification s the well visible and accessible? s the well properly identified with the correct well ID? s the well in a high traffic area and does the well require protection from traffic? s the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path) Casing s the protective casing free from apparent damage and able to be secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?		no	n/a
entification s the well visible and accessible? s the well properly identified with the correct well ID? s the well in a high traffic area and does the well require protection from traffic? s the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path) Casing s the protective casing free from apparent damage and able to be secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?		no	n/a
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protection from traffic? s the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path) <u>Casing</u> s the protective casing free from apparent damage and able to be secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	X X X X X		
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nor is well located in obvious drainage flow path) <u>Casing</u> s the protective casing free from apparent damage and able to be secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	X X X X X		
Casing s the protective casing free from apparent damage and able to be secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	X X X X X		
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secured? s the casing free of degradation or deterioration? Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	XXXXXXX		_
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Does the casing have a functioning weep hole? s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	XX		
s the annular space between casings clear of debris and water, or filled with pea gravel/sand? s the well locked and is the lock in good condition?	×		
or filled with pea gravel/sand? s the well locked and is the lock in good condition?	$\frac{\times}{\times}$		
s the well locked and is the lock in good condition?	$\overline{\times}$		
4			
s the well pad in good condition (not cracked or broken)?	×		
s the well pad sloped away from the protective casing?	$\overline{\mathbf{x}}$		
s the well pad in complete contact with the protective casing?	$\overline{\mathbf{x}}$		÷
s the well pad in complete contact with the ground surface and			(
stable? (not undermined by erosion, animal burrows, and does not	t		
nove when stepped on)	V		
s the pad surface clean (not covered with sediment or debris)?	$\overline{\mathbf{x}}$		
<u>Ing</u>	24		
Does the cap prevent entry of foreign material into the well?	<u>×</u>		<u> </u>
s the casing free of kinks or bends, or any obstructions from	1		
oreign objects (such as ballers)?	<u> </u>		
s the our reperty vented for equilibration of air pressure?	×		
s the survey point clearly marked on the inner casing?	<u> </u>		
s the depth of the well consistent with the original well log?		<u>×</u>	
s the casing stable? (of does the pvc move easily when touched			
call it be taken apart by hand due to lack of grout of use of slip	\checkmark		
ouplings in construction)	<u> </u>		
Groundwater Wells Only:			
Does well recharge adequately when purged?	$\underline{\times}$		
f dedicated sampling equipment installed, is it in good condition	. /		
Ind specified in the approved groundwater plan for the facility?	\sim		
Does the well require redevelopment (low flow, turbid)?		\mathbf{X}	
our professional judgement, is the well construction / location			
ppropriate to 1) achieve the objectives of the Groundwater			
Anitoring Program and 2) comply with the applicable regulatory			
equirements?	\times		
	<u> </u>		
actions as needed, by date:			
	² s the well pad in good condition (not cracked or broken)? s the well pad sloped away from the protective casing? s the well pad in complete contact with the protective casing? s the well pad in complete contact with the ground surface and table? (not undermined by erosion, animal burrows, and does not nove when stepped on) s the pad surface clean (not covered with sediment or debris)? <u>ing</u> Does the cap prevent entry of foreign material into the well? s the casing free of kinks or bends, or any obstructions from oreign objects (such as bailers)? s the well properly vented for equilibration of air pressure? s the survey point clearly marked on the inner casing? s the depth of the well consistent with the original well log? s the casing stable? (or does the pvc move easily when touched or can it be taken apart by hand due to lack of grout or use of slip souplings in construction) <u>Aroundwater Wells Only:</u> Does well recharge adequately when purged? i dedicated sampling equipment installed, is it in good condition .nd specified in the approved groundwater plan for the facility? Does the well require redevelopment (low flow, turbid)? tour professional judgement, is the well construction / location .ppropriate to 1) achieve the objectives of the Groundwater Monitoring Program and 2) comply with the applicable regulatory equirements? actions as needed, by date:	s the well pad in good condition (not cracked or broken)? s the well pad sloped away from the protective casing? s the well pad in complete contact with the protective casing? s the well pad in complete contact with the ground surface and table? (not undermined by erosion, animal burrows, and does not nove when stepped on) s the pad surface clean (not covered with sediment or debris)? ing Does the cap prevent entry of foreign material into the well? s the casing free of kinks or bends, or any obstructions from preign objects (such as bailers)? s the well properly vented for equilibration of air pressure? s the survey point clearly marked on the inner casing? s the depth of the well consistent with the original well log? s the casing stable? (or does the pvc move easily when touched r can it be taken apart by hand due to lack of grout or use of slip ouplings in construction) Aroundwater Wells Only: Does well recharge adequately when purged? i dedicated sampling equipment installed, is it in good condition and specified in the approved groundwater plan for the facility? Does the well require redevelopment (low flow, turbid)? Dur professional judgement, is the well construction / location appropriate to 1) achieve the objectives of the Groundwater Monitoring Program and 2) comply with the applicable regulatory equirements? Arctions as needed, by date:	 s the well pad in good condition (not cracked or broken)? s the well pad sloped away from the protective casing? s the well pad in complete contact with the protective casing? s the well pad in complete contact with the ground surface and table? (not undermined by erosion, animal burrows, and does not nove when stepped on) s the pad surface clean (not covered with sediment or debris)? ing Does the cap prevent entry of foreign material into the well? s the casing free of kinks or bends, or any obstructions from oreign objects (such as bailers)? s the depth of the well consistent with the original well log? s the depth of the well consistent with the original well log? s the casing stable? (or does the pvc move easily when touched or can it be taken apart by hand due to lack of grout or use of slip ouplings in construction) Aroundwater Wells Only: Does well recharge adequately when purged? idedicated sampling equipment installed, is it in good condition and specified in the approved groundwater plan for the facility? Does the well require redevelopment (low flow, turbid)? Aroundwater Wells Only: Does the well require redevelopment (low flow, turbid)? Aroundwater Wells Only: Aroundwater Nonitoring Program and 2) comply with the applicable regulatory equirements? Actions as needed, by date:

Site Name	AP-3			
Permit Number		•		
Well ID	HCINIC = 171A	-		
Date, field conditions	09/77/19 Clark Grand BOOE	•		
		Ves	no	n/a
1 Location/I	dentification	,	110	n a
а	Is the well visible and accessible?	\times		
b	Is the well properly identified with the correct well ID?	$\overline{\times}$		
С	Is the well in a high traffic area and does the well require			
	protection from traffic?		×	
d	Is the drainage around the well acceptable? (no standing water,			
	nor is well located in obvious drainage flow path)	X		
2 Protective	Casing			
а	Is the protective casing free from apparent damage and able to be	. /		
	secured?	$\underline{\times}$		
b	Is the casing free of degradation or deterioration?	\times		
С	Does the casing have a functioning weep hole?	<u> × </u>		\
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?	<u>×</u>		
е	Is the well locked and is the lock in good condition?	$\underline{\times}$		
3 Surface p	he			
a <u>edinace pr</u>	is the well pad in good condition (not cracked or broken)?	\times		
a h	Is the well pad sloped away from the protective casing?	1		
C	Is the well pad in complete contact with the protective casing?	$\overline{\checkmark}$		
b	Is the well pad in complete contact with the ground surface and			
ŭ	stable? (not undermined by erosion, animal burrows, and does not			
	move when stenned on)	. /		
۵	Is the pad surface clean (not covered with sediment or debris)?	\rightarrow		· · · · · ·
C				
4 <u>Internal ca</u>	asing			
а	Does the cap prevent entry of foreign material into the well?	\times		
b	Is the casing free of kinks or bends, or any obstructions from	j.		
	foreign objects (such as bailers)?	$\underline{\times}$		
С	Is the well properly vented for equilibration of air pressure?	×		3
d	Is the survey point clearly marked on the inner casing?	\times		
е	Is the depth of the well consistent with the original well log?		\mathbf{X}	
f	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip			
	couplings in construction)	X		
5 Sompling	Groundwater Wells Only			
o <u>Sariping.</u>	Doos well recharge adaguately when purged?	\checkmark		
a	If dedicated campling equipment installed, is it in good condition	$\overline{}$		
U	and encoding in the approved groupdwater plan for the facility?			X
	Deep the well require redevelopment (low flow, turbid)?			
С	Does the well require redevelopment (low now, turbid)?		<u>×</u>	
6 Based on	your professional judgement, is the well construction / location			
	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory			
	requirements?	X		
		<u> /</u>		
7 Corrective	actions as needed, by date:			

ite Name	AP-3	•,		
ermit Number		•		
Vell ID	HGWC-174			
ate, field conditions	03/23/19 clear, swiny, 96°F	VAR	no	n/a
1 Location/I	dentification	yc3	no	n/a
а	Is the well visible and accessible?	<u>×</u>		
b	Is the well properly identified with the correct well ID?	\times		
С	Is the well in a high traffic area and does the well require		257	
	protection from traffic?		<u>×</u>	
d	Is the drainage around the well acceptable? (no standing water,			
	nor is well located in obvious drainage flow path)	<u>×</u>		
2 Protective	Casing			
а	Is the protective casing free from apparent damage and able to be	1 é		
	secured?	<u>×</u>		
b	Is the casing free of degradation or deterioration?	<u> </u>		
С	Does the casing have a functioning weep hole?	\times		
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?	<u>×</u>		
e	is the well locked and is the lock in good condition?	<u>×</u>		
3 <u>Surface p</u> a	ad			
а	Is the well pad in good condition (not cracked or broken)?	$\underline{\times}$		
b	Is the well pad sloped away from the protective casing?	\times		
С	Is the well pad in complete contact with the protective casing?	$\underline{\times}$	<u> </u>	
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not	*		
-	move when stepped on)			/
е	is the pad sufface clean (not covered with sediment or debits)?			
4 Internal ca	asing			
а	Does the cap prevent entry of foreign material into the well?	$\underline{\times}$		·
b	Is the casing free of kinks or bends, or any obstructions from			
	foreign objects (such as ballers)?	<u> </u>	<u> </u>	
C	Is the well properly vented for equilibration of air pressure?	<u>×</u>		
d	Is the survey point clearly marked on the inner casing?	\rightarrow	:	
e f	Is the casing stable? (or does the pyc move easily when touched	<u> </u>	·	
I	or can it be taken apart by hand due to lack of grout or use of slip			
	couplings in construction)	$\underline{\times}$		
5 Sampling	Groundwater Wells Only:			
a	Does well recharge adequately when purged?	X		
b	If dedicated sampling equipment installed, is it in good condition			
	and specified in the approved groundwater plan for the facility?			X
С	Does the well require redevelopment (low flow, turbid)?		X	
6 Based on	your professional judgement, is the well construction / location			
2.000	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory			
	requirements?	\times		
7 Corrective	actions as needed, by data:			
7 Corrective	מכווטווה מה חפפטפט, שי טמופ.			
· · · · · · · · · · · · · · · · · · ·				

Site Name	AP-1			
Permit Number				
Well ID	APIA-1			
nate, field conditions	08/21/19 Sunny 78°			
	5	yes	no	n/a
1 Location/I	dentification	\sim		
a	Is the well visible and accessible?			
b	Is the well properly identified with the correct well ID?	$\underline{\times}$		
С	Is the well in a high traffic area and does the well require		~	
	protection from traffic?			
d	Is the drainage around the well acceptable? (no standing water,	N		
	nor is well located in obvious drainage flow path)	<u>×</u>		
2 Protective	Casing			
a	Is the protective casing free from apparent damage and able to be			
	secured?	X		
b	Is the casing free of degradation or deterioration?	X		
C	Does the casing have a functioning weep hole?	X		
d	Is the annular space between casings clear of debris and water.			<u> </u>
	or filled with pea gravel/sand?	\times		
е	Is the well locked and is the lock in good condition?	X		
3 <u>Surface p</u>	ad			
a	Is the well pad in good condition (not cracked or broken)?	<u>~</u>		
b	Is the well pad sloped away from the protective casing?	X		
С	Is the well pad in complete contact with the protective casing?	<u>×</u>		
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not	V		
	move when stepped on)	$\overline{}$		
е	Is the pad surface clean (not covered with sediment or debris)?	X	<u> </u>	
4 Internal ca	asing			
a	Does the cap prevent entry of foreign material into the well?	X		
b	Is the casing free of kinks or bends, or any obstructions from			
L L	foreign objects (such as bailers)?	×		
С	Is the well properly vented for equilibration of air pressure?	X		
d	Is the survey point clearly marked on the inner casing?	ý.		
e	Is the depth of the well consistent with the original well log?	X		
f	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip			
	couplings in construction)	×		
5 <u>Sampling:</u>	Groundwater Wells Only:			
a	Does well recharge adequately when purged?			X
b	If dedicated sampling equipment installed, is it in good condition			V
	and specified in the approved groundwater plan for the facility?			<u> </u>
С	Does the well require redevelopment (low flow, turbid)?			×
6 Based on	your professional judgement, is the well construction / location			
	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory			
	requirements?	×		
		<u> </u>	·	
7 Corrective	actions as needed, by date:			

Site Name	AQ-1	-		
Permit Number		8		
Well ID	MW-1			
∩ate, field conditions	D8 21/19 SUNNY 780F	-		
1	J	yes	no	n/a
I Location/I		V		
a	Is the well visible and accessible?			
b	Is the well properly identified with the correct well ID?	<u>×</u>		
С	Is the well in a high traffic area and does the well require		57	
	protection from traffic?		$\underline{\times}$	3
d	Is the drainage around the well acceptable? (no standing water,	-1		
	nor is well located in obvious drainage flow path)	<u> </u>	<u> </u>	
2 Protective	Casing			
a	Is the protective casing free from apparent damage and able to be			
	secured?	X		
b	Is the casing free of degradation or deterioration?	×		
С	Does the casing have a functioning weep hole?	X		S
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?	Х		
е	Is the well locked and is the lock in good condition?	X		
2 Curtoso o				
S <u>Sunace pa</u>	<u>10</u> Is the well red in good condition (not creaked or broken)?	X		
a	Is the well had allohed away from the protective easing?			·
D	Is the well had sloped away from the protective casing?			
d	Is the well pad in complete contact with the ground surface and	<u>_X</u> _		
u	stable? (not undermined by erosion, animal burrows, and does not			
	move when stepped on)	×		
۵	Is the pad surface clean (not covered with sediment or debris)?	$\frac{1}{X}$		
C	is the pad surface clean (not covered with sediment of debits):			
4 <u>Internal ca</u>	sing	>/		
а	Does the cap prevent entry of foreign material into the well?	<u>×</u>		
b	Is the casing free of kinks or bends, or any obstructions from	1		
	foreign objects (such as bailers)?	~		
С	Is the well properly vented for equilibration of air pressure?	×		
d	Is the survey point clearly marked on the inner casing?	×		
е	Is the depth of the well consistent with the original well log?	×		
f	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip	$\mathbf{\nabla}$		
	couplings in construction)	<u> </u>		
5 Sampling:	Groundwater Wells Only:			
a	Does well recharge adequately when purged?			X
b	If dedicated sampling equipment installed, is it in good condition			Y
	and specified in the approved groundwater plan for the facility?			
С	Does the well require redevelopment (low flow, turbid)?			X
6 Record on a	your professional judgement, is the well construction / location			
o Dased On	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory			
	requirements?	X		
	requiremente.			
7 Corrective	actions as needed, by date:			

Site Name	AP-3			
Permit Number	A			
Well ID	MW-ZI	2		
∩ate, field conditions	08/21/191 sunny 789=	VOS	20	n/a
1 Location/I	dentification	yes	no	II/d
а	Is the well visible and accessible?	$\underline{\times}$		
b	Is the well properly identified with the correct well ID?	<u> </u>		
С	Is the well in a high traffic area and does the well require			
	protection from traffic?		<u> </u>	
d	Is the drainage around the well acceptable? (no standing water,			
	nor is well located in obvious drainage flow path)	$\underline{\times}$	<u> </u>	
2 Protective	Casing			
а	Is the protective casing free from apparent damage and able to be			
	secured?	X		
b	Is the casing free of degradation or deterioration?	X		
С	Does the casing have a functioning weep hole?	X		
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?	X		
е	Is the well locked and is the lock in good condition?	X		
3 Surface pa	ad			
a	Is the well pad in good condition (not cracked or broken)?	×		
b	Is the well pad sloped away from the protective casing?	×		
С	Is the well pad in complete contact with the protective casing?	×		
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not			
	move when stepped on)	X		
е	Is the pad surface clean (not covered with sediment or debris)?	X	\equiv	
4 Internal ca	asing			
а	Does the cap prevent entry of foreign material into the well?	×		
b	Is the casing free of kinks or bends, or any obstructions from	3.7	1. 	
	foreign objects (such as bailers)?	~		
С	Is the well properly vented for equilibration of air pressure?	$\overline{\times}$		
d	Is the survey point clearly marked on the inner casing?	X		
е	Is the depth of the well consistent with the original well log?	X		
f	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip	2		
	couplings in construction)	$\underline{\mathcal{X}}$		
5 Samplina:	Groundwater Wells Only:			
a	Does well recharge adequately when purged?			\times
b	If dedicated sampling equipment installed, is it in good condition	· · · · · ·		
	and specified in the approved groundwater plan for the facility?			X
С	Does the well require redevelopment (low flow, turbid)?			X
6 Rased on	your professional judgement is the well construction / location			
5 24000 ON	appropriate to 1) achieve the objectives of the Groundwater			
	Monitoring Program and 2) comply with the applicable regulatory			
	requirements?	X		
		_ <u>/`</u> _		
7 Corrective	actions as needed, by date:			
ā — ———				

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Site Name	AP-3							
Permit Number								
Well ID	MW-23							
nate, field conditions	08/2/119, cloudy 75°F							
		yes	no	n/a				
1 Location/I	dentification	V						
a	Is the well visible and accessible?	<u>×</u>	<u> </u>					
b	is the well properly identified with the correct well ID?	$\underline{\times}$						
С	protection from traffic?		$\underline{\times}$					
d	Is the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path)	\times						
2 Protective	Casing							
a	Is the protective casing free from apparent damage and able to be secured?	Х						
b	Is the casing free of degradation or deterioration?	X						
С	Does the casing have a functioning weep hole?	X						
d	Is the annular space between casings clear of debris and water,							
	or filled with pea gravel/sand?	X						
е	Is the well locked and is the lock in good condition?	X	_					
3 <u>Surface p</u> a	ad							
а	Is the well pad in good condition (not cracked or broken)?	X						
b	Is the well pad sloped away from the protective casing?	X						
С	Is the well pad in complete contact with the protective casing?	X						
d	Is the well pad in complete contact with the ground surface and							
	stable? (not undermined by erosion, animal burrows, and does not							
	move when stepped on)	X						
е	Is the pad surface clean (not covered with sediment or debris)?	X	_					
4 Internal ca	sing							
а	Does the cap prevent entry of foreign material into the well?	X						
b	Is the casing free of kinks or bends, or any obstructions from							
	foreign objects (such as bailers)?	X						
С	Is the well properly vented for equilibration of air pressure?	X						
d	Is the survey point clearly marked on the inner casing?	X						
е	Is the depth of the well consistent with the original well log?	×						
f	Is the casing stable? (or does the pvc move easily when touched							
	or can it be taken apart by hand due to lack of grout or use of slip							
	couplings in construction)	X						
5 Sampling:	Groundwater Wells Only:							
a	Does well recharge adequately when purged?			X				
b	If dedicated sampling equipment installed, is it in good condition							
	and specified in the approved groundwater plan for the facility?			\times				
С	Does the well require redevelopment (low flow, turbid)?			X				
6 Based on	your professional judgement, is the well construction / location							
	appropriate to 1) achieve the objectives of the Groundwater							
	Monitoring Program and 2) comply with the applicable regulatory							
	requirements?	X						
7 Corrective	actions as needed, by date:							
	A . C							
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Field Technici	an: IJAN (M3i	31	Site/Location	Have	received			Inspection Date: 10-21-2019
					Well Inspect	ion Items		
Wall ID	Inspection			Prese	ent (Y/N)			
wentb	Time	Lock	Locking Cap	Bollards	Concrete Pad	Protective Casing	Vegetation	Comments regarding well condition
MW-1	09:00	1	Y	Y	Y	Ч	N	
apiai	09:06	Ý	Y	Y	4	¥-	.y	
1410-21	09:19	Ý	Y	4	4	y	4	
f1602-120	9:26	Y	γ	Y	4	Y	Ý	
16WL 124	9:31	у	Y	Y	Y	Y	γ	
MW-23	9:36	У	У	Y	Y	ý	Y	
IGWA . 12L	9:43	Y	Y	7	Y	Y	Ŷ	
16WL-12ZA	10:06	V	Y >	y	Y	У	N	

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1. .

e Name	Hammond	_			
	11(1)0 122				
te field conditions	FIGW A 122				
	5 10.51.2014	-			
1 Location	(Identification	yes	no	n/a	
a	Is the well visible and accessible?	1			
b	Is the well properly identified with the correct well ID?	<u> </u>			
С	Is the well in a high traffic area and does the well require	· · · · ·			
	protection from traffic?	J			
d	Is the drainage around the well acceptable? (no standing water.				
	nor is well located in obvious drainage flow path)	_/			
2 Protective	e Casing				
a	Is the protective casing free from apparent damage and able to be	2			
	secured?				
b	Is the casing free of degradation or deterioration?			/	
С	Does the casing have a functioning weep hole?				
d	Is the annular space between casings clear of debris and water.				
	or filled with pea gravel/sand?	1			
е	Is the well locked and is the lock in good condition?	1			
3 Surface r	bad				
a	Is the well had in good condition (not cracked or broken)?	,			
b	Is the well had sloped away from the protective casing?				
c	Is the well pad in complete contact with the protective casing?				
d	Is the well pad in complete contact with the ground surface and	<u> </u>			
-	stable? (not undermined by erosion animal burrows and does no	ł			
	move when stepped on)	1			
е	Is the pad surface clean (not covered with sediment or debris)?		1		minor debis from vegetation
4 Internal c	asing				
a	Does the cap prevent entry of foreign material into the well?	./			
b	Is the casing free of kinks or bends, or any obstructions from	<u> </u>	-		
	foreign objects (such as bailers)?	1			
С	Is the well properly vented for equilibration of air pressure?				
d	Is the survey point clearly marked on the inner casing?	1			
е	Is the depth of the well consistent with the original well log?	$\overline{}$			
f	Is the casing stable? (or does the pvc move easily when touched				
	or can it be taken apart by hand due to lack of grout or use of slip				
	couplings in construction)				
5 Sampling:	Groundwater Wells Only:				
а	Does well recharge adequately when purged?	/			
b	If dedicated sampling equipment installed, is it in good condition				
	and specified in the approved groundwater plan for the facility?	1			
С	Does the well require redevelopment (low flow, turbid)?		\checkmark		
6 Based on	your professional judgement, is the well construction / location				
	appropriate to 1) achieve the objectives of the Groundwater				
	Monitoring Program and 2) comply with the applicable regulatory				
	requirements?		/		
7 Corrective	actions as needed, by date:				

Signature and Seal of PE/PG responsible for inspection

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Site Name Permit Number	Hammond	-		
Well ID	46101-170	-		
Date, field conditions	10-22-2019 Wet /2001	-		
		yes	no	n/a
1 Location/I	dentification	- 41		
a	Is the well visible and accessible?			
b	Is the well properly identified with the correct well ID?	J		
С	Is the well in a high traffic area and does the well require	,		
d	In the draine record the well encoded by 0 (
a	is the drainage around the well acceptable? (no standing water,	1		
	nor is well located in obvious drainage now path)			
2 Protective	Casing			
а	Is the protective casing free from apparent damage and able to be			
	secured?	1		
b	Is the casing free of degradation or deterioration?	1		
С	Does the casing have a functioning weep hole?	<u> </u>	· · · · · · · · · · · · · · · · · · ·	·
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?			
e	is the well locked and is the lock in good condition?			
3 Surface pa	<u>ad</u>			
а	Is the well pad in good condition (not cracked or broken)?	1		
b	Is the well pad sloped away from the protective casing?	1		
С	Is the well pad in complete contact with the protective casing?	7		
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not			
	move when stepped on)	<u> </u>		
e	Is the pad surface clean (not covered with sediment or debris)?	<u> </u>		
4 Internal ca	sing			
а	Does the cap prevent entry of foreign material into the well?	J		
b	Is the casing free of kinks or bends, or any obstructions from		2. N	-
	foreign objects (such as bailers)?	J		
С	Is the well properly vented for equilibration of air pressure?	1		
d	Is the survey point clearly marked on the inner casing?	1		
е	Is the depth of the well consistent with the original well log?	J		
t	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip	,		
5 Sampling:	Groundwater Wells Only:			
а	Does well recharge adequately when purged?	5		
b	If dedicated sampling equipment installed, is it in good condition			
	and specified in the approved groundwater plan for the facility?			
С	Does the well require redevelopment (low flow, turbid)?			
6 Based on v	our professional judgement, is the well construction / location			4
	appropriate to 1) achieve the objectives of the Groundwater			X
	Monitoring Program and 2) comply with the applicable regulatory	1		
	requirements?	1		
7 Correctivo	actions as needed, by date:			
/ Conective	uctions as needed, by date.			

Signature and Seal of PE/PG responsible for inspection

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Site Name Permit Number	Hampond	_ :		
	10.00	-		
Date field conditions	HGWC-121n	-		
ale, nela conditions	10/21/2014			,
1 Location/	Identification	yes	no	n/a
а	Is the well visible and accessible?			
b	Is the well properly identified with the correct well ID?	V		
С	Is the well in a high traffic area and does the well require			
	protection from traffic?	V		
d	Is the drainage around the well acceptable? (no standing water,			·
	nor is well located in obvious drainage flow path)			
2 Protective	Casing			
a	Is the protective casing free from apparent damage and able to be			
	secured?	1		
b	Is the casing free of degradation or deterioration?	1		
С	Does the casing have a functioning weep hole?			
d	Is the annular space between casings clear of debris and water,			
	or filled with pea gravel/sand?	1		
е	Is the well locked and is the lock in good condition?	1		
0 Durfasses	2.4		•	
3 Surface p	ao			
a	is the well pad in good condition (not cracked or broken)?			
D	Is the well pad in complete contect with the protective casing?			
c d	Is the well pad in complete contact with the protective casing?		-	
u	stable? (not undermined by creation, animal burrows, and deep not			
	move when stepped on)	1		
۵	Is the pad surface clean (not covored with codiment or debrie)?	<u> </u>		
0	to the pad surface clean (not covered with sediment of debits)?			
4 Internal ca	asing			
а	Does the cap prevent entry of foreign material into the well?	V		
b	Is the casing free of kinks or bends, or any obstructions from			
	foreign objects (such as bailers)?	V		
С	Is the well properly vented for equilibration of air pressure?	1		
d	Is the survey point clearly marked on the inner casing?	/		
е	Is the depth of the well consistent with the original well log?	V		
t	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip	/		
	couplings in construction)			÷
5 Sampling:	Groundwater Wells Only:			
а	Does well recharge adequately when purged?	\checkmark		
b	If dedicated sampling equipment installed, is it in good condition			
	and specified in the approved groundwater plan for the facility?	\checkmark		
С	Does the well require redevelopment (low flow, turbid)?		$\overline{}$	
o Based on	your protessional judgement, is the well construction / location			
	Monitoring Program and 0) comply with the anglight is the			
	requirements?	./		
	requirements:	<u> </u>		
7 Corrective	actions as needed, by date:			

Site Name	- Hummo ad			
	11/ 11/ 124	8		
Date field conditions		8		
		VAS	no	n/a
1 Location/I	dentification	yee	110	n/a
a	Is the well visible and accessible?	1		
b	Is the well properly identified with the correct well ID?			
С	Is the well in a high traffic area and does the well require			
	protection from traffic?	\checkmark		
d	Is the drainage around the well acceptable? (no standing water,			
	nor is well located in obvious drainage flow path)	<u> </u>		
2 Protective	Casing		-1	
a	Is the protective casing free from apparent damage and able to be			
a	secured?	./		
b	Is the casing free of degradation or deterioration?	V		
c	Does the casing have a functioning weep hole?	J		(
d	Is the annular space between casings clear of debris and water.			
	or filled with pea gravel/sand?	J		
е	Is the well locked and is the lock in good condition?	1		
3 Surface p	ad a		-	3
o <u>ounace pa</u>	s the well pad in good condition (not graphed or broken)?	,		
h	Is the well pad sloped away from the protective casing?			
C	Is the well pad in complete contact with the protective casing?	<u> </u>		
d	Is the well pad in complete contact with the ground surface and			
	stable? (not undermined by erosion, animal burrows, and does not			
	move when stepped on)	J.		
е	Is the pad surface clean (not covered with sediment or debris)?	-5		
1 Internal as	oine			
4 <u>Internal ca</u>	Sing Does the cap provent entry of foreign material into the well?			
a h	Is the casing free of kinks or bends, or any obstructions from	<u></u>		
U	foreign objects (such as bailers)?	1		
С	Is the well properly vented for equilibration of air pressure?			
d	Is the survey point clearly marked on the inner casing?	N.		
е	Is the depth of the well consistent with the original well log?	$ \rightarrow $		
f	Is the casing stable? (or does the pvc move easily when touched			
	or can it be taken apart by hand due to lack of grout or use of slip	,		
	couplings in construction)	<u> </u>		
5 Sampling	Groundwater Wells Only:			
a	Does well recharge adequately when purged?	1		
b	If dedicated sampling equipment installed, is it in good condition			
	and specified in the approved groundwater plan for the facility?	1		
С	Does the well require redevelopment (low flow, turbid)?		V	
b Based on y	our protessional judgement, is the well construction / location			
	Appropriate to 1) achieve the objectives of the Groundwater			
	$\alpha \alpha \beta \beta$	/		
	requirements :			
7 Corrective	actions as needed, by date:			

vame	Munumand	-			
		-			
ID Galdense Pitters	APIAI	-			
field conditions	10-21-2514 Overlast / Cool	Ves	no	n/a	
1 Location/I	dentification	yes	no	n/a	
а	Is the well visible and accessible?	V			
b	Is the well properly identified with the correct well ID?				
С	Is the well in a high traffic area and does the well require		, ,		
	protection from traffic?	V			
d	Is the drainage around the well acceptable? (no standing water,			· · · · ·	
	nor is well located in obvious drainage flow path)	<u></u>			
2 Protective	Casing				
а	Is the protective casing free from apparent damage and able to be	,			
	secured?	J			
b	Is the casing free of degradation or deterioration?	\checkmark			
С	Does the casing have a functioning weep hole?				
d	Is the annular space between casings clear of debris and water,				
	or filled with pea gravel/sand?	4			
е	Is the well locked and is the lock in good condition?	<u> </u>			
3 Surface p	ad				a 20
a	Is the well had in good condition (not cracked or broken)?				
h	Is the well had sloped away from the protective casing?				
0	Is the well had in complete contact with the protective casing:	<u>_v</u> _			9
d	Is the well pad in complete contact with the protective casing:				36
u	stable? (not undermined by creation, animal burrows, and does not	. ,			
	move when stepped on)				Albert 10
е	Is the pad surface clean (not covered with sediment ör debris)?		- <u>/</u> -		how sedment.
4 Internal ca	sina				vegetation
2	Does the can prevent entry of foreign material into the well?	1			
h	Is the casing free of kinks or bends, or any obstructions from				
D	foreign objects (such as bailers)?	1			
C	Is the well properly vented for equilibration of air pressure?				
d	Is the survey point clearly marked on the inner casing?			—	
ŭ	Is the denth of the well consistent with the original well log?	<u> </u>			
f	Is the casing stable? (or does the nyc move easily when touched	<u> </u>			
I	or can it be taken apart by hand due to lack of grout or use of slip				
	couplings in construction)	/			
E Comelia	Orean basks Wills Orly				
5 Sampling:	Groundwater Wells Only:			/	Only
a	Does well recharge adequately when purged?				0.)
b	If dedicated sampling equipment installed, is it in good condition			./	MEL
	and specified in the approved groundwater plan for the facility?				VOO
С	Does the well require redevelopment (low flow, turbid)?			/	
6 Based on	your professional judgement, is the well construction / location		,		
	appropriate to 1) achieve the objectives of the Groundwater	2	~ 12/23		
	Monitoring Program and 2) comply with the applicable regulatory	Ť	54	/ N	n col US
	requirements?	/		1	
	actions as pooled by detail				
7 () + +++++++++++++++++++++++++++++++++	actions as needed invitate.				

te Name	Hansiend	-			
	ANI				
ate, field conditions	1D-21-28/4 Allerenet and	÷			
		Ves	no	n/a	
1 Location/I	dentification	yc3	110	11/a	
a	Is the well visible and accessible?				
b	Is the well properly identified with the correct well ID?	~			
С	Is the well in a high traffic area and does the well require				
	protection from traffic?	\checkmark			
d	Is the drainage around the well acceptable? (no standing water,				
	nor is well located in obvious drainage flow path)				
2 Protective	Casing				
a	Is the protective casing free from apparent damage and able to be				
U.	secured?	J			
b	Is the casing free of degradation or deterioration?	~			
С	Does the casing have a functioning weep hole?	V			
d	Is the annular space between casings clear of debris and water.	-			
	or filled with pea gravel/sand?	1			
е	Is the well locked and is the lock in good condition?				
3 Surface pr	ad a start and a start				
a <u>ounace pa</u>	ls the well had in good condition (not cracked or broken)?	J			
b	Is the well pad sloped away from the protective casing?				
C	Is the well pad in complete contact with the protective casing?	<u> </u>			
d	Is the well pad in complete contact with the ground surface and				
-	stable? (not undermined by erosion, animal burrows, and does not				
	move when stepped on)	1			
е	Is the pad surface clean (not covered with sediment or debris)?				
A Internal as	alaa				ં સં
4 <u>Internal ca</u>	Ising				
a	Is the casing free of kinks or hands, or any obstructions from				
U	foreign objects (such as bailors)?				
C	Is the well properly vented for equilibration of air prossure?				
d	Is the survey point clearly marked on the inper casing?				
e	Is the denth of the well consistent with the original well log?				
f	Is the casing stable? (or does the pyc move easily when touched				
-	or can it be taken apart by hand due to lack of grout or use of slip	1			
	couplings in construction)	1			
5 Sampling	Groundwater Walls Only				
o <u>barriping.</u>	Does well recharge adequately when purged?			/	NL
a h	If dedicated sampling equipment installed is it in good condition				- 1.1
0	and specified in the approved groundwater plan for the facility?			6	ony
С	Does the well require redevelopment (low flow, turbid)?				J
b Based on y	/our protessional judgement, is the well construction / location		105		~
	Monitoring Program and 2) comply with the applicable regulatory	۶ť	10/03	r	10/2)
	requirements?	1		X hr	\sum
_					
7 Corrective	actions as needed, by date:				

Site Name	HUMRIDAL	-:			
Permit Number		•)			
Well ID	Mit-23	6			
ate, field conditions	5 10-21 2017	<			
1 Location/	Identification	yes	no	n/a	
a	Is the well visible and accessible?	V			
b	Is the well properly identified with the correct well ID?				
С	Is the well in a high traffic area and does the well require protection from traffic?				
d	Is the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path)	1			
2 Protective	e Casing				
a	Is the protective casing free from apparent damage and able to be	/			
	secured?	1			
b	Is the casing free of degradation or deterioration?	1			
С	Does the casing have a functioning weep hole?	1.			
d	Is the annular space between casings clear of debris and water,	2			
	or filled with pea gravel/sand?	1			
е	Is the well locked and is the lock in good condition?				
3 Surface p	bad				
a	Is the well pad in good condition (not cracked or broken)?	1			
b	is the well pad sloped away from the protective casing?	$\overline{}$;		
С	Is the well pad in complete contact with the protective casing?	./			
d	Is the well pad in complete contact with the ground surface and				
	stable? (not undermined by erosion, animal burrows, and does not move when stepped on)	J			
е	Is the pad surface clean (not covered with sediment or debris)?	1		2	
4 Internal c	asing				
a	Does the cap prevent entry of foreign material into the well?	/			
b	Is the casing free of kinks or bends, or any obstructions from				
	foreign objects (such as bailers)?	V			
С	Is the well properly vented for equilibration of air pressure?	/			
d	Is the survey point clearly marked on the inner casing?	7			
е	Is the depth of the well consistent with the original well log?				
f	Is the casing stable? (or does the pvc move easily when touched				
	or can it be taken apart by hand due to lack of grout or use of slip	,			
	couplings in construction)				
5 Sampling	Groundwater Wells Only:				
a	Does well recharge adequately when purged?			1	wl
b	If dedicated sampling equipment installed, is it in good condition				malu
	and specified in the approved groundwater plan for the facility?			V	Ong
С	Does the well require redevelopment (low flow, turbid)?				
6 Based on	vour professional judgement is the well construction / location				
	appropriate to 1) achieve the objectives of the Groundwater	NM.	5		
	Monitoring Program and 2) comply with the applicable regulatory	joli	2	NM	10/2)
	requirements?	<u> </u>		X	
7 Corrective	e actions as needed, by date:				
	-				

APPENDIX C

Laboratory Analytical and Field Sampling Reports

APPENDIX C1

Laboratory Analytical Data Packages and Data Validation Reports

Laboratory Reports



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

March 12, 2020

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP GW6851 Pace Project No.: 2622352

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 23, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP GW6851 Pace Project No.: 2622352

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622352001	HGWA-122	Water	08/22/19 10:37	08/23/19 12:00
2622352002	HGWC-121A	Water	08/22/19 13:05	08/23/19 12:00
2622352003	HGWC-120	Water	08/22/19 15:47	08/23/19 12:00



SAMPLE ANALYTE COUNT

Project:Plant Hammond AP GW6851Pace Project No.:2622352

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2622352001	— — HGWA-122	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2622352002	HGWC-121A	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2622352003	HGWC-120	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



ANALYTICAL RESULTS

Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

Sample: HGWA-122	Lab ID: 2622352001 Collected: 08/22/19 10:37 Received: 08/23/19 1					23/19 12:00 Ma	atrix: Water		
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00027	1	08/27/19 11:50	08/27/19 18:11	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00035	1	08/27/19 11:50	08/27/19 18:11	7440-38-2	
Barium	0.044	mg/L	0.010	0.00049	1	08/27/19 11:50	08/27/19 18:11	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000074	1	08/27/19 11:50	08/27/19 18:11	7440-41-7	
Cadmium	ND	mg/L	0.0025	0.00011	1	08/27/19 11:50	08/27/19 18:11	7440-43-9	
Chromium	0.00060J	mg/L	0.010	0.00039	1	08/27/19 11:50	08/27/19 18:11	7440-47-3	В
Cobalt	ND	mg/L	0.0050	0.00030	1	08/27/19 11:50	08/27/19 18:11	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	08/27/19 11:50	08/27/19 18:11	7439-92-1	
Lithium	ND	mg/L	0.030	0.00078	1	08/27/19 11:50	08/27/19 18:11	7439-93-2	
Molybdenum	0.0030J	mg/L	0.010	0.00095	1	08/27/19 11:50	08/27/19 18:11	7439-98-7	
Selenium	ND	mg/L	0.010	0.0013	1	08/27/19 11:50	08/27/19 18:11	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000052	1	08/27/19 11:50	08/27/19 18:11	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.00014	1	08/26/19 14:21	08/27/19 14:17	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.12J	mg/L	0.30	0.029	1		08/30/19 20:44	16984-48-8	



ANALYTICAL RESULTS

Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

Sample: HGWC-121A	Lab ID:	2622352002	Collecte	ed: 08/22/19	9 13:05	Received: 08/	23/19 12:00 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00027	1	08/27/19 11:50	08/27/19 18:17	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00035	1	08/27/19 11:50	08/27/19 18:17	7440-38-2	
Barium	0.066	mg/L	0.010	0.00049	1	08/27/19 11:50	08/27/19 18:17	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000074	1	08/27/19 11:50	08/27/19 18:17	7440-41-7	
Cadmium	ND	mg/L	0.0025	0.00011	1	08/27/19 11:50	08/27/19 18:17	7440-43-9	
Chromium	ND	mg/L	0.010	0.00039	1	08/27/19 11:50	08/27/19 18:17	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	08/27/19 11:50	08/27/19 18:17	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	08/27/19 11:50	08/27/19 18:17	7439-92-1	
Lithium	0.0084J	mg/L	0.030	0.00078	1	08/27/19 11:50	08/27/19 18:17	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00095	1	08/27/19 11:50	08/27/19 18:17	7439-98-7	
Selenium	ND	mg/L	0.010	0.0013	1	08/27/19 11:50	08/27/19 18:17	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000052	1	08/27/19 11:50	08/27/19 18:17	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.00014	1	08/26/19 14:21	08/27/19 14:19	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.20J	mg/L	0.30	0.029	1		08/30/19 21:07	16984-48-8	



ANALYTICAL RESULTS

Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

Sample: HGWC-120	Lab ID:	2622352003	Collecte	ed: 08/22/19	9 15:47	Received: 08/	23/19 12:00 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00027	1	08/27/19 11:50	08/27/19 18:23	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00035	1	08/27/19 11:50	08/27/19 18:23	7440-38-2	
Barium	0.050	mg/L	0.010	0.00049	1	08/27/19 11:50	08/27/19 18:23	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000074	1	08/27/19 11:50	08/27/19 18:23	7440-41-7	
Cadmium	ND	mg/L	0.0025	0.00011	1	08/27/19 11:50	08/27/19 18:23	7440-43-9	
Chromium	0.00072J	mg/L	0.010	0.00039	1	08/27/19 11:50	08/27/19 18:23	7440-47-3	В
Cobalt	0.0028J	mg/L	0.0050	0.00030	1	08/27/19 11:50	08/27/19 18:23	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	08/27/19 11:50	08/27/19 18:23	7439-92-1	
Lithium	0.029J	mg/L	0.030	0.00078	1	08/27/19 11:50	08/27/19 18:23	7439-93-2	
Molybdenum	0.039	mg/L	0.010	0.00095	1	08/27/19 11:50	08/27/19 18:23	7439-98-7	
Selenium	ND	mg/L	0.010	0.0013	1	08/27/19 11:50	08/27/19 18:23	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000052	1	08/27/19 11:50	08/27/19 18:23	7440-28-0	
7470 Mercury	Analytical	Method: EPA 7	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.00014	1	08/26/19 14:21	08/27/19 14:21	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	300.0						
Fluoride	0.30J	mg/L	0.30	0.029	1		08/30/19 21:30	16984-48-8	



Project:	Plant Hammond A	P GW6851										
Pace Project No.:	2622352											
QC Batch:	34265		Analy	sis Metho	od: I	EPA 7470A						
QC Batch Method:	EPA 7470A		Analy	vsis Descr	iption:	7470 Mercu	iry					
Associated Lab San	nples: 26223520	01, 2622352002,	262235200	3								
METHOD BLANK:	154112			Matrix: V	Vater							
Associated Lab San	nples: 26223520	01, 2622352002,	262235200	3								
			Blar	nk	Reporting							
Paran	neter	Units	Res	ult	Limit	MD	L	Analyzed	Q	ualifiers		
Mercury		mg/L		ND	0.0005	0 0.	00014	08/27/19 13:	:41			
LABORATORY COM	NTROL SAMPLE:	154113										
			Spike	L	CS	LCS	%	Rec				
Paran	neter	Units	Conc.	Re	sult	% Rec	Lir	nits	Qualifiers	_		
Mercury		mg/L	0.002	5	0.0026	10	3	80-120				
MATRIX SPIKE & M	IATRIX SPIKE DUP	LICATE: 1541	14		154115							
			MS	MSD								
Parameter	· Units	2622337002 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0025	0.0025	0.0025	0.0025	10	1 100	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

QC Batch:	34320	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3005A	Analysis Description:	6020B MET
Associated Lab Sam	ples: 2622352001, 2622352002, 262	2352003	
METHOD BLANK:	154347	Matrix: Water	

Associated Lab Samples: 2622352001 2622352002 2622352003

	02001, 2022002002, 2	022002000				
		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Antimony	mg/L	ND	0.0030	0.00027	08/27/19 16:36	
Arsenic	mg/L	ND	0.0050	0.00035	08/27/19 16:36	
Barium	mg/L	ND	0.010	0.00049	08/27/19 16:36	
Beryllium	mg/L	ND	0.0030	0.000074	08/27/19 16:36	
Cadmium	mg/L	ND	0.0025	0.00011	08/27/19 16:36	
Chromium	mg/L	0.0012J	0.010	0.00039	08/27/19 16:36	
Cobalt	mg/L	ND	0.0050	0.00030	08/27/19 16:36	
Lead	mg/L	ND	0.0050	0.000046	08/27/19 16:36	
Lithium	mg/L	ND	0.030	0.00078	08/27/19 16:36	
Molybdenum	mg/L	ND	0.010	0.00095	08/27/19 16:36	
Selenium	mg/L	ND	0.010	0.0013	08/27/19 16:36	
Thallium	mg/L	ND	0.0010	0.000052	08/27/19 16:36	

LABORATORY CONTROL SAMPLE: 154348

			Spike	LCS	LCS	% Rec	
	Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony		mg/L	0.1	0.090	90	80-120	
Arsenic		mg/L	0.1	0.085	85	80-120	
Barium		mg/L	0.1	0.088	88	80-120	
Beryllium		mg/L	0.1	0.086	86	80-120	
Cadmium		mg/L	0.1	0.088	88	80-120	
Chromium		mg/L	0.1	0.088	88	80-120	
Cobalt		mg/L	0.1	0.086	86	80-120	
Lead		mg/L	0.1	0.086	86	80-120	
Lithium		mg/L	0.1	0.087	87	80-120	
Molybdenum		mg/L	0.1	0.089	89	80-120	
Selenium		mg/L	0.1	0.085	85	80-120	
Thallium		mg/L	0.1	0.087	87	80-120	

MATRIX SPIKE & MATRIX SP	PIKE DUPL	ICATE: 1543	49		154350							
		000007000	MS	MSD	MC	MOD	MC	MOD	0/ Dee		Mari	
		2622337002	Бріке	Spike	IVIS	MSD	IVIS	INSD	% Rec		wax	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.10	102	103	75-125	1	20	
Arsenic	mg/L	ND	0.1	0.1	0.098	0.098	98	98	75-125	1	20	
Barium	mg/L	0.078	0.1	0.1	0.18	0.18	104	104	75-125	0	20	
Beryllium	mg/L	ND	0.1	0.1	0.092	0.093	92	93	75-125	1	20	
Cadmium	mg/L	ND	0.1	0.1	0.099	0.10	99	101	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1543	49		154350							
			MS	MSD								
		2622337002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.10	0.10	101	100	75-125	1	20	
Cobalt	mg/L	ND	0.1	0.1	0.099	0.098	99	98	75-125	1	20	
Lead	mg/L	ND	0.1	0.1	0.096	0.098	96	98	75-125	2	20	
Lithium	mg/L	0.0025J	0.1	0.1	0.095	0.096	92	93	75-125	1	20	
Molybdenum	mg/L	ND	0.1	0.1	0.11	0.11	106	105	75-125	0	20	
Selenium	mg/L	ND	0.1	0.1	0.099	0.096	99	96	75-125	3	20	
Thallium	mg/L	0.00018J	0.1	0.1	0.098	0.099	97	99	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project:	Plant Hammond Al	P GW6851										
Pace Project No .:	2622352											
QC Batch:	34533		Analy	ysis Metho	d:	EPA 300.0						
QC Batch Method:	EPA 300.0		Anal	ysis Descri	ption:	300.0 IC An	ions					
Associated Lab Sam	nples: 26223520	01, 2622352002,	262235200)3								
METHOD BLANK:	155485			Matrix: W	ater							
Associated Lab Sam	nples: 26223520	01, 2622352002,	262235200)3								
			Blai	nk	Reporting							
Param	neter	Units	Res	ult	Limit	MD	L	Analyzed	Qı	Jalifiers		
Fluoride		mg/L		ND	0.3	0	0.029 0	8/30/19 13:	57			
LABORATORY CON	ITROL SAMPLE:	155486										
Param	neter	Units	Spike Conc.	LC Res	:S sult	LCS % Rec	% F Lim	Rec lits (Qualifiers			
Fluoride		mg/L	1	0	9.3	9	3	90-110		_		
MATRIX SPIKE & M	IATRIX SPIKE DUP	LICATE: 1554	87		155488							
			MS	MSD								
Parameter	Units	2622319009 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	ND	10	10	10.8	10.7	108	107	90-110	1	15	
MATRIX SPIKE SAM	MPLE:	155523										
			26223	337002	Spike	MS		MS	% Rec	;		
Param	neter	Units	Re	sult	Conc.	Result	Q	% Rec	Limits		Qualif	iers
Fluoride		mg/L		0.11J	10		9.5	94	90	-110		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Plant Hammond AP GW6851

Pace Project No.: 2622352

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:Plant Hammond AP GW6851Pace Project No.:2622352

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622352001	HGWA-122	EPA 3005A	34320	EPA 6020B	34344
2622352002	HGWC-121A	EPA 3005A	34320	EPA 6020B	34344
2622352003	HGWC-120	EPA 3005A	34320	EPA 6020B	34344
2622352001	HGWA-122	EPA 7470A	34265	EPA 7470A	34311
2622352002	HGWC-121A	EPA 7470A	34265	EPA 7470A	34311
2622352003	HGWC-120	EPA 7470A	34265	EPA 7470A	34311
2622352001	HGWA-122	EPA 300.0	34533		
2622352002	HGWC-121A	EPA 300.0	34533		
2622352003	HGWC-120	EPA 300.0	34533		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

112

Section . Required	A I Client Information:	Section B Required Proje	et Info	rmation:				σs	action (voice b	C Mormat	tion:										0		-	5	-
Company	Georgia Power - Coal Combustion Residuals	Report To: J	oju Abr	aham / La	Iren Petty			At	tention	S	sinvoi	ces@	southe	mco.	ШÖ					-	7		-	5	
Address:	2480 Maner Road	Copy To: G	eosynt	90				Ŭ,	ompany	Name:															
noit Taoit	Attanta, GA 30339							¥ i	Idress:												History B.				
Phone:	(404)506-7239 Fax	Project Name:	- BIG	nt Hammo	od AP				Sce Pro	ect Mar	hager:	bets	v modar	iel@ns	tcelabs	80			E TO A	Constant of the		A PARTY OF	A CONTRACTOR	100000	
Requeste	ad Due Date: S-tandoral TAT	Project #:	22	<u>85</u>				<u>م</u>	ace Pro	:# elij	327.4	7										ß	4		
			(di)(O)		COLLE	CTED				^۲	Mase	atives					tantian					a catao			
				STA	.RT	E E				·				0.000	0	2 1						(N/A) 8			
# WƏTI	One Character per box. Wea (A-Z, 0-9 / , -) One Sample Ids must be unique Taxee	222 VICTAN		DATE	TIME	DATE	TIME	A 9M9LE TEMP A # OF CONTAINES	Unpreserved	HNO3 HSSO4	нсі	EOZSZBN HO ^B N	Methanol	BOS DELY	Pluoride by 300.	Redium 226/228						Residual Chlorin			
	HGWA-122	3	ۍ ۲	e/22 hg	1022	Philig	FE 01	21 6	-	6					7	7		┢				२			
	HGWC-IZIA	*	5	8/rp	2421	bynye	5051	727	-	19)					77	7	<u> </u>	-				2			
E.	HGWC - 120	3	נוט	11/18	1524	Phr 14	fyz	24 4	-	(1)					7	7					-	2			
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Sar	nple Condition L	Jpon Receipt	WO#:26223	50
Face Analytical Client Name	GA-POW	er cck	PM: BM Due D CLIENT: GRPours COD	JZ ate: 08/30/19
Courier: C Fed Ex C UPS USPS C Clie	nt 🗆 Commercial 🕻	Pace Other		
Custody Seal on Cooler/Box Present: 🛛 🖉	no Seals in	itact: 🖵 yes		
Packing Material: FIBubble Wrap Bubble	Bags 🔽 Noné 🗌	Other		1
Thermometer Used 2/4	Type of Ice: Wet	Blue None	Samples on ice, cooling proc	ess has begun
Cooler Temperature 3// 0/	Biological Tissue is	Frozen: Yes No	Date and Initials of pers contents:	on examining
Chain of Custody Present:		•		
Chain of Custody Filled Out:				
Chain of Custody Relinquished:		l		
Sampler Name & Signature on COC:		i.	·	
Samples Arrived within Hold Time:		ö.		1
Short Hold Time Analysis (<72hr):		S		
Rush Turn Around Time Requested:		·		
Sufficient Volume:		3.	1	
Correct Containers Used:		9.		i i
-Pace Containers Used:	HTES INO IN/A			
Containers Intact:		10		
Filtered volume received for Dissolved tests		11.		
Sample Labels match COC:		12.		l.
-Includes date/time/ID/Analysis Matrix:	W			
All containers needing preservation have been checked.		13.		
All containers needing preservation are found to be in compliance with EPA recommendation.			L of # of added	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes □No	completed	preservative	
Samples checked for dechlorination:	Yes No CAR	14.		
Headspace in VOA Vials (>6mm):		15.		
Trip Blank Present:	□Yes □No □N/A	16.		1
Trip Blank Custody Seals Present	□Yes □No ₽N/A			
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field Data Required?	Y / N
Person Contacted:	Date/T	lime:		
Comments/ Resolution:				
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		•.	<u> </u>	
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		. <u></u>		
Project Manager Review:			Date:	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

September 23, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP GW6851 Pace Project No.: 2622353

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 23, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP GW6851 Pace Project No.: 2622353

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: Plant Hammond AP GW6851

Pace Project No.: 2622353

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622353001	HGWA-122	Water	08/22/19 10:37	08/23/19 12:00
2622353002	HGWC-121A	Water	08/22/19 13:05	08/23/19 12:00
2622353003	HGWC-120	Water	08/22/19 15:47	08/23/19 12:00



SAMPLE ANALYTE COUNT

Project:Plant Hammond AP GW6851Pace Project No.:2622353

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2622353001	HGWA-122	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2622353002	HGWC-121A	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2622353003	HGWC-120	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Plant Hammond AP GW6851

Pace Project No.: 2622353

Sample: HGWA-122 PWS:	Lab ID: 26223530 Site ID:	01 Collected: 08/22/19 10:37 Sample Type:	Received:	08/23/19 12:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.308 ± 0.250 (0.423) C:89% T:NA	pCi/L	09/05/19 09:54	13982-63-3	
Radium-228	EPA 9320	0.886 ± 0.448 (0.773) C:72% T:79%	pCi/L	09/16/19 12:49	15262-20-1	
Total Radium	Total Radium Calculation	1.19 ± 0.698 (1.20)	pCi/L	09/17/19 14:18	7440-14-4	



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Plant Hammond AP GW6851

Pace Project No.: 2622353

Sample: HGWC-121A PWS:	Lab ID: 26223530 Site ID:	Collected: 08/22/19 13:05 Sample Type:	Received:	08/23/19 12:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.635 ± 0.316 (0.315) C:92% T:NA	pCi/L	09/05/19 09:54	13982-63-3	
Radium-228	EPA 9320	0.664 ± 0.409 (0.755) C:71% T:79%	pCi/L	09/19/19 12:11	15262-20-1	
Total Radium	Total Radium Calculation	1.30 ± 0.725 (1.07)	pCi/L	09/20/19 12:23	7440-14-4	



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Plant Hammond AP GW6851

Pace Project No.: 2622353

Sample: HGWC-120 PWS:	Lab ID: 26223530 Site ID:	Collected: 08/22/19 15:47 Sample Type:	Received:	08/23/19 12:00	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.845 ± 0.350 (0.295) C:98% T:NA	pCi/L	09/05/19 09:52	13982-63-3	
Radium-228	EPA 9320	0.500 ± 0.395 (0.772) C:63% T:78%	pCi/L	09/19/19 12:11	15262-20-1	
Total Radium	Total Radium Calculation	1.35 ± 0.745 (1.07)	pCi/L	09/20/19 12:23	5 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond AP GW6851						
Pace Project No.:	2622353						
QC Batch:	359490	Analysis Method:	EPA 9315				
QC Batch Method:	EPA 9315	Analysis Description:	9315 Total Radium				
Associated Lab San	nples: 262235300	1, 2622353002, 2622353003					
METHOD BLANK: 1745579		Matrix: Water					
Associated Lab Samples: 2622353001, 2622353002, 2622353003							
Parameter		Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers		
Radium-226		0.243 ± 0.244 (0.474) C:94% T:NA	pCi/L	09/05/19 08:07			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P GW6851					
Pace Project No.:	2622353						
QC Batch:	358894		Analysis Method:	EPA 9320			
QC Batch Method: EPA 9320			Analysis Description:	9320 Radium 228			
Associated Lab Sar	mples: 26223530	01					
METHOD BLANK:	1742552		Matrix: Water				
Associated Lab Sar	mples: 26223530	01					
Paran	meter	Act =	LUnc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-228		0.862 ± 0.415	(0.695) C:79% T:75%	pCi/L	09/16/19 12:47		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P GW6851					
Pace Project No.:	2622353						
QC Batch:	358895		Analysis Method:	EPA 9320			
QC Batch Method:	EPA 9320		Analysis Description:	9320 Radium 228			
Associated Lab San	nples: 26223530	02, 262235300	3				
METHOD BLANK:	1742554		Matrix: Water				
Associated Lab San	nples: 26223530	002, 262235300	3				
Parameter Act ± 0		Lunc (MDC) Carr Trac	Units	Analyzed	Qualifiers		
Radium-228		0.167 ± 0.291	(0.635) C:73% T:86%	pCi/L	09/19/19 12:11		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.


QUALIFIERS

Project: Plant Hammond AP GW6851

Pace Project No.: 2622353

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:Plant Hammond AP GW6851Pace Project No.:2622353

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622353001	HGWA-122	EPA 9315	359490		
2622353002	HGWC-121A	EPA 9315	359490		
2622353003	HGWC-120	EPA 9315	359490		
2622353001	HGWA-122	EPA 9320	358894		
2622353002	HGWC-121A	EPA 9320	358895		
2622353003	HGWC-120	EPA 9320	358895		
2622353001	HGWA-122	Total Radium Calculation	361776		
2622353002	HGWC-121A	Total Radium Calculation	362430		
2622353003	HGWC-120	Total Radium Calculation	362430		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Section	A 1 Eliant Information.	Section B	-	, Informa	Hon.				ν, Έ	ection	0	noiten														-	č	-	
Company	V: Georgia Power - Coal Combustion Residuals	Report To:	i i i	Abrahar	n / Lauren	Pettv			ľ	tentior		scsin	voice	s@sc	uther	DCO.C	E S				Г			22		-	;		1
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	Atlanta, GA 30339								Ĭ	dress				ŀ							5		5777	SARD	गवितिक	zAgedo			N
Email:	jabraham@southernco.com	Purchase Orde	er #	Š	S1038277	5			đ	о Зсе О	uote:										┝								
Phone:	(404)506-7239, Fax	Project Name:		Plant H	ammond A	9			đ	ace Pr	oject N	Manage	er:	betsy	mcdan	el@pa	celabs	Ë S				P_{ij}	1.12		ALC: NO DE	call on	E NUG		12
Request	ed Due Date: Structured 1 A.1	Project #:	5	200	1				ã	ace Pr	ofile #	3	27.4.2			17 17		20 AU	third A	a had		AVV.	Series of	語を思	S	語語			2
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	HGWA-122		15	ر <i>گر</i>	2 19 10:	1/a 22	2lig II	2 66.0	315	4		ς.				Ė	7 7	7							2)	
	H G WC -121A		5	5	11/12	1/2 2 h	2/19	507 2	27	~		5					7	7	-						2				7
	HGW2 -120		1	<u>ن</u> 19	11415	1 P2	1 1/2	547 2	3			R				1	17	7			\vdash				2				m
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Sar	nple Condition L	Jpon Receipt	WO#: 262235	3
Face Analytical Client Name	CA-Paul	1 CCR		0. 09/23/
	$\Theta_7 \cup O_W$	er n	CITENT: GRPouer-CCR	
Courier: 🔲 Fed Ex 🛄 UPS 🗍 USPS 🗍 Clien	nt 🗌 Commercial 🖡	Pace Other		
Fracking #:	-		Proj. Due Date	
Custody Seal on Cooler/Box Present:	no Seals ir	ntact: 🖵 yes	no	
Packing Material; Bubble Wrap Bubble	Bags 🔲 Noné] Other		I
Thermometer Used 244	Type of Ice: Wet	Blue None	Samples on ice, cooling process I	nas begun
Cooler Temperature	Biological Tissue is	s Frozen: Yes No	Date and Initials of person of contents:	ixamining
Femp should be above freezing to 6°C	(Comments:		
Chain of Custody Present:		1	·	
Chain of Custody Filled Out:		2		
Chain of Custody Relinquished:		3		<u> </u>
Sampler Name & Signature on COC:		4.	· · · · · · · · · · · · · · · · · · ·	
Samples Arrived within Hold Time:		5		
Short Hold Time Analysis (<72hr):	Yes Ane ON/A	6	·	!
Rush Turn Around Time Requested:		7		
Sufficient Volume:		8	6	1
Correct Containers Used:		9.		
-Pace Containers Used:			<u> </u>	
Containers Intact:		10.		
Filtered volume received for Dissolved tests		11.		
Sample Labels match COC:		12.		
-Includes date/time/ID/Analysis Matrix:				
All containers needing preservation have been checked.	ØYes □No □N/A	13.		
All containers needing preservation are found to be in compliance with EPA recommendation			1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	
		Initial when	Lot # of added	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)		completed	preservative	-
Samples checked for dechlorination:		14.		
Headspace in VOA Vials (>6mm):		15.		
Trip Blank Present:	□Yes □No □N/A	16.		
Trip Blank Custody Seals Present	□Yes □No IÓN/A			
Pace Trip Blank Lot # (if purchased):			·····	
Client Notification/ Resolution:			Field Data Required? Y	/ N
Person Contacted:	Date/1	Fime:		
Comments/ Resolution:				
	•			_
·····		۰.		
			· · · · · · · · · · · · · · · · · · ·	-
Project Manager Review:			Date:	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

March 12, 2020

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP GW6581 Pace Project No.: 2622398

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP GW6581 Pace Project No.: 2622398

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project:Plant Hammond AP GW6581Pace Project No.:2622398

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622398001	HGWC-124	Water	08/23/19 10:31	08/26/19 18:30



SAMPLE ANALYTE COUNT

Project:Plant Hammond AP GW6581Pace Project No.:2622398

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2622398001	HGWC-124	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



ANALYTICAL RESULTS

Project: Plant Hammond AP GW6581

Pace Project No.: 2622398

Sample: HGWC-124	Lab ID:	2622398001	Collecte	ed: 08/23/19	9 10:31	Received: 08/	26/19 18:30 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	hod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00027	1	08/29/19 18:05	08/30/19 17:53	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00035	1	08/29/19 18:05	08/30/19 17:53	7440-38-2	
Barium	0.066	mg/L	0.010	0.00049	1	08/29/19 18:05	08/30/19 17:53	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000074	1	08/29/19 18:05	08/30/19 17:53	7440-41-7	
Cadmium	ND	mg/L	0.0025	0.00011	1	08/29/19 18:05	08/30/19 17:53	7440-43-9	
Chromium	ND	mg/L	0.010	0.00039	1	08/29/19 18:05	08/30/19 17:53	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	08/29/19 18:05	08/30/19 17:53	7440-48-4	
Lead	0.000049J	mg/L	0.0050	0.000046	1	08/29/19 18:05	08/30/19 17:53	7439-92-1	В
Lithium	0.0011J	mg/L	0.030	0.00078	1	08/29/19 18:05	08/30/19 17:53	7439-93-2	
Molybdenum	0.0014J	mg/L	0.010	0.00095	1	08/29/19 18:05	08/30/19 17:53	7439-98-7	
Selenium	ND	mg/L	0.010	0.0013	1	08/29/19 18:05	08/30/19 17:53	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000052	1	08/29/19 18:05	08/30/19 17:53	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Prej	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.00014	1	08/28/19 13:26	08/28/19 16:26	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	0.11J	mg/L	0.30	0.029	1		09/03/19 21:43	16984-48-8	



Project:	Plant Hammond AF	9 GW6581										
Pace Project No.:	2622398											
QC Batch:	34391		Analy	sis Metł	hod: E	EPA 7470A						
QC Batch Method:	EPA 7470A		Analy	sis Des	cription: 7	470 Mercu	iry					
Associated Lab Sam	ples: 262239800	1										
METHOD BLANK:	154672			Matrix:	Water							
Associated Lab Sam	ples: 262239800	1										
			Blan	k	Reporting							
Param	neter	Units	Resu	ılt	Limit	MD	L	Analyzed	l Qi	ualifiers		
Mercury		mg/L		ND	0.00050	0.	00014	08/28/19 16	:21			
LABORATORY CON	ITROL SAMPLE:	154673										
			Spike		LCS	LCS	%	Rec				
Param	neter	Units	Conc.	R	Result	% Rec	L	imits	Qualifiers	_		
Mercury		mg/L	0.002	5	0.0025	10	0	80-120				
MATRIX SPIKE & M	ATRIX SPIKE DUPL	-ICATE: 1546	74		154675							
			MS	MSD					_			
Parameter	Units	2622398001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0025	0.002	25 0.0024	0.0025	(98 100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Hammond AP GW6581

2622398 Pace Project No.:

10,000.100	2022550	

QC Batch: 34496	Analysis Meth	hod: EP	A 6020B		
QC Batch Method: EPA 3005A	Analysis Des	cription: 602	20B MET		
Associated Lab Samples: 2622398001					
METHOD BLANK: 155177	Matrix:	Water			
Associated Lab Samples: 2622398001					
	Blank	Reporting			
Parameter Units	Result	Limit	MDL	Analyzed	Qualifiers
Antimony mg/L	ND	0.0030	0.00027	08/30/19 17:42	
Arsenic mg/L	ND	0.0050	0.00035	08/30/19 17:42	
Barium mg/L	ND	0.010	0.00049	08/30/19 17:42	
Beryllium mg/L	ND	0.0030	0.000074	08/30/19 17:42	
Cadmium mg/L	ND	0.0025	0.00011	08/30/19 17:42	
Chromium mg/L	ND	0.010	0.00039	08/30/19 17:42	
Cobalt mg/L	ND	0.0050	0.00030	08/30/19 17:42	
Lead mg/L	ND	0.0050	0.000046	08/30/19 17:42	
Lithium mg/L	ND	0.030	0.00078	08/30/19 17:42	
Molybdenum mg/L	ND	0.010	0.00095	08/30/19 17:42	
Selenium mg/L	ND	0.010	0.0013	08/30/19 17:42	
Thallium mg/L	ND	0.0010	0.000052	08/30/19 17:42	

LABORATORY CONTROL SAMPLE: 155178

			Spike	LCS	LCS	% Rec	
	Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony		mg/L	0.1	0.10	104	80-120	
Arsenic		mg/L	0.1	0.10	101	80-120	
Barium		mg/L	0.1	0.10	104	80-120	
Beryllium		mg/L	0.1	0.10	104	80-120	
Cadmium		mg/L	0.1	0.10	103	80-120	
Chromium		mg/L	0.1	0.10	103	80-120	
Cobalt		mg/L	0.1	0.10	101	80-120	
Lead		mg/L	0.1	0.10	101	80-120	
Lithium		mg/L	0.1	0.11	105	80-120	
Molybdenum		mg/L	0.1	0.10	105	80-120	
Selenium		mg/L	0.1	0.10	102	80-120	
Thallium		mg/L	0.1	0.10	102	80-120	

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1551	79		155180							
		2622479002	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	mg/L	 ND	0.1	0.1	0.10	0.10	104	102	75-125	2	20	
Arsenic	mg/L	ND	0.1	0.1	0.11	0.11	106	107	75-125	1	20	
Barium	mg/L	0.036	0.1	0.1	0.14	0.13	103	97	75-125	4	20	
Beryllium	mg/L	0.00024J	0.1	0.1	0.098	0.095	97	95	75-125	3	20	
Cadmium	mg/L	0.00072	0.1	0.1	0.10	0.099	100	98	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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Project: Plant Hammond AP GW6581

Pace Project No.: 2622398

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1551	79		155180							
Parameter	Units	2622479002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	mg/L		0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Cobalt	mg/L	0.0018J	0.1	0.1	0.098	0.098	97	96	75-125	1	20	
Lead	mg/L	0.000049J	0.1	0.1	0.094	0.093	94	93	75-125	1	20	
Lithium	mg/L	0.0033J	0.1	0.1	0.10	0.10	100	97	75-125	2	20	
Molybdenum	mg/L	0.0065J	0.1	0.1	0.11	0.11	106	105	75-125	1	20	
Selenium	mg/L	ND	0.1	0.1	0.11	0.11	106	109	75-125	2	20	
Thallium	mg/L	ND	0.1	0.1	0.096	0.095	96	95	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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Project:	Plant Hammond A	P GW6581										
Pace Project No.:	2622398											
QC Batch:	34680		Anal	ysis Metho	d: E	EPA 300.0						
QC Batch Method:	EPA 300.0		Anal	ysis Descri	ption: 3	300.0 IC Ani	ions					
Associated Lab Sar	mples: 26223980	01										
METHOD BLANK:	156099			Matrix: W	ater							
Associated Lab Sar	nples: 26223980	01										
			Bla	nk	Reporting							
Parar	neter	Units	Res	ult	Limit	MDI	_	Analyzed	Qı	alifiers		
Fluoride		mg/L		ND	0.30	0	0.029 0	9/03/19 20:	58			
LABORATORY CO	NTROL SAMPLE:	156100										
_			Spike	LC	S	LCS	% R	ec				
Parar	neter	Units	Conc.	Res	sult	% Rec	Lim		Jualifiers	_		
Fluoride		mg/L	,	10	9.4	94	4	90-110				
MATRIX SPIKE & N	ATRIX SPIKE DUF	LICATE: 1561	01		156102							
			MS	MSD								
		2622398001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	r Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Fluoride	mg/L	0.11J	10	10	9.4	9.2	92	91	90-110	1	15	
MATRIX SPIKE SA	MPLE:	156103										
			2622	402001	Spike	MS		MS	% Rec			
Parar	neter	Units	Re	esult	Conc.	Result	9	6 Rec	Limits		Qualif	iers
Fluoride		mg/L		ND	10		9.6	96	90	-110		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Plant Hammond AP GW6581

Pace Project No.: 2622398

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:Plant Hammond AP GW6581Pace Project No.:2622398

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622398001	HGWC-124	EPA 3005A	34496	EPA 6020B	34557
2622398001	HGWC-124	EPA 7470A	34391	EPA 7470A	34429
2622398001	HGWC-124	EPA 300.0	34680		

Section A

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Addres	ss: 2480 Maner Road	Copy To:	Geosyn	tlec				ð	npany N	ame:							_						
	Atlanta, GA 30339							Adc	fress:									1999 B	Bisking	MAREN A	Herity		Strent B
Email:	jabraham@southernco.com	Purchase On	der #:	SCS103	32775			Pac	ce Quote														Γ
Phone:	c (404)506-7239 Fax:	Project Name	e: Ph	ant Hamm	nd AP			Pac	o Projec	t Manage	sr: bet	sy.mcdan	iel@pac	elabs.co	Ē				日本語の語	ate Mice	HORIZE	101100	NP CH
Reque	sted Due Date: Ston Revice The	Projact #:	Ň	4581				Pac	se Profile	#: 32	7.4.2						L			g			
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	Orinking Wa	M	C=C sepo					1011		F			10					-	F				
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 Metals 	i list Hg. Sb. As. Ba, Bo, Cd, Cr. Co, Pb, Li, Mo, So, Ti	Mor	ilia	M	hada	w ha	1/20	6	oesi	Ň	Heard .		X	6		8	2//4	(540					
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S	ample Condition	Upon Receir	0#:262	2398
Face Analytical Client Nam	e latt.	In Pr	BM	
		<i>Nel</i> cl	IENT: GAPower-	CCR 09/04/1
Courier: 🗆 Fed Ex 🗍 UPS 🗍 USPS 🕄 C	ient 🗋 Commercial	Pace Other		
Fracking #:		_	RIORDU	
Custody Seal on Cooler/Box Present:	es 🗌 no 🛛 Seals i	ntact: 🛛 yes 🗌] no	1165
Packing Material:	ble Bags 🗍 None [Other		
Chermometer Used 214	Type of Ice: Net	Biue None] Samples on ice, cool	ing process has begun
Coolor Tomporature $7/5^{\circ}$	Biological Tissue i	s Frozen: Yes No	Date and Initials	of porson examining
emp should be above freezing to 6°C		Comments:	contents:	2011900
Chain of Custody Present:		1.		
Chain of Custody Filled Out:		2.		
Chain of Custody Relinquished:		3.		
Sampler Name & Signature on COC:		4.		
Samples Arrived within Hold Time:		5.		
Short Hold Time Analysis (<72hr):		6.		
Rush Turn Around Time Requested:		7.		
Sufficient Volume:		8.		
Correct Containers Used:	Pres DNo DN/A	9.		
-Pace Containers Used:				
Containers Intact:	Deves Ono On/A	10.		
Filtered volume received for Dissolved tests	□Yes □No 🖬₩/A	·11.		
Sample Labels match COC:		12.		
-Includes date/time/ID/Analysis Matrix:	W			
All containers needing preservation have been checked.		13.		
All containers needing preservation are found to be in				
compliance with EPA recommendation.	LAH 8/26/09			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	Elves DATO	completed	preservative	
Samples checked for dechlorination:	□Yes □No □dM/A	14.	• • • • • • • • • • • • • • • • • • • •	
Headspace in VOA Vials (>6mm):		15.		
Trip Blank Present:		16.	#***	
Trip Blank Custody Seals Present	□Yes □No ₽N/A			
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Possiution			Eiold Data Desuiced	2 V / N
Person Contacted	Data	lime.	rielu Data Kequifed	
Comments/ Resolution:				
		·		
Project Manager Peview			Dato	
			Date:	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

September 25, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP GW 6581 Pace Project No.: 2622399

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP GW 6581 Pace Project No.: 2622399

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project:Plant Hammond AP GW 6581Pace Project No.:2622399

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622399001	HGWC-124	Water	08/23/19 10:31	08/26/19 18:30



SAMPLE ANALYTE COUNT

Project:Plant Hammond AP GW 6581Pace Project No.:2622399

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2622399001	HGWC-124	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Plant Hammond AP GW 6581

Pace Project No.: 2622399

Sample: HGWC-124 PWS:	Lab ID: 26223990 Site ID:	01 Collected: 08/23/19 10:31 Sample Type:	Received:	08/26/19 18:30 N	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.450 ± 0.217 (0.233) C:87% T:NA	pCi/L	09/09/19 08:53	13982-63-3	
Radium-228	EPA 9320	0.384 ± 0.279 (0.534) C:79% T:91%	pCi/L	09/20/19 11:53	15262-20-1	
Total Radium	Total Radium Calculation	0.834 ± 0.496 (0.767)	pCi/L	09/23/19 12:55	7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P GW 6581					
Pace Project No.:	2622399						
QC Batch:	359966		Analysis Method:	EPA 9320			
QC Batch Method:	EPA 9320		Analysis Description:	9320 Radium 228			
Associated Lab Sar	nples: 26223990	01					
METHOD BLANK:	1747390		Matrix: Water				
Associated Lab Sar	nples: 26223990	01					
Parar	neter	Act	± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-228		0.232 ± 0.311	(0.664) C:77% T:89%	pCi/L	09/20/19 11:52		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P GW 6581					
Pace Project No.:	2622399						
QC Batch:	359801		Analysis Method:	EPA 9315			
QC Batch Method:	EPA 9315		Analysis Description:	9315 Total Radium	ı		
Associated Lab San	nples: 26223990	01					
METHOD BLANK:	1746802		Matrix: Water				
Associated Lab San	nples: 26223990	01					
Paran	neter	Act	± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-226		0.563 ± 0.229	(0.205) C:97% T:NA	pCi/L	09/09/19 09:06		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Plant Hammond AP GW 6581

Pace Project No.: 2622399

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:Plant Hammond AP GW 6581Pace Project No.:2622399

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622399001	HGWC-124	EPA 9315	359801		
2622399001	HGWC-124	EPA 9320	359966		
2622399001	HGWC-124	Total Radium Calculation	362632		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT: All relevant fields must be completed accurately.

Section /		Section B						•••	Section	v														
Required	l Client Information:	Required P	roject	Informati	ä			_	nvoice	Informa	tion:									Ра	ge :	-	ŏ	
Company	Georgia Power - Coal Combustion Residuals	Report To.	형	Abraham .	Lauren Pe	Å			Attentior	5 <u></u>	sinvoi	ces@so	uthern	CO.CO	E								- - -	
Address:	2480 Maner Road	Copy To:	<u>G</u>	syntec				Ű	Compan	y Name														
	Atlanta, GA 30339								Address					İ							Rogulat	or Agen	CV	
Email:	abraham@southemco.com	Purchase O	Irder #.	SCS1	0382775				Pace QL	iole:														
Phone:	(404)506-7239 Fax	Project Nam	ie Ie	Plant Han	AP phome				Pace Pri	oject Ma	nager	betsvir	mcdanie	QDace	labs.coi						Stato /	Locatio		
Requeste	d Due Date: Storn fruch TPT	Project #:	È	1455					Pace Pri	ofile #:	327.4	2										GA		
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	SAMPLE ID	8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	eee Asija coq		START		QN	COLLECTIO	s					(ISO)	C						(N/X) ə			
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	HGWC-124		1.3	G &n	101 101	142/2	10:01	ñ	-	<u> </u>	<u>م</u>			7	5		-				2			
																								
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• Metals list	: Hg. Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl	1/10	Uli	5 2	lad	yin	06/23	the	ES1	0	· V	and her		X.e.	5		Ø	2/19	154	9				
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Sa	mple Condition	Upon Receir	10# . 20	22200	
Face Analytical Client Name	: GAP	we/	NUH · ZU PM: BM CLIENT: GAPO	Due Date: wer-CCR	09/25/:
Courier: Fed Ex UPS USPS Clie	nt Commercial	Pace Other	<u></u> Pro Pro	unal , Due Date: Name:	
Custody Seal on Cooler/Box Present: gyes	no Seals	s intact: 🛛 yes [no		
Packing Material: Bubble Wrap Bubble	e Bags 🗍 None	Other			
Thermometer Used 214	Type of Ice:	Blue None	Samples on ice	, cooling process ha	s begun
Cooler Temperature	Biological Tissue	e is Frozen: Yes No Comments:	Date and I contents	nitials of porson ex	mining 1915
Chain of Custody Present:		1.			
Chain of Custody Filled Out:		2.			
Chain of Custody Relinquished:		3.			
Sampler Name & Signature on COC:		4.			
Samples Arrived within Hold Time:		5.			
Short Hold Time Analysis (<72hr):		6.			
Rush Turn Around Time Requested:		7.			
Sufficient Volume:		8.			
Correct Containers Used:	Pres INO IN/	9.			
-Pace Containers Used:		A			
Containers Intact:	Deves DNO DN/	10.			
Filtered volume received for Dissolved tests		T 11.			
Sample Labels match COC:		12.			
-Includes date/time/ID/Analysis Matrix:					
All containers needing preservation have been checked.	□Yes □No □N/	4 13.			
All containers needing preservation are found to be in compliance with EPA recommendation.	LATSPLOID		Lot # of added		
exceptions: VOA. coliform, TOC. 0&G. WI-DRO (water)	Etes DAG	completed	preservative		
Samples checked for dechlorination:		A 14.			
Headspace in VOA Vials (>6mm):		A 15.	<u></u>		
Trip Blank Present:		A 16.			
Trip Blank Custody Seals Present	□Yes □No ØN	Ā			
Pace Trip Blank Lot # (if purchased):					
Client Notification/ Resolution:			Field Data Re	quired? Y	/ N
Person Contacted:	Date	e/Time:			
Comments/ Resolution:			·		
·····					
			_		

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

March 12, 2020

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP Pace Project No.: 2622400

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP Pace Project No.: 2622400

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project: Plant Hammond AP

Pace Project No.: 2622400

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622400001	EB-01	Water	08/23/19 11:45	08/26/19 18:30
2622400002	EB-02	Water	08/23/19 11:55	08/26/19 18:30



SAMPLE ANALYTE COUNT

Project:Plant Hammond APPace Project No.:2622400

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2622400001	EB-01	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1
2622400002	EB-02	EPA 6020B	CSW	12
		EPA 7470A	DRB	1
		EPA 300.0	MWB	1



ANALYTICAL RESULTS

Project: Plant Hammond AP

Pace Project No.: 2622400

Sample: EB-01	Lab ID:	2622400001	Collected: 08/23/19 11:45			Received: 08/26/19 18:30 Matrix: Water				
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	thod: EF	PA 3005A				
Antimony	ND	mg/L	0.0030	0.00027	1	08/29/19 18:05	08/30/19 17:59	7440-36-0		
Arsenic	ND	mg/L	0.0050	0.00035	1	08/29/19 18:05	08/30/19 17:59	7440-38-2		
Barium	ND	mg/L	0.010	0.00049	1	08/29/19 18:05	08/30/19 17:59	7440-39-3		
Beryllium	ND	mg/L	0.0030	0.000074	1	08/29/19 18:05	08/30/19 17:59	7440-41-7		
Cadmium	ND	mg/L	0.0025	0.00011	1	08/29/19 18:05	08/30/19 17:59	7440-43-9		
Chromium	ND	mg/L	0.010	0.00039	1	08/29/19 18:05	08/30/19 17:59	7440-47-3		
Cobalt	ND	mg/L	0.0050	0.00030	1	08/29/19 18:05	08/30/19 17:59	7440-48-4		
Lead	ND	mg/L	0.0050	0.000046	1	08/29/19 18:05	08/30/19 17:59	7439-92-1		
Lithium	ND	mg/L	0.030	0.00078	1	08/29/19 18:05	08/30/19 17:59	7439-93-2		
Molybdenum	ND	mg/L	0.010	0.00095	1	08/29/19 18:05	08/30/19 17:59	7439-98-7		
Selenium	ND	mg/L	0.010	0.0013	1	08/29/19 18:05	08/30/19 17:59	7782-49-2		
Thallium	ND	mg/L	0.0010	0.000052	1	08/29/19 18:05	08/30/19 17:59	7440-28-0		
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EP	A 7470A				
Mercury	ND	mg/L	0.00050	0.00014	1	08/28/19 13:26	08/28/19 16:35	7439-97-6		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0							
Fluoride	ND	mg/L	0.30	0.029	1		08/31/19 00:53	16984-48-8		



ANALYTICAL RESULTS

Project: Plant Hammond AP

Pace Project No.: 2622400

Sample: EB-02	Lab ID:	2622400002	Collected: 08/23/19 11:55			Received: 08/			
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA 6	6020B Pre	paration Met	thod: EF	PA 3005A			
Antimony	ND	mg/L	0.0030	0.00027	1	08/29/19 18:05	08/30/19 18:05	7440-36-0	
Arsenic	ND	mg/L	0.0050	0.00035	1	08/29/19 18:05	08/30/19 18:05	7440-38-2	
Barium	ND	mg/L	0.010	0.00049	1	08/29/19 18:05	08/30/19 18:05	7440-39-3	
Beryllium	ND	mg/L	0.0030	0.000074	1	08/29/19 18:05	08/30/19 18:05	7440-41-7	
Cadmium	ND	mg/L	0.0025	0.00011	1	08/29/19 18:05	08/30/19 18:05	7440-43-9	
Chromium	ND	mg/L	0.010	0.00039	1	08/29/19 18:05	08/30/19 18:05	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	08/29/19 18:05	08/30/19 18:05	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	08/29/19 18:05	08/30/19 18:05	7439-92-1	
Lithium	ND	mg/L	0.030	0.00078	1	08/29/19 18:05	08/30/19 18:05	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00095	1	08/29/19 18:05	08/30/19 18:05	7439-98-7	
Selenium	ND	mg/L	0.010	0.0013	1	08/29/19 18:05	08/30/19 18:05	7782-49-2	
Thallium	ND	mg/L	0.0010	0.000052	1	08/29/19 18:05	08/30/19 18:05	7440-28-0	
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	hod: EF	PA 7470A			
Mercury	ND	mg/L	0.00050	0.00014	1	08/28/19 13:26	08/28/19 16:38	7439-97-6	
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Fluoride	ND	mg/L	0.30	0.029	1		08/31/19 01:16	16984-48-8	



Project:	Plant Hammond A	Р										
Pace Project No.:	2622400											
QC Batch:	34391		Analy	sis Meth	nod: E	PA 7470A						
QC Batch Method:	EPA 7470A		Analy	sis Desc	cription: 7	470 Mercu	ry					
Associated Lab San	nples: 26224000	01, 2622400002										
METHOD BLANK:	154672			Matrix:	Water							
Associated Lab San	ples: 26224000	01, 2622400002										
_			Blan	ik	Reporting							
Paran	neter	Units	Resu	ult	Limit	MD		Analyzec	Q.	ualifiers		
Mercury		mg/L		ND	0.00050) 0.	00014	08/28/19 16	:21			
LABORATORY COM	ITROL SAMPLE:	154673										
			Spike	L	LCS	LCS	%	6 Rec				
Paran	neter	Units	Conc.	R	esult	% Rec	L		Qualifiers			
Mercury		mg/L	0.002	5	0.0025	10	D	80-120				
MATRIX SPIKE & M	ATRIX SPIKE DUP	PLICATE: 1546	74		154675							
			MS	MSD					_			
Parameter	Units	2622398001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Re	MSD c % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0025	0.002	5 0.0024	0.0025		98 100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: Plant Hammond AP

Pace Project No.: 2622400

QC Batch: 34496		Analysis Method:		EPA 6020B				
QC Batch Method: EPA	3005A	Analysis Desc	cription:	6020B MET				
Associated Lab Samples:	2622400001, 2622400002							
METHOD BLANK: 15517	7	Matrix:	Water					
Associated Lab Samples:	2622400001, 2622400002							
		Blank	Reporting					
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers		
Antimony	mg/L	ND	0.003	0 0.00027	08/30/19 17:42			
Arsenic	mg/L	ND	0.005	0 0.00035	08/30/19 17:42			
Barium	mg/L	ND	0.01	0 0.00049	08/30/19 17:42			
Beryllium	mg/L	ND	0.003	0 0.000074	08/30/19 17:42			
Cadmium	mg/L	ND	0.002	5 0.00011	08/30/19 17:42			
Chromium	mg/L	ND	0.01	0 0.00039	08/30/19 17:42			
Cobalt	mg/L	ND	0.005	0 0.00030	08/30/19 17:42			
Lead	mg/L	ND	0.005	0 0.000046	08/30/19 17:42			
Lithium	mg/L	ND	0.03	0 0.00078	08/30/19 17:42			
Molybdenum	mg/L	ND	0.01	0 0.00095	08/30/19 17:42			
Selenium	mg/L	ND	0.01	0 0.0013	08/30/19 17:42			
Thallium	mg/L	ND	0.001	0 0.000052	08/30/19 17:42			

LABORATORY CONTROL SAMPLE: 155178

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1551	79 MS	MSD	155180							
		2622479002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.10	0.10	104	102	75-125	2	20	
Arsenic	mg/L	ND	0.1	0.1	0.11	0.11	106	107	75-125	1	20	
Barium	mg/L	0.036	0.1	0.1	0.14	0.13	103	97	75-125	4	20	
Beryllium	mg/L	0.00024J	0.1	0.1	0.098	0.095	97	95	75-125	3	20	
Cadmium	mg/L	0.00072	0.1	0.1	0.10	0.099	100	98	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Plant Hammond AP Pace Project No.: 2622400

MATRIX SPIKE & MATRIX SPIK	E DUPL	ICATE: 1551	79		155180							
			MS	MSD								
		2622479002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chromium	mg/L	ND	0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Cobalt	mg/L	0.0018J	0.1	0.1	0.098	0.098	97	96	75-125	1	20	
Lead	mg/L	0.000049J	0.1	0.1	0.094	0.093	94	93	75-125	1	20	
Lithium	mg/L	0.0033J	0.1	0.1	0.10	0.10	100	97	75-125	2	20	
Molybdenum	mg/L	0.0065J	0.1	0.1	0.11	0.11	106	105	75-125	1	20	
Selenium	mg/L	ND	0.1	0.1	0.11	0.11	106	109	75-125	2	20	
Thallium	mg/L	ND	0.1	0.1	0.096	0.095	96	95	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Fluoride			mg/L		0.11J	10		9.5	94	90	-110		
Param	eter		Units	26223 Re	337002 esult	Spike Conc.	MS Result	%	MS Rec	% Rec Limits		Qualif	iers
MATRIX SPIKE SAM	1PLE:	15	55523										
Fluoride	n	ng/L	ND	10	10	10.8	10.7	108	107	90-110	1	15	
Parameter	L	nits	2622319009 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
MATRIX SPIKE & M	ATRIX SPIKE I	DUPLIC	CATE: 1554	87 MS	MSD	155488							
Fluoride			mg/L	1	0	9.3	93	3 9	90-110				
Param	eter		Units	Conc.	Res	sult	% Rec	Limi	ts (Qualifiers	_		
LABORATORY CON	ITROL SAMPL	E: 15	55486	Spike	LC	s	LCS	% R	ec				
Fluoride			mg/L		ND	0.30	0	0.029 08	3/30/19 13:	57			
Param	eter		Units	Res	ult	Limit	MDI		Analyzed	Qu	alifiers		
Associated Lab Sam	ples: 26224	00001,	2622400002	Bla	nk l	Reporting							
METHOD BLANK:	155485				Matrix: W	ater							
Associated Lab Sam	ples: 26224	00001,	2622400002										
QC Batch Method:	EPA 300.0			Analy	ysis Descrij	ption: 3	300.0 IC An	ions					
QC Batch:	34533			Anal	ysis Method	d: E	EPA 300.0						
Pace Project No.:	2622400												
Project:	Plant Hammor	Id AP											

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Plant Hammond AP

Pace Project No.: 2622400

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Plant Hammond AP Pace Project No.: 2622400

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622400001	EB-01	EPA 3005A	34496	EPA 6020B	34557
2622400002	EB-02	EPA 3005A	34496	EPA 6020B	34557
2622400001	EB-01	EPA 7470A	34391	EPA 7470A	34429
2622400002	EB-02	EPA 7470A	34391	EPA 7470A	34429
2622400001	EB-01	EPA 300.0	34533		
2622400002	EB-02	EPA 300.0	34533		

Pace Anelytical

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Require	d Client Information:	aquired Proje	oct Int	Iformation				8 5	voice	ر Inform	nation:												Page		~	õ	~	
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Address	2480 Maner Road Atlanta GA 30339	opy To: G	3005/	ntec				<u>8 8</u>	intese.	v Nam	ie										1. C. A. A.	100-000	- 19 00	2012		100000000000000000000000000000000000000		a trebuc
mail:	iabraham@southernco.com	rchase Order	#	SCS10	18775				l	jeje I											A				10000			
hone:	(404)506-7239 Fax:	oject Name:	ľ	fant Hamn	tond AP			<u> </u>	Ce Pro	oject M	Aanage	Li Li	betsv	mcdan	iel@ps	acelabs	E E				10		Same	HEROTA			A TOTAL	
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	nia Condition Upon Receipt	WO#:2622	400	
Sam		PM: BM Due	Date: 09/	04/
Pace Analytical Client Name:	GAPAWER (CK	CLIENT: GAPower-CCR	Date: US/	24/
	t Commercial Pace Other	Proj. Due Date		
racking #:				
Custody Seal on Cooler/Box Present:	no Seals intact: Gyes			
Packing Material: Bubble Wrap Bubble	Bags None Other		ocess has begu	n
Thermometer Used 214	Type of Ice: Wet Blue None	Date and Initials of pe	rson examinin	g
Andre Temporature 2.8°C	Biological Tissue is Frozen: Yes N	contents:	6/1200	14
Temp should be above freezing to 6°C	Comments:			
Chain of Custody Present:			i.	
Chain of Custody Filled Out:	Dares INO IN/A 2.			
Chain of Custody Relinquished:	Dres DNo DN/A 3.			
Sampler Name & Signature on COC:	□Yes □No □N/A 4.			
Samples Arrived within Hold Time:	Dres DNO DN/A 5.		1	
Short Hold Time Analysis (<72hr):				
Rush Turn Around Time Requested:	□Yes ☑No □N/A 7.			
Sufficient Volume:	TYes DNo DN/A 8.			
Correct Containers Used:	$\square Y_{\text{Yes}} \square N_0 \square N/A 9.$		1	
-Pace Containers Used:				
Containers Intact:	27Yes 0No 0N/A 10.			
Filtered volume received for Dissolved tests	□Yes □No □M/A 11			
Sample Labels match COC:	22 Tes INO IN/A 12.		:	
-Includes date/time/ID/Analysis Matrix:	<u> </u>			
All containers needing preservation have been checked.	Gres Ino In/A 13.			
All containers needing preservation are found to be in compliance with EPA recommendation	Eres DNO DN/A		i.	
	Initial when	Lot # of added		
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	Ves KINo completed	preservative	i	
Samples checked for dechlorination:	<u> </u>			
Headspace in VOA Vials (>6mm):	□Yes □No □N/A 15.		1	
Trip Blank Present:	□Yes □No <i>□</i> N/A 16.			
Pace Trip Blank Custody Seals Present				
race mp Blank Lot # (if purchased):				
Client Notification/ Resolution:		Field Onto D		
Person Contacted:	Date/Time:	Field Data Required?	Y / N	
Comments/ Resolution:				
Project M				
Froject manager Review:		D		
Note: Whenever there is a discremence of a straight of the str		Date;		
Certification Office (arolina compliance energy	P	and 14 of 14	

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Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

September 25, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: Plant Hammond AP Pace Project No.: 2622401

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on August 26, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: Plant Hammond AP Pace Project No.: 2622401

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: Plant Hammond AP

Pace Project No.: 2622401

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2622401001	EB-01	Water	08/23/19 11:45	08/26/19 18:30
2622401002	EB-02	Water	08/23/19 11:55	08/26/19 18:30



SAMPLE ANALYTE COUNT

Project: Plant Hammond AP Pace Project No.: 2622401

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2622401001	EB-01	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2622401002	EB-02	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: Plant Hammond AP

Pace Project No.: 2622401

Sample: EB-01	Lab ID: 262240	Collected: 08/23/19 11:45	Received:	08/26/19 18:30	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.251 ± 0.254 (0.495) C:91% T:NA	pCi/L	09/18/19 08:37	13982-63-3	
Radium-228	EPA 9320	-0.369 ± 0.255 (0.680) C:77% T:83%	pCi/L	09/20/19 11:53	15262-20-1	
Total Radium	Total Radium Calculation	0.251 ± 0.509 (1.18)	pCi/L	09/23/19 12:55	7440-14-4	



Project: Plant Hammond AP

Pace Project No.: 2622401

Sample: EB-02 PWS:	Lab ID: 26224010 Site ID:	Collected: 08/23/19 11:55 Sample Type:	Received:	08/26/19 18:30 N	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.539 ± 0.297 (0.374) C:91% T:NA	pCi/L	09/18/19 08:37	13982-63-3	
Radium-228	EPA 9320	0.478 ± 0.382 (0.753) C:75% T:75%	pCi/L	09/20/19 11:54	15262-20-1	
Total Radium	Total Radium Calculation	1.02 ± 0.679 (1.13)	pCi/L	09/23/19 12:55	7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P					
Pace Project No.:	2622401						
QC Batch:	359964		Analysis Method:	EPA 9315			
QC Batch Method:	EPA 9315		Analysis Description:	9315 Total Radium			
Associated Lab Sar	nples: 26224010	01, 262240100	2				
METHOD BLANK:	1747386		Matrix: Water				
Associated Lab Sar	nples: 26224010	01, 262240100	2				
Parar	neter	Act ±	Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-226		0.204 ± 0.233	(0.472) C:94% T:NA	pCi/L	09/18/19 08:31		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	Plant Hammond A	P					
Pace Project No.:	2622401						
QC Batch:	359966		Analysis Method:	EPA 9320			
QC Batch Method:	EPA 9320		Analysis Description:	9320 Radium 228			
Associated Lab Sar	mples: 26224010	01, 262240100	2				
METHOD BLANK:	1747390		Matrix: Water				
Associated Lab Sar	mples: 26224010	01, 262240100	2				
Parar	neter	Act -	Lunc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-228		0.232 ± 0.311	(0.664) C:77% T:89%	pCi/L	09/20/19 11:52		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Plant Hammond AP

Pace Project No.: 2622401

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Plant Hammond AP Pace Project No.: 2622401

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2622401001	EB-01	EPA 9315	359964		
2622401002	EB-02	EPA 9315	359964		
2622401001	EB-01	EPA 9320	359966		
2622401002	EB-02	EPA 9320	359966		
2622401001	EB-01	Total Radium Calculation	362632		
2622401002	EB-02	Total Radium Calculation	362632		

CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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Company	Georgia Power - Coal Combustion Residuals	Report To.	Joju Abral	ham / Laur	en Petty			Attent	u U	scsinv	oices	Dsouth	ernco.	E										
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	Atlanta, GA 30339	Durchasa Ord	1	CC 510382	775			Pace	Quote															
Email: jabi	raham(@southemco.com	Project Name:	Plan	t Hammon	d AP			Pace	Project	Manage	r. be	atsy.mcdi	aniel@p	acelabs.	com.				10 N.	- Stato	M.GGRAG	nterste		3
Phone:	(404)506-/239 Jrax	Project #	-					Pace	Profile #	1 32	7.4.2										GA			
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- Metals list: F	4g, Sb, As, Ba, Bo, Cd, Cr, Co, Pb, Li, Mo, Se, Tl	0	relia	M	udar	2/60	4/80	1 611	530		line li	ne he	5	+			NEZ	2-12	32		≯		د	
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11 of 12					8 <u>10</u>	ATURE	of SAMPI	EB	DEF		Wer	- m		Å	TE Sign	с ці	8/2	3/	61	темр	Recei	olsu0 olsu0	(V/V) Samp Intact	(N/A)
5	6 22401		~					~																

Sar	mple Condition	Upon Receipt	WO#:26224	0 1
Pace Analytical Client Name	: CAPOW	er (CR	PM: BM Due Da CLIENT: GAPower-CCR	ute: 09/25/1
· Courier:	nt Commercial	Pace Other _	Proj. Due Date:	
Custody Seal on Cooler/Box Present:	no Seals i	intact: eyes [
	Bags I None	Other		
$\frac{1}{1}$			Samples on ice, cooling process	has becun
	Biological Tissue i	Erozen: Yes No	Date and Initials of person	examining
Femp should be above freezing to 6°C	Biological Hoode I	Comments:	contents:	2004
Chain of Custody Present:		1.		
Chain of Custody Filled Out:		2.		
Chain of Custody Relinquished:		3.		
Sampler Name & Signature on COC:	Yes No N/A	4.		
Samples Arrived within Hold Time:		5.		
Short Hold Time Analysis (<72hr):		6.		
Rush Turn Around Time Requested:		7.		
Sufficient Volume:		8.		
Correct Containers Used:		9.		
-Pace Containers Used:				
Containers Intact:	ØYes □No □N/A	10.		
Filtered volume received for Dissolved tests		11.		
Sample Labels match COC:	Dates INO IN/A	12.		
-Includes date/time/ID/Analysis Matrix:	<u> </u>			
All containers needing preservation have been checked.		13.		
All containers needing preservation are found to be in compliance with EPA recommendation.				
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes €No	completed	Lot # of added preservative	
Samples checked for dechlorination:	Yes No	P14.		
Headspace in VOA Vials (>6mm):	□Yes □No □N/A	- 15.		
Trip Blank Present:	□Yes □No ₽N/A	16.		
Trip Blank Custody Seals Present				
Pace Trip Blank Lot # (if purchased):				
Client Notification/ Resolution:			Field Data Required? Y	/ N
Person Contacted:	Date/	Time:		
Comments/ Resolution:				
				<u> </u>
	<u></u>			
Project Manager Review:			Date:	
Note: Whenever there is a discrepancy affecting North	Carolina compliance sar	nples, a copy of this for	n will be sent to the North Carolina D	EHNR

Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

-



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

November 19, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND RAD Pace Project No.: 2624782

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624782001	HGWA-122	Water	10/21/19 11:55	10/22/19 09:57
2624782002	HGWC-124	Water	10/21/19 13:35	10/22/19 09:57
2624782003	HGWC-121A	Water	10/21/19 16:50	10/22/19 09:57



SAMPLE ANALYTE COUNT

Project: PLANT HAMMOND RAD Pace Project No.: 2624782

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2624782001	HGWA-122	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2624782002	HGWC-124	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2624782003	HGWC-121A	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

Sample: HGWA-122	Lab ID: 26247820	01 Collected: 10/21/19 11:55	Received:	10/22/19 09:57	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.555 ± 0.349 (0.528) C:70% T:NA	pCi/L	11/15/19 08:32	13982-63-3	
Radium-228	EPA 9320	0.217 ± 0.359 (0.782) C:77% T:77%	pCi/L	11/12/19 12:15	15262-20-1	
Total Radium	Total Radium Calculation	0.772 ± 0.708 (1.31)	pCi/L	11/18/19 14:56	7440-14-4	



Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

Sample: HGWC-124 PWS:	Lab ID: 26247820 Site ID:	002 Collected: 10/21/19 13:35 Sample Type:	Received:	10/22/19 09:57 N	Matrix: Water	
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.707 ± 0.330 (0.376) C:92% T:NA	pCi/L	11/15/19 08:32	13982-63-3	
Radium-228	EPA 9320	0.406 ± 0.425 (0.887) C:81% T:80%	pCi/L	11/12/19 12:15	15262-20-1	
Total Radium	Total Radium Calculation	1.11 ± 0.755 (1.26)	pCi/L	11/18/19 14:56	7440-14-4	



Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

Sample: HGWC-121A	Lab ID: 2624782	Collected: 10/21/19 16:50	Received:	10/22/19 09:57	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.327 ± 0.243 (0.397) C:90% T:NA	pCi/L	11/15/19 08:32	13982-63-3	
Radium-228	EPA 9320	0.0664 ± 0.338 (0.770) C:81% T:84%	pCi/L	11/12/19 15:51	15262-20-1	
Total Radium	Total Radium Calculation	0.393 ± 0.581 (1.17)	pCi/L	11/18/19 14:56	6 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMON	D RAD					
Pace Project No.:	2624782						
QC Batch:	369306		Analysis Method:	EPA 9320			
QC Batch Method:	EPA 9320		Analysis Description:	9320 Radium 228			
Associated Lab San	nples: 26247820	01, 262478200	2, 2624782003				
METHOD BLANK:	1791694		Matrix: Water				
Associated Lab San	nples: 26247820	01, 262478200	2, 2624782003				
Paran	neter	Act ±	LUnc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-228		0.317 ± 0.325	(0.673) C:79% T:91%	pCi/L	11/12/19 12:14		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMONI	D RAD					
Pace Project No.:	2624782						
QC Batch:	369307	Analysis Metho	od: EPA 9	315			
QC Batch Method:	EPA 9315	Analysis Desc	ription: 9315	Total Radiu	n		
Associated Lab San	nples: 262478200	1, 2624782002, 2624782003					
METHOD BLANK:	1791695	Matrix: V	Vater				
Associated Lab San	nples: 262478200	1, 2624782002, 2624782003					
Paran	neter	Act ± Unc (MDC) Carr Trac		Jnits	Analyzed	Qualifiers	
Radium-226		0.330 ± 0.234 (0.359) C:92% T:NA		oCi/L	11/15/19 08:32		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: PLANT HAMMOND RAD

Pace Project No.: 2624782

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:PLANT HAMMOND RADPace Project No.:2624782

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624782001	HGWA-122	EPA 9315	369307		
2624782002	HGWC-124	EPA 9315	369307		
2624782003	HGWC-121A	EPA 9315	369307		
2624782001	HGWA-122	EPA 9320	369306		
2624782002	HGWC-124	EPA 9320	369306		
2624782003	HGWC-121A	EPA 9320	369306		
2624782001	HGWA-122	Total Radium Calculation	371524		
2624782002	HGWC-124	Total Radium Calculation	371524		
2624782003	HGWC-121A	Total Radium Calculation	371524		

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			App. N Metals = Ba, Cr, Co, Pb, Li, Mo		lideole = B. Co.	A STATE STATE OF											HGWC-121A	H6WC-124	HGWA-122	One Churacter per box. (A-2, 0-9 /, -) Sample Ids must be unique	SAMPLE ID		ted Due Date: STAN DARD TAT	(404)508-7239 Fax	jabraham@southernco.com	E 2490 Maner Roed GA 30339	V: Georgia Power - Coal Combustion Resid		3	
			und the second se	AND AND	Dr. C					A										Wige Air AR Othe OT Thuwe 15	Wane WT Wasta Wane WT Product P Solu'Solid SL Ca OL	MATRIX CODE	Project #:	Project Name:	Purchase Ord	Copy Lo:	uals Report To:	Section B Required Pro		
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-	preservative	completed	OND SOY	ceptions: VOA, coliform, TOC, O&G, WI-DRO (water)
-	Lot # of added	nərtw leitint		containers needing preservation are found to be in mpliance with EPA recommendation.
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		.21		mple Labels match COC:
-				tered volume received for Dissolved tests
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e	Contents: Contents:	Frozen: Yes No	Biological Tissue is	A S S anteroduce I ref
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	Wa w			000 1114 200



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

December 13, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND Pace Project No.: 2624784

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 22, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND

Pace Project No.: 2624784

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project: PLANT HAMMOND

Pace Project No.: 2624784

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624784001	HGWA-122	Water	10/21/19 11:55	10/22/19 09:57
2624784002	HGWC-124	Water	10/21/19 13:35	10/22/19 09:57
2624784003	HGWC-121A	Water	10/21/19 16:50	10/22/19 09:57



SAMPLE ANALYTE COUNT

Project: PLANT HAMMOND Pace Project No.: 2624784

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2624784001	HGWA-122	EPA 6020B	CSW	8
		SM 2540C	MZP	1
		EPA 300.0	MWB	3
2624784002	HGWC-124	EPA 6020B	CSW	8
		SM 2540C	MZP	1
		EPA 300.0	MWB	3
2624784003	HGWC-121A	EPA 6020B	CSW	8
		SM 2540C	MZP	1
		EPA 300.0	MWB	3



ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624784

Sample: HGWA-122	Lab ID:	2624784001	Collect	ed: 10/21/19	9 11:55	Received: 10/	22/19 09:57 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: Ef	PA 3005A			
Barium	0.040	mg/L	0.010	0.00049	1	10/28/19 20:04	10/29/19 20:02	7440-39-3	
Boron	0.25	mg/L	0.040	0.0049	1	10/28/19 20:04	10/29/19 20:02	7440-42-8	
Calcium	80.8	mg/L	5.0	0.55	50	10/28/19 20:04	10/29/19 20:08	7440-70-2	
Chromium	0.00068J	mg/L	0.010	0.00039	1	10/28/19 20:04	10/29/19 20:02	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	10/28/19 20:04	10/29/19 20:02	7440-48-4	
Lead	0.000097J	mg/L	0.0050	0.000046	1	10/28/19 20:04	10/29/19 20:02	7439-92-1	
Lithium	ND	mg/L	0.030	0.00078	1	10/28/19 20:04	10/29/19 20:02	7439-93-2	
Molybdenum	0.0049J	mg/L	0.010	0.00095	1	10/28/19 20:04	10/29/19 20:02	7439-98-7	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	296	mg/L	10.0	10.0	1		10/28/19 13:56		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	4.5	mg/L	1.0	0.024	1		10/29/19 16:32	16887-00-6	
Fluoride	0.15J	mg/L	0.30	0.029	1		10/29/19 16:32	16984-48-8	
Sulfate	45.6	mg/L	1.0	0.017	1		10/29/19 16:32	14808-79-8	


ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624784

Sample: HGWC-124	Lab ID:	2624784002	Collecte	ed: 10/21/19	9 13:35	Received: 10/	22/19 09:57 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: El	PA 3005A			
Barium	0.075	mg/L	0.010	0.00049	1	10/28/19 20:04	10/29/19 20:25	7440-39-3	
Boron	0.50	mg/L	0.040	0.0049	1	10/28/19 20:04	10/29/19 20:25	7440-42-8	
Calcium	96.9	mg/L	5.0	0.55	50	10/28/19 20:04	10/29/19 20:31	7440-70-2	
Chromium	0.00046J	mg/L	0.010	0.00039	1	10/28/19 20:04	10/29/19 20:25	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	10/28/19 20:04	10/29/19 20:25	7440-48-4	
Lead	0.000049J	mg/L	0.0050	0.000046	1	10/28/19 20:04	10/29/19 20:25	7439-92-1	
Lithium	0.0011J	mg/L	0.030	0.00078	1	10/28/19 20:04	10/29/19 20:25	7439-93-2	
Molybdenum	0.0013J	mg/L	0.010	0.00095	1	10/28/19 20:04	10/29/19 20:25	7439-98-7	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	357	mg/L	10.0	10.0	1		10/28/19 13:57		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	3.6	mg/L	1.0	0.024	1		10/29/19 18:20	16887-00-6	
Fluoride	0.073J	mg/L	0.30	0.029	1		10/29/19 18:20	16984-48-8	
Sulfate	78.5	mg/L	5.0	0.085	5		10/29/19 19:24	14808-79-8	



ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624784

Sample: HGWC-121A	Lab ID:	2624784003	Collecte	ed: 10/21/19	9 16:50	Received: 10/	22/19 09:57 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: El	PA 3005A			
Barium	0.074	mg/L	0.010	0.00049	1	10/28/19 20:04	10/29/19 20:36	7440-39-3	
Boron	2.4	mg/L	0.040	0.0049	1	10/28/19 20:04	10/29/19 20:36	7440-42-8	
Calcium	173	mg/L	5.0	0.55	50	10/28/19 20:04	10/29/19 20:42	7440-70-2	
Chromium	ND	mg/L	0.010	0.00039	1	10/28/19 20:04	10/29/19 20:36	7440-47-3	
Cobalt	ND	mg/L	0.0050	0.00030	1	10/28/19 20:04	10/29/19 20:36	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	10/28/19 20:04	10/29/19 20:36	7439-92-1	
Lithium	0.0090J	mg/L	0.030	0.00078	1	10/28/19 20:04	10/29/19 20:36	7439-93-2	
Molybdenum	ND	mg/L	0.010	0.00095	1	10/28/19 20:04	10/29/19 20:36	7439-98-7	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	771	mg/L	10.0	10.0	1		10/28/19 13:57		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	29.9	mg/L	1.0	0.024	1		10/29/19 18:42	16887-00-6	
Fluoride	0.18J	mg/L	0.30	0.029	1		10/29/19 18:42	16984-48-8	
Sulfate	238	mg/L	10.0	0.17	10		10/29/19 20:07	14808-79-8	



Project: PLANT HAMMOND

Pace Project No.: 2624784

QC Batch:	37696	Analysis Method:	EPA 6020B	
QC Batch Method:	EPA 3005A	Analysis Description:	6020B MET	
Associated Lab Sam	ples: 2624784001	, 2624784002, 2624784003		
METHOD BLANK:	171182	Matrix: Water		

Associated Lab Samples: 2624784001, 2624784002, 2624784003

100						
		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Barium	mg/L	ND	0.010	0.00049	10/29/19 19:20	
Boron	mg/L	ND	0.040	0.0049	10/29/19 19:20	
Calcium	mg/L	ND	0.10	0.011	10/29/19 19:20	
Chromium	mg/L	ND	0.010	0.00039	10/29/19 19:20	
Cobalt	mg/L	ND	0.0050	0.00030	10/29/19 19:20	
Lead	mg/L	ND	0.0050	0.000046	10/29/19 19:20	
Lithium	mg/L	ND	0.030	0.00078	10/29/19 19:20	
Molybdenum	mg/L	ND	0.010	0.00095	10/29/19 19:20	

LABORATORY CONTROL SAMPLE: 171183

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L	0.1	0.10	104	80-120	
Boron	mg/L	1	0.99	99	80-120	
Calcium	mg/L	1	1.0	101	80-120	
Chromium	mg/L	0.1	0.11	107	80-120	
Cobalt	mg/L	0.1	0.11	106	80-120	
Lead	mg/L	0.1	0.11	106	80-120	
Lithium	mg/L	0.1	0.11	106	80-120	
Molybdenum	mg/L	0.1	0.10	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 171184

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1711	84		171185							
Parameter	Units	2624794002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ma/L	0.35	0.1	0.1	0.46	0.46	108	109	75-125	0	20	
Boron	mg/L	1.1	1	1	1.9	1.9	78	81	75-125	1	20	
Calcium	mg/L	260	1	1	269	272	841	1200	75-125	1	20	
Chromium	mg/L	0.0019J	0.1	0.1	0.11	0.11	104	103	75-125	1	20	
Cobalt	mg/L	ND	0.1	0.1	0.095	0.094	95	94	75-125	1	20	
Lead	mg/L	ND	0.1	0.1	0.095	0.096	95	96	75-125	1	20	
Lithium	mg/L	0.096	0.1	0.1	0.20	0.20	101	102	75-125	0	20	
Molybdenum	mg/L	ND	0.1	0.1	0.11	0.11	109	110	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Project:	PLANT HAMMON	D									
	2624784										
QC Batch:	37642		Analysis I	Method:	SM 25400	;					
QC Batch Method:	SM 2540C		Analysis I	Description:	2540C To	tal Dis	solve	d Solids			
Associated Lab Sar	mples: 26247840	01, 2624784002,	2624784003								
LABORATORY CO	NTROL SAMPLE:	170927									
			Spike	LCS	LCS		% F	Rec			
Para	neter	Units	Conc.	Result	% Rec		Lim	its	Qu	alifiers	
Total Dissolved Sol	ds	mg/L	400	377		94		84-108			
SAMPLE DUPLICA	TE: 170928										
_			262478400	1 Dup				Max			
Parar	neter	Units	Result	Result	RI	PD		RPD		Qualifiers	
Total Dissolved Sol	ids	mg/L	29	96 2	297		0		10		
SAMPLE DUPLICA	TE: 170929										
			262468501	D Dup				Max			
Para	neter	Units	Result	Result	RI	PD		RPD		Qualifiers	
Total Dissolved Sol	ids	mg/L	8	17 8	313		0		10		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: PLANT HAMMOND

Pace Project No.: 2624784

QC Batch: 37730		Analysis M	ethod:	EPA 300.0		
QC Batch Method: EPA 300.0		Analysis De	escription:	300.0 IC Anion	S	
Associated Lab Samples: 26247840	001, 2624784002, 2	2624784003				
METHOD BLANK: 171248		Matri	k: Water			
Associated Lab Samples: 26247840	01, 2624784002, 2	2624784003				
Parameter	Units	Blank Result	Reporting Limit	MDL	Analyz	ed Qualifiers
Chloride	mg/L	0.034	J	1.0 0.0	024 10/29/19 ·	13:23
Fluoride	mg/L	NE) 0.	30 0.0	029 10/29/19 ⁻	13:23
Sulfate	mg/L	NE)	1.0 0.0	017 10/29/19 ⁻	13:23
LABORATORY CONTROL SAMPLE:	171249					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	10	10.5	105	90-110	
Fluoride	mg/L	10	10.8	108	90-110	
Sulfate	mg/L	10	10.5	105	90-110	
MATRIX SPIKE & MATRIX SPIKE DU		50	17125			

WATRIA SPIRE & WATRIA SPI		IGATE. 1712	MS	MSD	171251							
		2624505001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	57.2	20	20	75.8	74.8	93	88	90-110	1	15	M1
Fluoride	mg/L	1.7	20	20	20.7	21.6	95	100	90-110	4	15	
Sulfate	mg/L	ND	20	20	ND	ND	0	0	90-110		15	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: PLANT HAMMOND

Pace Project No.: 2624784

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT HAMMOND Pace Project No.: 2624784

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624784001	HGWA-122	EPA 3005A	37696	EPA 6020B	37751
2624784002	HGWC-124	EPA 3005A	37696	EPA 6020B	37751
2624784003	HGWC-121A	EPA 3005A	37696	EPA 6020B	37751
2624784001	HGWA-122	SM 2540C	37642		
2624784002	HGWC-124	SM 2540C	37642		
2624784003	HGWC-121A	SM 2540C	37642		
2624784001	HGWA-122	EPA 300.0	37730		
2624784002	HGWC-124	EPA 300.0	37730		
2624784003	HGWC-121A	EPA 300.0	37730		

		[(2, AP-3)	(I) App. (in the second						ITEM #			Reques	Phone:	Email	Allanta	Compar	Section		
				App. IV Metals = Ba, Cr, Co, Pb, Li, Mo	Metals = B, Ca		V									HGWC - 121 A	H6WC-124	H6WA-122	One Chusecter per box. (A-2, 0-9 /, -) Sample Ids must be unique	SAMPLE ID		ted Due Date: STANDARD TAT	(404)506-7239 Fax	jabraham@southernco.com	CA 20339	V: Georgia Power - Coal Combustion Resid	A A Cleant Information:	*	
			-	al a	DAW		the second se			A									Vidge Ar Coher Coher Thume 16	Wanter Wither With Waste Water With Product P Solf/Solfd SL Of OL	MATRIX Dilniding Weden DW	Project #:	Project Name	Purchase On	vopy lo:	uals Report To:	Section B Required Pr		
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	Lot # of added	nedw leitint	A/ND 0ND 293	phianers needing preservation are found to be in phiance with EPA recommendation
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		12.		rple Labels match COC:
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-	10# 2624784	2	262478	



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

November 21, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND Pace Project No.: 2624785

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 24, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND Pace Project No.: 2624785

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: PLANT HAMMOND

Pace Project No.: 2624785

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624785001	HGWC-120	Water	10/22/19 08:39	10/24/19 10:07
2624785002	FD-01	Water	10/22/19 00:00	10/24/19 10:07



SAMPLE ANALYTE COUNT

Project: PLANT HAMMOND Pace Project No.: 2624785

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2624785001	HGWC-120	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
2624785002	FD-01	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT HAMMOND

Pace Project No.: 2624785

Sample: HGWC-120	Lab ID: 2624785	001 Collected: 10/22/19 08:39	Received:	10/24/19 10:07	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.760 ± 0.379 (0.563) C:89% T:NA	pCi/L	11/15/19 07:35	5 13982-63-3	
Radium-228	EPA 9320	-0.382 ± 0.393 (0.996) C:80% T:84%	pCi/L	11/12/19 17:47	7 15262-20-1	
Total Radium	Total Radium Calculation	0.760 ± 0.772 (1.56)	pCi/L	11/19/19 09:18	3 7440-14-4	



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT HAMMOND

Pace Project No.: 2624785

Sample: FD-01	Lab ID: 26247850	Collected: 10/22/19 00:00	Received:	10/24/19 10:07 I	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.420 ± 0.252 (0.346) C:92% T:NA	pCi/L	11/15/19 10:17	13982-63-3	
Radium-228	EPA 9320	0.485 ± 0.505 (1.05) C:78% T:81%	pCi/L	11/12/19 17:49	15262-20-1	
Total Radium	Total Radium Calculation	0.905 ± 0.757 (1.40)	pCi/L	11/19/19 09:18	8 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMON	D					
Pace Project No.:	2624785						
QC Batch:	369310		Analysis Method:	EPA 9315			
QC Batch Method:	EPA 9315		Analysis Description:	9315 Total Radium			
Associated Lab San	nples: 26247850	01, 262478500	2				
METHOD BLANK:	1791698		Matrix: Water				
Associated Lab San	nples: 26247850	01, 262478500	2				
Paran	neter	Act :	± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-226		0.590 ± 0.307	(0.405) C:93% T:NA	pCi/L	11/15/19 07:34		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMON	ID					
Pace Project No.:	2624785						
QC Batch:	369311		Analysis Method:	EPA 9320			
QC Batch Method:	EPA 9320		Analysis Description:	9320 Radium 228			
Associated Lab Sar	mples: 26247850	01, 262478500	2				
METHOD BLANK:	1791699		Matrix: Water				
Associated Lab Sar	mples: 26247850	01, 262478500	2				
Parar	meter	Act -	LUnc (MDC) Carr Trac	Units	Analyzed	Qualifiers	
Radium-228		0.174 ± 0.362	(0.799) C:80% T:87%	pCi/L	11/12/19 15:54		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: PLANT HAMMOND

Pace Project No.: 2624785

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT HAMMOND Pace Project No.: 2624785

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624785001	HGWC-120	EPA 9315	369310		
2624785002	FD-01	EPA 9315	369310		
2624785001	HGWC-120	EPA 9320	369311		
2624785002	FD-01	EPA 9320	369311		
2624785001	HGWC-120	Total Radium Calculation	371617		
2624785002	FD-01	Iotal Radium Calculation	371617		

Section Require	A A A A A A A A A A A A A A A A A A A	Section B Required Project Information:		#	56	54	82	9_	in a la companya de l		M = S	#	5	324	28	5		-	
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Phone	jabraham@southernco.com	Purchase Order # SCS103827	2		Pece	Ouote										ALC: No.	A CONTRACTOR	A REAL PROPERTY AND INCOME.	
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Pace Analytical Clie PM: BN	262478	6	WO# : 262	4785
CLIENT:	GAPower-CCR	:: 10/31/19	CLIENT: GAPower-C	e Date: 11/21/ CR
ustody Seal on Cooler/Box Pretent: yes	no Seels in	tact: 🗌 yes	no Pro Nene	
acking Material: Bubble Wrap Bubble	Bags 🗋 None] Other		
hermometer Used THR 214	Type of Ice: Wet	Blue None	Samples on ice, cooling	process has begun
cooler Temperature 53	Biological Tissue is	Frozen: Yes No	Date and Initials of contents:	person examining
emp should be above freezing to 6°C		comments:		
Chain of Custody Present:				
Chain of Custody Filled Out:	ZYes No N/A 2	P		
Chain of Custody Relinquished:		3.		
Sampler Name & Signature on COC:	Pres DNO DN/A	ł		
Samples Arrived within Hold Time:	EYes DNO DN/A	5,		
Short Hold Time Analysis (<72hr):		6.		
Rush Turn Around Time Requested:		7		
Sufficient Volume:		8.		
Correct Containers Used:	ØYes □No □N/A	9.	20 [°]	
-Pace Containers Used:		ī		
Containers Intact:		10.		
Filtered volume received for Dissolved tests		11.		
Sample Labels match COC:	Ves ONO ON/A	12.		
-Includes date/time/ID/Analysis Matrix:			<u>8</u>	
All containers needing preservation have been checked.		13		
All containers needing preservation are found to be in compliance with EPA recommendation.	ØYes □No □N/A			
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes □No	initial when completed	preservative	
Samples checked for dechlorination:		14.		
Headspace in VOA Vials (>6mm);		15.		
Trip Blank Present:		16.		
Trip Blank Custody Seals Present				
Pace Trip Blank Lot # (if purchased):			1	
Client Notification/ Resolution:			Field Data Required?	Y / N
Person Contacted: Comments/ Resolution:	Date	Time:		2
11				
29%			3000 W28	
		· · · · · · · · ·		
Project Manager Review:			Date:	

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

December 13, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND Pace Project No.: 2624786

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 24, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND

Pace Project No.: 2624786

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project: PLANT HAMMOND

Pace Project No.: 2624786

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624786001	HGWC-120	Water	10/22/19 08:39	10/24/19 10:07
2624786002	FD-01	Water	10/22/19 00:00	10/24/19 10:07



SAMPLE ANALYTE COUNT

Project: PLANT HAMMOND Pace Project No.: 2624786

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2624786001	HGWC-120	EPA 6020B	CSW	8
		SM 2540C	MZP	1
		EPA 300.0	MWB	3
2624786002	FD-01	EPA 6020B	CSW	8
		SM 2540C	MZP	1
		EPA 300.0	MWB	3



ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624786

Sample: HGWC-120	Lab ID:	2624786001	Collecte	ed: 10/22/19	9 08:39	Received: 10/	24/19 10:07 Ma	atrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: EF	PA 3005A		·	
Barium	0.051	mg/L	0.010	0.00049	1	11/01/19 16:00	11/04/19 02:27	7440-39-3	
Boron	1.0	mg/L	0.040	0.0049	1	11/01/19 16:00	11/04/19 02:27	7440-42-8	
Calcium	171	mg/L	5.0	0.55	50	11/01/19 16:00	11/04/19 02:32	7440-70-2	
Chromium	ND	mg/L	0.010	0.00039	1	11/01/19 16:00	11/04/19 02:27	7440-47-3	
Cobalt	0.0031J	mg/L	0.0050	0.00030	1	11/01/19 16:00	11/04/19 02:27	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	11/01/19 16:00	11/04/19 02:27	7439-92-1	
Lithium	0.030J	mg/L	0.030	0.00078	1	11/01/19 16:00	11/04/19 13:20	7439-93-2	
Molybdenum	0.040	mg/L	0.010	0.00095	1	11/01/19 16:00	11/04/19 02:27	7439-98-7	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	693	mg/L	10.0	10.0	1		10/29/19 13:02		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	3.4	mg/L	1.0	0.024	1		10/31/19 07:37	16887-00-6	
Fluoride	0.53	mg/L	0.30	0.029	1		10/31/19 07:37	16984-48-8	
Sulfate	266	mg/L	10.0	0.17	10		10/31/19 09:29	14808-79-8	



ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624786

Sample: FD-01	Lab ID:	2624786002	Collecte	ed: 10/22/19	9 00:00	Received: 10/	/24/19 10:07 Ma	atrix: Water	
			Report						
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	hod: Ef	PA 3005A			
Barium	0.052	mg/L	0.010	0.00049	1	11/01/19 16:00	11/04/19 02:38	7440-39-3	
Boron	1.0	mg/L	0.040	0.0049	1	11/01/19 16:00	11/04/19 02:38	7440-42-8	
Calcium	176	mg/L	5.0	0.55	50	11/01/19 16:00	11/04/19 02:44	7440-70-2	
Chromium	ND	mg/L	0.010	0.00039	1	11/01/19 16:00	11/04/19 02:38	7440-47-3	
Cobalt	0.0032J	mg/L	0.0050	0.00030	1	11/01/19 16:00	11/04/19 02:38	7440-48-4	
Lead	ND	mg/L	0.0050	0.000046	1	11/01/19 16:00	11/04/19 02:38	7439-92-1	
Lithium	0.030J	mg/L	0.030	0.00078	1	11/01/19 16:00	11/04/19 13:25	7439-93-2	
Molybdenum	0.041	mg/L	0.010	0.00095	1	11/01/19 16:00	11/04/19 02:38	7439-98-7	
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C						
Total Dissolved Solids	709	mg/L	10.0	10.0	1		10/29/19 13:03		
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0						
Chloride	3.2	mg/L	1.0	0.024	1		10/31/19 05:44	16887-00-6	
Fluoride	0.56	mg/L	0.30	0.029	1		10/31/19 05:44	16984-48-8	
Sulfate	240	mg/L	20.0	0.34	20		10/31/19 17:13	14808-79-8	



Project: PLANT HAMMOND

Pace Project No.: 2624786

QC Batch:	38024		Analysis Meth	nod:	EPA 6020B			
QC Batch Method:	EPA 3005A		Analysis Desc	cription:	6020B MET			
Associated Lab Samp	oles: 26247860	001, 2624786002						
METHOD BLANK:	172889		Matrix:	Water				
Associated Lab Samp	oles: 26247860	01, 2624786002						
			Blank	Reporting				
Parame	eter	Units	Result	Limit	MDL	Analyzed	Qualifiers	
Barium		mg/L	ND	0.01	0 0.00049	11/04/19 01:12		
Boron		mg/L	0.0059J	0.04	0 0.0049	11/04/19 01:12		
Calcium		mg/L	ND	0.1	0 0.011	11/04/19 01:12		
Chromium		mg/L	ND	0.01	0 0.00039	11/04/19 01:12		
Cobalt		mg/L	ND	0.005	0 0.00030	11/04/19 01:12		
Lead		mg/L	ND	0.005	0 0.000046	11/04/19 01:12		
Lithium		mg/L	ND	0.03	0 0.00078	11/04/19 01:12		
Molybdenum		mg/L	ND	0.01	0 0.00095	11/04/19 01:12		

LABORATORY CONTROL SAMPLE: 172890

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Barium	mg/L	0.1	0.10	103	80-120	
Boron	mg/L	1	1.2	116	80-120	
Calcium	mg/L	1	1.1	106	80-120	
Chromium	mg/L	0.1	0.10	105	80-120	
Cobalt	mg/L	0.1	0.10	104	80-120	
Lead	mg/L	0.1	0.10	102	80-120	
Lithium	mg/L	0.1	0.11	112	80-120	
Molybdenum	mg/L	0.1	0.10	103	80-120	

MATRIX SPIKE & MATRIX SI	PIKE DUPL	ICATE: 1728	91		172892							
			MS	MSD								
		2624772007	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Barium	mg/L	0.22	0.1	0.1	0.32	0.31	99	98	75-125	0	20	
Boron	mg/L	3.8	1	1	5.1	5.2	85	95	75-125	2	20	
Calcium	mg/L	177	1	1	170	179	-693	243	75-125	5	20	M6
Chromium	mg/L	ND	0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Cobalt	mg/L	ND	0.1	0.1	0.097	0.096	97	96	75-125	0	20	
Lead	mg/L	ND	0.1	0.1	0.092	0.090	92	90	75-125	2	20	
Lithium	mg/L	0.29	0.1	0.1	0.36	0.36	73	75	75-125	1	20	M1
Molybdenum	mg/L	0.49	0.1	0.1	0.58	0.60	89	105	75-125	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: PL Pace Project No.: 26	LANT HAMMON	D								
QC Batch: 3 QC Batch Method: 5	37734 SM 2540C		Analysis I Analysis I	Method: Description:	SM 2540C 2540C Total	Dissolve	ed Solids			
Associated Lab Sample	es: 26247860	01, 2624786002								
LABORATORY CONTR	ROL SAMPLE: er	171260 Units	Spike Conc.	LCS Result	LCS % Rec	% Lir	Rec mits	Qu	alifiers	
Total Dissolved Solids		mg/L	400	395	99		84-108			
SAMPLE DUPLICATE:	171261		262467400	1 Dup			Max			
Total Dissolved Solids	er	mg/L	Result 20	69 Result	270 RPD	0	RPD	10	Qualifiers	
SAMPLE DUPLICATE:	171262									
Paramete	er	Units	262478600 ² Result	1 Dup Result	RPD		Max RPD		Qualifiers	
Total Dissolved Solids		mg/L	69	93 7	709	2		10		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL DATA

Project:	PLAN	T HAMMOND												
Pace Project No.:	26247	86												
QC Batch:	3785	58		Anal	ysis Metho	d:	EPA 300.0							
QC Batch Method:	EPA	300.0		Anal	ysis Descri	ption:	300.0 IC An	ions						
Associated Lab Sar	nples:	262478600	1											
METHOD BLANK:	17179	5			Matrix: W	/ater								
Associated Lab Sar	nples:	262478600	1											
				Bla	nk	Reporting								
Parar	neter		Units	Res	sult	Limit	MD	L	Analyze	ed	Qual	ifiers		
Chloride			mg/L		0.032J	1.	0	0.024	10/30/19 2	20:37				
Fluoride			mg/L		ND	0.3	0	0.029	10/30/19 2	20:37				
Sulfate			mg/L		0.36J	1.	0	0.017	10/30/19 2	20:37				
LABORATORY CO	NTROL	SAMPLE:	171796											
				Spike	LC	S	LCS	%	Rec					
Parar	neter		Units	Conc.	Re	sult	% Rec	Lir	nits	Qualifie	ers			
Chloride			mg/L		10	10.7	10	7	90-110					
Fluoride			mg/L		10	10.9	109	9	90-110					
Sulfate			mg/L		10	10.9	109	9	90-110					
MATRIX SPIKE & N	IATRIX	SPIKE DUPL	ICATE: 1717	97		171798								
				MS	MSD									
			2624403001	Spike	Spike	MS	MSD	MS	MSD	% R	ec		Max	
Paramete	r	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	: Limi	ts F	۲PD	RPD	Qual
Chloride		mg/L	123	100	100	328	328	20	5 20	05 90-	110	0	15	M6
Fluoride		mg/L	1.0	100	100	107	106	10	6 10	05 90-	110	0	15	
MATRIX SPIKE SA	MPLE:		171799											
				2624	685004	Spike	MS		MS	%	Rec			
Parar	neter		Units	Re	esult	Conc.	Result		% Rec	Lii	nits		Quali	fiers
Chloride			mg/L		18.0	10		26.2	8	2	90-1	10 M	1	
Fluoride			mg/L		0.20J	10		10.9	10	7	90-1	10		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



Desiset	
Project.	

Pace Project No.: 2624786												
QC Batch: 37870			Analy	sis Metho	d: I	EPA 300.0						
QC Batch Method: EPA 30	0.0		Analy	vsis Descri	iption:	300.0 IC An	ions					
Associated Lab Samples: 2	262478600	2										
METHOD BLANK: 171906				Matrix: W	/ater							
Associated Lab Samples: 2	262478600	2										
			Blan	ık	Reporting							
Parameter		Units	Resu	ult	Limit	MD	L	Analyzed	Qı	ualifiers		
Chloride		mg/L		ND	1.	0	0.024	10/31/19 04::	37			
Fluoride		mg/L		ND	0.3	0	0.029	10/31/19 04:3	37			
Sulfate		mg/L		ND	1.	0	0.017	10/31/19 04::	37			
LABORATORY CONTROL SA	MPLE:	171907	Spike	LC	CS	LCS	%	Rec	Juglifiers			
Chlorido		ma/l							guainero	_		
Fluoride		mg/L		5	4.0 5.0	9 10	1	90-110 90-110				
Sulfate		mg/L		5	5.1	10	1	90-110				
MATRIX SPIKE & MATRIX SF	PIKE DUPL	ICATE: 1719	08		171909							
			MS	MSD					_			
Parameter	Units	2624786002 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.2	10	10	13.0	13.2	9	7 100	90-110	2	15	
Fluoride	mg/L	0.56	10	10	10.6	10.9	10	0 103	90-110	3	15	
		171010										

MATRIX SPIRE SAMPLE.	171910	2624800005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	4.6	10	14.7	101	90-110	
Fluoride	mg/L	0.099J	10	10.6	105	90-110	
Sulfate	mg/L	23.2	10	28.2	50	90-110 N	Л1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: PLANT HAMMOND

Pace Project No.: 2624786

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT HAMMOND Pace Project No.: 2624786

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624786001	HGWC-120	EPA 3005A	38024	EPA 6020B	38049
2624786002	FD-01	EPA 3005A	38024	EPA 6020B	38049
2624786001	HGWC-120	SM 2540C	37734		
2624786002	FD-01	SM 2540C	37734		
2624786001	HGWC-120	EPA 300.0	37858		
2624786002	FD-01	EPA 300.0	37870		

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ustody Seal on Cooler/Box Present	: 🗌 yes 🔲 no 🛛 Seels ii	ntact: 🗌 yes [no Proj. Nente	
acking Material: Bubble Wrap	Bubble Bags 🗍 Noné.	Other		
hermometer Used THR 21	4 Type of ice: Wet	Blue None	Samples on ice, cooling proces	s has begun
emp should be above freezing to 6°C	Biological Tissue i	s Frozen : Yes No Comments:	Date and Initials of person contents:	n examining
Chain of Custody Present:		1.		
hain of Custody Filled Out:		2		
Chain of Custody Relinquished:		3.		
Sampler Name & Signature on COC:		4		
Samples Arrived within Hold Time:		5.		
Short Hold Time Analysis (<72hr):		6.		
Rush Turn Around Time Requested	: 🛛 Yes 🖉 No 🗆 N/A	7.	1	
Sufficient Volume:		8.	· · ·	
Correct Containers Used:	ZYes ONO ON/A	9.		
-Pace Containers Used:			2 - ¹	3
Containers Intact:		10.		
Filtered volume received for Dissolver		11.		
Sample Labels match COC:		12		
-Includes date/time/ID/Analysis	Matrix:		8	
All containers needing preservation have been	en checked	13		
All containers needing preservation are for compliance with EPA recommendation.				
exceptions: VOA, coliform, TOC, O&G, WI-DR/	O (water)	Initial when completed	Lot # of added preservative	
Samples checked for dechlorination:		14.		
Headspace in VOA Vials (>6mm);		15.		
Trip Blank Present:		16.		
Trip Blank Custody Seals Present			· ·	
Pace Trip Blank Lot # (if purchased):			1	
Client Notification/ Resolution:			Field Data Required?	Y / N
Person Contacted:	Date	2/Time:		2
299		- Anna (1997)	3000 W28	
	19			

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

November 21, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND Pace Project No.: 2624802

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 24, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Batery Mr Damil

Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta




Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND Pace Project No.: 2624802

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601 ANAB DOD-ELAP Rad Accreditation #: L2417 Alabama Certification #: 41590 Arizona Certification #: AZ0734 Arkansas Certification California Certification #: 04222CA Colorado Certification #: PA01547 Connecticut Certification #: PH-0694 **Delaware Certification** EPA Region 4 DW Rad Florida/TNI Certification #: E87683 Georgia Certification #: C040 Florida: Cert E871149 SEKS WET **Guam Certification** Hawaii Certification Idaho Certification **Illinois Certification** Indiana Certification Iowa Certification #: 391 Kansas/TNI Certification #: E-10358 Kentucky Certification #: KY90133 KY WW Permit #: KY0098221 KY WW Permit #: KY0000221 Louisiana DHH/TNI Certification #: LA180012 Louisiana DEQ/TNI Certification #: 4086 Maine Certification #: 2017020 Maryland Certification #: 308 Massachusetts Certification #: M-PA1457 Michigan/PADEP Certification #: 9991

Missouri Certification #: 235 Montana Certification #: Cert0082 Nebraska Certification #: NE-OS-29-14 Nevada Certification #: PA014572018-1 New Hampshire/TNI Certification #: 297617 New Jersey/TNI Certification #: PA051 New Mexico Certification #: PA01457 New York/TNI Certification #: 10888 North Carolina Certification #: 42706 North Dakota Certification #: R-190 Ohio EPA Rad Approval: #41249 Oregon/TNI Certification #: PA200002-010 Pennsylvania/TNI Certification #: 65-00282 Puerto Rico Certification #: PA01457 Rhode Island Certification #: 65-00282 South Dakota Certification Tennessee Certification #: 02867 Texas/TNI Certification #: T104704188-17-3 Utah/TNI Certification #: PA014572017-9 USDA Soil Permit #: P330-17-00091 Vermont Dept. of Health: ID# VT-0282 Virgin Island/PADEP Certification Virginia/VELAP Certification #: 9526 Washington Certification #: C868 West Virginia DEP Certification #: 143 West Virginia DHHR Certification #: 9964C Wisconsin Approve List for Rad Wyoming Certification #: 8TMS-L



SAMPLE SUMMARY

Project: PLANT HAMMOND Pace Project No.: 2624802

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624802001	FB-01	Water	10/22/19 17:10	10/24/19 10:07



SAMPLE ANALYTE COUNT

Project:PLANT HAMMONDPace Project No.:2624802

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
2624802001	FB-01	EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PLANT HAMMOND

Pace Project No.: 2624802

Sample: FB-01	Lab ID: 26248020	01 Collected: 10/22/19 17:10	Received:	10/24/19 10:07 I	Matrix: Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 9315	0.270 ± 0.222 (0.392) C:97% T:NA	pCi/L	11/15/19 10:17	13982-63-3	
Radium-228	EPA 9320	-0.147 ± 0.412 (0.993) C:83% T:84%	pCi/L	11/12/19 17:50	15262-20-1	
Total Radium	Total Radium Calculation	0.270 ± 0.634 (1.39)	pCi/L	11/19/19 09:18	8 7440-14-4	



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMON	D				
Pace Project No.:	2624802					
QC Batch:	369310		Analysis Method:	EPA 9315		
QC Batch Method:	EPA 9315		Analysis Description:			
Associated Lab Sar	nples: 26248020	01				
METHOD BLANK:	1791698		Matrix: Water			
Associated Lab Sar	nples: 26248020	01				
Parar	neter	Act :	± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226		0.590 ± 0.307	(0.405) C:93% T:NA	pCi/L	11/15/19 07:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL - RADIOCHEMISTRY

Project:	PLANT HAMMON	D				
Pace Project No.:	2624802					
QC Batch:	369311		Analysis Method:	EPA 9320		
QC Batch Method:	EPA 9320		Analysis Description:			
Associated Lab San	nples: 26248020	01				
METHOD BLANK:	1791699		Matrix: Water			
Associated Lab San	nples: 26248020	01				
Paran	neter	Act =	⊧ Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228		0.174 ± 0.362	(0.799) C:80% T:87%	pCi/L	11/12/19 15:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: PLANT HAMMOND

Pace Project No.: 2624802

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT HAMMOND Pace Project No.: 2624802

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624802001	FB-01	EPA 9315	369310		
2624802001	FB-01	EPA 9320	369311		
2624802001	FB-01	Total Radium Calculation	371617		

		2. AP-4	(I) Ago	1000	12	-	10	9	100 M	T				3	2		ITEM #	kak a		11	Request	Phone	Allanta,	Address	Company	Section	
		App IV Metals = AA, Ba, Ba, CA, CA, Ca, Pb, U, MO	III Metals = 8, Ca	ADOITIONAL CONMENTS	\backslash			/								FB-01	(A-Z, 0-9 (, -) Au (A-Z, 0-9 (, -) Au Sample Ids must be unique Traux	SAMPLE ID	MATRIX		ed Due Date Shanka Tor	(404)508-7239 Fax	GA 30339	2480 Maner Road	Georgia Power - Coal Combustion Residuals	/ Pacerikal A d Client Information:	
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Samples		+		ALL ALL									5 B						Sec.	15 xcer	(Callor)				t		
(Y/N		_			1				- 1				= 2			2.3			the second	ALC: N	100				L		

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Page 10 of 11

Sa	mple Condition U	pon Receipt	
Pace Analytical Cli WO#	: 2624803	10/31/19	10#:2624802
cking #:	GAPouer-CCR		: BM Due Date: 11/21/19 LIENT: GAPower-CCR
stody Seal on Cooler/Box Present. Uye	s 🗋 no Seels in 💈	tact: 🗌 ye	
cking Material: Bubble Wrap Bubb	ile Bags 🗌 North	Other	
ermometer Used	Type of Ice: Wet	Blue None	Samples on ice, cooling process has begun
oler Temperature	Biological Tissue is	Frozen: Yes No	contents:
np should be above freezing to 6°C	C	omments:	
ain of Custody Present:	Pres No N/A 1	•	
ain of Custody Filled Out:	ZYes INO IN/A 2		
nain of Custody Relinquished:	Pres DNo DN/A 3		
ampler Name & Signature on COC:	ZYes DNo DN/A	k	
amples Arrived within Hold Time:		5.	
nort Hold Time Analysis (<72hr):		ŝ	
ush Turn Around Time Requested:		7	
ufficient Volume:	EYes DNO DNA	8	
orrect Containers Used:		9.	
-Pace Containers Used:	Eyes DNO DN/A		
ontainers Intact:		10.	
ilterart volume received for Dissolved tests		11.	
ample Labels match COC:		12	
langudes dete/fime/ID/Asshutia Metrix			
I containers needing preservation have been checked		42	
		13	
Il containers needing preservation are found to be ompliance with EPA recommendation.	n 🛛 🖉 Yes 🗆 No 🗇 N/A		
		Initial when	Lot # of added
xceptions: VOA, coliform, TOC, O&G, WI-DRO (water)		completed	preservative
Samples checked for dechlorination:	Yes No N/A	14.	
leadspace in VOA Vials (>6mm):	Yes No 21/A	15.	
rip Blank Present:	□Yes □No ⊉N/A	16.	14
Trip Blank Custody Seals Present	□Yes □No ØN/A	1	2
Pace Trip Blank Lot # (if purchased):		1	
Client Notification/ Resolution:			Field Data Required? Y / N
Person Contacted:	Date	Time	
Comments/ Resolution:		88 - 17 L .	
			3000 W28
200			
5			

Note Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

December 17, 2019

Joju Abraham Georgia Power - Coal Combustion Residuals 2480 Maner Road Atlanta, GA 30339

RE: Project: PLANT HAMMOND Pace Project No.: 2624803

Dear Joju Abraham:

Enclosed are the analytical results for sample(s) received by the laboratory on October 24, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kein Hung

Kevin Herring for Betsy McDaniel betsy.mcdaniel@pacelabs.com (770)734-4200 Project Manager

Enclosures

cc: Whitney Law, Geosyntec Consultants Noelia Muskus, Geosyntec Consultants Lauren Petty, Southern Company Services, Inc. Rebecca Thornton, Pace Analytical Atlanta





Pace Analytical Services, LLC 110 Technology Parkway Peachtree Corners, GA 30092 (770)734-4200

CERTIFICATIONS

Project: PLANT HAMMOND

Pace Project No.: 2624803

Pace Analytical Services Atlanta

110 Technology Parkway Peachtree Corners, GA 30092 Florida DOH Certification #: E87315 Georgia DW Inorganics Certification #: 812 Georgia DW Microbiology Certification #: 812 North Carolina Certification #: 381 South Carolina Certification #: 98011001 Virginia Certification #: 460204



SAMPLE SUMMARY

Project: PLANT HAMMOND Pace Project No.: 2624803

Lab ID	Sample ID	Matrix	Date Collected	Date Received
2624803001	 FB-01	Water	10/22/19 17:10	10/24/19 10:07



SAMPLE ANALYTE COUNT

Project: PLANT HAMMOND Pace Project No.: 2624803

Lab ID	Sample ID	Method	Analysts	Analytes Reported
2624803001		EPA 6020B	CSW	14
		EPA 7470A	DRB	1
		SM 2540C	MZP	1
		EPA 300.0	MWB	3



ANALYTICAL RESULTS

Project: PLANT HAMMOND

Pace Project No.: 2624803

Sample: FB-01	Lab ID:	2624803001	Collecte	ed: 10/22/19	9 17:10	Received: 10/24/19 10:07 Matrix: Water					
			Report								
Parameters	Results	Units	Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual		
6020B MET ICPMS	Analytical	Method: EPA	6020B Pre	paration Met	thod: EF	PA 3005A					
Antimony	ND	mg/L	0.0030	0.00027	1	11/01/19 16:00	11/04/19 05:07	7440-36-0			
Arsenic	ND	mg/L	0.0050	0.00035	1	11/01/19 16:00	11/04/19 05:07	7440-38-2			
Barium	ND	mg/L	0.010	0.00049	1	11/01/19 16:00	11/04/19 05:07	7440-39-3			
Beryllium	ND	mg/L	0.0030	0.000074	1	11/01/19 16:00	11/04/19 14:49	7440-41-7			
Boron	ND	mg/L	0.040	0.0049	1	11/01/19 16:00	11/04/19 14:49	7440-42-8			
Cadmium	ND	mg/L	0.0025	0.00011	1	11/01/19 16:00	11/04/19 05:07	7440-43-9			
Calcium	0.011J	mg/L	0.10	0.011	1	11/01/19 16:00	11/04/19 05:07	7440-70-2			
Chromium	ND	mg/L	0.010	0.00039	1	11/01/19 16:00	11/04/19 05:07	7440-47-3			
Cobalt	ND	mg/L	0.0050	0.00030	1	11/01/19 16:00	11/04/19 05:07	7440-48-4			
Lead	ND	mg/L	0.0050	0.000046	1	11/01/19 16:00	11/04/19 05:07	7439-92-1			
Lithium	ND	mg/L	0.030	0.00078	1	11/01/19 16:00	11/04/19 14:49	7439-93-2			
Molybdenum	ND	mg/L	0.010	0.00095	1	11/01/19 16:00	11/04/19 05:07	7439-98-7			
Selenium	ND	mg/L	0.010	0.0013	1	11/01/19 16:00	11/04/19 05:07	7782-49-2			
Thallium	ND	mg/L	0.0010	0.000052	1	11/01/19 16:00	11/04/19 05:07	7440-28-0			
7470 Mercury	Analytical	Method: EPA	7470A Pre	paration Met	thod: EF	PA 7470A					
Mercury	ND	mg/L	0.00050	0.00014	1	10/29/19 09:50	10/29/19 16:31	7439-97-6			
2540C Total Dissolved Solids	Analytical	Method: SM 2	540C								
Total Dissolved Solids	ND	mg/L	10.0	10.0	1		10/29/19 13:15				
300.0 IC Anions 28 Days	Analytical	Method: EPA	300.0								
Chloride	ND	mg/L	1.0	0.024	1		10/31/19 12:24	16887-00-6			
Fluoride	ND	mg/L	0.30	0.029	1		10/31/19 12:24	16984-48-8			
Sulfate	ND	mg/L	1.0	0.017	1		10/31/19 12:24	14808-79-8			



Associated Lab Samples: 262/	1902001										
Associated Lab Samples. 202-	+803001										
METHOD BLANK: 171214		Μ	latrix: W	ater							
Associated Lab Samples: 2624	4803001										
		Blank		Reporting							
Parameter	Units	Result	:	Limit	MDI		Analyze	d Q	ualifiers		
Mercury	mg/L		ND	0.00050	0.0	00014	10/29/19 15	5:19			
LABORATORY CONTROL SAMP	PLE: 171215										
LABORATORY CONTROL SAMP	PLE: 171215	Spike	LC	S	LCS	9	% Rec				
LABORATORY CONTROL SAMP Parameter	PLE: 171215 Units	Spike Conc.	LC Res	:S sult	LCS % Rec	9 	% Rec Limits	Qualifiers			
LABORATORY CONTROL SAMP Parameter Mercury	PLE: 171215 Units mg/L	Spike Conc. 0.0025	LC Res	Sult	LCS % Rec 105	9 	% Rec Limits 80-120	Qualifiers			
LABORATORY CONTROL SAMP Parameter Mercury MATRIX SPIKE & MATRIX SPIKE	PLE: 171215 Units mg/L E DUPLICATE: 17	Spike Conc. 0.0025	LC Res	S sult 0.0026 171217	LCS % Rec 105	9 	% Rec Limits	Qualifiers			
LABORATORY CONTROL SAMP Parameter Mercury MATRIX SPIKE & MATRIX SPIKE	PLE: 171215 Units mg/L E DUPLICATE: 17	Spike Conc. 0.0025	LC Res MSD	S sult 0.0026 171217	LCS % Rec 105	9 	% Rec Limits 80-120	Qualifiers			
LABORATORY CONTROL SAMP Parameter Mercury MATRIX SPIKE & MATRIX SPIKE	PLE: 171215 Units mg/L E DUPLICATE: 17 ⁻ 2624786001	Spike Conc. 0.0025	LC Res MSD Spike	2S Sult 0.0026 171217 MS Deput	LCS % Rec 105 MSD	9 1 5 MS	% Rec Limits 80-120 MSD	Qualifiers	_	Max	
LABORATORY CONTROL SAMP Parameter Mercury MATRIX SPIKE & MATRIX SPIKE Parameter	PLE: 171215 Units mg/L E DUPLICATE: 17 ⁻ 2624786001 Units Result	Spike Conc. 0.0025 1216 MS Spike S Conc.	LC Res MSD Spike Conc.	S Sult 0.0026 171217 MS Result	LCS % Rec 105 MSD Result	9 1 5 5 8 8 8 8 8	% Rec Limits 80-120 MSD cc % Rec	Qualifiers % Rec Limits	RPD	Max RPD	Qual

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



Project: PLANT HAMMOND

Pace Project No.: 2624803

QC Batch Method: EPA 3005A Analysis Description: 6020B MET	г
Associated Lab Samples: 2624803001	
METHOD BLANK: 172889 Matrix: Water	
Associated Lab Samples: 2624803001	
Blank Reporting	
Parameter Units Result Limit MD	L Analyzed Qualifiers
Antimony mg/L ND 0.0030 0.	.00027 11/04/19 01:12
Arsenic mg/L ND 0.0050 0.	.00035 11/04/19 01:12
Barium mg/L ND 0.010 0.	.00049 11/04/19 01:12
Beryllium mg/L ND 0.0030 0.0	000074 11/04/19 01:12
Boron mg/L 0.0059J 0.040 (0.0049 11/04/19 01:12
Cadmium mg/L ND 0.0025 0.	.00011 11/04/19 01:12
Calcium mg/L ND 0.10	0.011 11/04/19 01:12
Chromium mg/L ND 0.010 0.	.00039 11/04/19 01:12
Cobalt mg/L ND 0.0050 0.	.00030 11/04/19 01:12
Lead mg/L ND 0.0050 0.0	000046 11/04/19 01:12
Lithium mg/L ND 0.030 0.	.00078 11/04/19 01:12
Molybdenum mg/L ND 0.010 0.	.00095 11/04/19 01:12
Selenium mg/L ND 0.010 (0.0013 11/04/19 01:12
Thallium mg/L ND 0.0010 0.0	000052 11/04/19 01:12

LABORATORY CONTROL SAMPLE: 172890

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Antimony	mg/L	0.1	0.11	107	80-120	
Arsenic	mg/L	0.1	0.10	100	80-120	
Barium	mg/L	0.1	0.10	103	80-120	
Beryllium	mg/L	0.1	0.11	114	80-120	
Boron	mg/L	1	1.2	116	80-120	
Cadmium	mg/L	0.1	0.11	106	80-120	
Calcium	mg/L	1	1.1	106	80-120	
Chromium	mg/L	0.1	0.10	105	80-120	
Cobalt	mg/L	0.1	0.10	104	80-120	
Lead	mg/L	0.1	0.10	102	80-120	
Lithium	mg/L	0.1	0.11	112	80-120	
Molybdenum	mg/L	0.1	0.10	103	80-120	
Selenium	mg/L	0.1	0.10	101	80-120	
Thallium	ma/L	0.1	0.10	103	80-120	

MATRIX SPIKE & MATRIX SP	IKE DUPLI	CATE: 1728	91		172892							
			MS	MSD								
		2624772007	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Antimony	mg/L	ND	0.1	0.1	0.11	0.10	106	104	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Project: PLANT HAMMOND

Pace Project No.: 2624803

MATRIX SPIKE & MATRIX SPI	KE DUPL	ICATE: 1728	91		172892							
			MS	MSD								
		2624772007	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Arsenic	mg/L	2.5	0.1	0.1	2.6	2.6	43	106	75-125	2	20	M6
Barium	mg/L	0.22	0.1	0.1	0.32	0.31	99	98	75-125	0	20	
Beryllium	mg/L	ND	0.1	0.1	0.090	0.086	90	86	75-125	5	20	
Boron	mg/L	3.8	1	1	5.1	5.2	85	95	75-125	2	20	
Cadmium	mg/L	ND	0.1	0.1	0.11	0.10	107	103	75-125	4	20	
Calcium	mg/L	177	1	1	170	179	-693	243	75-125	5	20	M6
Chromium	mg/L	ND	0.1	0.1	0.099	0.097	99	97	75-125	2	20	
Cobalt	mg/L	ND	0.1	0.1	0.097	0.096	97	96	75-125	0	20	
Lead	mg/L	ND	0.1	0.1	0.092	0.090	92	90	75-125	2	20	
Lithium	mg/L	0.29	0.1	0.1	0.36	0.36	73	75	75-125	1	20	M1
Molybdenum	mg/L	0.49	0.1	0.1	0.58	0.60	89	105	75-125	3	20	
Selenium	mg/L	ND	0.1	0.1	0.10	0.10	100	100	75-125	0	20	
Thallium	mg/L	ND	0.1	0.1	0.093	0.092	93	92	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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Project:	PLANT HAMMON	D							
Pace Project No.:	2624803								
QC Batch:	37735		Analysis I	Method:	SM 2540C				
QC Batch Method:	SM 2540C		Analysis I	Description:	2540C Total D	issolved Solids			
Associated Lab Sar	mples: 26248030	01							
LABORATORY CO	NTROL SAMPLE:	171263							
			Spike	LCS	LCS	% Rec			
Para	neter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers	
Total Dissolved Sol	ids	mg/L	400	402	100	84-108			
SAMPLE DUPLICA	TE: 171264								
_			262480000	5 Dup		Max			
Para	neter	Units	Result	Result	RPD	RPD		Qualifiers	
Total Dissolved Sol	ids	mg/L	2'	12 2	212	0	10		
SAMPLE DUPLICA	TE: 171265								
			2624792004	4 Dup		Max			
Para	neter	Units	Result	Result	RPD	RPD		Qualifiers	
Total Dissolved Sol	ids	mg/L	50	07 50	512	1	10		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



EPA 300.0

Analysis Method:

Project:	PLANT HAMMOND
Pace Project No.:	2624803
QC Batch:	37870

QC Batch Method: EPA 300.0 Associated Lab Samples: 262480300)1	Analy	vsis Deso	cription:	300.0 IC An	ions			
METHOD BLANK: 171906			Matrix:	Water					
Associated Lab Samples: 262480300)1								
		Blar	nk	Reporting					
Parameter	Units	Res	ult	Limit	MDI	_	Analyze	ed (Qualifiers
Chloride	mg/L		ND	1	.0	0.024	10/31/19 0	4:37	
Fluoride	mg/L		ND	0.	30	0.029	10/31/19 0	4:37	
Sulfate	mg/L		ND	1	.0	0.017	10/31/19 0	4:37	
LABORATORY CONTROL SAMPLE:	171907	Spike	l	LCS	LCS	%	6 Rec	0	
Parameter	Units	Conc.	R	esult	% Rec	L	_imits	Qualifiers	S
Chloride	mg/L		5	4.8	96	6	90-110		
Fluoride	mg/L		5	5.0	101	1	90-110		
Sulfate	mg/L		5	5.1	10 ⁻	1	90-110		
MATRIX SPIKE & MATRIX SPIKE DUPI	_ICATE: 1719	08		171909)				
	2624786002	spike	Spike	MS	MSD	MS	MSD	% Rec	Max

Parameter Un	2624786002 ts Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride mg	/L 3.2	10	10	13.0	13.2	97	100	90-110	2	15	
Fluoride mg	L 0.56	10	10	10.6	10.9	100	103	90-110	3	15	

MATRIX SPIKE SAMPLE:	171910						
		2624800005	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	4.6	10	14.7	101	90-110	
Fluoride	mg/L	0.099J	10	10.6	105	90-110	
Sulfate	mg/L	23.2	10	28.2	50	90-110 N	/11

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: PLANT HAMMOND

Pace Project No.: 2624803

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

M6 Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PLANT HAMMOND Pace Project No.: 2624803

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
2624803001	FB-01	EPA 3005A	38024	EPA 6020B	38049
2624803001	FB-01	EPA 7470A	37720	EPA 7470A	37761
2624803001	FB-01	SM 2540C	37735		
2624803001	FB-01	EPA 300.0	37870		

		2. AP-4	(I) Ago	1000	12	-	10	9	100 M	T				3	2		ITEM #	kak a		11	Request	Phone	Allanta,	Address	Company	Section	
		App IV Metals = AA, Ba, Ba, CA, CA, Ca, Ca, Pb, U, MO	III Metals = 8, Ca	ADOITIONAL CONMENTS	\backslash			/								FB-01	(A-Z, 0-9 (, -) Au (A-Z, 0-9 (, -) Au Sample Ids must be unique Traux	SAMPLE ID	MATRIX		ed Due Date Shanka Tor	(404)508-7239 Fax	GA 30339	2480 Maner Road	Georgia Power - Coal Combustion Residuals	/ Pacerikal A d Client Information:	
	H	2	6					K	Sa							s V 3	21 S &	0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Wale DW		Project #	Protect No	Purchase	Copy To	Report	Section E Required	
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Page 13 of 14

Sa	nple Condition U	pon Receir	
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cking #:	GAPouer-CCR		: BM Due Date: 11/21/19 JLIENT: GAPower-CCR
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ermometer Used	Type of Ice: "Wet	Blue None	Samples on ice, cooling process has begun
oler Temperature	Biological Tissue is	Frozen: Yes	No contents:
mp should be above freezing to 6°C		comments:	
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ampler Name & Signature on COC:	2Yes No N/A	l.	
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hort Hold Time Analysis (<72hr):		ô	
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ufficient Volume:	BYes DNO DNA	8	
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Samples checked for dechlorination:		14.	-
leadspace in VOA Vials (>6mm):		15	
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Note Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Data Validation Reports

Geosyntec[▷] consultants

Memorandum

Date: October 8, 2019

To: Whitney Law

From: Kristoffer Henderson

CC: J. Caprio

Subject: Stage 2A Data Validations - Level II Data Deliverables – Pace Analytical Services, LLC Project Numbers 2622317, 2622318, 2622352, 2622353, 2622354, 2622355, 2622398, 2622399, 2622400, 2622401, 2622402 and 2622403

SITE: Plant Hammond AP

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of fourteen aqueous samples and two equipment blanks, collected 21-23 August 2019, as part of the Plant Hammond AP onsite sampling event.

The samples were analyzed at Pace Analytical Services, LLC, Peachtree Corners, Georgia, for the following analytical tests:

- Metals by Environmental Protection Agency (EPA) Methods 3005A/6020B
- Mercury by EPA Method 7470A
- Fluoride by EPA Method 300.0

The samples were analyzed at Pace Analytical Services, LLC, Greensburg, Pennsylvania, for the following analytical tests:

- Radium-226 by EPA Method 9315
- Radium-228 by EPA Method 9320
- Total Radium by Calculation

EXECUTIVE SUMMARY

Based on the Stage 2A data validation covering the quality control (QC) parameters listed below and the information provided, the data as qualified are usable for meeting project objectives. The qualified data should be used within the limitations 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,
- 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);

Laboratory ID	Client ID
2622317001	HGWA-111
2622317002	HGWA-112
2622317003	HGWA-113
2622318001	HGWA-111
2622318002	HGWA-112
2622318003	HGWA-113
2622352001	HGWA-122
2622352002	HGWC-121A
2622352003	HGWC-120
2622353001	HGWA-122
2622353002	HGWC-121A
2622353003	HGWC-120
2622354001	HGWC-117
2622354002	HGWC-101
2622354003	HGWC-118
2622354004	HGWC-103

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

Laboratory ID	Client ID
2622354005	HGWC-105
2622355001	HGWC-117
2622355002	HGWC-101
2622355003	HGWC-118
2622355004	HGWC-103
2622355005	HGWC-105
2622398001	HGWC-124
2622399001	HGWC-124
2622400001	EB-01
2622400002	EB-02
2622401001	EB-01
2622401002	EB-02
2622402001	HGWC-107
2622402002	HGWC-109
2622402001	HGWC-107
2622402002	HGWC-109

The samples were received within 0-6 degrees Celsius (°C). No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- 2622317, 2622318, 2622352, 2622353, 2622354 and 2622355: The relinquishing signature, date and time were missing for the final sample transfer on the COCs.
- 2622354 and 2622355: The collection time of HGWC-103 was listed as 1430 on the label and 1450 on the COC. The sample was logged in per the COC.
- 2622354, 2622355, 2622402 and 2622403: The years were missing from the start and end collection times from some or all of the samples.

- 2622400 and 2622401: There were time discrepancies between the relinquished by and received by times. For the first sample transfer the relinquished by time was documented as 08/23/19 1530 and the received by time was documented as 08/23/19 1540. For the second sample transfer the relinquished by time was documented as 08/26/19 0815 and the received by time was documented as 08/26/19 0815 and the received by time was documented as 08/26/19 1830.
- 2622402 and 2622403: There were time discrepancies between the relinquished by and received by times. For the second sample transfer the relinquished by time was documented as 08/23/19 1530 and the received by time was documented as 08/23/19 1540. For the third sample transfer the relinquished by time was documented as 08/26/19 0815 and the received by time was documented as 08/26/19 0815

1.0 METALS

The samples were analyzed for metals by EPA methods 3005A/6020B (Mercury evaluated separately in Section 2.0, below).

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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
- \otimes Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverables Review

1.1 Overall Assessment

The metals data reported in these packages 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 <u>Method Blank</u>

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 (batches 34179, 34320 and 34496). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exceptions.

2622317: Antimony was detected at an estimated concentration greater than the MDL and less than the reporting limit (RL) in the method blank in batch 34179. Since antimony was not detected in the associated samples, no qualifications were applied to the data.

2622352 and 2622354: Chromium was detected at an estimated concentration greater than the MDL and less than the RL in the method blank in batch 34320. Therefore, the chromium concentrations in the associated samples less than five times the method blank concentration were U^* qualified as not detected at the reported concentration.

Sample	Analyte	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier*	Reason Code**
HGWA-122	Chromium	0.00060	J	0.0006	U*	BL
HGWC-120	Chromium	0.00072	J	0.00072	U*	BL
HGWC-101	Chromium	0.00064	J	0.00064	U*	BL
HGWC-103	Chromium	0.00063	J	0.00063	U*	BL

mg/L- milligram per liter

J- estimated concentration greater than the MDL and less than the RL

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.4 <u>Matrix Spike/Matrix Spike Duplicate (MS/MSD)</u>

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three batch MS/MSD pairs were 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). Three LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Equipment Blank

Two equipment blanks were collected with the sample set, EB-01 and EB-02. Metals were not detected in the equipment blanks above the MDLs.

1.7 Field Blank

A field blank was not collected with the sample set.

1.8 <u>Field Duplicate</u>

A field duplicate was not collected with the sample set.

1.9 <u>Sensitivity</u>

The samples were reported to the MDLs. Elevated non-detect results were not reported.

1.10 Electronic Data Deliverables (EDDs) Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The laboratory flag B used in the level II reports were not included in the EDDs. In addition, there were project specific EDDs that included project data for samples from a different laboratory report or analytes were included in the EDDs that were not requested or reported in the laboratory report when the sample was used for laboratory batch QC (i.e. if the sample was used for the MS/MSD analyses). No other discrepancies were identified between the level II reports and the EDDs.

2.0 MERCURY

The samples were analyzed for mercury by EPA method 7470A.

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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 Deliverables Review

2.1 <u>Overall Assessment</u>

The mercury data reported in these packages 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%.

2.2 <u>Holding Time</u>

The holding time for mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

2.3 <u>Method Blank</u>

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 (batches 34231, 34265 and 34391). Mercury was not detected in the method blanks above the MDL.

2.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three batch MS/MSD pairs were 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.

2.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

2.6 Equipment Blank

Two equipment blanks were collected with the sample set, EB-01 and EB-02. Mercury was not detected in the equipment blanks above the MDL.

2.7 Field Blank

A field blank was not collected with the sample set.

2.8 Field Duplicate

A field duplicate was not collected with the sample set.

2.9 <u>Sensitivity</u>

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

2.10 <u>Electronic Data Deliverables Review</u>

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. There were project specific EDDs that included project data for samples from a different laboratory report when the sample was used for laboratory batch QC (i.e. if the sample was used for the MS/MSD analyses). No other discrepancies were identified between the level II reports and the EDDs.

3.0 FLUORIDE

The samples were analyzed for fluoride by EPA method 300.0.

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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 Deliverables Review

3.1 Overall Assessment

The fluoride data reported in these packages 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%.

3.2 <u>Holding Times</u>

The holding time for the fluoride analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

3.3 <u>Method Blank</u>

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 (batches 34532, 34533 and 34680). Fluoride was not detected in the method blanks above the MDL.

3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One sample set specific MS was reported using sample HGWC-107. The recovery result was within the laboratory specified acceptance criteria.

Two batch MSs and three MS/MSD pairs were also 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.

3.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Three LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

3.6 <u>Laboratory Duplicate</u>

Laboratory duplicates were not reported with the data.

3.7 Equipment Blank

Two equipment blanks were collected with the sample set, EB-01 and EB-02. Fluoride was not detected in the equipment blanks above the MDL.

3.8 Field Blank

A field blank was not collected with the sample set.

3.9 Field Duplicate

A field duplicate was not collected with the sample set.

3.10 Sensitivity

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

3.11 <u>Electronic Data Deliverables Review</u>

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. There were project specific EDDs that included project data for samples from a different laboratory report or analytes were included in the EDDs that were not requested or reported in the laboratory report when the sample was used for laboratory batch QC (i.e. if the sample was used for the MS/MSD analyses). No other discrepancies were identified between the level II reports and the EDDs.

4.0 RADIOCHEMISTRY

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

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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
- \otimes Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Tracers and Carriers

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

4.1 **Overall Assessment**

The radium-226 and radium-228 data reported in these packages 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%.

4.2 <u>Holding Times</u>

The holding times for the radium-226 and radium-228 analyses of a water sample are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

4.3 <u>Method Blank</u>

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-228 data (batches 358895, 358894 and 359966). Three method blanks were reported for the radium-226 data (batches 359801, 359490 and 359964). Radium-226 and radium-228 were not detected in the method blanks above the minimum detectable concentrations (MDCs), with the following exceptions.

2622318, 2622355 and 2622399: Radium-226 (0.563 pCi/L) was detected at a concentration greater than the MDC in the method blank in batch 359801. Therefore, the radium-226 concentration in the associated sample greater than the MDC and with a normalized absolute difference (NAD) less than 2.58 was U* qualified as not detected at the reported concentration. Also, samples with a combined radium 226 + 228 concentration greater than the MDC with a radium-228 concentration less than the MDC and a U* qualified radium-226 concentration were U* qualified as not detected at the reported concentration.

2622353: Radium-228 (0.862 pCi/L) was detected at a concentration greater than the MDC in the method blank in batch 358894. Therefore, the radium-228 concentration in the associated sample greater than the MDC and with a NAD less than 2.58 was U* qualified as not detected at the reported concentration.

Sample	Analyte	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
HGWA-111	Radium-226	0.492	NA	0.492	U*	BL
HGWA-112	Radium-226	0.417	NA	0.417	U*	BL
HGWA-122	Radium-228	0.886	NA	0.886	U*	BL
HGWC-101	Radium-226	0.474	NA	0.474	U*	BL
HGWC-118	Radium-226	0.492	NA	0.492	U*	BL
HGWC-103	Radium-226	0.434	NA	0.434	U*	BL
HGWC-124	Radium-226	0.450	NA	0.450	U*	BL
HGWC-124	Combined Radium 226 + 228	0.834	NA	0.834	U*	BL

pCi/L- picocuries per liter

NA-not applicable

4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data.

4.5 <u>Laboratory Control Sample</u>

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

4.6 <u>Laboratory Duplicate</u>

Four batch laboratory duplicates were reported for radium-226 and one batch laboratory duplicate was reported for radium-228. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

4.7 <u>Tracers and Carriers</u>

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

4.8 Equipment Blank

Two equipment blanks were collected with the sample sets, EB-01 and EB-02. Radium-226 and Radium-228 were not detected in the equipment blank above the MDCs, with the following exception.
Plant Hammond AP Site Data Validation 8 October 2019 Page 12

Radium-226 (0.539 pCi/L) was detected at a concentration greater than the MDC in EB-02. Therefore, the radium-226 concentration in the associated sample greater than the MDC and with a NAD less than 2.58 was U* qualified as not detected at the reported concentration. Also, samples with combined radium 226 + 228 concentrations greater than the MDC with a radium-228 concentration less than the MDC and a U* qualified radium-226 concentration were U* qualified as not detected at the reported concentration.

Sample	Analyte	Laborator	Laborator	Validatio	Validatio	Reaso
		y Result (pCi/L)	y Flag	n Result (pCi/L)	n Qualifier	n Code
HGWA-111	Radium-226	0.492	NA	0.492	U*	BE
HGWA-112	Radium-226	0.417	NA	0.417	U*	BE
HGWC-121A	Radium-226	0.635	NA	0.635	U*	BE
HGWC-121A	Combined Radium 226 + 228	1.30	NA	1.30	U*	BE
HGWC-120	Radium-226	0.845	NA	0.845	U*	BE
HGWC-120	Combined Radium 226 + 228	1.35	NA	1.35	U*	BE
HGWC-101	Radium-226	0.474	NA	0.474	U*	BE
HGWC-118	Radium-226	0.492	NA	0.492	U*	BE
HGWC-103	Radium-226	0.434	NA	0.434	U*	BE
HGWC-124	Radium-226	0.450	NA	0.450	U*	BE
HGWC-124	Combined Radium 226 + 228	0.834	NA	0.834	U*	BE
HGWC-107	Radium-226	0.502	NA	0.502	U*	BE
HGWC-107	Combined Radium 226 + 228	1.69	NA	1.69	J	BE

pCi/L- picocuries per liter NA-not applicable

4.9 Field Blank

A field blank was not collected with the sample set.

4.10 Field Duplicate

A field duplicate was not collected with the sample set.

4.11 Sensitivity

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

4.12 <u>Electronic Data Deliverables Review</u>

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDDs.

* * * * *

Plant Hammond AP Site Data Validation 8 October 2019 Page 14

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

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.

Plant Hammond AP Site Data Validation 8 October 2019 Page 15

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

Reason Code	Explanation
BE	Equipment blank contamination. The result should be considered
	"not-detected."
BF	Field blank contamination. The result should be considered "not-
	detected."
BL	Laboratory 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

Memorandum

Date:	20 January 2020
To:	Whitney Law
From:	Kristoffer Henderson
CC:	J. Caprio
Subject:	Stage 2A Data Validations - Level II Data Deliverables – Pace Analytical Services, LLC Project Numbers 2624782, 2624784, 2624785, 2624786, 2624787, 2624788, 2624791, 2624792, 2624799, 2624800, 2624802 and 2624803

SITE: Plant Hammond AP3/4

INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of fifteen aqueous samples, one field duplicate sample and one field blank, collected 21-23 October 2019, as part of the Plant Hammond AP3/4 on-site sampling event.

The samples were analyzed at Pace Analytical Services, LLC, Peachtree Corners, Georgia, for the following analytical tests:

- Metals by United States (US) Environmental Protection Agency (EPA) Methods 3005A/6020B
- Mercury by USEPA Method 7470A
- Total Dissolved Solids (TDS) by Standard Method 2540C
- Chloride, Fluoride and Sulfate by USEPA Method 300.0

The samples were analyzed at Pace Analytical Services, LLC, Greensburg, Pennsylvania, for the following analytical tests:

- Radium-226 by USEPA Method 9315
- Radium-228 by USEPA Method 9320
- Total Radium by Calculation

EXECUTIVE SUMMARY

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

Laboratory ID	Client ID
2624782001	HGWA-122
2624782002	HGWC-124
2624782003	HGWC-121A
2624784001	HGWA-122
2624784002	HGWC-124
2624784003	HGWC-121A
2624785001	HGWC-120
2624785002	FD-01
2624786001	HGWC-120
2624786002	FD-01
2624787001	HGWA-111
2624788001	HGWA-111
2624791001	HGWC-101
2624791002	HGWC-102
2624791003	HGWC-105
2624791004	HGWC-103
2624792001	HGWC-101

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

Laboratory ID	Client ID
2624792002	HGWC-102
2624792003	HGWC-105
2624792004	HGWC-103
2624799001	HGWA-112
2624799002	HGWC-117
2624799003	HGWC-118
2624799004	HGWA-113
2624799005	HGWC-109
2624799006	HGWC-107
2624800001	HGWA-112
2624800002	HGWC-117
2624800003	HGWC-118
2624800004	HGWA-113
2624800005	HGWC-109
2624800006	HGWC-107
2624802001	FB-01
2624803001	FB-01

The samples were received within 0-6°C. No sample preservation issues were noted by the laboratory.

The following issues were noted with the chain of custody (COC) forms:

- 2624785 and 2624786: There was no time of collection listed for the field duplicate, FD-01. The laboratory assigned the collection time of 00:00. Also, the year was not documented for the relinquished by and received by times for the second transfer.
- 2624787 and 2624788: The year was not documented for the sample collection time and relinquished by time for the sample transfer.

- 2624791, 2624792, 2624799 and 2624800: The year was not documented for the sample collection times for samples HGWC-101, HGWC-102, HGWA-112, HGWC-117 and HGWC-118 and the relinquished by and received by times for the sample transfers.
- 2624802 and 2624803: The year was not documented for the received by time for the first transfer and the relinquished by and received by times for the second transfer.

1.0 METALS

The samples were analyzed for metals by USEPA methods 3005A/6020B. (Mercury was evaluated separately in Section 2.0, below).

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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
- \otimes Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverables Review

1.1 Overall Assessment

The metals data reported in these packages 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 the dataset is 100%.

1.2 <u>Holding Time</u>

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 <u>Method Blank</u>

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported (batches 37696 and 38024). Metals were not detected in the method blanks above the method detection limits (MDLs), with the following exception.

2624786, 2624792, 2624800 and 2624803: Boron (0.0059 mg/L) was detected at an estimated concentration greater than the MDL and less than the reporting limit (RL) in the method blank in batch 38024. Therefore, the boron concentrations in the associated samples less than five times the method blank concentrations were U* qualified as not detected at the reported concentrations.

Sample	Analyte	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier*	Reason Code**
HGWA-112	Boron	0.016	JB	0.016	U*	BL
HGWA-113	Boron	0.010	JB	0.010	U*	BL

mg/L- milligram per liter

J- estimated concentration greater than the MDL and less than the RL

B-laboratory flag indicating analyte was detected in the associated method blank

* Validation qualifiers are defined in Attachment 1 at the end of this report

**Reason codes are defined in Attachment 2 at the end of this report

1.4 <u>Matrix Spike/Matrix Spike Duplicate (MS/MSD)</u>

MS/MSDs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two batch MS/MSD pairs were 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 <u>Laboratory Control Sample (LCS)</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The recovery results were within the laboratory specified acceptance criteria.

1.6 Equipment Blank

An equipment blank was not collected with the sample set.

1.7 Field Blank

One field blank was collected with the sample sets, FB-01. Metals were not detected in the field blank above the MDLs, with the following exception.

Calcium (0.011 mg/L) was detected at an estimated concentration greater than the MDL and less than the RL in FB-01. Since calcium was detected in the associated samples at concentrations greater than five times the field blank concentration, no qualifications were applied to the data.

1.8 <u>Field Duplicate</u>

One field duplicate sample was collected with the sample sets, FD-01. Acceptable precision [relative percent difference (RPD) \leq 20% or the difference between the concentrations < RL] was demonstrated between the field duplicate and the original sample HGWC-120.

1.9 <u>Sensitivity</u>

The samples were reported to the MDLs. Elevated nondetect results were not reported.

1.10 Electronic Data Deliverables (EDDs) Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The laboratory flag B used in the level II reports was not included in the EDDs. No other discrepancies were identified between the level II reports and the EDDs.

2.0 MERCURY

The samples were analyzed by USEPA method 7470A.

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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 Deliverables Review

2.1 Overall Assessment

The mercury data reported in these packages 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 the dataset is 100%.

2.2 <u>Holding Time</u>

The holding time for the mercury analysis of a water sample is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

2.3 <u>Method Blank</u>

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 37720). Mercury was not detected in the method blank above the MDL.

2.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

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.

2.5 <u>Laboratory Control Sample</u>

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 result was within the laboratory specified acceptance criteria.

2.6 Equipment Blank

An equipment blank was not collected with the sample set.

2.7 Field Blank

One field blank was collected with the sample sets, FB-01. Mercury was not detected in the field blank above the MDL.

2.8 <u>Field Duplicate</u>

The field duplicate was not analyzed for mercury.

2.9 <u>Sensitivity</u>

The samples were reported to the MDL. Elevated nondetect results were not reported.

2.10 Electronic Data Deliverables Review

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDDs.

3.0 WET CHEMISTRY

The samples were analyzed for TDS by Standard Method 2540C and chloride, fluoride and sulfate by USEPA method 300.0.

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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 Deliverables Review

3.1 Overall Assessment

The wet chemistry data reported in these packages 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 the dataset is 100%.

3.2 Holding Times

The holding times for the analysis of a water sample for the wet chemistry parameters are listed below. The holding times were met for the sample analyses.

Analyte	Holding Time
TDS	7 days from collection to analysis
Chloride, Fluoride and Sulfate	28 days from collection to analysis

3.3 <u>Method Blank</u>

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 anions (batches 37730, 37858 and 37870). The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

2624784 and 2624787: Chloride (0.034 mg/L) was detected at an estimated concentration greater than the MDL and less than the RL in the method blank in batch 37730. Since chloride was detected in the associated samples at concentrations greater than five times the method blank concentration, no qualifications were applied to the data.

2624786: Chloride (0.0032 mg/L) and sulfate (0.36 mg/L) were detected at estimated concentrations greater than the MDLs and less than the RLs in the method blank in batch 37858. Since chloride and sulfate were detected in the associated samples at concentrations greater than five times the method blank concentrations, no qualifications were applied to the data.

3.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

One sample set MS/MSD pair using sample FD-01 and one MS using sample HGWC-109 were reported for the anions. The RPD and recovery results were within the laboratory specified acceptance criteria, with the following exception.

2624800: The recovery of sulfate in the MS using sample HGWC-109 was low and outside the laboratory specified acceptance criteria. Therefore, the chloride concentration in sample HGWC-109 was J qualified as estimated.

One batch MS and two MS/MSD pairs were also reported for the anions. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data.

Sample	Analyte	Laboratory Result (mg/L)	Laboratory Flag	Validation Result (mg/L)	Validation Qualifier	Reason Code
HGWC-109	Sulfate	23.2	M1	23.2	J	M-

mg/L- milligram per liter

M1-laboratory flag indicating MS recovery exceeded the QC limits

3.5 <u>Laboratory Control Sample</u>

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 as appropriate. The recovery results were within the laboratory specified acceptance criteria.

3.6 <u>Laboratory Duplicate</u>

Four sample set specific laboratory duplicates were reported for TDS using samples HGWA-122, HGWC-120, HGWA-113 and HGWC-109. The RPD results were within the laboratory specified acceptance criteria.

Two 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.

3.7 Equipment Blank

An equipment blank was not collected with the sample set.

3.8 Field Blank

One field blank was collected with the sample sets, FB-01. The wet chemistry parameters were not detected in the field blank above the MDLs.

3.9 <u>Field Duplicate</u>

One field duplicate sample was collected with the sample sets, FD-01. Acceptable precision (RPD $\leq 20\%$ or the difference between the concentrations < RL) was demonstrated between the field duplicate and the original sample HGWC-120.

3.10 Sensitivity

The samples were reported to the MDLs. No elevated nondetect results were reported.

3.11 <u>Electronic Data Deliverables Review</u>

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. The laboratory flag M1 used in the level II report was not included in the EDDs. No other discrepancies were identified between the level II reports and the EDDs.

4.0 RADIOCHEMISTRY

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

The areas of data review are listed below. A leading check mark (\checkmark) indicates an area of review in which the data were acceptable. A preceding crossed circle (\otimes) 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
- \otimes Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Tracers and Carriers
- ✓ Equipment Blank
- ✓ Field Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverables Review

4.1 **Overall Assessment**

The radium-226 and radium-228 data reported in these packages 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%.

4.2 <u>Holding Times</u>

The holding times for the radium-226 and radium-228 analyses of a water sample are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

4.3 <u>Method Blank</u>

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported for the radium-228 data (batches 369306 and 369311). Two method blanks were reported for the radium-226 data (batches 369307 and 369310). Radium-226 and radium-228 were not detected in the method blanks above the minimum detectable concentrations (MDCs), with the following exception.

2624785, 2624791 and 2624799: Radium-226 was detected at concentrations greater than the MDC in the method blank in batch 369310. Therefore, the radium-226 concentrations in the associated samples less than five times the method blank concentrations were U* qualified as not detected.

Sample	Analyte	Laboratory Result (pCi/L)	Laboratory Flag	Validation Result (pCi/L)	Validation Qualifier	Reason Code
HGWC-120	Radium-226	0.760	NA	0.760	U*	BL
FD-01	Radium-226	0.420	NA	0.420	U*	BL
HGWC-103	Radium-226	0.571	NA	0.571	U*	BL
HGWC-118	Radium-226	0.424	NA	0.424	U*	BL
HGWA-113	Radium-226	0.401	NA	0.401	U*	BL
HGWC-109	Radium-226	0.545	NA	0.545	U*	BL

pCi/L-picocuries per liter NA-not applicable

4.4 <u>Matrix Spike/Matrix Spike Duplicate</u>

MS/MSD pairs were not reported with the data.

4.5 <u>Laboratory Control Sample</u>

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCS duplicate (LCSD) pairs were reported for radium-226. Two LCS/LCSD pairs were reported for radium-228. The recovery and replicate error ratio (RER) [2 sigma (2 σ)] results were within the laboratory specified acceptance criteria.

4.6 Laboratory Duplicate

One sample set specific laboratory duplicate was reported for radium-226 using sample BGWC-19. The RER (2σ) result was within the laboratory specified acceptance criteria.

Two batch laboratory duplicates were also reported for radium-226. Since these were batch QC, the results do not affect the samples in this data set and qualifications were not applied to the data. The recovery and RPD results were within the laboratory specified acceptance criteria.

4.7 <u>Tracers and Carriers</u>

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

4.8 Equipment Blank

An equipment blank was not collected with the sample set.

4.9 Field Blank

One field blank was collected with the sample sets, FB-01. Radium-226 and radium-228 were not detected in the field blank above the MDCs.

4.10 Field Duplicate

One field duplicate sample was collected with the sample sets, FD-01. Acceptable precision (RER $(2\sigma) < 3$) was demonstrated between the field duplicates and the original samples BGWA-29, HGWC-120.

4.11 <u>Sensitivity</u>

The samples were reported to the MDCs. No elevated nondetect results were reported.

4.12 <u>Electronic Data Deliverables Review</u>

The results and sample IDs in the EDDs were reviewed against the information provided by the associated level II reports at a minimum of 20% as part of the data validation process. No discrepancies were identified between the level II reports and the EDDs.

* * * * *

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

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.
- R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

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

Reason Code	Explanation
13	Other
BE	Equipment blank contamination. The result should be considered "not-detected."
BF	Field blank contamination. The result should be considered "not- detected."
BL	Laboratory blank contamination. The result should be considered "not-detected."
Н	Holding time exceedance.
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.

APPENDIX C2 Field Data Sheets Date: 2019-08-22 10:48:03

Project Information: Operator Name Company Name Project Name Site Name Latitude Longitude		Noe Geo GP- Plai 0° (0° (Noelia Muskus Geosyntec Consultants GP-Plant Hammond Plant Hammond 0° 0' 0" 0° 0' 0"		Pump Infor Pump Mod Tubing Typ Tubing Dia Tubing Ler	Pump Information: Pump Model/Type Tubing Type Tubing Diameter Tubing Length		Alexis polyethylene 0.17 in ft		
Sonde SN		613	229					<i>c</i> .		
Turbidity M	lake/Model	LaN	lotte 2020we		Pump plac	ement from TOC		ft		
Well Information: Well ID Well diameter Well Total Depth Screen Length Depth to Water		HG 2 in ft 10 f 15.4	HGWA-122 2 in ft 10 ft 15.42 ft		Pumping Ir Final Pump Total Syste Calculated Stabilizatio Total Volur	Pumping Information: Final Pumping Rate Total System Volume Calculated Sample Rate Stabilization Drawdown Total Volume Pumped		200 mL/min 0.09 L 300 sec 3.6 in 3.75 L		
Low-Flow S	Sampling Stabiliz	ation Summar	v							
Stabilizatio	Time n	Elapsed	Temp C +/- 0.5	рН +/- 0.1	SpCond μS +/- 5%	6/cmTurb NTU +/- 10	DTW ft	RDO mg/L +/- 10%	ORP mV +/- 10	
Last 5 Last 5 Last 5 Last 5 Last 5 Last 5	10:08:43 10:13:43 10:18:43	300.06 600.01 899.99	21.37 21.28 21.29	6.48 6.51 6.51	414.22 418.78 424.67	0.38 0.29 0.25	15.44 15.44 15.44	5.68 5.38 5.10	92.97 84.64 79.25	
Variance 0			nan	nan	nan			nan	nan	
Variance 1			-0.09	0.03	4.56			-0.30	-8.33	
Variance 2			0.01	0.00	5.89			-0.28	-5.39	

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 250-mL plastic bottle for F (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. IV metals (EPA 6020B/7470A). Total depth = 27.76 ft.

Grab Samples HGWA-122 Grab Date: 2019-08-22 16:07:52

Project Information:		Pump Information:				
Operator Name Company Name Project Name Site Name Latitude Longitude	Noelia Muskus Geosyntec Consultants GP-Plant Hammond Plant Hammond 0° 0' 0" 0° 0' 0"	Pump Model/Type Tubing Type Tubing Diameter Tubing Length	QED MP50 polyethylene 0.17 in ft			
Sonde SN	613229					
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	ft			
Well Information:		Pumping Information:				
Well ID	HGWC-120	Final Pumping Rate	200 mL/min			
Well diameter	2 in	Total System Volume	0.485 L			
Well Total Depth	ft	Calculated Sample Rate	300 sec			
Screen Length	10 ft	Stabilization Drawdown	3.6 in			
Depth to Water	40.96 ft	Total Volume Pumped	10 L			

Low-Flow San	npling Stabili:	zation Summary	/						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	15:01:13	1199.99	21.96	6.83	946.74	0.49	40.96	1.13	-4.55
Last 5	15:06:13	1499.98	22.53	6.82	948.05	0.63	40.96	0.92	-4.46
Last 5	15:11:13	1799.97	23.29	6.80	949.53	0.24	40.96	0.77	-4.50
Last 5	15:16:13	2099.96	23.34	6.80	943.75	0.32	40.96	0.65	-3.64
Last 5	15:21:13	2399.95	23.54	6.79	941.95	0.25	40.96	0.54	-3.17
Variance 0			0.76	-0.02	1.49			-0.15	-0.04
Variance 1			0.05	-0.00	-5.78			-0.12	0.86
Variance 2			0.20	-0.01	-1.81			-0.11	0.46

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 250-mL plastic bottle for F (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. IV metals (EPA 6020B/7470A). Total depth = 61.56 ft.

Grab Samples HGWC-120 Grab Date: 2019-08-22 13:12:04

Project Information:		Pump Information:	
Operator Name Company Name Project Name Site Name	Noelia Muskus Geosyntec Consultants GP-Plant Hammond Plant Hammond	Pump Model/Type Tubing Type Tubing Diameter Tubing Length	Alexis polyethylene 0.17 in ft
Latitude Longitude	0° 0' 0" 612220		
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	ft
Well Information:		Pumping Information:	
Well ID	HGWC-121A	Final Pumping Rate	200 mL/min
Well diameter	2 in	Total System Volume	0.09 L
Well Total Depth	ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	3.6 in
Depth to Water	18.46 ft	Total Volume Pumped	7.25 L

Low-Flow San	npling Stabiliz	zation Summary	/						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	12:19:53	600.04	22.54	6.77	1140.80	0.97	18.53	1.14	10.55
Last 5	12:24:53	900.00	22.35	6.77	1140.10	0.72	18.53	0.99	14.66
Last 5	12:29:53	1199.99	22.38	6.77	1144.02	0.45	18.53	0.87	15.30
Last 5	12:34:53	1499.98	22.59	6.77	1146.89	0.36	18.53	0.83	17.09
Last 5	12:39:53	1799.97	21.96	6.77	1138.39	0.35	18.53	0.82	19.07
Variance 0			0.03	-0.01	3.92			-0.12	0.64
Variance 1			0.21	-0.00	2.87			-0.04	1.79
Variance 2			-0.63	0.00	-8.50			-0.02	1.99

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 250-mL plastic bottle for F (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. IV metals (EPA 6020B/7470A). Total depth = 41.41 ft.

Grab Samples HGWC-121A Grab Date: 2019-08-23 10:47:25

Project Information:		Pump Information:	
Operator Name	Noelia Muskus	Pump Model/Type	Alexis
Company Name	Geosyntec Consultants	Tubing Type	polyethylene
Project Name	GP-Plant Hammond	Tubing Diameter	0.17 in
Site Name	Plant Hammond	Tubing Length	ft
Latitude	0° 0' 0"		
Longitude	0° 0' 0"		
Sonde SN	613229		
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	ft
Well Information:		Pumping Information:	
Well ID	HGWC-124	Final Pumping Rate	200 mL/min
Well diameter	2 in	Total System Volume	0.09 L
Well Total Depth	ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	3.6 in
Depth to Water	17.42 ft	Total Volume Pumped	10 L

Low-Flow San	npling Stabiliz	zation Summary	/						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	09:48:11	1499.98	20.52	7.05	572.23	0.36	17.87	2.19	53.32
Last 5	09:53:11	1799.97	20.57	7.04	574.59	0.47	17.87	1.50	50.98
Last 5	09:58:11	2099.96	20.04	7.04	580.56	0.50	17.86	2.70	49.68
Last 5	10:03:12	2400.95	20.30	7.04	576.90	0.35	17.86	2.62	46.62
Last 5	10:08:12	2700.94	20.62	7.02	578.83	0.32	17.85	2.49	45.48
Variance 0			-0.54	-0.00	5.96			1.20	-1.30
Variance 1			0.27	0.00	-3.65			-0.07	-3.05
Variance 2			0.32	-0.02	1.92			-0.13	-1.14

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 250-mL plastic bottle for F (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. IV metals (EPA 6020B/7470A). Total depth = 35.28 ft.

Grab Samples HGWC-124 Grab Date: 2019-10-21 11:58:50

Project Information:		Pump Information:	
Operator Name	Dan Gibbs	Pump Model/Type	QED MP50
Company Name	Geosyntec Consultants	Tubing Type	polyethylene
Project Name	GP-Plant Hammond	Tubing Diameter	0.17 in
Site Name	Plant Hammond	Tubing Length	23.52 ft
Latitude	0° 0' 0"		
Longitude	0° 0' 0"		
Sonde SN	497259		
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	23.52 ft
Well Information:		Pumping Information:	
Well ID	HGWA-122	Final Pumping Rate	200 mL/min
Well diameter	2 in	Total System Volume	0.5899797 L
Well Total Depth	ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	3.6 in
Depth to Water	16.96 ft	Total Volume Pumped	8 L

Low-Flow San	npling Stabili	zation Summary	/						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	11:11:45	1199.89	19.83	6.65	462.32	10.57	16.96	0.43	-124.48
Last 5	11:16:45	1499.89	19.95	6.66	464.74	5.33	16.96	0.40	-124.36
Last 5	11:21:45	1799.88	19.89	6.67	466.85	4.59	16.96	0.40	-124.30
Last 5	11:26:45	2099.87	20.07	6.68	467.28	3.47	16.96	0.41	-124.82
Last 5	11:31:45	2399.86	19.98	6.69	467.77	2.49	16.96	0.41	-124.68
Variance 0			-0.06	0.01	2.11			0.00	0.06
Variance 1			0.18	0.01	0.43			0.00	-0.52
Variance 2			-0.09	0.01	0.49			0.00	0.14

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 500-mL plastic bottle for TDS (EPA 2540C), CI, F, SO4 (EP A 300.0); and one 250-mL plastic bottle with HNO3 for App. III and IV metals (EPA 6020B/7470A). Total depth = 27.78'

Grab Samples HGWA-122 Grab Date: 2019-10-22 08:49:38

Project Information:		Pump Information:	
Operator Name	Dan Gibbs	Pump Model/Type	QED MP50
Company Name	Geosyntec Consultants	Tubing Type	polyethylene
Project Name	GP-Plant Hammond	Tubing Diameter	0.17 in
Site Name	Plant Hammond	Tubing Length	62.55 ft
Latitude	0° 0' 0"		
Longitude	0° 0' 0"		
Sonde SN	497259		
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	62.55 ft
Well Information:		Pumping Information:	
Well ID	HGWC-120	Final Pumping Rate	200 mL/min
Well diameter	2 in	Total System Volume	0.7641872 L
Well Total Depth	ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	3.6 in
Depth to Water	41.65 ft	Total Volume Pumped	5 L

Low-Flow Sa	ampling Stabiliz	zation Summary	V						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	07:57:31	300.08	18.49	6.83	960.89	3.25	41.65	1.33	-153.03
Last 5	08:02:31	600.01	18.24	6.76	966.79	4.98	41.65	0.50	-151.47
Last 5	08:07:31	900.00	18.11	6.75	966.59	2.83	41.65	0.30	-152.17
Last 5	08:12:31	1199.99	18.12	6.74	962.97	2.34	41.65	0.22	-152.92
Last 5	08:17:31	1499.98	18.04	6.74	962.03	1.59	41.65	0.18	-153.62
Variance 0			-0.13	-0.01	-0.20			-0.20	-0.70
Variance 1			0.01	-0.00	-3.63			-0.08	-0.75
Variance 2			-0.08	-0.00	-0.94			-0.04	-0.70

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 500-mL plastic bottle for TDS (EPA 2540C), Cl, F, SO4 (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. III and IV metals (EPA 6020B/7470A). Total depth = 61.58'

Grab Samples HGWC-120 Grab Date: 2019-10-21 16:51:12

Project Information: Operator Name Company Name Project Name Site Name Latitude Longitude		Dar Geo GP- Plar 0° 0 0° 0	Dan Gibbs Geosyntec Consultants GP-Plant Hammond Plant Hammond 0° 0' 0" 0° 0' 0"			Pump Information: Pump Model/Type Tubing Type Tubing Diameter Tubing Length			QED MP50 polyethylene 0.17 in 33.16 ft		
Sonde SN		497	259								
				Pump place	ement from TO		33.16 ft				
Well Information:Well IDWell diameter2 inWell Total DepthftScreen LengthDepth to Water19.33		WC-121A [:] t 33 ft		Pumping In Final Pump Total Syste Calculated Stabilizatio Total Volum	Pumping Information: Final Pumping Rate Total System Volume Calculated Sample Rate Stabilization Drawdown Total Volume Pumped		200 mL/min 0.6330071 L 300 sec 3.6 in 3 L				
Low-Flow Sa	ampling Stabiliz	ation Summar	y								
Stabilization	Time	Elapsed	Temp C +/- 0.5	рН +/- 0.1	SpCond µS +/- 5%	/cm Turb NTU +/- 10	DTW ft	RDO mg/L +/- 10%	ORP mV +/- 10		
Last 5 Last 5 Last 5 Last 5 Last 5 Last 5	16:19:33 16:24:33 16:29:33	300.02 600.00 900.00	20.12 19.92 19.83	6.76 6.75 6.74	1091.30 1094.87 1099.44	3.69 2.62 2.18	19.39 19.39 19.39	0.43 0.41 0.37	-134.49 -135.63 -136.43		
Variance 0			nan	nan	nan			nan	nan		
Variance 1			-0.20	-0.01	3.57			-0.02	-1.14		
Variance 2			-0.09	-0.01	4.57			-0.04	-0.80		

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 500-mL plastic bottle for TDS (EPA 2540C), CI, F, SO4 (EP A 300.0); and one 250-mL plastic bottle with HNO3 for App. III and IV metals (EPA 6020B/7470A). Total depth = 41.45'

Grab Samples HGWC-121A Grab

Date: 2019-10-21 13:42:22

Project Information:		Pump Information:	
Operator Name	Dan Gibbs	Pump Model/Type	QED MP50
Company Name	Geosyntec Consultants	Tubing Type	polyethylene
Project Name	GP-Plant Hammond	Tubing Diameter	0.17 in
Site Name	Plant Hammond	Tubing Length	30.52 ft
Latitude	0° 0' 0"		
Longitude	0° 0' 0"		
Sonde SN	497259		
Turbidity Make/Model	LaMotte 2020we	Pump placement from TOC	30.52 ft
Well Information:		Pumping Information:	
Well ID	HGWC-124	Final Pumping Rate	200 mL/min
Well diameter	2 in	Total System Volume	0.6212237 L
Well Total Depth	ft	Calculated Sample Rate	300 sec
Screen Length	10 ft	Stabilization Drawdown	3.6 in
Depth to Water	17.93 ft	Total Volume Pumped	8 L

Low-Flow Sar	npling Stabiliz	zation Summary	/						
	Time	Elapsed	Temp C	pН	SpCond µS	/cmTurb NTU	DTW ft	RDO mg/L	ORP mV
Stabilization			+/- 0.5	+/- 0.1	+/- 5%	+/- 10		+/- 10%	+/- 10
Last 5	12:53:37	1199.99	19.31	7.08	566.67	8.97	18.34	0.29	-123.91
Last 5	12:58:37	1499.98	19.36	7.08	567.97	6.48	18.34	0.24	-123.51
Last 5	13:03:37	1799.97	19.69	7.07	568.14	4.45	18.34	0.23	-123.98
Last 5	13:08:37	2099.96	19.67	7.06	570.37	4.02	18.34	0.21	-123.92
Last 5	13:13:37	2399.95	19.99	7.05	572.49	3.97	18.34	0.18	-124.67
Variance 0			0.34	-0.01	0.17			-0.01	-0.47
Variance 1			-0.02	-0.01	2.23			-0.01	0.06
Variance 2			0.33	-0.02	2.12			-0.03	-0.75

Notes

Four bottles: Two 1-L plastic bottles with HNO3 for radium (EPA 9315/9320); one 500-mL plastic bottle for TDS (EPA 2540C), Cl, F, SO4 (EPA 300.0); and one 250-mL plastic bottle with HNO3 for App. III and IV metals (EPA 6020B/7470A). Total depth = 35.31'

Grab Samples HGWC-124 Grab

APPENDIX D

Statistical Analyses

 Table D-1

 Assessment Monitoring Interwell Prediction Limit Comparison

 Plant Hammond AP-3, Floyd County, Georgia

Parameter	Well ID	Upper PL	Lower PL	Oct 21-22, 2019		
	Assessment					
Boron (mg/L)	HGWC-120	0.36	-	1.0		
Boron (mg/L)	HGWC-121A	0.36	-	2.4		
Boron (mg/L)	HGWC-124	0.36	-	0.50		
Calcium (mg/L)	HGWC-120	91.0	-	171		
Calcium (mg/L)	HGWC-121A	91.0	-	173		
Calcium (mg/L)	HGWC-124	91.0	-	96.9		
Chloride (mg/L)	HGWC-120	4.5	-	3.4		
Chloride (mg/L)	HGWC-121A	4.5	-	29.9		
Chloride (mg/L)	HGWC-124	4.5	-	3.6		
Fluoride (mg/L)	HGWC-120	0.25	-	0.53		
Fluoride (mg/L)	HGWC-121A	0.25	-	0.18 J		
Fluoride (mg/L)	HGWC-124	0.25	-	0.073 J		
pH (s.u.)	HGWC-120	6.9	6.3	6.7		
pH (s.u.)	HGWC-121A	6.9	6.3	6.7		
pH (s.u.)	HGWC-124	6.9	6.3	7.1		
Sulfate (mg/L)	HGWC-120	51.6	-	266		
Sulfate (mg/L)	HGWC-121A	51.6	-	238		
Sulfate (mg/L)	HGWC-124	51.6	-	78.5		
TDS (mg/L)	HGWC-120	360	-	693		
TDS (mg/L)	HGWC-121A	360	-	771		
TDS (mg/L)	HGWC-124	360	-	357		

Notes:

- = Not applicable

-- = Indicates the parameter was not analyzed as part of the verification event.

J = Indicates that analyte was estimated and detected between the laboratory Method Detection Limit (MDL) and Reporting Limit (RL).

mg/L = milligrams per liter

ND = Indicates the parameter was not detected above the laboratory MDL.

PL = Prediction Limit

s.u. = standard unit

TDS = Total Dissolved Solids

(1) Shaded values indicate an exceedance of the statistically derived PL using interwell statistics.

(2) The pH value presented was recorded at the time of sample collection in the field. This is the only parameter in which the field result is compared to both the upper and lower PL.

Interwell Prediction Limit - Significant Results

Hammond AP Client: Georgia Power Data: Hammond AP-3 Printed 1/29/2020, 3:04 AM

Constituent	Woll	l Inner I im	LowerLim	Date	Observ	Sia	Ba N	%NDe	Transform	Alpha	Method
	<u>vvcn</u>		Lower Lint.	Date	Observ.	<u>oig.</u>	Dyn	701103			<u>Metriou</u>
Boron (mg/L)	HGWC-120	0.3634	n/a	10/22/2019	1	Yes	11	0	No	0.002505	Param 1 of 2
Boron (mg/L)	HGWC-121A	0.3634	n/a	10/21/2019	2.4	Yes	11	0	No	0.002505	Param 1 of 2
Boron (mg/L)	HGWC-124	0.3634	n/a	10/21/2019	0.5	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-120	91.03	n/a	10/22/2019	171	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-121A	91.03	n/a	10/21/2019	173	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-124	91.03	n/a	10/21/2019	96.9	Yes	11	0	No	0.002505	Param 1 of 2
Chloride (mg/L)	HGWC-121A	4.5	n/a	10/21/2019	29.9	Yes	11	0	n/a	0.01166	NP (normality) 1 of 2
Fluoride (mg/L)	HGWC-120	0.2549	n/a	10/22/2019	0.53	Yes	12	0	No	0.002505	Param 1 of 2
pH (s.u.)	HGWC-124	6.909	6.329	10/21/2019	7.05	Yes	11	0	No	0.001253	Param 1 of 2
Sulfate (mg/L)	HGWC-120	51.55	n/a	10/22/2019	266	Yes	11	0	x^5	0.002505	Param 1 of 2
Sulfate (mg/L)	HGWC-121A	51.55	n/a	10/21/2019	238	Yes	11	0	x^5	0.002505	Param 1 of 2
Sulfate (mg/L)	HGWC-124	51.55	n/a	10/21/2019	78.5	Yes	11	0	x^5	0.002505	Param 1 of 2
Total Dissolved Solids (mg/L)	HGWC-120	360.1	n/a	10/22/2019	693	Yes	10	0	No	0.002505	Param 1 of 2
Total Dissolved Solids (mg/L)	HGWC-121A	360.1	n/a	10/21/2019	771	Yes	10	0	No	0.002505	Param 1 of 2

Interwell Prediction Limit - All Results

Hammond AP Client: Georgia Power Data: Hammond AP-3 Printed 1/29/2020, 3:04 AM

Constituent	<u>Well</u>	Upper Lim.	Lower Lim.	<u>Date</u>	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	HGWC-120	0.3634	n/a	10/22/2019	1	Yes	11	0	No	0.002505	Param 1 of 2
Boron (mg/L)	HGWC-121A	0.3634	n/a	10/21/2019	2.4	Yes	11	0	No	0.002505	Param 1 of 2
Boron (mg/L)	HGWC-124	0.3634	n/a	10/21/2019	0.5	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-120	91.03	n/a	10/22/2019	171	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-121A	91.03	n/a	10/21/2019	173	Yes	11	0	No	0.002505	Param 1 of 2
Calcium (mg/L)	HGWC-124	91.03	n/a	10/21/2019	96.9	Yes	11	0	No	0.002505	Param 1 of 2
Chloride (mg/L)	HGWC-120	4.5	n/a	10/22/2019	3.4	No	11	0	n/a	0.01166	NP (normality) 1 of 2
Chloride (mg/L)	HGWC-121A	4.5	n/a	10/21/2019	29.9	Yes	11	0	n/a	0.01166	NP (normality) 1 of 2
Chloride (mg/L)	HGWC-124	4.5	n/a	10/21/2019	3.6	No	11	0	n/a	0.01166	NP (normality) 1 of 2
Fluoride (mg/L)	HGWC-120	0.2549	n/a	10/22/2019	0.53	Yes	12	0	No	0.002505	Param 1 of 2
Fluoride (mg/L)	HGWC-121A	0.2549	n/a	10/21/2019	0.18	No	12	0	No	0.002505	Param 1 of 2
Fluoride (mg/L)	HGWC-124	0.2549	n/a	10/21/2019	0.073	No	12	0	No	0.002505	Param 1 of 2
pH (s.u.)	HGWC-120	6.909	6.329	10/22/2019	6.74	No	11	0	No	0.001253	Param 1 of 2
pH (s.u.)	HGWC-121A	6.909	6.329	10/21/2019	6.74	No	11	0	No	0.001253	Param 1 of 2
pH (s.u.)	HGWC-124	6.909	6.329	10/21/2019	7.05	Yes	11	0	No	0.001253	Param 1 of 2
Sulfate (mg/L)	HGWC-120	51.55	n/a	10/22/2019	266	Yes	11	0	x^5	0.002505	Param 1 of 2
Sulfate (mg/L)	HGWC-121A	51.55	n/a	10/21/2019	238	Yes	11	0	x^5	0.002505	Param 1 of 2
Sulfate (mg/L)	HGWC-124	51.55	n/a	10/21/2019	78.5	Yes	11	0	x^5	0.002505	Param 1 of 2
Total Dissolved Solids (mg/L)	HGWC-120	360.1	n/a	10/22/2019	693	Yes	10	0	No	0.002505	Param 1 of 2
Total Dissolved Solids (mg/L)	HGWC-121A	360.1	n/a	10/21/2019	771	Yes	10	0	No	0.002505	Param 1 of 2
Total Dissolved Solids (mg/L)	HGWC-124	360.1	n/a	10/21/2019	357	No	10	0	No	0.002505	Param 1 of 2

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Background Data Summary: Mean=0.272, Std. Dev.=0.04241, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9514, critical = 0.792. Kappa = 2.155 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.





Exceeds Limit: HGWC-120, HGWC-121A, HGWC-124

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Hollow symbols indicate censored values.

Prediction Limit



Background Data Summary: Mean=74.16, Std. Dev.=7.826, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9762, critical = 0.792. Kappa = 2.155 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Calcium Analysis Run 1/29/2020 2:58 AM

Hammond AP Client: Georgia Power Data: Hammond AP-3

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Exceeds Limit: HGWC-121A

Prediction Limit



Prediction Limit Exceeds Limit: HGWC-120 Interwell Parametric 2 HGWC-120 1.6 HGWC-121A 1.2 mg/L HGWC-124 0.8 Limit = 0.2549 0.4 0 8/31/16 4/17/17 12/2/17 7/20/18 3/6/19 10/22/19

Background Data Summary: Mean=0.1508, Std. Dev =0.04963, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9256, critical = 0.805. Kappa = 2.096 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 11 background values. Annual per-constituent alpha = 0.06795. Individual comparison alpha = 0.01166 (1 of 2). Comparing 3 points to limit.

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Background Data Summary: Mean=6.619, Std. Dev=0.1346, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9554, critical = 0.792. Kappa = 2.155 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.0012453. Comparison alpha = 0.001253. Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG

Exceeds Limit: HGWC-120, HGWC-121A, HGWC-124

Prediction Limit



Background Data Summary (based on x*5 transformation): Mean=2.4e8, Std. Dev=5.9e7, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8006, critical = 0.792. Kappa = 2.155 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: pH Analysis Run 1/29/2020 2:58 AM Hammond AP Client: Georgia Power Data: Hammond AP-3



Hammond AP Client: Georgia Power Data: Hammond AP-3

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Background Data Summary: Mean=272.8, Std. Dev.=39.42, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8188, critical = 0.781. Kappa = 2.214 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Total Dissolved Solids Analysis Run 1/29/2020 2:58 AM Hammond AP Client: Georgia Power Data: Hammond AP-3

Intrawell Prediction Limit - Significant Results

			Hammond AP	Client: Georg	gia Power I	Data: Hammo	ond AP-3	Printe	d 1/29/2020, 2:48	3 AM	
<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	Date	Observ	<u>/. Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method

Intrawell Prediction Limit - All Results

Hammond AP Client: Georgia Power Data: Hammond AP-3 Printed 1/29/2020, 2:48 AM

Constituent	Well	<u>Upper Lim.</u>	Lower Lim.	<u>Date</u>	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	Method
pH (s.u.)	HGWA-122	7.003	6.257	10/21/2019	6.69	No	8	0	No	0.001253	Param Intra 1 of 2
pH (s.u.)	HGWC-120	7.66	6.71	10/22/2019	6.74	No	8	0	n/a	0.04288	NP Intra (normality) 1 of 2
pH (s.u.)	HGWC-121A	7.65	6.57	10/21/2019	6.74	No	8	0	n/a	0.04288	NP Intra (normality) 1 of 2
pH (s.u.)	HGWC-124	7.219	6.929	10/21/2019	7.05	No	8	0	No	0.001253	Param Intra 1 of 2
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Background Data Summary: Mean=6.63, Std. Dev.=0.1516, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.955, critical = 0.749. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505.



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Within Limits

Prediction Limit Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.08484. Individual comparison alpha = 0.04288 (1 of 2).

Constituent: pH Analysis Run 1/29/2020 2:46 AM

Hammond AP Client: Georgia Power Data: Hammond AP-3

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Within Limits

Prediction Limit



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.08484. Individual comparison alpha = 0.04288 (1 of 2). Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG

Within Limits

Prediction Limit Intrawell Parametric



Background Data Summary: Mean=7.074, Std. Dev.=0.05902, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9892, critical = 0.749. Kappa = 2.458 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002505.

Trend Test - Significant Results

		Hammond AP	Client: Georgia Power	Data: Hammond AP-3		Printed 2/	10/2020, 1	1:22 PM			
Constituent	Well	Slope	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	N	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Chloride (mg/L)	HGWA-122 (bg)	0.2475	46	34	Yes	11	0	n/a	n/a	0.01	NP
Chloride (mg/L)	HGWC-121A	-8.258	-49	-34	Yes	11	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	HGWC-121A	-37.73	-41	-34	Yes	11	0	n/a	n/a	0.01	NP

Trend Test - All Results

		Hammond AP	Client: Georgia Power	Data: Hammond AP-3		Printed 2/10/2020, 11:22 PM					
Constituent	Well	Slope	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	Normality	<u>Xform</u>	<u>Alpha</u>	Method
Boron (mg/L)	HGWA-122 (bg)	-0.01993	-22	-34	No	11	0	n/a	n/a	0.01	NP
Boron (mg/L)	HGWC-120	-0.05273	-16	-34	No	11	0	n/a	n/a	0.01	NP
Boron (mg/L)	HGWC-121A	-0.1988	-28	-34	No	11	0	n/a	n/a	0.01	NP
Boron (mg/L)	HGWC-124	-0.01605	-16	-34	No	11	0	n/a	n/a	0.01	NP
Calcium (mg/L)	HGWA-122 (bg)	-2.43	-7	-34	No	11	0	n/a	n/a	0.01	NP
Calcium (mg/L)	HGWC-120	3.925	15	34	No	11	0	n/a	n/a	0.01	NP
Calcium (mg/L)	HGWC-121A	0	0	34	No	11	0	n/a	n/a	0.01	NP
Calcium (mg/L)	HGWC-124	0.9834	11	34	No	11	0	n/a	n/a	0.01	NP
Chloride (mg/L)	HGWA-122 (bg)	0.2475	46	34	Yes	11	0	n/a	n/a	0.01	NP
Chloride (mg/L)	HGWC-121A	-8.258	-49	-34	Yes	11	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	HGWA-122 (bg)	0	-3	-38	No	12	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	HGWC-120	-0.1016	-21	-38	No	12	0	n/a	n/a	0.01	NP
pH (s.u.)	HGWA-122 (bg)	-0.06942	-17	-34	No	11	0	n/a	n/a	0.01	NP
pH (s.u.)	HGWC-124	0.01007	6	34	No	11	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	HGWA-122 (bg)	-1.132	-27	-34	No	11	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	HGWC-120	-8.778	-16	-34	No	11	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	HGWC-121A	-20.99	-29	-34	No	11	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	HGWC-124	1.626	27	34	No	11	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	HGWA-122 (bg)	-4.614	-7	-30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	HGWC-120	-14.48	-9	-30	No	10	0	n/a	n/a	0.01	NP
Total Dissolved Solids (mg/L)	HGWC-121A	-37.73	-41	-34	Yes	11	0	n/a	n/a	0.01	NP







Sen's Slope Estimator

Constituent: Boron Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3

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Constituent: Boron Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 ٠

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100

80

60

40

20

Ω

8/30/16

4/16/17

12/1/17

mg/L





Constituent: Calcium Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 n = 11

Slope = 3.925

units per year.

Mann-Kendall

statistic = 15 critical = 34

Trend not significant at 99% confidence level

 $(\alpha = 0.005 \text{ per tail}).$

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Sen's Slope Estimator

HGWA-122 (bg)

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7/19/18

Constituent: Calcium Analysis Run 2/10/2020 11:20 PM

Hammond AP Client: Georgia Power Data: Hammond AP-3

3/5/19

10/21/19

n = 11

Slope = -2.43

units per year

Mann-Kendall

statistic = -7 critical = -34

Trend not significant at 99% confidence level

(α = 0.005 per tail).

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Constituent: Calcium Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG



Constituent: Calcium Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3





Hammond AP Client: Georgia Power Data: Hammond AP-3



Constituent: Chloride Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3

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Constituent: Fluoride Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG



Constituent: Fluoride Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3

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Constituent: Sulfate Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG



n = 11

Slope = 0.01007

units per year.

Mann-Kendall

Trend not significant at 99% confidence level

 $(\alpha = 0.005 \text{ per tail}).$

statistic = 6 critical = 34

Constituent: Sulfate Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3



Hammond AP Client: Georgia Power Data: Hammond AP-3



Constituent: Sulfate Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3



Constituent: Total Dissolved Solids Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3 Sanitas™ v.9.6.23f Sanitas software licensed to Geosyntec Consultants. UG



Constituent: Total Dissolved Solids Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3

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Constituent: Total Dissolved Solids Analysis Run 2/10/2020 11:20 PM Hammond AP Client: Georgia Power Data: Hammond AP-3