GROUNDWATER MONITORING PLAN

PLANT HAMMOND – ASH POND 2 (AP-2)
5 YEAR PERMIT REVIEW
FLOYD COUNTY, GEORGIA

FOR

Georgia Power

DECEMBER 2024 (REVISION 2)

Geosyntec consultants

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I. CERTIFICATION

This *Groundwater Monitoring Plan, Georgia Power Company - Plant Hammond Ash Pond 2 (AP-2)* has been prepared by a qualified groundwater scientist or engineer with Geosyntec Consultants, Inc. (Geosyntec) to meet the requirements contained in Chapter 391-3-4-.10 of the Georgia Environmental Protection Division Rules of Georgia, Solid Waste Management, Coal Combustion Residuals (i.e., State CCR Rule). References to the appropriate sections of the State CCR Rule are incorporated throughout this document.

I hereby certify that this Groundwater Monitoring Plan was prepared by, or under the direct supervision of, a "Qualified Groundwater Scientist," in accordance with the State of Georgia Rules of Solid Waste Management. According to 391-3-4-.01, a Qualified Groundwater Scientist is "a professional engineer or geologist registered to practice in Georgia who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action." The design of the groundwater monitoring system was developed in compliance with Georgia Environmental Protection Division Rules of Solid Waste Management, Chapter 391-3-4.10(6).

Signature: _____

Date: 12/18/2024

GEORGIA REGISTERED No. PE036641 PROFESSIONAL ENGINEER WHITNEY B. LAW

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
Approved
Solid Waste Management Program
Approved By: Mark Wescott P.G. Digitally signed by Mark Wescott P.G. Date: 2025.05.27 12:30:37 -04'00'

Signature: _____

Date: 12/18/2024

JOSEPH M. IVANOWSKI GEORGIA REGISTERED PROFESSIONAL GEOLOGIST No. 002140

1. INTRODUCTION

Groundwater monitoring is required by the Georgia Environmental Protection Division (EPD) to detect and quantify potential changes in groundwater chemistry. This Groundwater Monitoring Plan (plan) describes the groundwater monitoring program for Ash Pond 2 (AP-2 or Site) at Georgia Power Company's (Georgia Power's) Plant Hammond. This plan meets the requirements of EPD rules and uses EPD's *Manual for Ground Water Monitoring* dated September 1991 as a guide. Groundwater monitoring well locations are presented on **Figure A-1** of **Appendix A** and well construction details in **Table A-1** of Appendix A.

Groundwater monitoring will occur in accordance with 391-3-4-.10 of the Georgia Solid Waste Management Rules. If the monitoring requirements specified in this plan conflict with EPD rules (391-3-4), the EPD rules will take precedent.

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Residual (CCR) Rule (§257.90), which is incorporated by Georgia State CCR Rule by reference, a detection monitoring well network for AP-2 has been installed and certified by a qualified professional engineer. This certification has been placed in the facility's operating record and is included in Part B of the permit application. The existing monitoring wells were installed following the guidelines presented herein. Additionally, this plan documents the methods for future monitoring well installation and/or replacement, and procedures for well abandonment. As required by 391-3-4.10(6)(g), a minor modification will be submitted to the EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a Qualified Groundwater Scientist.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

The following section presents the geologic and hydrogeologic conditions for the Site as described in the "*Hydrogeologic Assessment Report (Revision 1)"* (HAR) (Geosyntec, 2019).

2.1 SITE GEOLOGY

AP-2 is located in the Valley and Ridge Physiographic Province of 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. (Golder, 2017) indicates that the Site is underlain by the lower units of the Cambrian age Conasauga Formation, consisting of mostly calcareous shale. Based on review of subsurface investigations at the Site, the bedrock was identified as predominantly calcareous shale and fissile black shale. AP-2 is underlain primarily by five lithologic units; (i) terrace alluvium, (ii) colluvium, (iii) residuum, (iv) partially weathered shale bedrock, and (v) unweathered shale bedrock.

Based on subsurface investigations, the alluvial deposits generally grade from a silt and silty clay to a clayey sand and silty sand to a sand and gravelly sand at depth. The colluvium consists of silty sand, silty clay with angular and sub-rounded chert fragments, and dolomite, sandstone, and shale fragments. Residual or native soils have been derived from the in-place weathering of the shale bedrock. The residuum is generally described as brown to yellow brown firm clayey silt with weathered shale fragments. The partially weathered shale zone occurs as an intermediate weathering stage between the residuum and the unweathered shale bedrock. The weathered material is described as black to dark gray to dark red hard, fissile shale and claystone. Limited rock was encountered within 20 feet of the water table during previous investigations. The unweathered shale bedrock was not encountered or directly observed in the historical borings advanced at the Site. However, based on geologic conditions in the region, weathering, fracturing and jointing decreases with depth and the weathered rock material grades into competent bedrock.

2.2 SITE HYDROGEOLOGY

The uppermost aquifer at AP-2 is a regional groundwater aquifer that occurs primarily in the residuum and within the weathered and fractured bedrock. Under natural conditions the water table surface would be expected to be a subdued reflection of the topography. Recharge is by precipitation falling on bedrock outcrop areas and through alluvial, colluvial, and residual soils to the bedrock. Based on observations of residuum soil types and horizontal conductivity values, the movement of groundwater in the soil can be characterized as low-to moderate permeability, porous media flow. The groundwater flow in the shallow underlying bedrock is characterized as fracture flow, and due to the preponderance of shale beneath the Site, is expected to be very low permeability. The regional groundwater flow direction is expected to be from north to south; however, the local flow direction beneath the Site is predominantly east to west with an additional southerly component. The flow direction is shown on the potentiometric surface map (**Figure A-2**) in Appendix A. The potentiometric surface map represents data recorded in February 2024.

Horizontal hydraulic conductivity (K_h) measurements were calculated from slug test data collected in a subset of AP-2 wells and piezometers. Results were broadly grouped based on the lithology in which the wells or piezometers were screened. At AP-2, the K_h for wells and piezometers screened in the alluvium, colluvium, and residuum/partially weathered rock ranged from 9.7×10^{-5} centimeters per second (cm/sec)

to 1.5 x 10^{-3} cm/sec with a geometric mean K_h of 5.2 x 10^{-4} cm/sec (Geosyntec, 2019), presented in Table A-1 of Appendix A.

2.3 HYDRAULIC GRADIENT AND GROUNDWATER FLOW VELOCITY

The horizontal groundwater hydraulic gradients within the uppermost aquifer beneath AP-2 was calculated using the groundwater elevation data from the February 12, 2024, gauging event (Figure A-2). A horizontal hydraulic gradient is commonly calculated between two points along the groundwater flow path perpendicular to groundwater elevation contours. Ideally, this flow path originates and concludes with groundwater elevations reported for two wells, but this may not be feasible and still remain perpendicular to the contours. The horizontal hydraulic gradient in this report was calculated between upgradient and downgradient wells selected to provide the most accurate alignment possible relative to the interpreted groundwater flow path. The horizontal hydraulic gradient was calculated across the central portion of AP-2 between MW-18 and HGWC-17. The general trajectory of the flow path used in the calculations and associated potentiometric contour lines are shown on Figure A-2. The calculated hydraulic gradient along the westerly flow path line for the February 2024 data is 0.006 feet per foot (ft/ft).

The minimum, maximum, and average groundwater velocities were calculated using: the horizontal hydraulic conductivity (K_h) values derived from slug tests detailed in the HAR (Geosyntec, 2019); the hydraulic gradient between the well pair discussed above; and an estimated effective porosity of 0.15, based on review of literature (Kresic, 2007), observed site lithology, and professional judgement. Based on these parameters, Darcy's equation for flow velocity in a porous medium was used as follows:

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

where:

V = Groundwater flow velocity (ft/day)
K_h = Horizontal Hydraulic Conductivity (ft/day)
i = Horizontal hydraulic gradient (ft/ft)
h_1 and h_2 = Groundwater elevation at location 1 and 2
L = Distance between location 1 and 2
n_e = Effective porosity

The supporting hydraulic gradient calculation and groundwater flow velocity calculations are presented in **Table A-2** of Appendix A.

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells were installed to monitor the uppermost occurrence of groundwater beneath the Site. Locations were selected based on the AP-2 footprint and geologic and hydrogeologic considerations. Georgia Power follows the recommendation as stated in Chapter 2 of the *Manual for Groundwater Monitoring* (EPD, 1991) to establish well spacings based on site-specific conditions. The monitoring well network for AP-2 is depicted on Figure A-1 included in Appendix A, Monitoring System Details. A more detailed discussion of the hydrogeological investigation conducted in support of monitoring well placement is provided in the HAR (Geosyntec, 2019).

The groundwater detection monitoring well network locations were chosen to monitor upgradient (HGWA) and downgradient (HGWC) conditions at the Site based on groundwater flow direction determined by potentiometric evaluation. The potentiometric surface map, Figure A-2 in Appendix A, depicts the groundwater flow direction beneath AP-2, based on February 2024 conditions. Wells are positioned to provide adequate coverage to detect potential impacts from the CCR impoundment. The majority of the wells, both upgradient and downgradient of AP-2, are screened in the uppermost aquifer, in the alluvium, colluvium, residuum, and/or or partially weathered shale bedrock above the competent shale bedrock. A limited number of wells were installed within the bedrock to characterize both background and downgradient conditions within the bedrock proximal to the unit. Recorded groundwater level data indicate these wells screened within the bedrock are hydraulically connected with the surficial aquifer.

Monitoring wells are generally located outside of areas with frequent auto traffic (Figure A-1); however, wells may be installed in heavily trafficked areas when necessary to meet the groundwater monitoring objectives of the EPD rules. Appendix A includes Table A-1 which provides a tabulated list of location coordinates for the individual wells and piezometers. Additional well and piezometer construction details (i.e., top-of-casing elevation, well depths and screened intervals) are also provided on this table. Well survey data certified by a Georgia-registered professional surveyor are included in Appendix A.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT AND REPORTING

The AP-2 monitoring well network described in this plan is already in place. The existing monitoring wells were installed in general accordance with the EPD *Manual for Groundwater Monitoring* (EPD, 1991) guidance document available at that time. Boring and well construction logs are provided in Appendix A for all wells and piezometers listed in Table A-1. Additional wells, if necessary, will be installed in accordance with USEPA Region 4 Science and Ecosystem Support Division (SESD) *Guidance for the Design and Installation of Monitoring Wells* (USEPA, SESDGUID-101-R2) or latest version as a general guide for best practices.

4.1 DRILLING

A variety of well drilling methods are available for the purpose of installing groundwater monitoring wells. Drilling methodologies include but are not limited to: hollow stem augers, direct push, air rotary, mud rotary, and rotosonic techniques. The drilling method will be selected to minimize the disturbance of subsurface materials and not cause impacts to groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in the site-specific geology. Monitoring wells will be installed using the most current version of the USEPA SESDGUID-101-R# as a general guide for best practices. Also, drilling equipment will be decontaminated before use and between borehole locations using the procedures described in the most current version of USEPA LSASD's *Operating Procedure for Field Equipment Cleaning and Decontamination* (USEPA, LSASDPROC-205-R4). Well installation will be directed by a Qualified Groundwater Scientist.

Sampling and/or coring may be used to help determine the stratigraphy and geology at the well location. Samples and cores will be logged by a Qualified Groundwater Scientist. Screen depths will be chosen based on the target installation depth.

All drilling for any subsurface hydrologic investigation, or for installation or abandonment of groundwater monitoring wells, will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. Appendix A includes the performance bonds applicable to the wells and piezometers listed in Table A-1.

4.2 DESIGN AND CONSTRUCTION

Well construction materials will be sufficiently durable to resist chemical and physical degradation and will not interfere with the quality of groundwater samples.

<u>WELL CASINGS AND SCREENS</u>

American Society for Testing and Materials (ASTM), National Science Foundation (NSF) rated, Schedule 40, 2-inch diameter polyvinyl chloride (PVC) pipe with flush threaded connections will be used for the well riser and screens. Compounds that can cause PVC to deteriorate (e.g., organic compounds) are not expected at this facility. If conditions warrant, other USEPA-approved and appropriate materials may be used for construction.

WELL INTAKE DESIGN

Intake for groundwater monitoring wells will be designed and constructed to: (1) allow sufficient groundwater flow to the well for sampling; (2) minimize the passage of formation materials (turbidity) into the well; and (3) ensure sufficient structural integrity to prevent the collapse of the intake structure.

Each groundwater monitoring well will include a well screen designed to limit the amount of formation material passing into the well when it is purged and sampled. Screens with 0.010-inch slots have proven effective for the earth materials at the Site and will be used unless geologic conditions discovered at the time of installation dictate a different size. Screen length will not exceed 10 feet without justification as to why a longer screen is necessary (e.g., significant variation in groundwater level). If these specifications prove ineffective for developing a well with sufficient yield or acceptable turbidity, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

Pre-packed dual-wall well screens may be used for well construction. Pre-packed well screens combine a centralized inner well screen, a developed filter sand pack, and an outer conductor screen in one integrated unit composed of inert materials. If utilized, pre-packed well screens will be installed following general industry standards and using the current version of USEPA SESDGUID-101-R# as a general guide. If the dual-wall pre-packed-screened wells do not yield sufficient water or are excessively turbid after development, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

FILTER PACK AND ANNULAR SEAL

The materials used to construct the filter pack will be clean quartz sand of a size that is appropriate for the screened formation. Fabric filters will not be used as filter pack material. Sufficient filter material will be placed in the boring and measurements taken to ensure that no bridging occurs. Upon placement of the filter pack, the well may be pumped to assure settlement of the pack. If pumping is performed, the top elevation of filter pack depth will be monitored, and additional sand added if necessary. The filter pack will extend a minimum of two feet above the top of the well screen.

The materials used to seal the annular space in the boring above the well pack must prevent hydraulic communication between strata and prevent migration from overlying areas into the well screen interval. A minimum of two feet of bentonite (chips, pellets, or slurry) will be placed immediately above the filter pack. The bentonite seal will extend up to the base of any overlying confining zone or the top of the water-bearing zone to prevent cementitious grout from entering the water-bearing or screened zones. If dry bentonite is used, the bentonite must be hydrated with potable water prior to grouting the remaining annulus.

The annulus above the bentonite seal will be grouted with a cement and bentonite mixture (approximately 94 pounds cement / 3 to 5 pounds bentonite / 6.5 gallons of potable water) placed via tremie pipe from the top of the bentonite seal. During grouting, care will be taken to assure that the bentonite seal is not disturbed by locating the base of the tremie pipe approximately two feet above the bentonite seal and injecting grout at low pressure/velocity.

PROTECTIVE CASING AND WELL COMPLETION

After allowing the grout to settle, the well will be finished by installing a flush-mount or above-ground protective casing as appropriate, and building a surface cap. The use of flush-mount wells will generally be limited to paved surfaces unless Site operations warrant otherwise. The surface cap will extend from the top of the cementitious grout to ground surface, where it will become a concrete apron extending outward with a radius of at least 2 feet from the edge of the well casing and sloped to drain water away from the well.

Each well will be fitted with a cap that contains a hole or opening to allow the air pressure in the well to equalize with atmospheric pressure. In wells with above-ground protection, the space between the well casing and the protective casing will be filled with coarse sand or pea-gravel to within approximately 6 inches of the top of the well casing. A small weep hole will be drilled at the base of the metal casing for the drainage of moisture from the casing. Above ground protective covers will be locked.

Protective bollards will be installed around each above-grade groundwater monitoring well. Well construction in high traffic areas will generally be limited unless Site conditions warrant otherwise.

The groundwater monitoring well detail attached in **Appendix B**, Groundwater Monitoring Well Detail, illustrates the general design and construction details for a monitoring well.

WELL DEVELOPMENT

Well development will be conducted under supervision of a qualified groundwater scientist. After well construction is completed, wells will be developed by alternately purging and surging until relatively clear discharge water with little turbidity is observed. The goal will be to achieve a turbidity of less than 5 nephelometric turbidity units (NTUs); however, formation-specific conditions may not allow this target to be accomplished. Development can be discontinued once a minimum of 10 NTU is achieved. Additionally, the stabilization criteria contained in **Appendix C** should be met. A variety of techniques may be used to develop Site groundwater monitoring wells. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. All development equipment will be decontaminated prior to first use and between wells.

In low-yielding wells, potable water may be added to the well to facilitate surging of the well screen interval and removal of fine-grained sediment. If water is added, the volume will be documented and at minimum, an equal volume purged from the well.

Many geologic formations contain clay and silt particles that are small enough to work their way through a well's filter pack over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, monitoring wells may need to be redeveloped periodically to remove the silt and clay that has worked its way into the filter packs of the wells. Each monitoring well should be redeveloped when sample turbidity values have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above. Well development data will be included in the well installation report.

4.3 ABANDONMENT

Per Georgia Rule 391-3-4-.10(6)(g), monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the EPD. Monitoring wells will be abandoned using industry-accepted practices and using the EPD *Manual for Groundwater Monitoring* (EPD, 1991) and Georgia's Well Water Standards Act of 1985 [Official Code of Georgia Annotated (O.C.G.A.) § 12-5-120, 1985] as guides. The wells will be abandoned under the direction of a Qualified Groundwater Scientist registered in Georgia. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. A minor modification shall be submitted in accordance with Rule 391-3-4.02(3)(b)(6) prior to the installation or decommissioning of monitoring wells. Any piezometers or groundwater wells located within the footprint of AP-2 will be over-drilled prior to abandonment

4.4 DOCUMENTATION

Within 60 days of the construction, development, and survey, or abandonment of each new groundwater monitoring well completed under the direction of a Qualified Groundwater Scientist, a well installation/abandonment report will be submitted to the EPD. The following information will be documented in this report.

- Well identification
- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council
- Narrative of drilling technique applied, well construction details, and well development procedures, including dates, drilling fluids used (if applicable), well casing and screen materials, screen slot size, and joint type
- Details of filter pack material/size, emplacement method (narrative), and volume
- Seal emplacement method and type/volume of sealant
- Borehole diameter and well casing diameter
- Type of protective well cap and sump dimensions
- Surface seal and volumes/mix of annular seal material
- Screen length and interval reported in feet below ground surface and elevation
- Well location given to within an accuracy of 0.5 feet based upon survey from acceptable survey point datum by a Georgia-registered professional surveyor
- Well depth given to within an accuracy of 0.01 feet based upon survey from acceptable survey point datum by a Georgia-registered professional surveyor
- Lithologic logs
- Documentation that water quality field parameters meet well development criteria (Section 4.2)
- Completed calibration field forms for the water quality instrumentation used during well development activities.
- Documentation of ground surface elevation (±0.01 feet)
- Documentation of top of casing elevation (±0.01 feet)
- Schematic of the well with dimensions for all components (e.g., casing, screen, sump, well pad)

In accordance with the Georgia Water Well Standards Act (O.C.G.A §12-5-134(5)(d)(vii)), at least once every five years, the owner of the property on which a monitoring well is constructed shall have the

monitoring well(s) inspected by a Qualified Groundwater Scientist, who shall direct appropriate remedial corrective work to be performed if the well does not conform to standards. Well inspection records and records of remedial corrective work are subject to review by EPD. Additionally, the cost estimate based upon current year cost for the well inspections will be provided as part of the cost calculations for the groundwater monitoring period.

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

The following describes groundwater sampling requirements with respect to parameters for analysis, sampling frequency, sample preservation and shipment, and analytical methods. Groundwater samples used to provide compliance monitoring data will not be filtered prior to collection.

Table 1, Groundwater Monitoring Parameters and Frequency, presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from existing detection monitoring wells were collected between May 2016 and May 2017, except for wells HGWA-42D, HGWA-43D, and HGWA-44D which were installed after 2017, and analyzed for 40 CFR 257, Subpart D, Appendix III and Appendix IV test parameters to establish a background statistical dataset. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semi-annually during the post-CCR removal monitoring period. Pursuant to 391-3-4-.10(6), an assessment monitoring program was initiated for AP-2 in January 2018 based on statistically significant increases documented in the *2017 Annual Groundwater Monitoring and Corrective Action Report* (dated January 31, 2018) (ERM, 2018). Georgia Power will conduct assessment monitoring in accordance with Chapter 391-3-4-.10(6).

When referenced throughout this plan, Appendix III and Appendix IV parameters refer to the parameters contained in Appendix III and Appendix IV of 40 CFR 257, Subpart D, 80 Fed. Reg. 21468 (April 17, 2015).

As shown on **Table 2**, Analytical Methods, the groundwater samples will be analyzed using methods specified in USEPA Manual SW-846, USEPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), USEPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), ASTM, or other suitable analytical methods approved by EPD. The method used will be able to reach a suitable practical quantification limit to detect natural background conditions at the facility. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Conference (NELAC). Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

TABLE 1
GROUNDWATER MONITORING PARAMETERS & FREQUENCY

MONITORING PARAMETER		GROUNDWATER MONITORING	
		Background	Semi-Annual Events
Field Parameters	Temperature	X	X
	pH	X	X
	ORP	X	X
	Turbidity	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
Appendix III (Detection)	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
Appendix IV (Assessment)	Antimony	X	Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4.10(6).
	Arsenic	X	
	Barium	X	
	Beryllium	X	
	Cadmium	X	
	Chromium	X	
	Cobalt	X	
	Fluoride	X	
	Lead	X	
	Lithium	X	
	Mercury	X	
	Molybdenum	X	
	Selenium	X	
	Thallium	X	
	Radium 226 & 228	X	

TABLE 2
ANALYTICAL METHODS

Parameters	USEPA Method Number
Boron	6010D/6020B
Calcium	6010B/6020B
Chloride	300.0/300.1/9250/9251/9253/9056A
Fluoride	300.0/300.1/9214/9056A
pH	150.1 field
Sulfate	9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	160/2540C
Antimony	EPA 7040/7041/6010B/6020B
Arsenic	EPA 7060A/7061A/6010B/6020B
Barium	EPA 7080A/7081/6010B/6020B
Beryllium	EPA 7090/7091/6010B/6020B
Cadmium	EPA 7130/7131A/6020B
Chromium	EPA 7190/7191/6010B/6020B
Cobalt	EPA 7200/7201/6010B/6020B
Fluoride	300.0/300.1/9214/9056A
Lead	EPA 7420/7421/6010B/6020B
Lithium	6010/6020B
Mercury	7470A
Molybdenum	6010/6020B
Selenium	EPA 7740/7741A/6010B/6020B
Thallium	EPA 7840/7841/6010/6020B
Radium 226 and 228 combined	EPA 903/9320/9315

6. SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in **Appendix C**, Groundwater Sampling Procedure. Sampling procedures were developed using standard industry practice and USEPA Region 4 *Field Branches Quality System and Technical Procedures* as a guide. Low-flow sampling methodology will be utilized for sample collection. Alternative USEPA accepted sampling techniques may be used when appropriate. The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

For groundwater sampling, positive gas displacement Teflon or stainless-steel bladder pumps will be used for purging. If dedicated bladder pumps are not used, portable bladder pumps or peristaltic pumps (with dedicated or disposable tubing) may be used. When non-dedicated equipment is used, it will be decontaminated prior to use and between wells.

Per Georgia Rule 391-3-4-.10(6)(g) monitoring wells require replacement after two consecutive dry sampling events. Well installation must be directed by a Qualified Groundwater Scientist. A minor modification shall be submitted in accordance with Rule 391-3-4-.02(3)(b)(6) prior to the installation or decommissioning of monitoring wells.

7. CHAIN-OF-CUSTODY

All samples will be handled under chain-of-custody (COC) procedures beginning in the field. The COC record will contain the following information:

- Sample identification numbers
- Signature of collector
- Date and time of collection
- Sample type
- Sample point identification
- Number of sample containers
- Signature of person(s) involved in the chain of possession
- Notated date(s) and time(s) of sample transfer between individuals

The samples will remain in the custody of assigned personnel, an assigned agent, or the laboratory. If the samples are transferred to other employees for delivery or transport, the sampler or possessor will relinquish possession and the samples must be received by the new owner, both documented on the COC.

If the samples are being shipped, a hard copy COC will be signed and enclosed within the shipping container.

Samplers will use COC forms provided by the analytical laboratory or use a COC form similarly formatted and containing the information listed above.

8. FIELD QUALITY ASSURANCE / QUALITY CONTROL

All field quality control samples will be prepared the same as compliance samples with regard to sample volume, containers, and preservation. The following quality control samples will be collected during each sampling event:

Field Equipment Rinsate Blanks - Where sampling equipment is not new or dedicated, an equipment rinsate blank will be collected at a rate of one blank per 10 samples using non-dedicated equipment.

Field Duplicates - Field duplicates are collected by filling additional containers at the same location, and the field duplicate is assigned a unique sample identification number. One blind field duplicate will be collected for every 20 samples.

Field Blanks - Field blanks are collected in the field using the same water source that is used for decontamination. The water is poured directly into the supplied sample containers in the field and submitted to the laboratory for analysis of target constituents. One field blank will be collected for every 20 samples.

The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP).

Calibration of field instruments will occur daily and follow the recommended (specific) instrument calibration procedures provided by the manufacturer and/or equipment manual specific to each instrument. Daily calibration will be documented on field forms and these field forms will be included in all groundwater monitoring reports. Instruments will be recalibrated as necessary (e.g., when calibration checks indicate significant variability), and all checks and recalibration steps will be documented on field calibration forms. Calibration of the instruments will also be checked if any readings during sampling activities are suspect. Replacement probes and meters will be obtained as a corrective action in the event that recalibration does not improve instrument function. Completed calibration field forms will be provided with the semi-annual groundwater monitoring reports.

9. REPORTING RESULTS

A semi-annual groundwater report that documents the results of sampling and analysis will be submitted to EPD. Semi-annual groundwater monitoring reports will be submitted to the EPD within 90 days of receipt and analysis of the groundwater analytical data from the laboratory. At a minimum, semi-annual reports will include:

1. A narrative describing sampling activities and findings including a summary of the number of samples collected, the dates the samples were collected and whether the samples were required by the detection or assessment monitoring programs.

2. A narrative of purging/sampling methodologies, which will include the type of sampling equipment used.

3. Discussion of results.

4. Recommendations for the future monitoring consistent with the Rules.

5. Potentiometric surface contour map for the aquifer(s) being monitored, signed and sealed by a Georgia-registered P.G. or P.E.

6. Table of as-built information for groundwater monitoring wells including top of casing elevations, ground elevations, screened elevations, current groundwater elevations and depth to water measurements.

7. Groundwater flow rate and direction calculations.

8. Identification of any groundwater wells that were installed or abandoned during the preceding year, along with a narrative description of why these actions were taken.

9. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels).

10. If applicable, semi-annual assessment monitoring results.

11. Any alternate source demonstration completed during the reported monitoring period, if applicable.

12. Laboratory Reports and associated data validation reports.

13. COC documentation.

14. Field sampling logs including field instrument calibration, indicator parameters and parameter stabilization data.

15. Field logs and forms will be kept for each sampling event, and will include the following, but not be limited to, well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling

16. Documentation of non-functioning wells.

17. Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL).

18. Statistical analyses.

19. Certification by a Qualified Groundwater Scientist.

20. An iso-concentration map of each Appendix IV constituent identified at a statistically significant level (SSL) during the reporting period. The concentrations will be contoured to the current applicable groundwater protection standard. Inclusion of the map(s) is only applicable for a unit currently undergoing assessment of corrective measures and/or corrective action

21. Trend charts (only applicable for a unit currently undergoing assessment of corrective measures and/or corrective action)

22. Updated potable water well survey, annually (if applicable based on exceedance of groundwater protection standards)

10. STATISTICAL ANALYSIS

Groundwater quality data from each sampling event will be statistically evaluated to determine if there has been a statistically significant change in groundwater chemistry. Historical background data will be used to determine statistical limits. Statistical analysis techniques are consistent with the USEPA document *Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance* (Unified Guidance) (USEPA, 2009).

According to EPD rules [391-3-4-.10(6)(a)], the Site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that will be used include:

1. A prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit. [§257.93(f)(3)].

2. A control chart approach that gives control limits for each constituent. [§257.93(f)(4)].

3. Another statistical test method (such as prediction limits or control charts) that meets the performance standards of §257.93(g) [§257.93(f)(5)]. A justification for an alternative method will be placed in the operating record and the Director notified of the use of an alternative test. The justification will demonstrate that the alternative method meets the performance standards of §257.93(g).

An interwell statistical method will be used to compare Appendix III groundwater monitoring data to background conditions. Confidence intervals will be constructed for each downgrardient well and used to compare Appendix IV groundwater monitoring data to groundwater protection standards.

A site-specific statistical analysis plan that provides details regarding the statistical methods to be used will be placed in the Site's operating record pursuant to 391-3-4-.10(6). **Figure 1**, *Statistical Analysis Plan Overview*, includes a flowchart that depicts the process that will be followed to develop the site-specific plan. **Figure 2**, Decision Logic for Computing Prediction Limits, presents the logic that will be used to calculate site-specific statistical limits and test compliance results against those limits.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

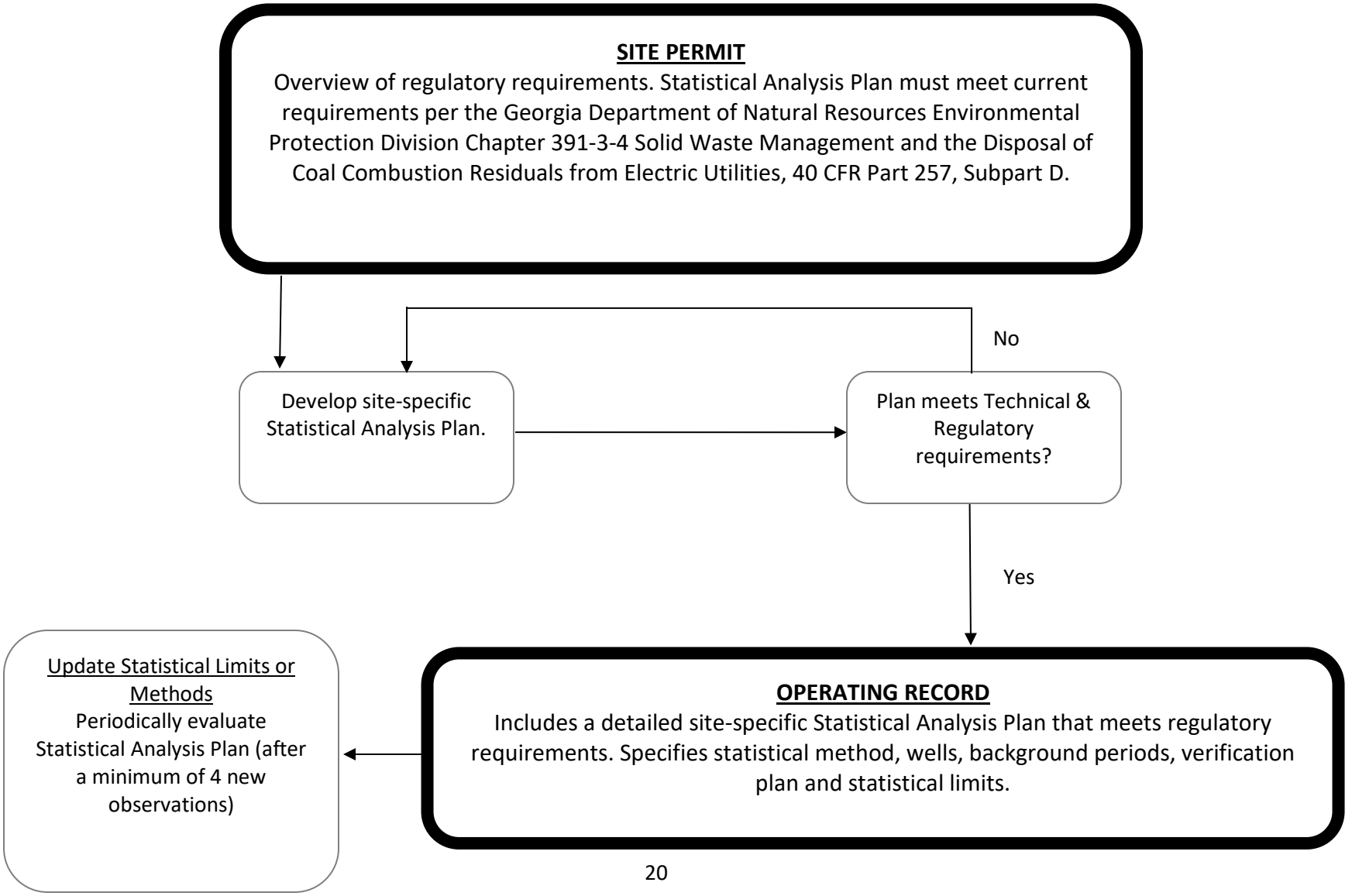
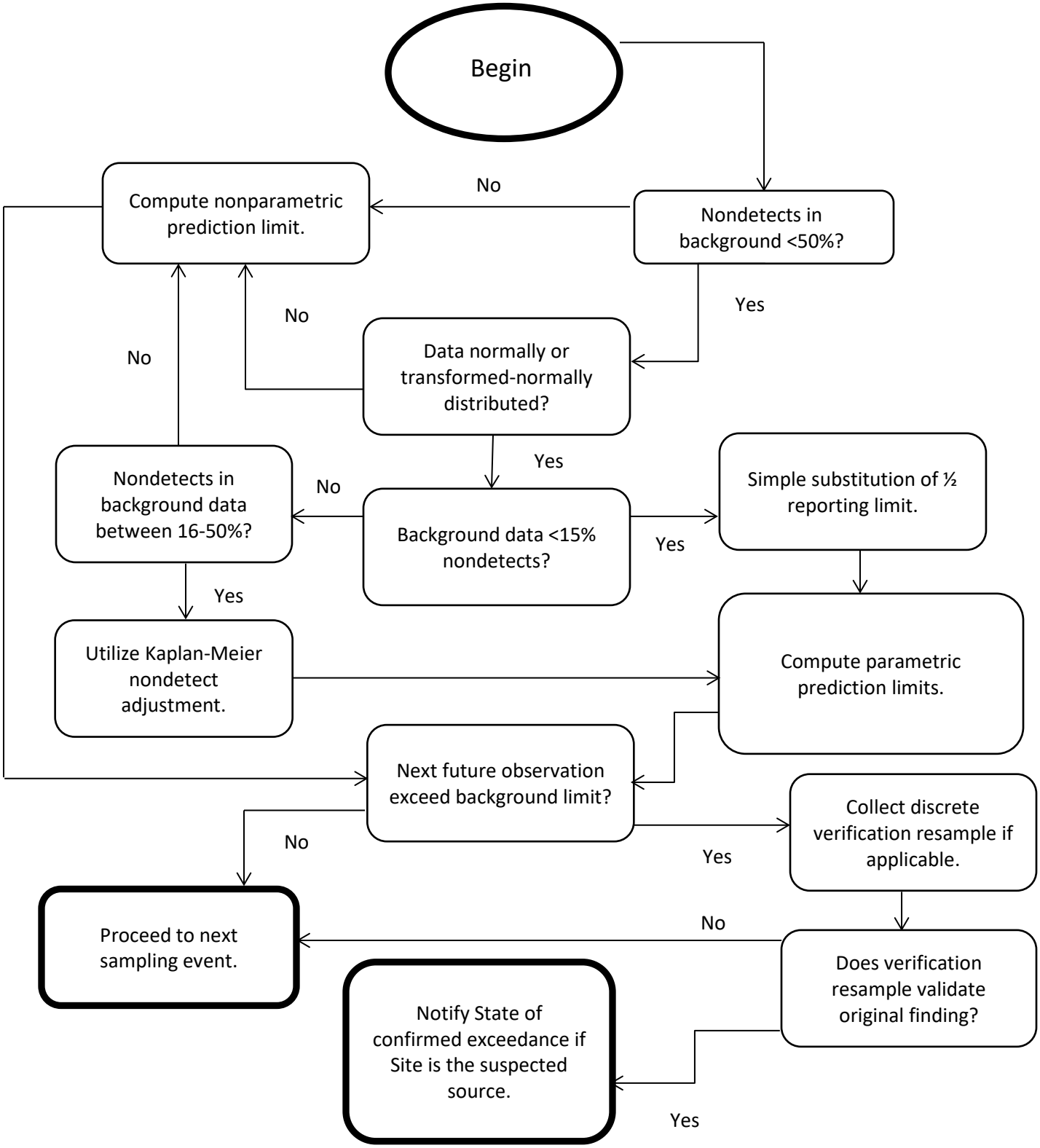


FIGURE 2. DECISION LOGIC FOR COMPUTING PREDICTION INTERVALS



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APPENDIX

A. MONITORING SYSTEM DETAILS
B. GROUNDWATER MONITORING WELL DETAIL
C. GROUNDWATER SAMPLING PROCEDURE

A. MONITORING SYSTEM DETAILS

FIGURE A-1 GROUNDWATER MONITORING NETWORK MAP

FIGURE A-2 POTENTIOMETRIC SURFACE CONTOUR MAP – FEBRUARY 2024

TABLE A-1 AP-2 WELL AND PIEZOMETER NETWORK DETAILS

TABLE A-2 HORIZONTAL GROUNDWATER GRADIENT AND FLOW VELOCITY CALCULATIONS

BORING AND WELL CONSTRUCTION LOGS

CERTIFIED WELL NETWORK SURVEY DATA

PERFORMANCE BOND FOR DRILLERS

FIGURES

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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Solid Waste Management Program

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HGWA-1
HGWA-43D
HGWA-44D
HGWA-4
GA-20 Alabama Hwy
HGWA-3
HGWA-2
HGWA-42D
MW-52
MW-16
MW-17
MW-18
HGWC-18
MW-37D
MW-21D
HGWA-5
HGWA-6
AP-2
HGWC-17
MW-36D
HGWC-16
Fosters Mill Rd
MW-9
MW-8
HGWC-14
MW-34D
MW-33
MW-35
MW-51
MW-12
MW-23D
MW-22
HGWC-15
Coosa River

N

LEGEND

- Detection Monitoring Well
- Horizontal Assessment Monitoring Well
- Vertical Assessment Monitoring Well
- Piezometer
- Approximate AP-2 Boundary
- Plant Hammond Property Boundary
- Unnamed Creek

Notes:
1. Piezometers installed in support of corrective action implementation are not shown.
2. Aerial photograph source: 2024 Microsoft Corporation, 2024 Maxar NES, Distribution Airbus DS, and Georgia Power Company, January 2024.

0 150 300 600

SCALE IN FEET

GROUNDWATER MONITORING NETWORK MAP

GEORGIA POWER COMPANY
PLANT HAMMOND AP-2
ROME, FLOYD COUNTY, GEORGIA

Prepared For: Georgia Power

Prepared By: Geosyntec consultants

KENNESAW, GA | DECEMBER 2024

FIGURE A-1

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HGWA-43D (577.73)
HGWA-1 577.91
HGWA-44D (576.31)
GA-20 Alabama Hwy
HGWA-4 579.84
HGWA-3 573.93
HGWA-2 573.71
HGWA-42D (576.92)
MW-52 578.47
MW-17 578.73
MW-16 569.77
MW-18 572.41
578
576
574
572
570
568
566
564
MW-37D (566.33)
HGWC-18 566.91
MW-21D (566.29)
HGWA-6 577.74
HGWA-5 576.38
AP-2
HGWC-17 564.89
Unnamed Creek 563.39
MW-36D (565.63)
HGWC-16 565.36
Fosters Mill Rd
MW-9 569.51
MW-8 565.45
Coosa River 562.50
MW-34D (564.77)
HGWC-14 566.00
MW-35 566.53
MW-33 566.11
MW-51 565.96
MW-12 565.87
MW-23D (563.65)
HGWC-15 565.66
MW-22 564.27
Coosa River

N

LEGEND

- Detection Monitoring Well
- Horizontal Assessment Monitoring Well
- Vertical Assessment Monitoring Well
- Piezometer
- Surface Water Level Gauge Point
- Groundwater Elevation Contour
- Approximate Groundwater Flow Direction
- Approximate AP-2 Boundary
- Plant Hammond Property Boundary

GEORGIA REGISTERED No. PE036540 PROFESSIONAL ENGINEER WHITNEY B. LAW

Notes:
1. Water level elevation recorded on February 12, 2024. Elevation provided in feet (ft) referenced to the North American Vertical Datum of 1988 (NAVD 88).
2. Groundwater elevations in parentheses were not used to make the groundwater contours because these wells are screened at a different elevation in the formation/aquifer.
3. Piezometers installed in support of corrective action implementation are not shown.
4. Aerial photograph source: 2024 Microsoft Corporation, 2024 Maxar NES, Distribution Airbus DS, and Georgia Power Company, January 2024.

0 150 300 600

SCALE IN FEET

POTENTIOMETRIC SURFACE CONTOUR MAP - FEBRUARY 2024

GEORGIA POWER COMPANY
PLANT HAMMOND AP-2
ROME, FLOYD COUNTY, GEORGIA

Prepared For: Georgia Power

Prepared By: Geosyntec consultants

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FIGURE A-2

Groundwater Monitoring Plan, Plant Hammond Ash Pond 2 (AP-2)

TABLES

Table A-1
AP-1 Well and Piezometer Network Details
Plant Hammond, Floyd County, Georgia

Well ID	Installation Date	Northing [1]	Easting [1]	Ground Surface Elevation [2] (ft)	Top of Casing Elevation [2] (ft)	Top of Screen Elevation [2] (ft)	Bottom of Screen Elevation [2] (ft)	Well Depth [3] (ft BTOC)	Mean Kh, [4] (cm/sec)	Mean Kv, [4] (cm/sec)	Screened Media
Detection Monitoring Well											
HGWA-1	12/3/2014	1550423.32	1940770.00	592.32	595.21	573.12	563.12	32.49	1.41E-03	--	Highly weathered shaley limestone, Competent shaley limestone
HGWA-2	12/2/2015	1549796.87	1939845.15	585.29	587.92	570.29	560.29	27.95	--	--	Terrace alluvium
HGWA-3	12/2/2015	1549794.41	1939833.39	585.23	587.74	553.23	543.23	44.51	--	--	Highly weathered shaley limestone
HGWA-43D	8/26/2020	1550422.85	1940753.81	592.08	595.08	544.08	534.08	61.25	--	--	Shaley, dolomitic limestone
HGWA-44D	8/25/2020	1550409.13	1940756.19	592.01	594.79	491.76	481.76	113.50	--	--	Shaley, dolomitic limestone
HGWC-7	12/3/2015	1549520.67	1942319.75	576.55	579.18	561.55	551.55	27.96	5.40E-04	--	Residuum, Highly weathered shaley limestone
HGWC-8	12/8/2015	1549114.61	1942392.56	577.14	579.82	564.64	554.64	25.51	4.30E-03	6.40E-08	Terrace alluvium
HGWC-9	12/9/2015	1548693.30	1942215.03	577.72	580.36	543.72	533.72	46.97	2.30E-03	1.50E-08	Terrace alluvium, Residuum, Highly weathered shaley limestone, Competent shaley limestone
HGWC-10	12/8/2015	1548469.25	1941644.43	576.76	579.37	566.76	556.76	22.94	--	--	Residuum, Highly weathered shaley limestone
HGWC-11	12/15/2015	1548477.91	1941146.79	578.12	580.67	565.19	555.19	25.78	--	6.10E-08	Residuum, Highly weathered shaley limestone
HGWC-12	12/9/2015	1548476.53	1941152.34	578.14	580.73	555.64	545.64	35.42	8.00E-03	--	Residuum, Highly weathered shaley limestone, Competent shaley limestone
HGWC-13	12/10/2015	1548628.03	1940900.60	592.94	595.76	560.94	550.94	45.15	7.40E-04	--	Terrace alluvium, Residuum
Assessment Well											
MW-19	9/26/2018	1548422.94	1940943.01	577.46	580.65	561.45	551.45	29.53	5.60E-04	--	Alluvium, Poorly-graded sand, Clay
MW-20	9/27/2018	1549029.68	1942736.85	575.96	579.00	554.96	544.96	34.37	--	--	Clay, Sandy clay, Partially weathered rock
MW-24D	11/7/2018	1548638.80	1940900.37	592.91	595.68	532.91	522.91	72.77	--	--	Limestone
MW-27D	11/8/2018	1549103.57	1942390.80	576.84	579.70	526.84	516.84	63.19	--	--	Limestone
Piezometer											
AP1A-1	12/15/2015	1550080.01	1941614.12	584.78	587.44	575.84	565.84	21.93	--	--	Residuum, Silty, clayey sand
MW-1	12/2/2014	1549938.24	1941589.06	585.63	588.66	567.93	557.93	31.06	2.68E-03	3.62E-07	Shaley limestone
MW-5	11/4/2014	1548436.02	1942448.85	578.00	581.14	560.70	550.70	30.84	1.84E-03	1.74E-07	Alluvium, Clayey sand to fat clay
MW-6	11/4/2014	1548383.12	1941689.01	579.18	581.84	559.28	549.28	32.96	1.14E-02	1.22E-07	Alluvium, Fat clay, Shaley limestone
MW-7	10/30/2014	1548230.47	1941087.44	574.94	577.73	561.24	551.24	26.89	2.35E-02	--	Alluvium, Fat clay
MW-8	10/29/2014	1548171.86	1940016.70	584.25	586.93	565.05	555.05	32.72	8.26E-04	--	Alluvium, Well-graded sand, Fat clay
MW-25D	11/6/2018	1548473.00	1941162.20	577.71	580.59	527.71	517.71	63.21	6.60E-05	--	Limestone
MW-26D	11/14/2018	1548699.91	1942222.36	577.63	580.41	512.63	502.63	78.11	--	--	Limestone
MW-28D	11/13/2018	1549510.90	1942321.14	576.20	579.08	531.20	521.20	58.21	--	--	Limestone
MW-29	11/13/2018	1549437.67	1942633.60	572.14	575.06	557.14	547.14	28.25	--	--	Clayey gravel, Partially weathered rock
MW-30D	6/19/2019	1549530.00	1942318.45	576.20	578.59	481.20	471.20	107.72	--	--	Limestone
MW-40D	4/29/2020	1549542.29	1942316.55	576.41	578.92	450.41	440.41	138.84	--	--	Limestone

Notes:
-- = not available
cm/sec = centimeters per second
ft = feet
ft BTOC = feet below top of casing
Kh = Horizontal Hydraulic Conductivity
Kv = Vertical Hydraulic conductivity
(1) Coordinates in North American Datum (NAD) 1983, State Plane, Georgia-West, feet.
(2) Vertical elevations are in North American Vertical Datum (NAVD) 1988.
(3) Total well depth accounts for sump if data provided on well construction logs.
(4) Source: Hydrogeologic Assessment Report, Revision 01 (Geosyntec, 2019); Semiannual Remedy Selection and Design Progress Report Plant Hammond Ash Pond 1 (Geosyntec, 2020)
(5) Survey completed by GEL Solutions on the dates presented in Appendix A of the Groundwater Monitoring Plan.
(6) Piezometers INW-03 through INW-05, MW-53, MW-54, and PT-07 through PT-15 shown on Figures A-1 and A-2 were installed in support of an Assessment of Corrective Measures (ACM) geochemical injections pilot study and are not included in the routine semiannual sampling of the monitoring well network. Therefore these wells are omitted from this well network summary table.

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Table A-2
Horizontal Groundwater Gradient and Flow Velocity Calculations
Plant Hammond AP-2, Floyd County, Georgia

	February 12, 2024			
Flow Path Direction [1]	**h_1 (ft)**	**h_2 (ft)**	**L (ft)**	**i (ft/ft)**
Westerly Flow Path (MW-18 to HGWC-17)	572.41	564.90	1,350	0.006

Flow Path Direction [1]	**K_h (ft/d) [2]**		**n_e**	**i (ft/ft)**	**V (ft/d)[3]**	
Westerly Flow Path (MW-18 to HGWC-17)	Min	0.27	0.15	0.006	Min	0.010
	Max	4.28			Max	0.159
	Avg	1.47			Avg	0.055

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Notes:
ft = feet
ft/day = feet per day
ft/ft = feet per foot
h_1 and h_2 = groundwater elevation at location 1 and 2
$i = h_1-h_2/L$ = horizontal hydraulic gradient
K_h = horizontal hydraulic conductivity
L = distance between location 1 and 2 along the flow path
n_e = effective porosity
V = groundwater flow velocity
(1) Flow path direction relative to the orientation of AP-2 and illustrated on Figures A-2 of associated report.
(2) Source of the K_h values *Hydrogeologic Assessment Report (Revision 1)* (Geosyntec, 2019).
(3) Groundwater flow velocity equation: $V = [K_h * i] / n_e$

BORING AND WELL CONSTRUCTION LOGS

Log updated with revised survey certified 5/19/2020.

BORING HGWA-1

SOUTHERN COMPANY

LOG OF TEST BORING

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 12/3/2014 **COMPLETED** 12/3/2014 **SURF. ELEV.** 592.32 **COORDINATES:** N:1550423.32 E:1940770.00
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 29.7 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** 17.1 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Clayey Gravel (GC)					
5		- brown and light brown, dry, dense		SS -1	3.5-5.0	7-13-18 (**31**)	
			586.32				
		Silty Clay (CL)					
10		- pale gray-brown, dry, very stiff, with red and yellow-brown mottling		SS -2	8.5-10.0	7-10-12 (**22**)	
15		- brown, dry, stiff, with gray mottling		SS -3	13.5-15.0	6-6-6 (**12**)	
			573.82)				
		SHALEY LIMESTONE					Auger refusal at 18.5 ft.
20		- gray and dark gray, not to highly weathered, shale seams less than 1/2 inch, shear/fracture zone fabric, near vertical bedding, water staining		RC -1	18.7-25.2	**95** (23)	
25				RC -2	25.2-29.7	**98** (9)	
			562.62				

Bottom of borehole at 29.7 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: HGWA-1

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 12/3/2014 **COMPLETED** 12/3/2014 **SURF. ELEV.** 592.32 **COORDINATES:** N:1550423.32 E:1940770.00
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 29.7 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 17.1 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

BOREHOLE DATA — ELEV. Strata | DEPTH (ft)

WELL DATA

Top of casing Elev: 595.21

Surface:
protective aluminum cover with bollards; 4-foot square concrete pad

Surface Seal: concrete — 590.32 [2.0]

Well: 2" OD PVC (SCH 40)

586.32

Annular Fill: Cement-Bentonite Grout (2 - 94lbs. bags, 22 gal.) — 582.42 [9.9]

Annular Seal: 3/8 bentonite pellets (1 - 50lbs. bucket) — 577.72 [14.6]

Filter: #1A silica filter sand (2 - 50lbs. bags)

573.82 — 573.12 [19.2]

Screen: 10 ft. 0.010" slot pre-pack

563.12

562.62 — Sump:0.40 ft. — 562.72

Backfill:Silica Sand

COMMENTS

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

RECORD OF BOREHOLE HGWA-2

SHEET 1 of 1

PROJECT: SCS Hammond
PROJECT NUMBER: 1545812
DRILLED DEPTH: 27.00 ft
LOCATION: Rome, GA

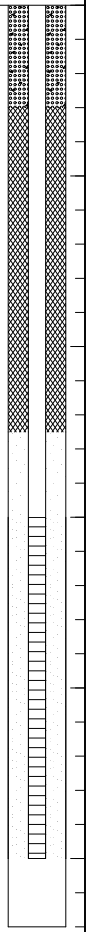
DRILL RIG: Pro Sonic 150
DATE STARTED: 12/2/15
DATE COMPLETED: 12/2/15

NORTHING: 1,549,796.87
EASTING: 1,939,845.15
GS ELEVATION: 585.29 ft
TOC ELEVATION: 587.92 ft

DEPTH W.L.:8.19
DATE W.L.:12/2/15
TIME W.L.:11:10

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	585	0.00 - 3.00 CLAY; light brown/grey silty clay, trace organic material, soft	CL		582.29			
		3.00 - 7.00 SILTY CLAY; grey/orange/light brown silty clay, mottled, stiff to very stiff, some black streaking from 3'-4', moist	CL		3.00 578.29			
5	580	7.00 - 8.00 CLAY; light brown/orange/grey sandy, gravelly clay, mottled, moist	CL		7.00 577.29			
		8.00 - 12.00 SANDY GRAVEL; orange/light brown sandy gravel, coarse grained, sub-angular gravel,	GP		8.00 573.29			
10	575	12.00 - 17.00 light brown/orange sandy gravel, coarse grain, loosely compacted, moist			12.00 568.29			
15	570	17.00 - 18.00 GRAVELLY CLAY; orange/light brown gravelly clay, sub-angular gravel, moist	CLG		17.00 567.29 (567.23)			
		18.00 - 24.00 SANDY GRAVEL; orange/light brown sandy gravel, coarse grained, trace clay lenses, wet	GP		18.00 561.29			
20	565	24.00 - 26.00 SILT; orange/light brown layered silt, soft, wet	ML		24.00 559.29			
25	560	26.00 - 27.00 grey silt with trace limestone shale and clay, foliated, soft, wet			26.00 558.29			
		Boring completed at 27.00 ft						
30	555							
35	550							
40	545							
45								

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -3'-15'
Material: Schedule 40 PVC
Diameter: 6"
Joint Type: Screw/Flush

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 15'-25'
Material: Schedule 40 PVC
Diameter: 2'
Slot Size: 0.010"
End Cap: Schedule 40 PVC

FILTER PACK
Interval: 12.5'-25'
Type: #1 sand/ Prepack Filter

FILTER PACK SEAL
Interval: 3'-12.5'
Type: 3/8" Bentonite Pellets

ANNULUS SEAL
Interval: 0'-3'
Type: Portland Type I/Type II/Gel Mix

WELL COMPLETION
Pad: 4'x4'x4"
Protective Casing: Anodized Aluminum

DRILLING METHODS
Soil Drill: 6-inch diameter Sonic
Rock Drill: 6-inch diameter Sonic

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade
DRILLER: Tom Ardito

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/24/16

Golder Associates

BOREHOLE RECORD HAMMOND BORING LOGS.GPJ PIEDMONT.GDT 3/1/16

Log updated with revised survey certified 5/19/2020.

RECORD OF BOREHOLE HGWA-3

SHEET 1 of 1

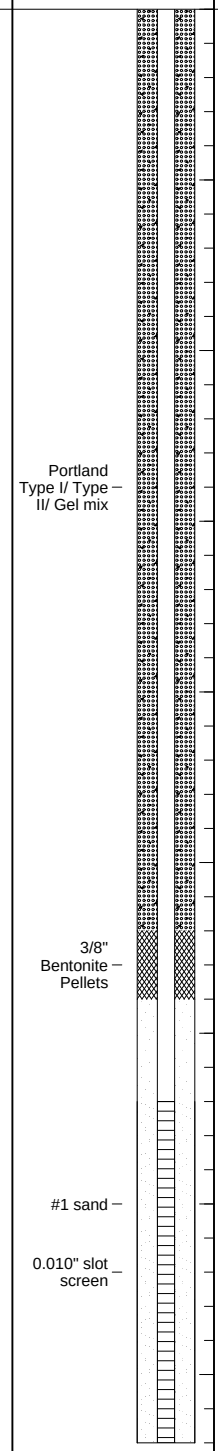
PROJECT: SCS Hammond
PROJECT NUMBER: 1545812
DRILLED DEPTH: 42.00 ft
LOCATION: Rome, GA

DRILL RIG: Pro Sonic 150
DATE STARTED: 12/1/15
DATE COMPLETED: 12/2/15

NORTHING: 1,549,794.41
EASTING: 1,939,833.39
GS ELEVATION: 585.23 ff
TOC ELEVATION: 587.74 ft

DEPTH W.L.:2.68
DATE W.L.:12/2/15
TIME W.L.:07:30

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	585	0.00 - 5.00 SANDY CLAY; grey/brown/orange mottled sandy clay, fine grained, medium density, stiff, moist	CLS		580.23			
5	580	5.00 - 13.00 CLAYEY GRAVEL; orange/brown clayey gravel with some sand, poorly sorted and angular pieces, gravel becomes more rounded at 9 feet, medium density compaction	GC		5.00 572.23			
10	575	13.00 - 14.00 wet around 13.5 feet	GC		13.00 571.23 (571.19)			
15	570	14.00 - 17.00 SANDY GRAVEL; brown/grey poorly sorted, well rounded sandy gravel, wet	GP		14.00 568.23			
20	565	17.00 - 25.00 orange/brown sandy gravel, well rounded, poorly sorted, wet			17.00 560.23			
25	560	25.00 - 26.00 some larger rock fragments and coarse grained sand			25.00 559.23			
		26.00 - 31.00 CLAY; brown/grey sandy gravel, changes to grey weathered limestone and clay, medium density, firm, moist	CL		26.00 554.23			
30	555	31.00 - 37.00 PARTIALLY WEATHERED ROCK; partially weathered limestone and trace clay, angular rock fragments, clay is mottled light and dark grey, wet	PWR		31.00 548.23			
35	550	37.00 - 42.00 partially weathered dark grey shaly limestone, poorly sorted and angular, some gravel, bottom 3 inches are solid limestone, wet (saturated)			37.00 543.23			
40	545	Boring completed at 42.00 ft						
45								



WELL CASING
Interval:
Material: Schedule 40 PVC
Diameter: 6"
Joint Type: Screw/Flush

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 32'-42'
Material: Schedule 40 PVC
Diameter: 2'
Slot Size: 0.010"
End Cap: Schedule 40 PVC

FILTER PACK
Interval: 29'-42'
Type: #1 sand/ Prepack Filter

FILTER PACK SEAL
Interval: 27'-29'
Type: 3/8" Bentonite Pellets

ANNULUS SEAL
Interval: 0'-27'
Type: Portland Type I/Type II/Gel Mix

WELL COMPLETION
Pad: 4'x4'x4"
Protective Casing: Anodized Aluminum

DRILLING METHODS
Soil Drill: 6-inch diameter Sonic
Rock Drill: 6-inch diameter Sonic

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade
DRILLER: Tom Ardito

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/24/16

Golder Associates

BOREHOLE RECORD HAMMOND BORING LOGS.GPJ PIEDMONT.GDT 3/1/16

Log updated with revised survey certified 5/19/2020.

BORING HGWA-4

SOUTHERN COMPANY

LOG OF TEST BORING

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers

LOCATION Plant Hammond

DATE STARTED 12/3/2014 **COMPLETED** 12/3/2014 **SURF. ELEV.** 584.94 **COORDINATES:** N: 1549930.45 E:1939385.45

CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger

DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____

BORING DEPTH 24 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 4.5 ft. after 24 hrs.

NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Lean Clay (CL)					
5		- pale brown-gray, damp, stiff, with red and yellow-brown mottling		SS -1	3.5-5.0	4-6-9 (**15**)	
10		- pale brown-gray, damp, stiff, sandy, with red and yellow-brown mottling		SS -2	8.5-10.0	4-5-6 (**11**)	
			572.94				
		Silty Gravel (GM)					
15		- yellow-brown, wet, medium dense, sandy, coarse well-rounded quartz gravel, some clay		SS -3	13.5-15.0	7-12-14 (**26**)	
20		- yellow-brown, wet, very loose, sandy, coarse well-rounded quartz gravel, some clay		SS -4	18.5-20.0	2-2-2 (**4**)	
			562.94				
		Clayey Sand (SC)					
		- pale brown, wet, very dense, some partially weathered bedrock (angular gravel)	560.94	SS -5	23.5-23.6	50/1" (**100+**)	Auger refusal at 24 ft.
		Bottom of borehole at 24.0 feet.					

Easting and Northing in NAD 1983. Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

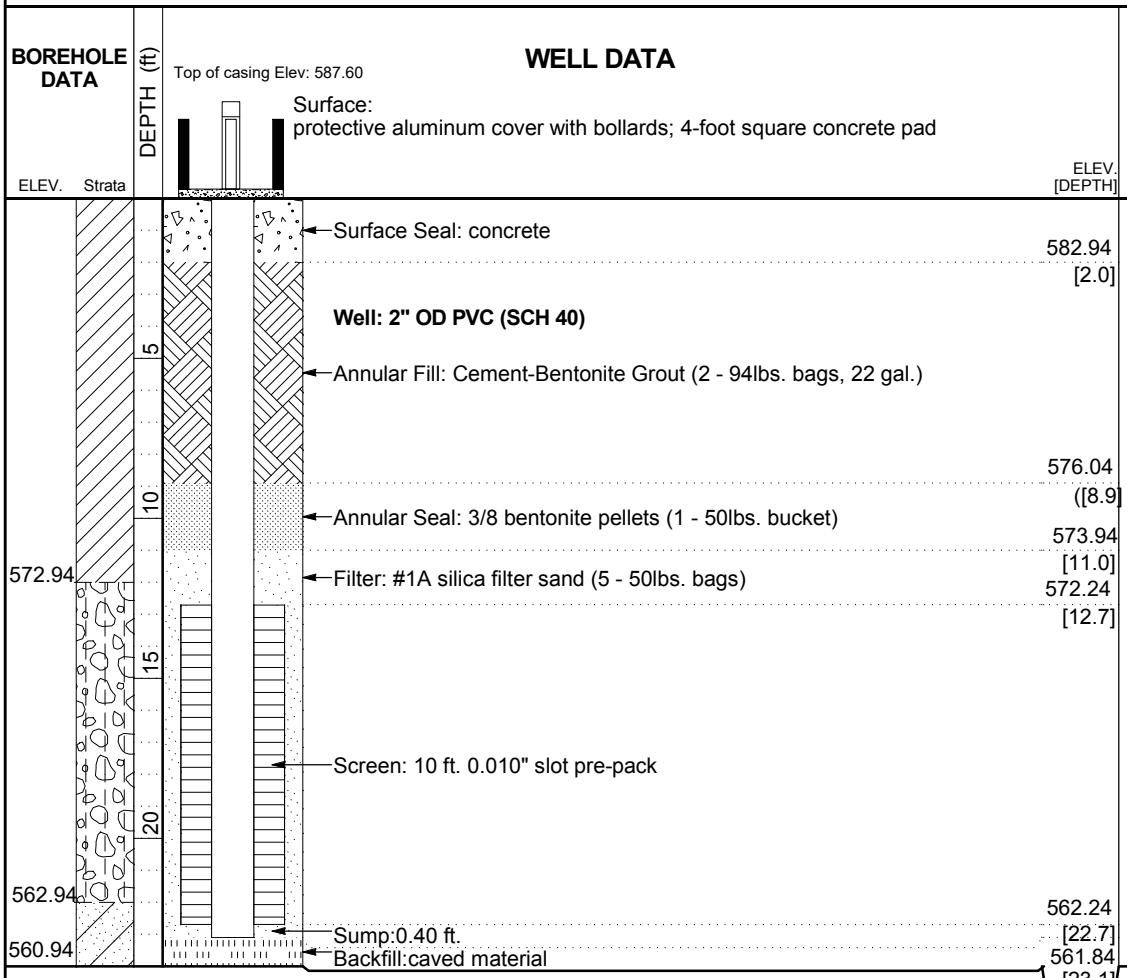
WELL: HGWA-4

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 12/3/2014 **COMPLETED** 12/3/2014 **SURF. ELEV.** 584.94 **COORDINATES:** N: 1549930.45 E:1939385.45
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 24 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 4.5 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



Easting and Northing in NAD 1983. Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

RECORD OF BOREHOLE HGWA-5

SHEET 1 of 1

PROJECT: SCS Hammond
PROJECT NUMBER: 1545812
DRILLED DEPTH: 26.00 ft
LOCATION: Rome, GA

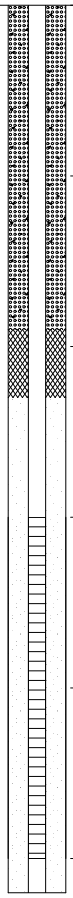
DRILL RIG: Pro Sonic 150
DATE STARTED: 12/10/15
DATE COMPLETED: 12/10/15

NORTHING: 1,548,633.33
EASTING: 1,937,184.17
GS ELEVATION: 580.52 ft
TOC ELEVATION: 583.24 ft

DEPTH W.L.:2.3'
DATE W.L.:12/10/15
TIME W.L.:13:05

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	580	0.00 - 2.00 CLAY; dark brown/grey clay with some fine to medium sand, trace organic material, trace gravel, non-plastic, very soft, moist W>PL	CL		578.52			
		2.00 - 7.00 yellow orangish red clay, trace fine sand, moderate plasticity, soft to firm, moist, W=PL			2.00			
5	575				573.52			
		7.00 - 16.50 reddish orange and blue grey mottled clay with trace fine sand and gravel, non to low plasticity, very stiff to hard, dry to moist			7.00			
10	570							
15	565							
		16.50 - 17.00 SILTY SAND; orange brown silty sand, sandy silt, non-plastic, loose, soft, uniform grading, moist	SM		563.52			
		17.00 - 19.00 SILTY CLAY; orange/yellow/dark grey silt and clay, trace gravel, non-plastic, very soft, wet, W>PL SHELBY TUBE: 17'-19'	CL-ML		17.00 561.52		SH	2.00 2.00
20	560	19.00 - 22.50 SAND; alluvium, dark grey sand with some pebbles and cobbles, rounded to sub-rounded, loose, soft, moist to wet	SP		19.00			
		22.50 - 23.00 CLAY; hard, dark grey clay, non-plastic, dry to moist, W<PL	CL		557.52			
		23.00 - 26.00 SILT; dark grey to black shale with trace fine sand, very stiff to hard, rock fragments contain pyrite, dry, W<PL	ML		23.00 554.52			
25	555	Boring completed at 26.00 ft						
30	550							
35	545							
40	540							
45								

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -3'-15'
Material: Schedule 40 PVC
Diameter: 6"
Joint Type: Screw/Flush

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 14.8'-24.8'
Material: Schedule 40 PVC
Diameter: 2'
Slot Size: 0.010"
End Cap: Schedule 40 PVC

FILTER PACK
Interval: 11.5'-26'
Type: #1 sand/ Prepack Filter

FILTER PACK SEAL
Interval: 9.5'-11.5'
Type: 3/8" Bentonite Pellets

ANNULUS SEAL
Interval: 0'-9.5'
Type: Portland Type I/Type II/Gel Mix

WELL COMPLETION
Pad: 4'x4'x4"
Protective Casing: Anodized Aluminum

DRILLING METHODS
Soil Drill: 6-inch diameter Sonic
Rock Drill: 6-inch diameter Sonic

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade
DRILLER: Tom Ardito

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/24/16

Golder Associates

BOREHOLE RECORD HAMMOND BORING LOGS.GPJ PIEDMONT.GDT 3/1/16

Log updated with revised survey certified 5/19/2020.

RECORD OF BOREHOLE HGWA-6

SHEET 1 of 2

PROJECT: SCS Hammond
PROJECT NUMBER: 1545812
DRILLED DEPTH: 47.30 ft
LOCATION: Rome, GA

DRILL RIG: Pro Sonic 150
DATE STARTED: 12/10/15
DATE COMPLETED: 12/11/15

NORTHING: 1,548,636.35
EASTING: 1,937,177.73
GS ELEVATION: 580.72 ft
TOC ELEVATION: 583.38 ft

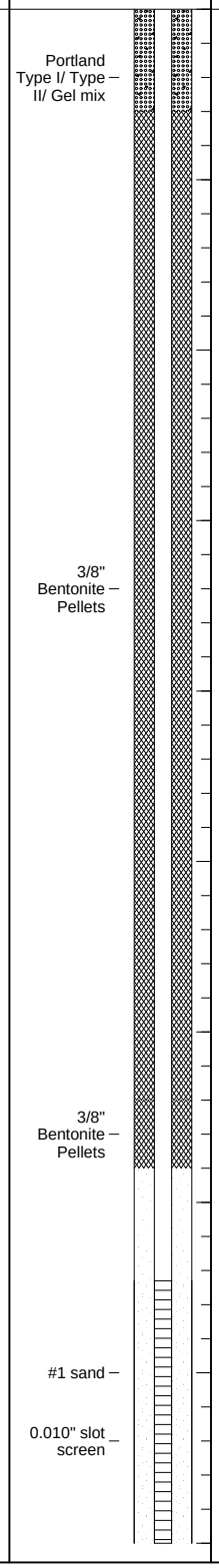
DEPTH W.L.:3.10'
DATE W.L.:12/11/15
TIME W.L.:07:50

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	ELEV. / DEPTH (ft)
0	580	0.00 - 2.00 CLAY; dark brown/grey clay wwith some fine to medium sand, trace organic material, trace gravel, very soft, non-plastic, moist, W>PL	CL	578.72
		2.00 - 7.00 yellow/orange/red clay, trace fine sand, moderate plasticity, soft to firm, moist, W=PL		2.00
5	575			573.72
		7.00 - 16.50 reddish orange and blue grey mottled clay, trace fine sand and gravel, non to low plasticity, very stiff to hard, dry to moist, W<PL		7.00
10	570			
15	565			563.72
		16.50 - 17.00 SILTY SAND; orange brown silty sand, non-plastic, loose soft, uniform grading, moist	SM	563.5
		17.00 - 19.00 SAND and CLAY; orange/yellow/dark grey sand and clay, trace gravel, non plastic, very soft, wet, W>PL	CLS	17.00 561.72
20	560	19.00 - 22.50 SANDY GRAVEL; alluvium, dark grey sand with some pebbles and cobbles, rounded to sub-rounded, loose, soft, moist to wet	GPS	19.00
		22.50 - 23.00 CLAY; dark grey clay, hard, dry to moist, W<PL	CL	557.72 23.00
25	555	23.00 - 27.00 SILT and GRAVEL; dark grey to black silt with trace fine sand and gravel, some shale, very stiff to hard, contains rock fragments with pyrite, dry, W<PL	GP-GM	553.72
		27.00 - 31.00 PARTIALLY WEATHERED ROCK; broken shale, dark grey to black silt with trace fine sand, dry, non-plastic, loose, W<PL	PWR	
30	550			549.72 31.00
		31.00 - 37.00 broken shale, dark grey to black silt with trace fine sand, dry, non-plastic, loose, W<PL		
35	545			543.72
		37.00 - 47.00 broken shale, dark grey to black silt with trace fine sand, more rock fragments (30-40%), dry, non-plastic, loose, W<PL		37.00
40	540			
45				

Log continued on next page

SAMPLES: SAMPLE NO. | TYPE | REC

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -3'-37'
Material: Schedule 40 PVC
Diameter: 6"
Joint Type: Screw/Flush

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 37.3'-47.3'
Material: Schedule 40 PVC
Diameter: 2'
Slot Size: 0.010"
End Cap: Schedule 40 PVC

FILTER PACK
Interval: 34'-47.3'
Type: #1 sand/ Prepack Filter

FILTER PACK SEAL
Interval: 32'-34'
Type: 3/8" Bentonite Pellets

ANNULUS SEAL
Interval: 0'-3'
Type: Portland Type I/Type II/Gel Mix

WELL COMPLETION
Pad: 4'x4'x4"
Protective Casing: Anodized Aluminum

DRILLING METHODS
Soil Drill: 6-inch diameter Sonic
Rock Drill: 6-inch diameter Sonic

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade
DRILLER: Tom Ardito

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/24/16

Golder Associates

BOREHOLE RECORD HAMMOND BORING LOGS.GPJ PIEDMONT.GDT 3/1/16

Log updated with revised survey certified 5/19/2020.

RECORD OF BOREHOLE HGWA-6

PROJECT: SCS Hammond
PROJECT NUMBER: 1545812
DRILLED DEPTH: 47.30 ft
LOCATION: Rome, GA

DRILL RIG: Pro Sonic 150
DATE STARTED: 12/10/15
DATE COMPLETED: 12/11/15

NORTHING: 1,548,636.35
EASTING: 1,937,177.73
GS ELEVATION: 580.72 ft
TOC ELEVATION: 583.38 ft

DEPTH W.L.:3.10'
DATE W.L.:12/11/15
TIME W.L.:07:50

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: SAMPLE NO.	SAMPLES: TYPE	SAMPLES: REC	MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES
45	535	37.00 - 47.00 broken shale, dark grey to black silt with trace fine sand, more rock fragments (30-40%), dry, non-plastic, loose, W<PL *(Continued)*			533.72				
		Boring completed at 47.30 ft			47.00				
50	530								
55	525								
60	520								
65	515								
70	510								
75	505								
80	500								
85	495								
90									

WELL CONSTRUCTION DETAILS

WELL CASING
Interval: -3'-37'
Material: Schedule 40 PVC
Diameter: 6"
Joint Type: Screw/Flush

SURFACE CASING
Interval: N/A
Material: N/A
Diameter: N/A

WELL SCREEN
Interval: 37.3'-47.3'
Material: Schedule 40 PVC
Diameter: 2'
Slot Size: 0.010"
End Cap: Schedule 40 PVC

FILTER PACK
Interval: 34'-47.3'
Type: #1 sand/ Prepack Filter

FILTER PACK SEAL
Interval: 32'-34'
Type: 3/8" Bentonite Pellets

ANNULUS SEAL
Interval: 0'-3'
Type: Portland Type I/Type II/Gel Mix

WELL COMPLETION
Pad: 4'x4'x4"
Protective Casing: Anodized Aluminum

DRILLING METHODS
Soil Drill: 6-inch diameter Sonic
Rock Drill: 6-inch diameter Sonic

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade
DRILLER: Tom Ardito

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/24/16

Golder Associates

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1255 Roberts Boulevard
Kennesaw, GA 30144

HGWA-42D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 8/26/20 **COMPLETED** 8/27/20
NORTHING 1549363.72 ft **EASTING** 1938443.86 ft
DRILLER Cascade Drilling
GROUND ELEVATION 583.39 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 586.17 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terrasonic 1051181
LOGGED BY A. Ramsey **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION
0				Hydro Excavation (0 ft to 10 ft) NO SAMPLE
	580			
5				
	575			
10				573.4 CLAYEY GRAVELLY SAND, Reddish yellow, with some subrounded cobbles, coarse grained, firm, moist to wet.
	570			568.9
15				PARTIALLY WEATHERED SHALE, Light reddish brown, recovered as shaley clay, hard, fissile, laminated, dry.
				567.1 SHALE, Black, fine lamination, fissile, hard, dry.
	565			
20				20 ft: Black to gray, fine laminations, fissile, hard, largely pulverized by drilling, dry.
	560			
25				
	555			
30				29 ft: Wet.
	550			549.4 34 ft: Black to gray, fine laminations, fissile, hard.

CONSTRUCTION DIAGRAM

- Schedule 40 PVC 2"
- Aquaguard Sodium Bentonite Grout
- Bentonite coated 3/8" pellets

SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D_AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20

(Continued Next Page)

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CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
35				34 ft: Black to gray, fine laminations, fissile, hard. *(continued)*	
	545				
40		Water utilized during drilling likely resulted in washing away pulverized shale material.		543.4 40 ft: No recovery.	
	540				
45					Bentonite coated 3/8" pellets
	535				
50				533.4 SHALE, Black to gray, fine lamination, fissile, hard, dry.	
	530				
55					20/40 Silica Sand
	525				
60				60 ft: Clayey, medium plasticity, hard, wet.	0.010 slot size 2" Pre Pack, U-Pack Screen
	520			63 ft: Black, dry, hard, thin bedding, fissile.	
65				518.1 Bottom of borehole at 65.3 feet.	Bottom of well: 65.25 ft

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D_AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20

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HGWA-43D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 8/26/20 **COMPLETED** 8/26/20
NORTHING 1550422.85 ft **EASTING** 1940753.80 ft
DRILLER Cascade Drilling
GROUND ELEVATION 592.08 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 595.08 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terrasonic 1051181
LOGGED BY A. Ramsey **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	590			Hydro Excavation (0 ft to 10 ft) NO SAMPLE	Schedule 40 PVC 2"
5	585				
10	580			582.1 CLAY, Yellowish red and light gray mottling, medium plasticity, trace coarse sand, hard, moist.	Aquaguard Sodium Bentonite Grout
15	575			576.6 CLAY, Reddish yellow with light gray mottling, laminated brown, with organic material, trace limestone gravel, hard, moist. 17 ft: Trace of limestone gravel.	
20	570			573.1 HIGHLY WEATHERED ROCK, Light brown, recovered as angular gravelly clay with trace limestone cobbles, non plastic to low plasticity, soft, wet.	Bentonite coated 3/8" pellets
25	565			569.1 LIMESTONE, Grayish blue to white, some white calcite healed fractures, 1 in clay filled fractures, mostly pulverized by drilling, powder reacts with HCl, hard, dry. 27 ft: Wet.	
				562.1	

(Continued Next Page)

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HGWA-43D

CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
30	560	30 ft to 50 ft: No voids reported.		30 ft to 34.5 ft: No recovery.	
				557.6	
35	555			LIMESTONE, Grayish blue to white, hard, dry, some white calcite healed fractures, 1 in clay filled fractures, 38 ft to 39 ft pulverized by drilling, powder reacts with HCl, wet.	
40	550			40 ft: Up to 1 in thick calcite healed fractures.	Bentonite coated 3/8" pellets
				548.1	
45	545			44 ft to 50 ft: No recovery.	
50	540			542.1	20/40 Silica Sand
				LIMESTONE, Grayish blue to white, hard, dry, up to 1 in thick calcite healed fractures, trace 1 in clay filled fractures, mostly pulverized by drilling, powder reacts with HCl.	0.010 slot size 2" Pre Pack, U-Pack Screen
55	535				Bottom of well: 58.25 ft
				533.8	

Bottom of borehole at 58.3 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D_AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20

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HGWA-44D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 8/24/20 **COMPLETED** 8/25/20
NORTHING 1550409.13 ft **EASTING** 1940756.18 ft
DRILLER Cascade Drilling
GROUND ELEVATION 592.01 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 594.79 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terrasonic 1051181
LOGGED BY A. Ramsey **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION
0	590			Hydro Excavation (0 ft to 10 ft) NO SAMPLE
5	585			
10	580			582.0 CLAY, Red with yellowish red and light gray mottling, medium plasticity, trace coarse sand, hard, moist. 12 ft: Yellowish red and light gray mottling.
15	575			577.0 CLAY, Reddish yellow with light gray mottling, some brown organic matter, trace limestone gravel, medium to low plasticity, hard, moist. 576.0 HIGHLY WEATHER ROCK, Light brown, gravelley clay with some angular cobbles, gravel and cobbles are limestone, non to low plasticity, soft, wet.
20	570			573.0 LIMESTONE, Dark bluish gray, reacts with HCl when powdered, partially pulverized by drilling, hard, dry to moist. 20 ft: With abundant white calcite healed fractures.
25	565			
30	560	Driller reports void between 30 ft and 31 ft. No returns. 31 ft to 33 ft no recovery, but returns coming back. Driller reports 'soft' material, potentially washed away.		562.0 30 ft to 31 ft: Void. 31 ft to 33 ft: No recovery. 559.0 LIMESTONE, Dark bluish gray, wet, hard, reacts with HCl when powdered, abundant white calcite healed fractures, bottom 1 ft is pulverized and dry.

CONSTRUCTION DIAGRAM

- Schedule 40 PVC 2"
- Aquaguard Sodium Bentonite Grout
- Bentonite coated 3/8" pellets

SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D_AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20

(Continued Next Page)

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1255 Roberts Boulevard
Kennesaw, GA 30144

CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
35	555	40 ft: Driller reports no returns.		LIMESTONE, Dark bluish gray, wet, hard, reacts with HCl when powdered, abundant white calcite healed fractures, bottom 1 ft is pulverized and dry. *(continued)*	
40	550			552.0 40 ft to 42 ft: No recovery. 550.0 LIMESTONE, Dark bluish gray, wet, hard, reacts with HCl when powdered, abundant white calcite healed fractures, bottom 1 ft is pulverized by drilling.	
45	545				
50	540			542.0 50 ft to 52 ft: No recovery. 540.0 LIMESTONE, Dark bluish gray, wet, hard, reacts with HCl when powdered, abundant white calcite healed fractures, bottom 1 ft is pulverized by drilling.	
55	535				◄Bentonite coated 3/8" pellets
60	530			532.0 60 ft to 61 ft: No recovery. 531.0 LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white 0.1 in to 2 in thick calcite healed fractures.	
65	525				
70	520			522.0 70 ft to 71 ft: No recovery. 521.0 LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white hite 0.1 in to 2 in thick calcite healed fractures.	

(Continued Next Page)

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1255 Roberts Boulevard
Kennesaw, GA 30144

CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
75	515			LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white hite 0.1 in to 2 in thick calcite healed fractures. *(continued)*	
				512.0	
80	510			80 ft to 84 ft: No recovery.	
				508.0	
85	505			LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white 0.1 in to 2 in thick calcite healed fractures.	Bentonite coated 3/8" pellets
				502.0	
90	500			90 ft to 94 ft: No recovery.	
				498.0	
95	495			LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white 0.1 in to 2 in thick calcite healed fractures.	
				492.0	
100	490			100 ft to 102 ft: No recovery.	20/40 Silica Sand
				490.0	
105	485			LIMESTONE, Dark bluish gray, hard, wet, bottom 1 ft pulverized by drilling, reacts with HCl when powdered, abundant white 0.1 in to 2 in thick calcite healed fractures.	0.010 slot size 2" Pre Pack, U-Pack Screen
110					Bottom of well: 110.5 ft
				480.0	

Bottom of borehole at 112.0 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

SCS MONITORING WELLS PLANT HAMMOND HGWA7 TO HGWA114 AND MW46D_AUGUST 2020.GPJ ACP GINT LIBRARY CH.GLB 9/23/20

Log updated with revised survey certified 5/19/2020.

BORING HGWC-14

SOUTHERN COMPANY

LOG OF TEST BORING

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/16/2014 **COMPLETED** 10/16/2014 **SURF. ELEV.** 594.67 **COORDINATES:** N: 1547998.96 E:1938406.27
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 40.4 ft. **GROUND WATER DEPTH: DURING** 30 ft. **COMP.** _____ **DELAYED** 23.2 ft. after 96 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Fill (CL)					
5		- dark brown and brown, dry, hard, clay and gravel		SS -1	3.5-5.0	2-13-21 (**34**)	
10		- dry, stiff, gravel, low recovery		SS -2	8.5-10.0	7-6-8 (**14**)	
15		- brown, very moist, very hard, clay with gravel, some sand		SS -3	13.5-14.6	42-50 (**100+**)	
			577.67				
		Silt (ML)					
20		- dark green and gray, damp, stiff, clayey, with black mottles		SS -4	18.5-20.0	6-5-7 (**12**)	
			572.67				
		Fat Clay (CH)					
25		- brown, damp, medium stiff, medium to high plasticity, some silt		SS -5	23.5-25.0	3-3-5 (**8**)	

(Continued Next Page)

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

LOG OF TEST BORING

BORING HGWC-14

ECS37736

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
30		**Fat Clay (CH)***(Con't)* - brown, wet, very stiff, medium to high plasticity, some silt, free water present		SS -6	28.5-30.0	10-15-13 (**28**)	
35		- brown-yellow, wet, stiff, with pale gray-brown mottles, free water present		SS -7	33.5-35.0	3-4-5 (**9**)	
40		- brown-yellow, very moist, very stiff, pale gray-brown mottles	555.67	SS -8	38.5-40.0	4-7-10 (**17**)	
		Clayey Sand (SC) - gray, very moist to wet, fine grain	554.27				
		Bottom of borehole at 40.4 feet.					

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

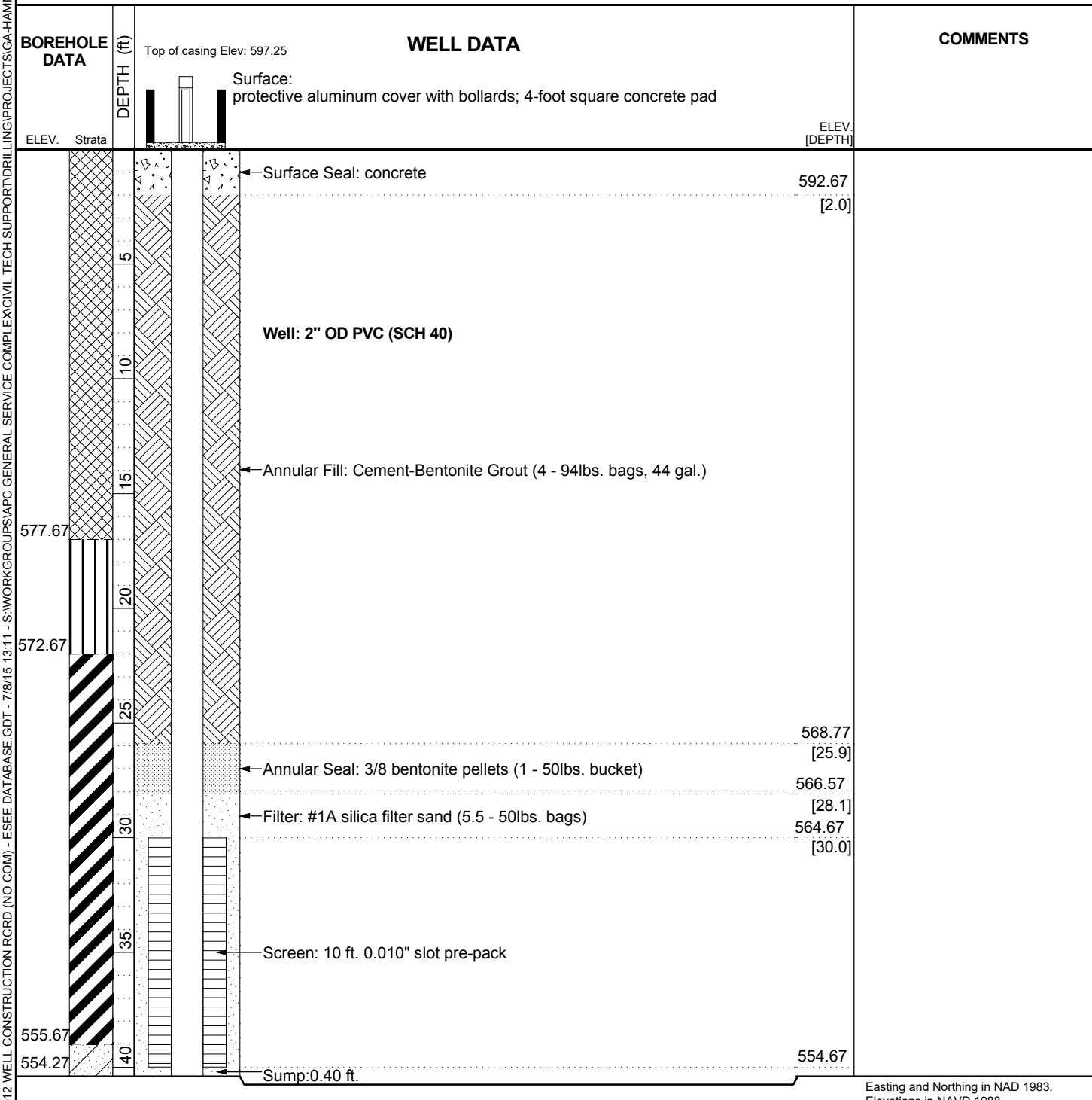
WELL: HGWC-14

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/16/2014 **COMPLETED** 10/16/2014 **SURF. ELEV.** 594.67 **COORDINATES:** N: 1547998.96 E:1938406.27
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 40.4 ft. **GROUND WATER DEPTH: DURING** 30 ft. **COMP.** **DELAYED** 23.2 ft. after 96 hrs.
NOTES Well installed. Refer to well data sheet.



Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

BORING HGWC-15

SOUTHERN COMPANY

LOG OF TEST BORING

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/20/2014 **COMPLETED** 10/20/2014 **SURF. ELEV.** 578.73 **COORDINATES:** N:1547875.33 E:1937854.92
CONTRACTOR SCS Field **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
Services **DRILLED BY** T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 35.2 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 14 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Silty Clay (CL)					
5		- brown, dry, stiff		SS -1	3.5-5.0	3-5-7 (**12**)	
10		- brown, dry, medium stiff		SS -2	8.5-10.0	3-4-4 (**8**)	
15		▼ ▽ - brown, very moist, soft		SS -3	13.5-15.0	2-2-2 (**4**)	
			562.73				
		Fat Clay (CH)					
20		- brown, very moist, stiff, medium to high plasticity, silty		SS -4	18.5-20.0	2-5-5 (**10**)	
25		- brown, wet, medium stiff, medium to high plasticity, silty, free water present		SS -5	23.5-25.0	1-2-3 (**5**)	
30		- brown, very moist to wet, medium stiff, medium to high plasticity		SS -6	28.5-30.0	2-3-3 (**6**)	
			546.73				
		Elastic Silt (MH)					
35		- gray, wet, medium stiff, medium to high plasticity, clayey	543.53	SS -7	33.5-35.0	WH-4-4 (**8**)	

Bottom of borehole at 35.2 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

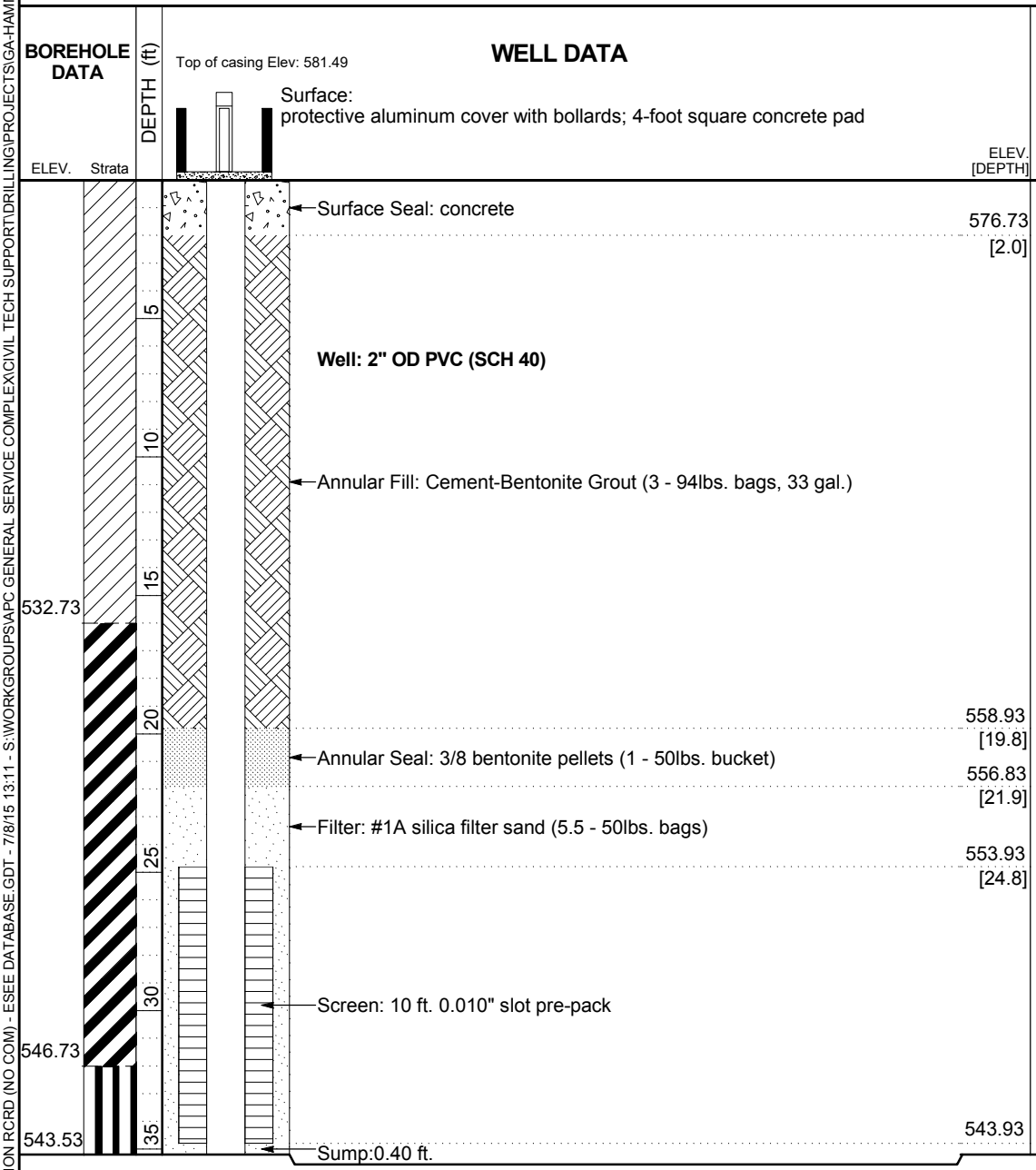
RECORD OF WELL CONSTRUCTION

WELL: HGWC-15

ECS37736

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/20/2014 **COMPLETED** 10/20/2014 **SURF. ELEV.** 578.73 **COORDINATES:** N: 1547875.33 E:1937854.92
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 35.2 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 14 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

BORING HGWC-16

SOUTHERN COMPANY

LOG OF TEST BORING

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/21/2014 **COMPLETED** 10/21/2014 **SURF. ELEV.** 577.36 **COORDINATES:** N:1548209.83 E:1937540.33
CONTRACTOR SCS Field **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
Services **DRILLED BY** T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 35 ft. **GROUND WATER DEPTH:** **DURING** 15 ft. **COMP.** **DELAYED** 7.7 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Fill (CL)					
5		- red-brown, damp, medium stiff, with pale brown mottles, some gravel		SS -1	3.5-5.0	2-2-3 (**5**)	
10		- red-brown, damp, soft, with pale brown mottles, some gravel, low recovery		SS -2	8.5-10.0	2-2-2 (**4**)	
			565.36				
		Clayey Sand (SC)					
15		- brown-gray, very moist, very loose, fine to coarse grain, sticky		SS -3	13.5-15.0	WH-1-1 (**2**)	
			559.36				
20		**Lean Clay (CL)** - gray, damp, medium stiff, low to medium plasticity		SS -4	18.5-20.0	3-3-5 (**8**)	
25		- gray-brown, damp, stiff, interbedded with clayey SAND (SC), wet, fine to coarse grained, some well rounded fine gravel		SS -5	23.5-25.0	5-6-4 (**10**)	
			549.36				
30		**Elastic Silt (MH)** - dark gray to black, wet, very stiff, clayey, weathered shale (boulder), dry, gray, strong HCl reaction (carbonate) at bottom of sample		SS -6	28.5-30.0	9-6-14 (**20**)	
			544.36				
35		**Clayey Gravel (GC)** - dark brown and gray, very moist to wet, very dense, with sand and gravel (well rounded), strong HCl reaction (carbonate gravel)	542.36	SS -7	33.5-34.3	17-50/4" (**100+**)	
		Bottom of borehole at 35.0 feet.					

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

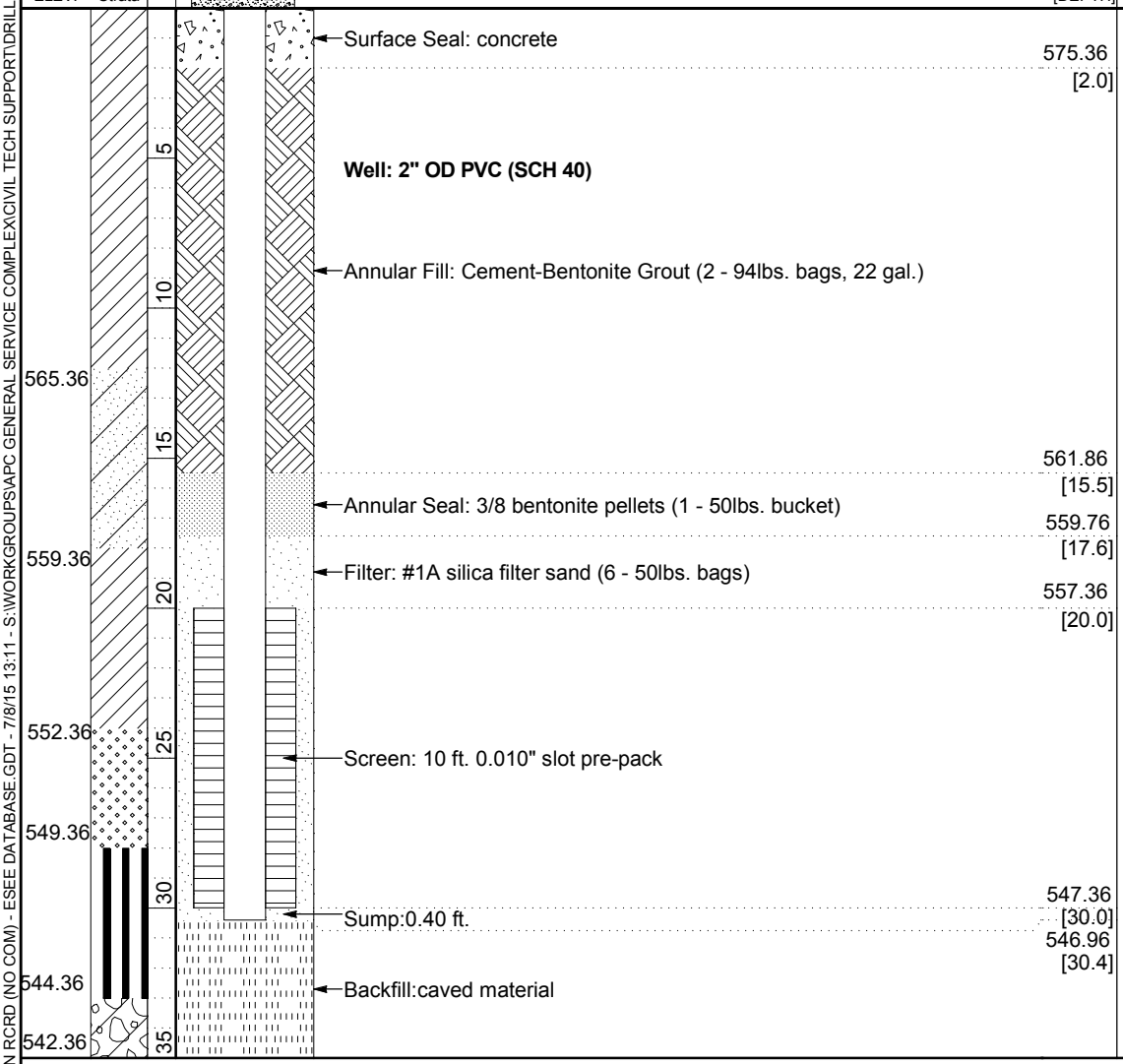
WELL: HGWC-16

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/21/2014 **COMPLETED** 10/21/2014 **SURF. ELEV.** 577.36 **COORDINATES:** N: 1548209.83 E:1937540.33
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 35 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 7.7 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

BORING HGWC-17

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/22/2014 **COMPLETED** 10/22/2014 **SURF. ELEV.** 581.51 **COORDINATES:** N:1548449.71 E: 1937538.98
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 13.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Lean Clay (CL)					
		- pale gray-brown, dry, stiff, with red and yellow-brown mottling (fill)		SS -1	3.5-5.0	5-6-9 (**15**)	
		- red-yellow, dry, stiff, low to medium plasticity, with distinct gray mottling		SS -2	8.5-10.0	3-5-8 (**13**)	
			570.51				
		Clayey Sand (SC)					
		- pale brown, very moist to wet, medium dense, fine grain, with gray mottling		SS -3	13.5-15.0	3-5-5 (**10**)	
		- pale brown, wet, medium dense, with red-yellow mottling		SS -4	18.5-20.0	6-10-13 (**23**)	
		- pale brown, wet, very dense, fine to coarse grain, with red-yellow mottling, coarse well-rounded gravel	557.58	SS -5	23.5-24.3	17-50/4" (**100+**)	
			556.51				
		Partially Weathered Rock (PWR) - dark gray and dark red, claystone and shale, no HCl reaction, possible boulder					
		Bottom of borehole at 25.0 feet.					

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: HGWC-17

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/22/2014 **COMPLETED** 10/22/2014 **SURF. ELEV.** 581.51 **COORDINATES:** N: 1548449.71 E:1937538.98
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 13.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

BOREHOLE DATA — ELEV. / Strata; DEPTH (ft)

WELL DATA

Top of casing Elev: 584.30

Surface:
protective aluminum cover with bollards; 4-foot square concrete pad

Surface Seal: concrete — 579.51 [2.0]

Well: 2" OD PVC (SCH 40)

Annular Fill: Cement-Bentonite Grout (2 - 94lbs. bags, 22 gal.) — 572.51 [9.0]

570.51 Annular Seal: 3/8 bentonite pellets (1 - 50lbs. bucket) — 569.41 [12.1]

Filter: #1A silica filter sand (6 - 50lbs. bags) — 566.91 [14.6]

Screen: 10 ft. 0.010" slot pre-pack

556.91

Sump:0.40 ft.

556.51

COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING HGWC-18

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/22/2014 **COMPLETED** 10/22/2014 **SURF. ELEV.** 581.36 **COORDINATES:** N:1548821.27 E: 1937558.32
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 11.5 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Gravelly Lean Clay (CL)					
		- yellow-brown, dry, stiff, with red mottling		SS -1	3.5-5.0	4-5-5 (**10**)	
5			573.36				
		Silt (ML) - yellow-brown, dry, hard, low recovery		SS -2	8.5-10.0	13-19-31 (**50**)	
10			570.36				
		Well-graded Gravelly Sand (SW)					
		- yellow-brown, very moist, dense, fine to coarse grain, with red-yellow mottling, coarse well-rounded gravel		SS -3	13.5-15.0	14-19-19 (**38**)	
15			563.36				
		Partially Weathered Rock (PWR) - black to dark gray, very hard, shale, fissle, irregular and inclined bedding, no HCl reaction		SS -4	18.5-20.0	23-41-43 (**84**)	
20							
		- black to dark gray, very hard, shale, fissle, irregular and inclined bedding, no HCl reaction		SS -5	23.5-24.8	19-31-54/4" (**100+**)	
25			556.36				

Bottom of borehole at 25.0 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

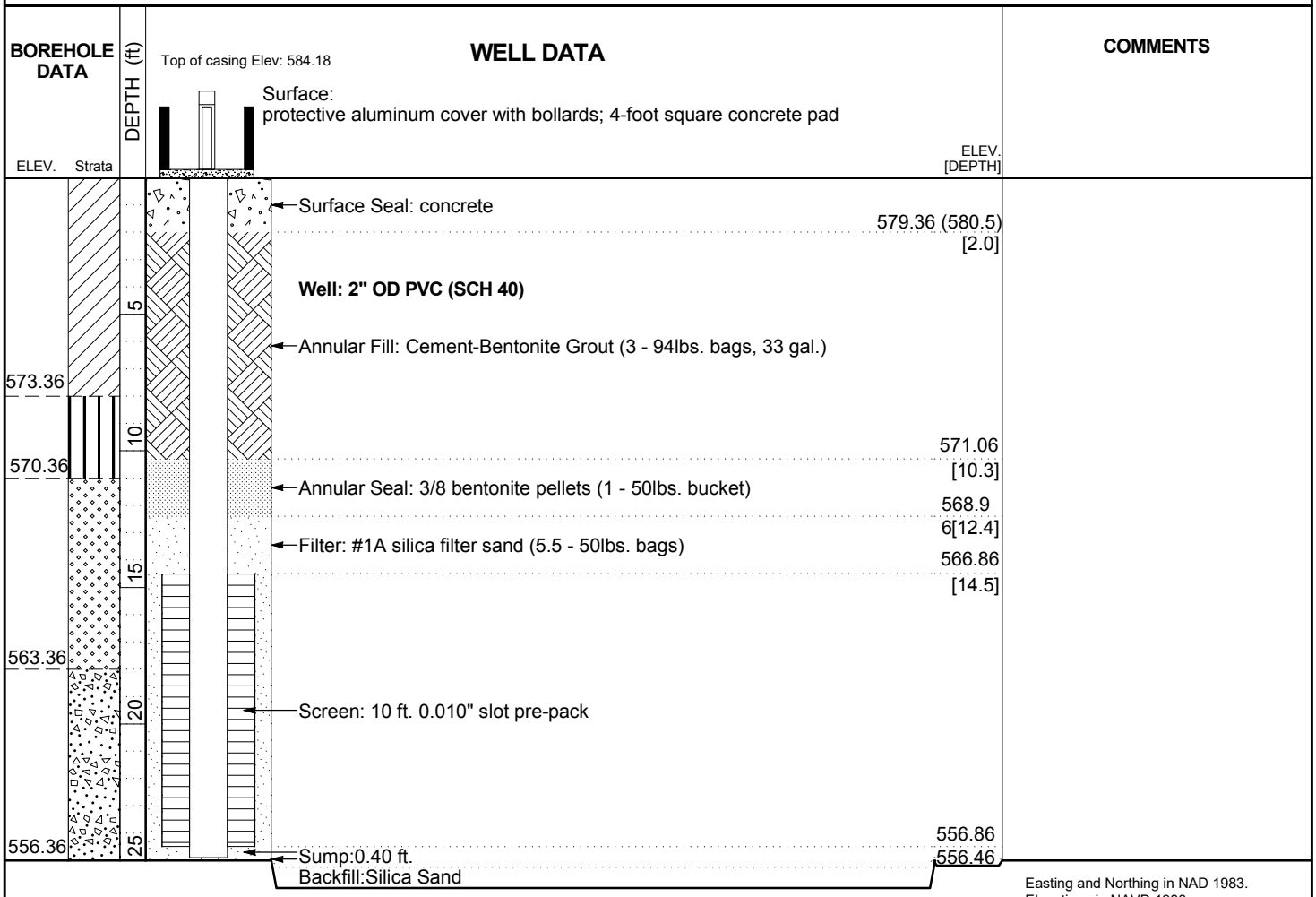
WELL: HGWC-18

ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/22/2014 **COMPLETED** 10/22/2014 **SURF. ELEV.** 581.36 **COORDINATES:** N: 1548821.27 E:1937558.32
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 11.5 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING MW08
PAGE 1 OF 1
ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/29/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 584.25 **COORDINATES:** N:1548171.86 E: 1940016.70
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 30 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** _____ **DELAYED** 10.8 ft. after 200 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Fill (CL)					
5		- gray-brown, dry, stiff, with yellow-red mottling, some silt		SS -1	3.5-5.0	4-6-9 (**15**)	
			578.25				
		Clayey Sand (SC)					
10		- yellow-brown, dry, medium dense, with red-yellow mottling		SS -2	8.5-10.0	4-9-11 (**20**)	
		▼	573.25				
		Poorly-graded Sand (SP)					
15		- yellow-brown, dry, loose, fine grain, with yellow-red mottling, some silt and fine well-rounded gravel, trace mica		SS -3	13.5-15.0	4-5-4 (**9**)	
			567.25				
		Well-graded Sand (SW)					
20		- red-yellow, wet, loose, fine to coarse grain, some fine well-rounded gravel ▽		SS -4	18.5-20.0	4-5-4 (**9**)	
		- red-yellow, wet, very loose, fine to coarse grain, coarse well-rounded gravel	560.25				
25		**Fat Clay (CH)** - yellow-brown, wet, soft, high plasticity, some coarse sand		SS -5	23.5-25.0	8-2-1 (**3**)	
		- gray-brown, wet, very stiff, medium to high plasticity, gravelly					
30			554.25	SS -6	28.5-30.0	6-8-11 (**19**)	

Bottom of borehole at 30.0 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 88.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: MW08
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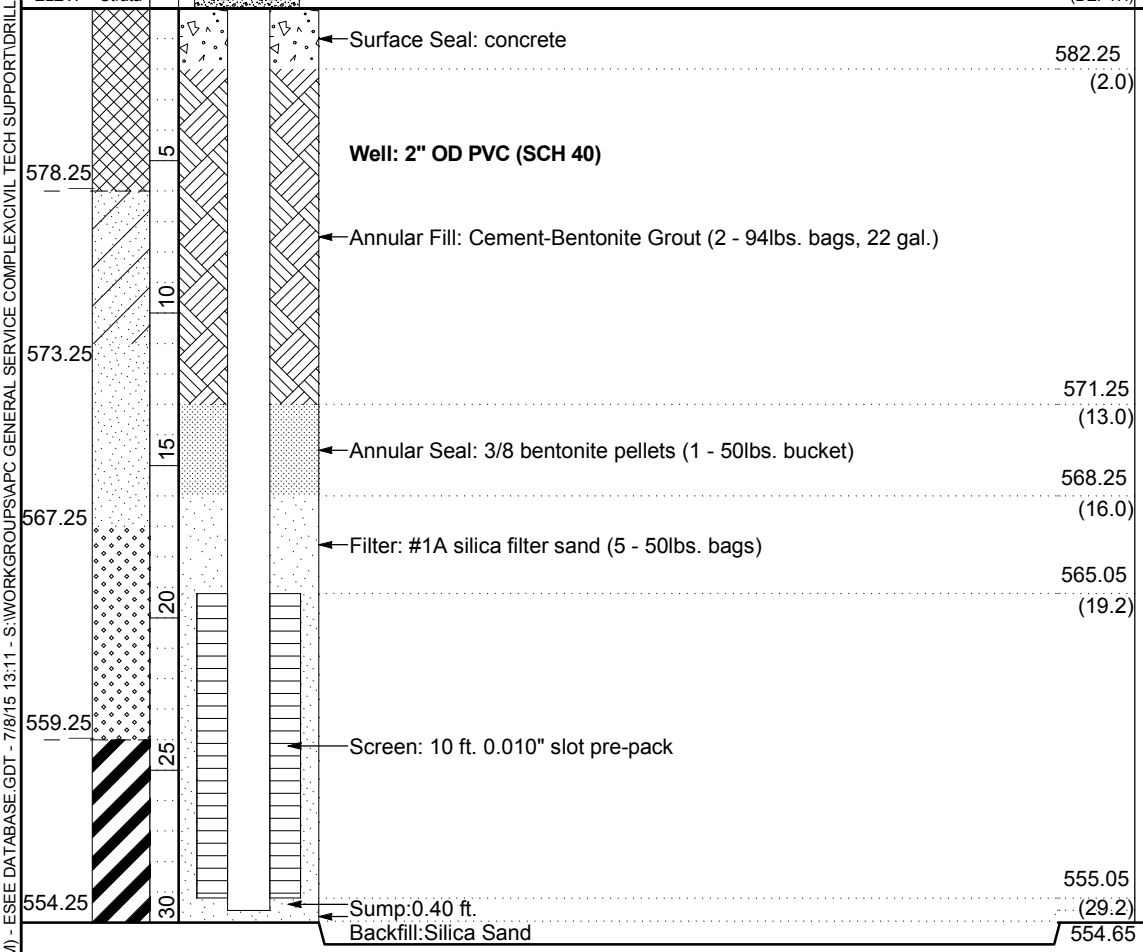
ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/29/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 584.25 **COORDINATES:** N: 1548171.86 E: 1940016.70
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 30 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** **DELAYED** 10.8 ft. after 200 hrs.
NOTES Well installed. Refer to well data sheet.



COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING AP02-MW09
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/29/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 588.42 **COORDINATES:** N:1548131.38 E:1938922.16
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 30 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 12.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Fill (CL)					
5		- red-brown and yellow-brown, dry, stiff, with black mottles, some fine gravel		SS -1	3.5-5.0	6-6-8 (**14**)	
10		- red-brown and yellow-red, very moist, medium stiff, with black mottles, some fine gravel		SS -2	8.5-10.0	3-4-3 (**7**)	
			576.42				
		Fat Clay (CH)					
15		- gray-brown and dark gray, very moist, very soft, medium to high plasticity, sticky		SS -3	13.5-15.0	0-0-2 (**2**)	
20		- gray-brown and dark gray, very moist to wet, stiff, medium to high plasticity, sticky, trace gravel		SS -4	18.5-20.0	4-5-8 (**13**)	
25		- yellow-brown, very moist, stiff, medium to high plasticity, silty, with yellow-red mottling		SS -5	23.5-25.0	4-5-9 (**14**)	
30		- pale gray-brown, very moist, stiff, sandy, some fine sub-rounded gravel	558.42	SS -6	28.5-30.0	3-3-6 (**9**)	

Bottom of borehole at 30.0 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: AP02-MW09
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/29/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 588.42 **COORDINATES:** N:1548131.38 E:1938922.16
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 30 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** **DELAYED** 12.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

BOREHOLE DATA — ELEV. / Strata; DEPTH (ft)

WELL DATA

Top of casing Elev: 591.67

Surface:
protective aluminum cover with bollards; 4-foot square concrete pad

ELEV. (DEPTH)	
	Surface Seal: concrete
586.42 (2.0)	
	Well: 2" OD PVC (SCH 40)
	Annular Fill: Cement-Bentonite Grout (3 - 94lbs. bags, 33 gal.)
576.42	
573.42 (15.0)	
	Annular Seal: 3/8 bentonite pellets (1 - 50lbs. bucket)
571.42 (17.0)	
	Filter: #1A silica filter sand (6 - 50lbs. bags)
569.12 (19.3)	
	Screen: 10 ft. 0.010" slot pre-pack
559.12 (29.3)	
558.42	Sump:0.40 ft.
	Backfill:Silica Sand
558.42	

COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING AP02-MW12
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ECS37736

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/21/2014 **COMPLETED** 10/21/2014 **SURF. ELEV.** 580.59 **COORDINATES:** N:1547853.78 E:1937525.46
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 35.2 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** _____ **DELAYED** 16.4 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Silt (ML)					
5		- brown and dark brown, dry, very stiff, clayey		SS -1	3.5-5.0	5-7-8 (**15**)	
10		- brown and dark brown, dry, medium stiff, clayey		SS -2	8.5-10.0	3-4-4 (**8**)	
15		- brown and brown-yellow, damp, medium stiff, mica		SS -3	13.5-15.0	3-2-3 (**5**)	
	▽						
20	▽	- brown and brown-yellow, very moist to wet, medium stiff, some very fine grained sand		SS -4	18.5-20.0	2-4-4 (**8**)	
		Sandy Silt (ML)	558.59				
25		- brown, wet, soft, mica		SS -5	23.5-25.0	2-2-2 (**4**)	
		Silty Sand (SM)	554.59				
30		- brown, wet, loose, fine grain, trace coarse grained sand		SS -6	28.5-30.0	2-4-3 (**7**)	
		- brown, wet, medium dense, fine grain, trace coarse grained sand	546.59				
35		**Well-graded Sand (SW)** - fine to coarse grain, some fine gravel	545.39	SS -7	33.5-35.0	7-9-9 (**18**)	
		Bottom of borehole at 35.2 feet.					

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: AP02-MW12
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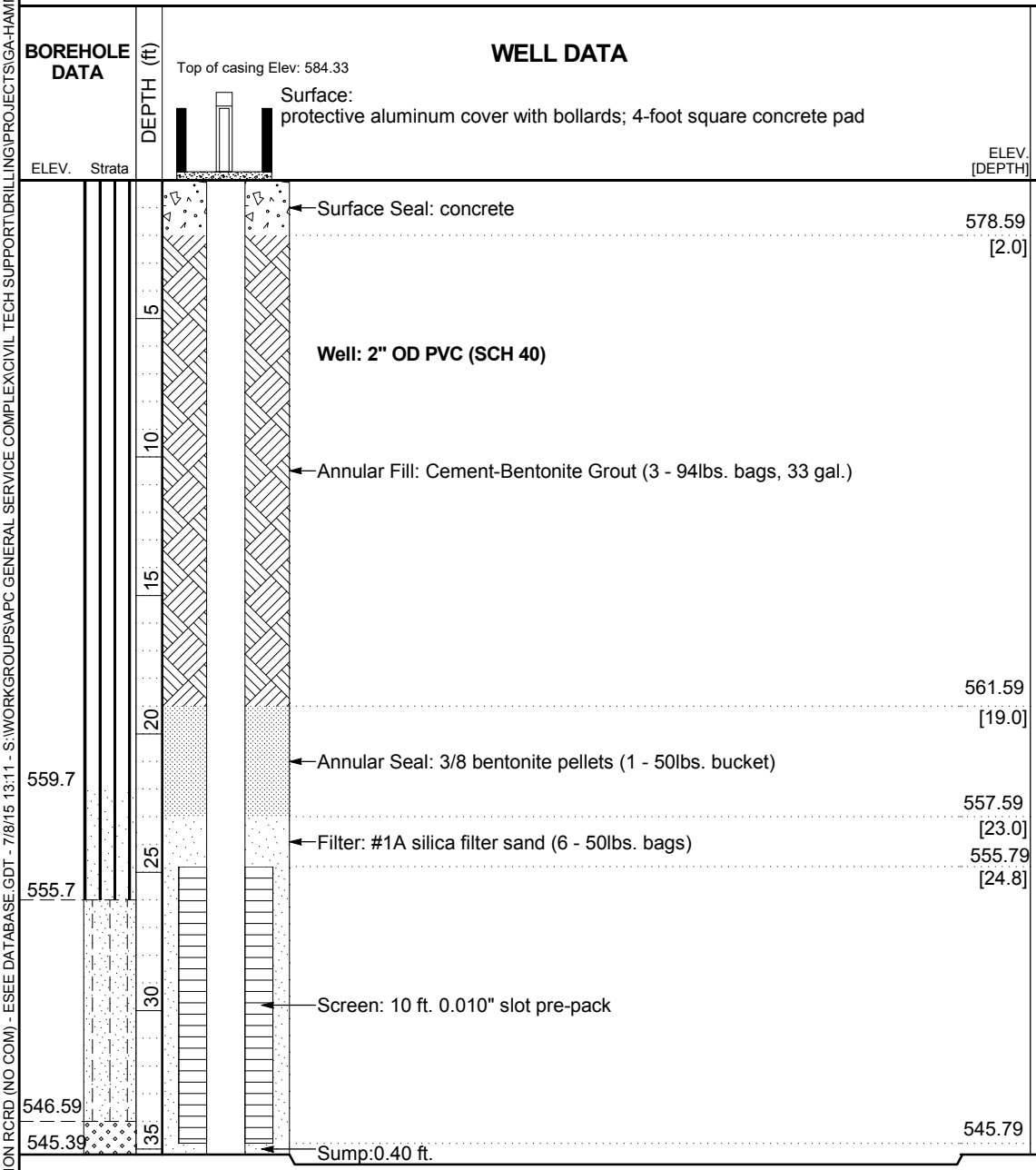
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/21/2014 **COMPLETED** 10/21/2014 **SURF. ELEV.** 580.59 **COORDINATES:** N: 1547853.78 E:1937525.46
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 35.2 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** **DELAYED** 16.4 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING AP02-MW16
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/23/2014 **COMPLETED** 10/27/2014 **SURF. ELEV.** 571.70 **COORDINATES:** N: 1549104.17 E:1937940.06
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 19.9 ft. **GROUND WATER DEPTH: DURING** 10 ft. **COMP.** _____ **DELAYED** 3.6 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Sandy Lean Clay (CL)					
		- yellow-brown and brown, damp, stiff, some fine to coarse gravel		SS -1	3.5-5.0	6-8-4 (**12**)	
			564.70				
		Partially Weathered Rock (PWR)					
		- dark brown to black, dry to very moist, very hard, shale		SS -2	8.5-10.0	9-16-37 (**53**)	
			560.80				
		Shale					Auger refusal at 10.9 ft.
		- black, steep bedding dip, fissle, low-angle fold, few thin white veins		RC -1	10.9-14.9	**98** (90)	
		- black, steep bedding dip, fissle, low-angle fold, few thin white veins		RC -2	14.9-19.9	**102** (30)	
			551.80				

Bottom of borehole at 19.9 feet.

Easting and northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: AP02-MW16
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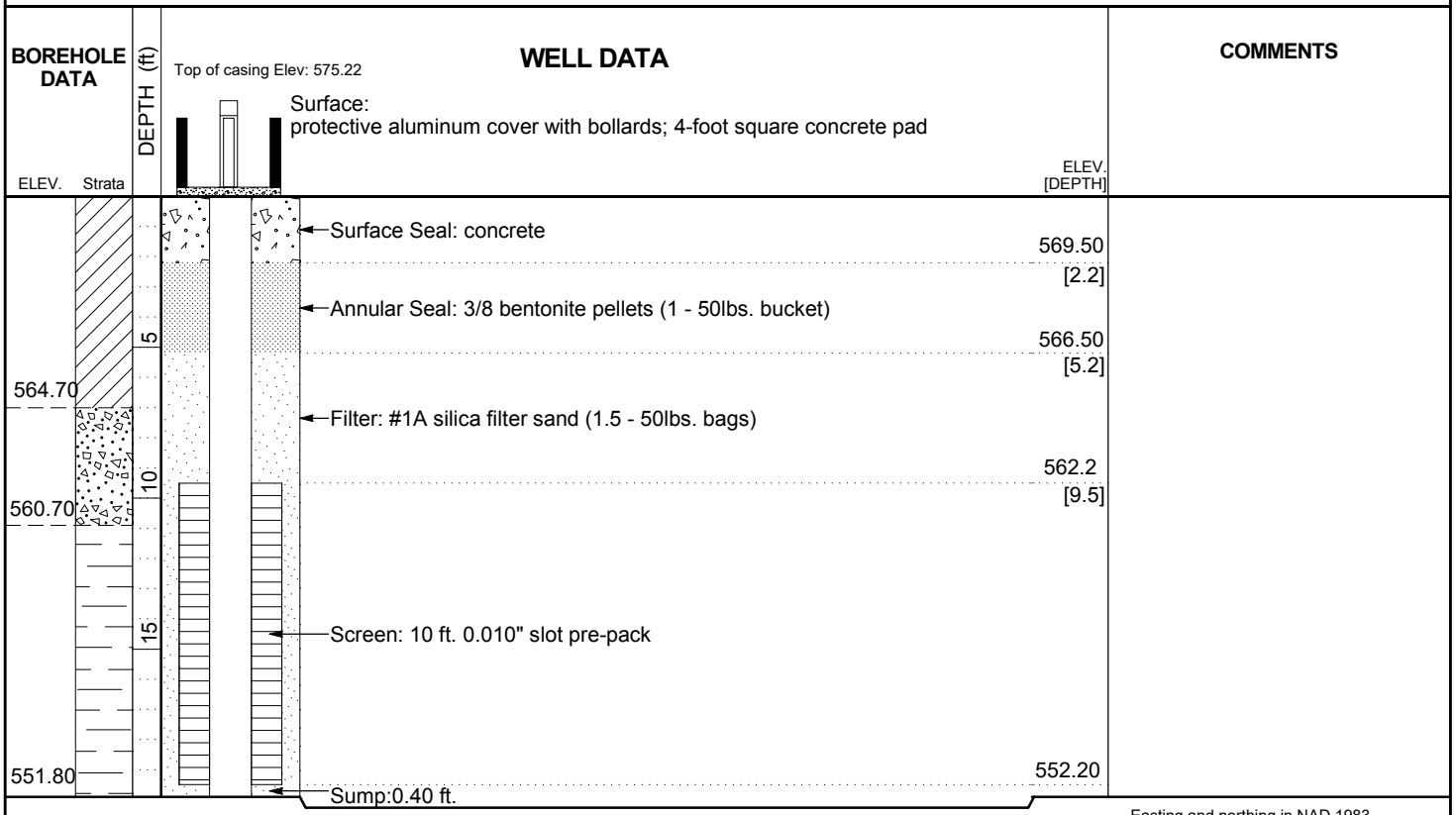
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/23/2014 **COMPLETED** 10/27/2014 **SURF. ELEV.** 571.70 **COORDINATES:** N:1549104.17 E:1937940.06
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 19.9 ft. **GROUND WATER DEPTH: DURING** 10 ft. **COMP.** **DELAYED** 3.6 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



Easting and northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING AP02-MW17
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/28/2014 **COMPLETED** 10/28/2014 **SURF. ELEV.** 583.68 **COORDINATES:** N:1549163.28 E:1938345.81
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 25.1 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** _____ **DELAYED** 6.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Lean Clay (CL)					
5		- pale gray-brown, dry, stiff, low to medium plasticity, silty, with yellow-red mottling		SS -1	3.5-5.0	5-5-8 (**13**)	
10		- pale brown, dry, very stiff, low to medium plasticity, with brown yellow mottling, coarse sub-rounded to well-rounded gravel		SS -2	8.5-10.0	5-8-10 (**18**)	
15		- yellow-brown, dry, very hard, silty, low recovery		SS -3	13.5-15.0	5-18-35 (**53**)	
			566.68				
		Silty Gravel (GM)					
20		- dark gray to black, very moist to wet, very dense, partially weathered shale		SS -4	18.5-20.0	33-41-40 (**81**)	
25		- dark gray to black, dry to very moist, very dense, partially weathered shale		SS -5	23.5-24.2	21-50/2" (**100+**)	
			558.58				

Bottom of borehole at 25.1 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: AP02-MW17
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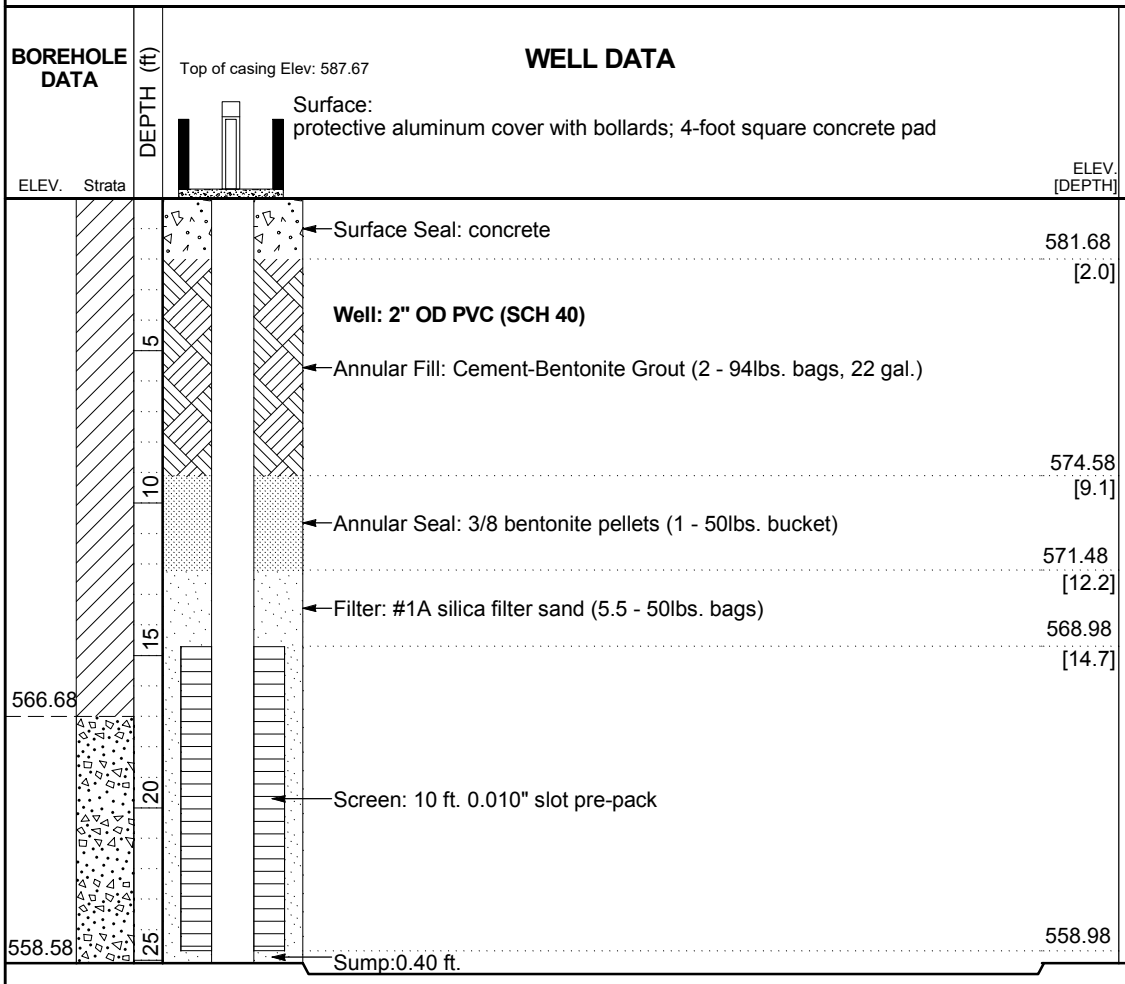
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/28/2014 **COMPLETED** 10/28/2014 **SURF. ELEV.** 583.68 **COORDINATES:** N: 1549163.28 E:1938345.81
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 25.1 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** **DELAYED** 6.9 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



COMMENTS

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

BORING AP02-MW18
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/28/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 589.75 **COORDINATES:** N:1548984.15 E:1938712.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** _____ **BEARING** _____
BORING DEPTH 29.2 ft. **GROUND WATER DEPTH: DURING** 10 ft. **COMP.** _____ **DELAYED** 9.6 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	STRATA DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N-VALUE) / PERCENT RECOVERY (RQD)	COMMENTS
		Fill (SC)					
5		- olive brown, dry, medium dense, with black mottling, coal sand		SS -1	3.5-5.0	5-7-12 (**19**)	
10		- dark olive brown to black, very moist to wet, very loose, some gravel, fine coal or ash		SS -2	8.5-10.0	1-1-3 (**4**)	
			577.75				
15		**Lean Clay (CL)** - yellow-brown, damp, very stiff, with gray and yellow-red mottling, some fine well-rounded gravel		SS -3	13.5-15.0	5-7-12 (**19**)	
		- yellow-brown, damp, very hard, with gray and yellow-red mottling, some fine well-rounded gravel	570.75	SS -4	18.5-19.1	25-50/1" (**100+**)	
20		**Silty Gravel (GM)** - black, wet					
25		- black, wet, very dense, angular gravel, weathered shale		SS -5	23.5-24.2	32-50/2" (**100+**)	
		- black, dry to very moist, very dense, sandy, angular gravel, sheared (irregular) fabric, weathered shale	560.55	SS -6	28.5-29.2	37-50/2" (**100+**)	

Bottom of borehole at 29.2 feet.

Easting and northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

SOUTHERN COMPANY

RECORD OF WELL CONSTRUCTION

WELL: AP02-MW18
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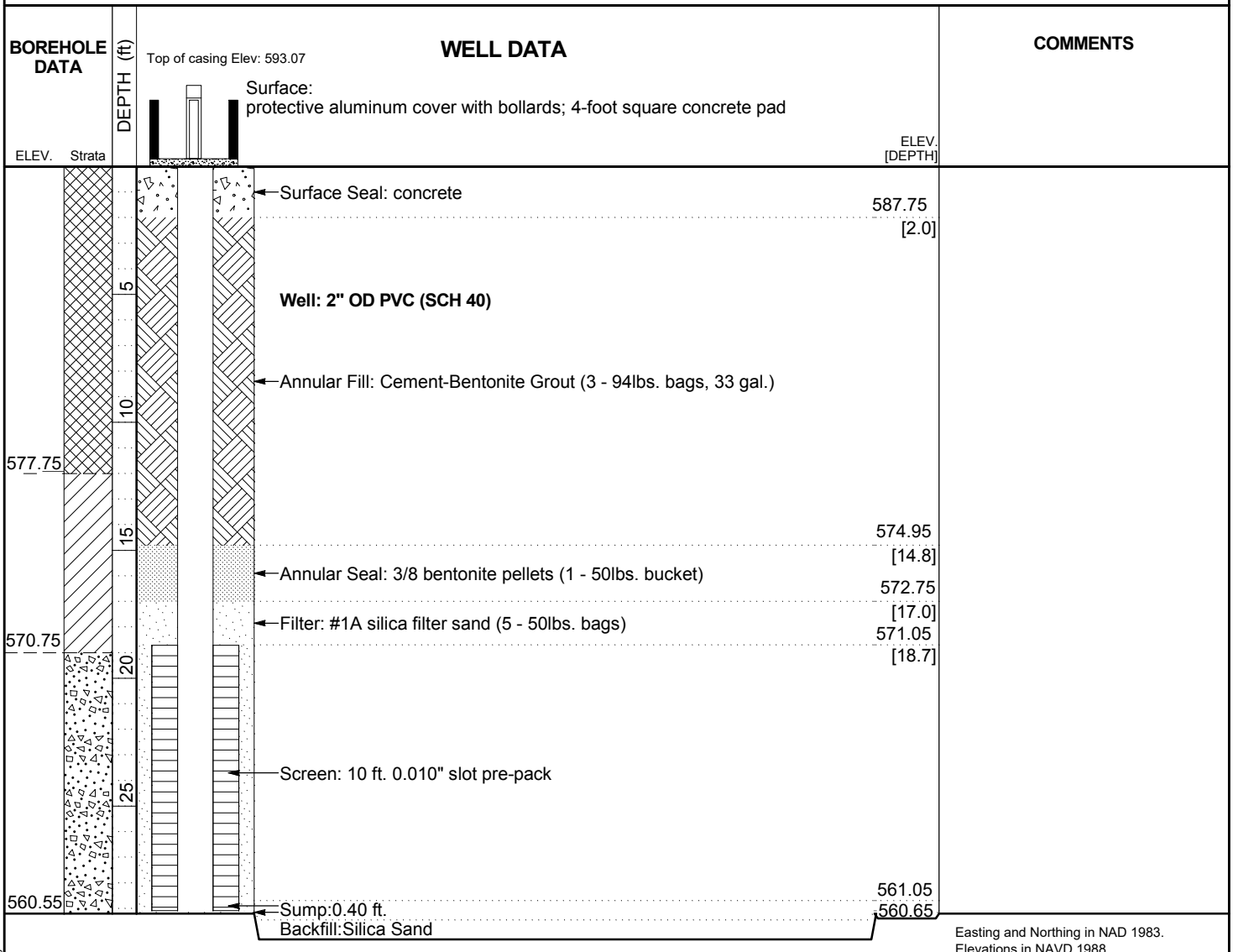
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Hammond

DATE STARTED 10/28/2014 **COMPLETED** 10/29/2014 **SURF. ELEV.** 589.75 **COORDINATES:** N:1548984.15 E: 1938712.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME 550 **METHOD** Hollow Stem Auger; Hollow Stem Auger
DRILLED BY T. Milam **LOGGED BY** W. Shaughnessy **CHECKED BY** L. Millet **ANGLE** **BEARING**
BORING DEPTH 29.2 ft. **GROUND WATER DEPTH: DURING** 10 ft. **COMP.** **DELAYED** 9.6 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.



Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

Log updated with revised survey certified 5/19/2020.

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1255 Roberts Boulevard
Kennesaw, GA 30144

MW-21D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 11/19/18 **COMPLETED** 11/19/18
NORTHING 1548814.86 ft **EASTING** 1937555.78 ft
DRILLER Cascade Drilling
GROUND ELEVATION 581.16 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 583.84 ft
SAMPLING METHOD 4" core 6" overide
GEOPHYSICAL CONTRACTOR Geosyntec
RIG TYPE Geoprobe 8140LC
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	GRAPHIC LOG	GAMMA (cps) 0 100	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	581				Hydro excavation (0-10') - No sample	
5	575					Bentonite grout
10	570				10-11': No recovery	
15	565				GRAVELLY SAND, Yellowish brown, trace silt and clay, fine to coarse sand, well graded, some subangular to rounded gravel, loose, wet.	Schedule 40 PVC 2"
20	560				PARTIALLY WEATHERED ROCK (PWR), Black, thinly bedded shale rock fragments, hard, moist.	Bentonite uncoated 3/8" chips
25	555				SHALE, Black, fine grained, hard, thinly bedded to massive, slightly to moderately weathered and fractured.	
	550					

(Continued Next Page)

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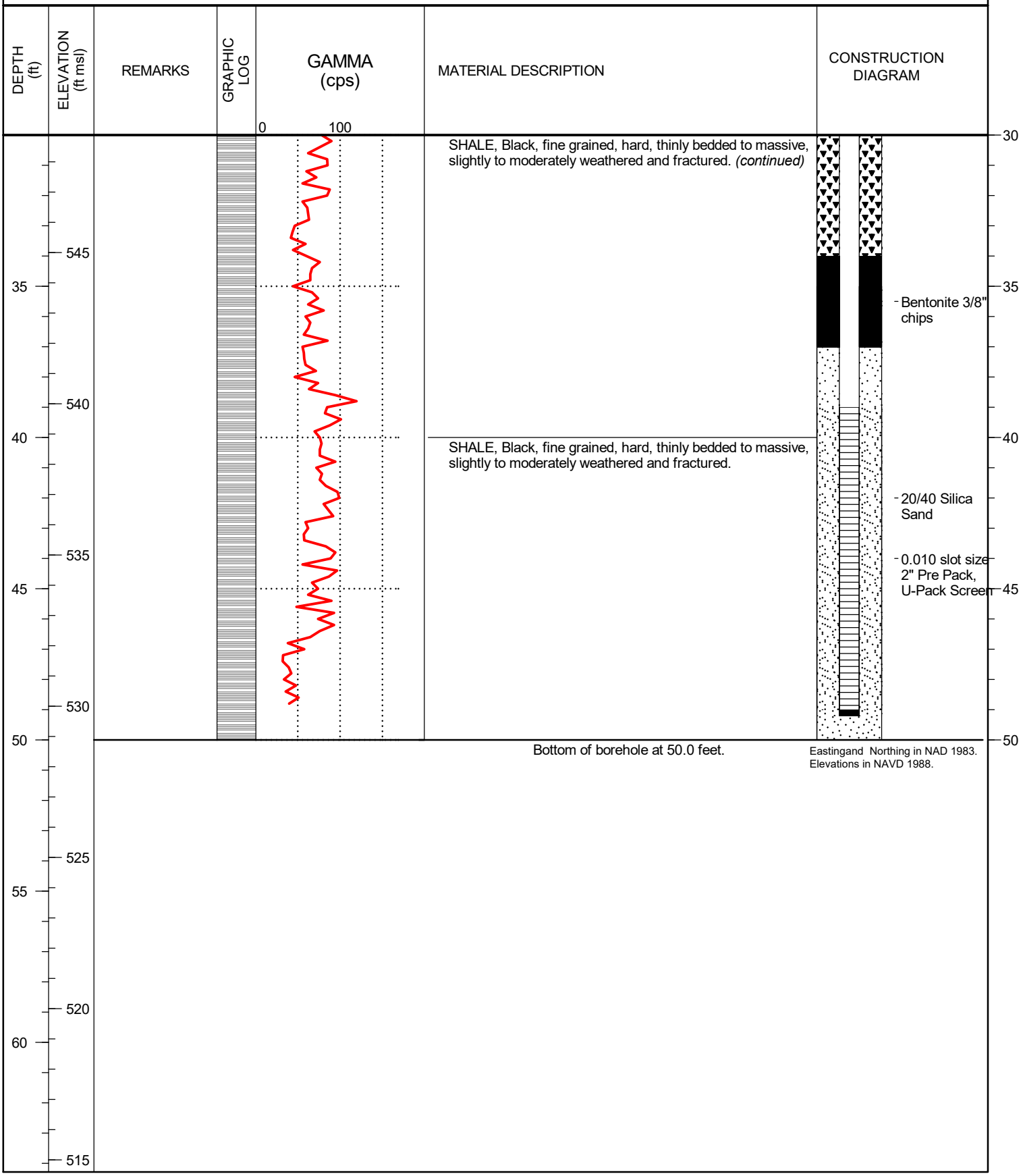
MW-21D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond



Bottom of borehole at 50.0 feet.

Eastingand Northing in NAD 1983.
Elevations in NAVD 1988.

SCS PLANT HAMMOND PLANT HAMMOND NOVEMBER 2018 WELL INSTALL.GPJ ACP GINT LIBRARY.GLB 3/18/19

Log updated with revised survey certified 5/19/2020.

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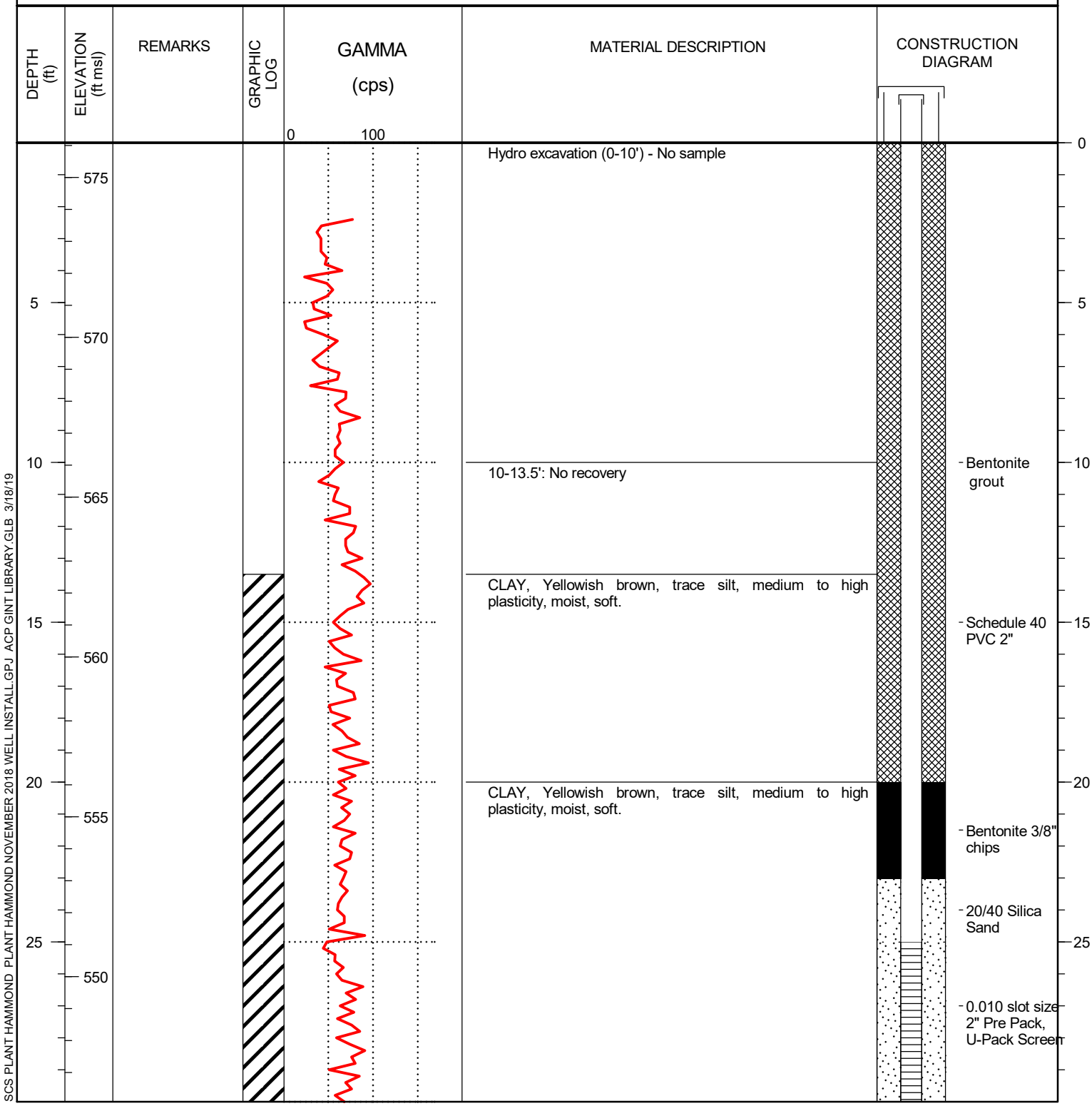
Kennesaw, GA 30144

MW-22

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 11/15/18 **COMPLETED** 11/15/18
NORTHING 1547854.68 ft **EASTING** 1937832.04 ft
DRILLER Cascade Drilling
GROUND ELEVATION 576.05 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 578.51 ft
SAMPLING METHOD 4" core 6" overide
GEOPHYSICAL CONTRACTOR Geosyntec
RIG TYPE Geoprobe 8140LC
LOGGED BY Consultants N.Tilahun **CHECKED BY** J. Ivanowski



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MW-22

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	GRAPHIC LOG	GAMMA (cps)	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
	545			0 100	CLAY, trace silt and fine sand, non plastic to low plasticity, dark brown, soft, moist, slightly laminated.	30
35	540				Bottom of borehole at 35.0 feet.	35
40	535					
45	530					
50	525					
55	520					
60	515					

Eastingand Northing in NAD 1983.
Elevations inNAVD 1988.

SCS PLANT HAMMOND PLANT HAMMOND NOVEMBER 2018 WELL INSTALL.GPJ ACP GINT LIBRARY.GLB 3/18/19

Log updated with revised survey certified 5/19/2020.

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Kennesaw, GA 30144

MW-23D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 11/15/18 **COMPLETED** 11/15/18
NORTHING 1547876.55 ft **EASTING** 1937843.89 ft
DRILLER Cascade Drilling
GROUND ELEVATION 579.06 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 581.30 ft
SAMPLING METHOD 4" core 6" overide
GEOPHYSICAL CONTRACTOR Geosyntec
RIG TYPE Geoprobe 8140LC
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft msl)	REMARKS	GRAPHIC LOG	GAMMA (cps) 0 100	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	580				Hydro excavation (0-10') - No sample	
5	575					Bentonite grout
10	570				10-13': No recovery	
					SILTY CLAY, Dark brown, low plasticity, trace fine sand, soft, moist.	
15	565				CLAY, Yellowish brown, medium to high plasticity, trace silt, moist, soft.	Schedule 40 PVC 2"
20	560				CLAY, Yellowish brown, medium to high plasticity, trace silt, moist, soft.	
25	555					Bentonite uncoated 3/8" chips

SCS PLANT HAMMOND PLANT HAMMOND NOVEMBER 2018 WELL INSTALL.GPJ ACP GINT LIBRARY.GLB 3/18/19

(Continued Next Page)

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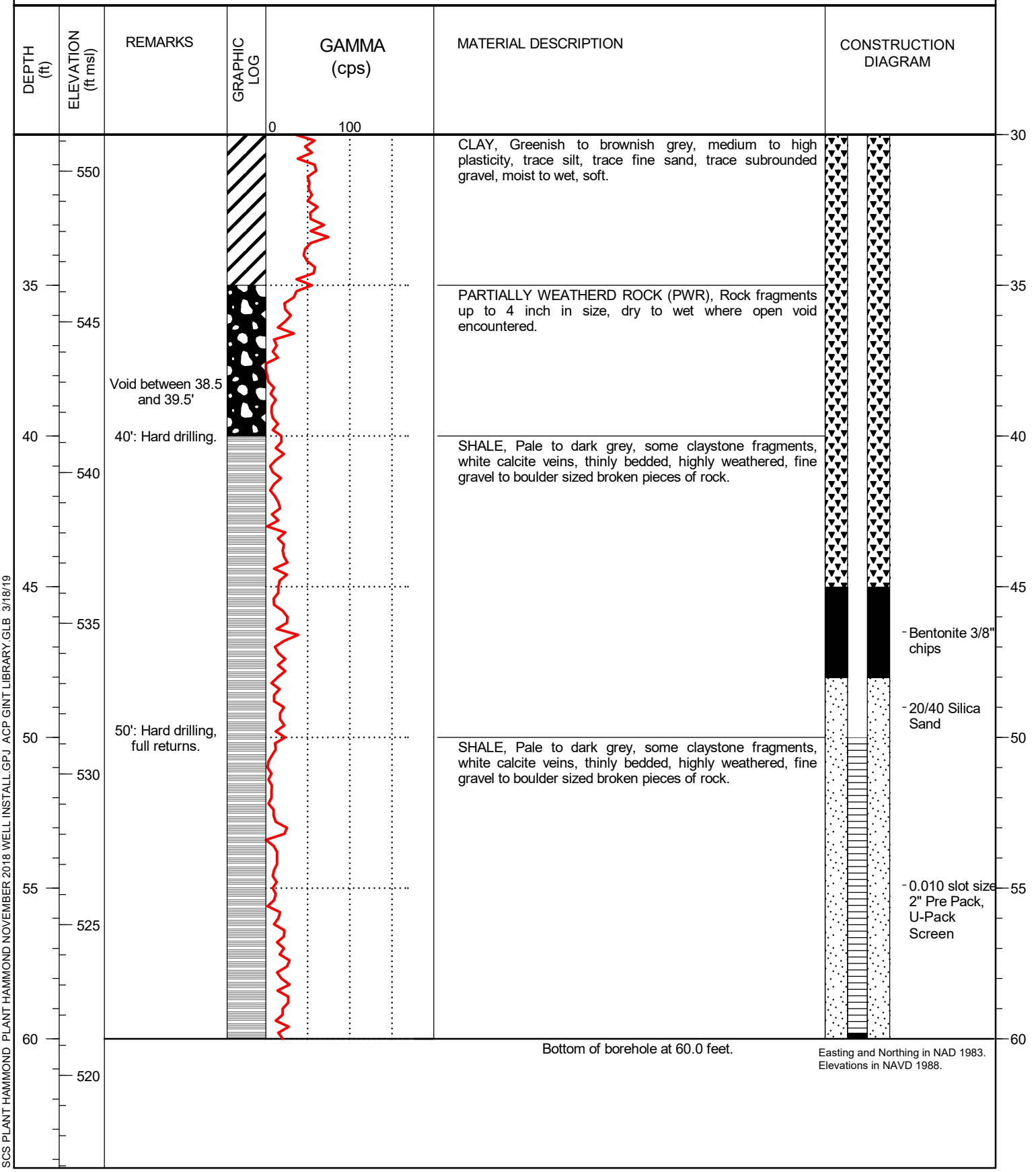
MW-23D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond



Bottom of borehole at 60.0 feet.

Easting and Northing in NAD 1983.
Elevations in NAVD 1988.

SCS PLANT HAMMOND PLANT HAMMOND NOVEMBER 2018 WELL INSTALL.GPJ ACP GINT LIBRARY.GLB 3/18/19

Log updated with revised survey certified 5/19/2020.

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MW-33

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 11/21/19 **COMPLETED** 11/22/19
NORTHING 1547973.50 ft **EASTING** 1938412.13 ft
DRILLER SCS Field Services
GROUND ELEVATION 591.19 ft **BORING DIAMETER** 8 in
DRILLING METHOD HSA
TOP OF CASING ELEVATION 593.92 ft
SAMPLING METHOD SPT
GEOPHYSICAL CONTRACTOR ---
RIG TYPE CME 550
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft msl)	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	590				Hydro excavation (0-10') - No sample.	
5	585					Bentonite grout
10	580				10-13.5': No Sample.	
15	575	33	4-8-9 (17)		GRAVELLY CLAY, Brown, low to medium plasticity, gravel is angular to subangular, stiff, trace sand and silt, moist.	Schedule 40 PVC 2"
					15-18.5': No sample.	
		78	14-6-6 (12)		GRAVELLY CLAY, Brown, low to medium plasticity, gravel is angular to subangular, stiff, trace sand and silt, moist.	
					SILT, Brown, low to medium plasticity, trace fine sand, firm to stiff, with some clay, moist.	

(Continued Next Page)

Log updated with revised survey certified 5/19/2020.

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MW-33

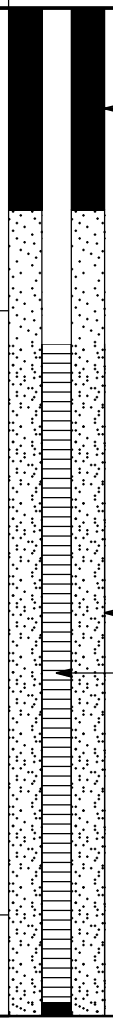
CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft msl)	RECOVERY %	BLOW COUNTS (N VALUE)	GRAPHIC LOG	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. *(continued)* 20': Firm to stiff.
		100	5-4-6 (10)		
		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)		
		78	2-4-4 (8)		27.5': Firm.
30		100	4-6-6 (12)		29': Light brown to light gray.
	560	89	4-5-6 (11)		30.5': Light brown to light gray, stiff.
		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.

Bottom of borehole at 35.0 feet.

CONSTRUCTION DIAGRAM



Easting and Northing in NAD 1983. Elevations in NAVD 1988.

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CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 5/6/20 **COMPLETED** 5/6/20
NORTHING 1547996.82 ft **EASTING** 1938392.20 ft
DRILLER Cascade Drilling
GROUND ELEVATION 593.83 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 596.51 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terra Sonic Compact Crawler
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0				Hydro Excavation (0 ft to 10 ft) NO SAMPLE	
	590				
5					
	585				
10				583.8 SANDY CLAY, Brown, low plasticity, some fine to coarse sand, few angular gravel, soft to firm, moist.	Schedule 40 PVC 2"
	580				
15					Aquaguard Sodium Bentonite Grout
	575			574.8	
20				SILT, Dark brown, few clay, trace fine sand, firm, moist. 573.8 CLAY, Yellowish brown, medium plasticity, few fine to coarse, rounded gravel, few silt, soft, moist.	
	570				
25					
	565				
30				30 ft: Trace red mottles.	
	560				
35				556.8 GRAVELLY CLAY, Grayish brown, low plasticity to non plastic, some fine to coarse rounded gravel up to 3 inch in diameter, few fine to coarse sand, soft, moist.	
	555				

SCS MONITORING WELLS PLANT HAMMOND MW34D TO MW41_MAY 2020.GPJ ACP GINT LIBRARY CH.GLB 7/8/20

(Continued Next Page)

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CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
40				551.8	
	550			CLAY, Yellowish brown to dark brown, low to medium plasticity, trace silt and fine sand, soft, moist.	
45					
	545			543.8	
50				CLAYEY GRAVEL, Yellowish brown, gravel is rounded, up to 3 inch diameter, some clay, trace silt, loose, wet.	Aquaguard Sodium Bentonite Grout
	540				
55					Bentonite coated 3/8" pellets
	535			533.8	
60				SHALE, Dark gray, pale brown near top, trace calcite veins, thinly bedded, fine grained, broken pieces of rock, moderately weathered.	
	530				
65					20/40 Silica Sand
	525				0.010 slot size 2" Pre Pack, U-Pack Screen
70				523.8	
				NO RECOVERY (70 ft to 71 ft)	
				522.8	

Bottom of borehole at 71.0 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

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MW-35

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 5/13/20 **COMPLETED** 5/13/20
NORTHING 1547905.33 ft **EASTING** 1938417.82 ft
DRILLER Cascade Drilling
GROUND ELEVATION 571.88 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 574.40 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terra Sonic Compact Crawler
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION
0	570	Hand auger to 10 ft. Description based on auger flights.		SILTY SAND, Dark brown to black, fine to coarse grained, well graded, some silt, trace clay, loose, wet.
5	565			566.9 CLAY, Yellowish brown, low to medium plasticity, few fine sand, trace silt, few black mottles, soft.
10	560			561.9 CLAY, Pale brown to yellowish brown, few black mottles, medium to high plasticity, some subangular to rounded gravel, soft, wet.
15	555			557.9 GRAVELLY CLAY, Greenish gray, low plasticity, gravel is fine to coarse, subangular to subrounded, soft, wet. 555.9 CLAY, Brown, low to medium plasticity, trace fine sand and silt, soft, wet.
20				19 ft: Brown to yellowish brown, few black mottles. 550.9

CONSTRUCTION DIAGRAM

- Aquaguard Sodium Bentonite Grout
- Bentonite coated 3/8" pellets
- Schedule 40 PVC 2"
- 20/40 Silica Sand
- 0.010 slot size 2" Pre Pack, U-Pack Screen

Bottom of borehole at 21.0 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

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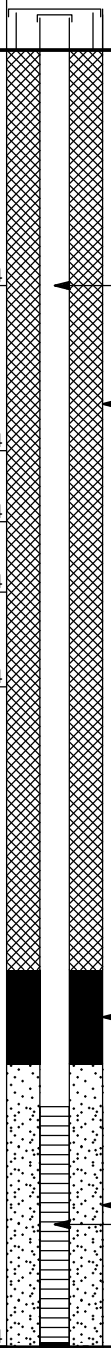
MW-36D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 5/7/20 **COMPLETED** 5/7/20
NORTHING 1548435.43 ft **EASTING** 1937538.19 ft
DRILLER Cascade Drilling
GROUND ELEVATION 581.44 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 584.10 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terra Sonic Compact Crawler
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION
0	580			Hydro Excavation (0 ft to 10 ft) NO SAMPLE
10	570			571.4 CLAY, Light brown with gray layers and mottles, low to medium plasticity, trace fine sand and silt, soft.
20	560			564.4 CLAYEY SAND, Light brown, fine grained, poorly graded, some clay, trace silt, medium dense, slightly laminated, moist. 561.4 GRAVELLY CLAY, Dark brown with black mottles, some fine to coarse gravel, few fine to coarse sand and silt, stiff, moist. 558.4 PARTIALLY WEATHERED ROCK, Dark gray to black, dry, shale rock fragments, hard. 554.4 SHALE, Black, fine grained, hard, thinly bedded, pulverized from drilling, dry.
30	550			
40	540			
50	530			

CONSTRUCTION DIAGRAM



Bottom of borehole at 55.0 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

SCS MONITORING WELLS PLANT HAMMOND MW34D TO MW41_MAY 2020.GPJ ACP GINT LIBRARY CH.GLB 7/8/20

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MW-37D

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 5/8/20 **COMPLETED** 5/8/20
NORTHING 1548803.01 ft **EASTING** 1937551.05 ft
DRILLER Cascade Drilling
GROUND ELEVATION 580.95 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic
TOP OF CASING ELEVATION 583.58 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terra Sonic Compact Crawler
LOGGED BY N.Tilahun **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	580	No water added during drilling.		Hydro Excavation (0 ft to 10 ft) NO SAMPLE	
10	570			571.0 GRAVELLY SAND, Yellowish brown, fine to coarse grained, well graded, some subangular to rounded gravel, loose, wet to moist.	Schedule 40 PVC 2"
15	565				Aquaguard Sodium Bentonite Grout
20	560			563.0 PARTIALLY WEATHERED ROCK, Black, thinly bedded, fine grained, shale rock fragments, hard. 561.0 SHALE, Black, fine grained, thinly bedded, weathered, pulverized from drilling, hard, wet to moist.	
25	555				
30	550			30 ft: Moist due to drilling potentially evaporate moisture.	
35	545				

SCS MONITORING WELLS PLANT HAMMOND MW34D TO MW41_MAY 2020.GPJ ACP GINT LIBRARY CH.GLB 7/8/20

(Continued Next Page)

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CLIENT Southern Company Services **PROJECT NAME** Plant Hammond Well Installation

PROJECT NUMBER GW6581B **PROJECT LOCATION** Plant Hammond

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
40	540			SHALE, Black, fine grained, thinly bedded, weathered, pulverized from drilling, hard, wet to moist. *(continued)*	
45	535				
50	530				Aquaguard Sodium Bentonite Grout
55	525				
60	520				Bentonite coated 3/8" pellets
65	515				
70	510				20/40 Silica Sand 0.010 slot size 2" Pre Pack, U-Pack Screen
					507.0

Bottom of borehole at 74.0 feet.

Easting and Northing in NAD 1983.
Elevation in NAVD 1988.

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MW-51

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 7/22/21 **COMPLETED** 7/22/21
NORTHING 1547872.35 ft **EASTING** 1938421.46 ft
DRILLER Sean Denty, Civil Field Services
GROUND ELEVATION 571.57 ft **BORING DIAMETER** 6 in
DRILLING METHOD Hollow Stem Auger
TOP OF CASING ELEVATION 574.54 ft
SAMPLING METHOD Split spoon
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Geoprobe 7822DT
LOGGED BY T. Kessler **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	GRAPHIC LOG	MATERIAL DESCRIPTION	CONSTRUCTION DIAGRAM
0	570	0 to 10 ft: Hand auger.		SILTY CLAY, Dark yellowish brown, medium plasticity, trace sands and organic matter, firm, moist.	Casing Top Elev: 574.54 (ft)
				568.57	Aquaguard Sodium Bentonite Grout
5	565			SANDY CLAY, Dark, grayish brown, medium plasticity, fine sands, soft, moist.	Schedule 40 PVC 2"
				8.5 ft: Wet.	
		10 to 15 ft bgs: Hollow stem auger.		561.57	
10	560			NO RECOVERY (10-15)	Bentonite coated 3/8" pellets
				556.57	20/40 Silica Sand
15	555	From 15 ft bgs: Continuous split spoon samples were used solely for sample collection.		SILITY CLAY, Dark grayish brown, medium plasticity, trace sands and mica, white mottling, very soft, moist.	
				554.57	
				NO RECOVERY (17-19) Material very soft and fell out of spoon.	
				552.57	
20				SANDY CLAY, Pinkish gray, low-medium plasticity, gray mottling, trace mica and silts, firm, moist to wet.	0.010 slot size 2" Pre Pack, U-Pack Screen
				550.57	
	550			CLAY, Reddish yellow/white, stiff, moist.	
				550.07	
				SANDY CLAY, Strong brown, medium plasticity trace silts and mica, relic rock strutures visible, stiff, moist.	
				548.57	
				SILTY CLAY, Light yellowish brown, high plasticity, very stiff, moist.	
25				From 24 ft: With subangular shale fragments, red, white, and grey mottling, relic rock structures visible, medium to high plasticity.	0.4 ft sump
				545.57	

Bottom of borehole at 26.0 feet.

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MW-52

CLIENT Southern Company Services
PROJECT NAME Plant Hammond Well Installation
PROJECT NUMBER GW6581B
PROJECT LOCATION Plant Hammond
DATE STARTED 1/25/2022 **COMPLETED** 1/25/2022
NORTHING 1549277.59 ft **EASTING** 1938398.82 ft
DRILLER Cascade Drilling
GROUND ELEVATION 583.25 ft **BORING DIAMETER** 6 in
DRILLING METHOD Sonic 4x6
TOP OF CASING ELEVATION 586.11 ft
SAMPLING METHOD 4" core 6" override
GEOPHYSICAL CONTRACTOR ---
RIG TYPE Terra Sonic Compact Crawler
LOGGED BY C. Hug **CHECKED BY** J. Ivanowski

DEPTH (ft)	ELEVATION (ft)	REMARKS	MATERIAL DESCRIPTION
0		0 to 9 ft: Hand auger.	CLAY, Yellow and reddish yellow, medium plasticity, with some fine grained sand, moist.
	580		From 2.5 ft: Yellow, reddish yellow and pale gray, bordering sandy clay, moist.
			578.25
5			SILTY CLAY with SAND, Red, yellowish brown, some pale gray, low plasticity, sand is fine grained, moist.
	575	9-20 ft: Sonic drilling.	
			573.25
10			SANDY CLAY, Red, yellowish red, low plasticity, sand is fine grained, moist to wet.
			572.25
			CLAYEY SAND, Yellow, pale gray, sand is fine grained, subrounded to rounded, with some fine to coarse grained, subrounded quartz gravel, wet.
	570		569.25
			GRAVELLY SAND, Yellow, pale gray, sand is fine to medium grained, gravel is fine grained, subrounded to rounded quartz, wet.
			568.25
15			SILTY CLAY, Red brown, yellowish red, low to medium plasticity, some fine grained sand, trace fine, rounded quartz gravel.
			567.25
			SILTY CLAY and CLAYEY SILT, Black, non plastic to low plasticity, trace fine pyrite, wet.
			566.25
			SHALE, Black, fine grained, recovered as pulverized, stiff silt and clayey silt, moist.
	565		From 18 ft: Dry.
20			562.96

CONSTRUCTION DIAGRAM

- Aquaguard Sodium Bentonite Grout
- Schedule 40 PVC 2"
- Bentonite coated 3/8" pellets
- 20/40 Silica Sand
- Top screen elevation: 573.29 ft
- 0.010 slot size 2" Pre Pack, U-Pack Screen
- Bottom screen elevation: 563.29 ft
- 0.3 ft sump

Bottom of borehole at 20.3 feet.

CERTIFIED WELL NETWORK SURVEY DATA

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail on Pad Northing	Nail on Pad Easting	Nail on Pad Elevation
AP1A-1	1550080.0050	1941614.1240	587.44	1550080.5990	1941613.9040	584.78
HGWA-1	1550423.3150	1940770.0000	595.21	1550424.4790	1940770.0550	592.32
HGWA-2	1549796.8670	1939845.1520	587.92	1549796.5130	1939845.2880	585.29
HGWA-3	1549794.4080	1939833.3900	587.74	1549794.0880	1939833.5600	585.23
HGWC-7	1549520.6650	1942319.7510	579.18	1549520.5890	1942320.0850	576.55
HGWC-8	1549114.6050	1942392.5560	579.82	1549114.5020	1942392.8550	577.14
HGWC-9	1548693.3000	1942215.0250	580.36	1548692.9890	1942215.1180	577.72
HGWC-10	1548469.2500	1941644.4320	579.37	1548469.5710	1941644.4340	576.76
HGWC-11	1548477.9080	1941146.7890	580.67	1548477.7080	1941146.7020	578.12
HGWC-12	1548476.5340	1941152.3430	580.73	1548475.9500	1941152.1790	578.14
HGWC-13	1548628.0320	1940900.6010	595.76	1548629.2680	1940900.3490	592.94
MW-1	1549938.2390	1941589.0590	588.66	1549939.5030	1941588.8340	585.63
MW-5	1548436.0170	1942448.8450	581.14	1548436.0640	1942447.5550	578.00
MW-6	1548383.1150	1941689.0050	581.84	1548384.4600	1941688.6600	579.18
MW-7	1548230.4670	1941087.4410	577.73	1548231.8360	1941086.8460	574.94
MW-8	1548171.8630	1940016.6970	586.93	1548173.5170	1940017.0010	584.25
MW-19	1548422.9360	1940943.0110	580.65	1548421.5880	1940943.4040	577.46
MW-20	1549029.6820	1942736.8510	579.00	1549028.9070	1942735.5530	575.96
MW-24D	1548638.7980	1940900.3660	595.68	1548637.3090	1940900.6270	592.91
MW-25D	1548473.0020	1941162.2000	580.59	1548471.7370	1941161.7310	577.71
MW-26D	1548699.9060	1942222.3600	580.41	1548699.0240	1942223.2540	577.63
MW-27D	1549103.5660	1942390.7990	579.70	1549103.6100	1942392.0210	576.84
MW-28D	1549510.9020	1942321.1440	579.08	1549511.1320	1942322.3460	576.20
MW-29	1549437.6710	1942633.5960	575.06	1549437.1050	1942632.4620	572.14
MW-30D	1549530.0040	1942318.4510	578.59	1549530.1910	1942319.7730	576.20
MW-40D	1549542.2900	1942316.5450	578.92	1549542.5160	1942317.8430	576.41

Benchmark	Northing	Easting	Elevation
BM H-3	1548237.4130	1941013.5710	574.63

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING.
DATE OF FIELD SURVEY & INSPECTION: 05/11/2020-05/14/2020.
FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD'88
EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION.
THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARK BM H-3 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL

5/19/2020

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail on Pad Northing	Nail on Pad Easting	Nail on Pad Elevation
HGWA-4	1549930.4460	1939385.4530	587.60	1549930.1010	1939384.1150	584.94
HGWA-5	1548633.3280	1937184.1740	583.24	1548632.7560	1937183.9790	580.52
HGWA-6	1548636.3450	1937177.7340	583.38	1548635.7150	1937177.4940	580.72
HGWC-14	1547998.9580	1938406.2650	597.25	1548000.4050	1938406.0400	594.67
HGWC-15	1547875.3310	1937854.9180	581.49	1547875.9530	1937855.0570	578.73
HGWC-16	1548209.8320	1937540.3280	580.02	1548209.5630	1937542.0880	577.36
HGWC-17	1548449.7060	1937538.9820	584.30	1548449.7130	1937540.5800	581.51
HGWC-18	1548821.2690	1937558.3190	584.18	1548820.7070	1937559.7460	581.36
MW-8	1548171.8630	1940016.6970	586.93	1548173.5170	1940017.0010	584.25
MW-9	1548131.3770	1938922.1610	590.95	1548132.6520	1938921.3810	588.42
MW-12	1547853.7790	1937525.4620	583.27	1547855.2080	1937525.2430	580.59
MW-16	1549104.1670	1937940.0630	574.22	1549104.2520	1937941.6720	571.70
MW-17	1549163.2760	1938345.8090	586.78	1549162.9630	1938344.3860	583.68
MW-18	1548984.1500	1938712.7270	592.28	1548984.1170	1938714.2680	589.75
MW-21D	1548814.8630	1937555.7770	583.84	1548814.5470	1937556.9520	581.16
MW-22	1547854.6800	1937832.0390	578.51	1547855.5540	1937832.1580	576.05
MW-23D	1547876.5450	1937843.8850	581.30	1547877.3670	1937844.2650	579.06
MW-33	1547973.4950	1938412.1340	593.92	1547975.0370	1938411.7580	591.19
MW-34D	1547996.8180	1938392.1960	596.51	1547998.0080	1938391.8470	593.83
MW-35	1547905.3270	1938417.8160	574.40	1547905.2250	1938418.8100	571.88
MW-36D	1548435.4290	1937538.1940	584.10	1548435.4660	1937539.6020	581.44
MW-37D	1548803.0050	1937551.0460	583.58	1548802.5500	1937552.1600	580.95

Benchmark	Northing	Easting	Elevation
BM H-2	1548149.4490	1938960.2220	590.68

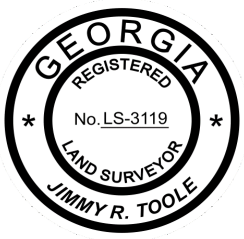
SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING.
DATE OF FIELD SURVEY & INSPECTION: 05/11/2020-05/14/2020.
FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD'88
EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION.
THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARK BM H-2 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL.

5/19/2020

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail on Pad Northing	Nail on Pad Easting	Nail on Pad Elevation
HGWA-42D	1549363.7180	1938443.8590	586.17	1549362.3140	1938444.3210	583.39
HGWA-43D	1550422.8480	1940753.8050	595.08	1550422.8120	1940754.9980	592.08
HGWA-44D	1550409.1260	1940756.1850	594.79	1550409.2230	1940757.6150	592.01
HGWA-45D	1551157.6780	1941907.5370	586.95	1551159.2250	1941907.4670	584.08
MW-46D	1551056.4780	1942929.1010	605.72	1551055.9530	1942927.8210	603.17
HGWA-47	1548990.9600	1934171.8440	580.33	1548989.2780	1934171.6440	577.39
HGWA-48D	1548989.3900	1934178.1460	580.26	1548988.1150	1934177.8070	577.29

Benchmark	Northing	Easting	Elevation
BM H-1	1547964.9650	1937219.0690	579.02
BM H-2	1548149.4490	1938960.2220	590.68
BM H-4	1549952.4470	1941611.3640	585.71

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING. DATE OF FIELD SURVEY & INSPECTION: 09/01/2020-09/02/2020. FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD'88. EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARKS BM H-1, BM-H2 & BM-H4 SET BY GEL SOLUTIONS DURING PREVIOUS SURVEYS USING A TRIMBLE DINI LEVEL



9/10/2020

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail or Pad Northing	Nail or Pad Easting	Nail or Pad Elevation	Description
HGWC-117A	1548082.038	1937157.249	581.759	1548080.943	1937157.918	578.849	NAIL ON PAD
MW-51	1547872.352	1938421.463	574.541	1547873.517	1938421.451	571.573	NAIL ON PAD
Benchmark	Northing	Easting	Elevation				
BM-H2	1548149.4490	1938960.2220	590.68				
BM-H1	1547964.965	1937219.069	579.02				

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING. DATE OF FIELD SURVEY & INSPECTION: 09/07/2021. FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD '88. EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARKS BM-H1 AND BM-H2 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL

9/8/2021

COA - LS003119
Exp. 06/30/2022

Well ID	Casing Northing	Casing Easting	Top of Casing Elevation	Nail or Pad Northing	Nail or Pad Easting	Nail or Pad Elevation	Description
MW-52	1549277.589	1938398.817	586.11	1549277.411	1938400.126	583.25	NAIL ON PAD
Benchmark	Northing	Easting	Elevation				
BM-H2	1548149.4490	1938960.2220	590.68				

SURVEY DATA CERTIFICATION FOR SOUTHERN COMPANY TO DETERMINE NORTHING, EASTING, AND VERTICAL ELEVATION OF THE NAIL IN THE CONCRETE PAD & THE PVC WELL CASING. DATE OF FIELD SURVEY & INSPECTION: 04/06/2022. FIELD SURVEY POSITIONAL TOLERANCE=0.5 FEET HORIZONTAL-NAD'83, 0.01 VERTICAL-NAVD '88. EQUIPMENT USED FOR HORIZONTAL LOCATION: TRIMBLE R10 RTK GPS & TRIMBLE S5 ROBOTIC TOTAL STATION. THE VERTICAL LOCATION OF EACH SURVEYED POINT WAS ESTABLISHED BASED UPON LEVEL RUNS WITH A DIGITAL LEVEL LOOP FROM VERTICAL CONTROL ESTABLISHED BY ON-SITE BENCHMARKS BM-H1 AND BM-H2 SET BY GEL SOLUTIONS USING A TRIMBLE DINI LEVEL

4/11/2022

COA - LS003119
Exp. 06/30/2022

PERFORMANCE BOND FOR DRILLERS

CONTINUATION CERTIFICATE

SAFECO Insurance Company of America , Surety upon

a certain Bond No. **4993104**

dated effective **June 30, 1987**
(MONTH-DAY-YEAR)

on behalf of **Southern Company Services, Inc.**
(PRINCIPAL)

and in favor of **Georgia - Dept. of Natural Resources**

(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on **June 30, 2014**
(MONTH-DAY-YEAR)

and ending on **June 30, 2015**
(MONTH-DAY-YEAR)

Amount of bond **$10,000.00**

Description of bond **Water Well Contractors & Drillers**

Premium: **$100.00**

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on **April 09, 2014**
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By _____
D-Ann Kleidosty, Attorney-In-Fact

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.
This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 6125754

First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chaun M. Wilson; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; Tracey D. Watson; William G. Moody

all of the city of Atlanta, state of GA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 15th day of May, 2013.

First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

By: _____
Gregory W. Davenport, Assistant Secretary

STATE OF WASHINGTON ss
COUNTY OF KING

On this 15th day of May, 2013, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.

K.D RILEY COMM. EXP. NOTARY PUBLIC 12-09-2013 STATE OF WASHINGTON

By: _____
KD Riley, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and biding upon the Company with the same force and effect as though manually affixed.

I, David M. Carey, the undersigned, Assistant Secretary, of First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of April, 20 14.

By: _____
David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

CERTIFICATE OF LIABILITY INSURANCE

DATE(MM/DD/YYYY) 11/02/2015

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
Aon Risk Services Southwest, Inc. Houston TX Office 5555 San Felipe Suite 1500 Houston TX 77056 USA	PHONE (A/C. No. Ext): (866) 283-7122	FAX (A/C. No.): (800) 363-0105
	E-MAIL ADDRESS:	

INSURER(S) AFFORDING COVERAGE		NAIC #
INSURER A:	Zurich American Ins Co	16535
INSURER B:	Aspen Specialty Insurance Company	10717
INSURER C:		
INSURER D:		
INSURER E:		
INSURER F:		

INSURED

Cascade Drilling, L.P.
PO Box 1184
17270 Woodinville-Redmond Road
Building "A", #777
Woodinville WA 98072 USA

COVERAGES **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

Limits shown are as requested

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
B	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC OTHER:			ERAFXLW15	11/01/2015	11/01/2016	EACH OCCURRENCE	$1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$300,000
							MED EXP (Any one person)	$25,000
							PERSONAL & ADV INJURY	$1,000,000
							GENERAL AGGREGATE	$2,000,000
							PRODUCTS - COMP/OP AGG	$2,000,000
							Professional Liability	$1,000,000
A	**AUTOMOBILE LIABILITY** X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS			BAP 0137342-01	11/01/2015	11/01/2016	COMBINED SINGLE LIMIT (Ea accident)	$2,000,000
							BODILY INJURY (Per person)	
							BODILY INJURY (Per accident)	
							PROPERTY DAMAGE (Per accident)	
B	**UMBRELLA LIAB** X OCCUR X **EXCESS LIAB** CLAIMS-MADE DED RETENTION			EXAFXLY15	11/01/2015	11/01/2016	EACH OCCURRENCE	$10,000,000
							AGGREGATE	$10,000,000
A	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANY PROPRIETOR / PARTNER / EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N: N **(Mandatory in NH)** If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		WC013734402 Workers Comp AOS	11/01/2015	11/01/2016	X PER STATUTE OTH-ER	
A				WC013734502 Workers Comp AR,MA,NE, NY	11/01/2015	12/01/2015	E.L. EACH ACCIDENT	$1,000,000
							E.L. DISEASE-EA EMPLOYEE	$1,000,000
							E.L. DISEASE-POLICY LIMIT	$1,000,000
B	Contractor Poll			ERAFXLW15	11/01/2015	11/01/2016	Aggregate	$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Certificate Holder is included as Additional Insured in accordance with the policy provisions of the Auto, General and Excess Liability policy. A Waiver of Subrogation is granted in favor of Certificate Holder in accordance with the policy provisions of the AL GL WC policy. Insurance evidenced herein is Primary to other insurance available to an Additional Insured, but only in accordance with the policy's provisions.

CERTIFICATE HOLDER

Southern Company Services
Attn: Keith Morgan
42 Inverness Center Parkway
BIN B426
Birmingham AL 35242 USA

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Risk Services Southwest, Inc.

POLICY NUMBER: ERAFXLW15

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

ADDITIONAL INSURED – PRIMARY AND NON-CONTRIBUTORY

It is hereby agreed that the Policy is amended as follows solely as respects Coverage Section 1. , Coverage 1A (Bodily Injury and Property Damage) and Coverage 1B (Personal and Advertising Injury):

SCHEDULE

Name of Person or Organization:
Where required by written contract.

(If no entry appears above, information required to complete this endorsement will be shown in the Declarations as applicable to this endorsement.)

The persons or organizations shown in the Schedule above are insureds under § III. WHO IS AN INSURED, paragraph F. of this Policy subject to all the terms and conditions of that paragraph.

With respect to the persons or organizations shown in the Schedule above, this Policy shall be primary and non-contributory with any other valid and collectible insurance available to such persons or organizations.

All other terms and conditions of this Policy remain unchanged.

POLICY NUMBER: ERAFXLW15

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

WAIVER OF TRANSFER OF RIGHTS OF RECOVERY

SCHEDULE

Name Of Additional Insured Person(s) Or Organization(s)
Blanket as required by written contract.

It is hereby agreed that “any person or organization” referred to in the waiver of rights of recovery contained in the last sentence of Section VI. **CONDITIONS**, paragraph O., **Subrogation,** includes the person or organization listed in the above Schedule.

All other terms and conditions of this Policy remain unchanged.

CONTINUATION
CERTIFICATE

Atlantic Specialty Insurance Company , Surety upon

a certain Bond No. 800033976

Issued on 9/27/2017
Expires on 6/30/2019
Renewed on 3/4/2019
Expires on 6/30/2021

dated effective 09/27/2017
(MONTH-DAY-YEAR)

on behalf of Ricky Davis / Cascade Drilling, L.P.
(PRINCIPAL)

and in favor of Department of Natural Resources, State of Georgia
(OBLIGEE)

does hereby continue said 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 ($30,000.00)

Description of bond Performance Bond for Water Well Contractors

Premium: $1200.00

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on March 4th, 2019
(MONTH-DAY-YEAR)

Atlantic Specialty Insurance Company

By Andrew P. Larsen
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

CONTINUATION
CERTIFICATE

SAFECO Insurance Company of America , Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2021
(MONTH-DAY-YEAR)

and ending on June 30, 2022
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 ($15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: $100.00

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/06/2021
(MONTH-DAY-YEAR)
SAFECO Insurance Company of America
175 Berkeley Street, Boston, MA 02116

By
Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, Inc.
Agent
2211 7th Avenue South, Birmingham, AL 35233
Address of Agent
(205) 252-9871
Telephone Number of Agent

S-0157/GE 8/08

XDP

Liberty Mutual SURETY

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company
First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

Certificate No: **8205019-016032**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Freel; Sam Audia; William M. Smith

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 11th day of March, 2021.

American States Insurance Company
First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

By: David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 11th day of March, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 6th day of May, 2021.

By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.

CONTINUATION
CERTIFICATE

SAFECO Insurance Company of America , Surety upon

a certain Bond No. **4993104**

dated effective June 30, 1987
(MONTH-DAY-YEAR)

on behalf of Southern Company Services, Inc.
(PRINCIPAL)

and in favor of Georgia Department of Natural Resources, Environmental Protection Division
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2022
(MONTH-DAY-YEAR)

and ending on June 30, 2023
(MONTH-DAY-YEAR)

Amount of bond Fifteen Thousand Dollars and 00/100 ($15,000.00)

Description of bond Water Well Contractors & Drillers

Premium: $100.00

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on 05/06/2021
(MONTH-DAY-YEAR)
SAFECO Insurance Company of America
175 Berkeley Street, Boston, MA 02116

By
Attorney-in-Fact Jeffrey M. Wilson, Attorney-in-Fact

McGriff Insurance Services, Inc.
Agent
2211 7th Avenue South, Birmingham, AL 35233
Address of Agent
(205) 252-9871
Telephone Number of Agent

S-0157/GE 8/08

XDP

Liberty Mutual SURETY

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

American States Insurance Company
First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

Certificate No: **8205019-016032**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American States Insurance Company is a corporation duly organized under the laws of the State of Indiana, that First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America are corporations duly organized under the laws of the State of New Hampshire (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Alisa B. Ferris; Anna Childress; Jeffrey M. Wilson; Mark W. Edwards II; Richard H. Mitchell; Robert R. Freel; Sam Audia; William M. Smith

all of the city of Birmingham state of AL each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 11th day of March, 2021.

American States Insurance Company
First National Insurance Company of America
General Insurance Company of America
Safeco Insurance Company of America

By: David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 11th day of March, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.

Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1126044
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-law and Authorizations of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America, which are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorney-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, of American States Insurance Company, First National Insurance Company of America, General Insurance Company of America, and Safeco Insurance Company of America do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 6th day of May, 2021.

By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.

CONTINUATION CERTIFICATE

Surety upon

Atlantic Specialty Insurance Company

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
Approved
Solid Waste Management Program
Approved By: Mark Wescott P.G. Digitally signed by Mark Wescott P.G. Date: 2025.05.27 12:36:55 -04'00'

a certain Bond No. 800033976

dated effective September 27, 2017
(MONTH-DAY-YEAR)

on behalf of Ricky Davis / Cascade Drilling, L.P.
(PRINCIPAL)

and in favor of Department of Natural Resources, State of Georgia
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2023
(MONTH-DAY-YEAR)

and ending on June 30, 2025
(MONTH-DAY-YEAR)

Amount of bond Thirty Thousand and 00/100 Dollars ($30,000.00)

Description of bond Performance Bond for Water Well Contractors

Premium:

PROVIDED: That this continuation certificate does not create a new obligation and is executed upon the express condition and provision that the Surety's liability under said bond and this and all Continuation Certificates issued in connection therewith shall not be cumulative and that the said Surety's aggregate liability under said bond and this and all such Continuation Certificates on account of all defaults committed during the period (regardless of the number of years) said bond had been and shall be in force, shall not in any event exceed the amount of said bond as hereinbefore set forth.

Signed and dated on April 13, 2023
(MONTH-DAY-YEAR)

Atlantic Specialty Insurance Company

By _____
ATTORNEY-IN-FACT Carlos A. Albelo

intact INSURANCE

Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Megan Sivley, Melissa Haddick, Sandra Parker, Orlando Aguirre, Stacy Killebrew, Carlos A. Albelo**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **unlimited** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the President, any Senior Vice President or Vice-President (each an "Authorized Officer") may execute for and in behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and affix the seal of the Company thereto; and that the Authorized Officer may appoint and authorize an Attorney-in-Fact to execute on behalf of the Company any and all such instruments and to affix the Company seal thereto; and that the Authorized Officer may at any time remove any such Attorney-in-Fact and revoke all power and authority given to any such Attorney-in-Fact.

Resolved: That the Attorney-in-Fact may be given full power and authority to execute for and in the name and on behalf of the Company any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof, and any such instrument executed by any such Attorney-in-Fact shall be as binding upon the Company as if signed and sealed by an Authorized Officer and, further, the Attorney-in-Fact is hereby authorized to verify any affidavit required to be attached to bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof.

This power of attorney is signed and sealed by facsimile under the authority of the following Resolution adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the twenty-fifth day of September, 2012:

Resolved: That the signature of an Authorized Officer, the signature of the Secretary or the Assistant Secretary, and the Company seal may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing an Attorney-in-Fact for purposes only of executing and sealing any bond, undertaking, recognizance or other written obligation in the nature thereof, and any such signature and seal where so used, being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this first day of January, 2023.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

By _____
Sarah A. Kolar, General Counsel

STATE OF MINNESOTA
HENNEPIN COUNTY

On this first day of January, 2023, before me personally came Sarah A. Kolar, General Counsel of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and she acknowledged the execution of the same, and being by me duly sworn, that she is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.

ALISON DWAN NASH-TROUT
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2026

_____
Notary Public

I, the undersigned, Secretary of ATLANTIC SPECIALTY INSURANCE COMPANY, a New York Corporation, do hereby certify that the foregoing power of attorney is in full force and has not been revoked, and the resolutions set forth above are now in force.

Signed and sealed. Dated 13th day of April, 2023.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

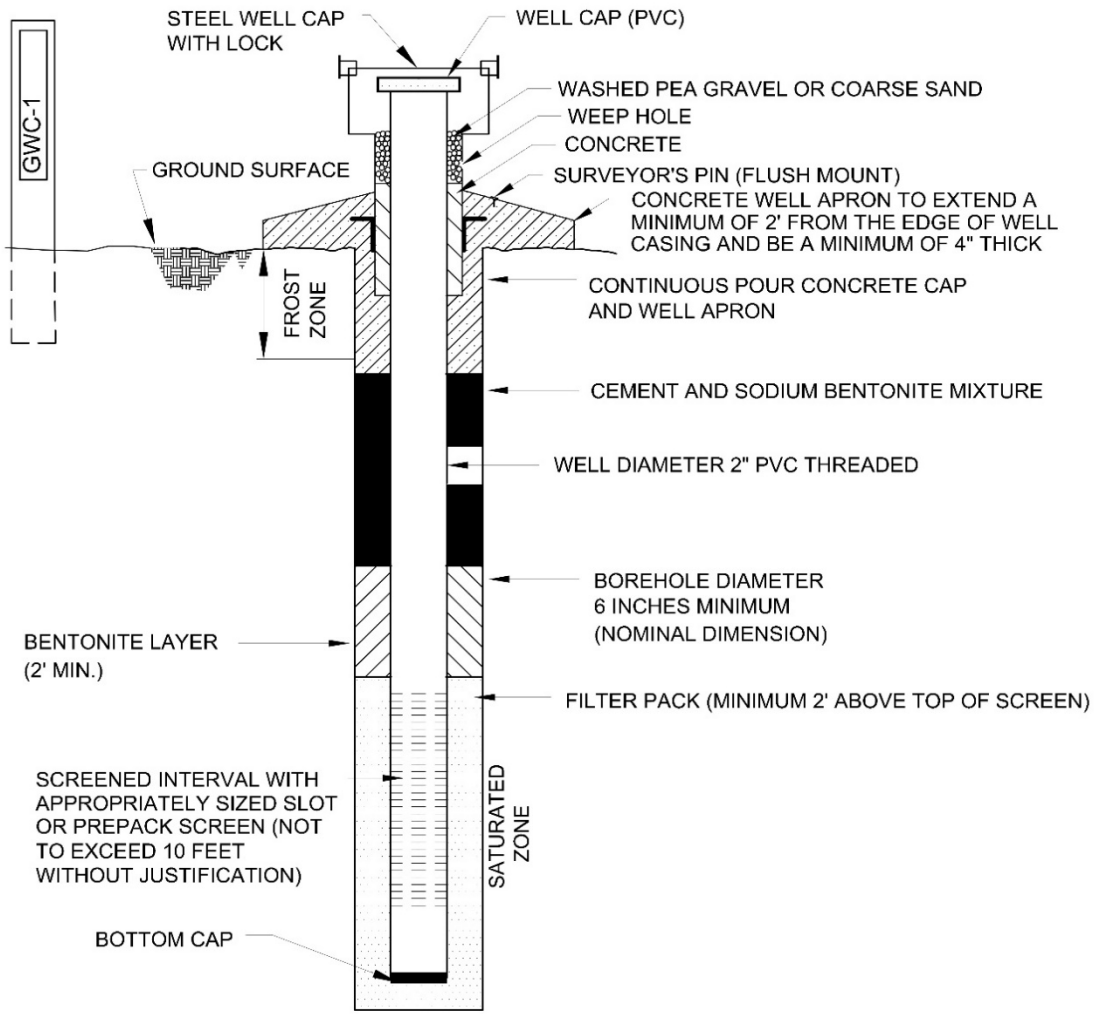
This Power of Attorney expires
January 31, 2025

_____
Kara Barrow, Secretary

Please direct bond verifications to surety@intactinsurance.com

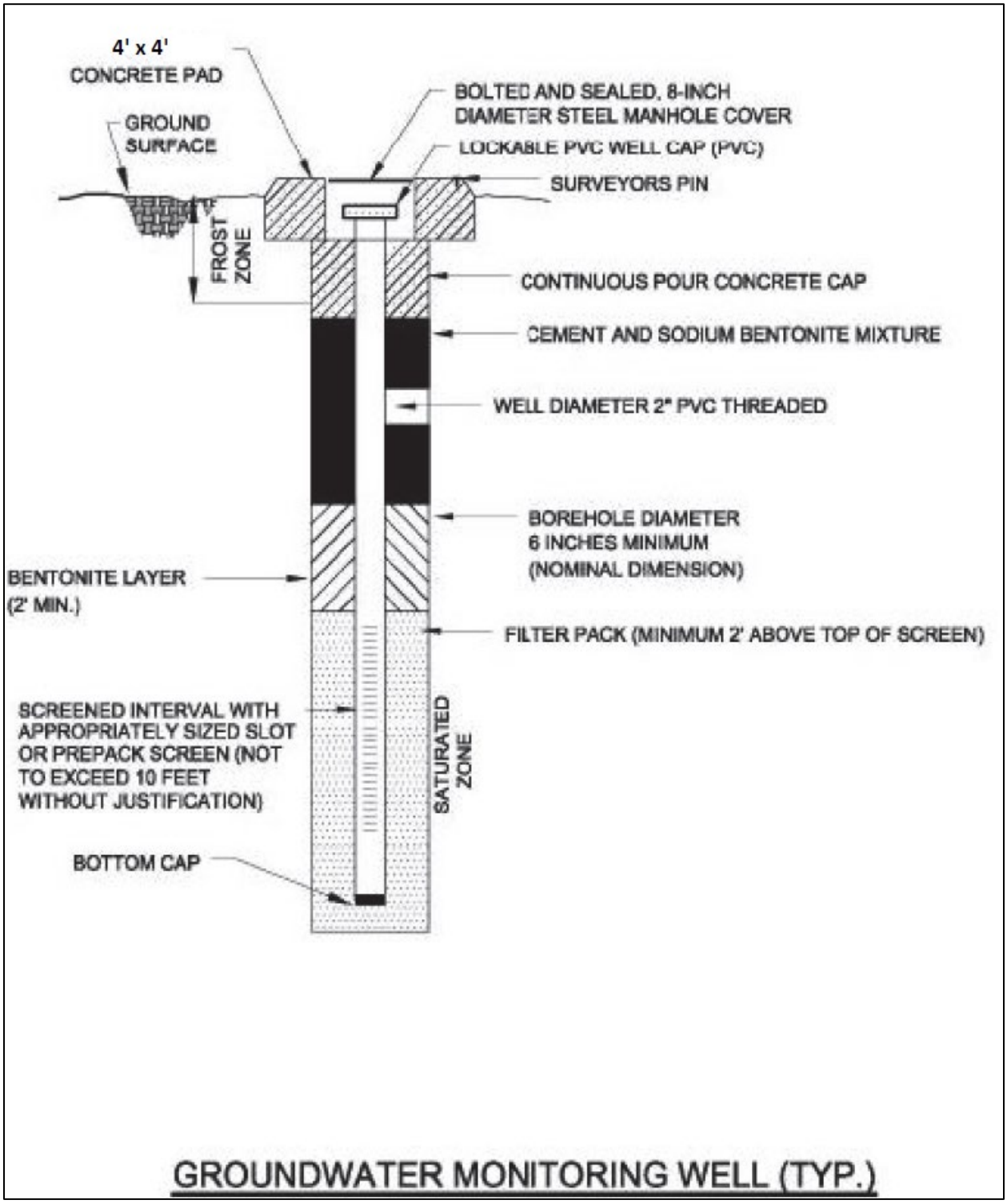
B. GROUNDWATER MONITORING WELL DETAIL

ABOVE-GROUND WELL CONFIGURATION



GROUNDWATER MONITORING WELL (TYP.)

FLUSH-MOUNT WELL CONFIGURATION



C. GROUNDWATER SAMPLING PROCEDURE

Groundwater sampling will be conducted using the most current applicable USEPA Region 4 LSASD Field Branches Quality System and Technical Procedures as a guide (https://www.epa.gov/quality/quality-system-and-technical-procedures-lsasd-field-branches). The following procedures describe the general methods associated with groundwater sampling at the Site. Prior to sampling, the well must be evacuated (purged) to ensure that representative groundwater is obtained. Any item coming in contact with the inside of the well casing or the well water will be kept in a clean container and handled only with gloved hands.

Georgia Power will follow the procedures below at each well to ensure that a representative sample is collected:

1. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations and notify Georgia Power if it appears that the well has been compromised.

2. Measure and record the depth to water in all wells to be sampled prior to purging using a water measuring device consisting of probe and measuring tape capable of measuring water levels with accuracy to 0.01 foot Static water levels will be measured from each well, within a 24-hour period. The water level measuring device will be decontaminated prior to lowering in each well.

3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. All non-dedicated equipment will be decontaminated before use and between well locations in general accordance with USEPA Region 4 LSASD guidance document, *Operating Procedure - Field Equipment Cleaning and Decontamination* (EPA, LSASDPROC-205-R4), or the latest version of the document.

4. Measure Water Level: Immediately prior to purging, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

5. Purge Well: Begin pumping the well at approximately 100 to 500 milliliters per minute (mL/min). Monitor the water level continually. Maintain a steady flow rate that results in a stabilized water level with 0.3 feet or less of variability. Avoid entraining air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

6. Monitor Indicator Parameters: Monitor and record the field indicator parameters [turbidity, temperature, specific conductance, pH, oxidation-reduction potential (ORP), and dissolved oxygen (DO)] approximately every three to five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:

   ±0.1 for pH

   ±5% for specific conductance (conductivity)

±10% or ±0.2 mg/L (whichever is greater) for DO where DO>0.5mg/L. If DO<0.5mg/L no stabilization criteria apply

<5 NTU for turbidity

Temperature – Record only, not used for stabilization criteria

ORP – Record only, not used for stabilization criteria.

7. Collect samples at a low-flow rate according to the most current version of USEPA Region 4 SESD guidance document, *Operating Procedure – Groundwater Sampling* (EPA, SESDPROC-301-R#), and such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.

8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results (i.e., >10 NTU), duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. A new filter must be used for each well and each sampling event. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity. Additional details related to managing for elevated turbidity is discussed below.

9. All sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.

10. Sample containers and preservative will be appropriate for the analytical method being used.

11. Information contained on sample container labels will include:

    a. Name of facility

    b. Date and time of sampling

    c. Sample description (well number)

    d. Sampler's initials

    e. Preservatives

    f. Analytical method(s)

12. After samples are collected, samplers will remove all non-dedicated equipment. Upon completion of all activity the well will be closed and locked.

13. Samples will be delivered to the laboratory following appropriate COC and temperature control requirements. The goal for sample delivery will be within 48 hours of collection.

Throughout the sampling process new latex or nitrile gloves will be worn by the sampling personnel. A clean pair of new, disposable gloves will be worn each time a different location is sampled, and new gloves donned prior to filling sample bottles. Gloves will be discarded after sampling each well and before sampling the next well.

The goal when sampling is to attain a turbidity of less than 5 NTU; however, samples may be collected where turbidity is less than 10 NTU and the stabilization criteria described above are met.

If sample turbidity is greater than 5 NTU and all other stabilization criteria have been met, samplers will continue purging for 3 additional hours in order to reduce the turbidity to 5 NTU or less.

- If turbidity remains above 5 NTU but is less than 10 NTU, and all other parameters are stabilized, the well can be sampled.
- Where turbidity remains above 10 NTU, an unfiltered sample will be collected followed by a filtered sample that has passed through an in-line 0.45-micron filter attached to the discharge (sample collection) tube. Data from filtered samples will only be used to quantify the effects of turbidity on sample results.

Samplers will identify the sample bottle as containing a filtered sample on the sample bottle label and on the COC form.