GROUNDWATER MONITORING PLAN

PLANT SCHERER COAL COMBUSTION RESIDUALS

CCR LANDFILL

MONROE COUNTY, GEORGIA

FOR

Georgia Power

February 2023

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Approved

Solid Waste Management Program

Approved By: Beverly Tipton

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Date: 2023.03.17 11:04:30 -04'00'

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CERTIFICATION

This *Groundwater Monitoring Plan, Georgia Power Company - Plant Scherer Coal Combustion Residuals (CCR) Landfill* has been prepared by a qualified groundwater scientist with WSP USA Inc. to meet the requirements contained in Chapter 391-3-4-.10 of Georgia Solid Waste Management Rules, Coal Combustion residuals (i.e., State Rule). References to the appropriate 391-3-4 Rules are incorporated throughout this document.

WSP USA Inc.

Dawn L. Prell, CPG
Senior Hydrogeologist

GEORGIA
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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 Rules of Solid Waste Management. According to 391-3-4-.01(61), 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 the Georgia Environmental Protection Division (EPD) Rules of Solid Waste Management, Chapter 391-3-4-.10.

WSP USA Inc.

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1.0 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 the site. This plan meets the requirements of EPD rules and uses EPD's Manual for Ground Water Monitoring dated September 1991 as a guide.

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 precedence.

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (§257.90), a detection monitoring well network for the landfill units (Cell 1 and PAC Ash Cell) has been installed and certified by a qualified professional engineer. This certification has been placed in the facility's operating record. 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), a minor modification will be submitted to the EPD prior to the installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist. The current monitoring well network is summarized on Table 1 and the locations of each of the site monitoring wells is presented on Figure 1.

2.0 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic and hydrogeologic conditions for this site are described in a report, Geologic and Hydrogeologic Summary Report, prepared by Golder Associates USA Inc., November 2018 (Golder, 2018). Key elements of this report are summarized below. The original Site Acceptability Report for this site was prepared by Southern Company Generation, Earth Science and Environmental Engineering (ES&EE) and dated December 2007 (SCS, 2007). A review of change in available site information since the 2007 Site Acceptability Report is presented in Part B in a document entitled *Hydrogeologic Assessment Review for Permit Application* by Bunnell-Lammons Engineering (BLE, 2022).

2.1 Site Geology

The site is located within the Southern Piedmont Physiographic province and is underlain by regolith consisting of residual soils and saprolite overlying fractured, crystalline bedrock. The regolith thickness ranges from approximately 3 to 30-feet below land surface. Bedrock at the site consists of interlayered feldspathic biotite gneiss with discontinuous layers and lenses of chlorite/actinolite schist and feldspathic hornblende gneiss/amphibolite. Large, discontinuous lenses or pods of mafic bodies, including gabbro were locally observed to be interlayered with the gneiss near the central and eastern portions of the site. A porphyritic, hornblende-biotite-feldspar diorite sill intrudes the biotite gneiss downstream of the ash pond along Berry Creek, and a diabase dike was observed north of the ash pond. Similar to the gabbro bodies, the diorite and diabase intrusives are resistant to weathering, standing out in relief relative to the surrounding differentially-weathered biotite gneiss. The biotite gneiss in the western portion of the property has been intruded by a large, discontinuous lens of unfoliated feldspathic granite which occurs as a series of isolated pavement outcrops.

The metamorphic and igneous rocks that underly the area have been subjected to physical and chemical weathering which has created a landscape dissected by creeks and streams forming a dendritic drainage pattern. These rocks are deeply weathered due to the humid climate and bedrock is typically overlain by a variably thick

blanket of residual soils and saprolite. Due to variations in rock types and structure, the depth of weathering can vary significantly over short horizontal distances. Based on boring logs, residual soils, primarily sandy silt, silty sand, sandy clay and silty clay, occur as a variably thick blanket overlying bedrock across most of the site, with the thickness of the residual soil ranging from a minimum of approximately 17 feet to as much as 168 feet, with an average residual soil thickness of about 57 feet.

2.2 Site Hydrogeology

Groundwater occurs within the regolith - fractured bedrock settings of Georgia Piedmont. The water-table typically occurs within the undifferentiated overburden consisting of saprolite (i.e., residual soils and weathered rock). This is a shallow, transient saturated zone in which groundwater is primarily stored within regolith and is generally unconfined. Groundwater flow occurs through the porous saprolite and is recharged by precipitation stored in residual soils and typically discharges into major streams and rivers. Beneath the saprolite, the fractured (crystalline) bedrock includes the upper bedrock and competent bedrock with open fractures sufficient to yield water to a well. Open fractures are the primary conduit for groundwater flow through bedrock because of bedrock's lack of primary porosity. The occurrence of these fractures generally decreases with depth. Recharge to bedrock aquifer systems comes from water stored in the saturated regolith, which functions as a sponge of sorts, slowly allowing groundwater to infiltrate the bedrock through areas of enhanced permeability. This rate of infiltration is very slow, as indicated by dating of groundwater in other areas in the Piedmont exceeding 60 years.

Local complexities in groundwater flow within this aquifer are influenced by topographic and related top of rock variations on site, which produces an uppermost aquifer surface that is generally a subdued reflection of topography. Groundwater flow is east/southeast from the landfilled areas. The first zone of groundwater saturation is generally present in the regolith; however, the water table at topographic highs may occur in the upper bedrock at higher land elevations.

Based on review of the potentiometric contours, the horizontal hydraulic gradient is also variable and reflects topography at the site. The horizontal gradient across the landfill units is relatively flat and appears to be steeper west of the landfill. Field hydraulic conductivity tests (i.e., slug tests) performed in a variety of geologic materials indicate an average hydraulic conductivity on the order of 10^{-4} centimeters per second [(cm/s); backup data includes 58 slug test measurements across the site with an average of 2.356 feet/day (ft/day); median 1.305 ft/day]. This hydraulic conductivity is generally consistent with regional measurements within Piedmont overburden. In general, groundwater flow is potentially faster through the weathered bedrock, often termed the transitionally weathered rock (TWR); however, the magnitude of difference is nominal enough to not be considered relevant at this site. Figure 2 presents the August 2021 potentiometric surface contours that depict groundwater flow across the site.

2.3 Uppermost Aquifer

The original *Site Acceptability Report* as well as the updated *Hydrogeologic Assessment Review for Permit Application (HAR)* provides a summary of the conceptual site model and describes the uppermost aquifer for the site. In summary, groundwater within the (saturated) overburden and upper weathered bedrock represents the uppermost aquifer. This uppermost aquifer is comprised of both residual soils and TWR, which are continuous and hydraulically interconnected. It is recharged by precipitation stored in residual soils and typically discharges into major streams and rivers.

The bedrock is recharged by groundwater from the overburden. This groundwater slowly infiltrates underlying bedrock by moving through preferentially weathered discontinuities in the bedrock mass, such as foliation/compositional layering, joints, and faults. Groundwater flow in the bedrock is through inter-connected fractures, and groundwater discharges into streams and rivers where the bedrock fractures intersect a surface water drainage.

Local complexities in groundwater flow within this aquifer are influenced by topographic and related top of rock variations on site. The water table surface is a subdued reflection of topography at the site, with groundwater generally flowing east southeast.

2.4 Groundwater Gradient and Flow Velocity

Hydraulic gradient is calculated as the difference in groundwater elevation (in feet) divided by the distance between two piezometers or wells (in feet). Groundwater elevation data recorded in August 2021 from four piezometer and/or well pairs across Cell 1; GWA-17/GWC-7, and GWC-19/GWC-3 and across PAC Ash Cell; GWA-45/GWC-51 and GWA-47/GWC-50, located along the groundwater flow path and perpendicular to the potentiometric contours were used to calculate hydraulic gradients.

Groundwater flow rates at the site were calculated based on hydraulic gradients, hydraulic conductivity from previous slug test results, and an estimated effective porosity of the screened horizon. Based on slug test data from the site monitoring wells, an average hydraulic conductivity value of 0.97 feet per day (ft/day) is used in the flow calculations. Note that this hydraulic conductivity value differs slightly from the value of 1.26 ft/day presented in the original *Site Acceptability Report* for the landfill but is representative of current site conditions at compliance monitoring locations. An effective porosity of 0.20 (Daniel and Dahlen (2002) and Dowd and Marshall (1995) is used based on the default values for effective porosity recommended by US EPA for a silty sand-type soil (US EPA, 1996).

Horizontal flow velocity was calculated using the commonly used derivative of Darcy's Law:

Where:

$V =$ Groundwater flow velocity $\left(\frac{feet}{day}\right)$

$K =$ Average Hydraulic Conductivity of the aquifer $\left(\frac{feet}{day}\right)$

$i =$ Horizontal hydraulic gradient $\left(\frac{feet}{feet}\right)$

$n_e =$ Effective porosity

Using this equation and groundwater elevation data from the August 2021 sampling event, groundwater flow velocity at the site ranges from approximately 0.09 ft/day to 0.21 ft/day (approximately 35 to 75 ft/year) across Cell 1 and PAC Ash Cell. The calculated groundwater flow velocities, as shown on Table 2, are consistent with expected velocities in the regolith-upper bedrock aquifers of GA Piedmont.

3.0 SELECTION OF WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost aquifer. Screened intervals for wells were installed to intersect the uppermost aquifer, which is comprised of both residual soils and TWR (i.e., upper bedrock); the groundwater aquifers in residual soils and TWR are hydraulically interconnected and meet the Rule

definition of uppermost aquifer. Georgia Power followed the recommendations as stated in Chapter 2 of the *Manual for Groundwater Monitoring* (EPD, 1991) to establish well spacings based on site-specific conditions. Locations are selected based on the disposal cell layouts and site geologic and hydrogeologic considerations. Locations are chosen to serve as upgradient (SGWA), lateral or downgradient (SGWC) based on groundwater flow direction determined by potentiometric evaluation. Monitoring wells have been identified for two constructed landfill units (Cell 1 and PAC Ash Cell) and two unconstructed landfill units (Cell 2 and Cell 3). Many of the wells identified for monitoring Cell 2 and Cell 3 have not yet been installed. Following installation of these monitoring wells, a well installation report documenting the actual well locations as well as the construction details and well logs will be submitted to EPD within 60 days of completion of installation and development.

Monitoring wells will generally be located outside of areas with frequent auto traffic; however, wells may be installed in heavily trafficked areas when necessary to meet the groundwater monitoring objectives of the EPD rules.

The current monitoring well network consists of 20 detection monitoring wells around Cell 1 and 12 monitoring wells located around PAC Ash Cell targeted to capture groundwater flow across Cell 1 and PAC Ash Cell and serve as monitoring network in the uppermost aquifer. Table 1 present a tabulated list of individual monitoring wells, with well construction details such as location coordinates, top-of-casing elevation, well depths and screened intervals. A map depicting monitoring well locations for monitoring is included as Figure 1. Any modification that involves the addition of or a change to the detection monitoring network will be made by a minor modification to the permit pursuant to 391-3-4-.02(3)(b)6. Monitoring well logs and construction details are included in Appendix A.

4.0 MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The existing detection monitoring well network for Cell 1 and PAC Ash Cell is in place. Existing monitoring wells were installed following Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells as a general guide for best practices. The monitoring wells and piezometers were surveyed by Metro Engineering & Surveying Co., Inc, with a horizontal accuracy of 0.5 foot and a vertical accuracy of 0.01 foot referenced to Georgia State Plane Coordinate System (Georgia State Plane, West Zone, NAD83) and vertical datum North American Vertical Datum 1988 (NAVD88). The certified surveyor's report is included in Appendix A and includes a copy of the Georgia registered land surveyor certificate. Monitoring well logs, for the existing monitoring well network, are included in Appendix A. The following sections describe the methods used for well drilling, construction, abandonment, and reporting for modifications to the well network at the site. The proposed well network for Cell 2 will be installed following the same guidance.

4.1 Drilling

A variety of well drilling methods are available for installing groundwater wells. Drilling methodology may include, but not be limited to: hollow stem augers, direct push, air rotary, mud rotary, or rotosonic techniques. The drilling method shall minimize the disturbance of subsurface materials and shall not cause impact to the groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in site specific geology. Monitoring wells will be installed using the most current version of the Region 4 USEPA Science and Ecosystem Support Division (SESD) Operating Procedure SESDGUID-101-R2 as a general guide for best

practices. Drilling equipment shall be decontaminated before use and between borehole locations using the procedures described in the latest version of the Region 4 U.S. EPA SESD Operating Procedure for Field Equipment Cleaning and Decontamination as a guide. Drilling and well installation activities will be completed under the direction of a qualified groundwater scientist, professional geologist (P.G) or engineer (P.E.) registered in the state of Georgia.

Sampling and/or coring may be used to help determine the stratigraphy and geology. Samples will be logged under the oversight of a qualified groundwater scientist. Screen depths will be chosen based on the depth of the uppermost aquifer.

Drilling for any subsurface hydrologic investigation, installation, or abandonment of groundwater wells at a landfill in Georgia must be performed by a driller that has at the time of installation, a performance bond on file with the Water Well Standards Advisory Council.

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.

4.2.1 Well Casings and Screens

American Society for Testing Materials (ASTM), National Sanitation Foundation (NSF) rated, Schedule 40, 2-inch 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 appropriate materials may be used for construction with prior written approval from the EPD.

4.2.2 Well Intake Design

The design and construction of the intake of the groundwater wells shall: (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 shall not exceed 10 feet without justification as to why a longer screen is necessary (e.g., significant variation in groundwater level). If the above techniques 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. Pre-packed well screens will be installed following general industry standards and using the latest version of the Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells 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.

4.2.3 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 borehole 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 of filter pack depth will be measured, 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 (i.e., 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 cementinous grout from entering the water-bearing or screened zone. 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 2 feet above the bentonite seal and injecting grout at low pressure/velocity.

4.2.4 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 cement grout to ground surface, where it will become a concrete apron extending outward with a radius of at approximately 2 feet from 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 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 may 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 may 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.

4.2.5 Well Development

Well development will be conducted under direction 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 measured turbidity of less than 10 NTUs 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. 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 the wells' filter packs over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, the monitoring wells may have to be redeveloped periodically to remove the silt and clay that has worked its way into the filter pack of the monitoring 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 Well Abandonment

Monitoring wells will be abandoned using industry-accepted practices and using the Manual for Groundwater Monitoring (1991) and Georgia Water Well Standards Act of 1985 [Official Code of Georgia Annotated (O.C.G.A.) 12-5-120, 1985] as guides. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole.

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 GA EPD. Well replacement and/or abandonment will be performed under the direction of a professional geologist (P.G) or engineer (P.E.) registered in the state of Georgia. A minor modification shall be submitted in accordance with Rule 391-3-4-.10(3)(b)(6) prior to the installation or decommissioning of monitoring wells.

4.4 Documentation

The following information documenting the construction and development of each well is provided on the boring logs for the existing monitoring system (Appendix A). Within 60 days of the construction and development or abandonment of each groundwater monitoring well, a well installation/abandonment report will be submitted to the EPD by a qualified groundwater scientist. For installed wells, the following information will be provided:

1) Well Identification

2) Name of drilling contractor and type of drill rig

3) Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council

4) 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
5) Filter pack material/size and volume (placement narrative)
6) Seal emplacement method and type/volume of sealant
7) Borehole diameter and well casing diameter
8) Type of protective well cap and sump dimensions for each well
9) Surface seal and volumes/mix of annular seal material
10) Screen length and slot size
11) Screen materials and design (i.e., interval in feet below ground surface and elevation)
12) Well location data given to within an accuracy of 0.5 feet based on survey data recorded from known datum.
13) Well elevation data at concrete pad nail given to within an accuracy of 0.01 feet based on survey data recorded from known datum.
14) Documentation of ground surface elevation at well location (±0.01 ft.). Based on survey data recorded from known datum.
15) Documentation of top of casing elevation (±0.01 ft.). Based on survey data recorded from known datum.
16) Well depth (±0.1 ft.).
17) Dates of drilling and initial well emplacement
18) Drilling method and drilling fluid if used
19) Schematic of well with dimensions
20) Lithologic logs
21) Well casing materials
22) Well development date
23) Well turbidity following development.
24) Documentation that water quality field parameters meet well development criteria.
25) Narrative of well development method - specific well development procedure.
26) Documentation stating that a Georgia-registered professional surveyor has certified that the horizontal accuracy for the installed monitoring wells is 0.5 foot, and vertical accuracy for elevations to 0.01 foot using a known datum.

In accordance with the Georgia Water Well Standards Act (O.C.G.A. § 12-5-120), 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 professional engineer or professional geologist, 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, as part of the post closure care plan, the cost estimate based upon current year cost for the well inspections will be provided for as part of the cost calculations for the groundwater monitoring period.

5.0 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 3 presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from each groundwater well will be collected and analyzed for EPD approved modified Appendix I and Appendix II test parameters, as well as 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 Appendix I and Appendix III will be at least semi-annual during the active life of the facility and the post-closure care period. If the requirements for assessment monitoring are met, Georgia Power will conduct assessment monitoring in accordance with the Georgia Rules for Solid Waste Management Chapter 391-3-4-.10 to also include EPD approved modified Appendix II and 40 CFR, Subpart D, Appendix IV test parameters.

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 4 the groundwater samples will be analyzed using methods specified in USEPA Manual SW-846, EPA 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 the GA 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.).

6.0 SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in Appendix C and Appendix D. 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 groundwater sample collection. EPA approved alternative industry accepted sampling techniques may be used when appropriate. The applied groundwater purging, and sampling methodologies will be discussed in the semi-annual monitoring reports submitted to GA 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. Non-dedicated equipment will be decontaminated in accordance with US EPA LSASDPROC-205-R4 (US EPA, 2020).

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

7.0 SURFACE WATER MONITORING PLAN

During each semi-annual sampling event, if flowing water is present, surface water samples will be collected from each location (see Figure 3). This surface water monitoring is for the Solid Waste Management Program and is not associated with any existing industrial, industrial stormwater, and/or construction stormwater discharge permitting which are regulated by the National Pollutant Discharge Elimination System (NPDES) requirements of Section 402 of the Clean Water Act. In the event that no flowing water is present at the sampling locations at the time of sampling, it will be noted in the field sampling documents associated with that event and no sample will be collected for that event.

During each sampling event, samples will be collected and handled in accordance with the procedures specified in Appendix D. Surface water samples will be collected and handled in accordance with standard industry practice and USEPA Region 4 Laboratory Services and Applied Science Division as a guide (USEPA, 2021). When possible, the sample should be collected directly into the appropriate sample container provided by the analytical laboratory. If the sample location cannot be physically reached, an intermediate collection device may be used (e.g., a “swing sampler” with a 12-foot handle and a single use container) as presented in the current USEPA field guidance document. When non-dedicated equipment is used, it will be decontaminated prior to use and between surface water sampling locations.

Surface water samples will be analyzed for the constituents listed in Table 5 including, field parameters pH, temperature, specific conductance, dissolved oxygen, oxidation reduction potential (ORP), and turbidity, as well as various Appendix I constituents and Appendix III constituents by the methods as listed in Table 4. If the site enters into Assessment Monitoring, surface water sampling will also include each of the Appendix IV constituents.

Monitoring results from surface water sampling will be incorporated into semi-annual groundwater monitoring reports.

8.0 EFFLUENT MONITORING

During each sampling event, an effluent sample will be collected from the point of discharge of FGD waste stream. The FGD sample is analyzed for the target constituents listed in Table 6 and include both Appendix III and Appendix IV constituents.

9.0 CHAIN-OF-CUSTODY

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 must relinquish possession and the samples must be received by the new owner.

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

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

10.0 FIELD AND LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Field quality control samples will be prepared the same as compliance samples with regards 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 20 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.

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 groundwater monitoring reports. Instruments will be recalibrated as necessary (e.g., when calibration checks indicate significant variability), and any 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. Calibration field forms will be provided as part of each groundwater report's quality control documentation.

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

11.0 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 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 record of field sampling conditions including, well signage, well access, sampling and purging equipment condition, and site conditions that may affect sampling will be recorded on a Well Inspection Form (Appendix C). These forms will be included as an appendix to the semi-annual groundwater monitoring reports.

3) A brief overview of purging/sampling methodologies

4) Discussion of results

5) Recommendations for the future monitoring consistent with the Rules

6) Potentiometric surface contour map for the aquifer(s) being monitored, signed and sealed by a Georgia-registered PG. or PE.

7) 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

8) Groundwater flow rate and direction calculations

9) Identification of any groundwater wells that were installed or decommissioned during the preceding year, along with a narrative description of why these actions were taken

10) 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)

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

12) A tabular summary of surface water monitoring results from the current monitoring event as well as each of the historical monitoring events.

13) If applicable, semi-annual assessment monitoring results

14) Any alternate source demonstration completed during the previous monitoring period, if applicable

15) Laboratory Reports

16) COC documentation

17) Field sampling logs including field instrument calibration, indicator parameters and parameter stabilization data

18) Documentation of non-functioning wells or dry surface water sampling locations

19) Statistical analyses, including trend analyses (as appropriate)

20) Plume delineation (if applicable based on exceedances of groundwater protection standards)

21) Updated potable water well survey (annually, if applicable based on exceedances of groundwater protection standards)

22) Certification by a qualified groundwater scientist.

12.0 STATISTICAL ANALYSES

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 analyses methods will be consistent with the *Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance* (Unified Guidance) (EPA, 2009).

According to EPD rules (391-3-4-.10(6)(a), which incorporates the statistical analysis requirements of 40 CFR 257.93 by reference), the site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each constituent. The statistical test chosen shall be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that may 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 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). 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) and (§257.93(f)(5)).

Based on site-specific conditions, the selected statistical methods include a combination of intrawell and interwell comparisons (i.e., the approved two-step statistical method). Intrawell methods use background data for individual wells and are sensitive to natural variation; therefore, statistically significant increases (SSIs) may occur as a result of natural variation rather than facility impacts. A second step is used to further evaluate the results and mitigate SSIs that result from natural variation. In instances where intrawell statistical methods identify an apparent SSI, a second step of interwell statistical evaluation is performed to determine whether the measurement exceeds the sitewide background limit. This two-step statistical method is similar in concept to the procedure used in compliance monitoring programs where an interwell statistical limit is used to determine background per USEPA Unified Guidance (2009). If the result does not exceed sitewide (interwell) background, an SSI is not declared, and no further action is needed to stay in detection monitoring. This statistical method is combined with a 1-of-2 resample plan, allowing for a collection of an independent resample to confirm or disconfirm the initial finding. An SSI is not declared unless the resample also exceeds the intrawell/interwell prediction limits. Trend tests will continue to be included in Semi-Annual and Annual Groundwater Monitoring and Corrective Action Reports for constituents exhibiting an SSI using an intrawell statistical method that does not exceed sitewide (interwell) background.

A site-specific statistical analysis plan that provides details regarding the statistical methods to be used has been placed in the operating record pursuant to 391-3-4-.10(6) and §257.93 (Groundwater Stats, 2020). Figure 4 includes a flowchart that depicts the process that is followed to develop the site-specific plan. Figure 5 depicts the decision logic that is used to determine the appropriate method as required by 391-3-4-.10(6) or §257.93. Figure 6 presents the logic that is used to calculate site-specific intrawell statistical limits and test compliance results against those limits. Figure 7 presents the logic that is used to calculate site-specific interwell statistical limits and test compliance results against those limits.

13.0 REFERENCES

American Society for Testing and Materials (ASTM)

BLE, 2022. *Hydrogeologic Assessment Review for Permit Application* by Bunnell-Lammons Engineering, May, 2022.

Georgia (GA) Department of Natural Resources Environmental Protection Division, *Rules of Solid Waste Management, Chapter 391-3-4-.10(6),* Georgia Environmental Protection Division.

Georgia (GA) Department of Natural Resources Environmental Protection Division, *Solid Waste Permit 102-009D(LI).*)

Georgia Water Well Standards Act (1985)

Georgia Environmental Protection Division, *Manual for Groundwater Monitoring* (1991)

Golder Associates Inc., *Geological and Hydrogeological Summary Report, Plant Scherer, November 2018*

Groundwater Stats Consulting, 2020. Two-Step Detection Monitoring Statistical Approach, Groundwater Stats Consulting, October 28, 2020.

National Environmental Laboratory Accreditation Program (NELAP)

Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division, *Operating Procedure for Design and Installation of Monitoring Wells* (SESDGUID-101-R2), January 16, 2018.

Region 4 U.S. Environmental Protection Agency, Laboratory Services and Applied Science Division, *Field Equipment Cleaning and Decontamination*, (LSASDPROC-205-R4), June 22, 2020.

Region 4 U.S. Environmental Protection Agency, *Field Branches Quality System and Technical Procedures.*

Region 4 U.S. Environmental Protection Agency, Laboratory Services and Applied Science Division Operating Procedures.

Region 4 U.S. Environmental Protection Agency, Laboratory Services and Applied Science Division, *Surface Water Sampling*, (LSASDPROC-201-R5), December 23, 2021.

Southern Company Services Earth Science and Environmental Engineering, *Combustion By-Products Disposal Facility Site Acceptability Report,* 2007.

U.S. Environmental Protection Agency, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, (EPA 530-R-09-007), March 2009.

U.S. Environmental Protection Agency, *40 CFR 257, Subpart D, 80 Fed*. Reg. 21468 (April 17, 2015).

U.S. Environmental Protection Agency, *Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater* (SM18-20),

U.S. Environmental Protection Agency, *Methods for the Chemical Analysis of Water and Wastes* (MCAWW).

TABLES

TABLE 1
SUMMARY OF MONITORING WELL CONSTRUCTION DATA
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Hydraulic Location	Hydrogeologic Unit Screened	NAD 83 Northing[1]	NAD 83 Easting[1]	Ground Surface Elevation at Concrete Pad (feet NAVD88)	Ground Surface Elevation (feet NAVD88)[2]	Top of Casing Elevation (feet NAVD88)[2]	Well Depth (ft BTOC)[2]	Top of Screen Elevation (feet NAVD88)[2]	Bottom of Screen Elevation (feet NAVD88)[2]	Screen Length (feet)	Date of Installation	Average Hydraulic Conductivity (cm/sec)	Kh/Kv	Groundwater Elevation (feet NAVD88) (August 2021)
GYPSUM CELL 1															
GWC-1	Downgradient	Saprolite	1120077.85	2411555.32	371.77	371.6	374.95	39.35	346.91	336.91	10	10/28/2009	--	--	364.94
GWC-2	Downgradient	Saprolite	1119816.59	2411493.53	377.02	376.9	380.22	57.82	332.12	322.12	10	10/8/2009	1.10E-04	Kh	365.97
GWC-3	Downgradient	Residuum	1119615.01	2411201.98	409.97	409.6	412.66	49.46	373.20	363.20	10	10/29/2009	--	--	372.47
GWC-4	Downgradient	Residuum	1119255.96	2411041.82	408.50	408.4	411.75	42.85	378.70	368.70	10	11/21/2009	--	--	379.40
GWC-5	Downgradient	Residuum/PWR	1118897.72	2411025.88	393.37	393.3	396.69	38.22	372.84	362.84	10	10/22/2009	--	--	376.38
GWC-6	Downgradient	Gneiss	1118575.69	2410872.56	412.48	412.4	415.80	47.92	377.52	367.52	10	10/21/2009	8.21E-04	Kh	377.36
GWC-7	Downgradient	Saprolite	1118243.67	2410645.91	414.51	414.4	418.27	58.36	369.84	359.84	10	10/20/2009	--	--	375.72
GWC-8A	Downgradient	Saprolite/PWR	1117917.32	2410375.16	398.65	398.6	401.62	48.02	364.30	354.30	10	3/29/2017	--	--	378.57
GWC-9	Downgradient	Residuum/Saprolite	1117955.40	2410167.75	383.21	382.8	386.18	19.87	376.02	366.02	10	11/4/2009	2.57E-04	Kh	378.85
GWC-10	Downgradient	Residuum	1118306.77	2410018.28	389.49	388.9	392.87	39.48	367.50	357.50	10	11/3/2009	--	--	381.61
GWC-11	Downgradient	Saprolite	1118648.98	2409778.84	399.21	398.8	402.33	33.52	377.81	367.81	10	11/3/2009	--	--	383.64
GWC-12	Downgradient	Residuum	1118977.87	2409554.57	409.66	409.2	412.89	37.23	384.94	374.94	10	11/3/2009	--	--	387.08
GWC-13	Downgradient	Residuum	1119338.68	2409390.95	416.71	416.5	419.77	42.76	386.52	376.52	10	11/2/2009	--	--	389.17
GWC-14	Downgradient	Residuum	1119655.05	2409111.75	400.41	400.2	403.60	28.43	386.09	376.09	10	11/4/2009	--	--	390.54
GWA-15	Upgradient	Residuum	1120009.40	2409282.43	412.00	411.7	415.01	28.31	395.51	385.51	10	11/4/2009	8.02E-04	Kh	403.12
GWA-16	Upgradient	Saprolite	1120248.68	2409579.75	441.01	440.9	444.24	58.33	396.71	386.71	10	10/13/2009	--	--	411.57
GWA-17	Upgradient	Saprolite/PWR	1120210.57	2409946.73	442.92	442.8	445.84	46.32	409.27	399.27	10	9/28/2009	--	--	416.82
GWC-18	Downgradient	Saprolite	1119998.73	2410261.85	436.40	436.3	439.66	62.86	389.49	379.49	10	9/29/2009	2.24E-04	Kh	406.90
GWC-19	Downgradient	Saprolite	1119645.70	2410713.20	426.34	426.3	430.20	73.90	382.45	372.45	10	10/2/2009	--	--	393.54
GWC-20	Downgradient	Saprolite	1119950.51	2411195.38	423.03	423.0	426.30	72.93	363.85	353.85	10	10/6/2009	--	--	382.32

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SUMMARY OF MONITORING WELL CONSTRUCTION DATA
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Hydraulic Location	Hydrogeologic Unit Screened	NAD 83 Northing[1]	NAD 83 Easting[1]	Ground Surface Elevation at Concrete Pad (feet NAVD88)	Ground Surface Elevation (feet NAVD88)[2]	Top of Casing Elevation (feet NAVD88)[2]	Well Depth (ft BTOC)[2]	Top of Screen Elevation (feet NAVD88)[2]	Bottom of Screen Elevation (feet NAVD88)[2]	Screen Length (feet)	Date of Installation	Average Hydraulic Conductivity (cm/sec)	Kh/Kv	Groundwater Elevation (feet NAVD88) (August 2021)
PAC ASH CELL															
GWA-21	Upgradient	Saprolite/TWR	1120675.73	2409462.70	419.81	419.7	422.58	19.88	412.04	402.04	10	6/29/2010	--	--	417.18
GWA-22	Upgradient	TWR/Gneiss	1120962.12	2409473.22	442.01	442.0	444.50	42.49	412.29	402.29	10	6/30/2010	--	--	419.85
GWC-29	Downgradient	Saprolite	1119875.58	2408717.95	396.98	396.9	399.64	27.12	382.78	372.78	10	6/28/2010	9.04E-04	Kh	394.04
GWA-45	Upgradient	Residuum	1120669.03	2407889.56	448.33	448.3	451.08	35.81	425.99	415.99	10	6/23/2010	2.33E-04	Kh	435.99
GWA-46	Upgradient	Residuum	1120783.23	2408235.69	458.37	458.3	461.13	46.31	424.38	414.38	10	6/23/2010	--	--	429.06
GWA-47	Upgradient	Saprolite/TWR	1120862.63	2408585.01	463.03*	462.9	465.77	57.87	421.74	411.74	10	6/22/2010	--	--	427.25
GWA-48	Upgradient	Saprolite/TWR	1120953.42	2408939.48	459.00	458.8	461.73	74.89	407.74	397.74	10	6/22/2010	--	--	425.13
GWA-49	Upgradient	Saprolite	1121030.08	2409288.38	430.16	429.9	432.88	40.02	401.81	391.81	10	6/21/2010	2.52E-04	Kh	421.30
GWC-50	Downgradient	Saprolite	1119917.51	2408956.10	404.44	404.3	407.16	37.82	380.88	370.88	10	6/28/2010	--	--	398.42
GWC-51	Downgradient	Saprolite	1119835.51	2408436.95	407.37	407.3	410.15	29.87	393.78	383.78	10	7/27/2010	--	--	401.57
GWC-52	Downgradient	Saprolite	1119972.34	2408203.99	414.43	414.4	417.13	32.75	394.53	384.53	10	6/24/2010	7.27E-04	Kh	407.14
GWC-53	Downgradient	Residuum	1120319.65	2407943.05	433.10	432.9	435.83	30.93	412.84	402.84	10	6/23/2010	--	--	425.05

TABLE 1
SUMMARY OF MONITORING WELL CONSTRUCTION DATA
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Hydraulic Location	Hydrogeologic Unit Screened	NAD 83 Northing[1]	NAD 83 Easting[1]	Ground Surface Elevation at Concrete Pad (feet NAVD88)	Ground Surface Elevation (feet NAVD88)[2]	Top of Casing Elevation (feet NAVD88)[2]	Well Depth (ft BTOC)[2]	Top of Screen Elevation (feet NAVD88)[2]	Bottom of Screen Elevation (feet NAVD88)[2]	Screen Length (feet)	Date of Installation	Average Hydraulic Conductivity (cm/sec)	Kh/Kv	Groundwater Elevation (feet NAVD88) (August 2021)
CELL 3															
GWC-30	Downgradient	Residuum/Biotite Gneiss	1119366.69	2408976.35	392.19	392.0	394.49	21.5	384.04	374.04	10	1/24/2020	--	--	386.98
GWC-31	Downgradient	Residuum/TWR	1118970.00	2409062.02	390.13	390.0	392.78	21.8	380.68	370.68	10	1/23/2020	--	--	385.52
GWC-32	Downgradient	Saprolite/TWR	1118749.53	2409084.83	407.25	406.9	410.03	38.1	381.95	371.95	10	1/21/2020	--	--	385.44
GWC-33A	Downgradient	Saprolite	1118458.68	2409359.58	391.32	390.9	393.96	27.1	376.87	366.87	10	1/25/2020	--	--	383.51
GWC-34	Downgradient	Sarpolite/TWR	1118248.26	2409680.41	386.48	386.2	389.29	22.1	377.23	367.23	10	1/13/2020	--	--	381.43
GWC-35	Downgradient	Saprolite/TWR	1117860.46	2409906.21	385.35	385.1	387.90	22.8	375.10	365.10	10	1/12/2020	--	--	382.20
GWC-36	Downgradient	Saprolite/TWR	1117561.29	2409681.44	422.52	422.0	425.12	48.5	386.62	376.62	10	1/10/2020	--	--	392.31
GWC-37	Downgradient	Residuum	1117239.70	2409636.56	427.38	427.2	429.80	44.6	395.23	385.23	10	1/8/2020	--	--	405.56
GWC-38	Downgradient	Saprolite/TWR	1116786.45	2409533.11	416.23	416.0	418.68	41.7	386.98	376.98	10	1/7/2020	--	--	406.06
GWA-39	Upgradient	Biotite Gneiss	1116967.57	2408671.68	454.59	454.2	457.62	62.4	405.24	395.24	10	12/20/2019	--	--	429.51
GWA-40	Upgradient	Saprolite	1117365.24	2408730.04	461.25	461.2	463.84	47.5	427.15	417.15	10	12/18/2020	--	--	430.44
GWA-41	Upgradient	Saprolite/TWR	1118096.97	2408412.15	431.70	431.4	434.12	46.7	403.75	393.75	10	1/26/2020	--	--	423.27
GWA-42	Upgradient	Saprolite/TWR	1118500.68	2408233.53	402.57	402.2	405.19	21.8	393.37	383.37	10	1/27/2020	--	--	399.83
GWA-43	Upgradient	Saprolite/TWR	1118861.38	2408484.42	398.42	398.1	400.94	21.8	389.12	379.12	10	1/26/2020	--	--	396.47
GWA-44A	Upgradient	Residuum	1119296.99	2408569.76	396.83	396.5	399.62	23.9	386.58	376.58	10	1/27/2020	--	--	395.46
GWA-54	Upgradient	Biotite Gneiss	1117751.40	2408588.52	448.78	448.6	451.49	51.7	409.83	399.83	10	12/21/2020	--	--	426.70

Notes:
ft = feet; feet bgs = feet below ground surface; 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 feet relative to the North American Vertical Datum (NAVD) 1988.
(3) Total well depth accounts for sump if data provided on well construction logs.
(4) Survey data provided by Jordan Engineering, Inc., July 2020.
(5) - = not applicable

TABLE 2
HORIZONTAL GROUNDWATER FLOW VELOCITY CALCULATIONS - August 2021
Georgia Power - Plant Scherer
Juliette, GA

Flow Paths	Groundwater Elevation (feet msl)	Δ H (feet)[2]	Δ L (feet)[3]	Hydraulic Gradient (Δ H/Δ L)	Average Hydraulic Conductivity, K (feet per day)[5]	Assumed Effective Porosity (n_e)	Average Linear Groundwater Velocity	
							(feet per day)[4]	(feet per year)[4]
Cell 1:								
GWA-17/GWC-7	416.82	41.10	2110	0.019	0.97	0.2	0.09	35
	375.72							
GWC-19/GWC-3	393.54	21.07	500	0.042	0.97	0.2	0.21	75
	372.47							
PAC Ash:								
GWA-45/GWC-51	435.99	34.42	1062	0.032	0.97	0.2	0.16	58
	401.57							
GWA-47/GWC-50	427.25	28.83	1020	0.028	0.97	0.2	0.14	50
	398.42							

Notes:

1. Δ H = Change in groundwater elevation
2. Δ L = Distance along flow path
3. I = Δ H / Δ L
4. Velocity = $(I * K)/n_e$
5. Hydraulic conductivity range based on historical aquifer performance tests [Refer to Table 1 for K values of the Overburden (Saprolite, Residuum, PWR)]
6. Effective porosity based on default values for effective porosity recommended by USEPA for a silty sand-type soil (USEPA, 1996)

TABLE 3
GROUNDWATER MONITORING PARAMETERS AND FREQUENCY
Georgia Power - Plant Scherer
Juliette, Georgia

MONITORING PARAMETERS		GROUNDWATER MONITORING	
		BACKGROUND	SEMI-ANNUAL EVENTS
Field Parameters	Temperature	x	x
	pH	x	x
	Turbidity	x	x
	Specific Conductance	x	x
	Oxidation Reduction Potential	x	x
	Dissolved Oxygen	x	x
Appendix I and II EPD-approved modified Appendix I and II Detection Monitoring test parameters from 40 CFR 258, Subpart E	Antimony	x	x
	Arsenic	x	x
	Barium	x	x
	Beryllium	x	x
	Cadmium	x	x
	Chromium	x	x
	Cobalt	x	x
	Copper	x	x
	Lead	x	x
	Mercury	x	x
	Nickel, Total	x	x
	Selenium	x	x
	Silver	x	x
	Thallium	x	x
	Vanadium	x	x
	Zinc	x	x
Appendix III Detection Monitoring test parameters from 40 CFR 257 Subpart D)	Boron	x	x
	Calcium	x	x
	Chloride	x	x
	Fluoride	x	x
	pH (field)	x	x
	Sulfate	x	x
	Total Dissolved Solids	x	x

TABLE 3
GROUNDWATER MONITORING PARAMETERS AND FREQUENCY
Georgia Power - Plant Scherer
Juliette, Georgia

MONITORING PARAMETERS		GROUNDWATER MONITORING	
		BACKGROUND	SEMI-ANNUAL EVENTS
Appendix IV Assessment Monitoring test parameters from 40 CFR 257, Subpart D	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	
	Radium 226+228	x	
	Selenium	x	
	Thallium	x	

Notes:

1. The water samples will be tested for total metals following the SW-846 EPA Methods or the most current approved EPA Methods.

2. Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4-.10(6)

TABLE 4
ANALYTICAL METHODS
Georgia Power - Plant Scherer
Juliette, Georgia

PARAMETERS	EPA METHOD NUMBER
FIELD PARAMETERS	
Dissolved Oxygen (DO)	Field Test 360.2/NPDES 4500
Temperature (T)	Field Test
pH	Field Test 150.1
Specific Conductance	Field Test 120.1/9050A
ORP	Field Test
Turbidity	Field Test
APPENDIX III	
Boron	EPA 6010D/6020B
Calcium	EPA 6010D/6020B
Chloride	EPA 300.0/300.1/9250/9251/9253/9056A
Fluoride	EPA 300.0/300.1/9214/9056A
pH	150.1 field
Sulfate	EPA 9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	EPA 160/2540C
STATE METALS & APPENDIX IV	
Antimony	EPA 7040/7041/6010D/6020B
Arsenic	EPA 7060A/7061A/6010D/6020B
Barium	EPA 7080A/7081/6010D/6020B
Beryllium	EPA 7090/7091/6010D/6020B
Cadmium	EPA 7130/7131A/6020B
Chromium	EPA 7190/7191/6010D/6020B
Cobalt	EPA 7200/7201/6010D/6020B
Copper	EPA 7840/7841/6010D/6020B
Fluoride	EPA 300.0/300.1/9214/9056/9214
Lead	EPA 7420/7421/6010D/6020B
Lithium	EPA 6010D/6020B
Mercury	EPA 7470A
Molybdenum	EPA 6010D/6020B
Nickel	EPA 7840/7841/6010D/6020B
Selenium	EPA 7740/7741A/6010D/6020B
Silver	EPA 7840/7841/6010D/6020B
Thallium	EPA 7840/7841/6010D/6020B
Vanadium	EPA 7840/7841/6010D/6020B
Zinc	EPA 7840/7841/6010D/6020B
Radium 226 and 228 combined	EPA 903/9320/9315
STATE REQUIRED INORGANICS	
Cyanide, Total	EPA 7060A/7061A/6010D/6020B/335.4

Note: The water Samples will be tested for total metals by following the SW-846, EPA Methods or the most current approved EPA methods.

TABLE 5
SURFACE WATER MONITORING PARAMETERS AND FREQUENCY
Georgia Power Company - Plant Scherer
Juliette, Georgia

Analyte	SURFACE WATER SAMPLING LOCATIONS								
	SWA-1	SWA-2	SWA-3	SWC-4	SWC-5	SWC-6	SWC-7	SWC-8	SWC-9
FIELD MONITORING PARAMETERS									
pH	X	X	X	X	X	X	X	X	X
ORP	X	X	X	X	X	X	X	X	X
SPECIFIC CONDUCTANCE	X	X	X	X	X	X	X	X	X
DISSOLVED OXYGEN	X	X	X	X	X	X	X	X	X
TEMPERATURE	X	X	X	X	X	X	X	X	X
TURBIDITY	X	X	X	X	X	X	X	X	X
APPENDIX III									
BORON, TOTAL	X	X	X	X	X	X	X	X	X
CALCIUM, TOTAL	X	X	X	X	X	X	X	X	X
CHLORIDE, TOTAL	X	X	X	X	X	X	X	X	X
FLUORIDE, TOTAL	X	X	X	X	X	X	X	X	X
SULFATE, TOTAL	X	X	X	X	X	X	X	X	X
TOTAL DISSOLVED SOLIDS	X	X	X	X	X	X	X	X	X
STATE REQUIRED METALS									
ANTIMONY, TOTAL	X	X	X	X	X	X	X	X	X
ARSENIC, TOTAL	X	X	X	X	X	X	X	X	X
BARIUM, TOTAL	X	X	X	X	X	X	X	X	X
BERYLLIUM, TOTAL	X	X	X	X	X	X	X	X	X
CADMIUM, TOTAL	X	X	X	X	X	X	X	X	X
CHROMIUM, TOTAL	X	X	X	X	X	X	X	X	X
COBALT, TOTAL	X	X	X	X	X	X	X	X	X
COPPER, TOTAL	X	X	X	X	X	X	X	X	X
LEAD, TOTAL	X	X	X	X	X	X	X	X	X
MERCURY, TOTAL	X	X	X	X	X	X	X	X	X
NICKEL, TOTAL	X	X	X	X	X	X	X	X	X
SELENIUM, TOTAL	X	X	X	X	X	X	X	X	X
SILVER, TOTAL	X	X	X	X	X	X	X	X	X
THALLIUM, TOTAL	X	X	X	X	X	X	X	X	X
VANADIUM, TOTAL	X	X	X	X	X	X	X	X	X
ZINC, TOTAL	X	X	X	X	X	X	X	X	X
STATE REQUIRED INORGANICS									
CYANIDE, TOTAL	X	X	X				X		
APPENDIX IV									
LITHIUM, TOTAL	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]
MOLYBDENUM, TOTAL	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]
RADIUM, COMBINED (226 + 228)	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]	X[4]

Notes:

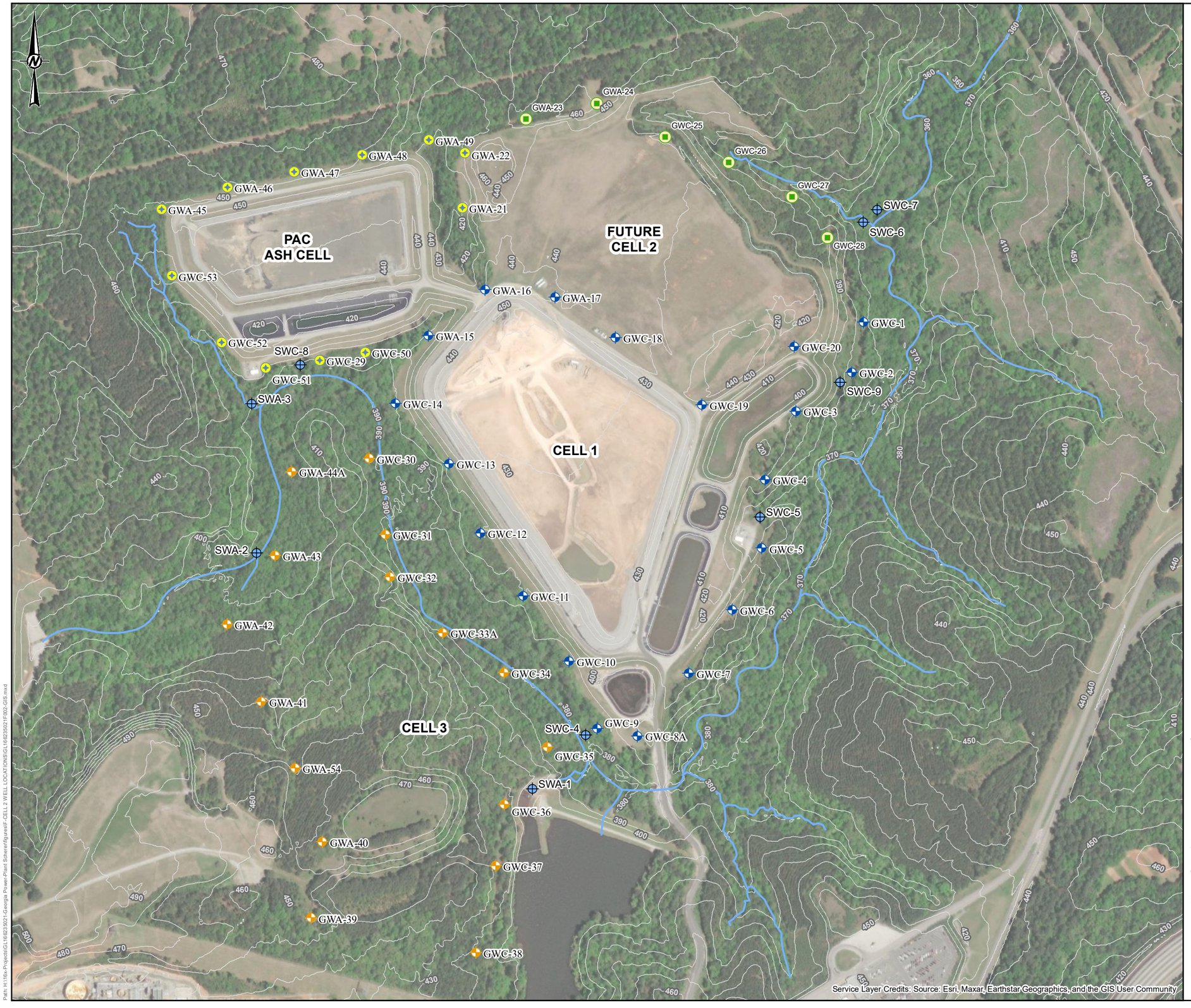
1. N/S = Not Sampled
2. Surface water is collected Semi-Annually concurrent with the groundwater sampling event.
3. Any location that is Dry at the time of the sampling event will be identified as such.
4. AppendIX IV monitoring will not be performed unless the site enters into Assessment Monitoring.

TABLE 6
EFFLUENT MONITORING PARAMETERS AND FREQUENCY
Georgia Power Company - Plant Scherer
Juliette, Georgia

ANALYTE	EFFLUENT MONITORING	
	1st Semi-Annual Event	2nd Semi-Annual Event
FIELD MONITORING PARAMETERS		
pH	X	X
SPECIFIC CONDUCTANCE	X	X
TEMPERATURE	X	X
STATE REQUIRED METALS		
ANTIMONY, TOTAL	X	X
ARSENIC, TOTAL	X	X
BARIUM, TOTAL	X	X
BERYLLIUM, TOTAL	X	X
CADMIUM, TOTAL	X	X
CHROMIUM, TOTAL	X	X
COBALT, TOTAL	X	X
COPPER, TOTAL	X	X
LEAD, TOTAL	X	X
MERCURY, TOTAL	X	X
NICKEL, TOTAL	X	X
SELENIUM, TOTAL	X	X
SILVER, TOTAL	X	X
THALLIUM, TOTAL	X	X
VANADIUM, TOTAL	X	X
ZINC, TOTAL	X	X

Notes:
Effluent sample is collected from the point of discharge of FGD waste stream into the Cell 1 disposal facility.

FIGURES



LEGEND

- FUTURE CELL 2 MONITORING WELL
- CELL 1 LANDFILL MONITORING WELL
- PAC ASH LANDFILL MONITORING WELL
- CELL 3 MONITORING WELL
- SURFACE WATER LOCATION

REFERENCE

1. COORDINATE SYSTEM: NAD 1983 STATE PLAN GEORGIA WEST (U.S. FEET).

2. MONITORING WELL LOCATIONS PROVIDED BY JORDAN ENGINEERING.

500 250 0 500

Feet

CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

Georgia Power

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

TITLE
SITE PLAN AND DETECTION MONITORING WELL LOCATION MAP

CONSULTANT

wsp

YYYY-MM-DD	2021-07-06
PREPARED	DJC
DESIGN	DH
REVIEW	DLP
APPROVED	RPK

PROJECT No. GL166235021 | CONTROL GL166235021F002-GIS.mxd | Rev. 0 | FIGURE 1

Path: H:\16b-Projects\GL166235021-Georgia Power-Plant Scherer\figures\F-CELL 2 WELL LOCATIONS\GL166235021F002-GIS.mxd

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

LEGEND

- FUTURE CELL 2 MONITORING WELL
- CELL 1 LANDFILL MONITORING WELL
- CELL 3 MONITORING WELL
- PAC ASH LANDFILL MONITORING WELL
- PIEZOMETER
- SURFACE WATER SAMPLING LOCATION
- INFERRED POTENTIOMETRIC SURFACE CONTOUR (FT-NAVD 88)
- STREAM
- PROPERTY BOUNDARY
- PONDS

NOTES

1. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED AUGUST 16, 2021 BY GOLDER ASSOCIATES.
2. GROUNDWATER ELEVATIONS DISPLAYED IN FEET-NORTH AMERICAN VERTICAL DATUM (FT-NAVD 88).
3. DEEP AND INTERMEDIATE WELL GROUNDWATER ELEVATIONS WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

REFERENCE

1. COORDINATE SYSTEM: NAD 1983 STATE PLAN GEORGIA WEST (U.S. FEET).
2. MONITORING WELL/PIEZOMETER LOCATIONS PROVIDED BY JORDAN ENGINEERING.

350 175 0 350

Feet

CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

Georgia Power

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR
LANDFILL

TITLE
POTENTIOMETRIC SURFACE MAP - CELL 1 AND PAC ASH
AUGUST 16, 2021

CONSULTANT

wsp

YYYY-MM-DD	2021-09-29
PREPARED	DJC
DESIGN	DLP
REVIEW	DLP
APPROVED	RPK

PROJECT No. GL166235021 | CONTROL GL166235021F001-GIS.mxd | Rev. 0 | FIGURE **2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

1 in

0

Path: H:\16x-Projects\GL166235021-Georgia Power-Plant Scherer\figures\F-CELL 2 WELL LOCATIONS\GL166235021F001-GIS.mxd

LEGEND

SURFACE WATER LOCATION

REFERENCE

1. COORDINATE SYSTEM: NAD 1983 STATE PLAN GEORGIA WEST (U.S. FEET).

2. MONITORING WELL LOCATIONS PROVIDED BY JORDAN ENGINEERING.

500 250 0 500

Feet

CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

Georgia Power

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

TITLE
SURFACE WATER MONITORING LOCATIONS

CONSULTANT

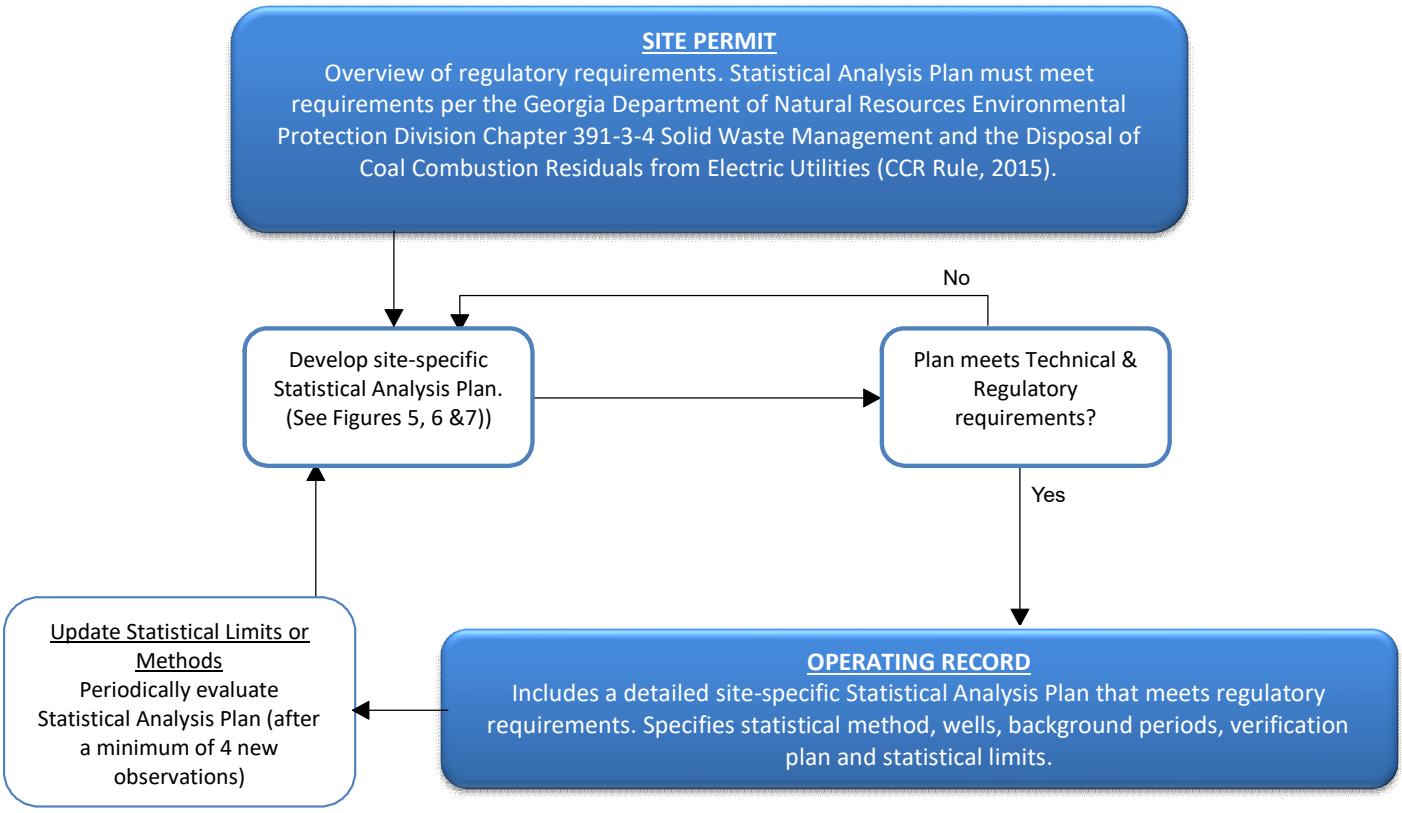
wsp

YYYY-MM-DD	2021-11-10
PREPARED	DJC
DESIGN	DLP
REVIEW	
APPROVED	

PROJECT No. 166235021 | CONTROL 166235021AB007-GIS.mxd | Rev. 0 | FIGURE **3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM: ANSI B

Path: H:\16k-Projects\166235O-Southern Company Services\figures\AB-GW CONTOUR MAPS MAR 2021\166235021AB007-GIS.mxd



CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

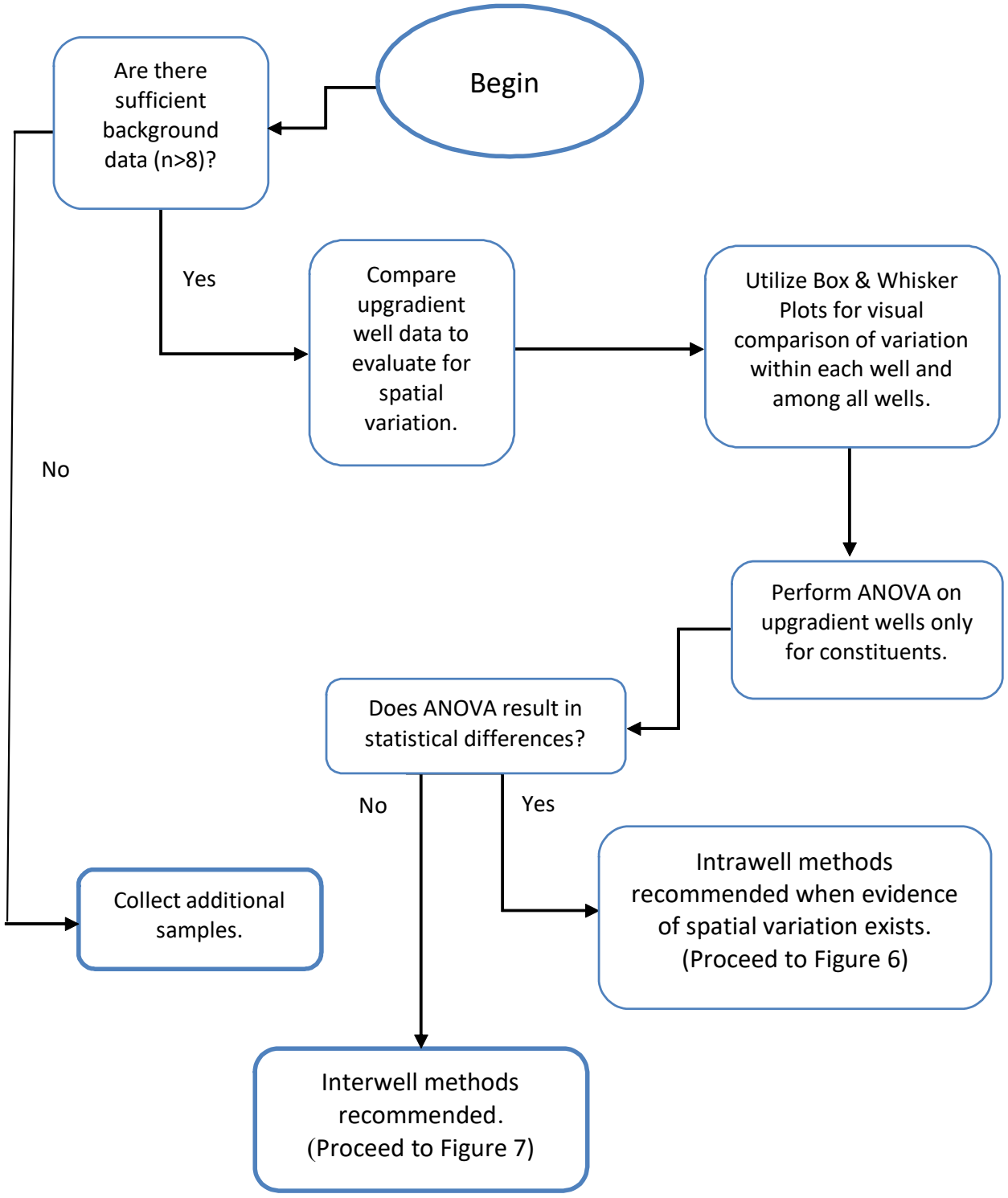
CONSULTANT
wsp

YYYY-MM-DD	2022-02-18
DESIGNED	DLP
PREPARED	DJC
REVIEWED	
APPROVED	

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

TITLE
STATISTICAL ANALYSIS PLAN OVERVIEW

PROJECT NO.	CONTROL	REV.	FIGURE
GL166235021	GL166235021B001.mxd	0	4



CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

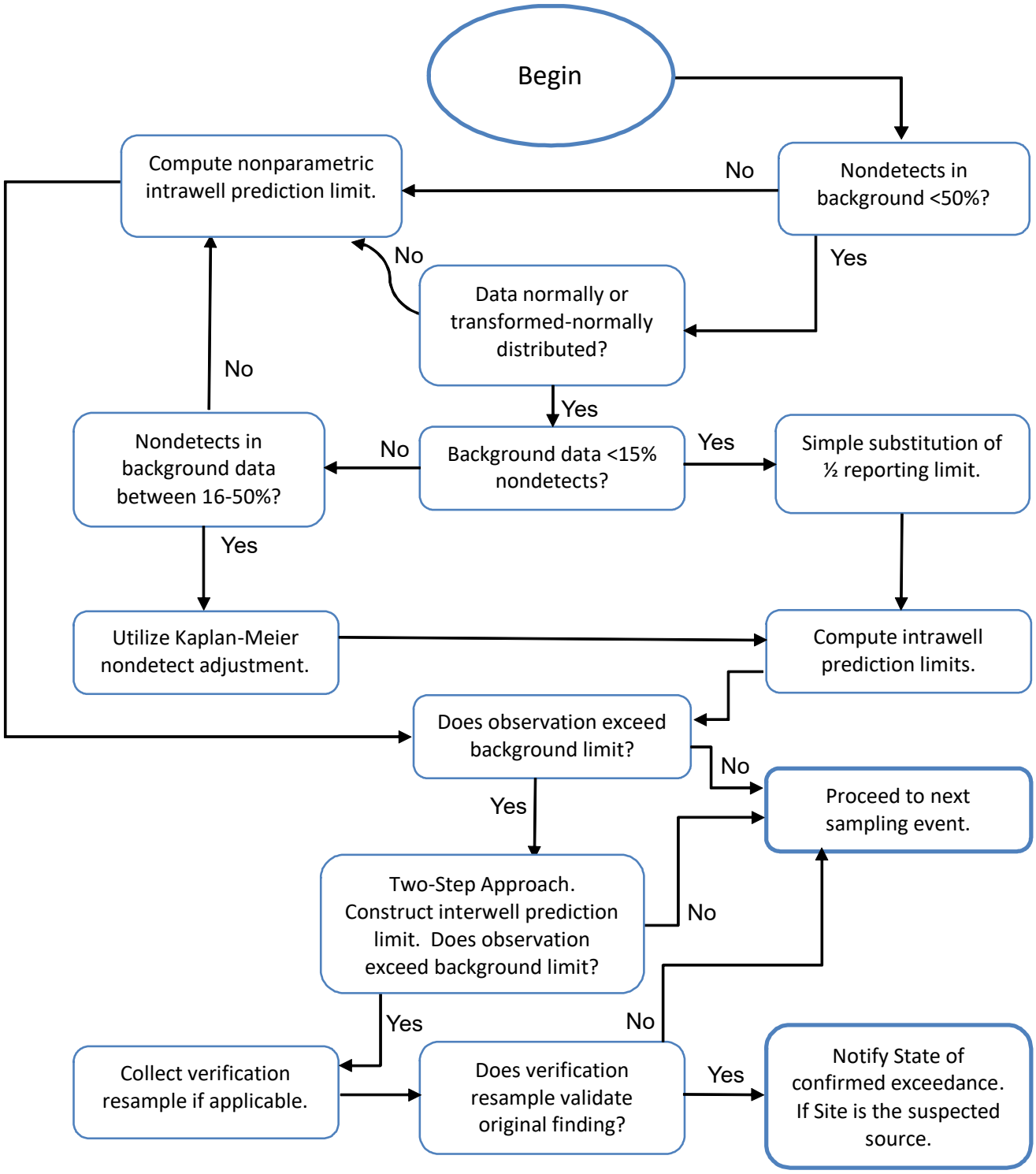
PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

CONSULTANT
wsp

YYYY-MM-DD	2022-03-09
DESIGNED	DLP
PREPARED	DJC
REVIEWED	
APPROVED	

TITLE
DECISION LOGIC FOR DETERMINING APPROPRIATE STATISTICAL METHOD

PROJECT NO.	CONTROL	REV.	FIGURE
GL166235021	GL166235021B002.mxd	0	5



CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

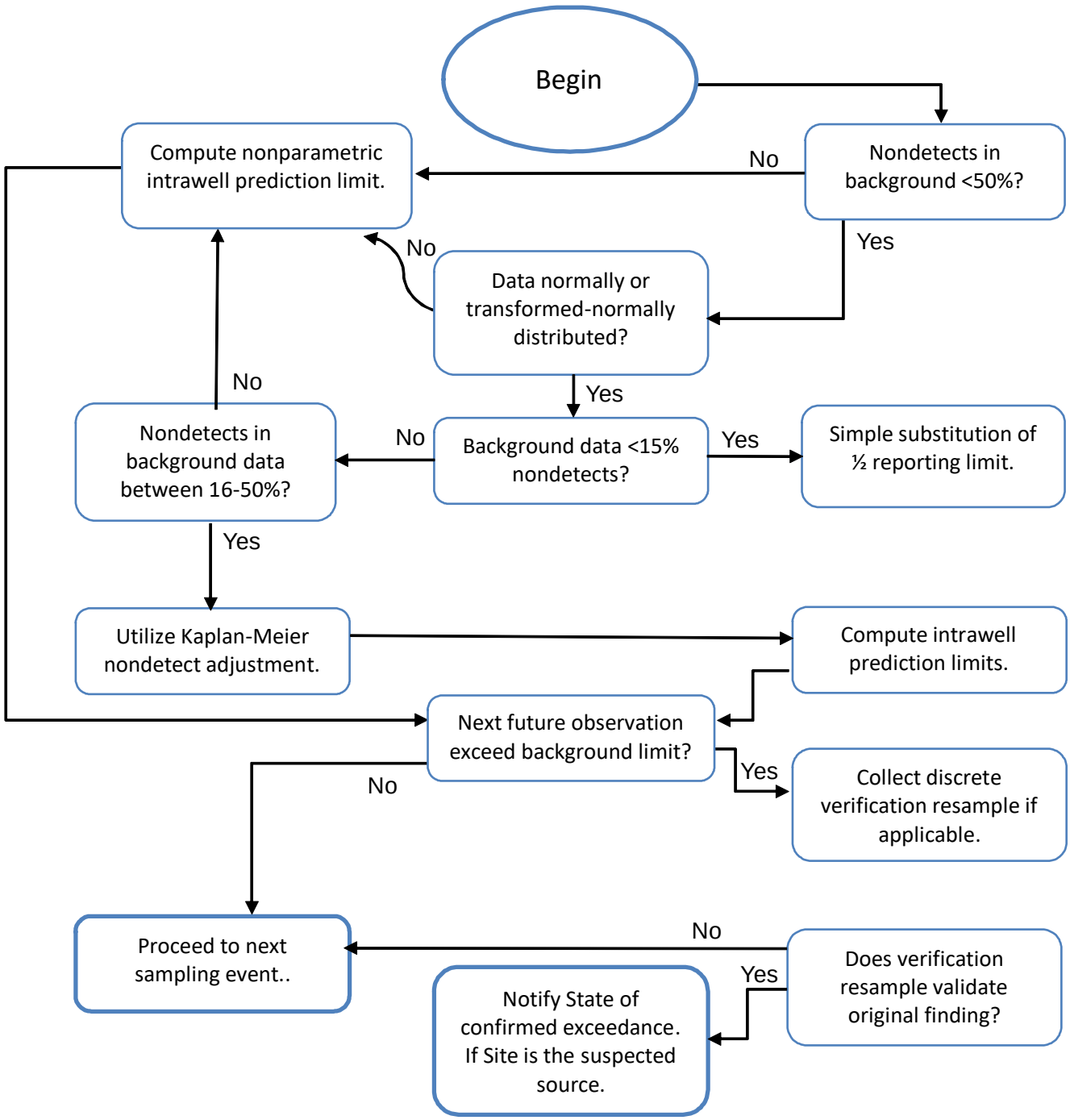
CONSULTANT
wsp

YYYY-MM-DD	2022-03-09
DESIGNED	DLP
PREPARED	DJC
REVIEWED	
APPROVED	

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

TITLE
DECISION LOGIC FOR COMPUTING INTRAWELL PREDICTION LIMITS

PROJECT NO.	CONTROL	REV.	FIGURE
GL166235021	GL166235021B003.mxd	0	6



CLIENT
GEORGIA POWER COMPANY
PLANT SCHERER

CONSULTANT
WSP GOLDER

YYYY-MM-DD	2022-03-09
DESIGNED	DLP
PREPARED	DJC
REVIEWED	
APPROVED	

PROJECT
GROUNDWATER MONITORING PLAN
COAL COMBUSTION RESIDUALS CCR LANDFILL

TITLE
DECISION LOGIC FOR COMPUTING **INTERWELL PREDICTION LIMITS**

PROJECT NO.	CONTROL	REV.	FIGURE
GL166235021	GL166235021B004.mxd	0	7

APPENDIX A

MONITORING SYSTEM DETAILS

A1 CELL 1 MONITORING WELL LOGS AND CONSTRUCTION DIAGRAMS

A2 PAC ASH CELL MONITORING WELL LOGS AND CONSTRUCTION DIAGRAMS

A3 CELL 3 MONITORING WELL LOGS AND CONSTRUCTION DIAGRAMS

A4 DRILLER BONDS

A5 CERTIFIED WELL SURVEY

APPENDIX A

Cell 1

Monitoring Well Logs and Construction Diagrams

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/28/2009 **COMPLETED** 10/28/2009 **SURF. ELEV.** 371.6 **COORDINATES:** N 1120077.85 E 2411555.32
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY P. Smith **LOGGED BY** D. Brooks **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 36 ft. **GROUND WATER DEPTH: DURING** 6 ft. **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Residuum, sandy SILT (MLS) and silty SAND (SM)						
5		▽						
10								
15								
			352.0					
20		Silty SAND (SM); mottled black and white; fine grained; gnessic saprolite		SS -1	19.5-21.0	3-5-16 (21)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty SAND (SM); mottled black and white; fine grained; gnessic saprolite *(Con't)*						
25				SS -2	24.5-26.0	11-7-9 (16)		
30		Silty SAND (SM); mottled black and white; fine to medium grained		SS -3	29.5-31.0	21-15-11 (26)		
35			335.5	SS -4	34.5-36.0	7-9-21 (30)		
		Bottom of borehole at 36.0 feet.						
40								
45								
50								

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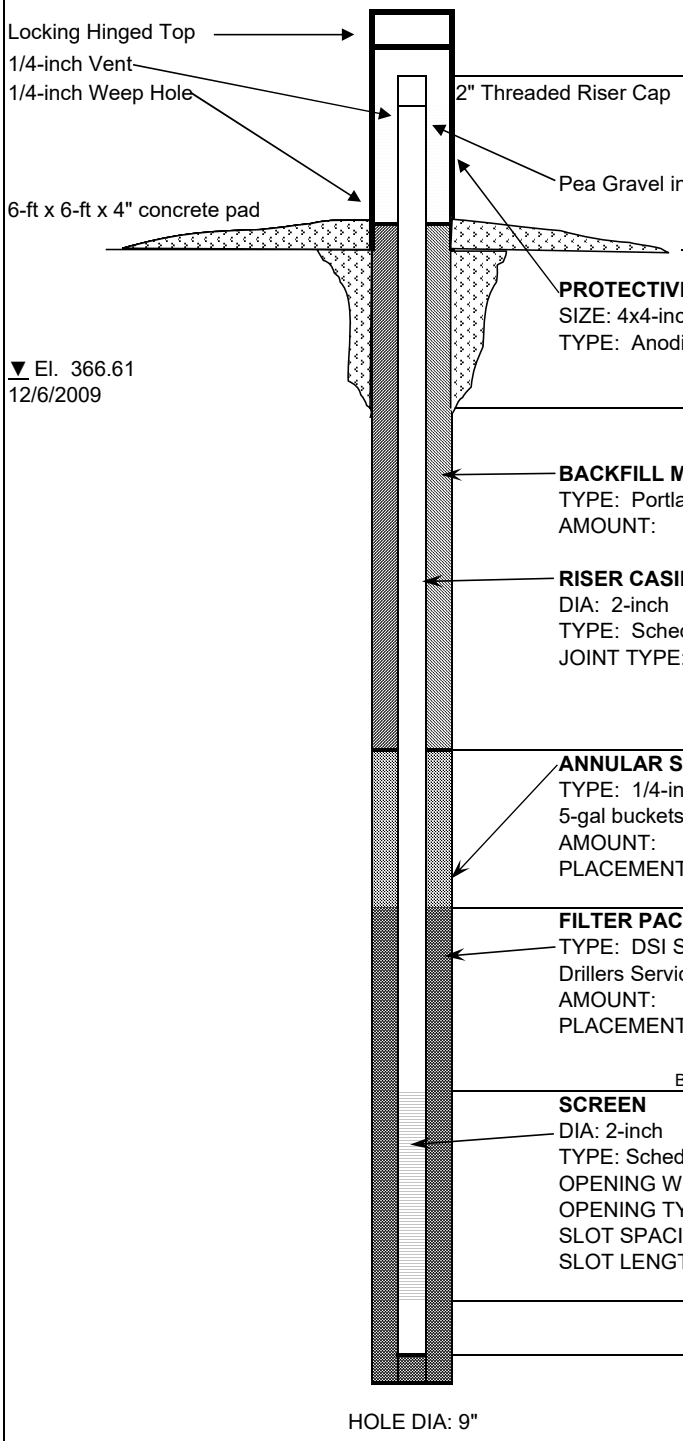
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: P. Smith	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: D. Brooks	DRILLING METHODS: HSA	GWC-1
DATE CONSTRUCTED: 10/28/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.35	374.95
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	371.6
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 8 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	19.50	352.10
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	22.00	349.60
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 2.5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	24.69	346.91
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	34.69	336.91
BOTTOM OF CASING	34.85	336.75

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/7/2009 **COMPLETED** 10/7/2009 **SURF. ELEV.** 376.9 **COORDINATES:** N 1119816.59 E 2411493.53
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** L. Millet **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 54.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Very moist, sandy SILT (MLS) and silty SAND (SM)						
5								
10								
15								
			357.4					
20		Wet, silty SAND (SM); green and white with occassional orange mottling; gneissic saprolite		SS -1	19.5-21.0	2-3-6 (9)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Wet, silty SAND (SM); green and white with occassional orange mottling; gneissic saprolite *(Con't)*						
25		Wet, silty SAND (SM); green and white with occassional lite orange and black mottling; soft; gneissic saprolite		SS -2	24.5-26.0	3-5-7 (12)		
30		Wet, silty SAND (SM); green and white with occassional orange mottling; soft; gneissic saprolite		SS -3	29.5-31.0	6-5-6 (11)		
35				SS -4	34.5-36.0	5-5-9 (14)		
40				SS -5	39.5-41.0	4-5-8 (13)		
45				SS -6	44.5-46.0	4-6-10 (16)		
50		Wet, silty SAND (SM); black, green and white with occassional lite orange mottling; micaceous;		SS -7	49.5-51.0	6-7-10 (17)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

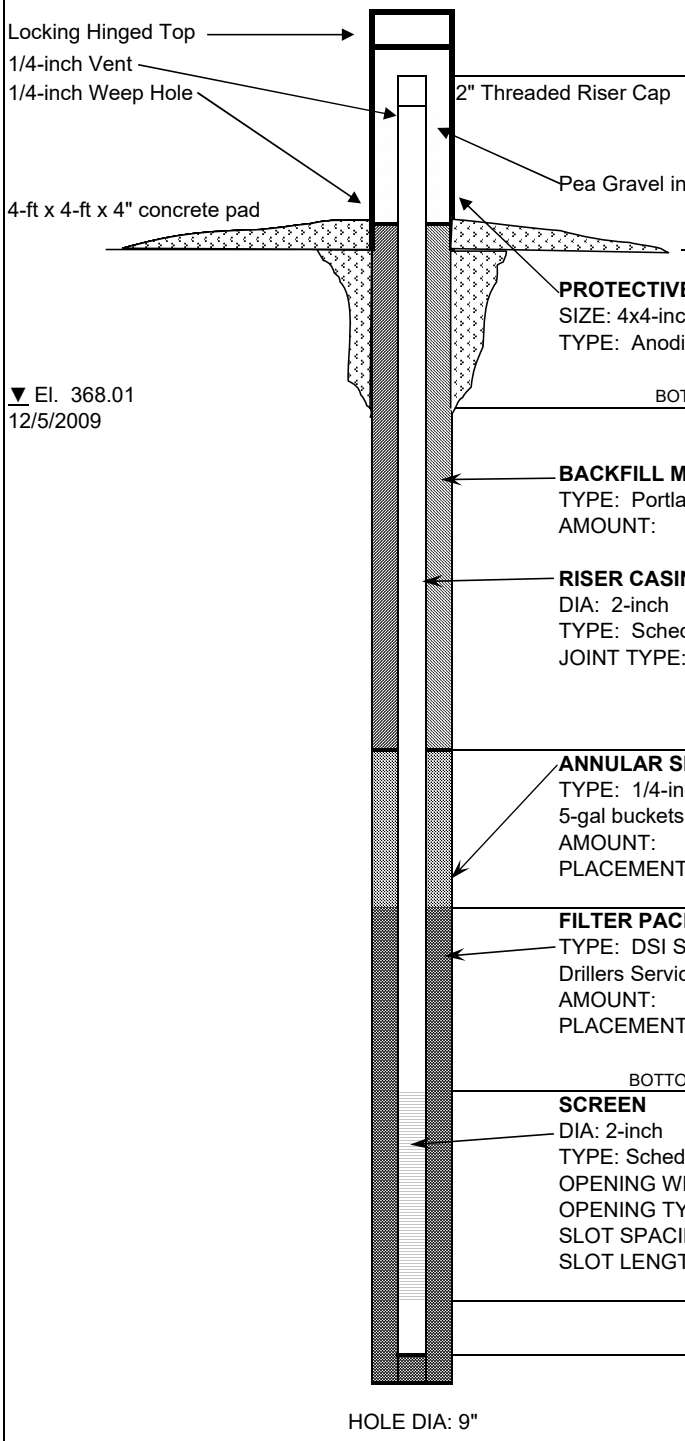
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		gneissic saprolite Wet, silty SAND (SM); green and white with occassional orange mottling; gneissic saprolite *(Con't)*						
55			320.9	SS -8	54.5-56.0	7-10-15 (25)		
		Bottom of borehole at 54.5 feet.						
60								
65								
70								
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT:Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage facility	DRILLER: S. Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: L. Millet	DRILLING METHODS: HSA	GWC-2
DATE CONSTRUCTED: 10/8/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.32	380.22
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	376.9
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 4.5 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	40.98	335.92
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	42.98	333.92
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 6 3/4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	44.78	332.12
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	54.78	322.12
BOTTOM OF CASING	54.88	322.02

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1
Updated Ground Surface Elevation 2/2022: 409.6

DATE STARTED 10/29/2009 **COMPLETED** 10/29/2009 **SURF. ELEV.** 407.1 **COORDINATES:** N 1119613.99 E 2411202.86
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** D. Brooks **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 46 ft. **GROUND WATER DEPTH: DURING** 38 ft. **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) and SILT (ML)						
5								
10								
15								
20		Sandy SILT (MLS), mottled orange, tan and black, micaceous		SS -1	18.5-20.0	4-4-7 (11)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

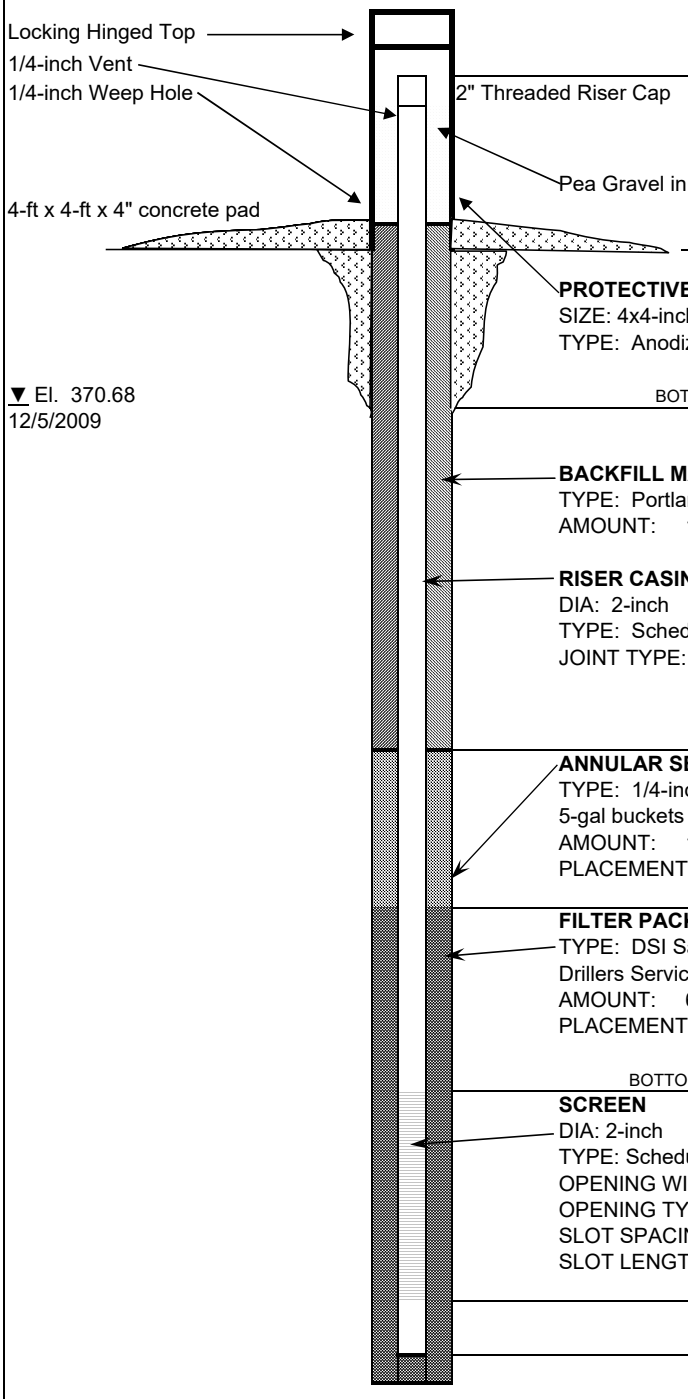
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) and SILT (ML) *(Con't)*						
25		Sandy SILT (MLS), mottled orange, tan and black with tan lean CLAY (CL), micaceous		SS -2	23.5-25.0	5-5-7 (12)		
			378.7					
30		Silty SAND (SM), mottled orange, tan, white and black, fine grained, micaceous		SS -3	28.5-30.0	8-9-14 (23)		
35		Silty SAND (SM), mottled orange and tan with trace amounts of white sand, fine grained, micaceous		SS -4	33.5-35.0	11-12-22 (34)		
40		Silty SAND (SM), mottled orange and whit, fine to medium grained, micaceous		SS -5	38.5-40.0	17-28-44 (72)		
45		Silty SAND (SM), mottled orange, tan, and black, fine grained, micaceous		SS -6	43.5-43.9	24-30-50/-7" (100+)		
			361.2					Auger refusal.
		Bottom of borehole at 46.0 feet.						
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT:Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage FacilitySolid Waste Management	DRILLER: Ranger	NAME
LOCATION: Cell 1	RIG TYPE: CME 55	
LOGGER: D. Brooks	DRILLING METHODS: HSA	GWC-3
DATE CONSTRUCTED: 10/29/2009		

New Survey Recorded 2/21/2022
New Top of Casing Elevation: 412.66
New Ground Surface Elevation: 409.6



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.34	410.44
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	407.1
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 14 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	31.90	375.20
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	34.40	372.70
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 6.5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	36.40	370.70
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	46.40	360.70
BOTTOM OF CASING	46.39	360.71

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/2/2009 **COMPLETED** 11/2/2009 **SURF. ELEV.** 408.4 **COORDINATES:** N 1119255.96 E 2411041.82
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** **BEARING**
BORING DEPTH 39.5 ft. **GROUND WATER DEPTH: DURING** 27.5 ft. **COMP.** **DELAYED**
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) and SILT (ML)						
5								
10								
15								
			389.8					
20		Damp, soft, SILT (ML), mottled black, tan and orange, micaceous		SS -1	18.5-20.0	11-7-10 (17)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Damp, soft, SILT (ML), mottled black, tan and orange, micaceous *(Con't)* Very damp, soft, SILT (ML), mottled black, tan, white and orange, micaceous		SS -2	23.5-25.0	7-8-11 (19)		
		▽	379.8					
30		Very moist, soft, silty SAND (SM) and SILT (ML); mottled black, tan, orange and white; fine grained; very micaceous with large mica flakes		SS -3	28.5-30.0	9-13-20 (33)		
35		Moist, soft, silty SAND (SM); mottled black, tan, orange and white; fine to medium grained; micaceous		SS -4	33.5-33.9	50/5" (100+)		
			369.8					
		Moist, soft, clayey SAND (SC); black with orange, tan and white mottles; fine grained; micaceous	368.8	SS -5	38.5-39.0	50 (0)		auger refusal.
40		Bottom of borehole at 39.5 feet.						
45								
50								

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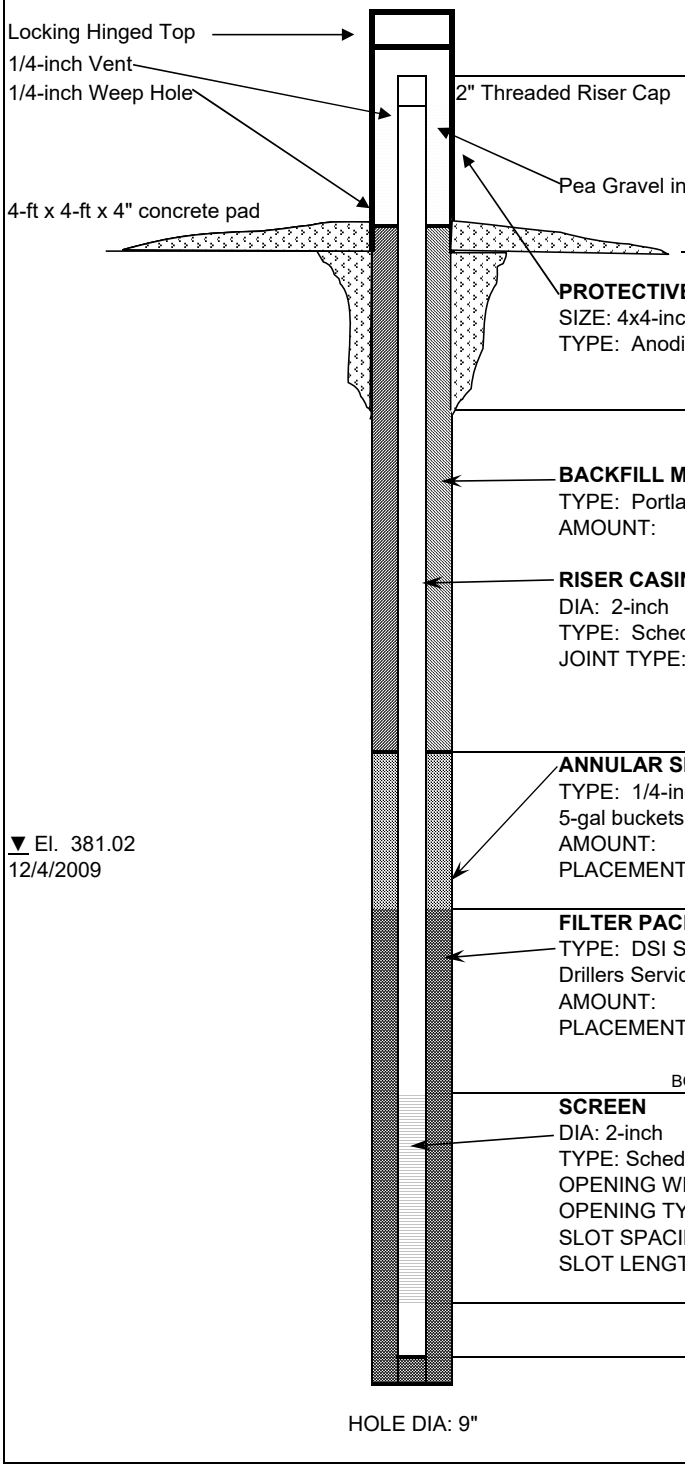
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL NAME
CCB Storage Facility	DRILLER: Ranger	
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-4
DATE CONSTRUCTED:11/21/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.35	411.75
GROUND SURFACE	0.00	408.4
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 11.5 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	26.30	382.10
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1.25 buckets PLACEMENT: Tremie		
TOP OF FILTER PACK	27.95	380.45
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5.5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	29.70	378.70
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	39.70	368.70
BOTTOM OF CASING	39.91	368.49

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/7/2009 **COMPLETED** 10/7/2009 **SURF. ELEV.** 393.3 **COORDINATES:** N 1118897.72 E 2411025.88
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** LM/BG **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 34.8 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** 20.2 ft. after 18 hrs.
NOTES Elevation based on stake. Offset 5' west of stake. Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		CLAY (CL); red and tan; medium stiff; damp; low plasticity						
5								
10								
15								
20		▼		SS -1	19.5-21.0	2-3-5 (8)		
			372.2					
		SILT (ML); gray; medium dense; moist; micaceous						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SILT (ML); gray; medium dense; moist; micaceous *(Con't)*						
25				SS -2	24.5-26.0	3-3-6 (9)		
			367.2					
		Silty SAND (SM); gray; fine grained; dense; very moist; micaceous						
			364.2					
		GNEISS - black and white, weathered, hard augering						
30			363.2	SS -3	29.5-29.7	50/2" (100+)		
		GNEISS - black and white, fine to medium grain, hard, not weathered						Auger refusal.
				RC -1	30.0-34.8		100 (100)	
35			358.4					
		Bottom of borehole at 34.8 feet.						
40								
45								
50								

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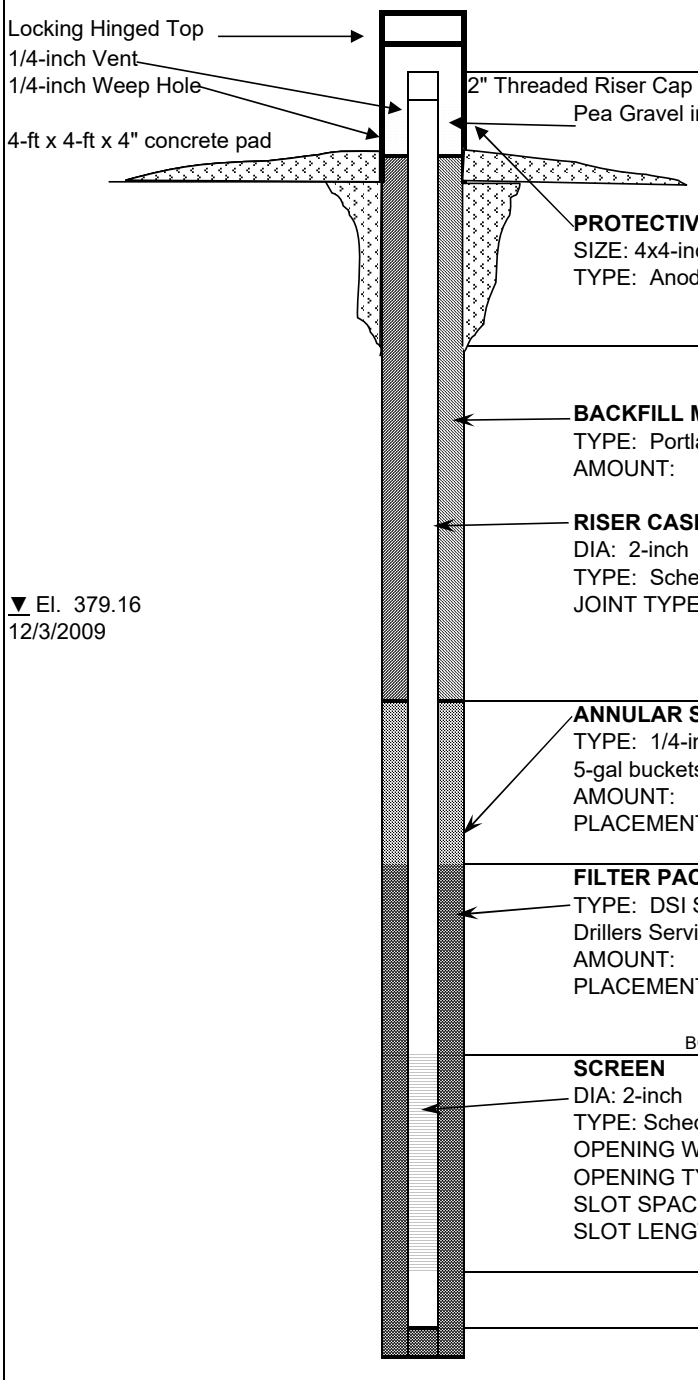
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: S. Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: B. Gallagher	DRILLING METHODS: HAS/HQ Core	GWC-5
DATE CONSTRUCTED: 10/22/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.39	396.69
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	393.3
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 7 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	14.97	378.33
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: PLACEMENT: Tremie		
TOP OF FILTER PACK	16.97	376.33
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	20.43	372.87
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	30.43	362.87
BOTTOM OF CASING	30.66	362.64

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/8/2009 **COMPLETED** 10/8/2009 **SURF. ELEV.** 412.4 **COORDINATES:** N 1118575.69 E 2410872.56
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam **LOGGED BY** LM/BG **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 44.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Offset 5' west of stake. Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		CLAY (CL)						
10			402.4					
		SILT (ML)						
15			397.4					
		Silty SAND (SM); tan with orange and black mottling; loose; dry; abundant mica						
20		Silty SAND (SM); tan with orange and black mottling; loose; dry; abundant mica	392.4	SS -1	19.5-21.0	3-5-6 (11)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Silty SAND (SM); black and tan with occasional black mottling; very fine to fine grained; loose; dry; mica		SS -2	24.0-25.5	5-6-10 (16)		
30		White cobble		SS -3	29.5-29.8	50/4" (100+)		Auger refusal.
35		**GNEISS** - white and black, medium to fine grain, soft to medium hard, slightly to highly weathered, banded		RC -1	34.0-35.5		100 (0)	
		Micaceous seam at 35.9'		RC -2	35.5-40.5		100	
40			370.7					
		SCHIST - black, soft, highly weathered Secondary quartz seam at 41.9'		RC -3	40.5-44.5		50 (30)	Lost all water return at 42.0'..
		Nearly completely weathered mica seam at 43.8'	367.9					
45		Bottom of borehole at 44.5 feet.						
50								

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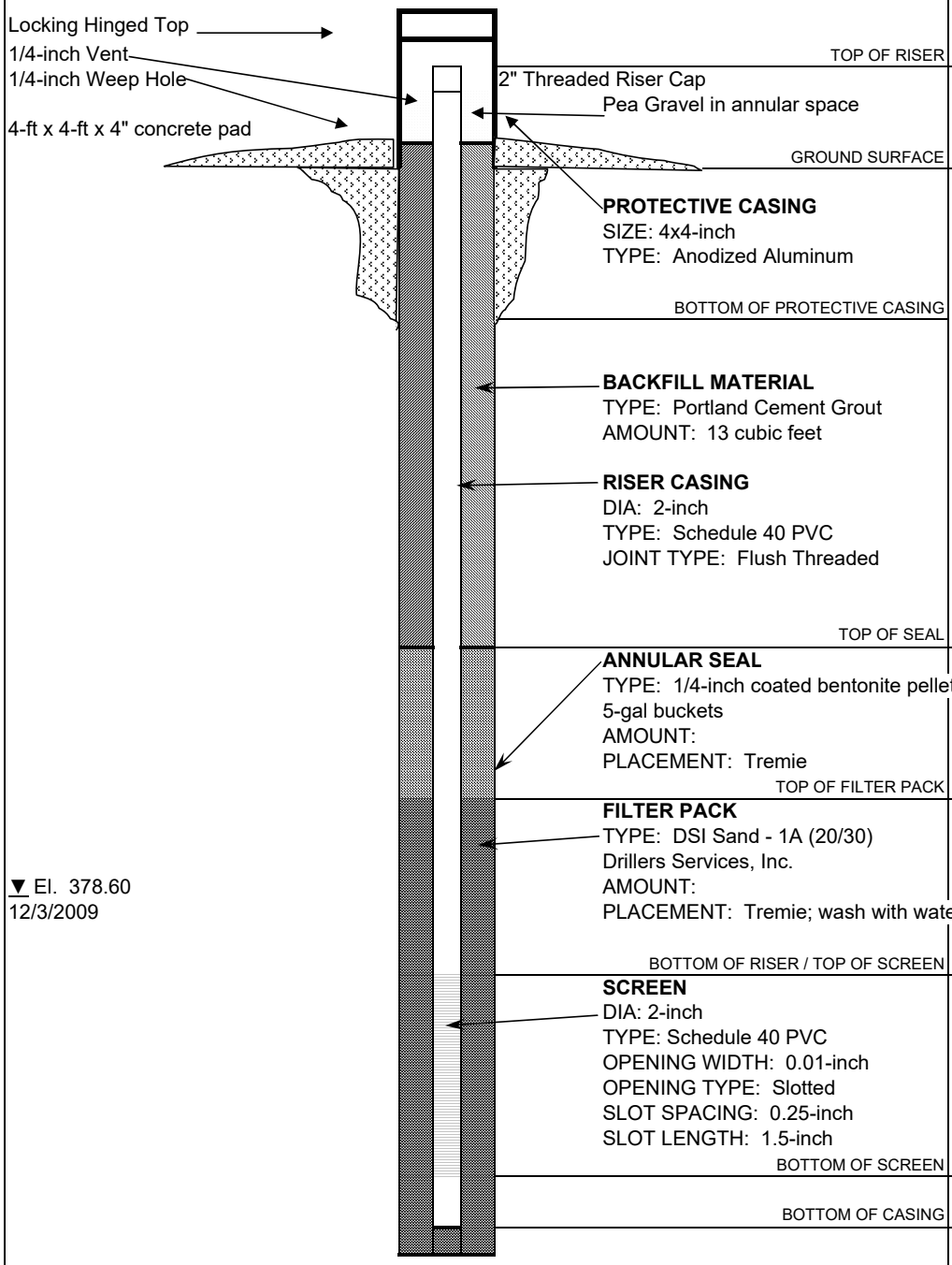
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: S. Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: B. Gallagher	DRILLING METHODS: HAS/HQ Core	GWC-6
DATE CONSTRUCTED: 10/21/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.40	415.8
GROUND SURFACE	0.00	412.4
BOTTOM OF PROTECTIVE CASING		
TOP OF SEAL	29.86	382.54
TOP OF FILTER PACK	31.86	380.54
BOTTOM OF RISER / TOP OF SCREEN	34.86	377.54
BOTTOM OF SCREEN	44.86	367.54
BOTTOM OF CASING	45.10	367.30

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/19/2009 **COMPLETED** 10/20/2009 **SURF. ELEV.** 414.4 **COORDINATES:** N 1118243.67 E 2410645.91
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** B. Gallagher **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 54.5 ft. **GROUND WATER DEPTH: DURING** 39.5 ft. **COMP.** _____ **DELAYED** _____
NOTES Elevation based on stake. Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		*Residuum*, CLAY (CL); red; medium dense; damp; low plasticity; trace mica	405.3					
10		*Residuum*, SILT (ML); tan; medium dense; damp; with mica	398.3					
15								
20		*Saprolite*, silty SAND (SM); tan and black; medium dense; damp; with mica (remnant gneiss texture)		SS -1	19.5-21.0	5-6-8 (14)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Saprolite, silty SAND (SM); tan and black; medium dense; damp; with mica (remnant gneiss texture) *(Con't)*	389.8					
25		*Saprolite*, poorly graded SAND with SILT (SP-SM); tan, white and black; medium dense; damp; with iron oxide stain (remnant gneiss texture)		SS -2	24.5-26.0	6-8-16 (24)		
			384.8					
30		*Saprolite*, silty SAND (SM); white and tan; medium dense; moist		SS -3	29.5-31.0	6-6-8 (14)		
35				SS -4	34.5-36.0	3-5-6 (11)		
		▽	374.8					
40		*Saprolite*, poorly graded SAND (SP); white, black, and tan; medium dense to dense; moist; trace mica		SS -5	39.5-41.0	5-8-10 (18)		
45				SS -6	44.5-46.0	5-11-15 (26)		
50				SS -7	49.5-51.0	17-23-28 (51)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

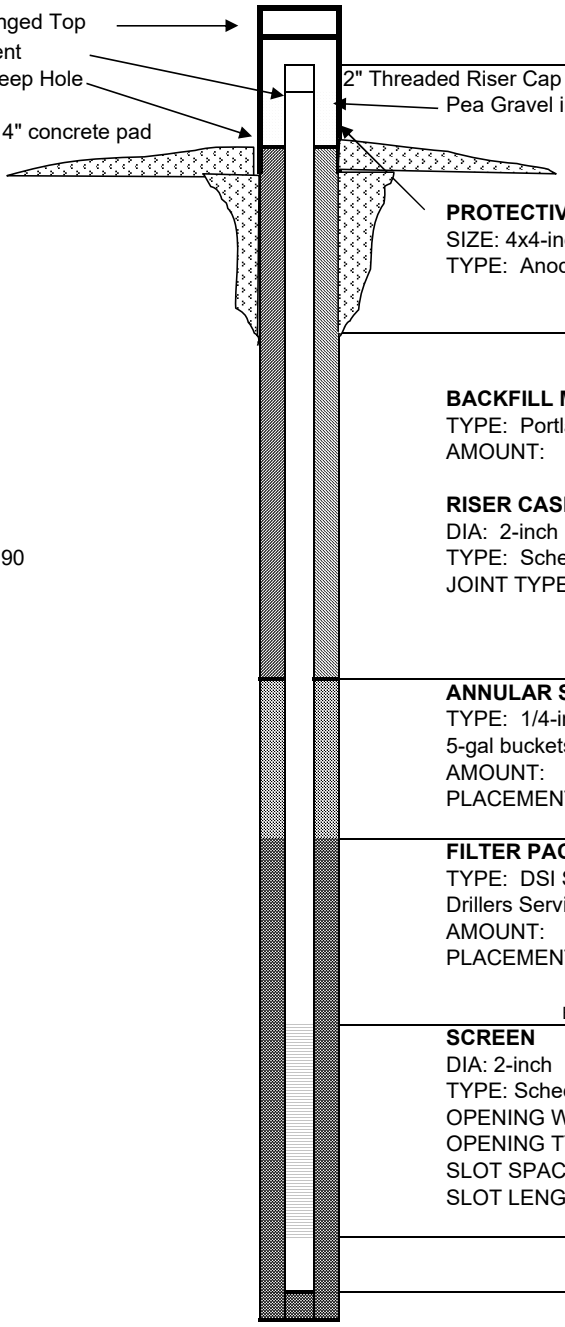
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Saprolite, poorly graded SAND (SP); white, black, and tan; medium dense to dense; moist; trace mica *(Con't)*						
			359.7					
55		Bottom of borehole at 54.5 feet.		SS -8	54.5-54.6	50/1" (100+)		
60								
65								
70								
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: P. Smith	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Ben Gallagher	DRILLING METHODS: HSA	GWC-7
DATE CONSTRUCT 10/20/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.87	418.27
GROUND SURFACE	0.00	414.4
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 18 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	39.90	374.50
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	41.70	372.70
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	44.57	369.83
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	54.57	359.83
BOTTOM OF CASING	54.78	359.62

Well Decommissioned on March 29, 2017

BORING GWC-8

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/20/2009 **COMPLETED** 10/20/2009 **SURF. ELEV.** 404.8 **COORDINATES:** N 1,117,934.46 E 2,410,435.83
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** B. Gallagher **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 54.5 ft. **GROUND WATER DEPTH: DURING** 40 ft. **COMP.** _____ **DELAYED** _____
NOTES Elevation based on stake. Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty SAND (SM); white and tan; fine grained; loose; damp						
5								
10								
15								
20				SS -1	19.5-21.0	3-3-4 (7)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

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Well Decommissioned on March 29, 2017

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty SAND (SM); white and tan; fine grained; loose; damp *(Con't)*						
25		*Saprolite*, white and green; very damp; trace root hairs		SS -2	24.5-26.0	2-2-4 (6)		
			375.3					
30		*Saprolite*, SILT (ML); tan; loose; moist; micaceous		SS -3	29.5-31.0	2-3-4 (7)		
			370.3					
35		*Saprolite*, silty SAND (SM); white and tan; fine grained; medium dense; micaceous		SS -4	34.5-36.0	3-5-9 (14)		
			365.3					
40		▽ Poorly graded SAND (SP); white and black; fine grained; dense; wet		SS -5	39.5-41.0	7-12-27 (39)		-water on rods at 40.0 feet..
45		Tan; very dense; trace mica		SS -6	44.5-46.0	23-27-34 (61)		
50				SS -7	49.5-51.0			

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Well Decommissioned on March 29, 2017

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Poorly graded SAND (SP); white and black; fine grained; dense; wet *(Con't)*						
			350.3					
55		*Saprolite*, poorly graded SAND (SP); white and black; fine grained; very dense; wet	350.0	SS -8	54.5-54.8	50/3" (100+)		
		Bottom of borehole at 54.5 feet.						
60								
65								
70								
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

RECORD OF BOREHOLE GWC-8A

SHEET 1 of 1

PROJECT: SCS-Plant Scherer
PROJECT NUMBER: 1662350A-01
DRILLED DEPTH: 45.00 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550
DATE STARTED: 3/29/17
DATE COMPLETED: 3/29/17

NORTHING: 1117917.32
EASTING: 2410375.16
GS ELEVATION: 398.6 ft
TOC ELEVATION: 401.62 ft

DEPTH W.L.:22.4'
DATE W.L.:3/30/2017
TIME W.L.:9:00

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N-VALUE	REC
0	395	0.00 - 8.50 SM, SILTY SAND, non-plastic; dark brown; non-cohesive, dry, w<PL, loose.	SM			S1	DO	2-2-2	4	0.00 / 1.50
5										
	390				389.7					
		8.50 - 18.50 CL, CLAY with trace organics, moderate plasticity; dark brown to red brown; cohesive, moist, w~PL very soft.			8.50	S2	DO	1-2-1	3	0.16 / 1.50
10										
	385		CL			S3	DO	1-1-3	4	0.66 / 1.50
15										
	380				379.7					
		18.50 - 19.50 ML, SILT with trace fine sand, non to low plasticity; red brown to black; cohesive, moist, w<PL, soft.	ML		18.50 378.7	S4	DO	3-4-6	10	1.50 / 1.50
20		19.50 - 23.50 SP, Poorly-graded SAND, fine to coarse, non plastic; white to black; non-cohesive, moist, w<pl, loose.	SP		19.50					
	375				374.7					
		23.50 - 33.50 SM, SILTY SAND, fine to coarse, non to low plasticity; white to black to bronze, saprolite, biotite gneiss; non-cohesive, moist, w<PL, loose			23.50	S5	DO	2-7-10	17	1.50 / 1.50
25										
	370		SM			S6	DO	10-25-42	67	1.16 / 1.50
30										
	365				364.7					
		33.50 - 45.00 SC, CLAYEY SAND, fine to coarse, non-plastic; gray to olive; non-cohesive, wet, w<PL, very dense.			33.50	S7	DO	20-50/5	50/5	0.75 / 1.50
35										
	360		SC			S8	DO	50/4	50/4	0.16 / 1.50
40										
	355									
						S9	DO	50/5	50/5	0.33 / 1.50
45		Boring completed at 45.00 ft			353.2					

MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES

WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 44.7'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Screw

WELL SCREEN
Interval: 34.3' - 44.3'
Material: Schedule 40 PVC
Diameter: 2"
Slot Size: 0.010
End Cap: 44.3' - 44.7"

FILTER PACK
Interval: 27.8' - 45'
Type: FilterSil

FILTER PACK SEAL
Interval: 24.7' - 27.8'
Type: Pel-Plug Bentonite Pellets

ANNULUS SEAL
Interval: 0' - 24.7'
Type: CETCO Pure Gold Grout (70:30)

WELL COMPLETION
Pad: 6'x6'x6"
Protective Casing: Aluminum 4" x 4" x 5'
Bollards: 5' Round Steel

DRILLING METHODS
Soil Drill: 4.25 inch HSA
Rock Drill: N/A

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: Sean Denty

GA INSPECTOR: Michael Boatman, P.G.
CHECKED BY: Rachel Kirkman, PG
DATE: 4/21/17

Golder Associates

BOREHOLE RECORD 1662350A-01.GPJ PIEDMONT.GDT 4/21/17

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/4/2009 **COMPLETED** 11/4/2009 **SURF. ELEV.** 382.8 **COORDINATES:** N 1117955.40 E 2410167.75
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 16.5 ft. **GROUND WATER DEPTH: DURING** 2.5 ft. **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Sandy SILT (MLS) to silty SAND (SM) ▽						
10								
15			368.5					
		Damp, silty SAND (SM); dark greenish gray with white and pale brown mottles; fine grained; micaceous; gneissic saprolite		SS -1	14.5-16.0	8-8-33 (41)		auger refusal.
20		Bottom of borehole at 16.5 feet.						

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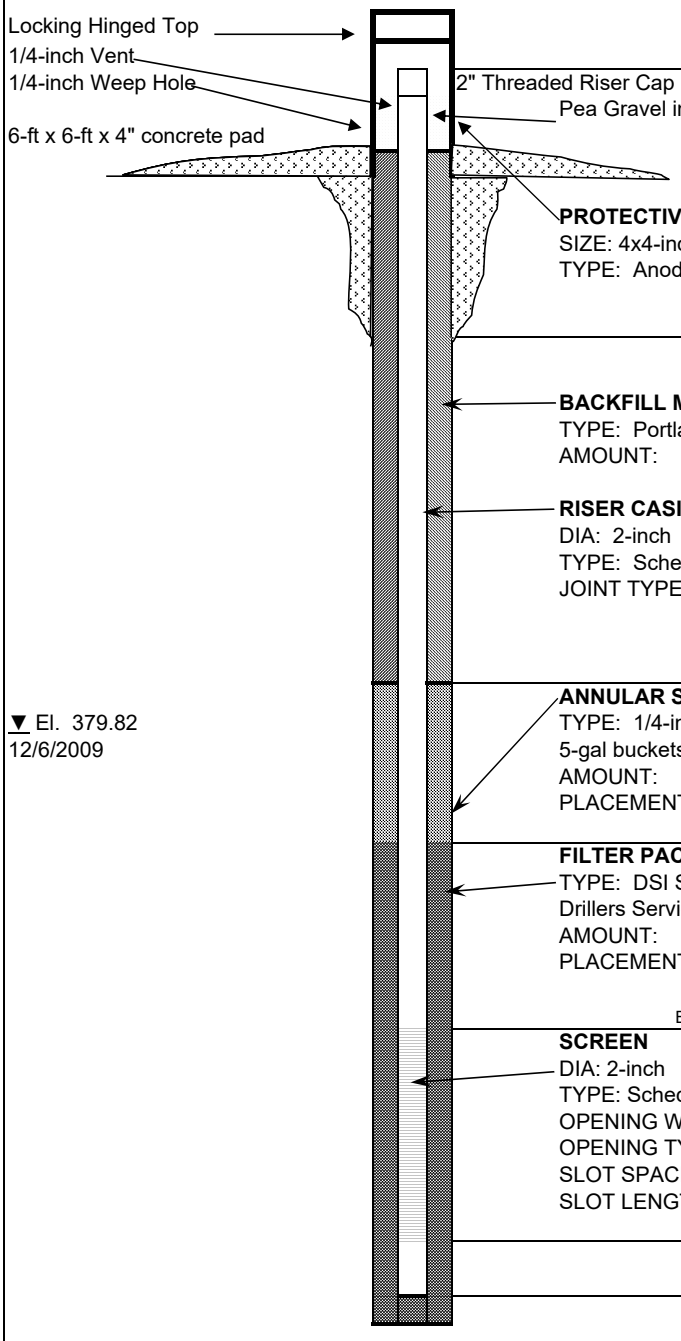
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Ranger	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Clanton	DRILLING METHODS: HSA	GWC-9
DATE CONSTRUCTED: 11/4/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.38	386.18
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	382.8
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 0.8		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	2.49	380.31
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: PLACEMENT: Tremie		
TOP OF FILTER PACK	4.79	378.01
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	6.79	376.01
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	16.79	366.01
BOTTOM OF CASING	16.70	366.10

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/3/2009 **COMPLETED** 11/3/2009 **SURF. ELEV.** 388.9 **COORDINATES:** N 1118306.77 E 2410018.28
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 35.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) to silty SAND (SM)						
5								
10								
15								
			369.8					
20		Damp, silty SAND (SM); mottled green, orange, reddish brown, black, and light brownish yellow with laminations of pink SAND; fine grained; very micaceous		SS -1	19.5-21.0	7-8-16 (24)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Damp, silty SAND (SM); mottled green, orange, reddish brown, black, and light brownish yellow with laminations of pink SAND; fine grained; very micaceous *(Con't)*		SS -2	24.5-26.0	7-12-21 (33)		
30		Damp, silty SAND (SM); mottled reddish brown, dark brown, reddish orange, white, and tan; fine grained; micaceous		SS -3	29.5-31.0	10-13-20 (33)		
35		Damp, silty SAND (SM); mottled green, reddish yellow, reddish brown, white, yellowish brown, and dark brown with shards of pink silica; fine grained; micaceous	353.8	SS -4	34.5-36.0	11-20-24 (44)		
		Bottom of borehole at 35.5 feet.						
40								
45								
50								

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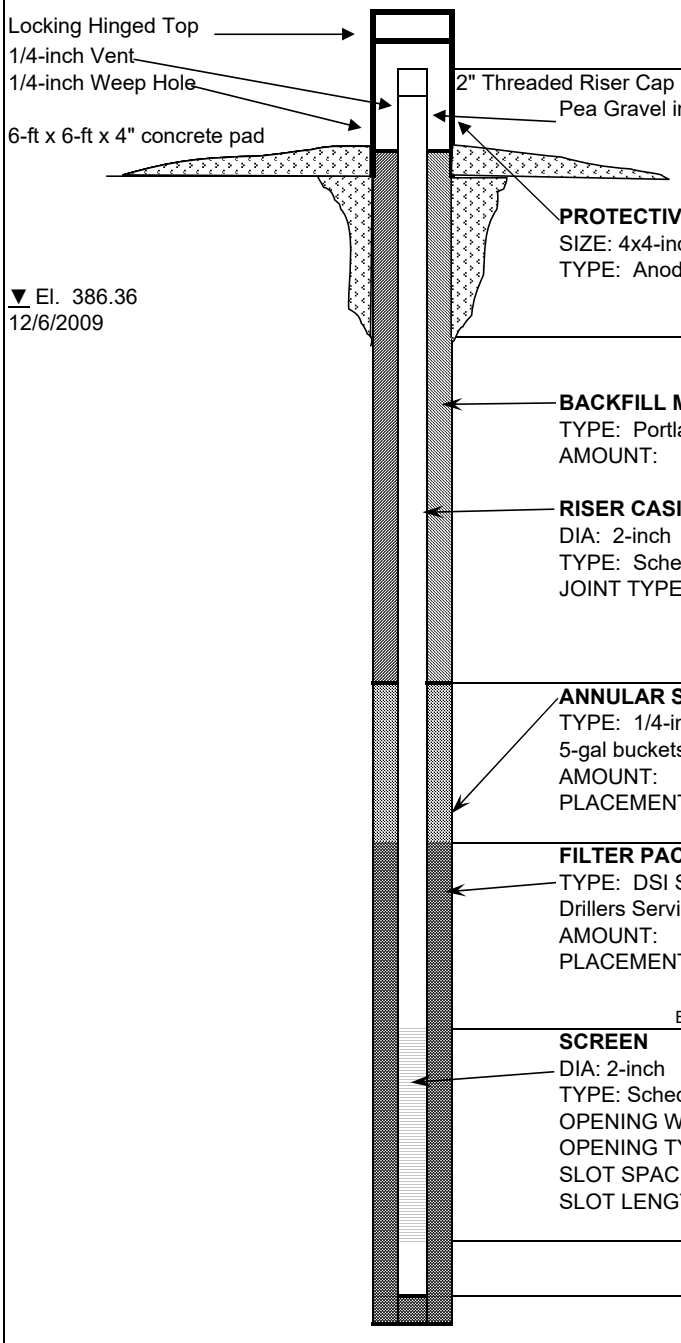
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: S. Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-10
DATE CONSTRUCTED: 11/3/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.97	392.87
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	388.9
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 10 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	17.19	371.71
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	19.19	369.71
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 6 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	21.39	367.51
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	31.39	357.51
BOTTOM OF CASING	31.10	357.80

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/3/2009 **COMPLETED** 11/3/2009 **SURF. ELEV.** 398.8 **COORDINATES:** N 1118648.98 E 2409778.84
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 30 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Sandy SILT (MLS) to silty SAND (SM)						
10								
15								
			380.6					
20		Moist, silty SAND (SM); mottled white, light brown, orange, and black; fine grained; micaceous		SS -1	18.5-20.0	6-7-10 (17)		

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LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Moist, silty SAND (SM); mottled white, light brown, orange, and black; fine grained; micaceous *(Con't)* Moist, silty SAND (SM); light brown with orange, green and black mottles; fine grained; micaceous; some gneissic saprolite		SS -2	23.5-25.0	5-9-11 (20)		
30		Moist, silty SAND (SM); mottled white, black, and blackish green; fine grained; micaceous; gneissic saprolite	369.1	SS -3	28.5-30.0	6-14-18 (32)		
		Bottom of borehole at 30.0 feet.						

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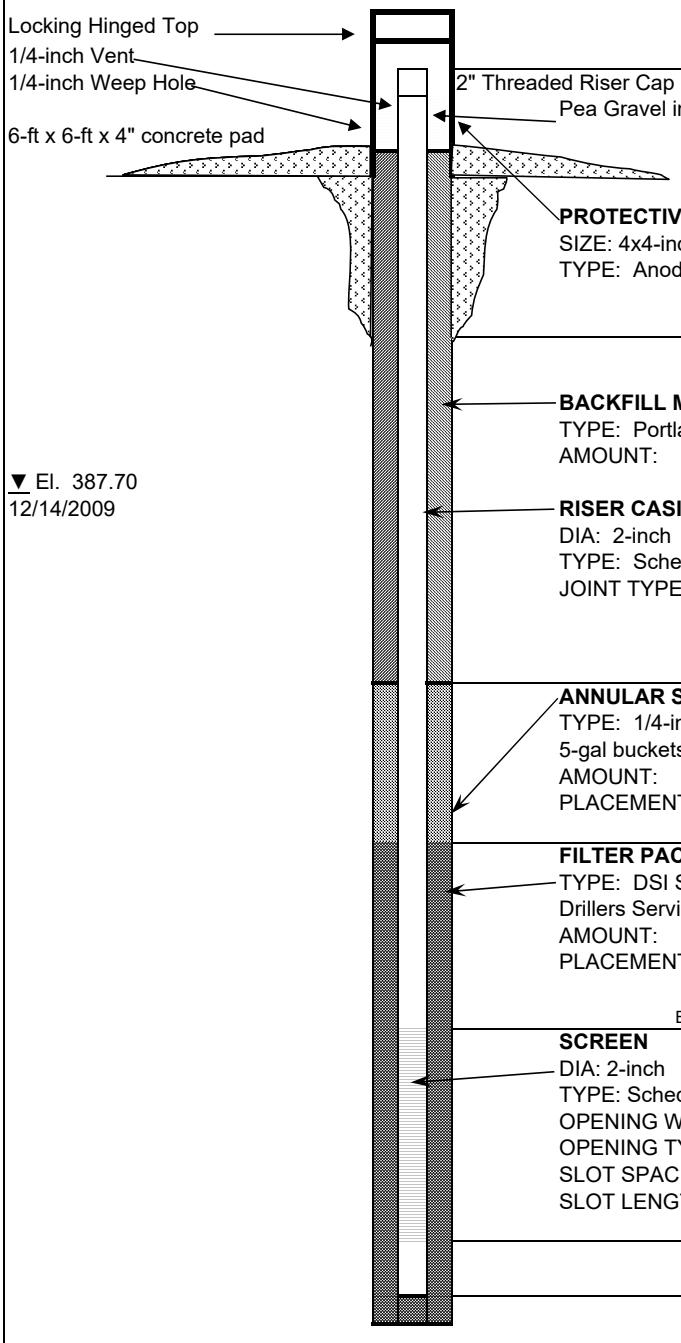
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL NAME
CCB Storage Facility	DRILLER: Ranger	
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-11
DATE CONSTRUCTED: 11/3/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.53	402.33
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	398.8
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 7 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	16.50	382.30
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	19.00	379.80
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	21.00	377.80
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	31.00	367.80
BOTTOM OF CASING	30.90	367.90

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/3/2009 **COMPLETED** 11/3/2009 **SURF. ELEV.** 409.2 **COORDINATES:** N 1118977.87 E 2409554.57
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 33.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Moist, lean CLAY (CL); mottled orange, black and light brown; micaceous						
5								
10								
15								
20				SS -1	18.5-20.0	17-11-3 (14)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility

LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
			386.0					
25		Wet, clayey SAND (SC); mottled ornge, white, tan and black; fine grained; micaceous		SS -2	23.5-25.0	5-6-7 (13)		
30		Wet, clayey SAND (SC); mottled ornge, white and tan with sparse black organics; fine grained; micaceous		SS -3	28.5-30.0	7-11-15 (26)		
			376.0					
35		Bottom of borehole at 33.5 feet.		SS -4	33.5-35.0	6-11-8 (19)		
40								
45								
50								

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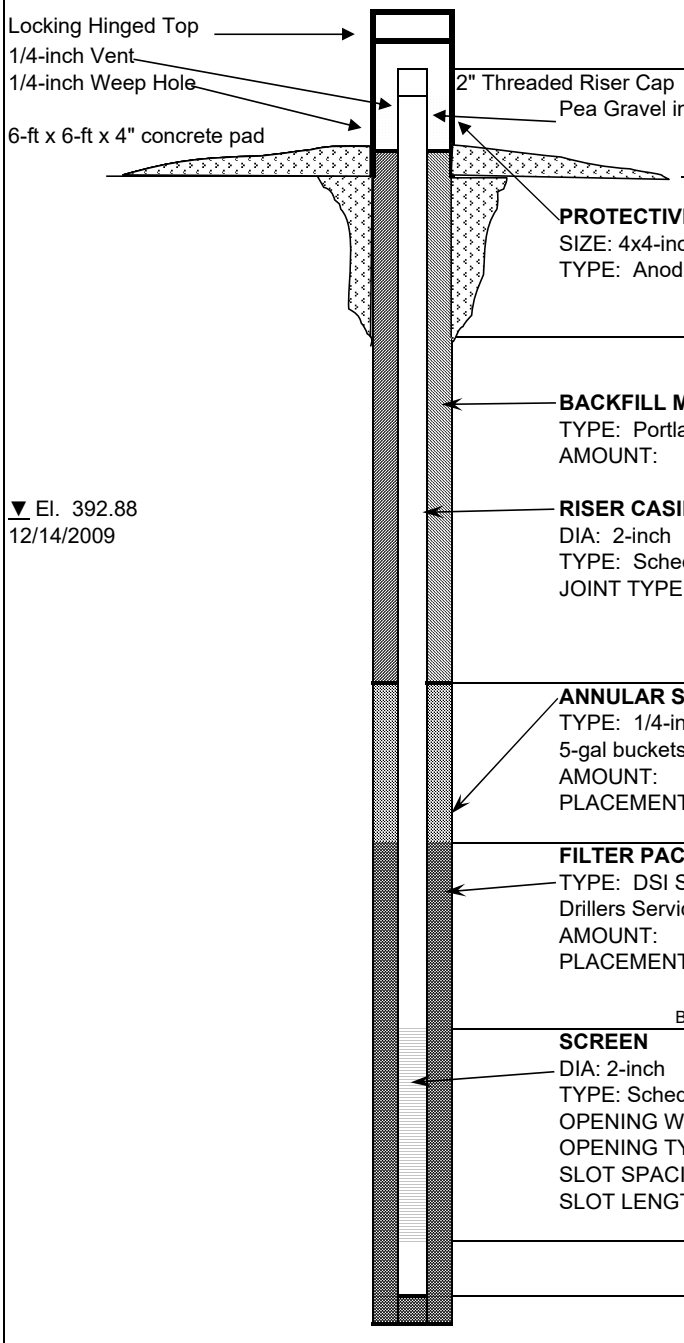
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Ranger	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-12
DATE CONSTRUCTED: 11/3/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.69	412.89
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	409.2
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 8.5 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	20.12	389.08
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	22.22	386.98
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	24.22	384.98
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	34.22	374.98
BOTTOM OF CASING	34.04	375.16

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/2/2009 **COMPLETED** 11/2/2009 **SURF. ELEV.** 416.5 **COORDINATES:** N1119338.68 E 2409390.95
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 39.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) to silty SAND (SM)						
5								
10								
15								
			398.0					
20		SILT (ML); brownish yellow with black mottles; micaceous with large flakes of mica		SS -1	18.5-20.0	7-5-6 (11)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SILT (ML); brownish yellow with black mottles; micaceous with large flakes of mica *(Con't)*						
25		Damp, SILT (ML) and silty SAND (SM); mottled light brown, black, orange and white; micaceous		SS -2	23.5-25.0	4-7-11 (18)		
30		Very damp, SILT (ML) with very fine grain silty SAND (SM); mottled black and dark brown; micaceous	386.5	SS -3	29.5-31.0	6-8-11 (19)		
		Damp, SILT (ML) with very fine grain silty SAND (SM); mottled light brown, black, orange and white; micaceous						
35		Very damp, silty SAND (SM); mottled white, tan, orange, and black; fine grained; micaceous		SS -4	33.5-35.0	12-16-20 (36)		
		Very damp, silty SAND (SM); mottled white, tan, and black; fine grained; micaceous	377.0	SS -5	38.5-40.0	5-9-12 (21)		
40		Bottom of borehole at 39.5 feet.						
45								
50								

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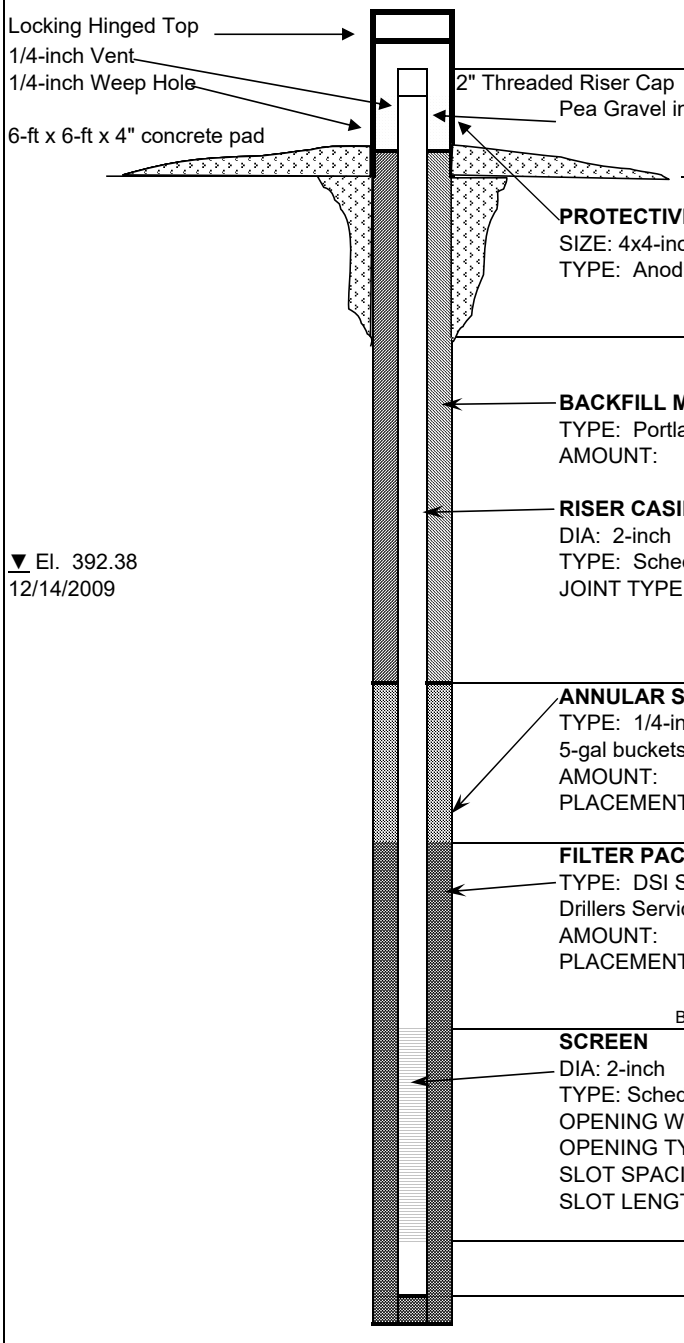
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL NAME
CCB Storage Facility	DRILLER: Ranger	
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-13
DATE CONSTRUCTED: 11/2/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.27	419.77
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	416.5
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 11.25 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	25.69	390.81
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	27.69	388.81
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	29.99	386.51
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	39.99	376.51
BOTTOM OF CASING	40.06	376.44

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/4/2009 **COMPLETED** 11/4/2009 **SURF. ELEV.** 400.2 **COORDINATES:** N 1119655.05 E 2409111.75
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** **BEARING**
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** 9.5 ft. **COMP.** **DELAYED**
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		Sandy SILT (MLS) to silty SAND (SM)						
10		▽						
15								
			381.8					
20		Moist, silty SAND (SM); greenish black, white, yellow, and brown; fine grained; micaceous		SS -1	18.5-20.0	5-8-13 (21)		

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

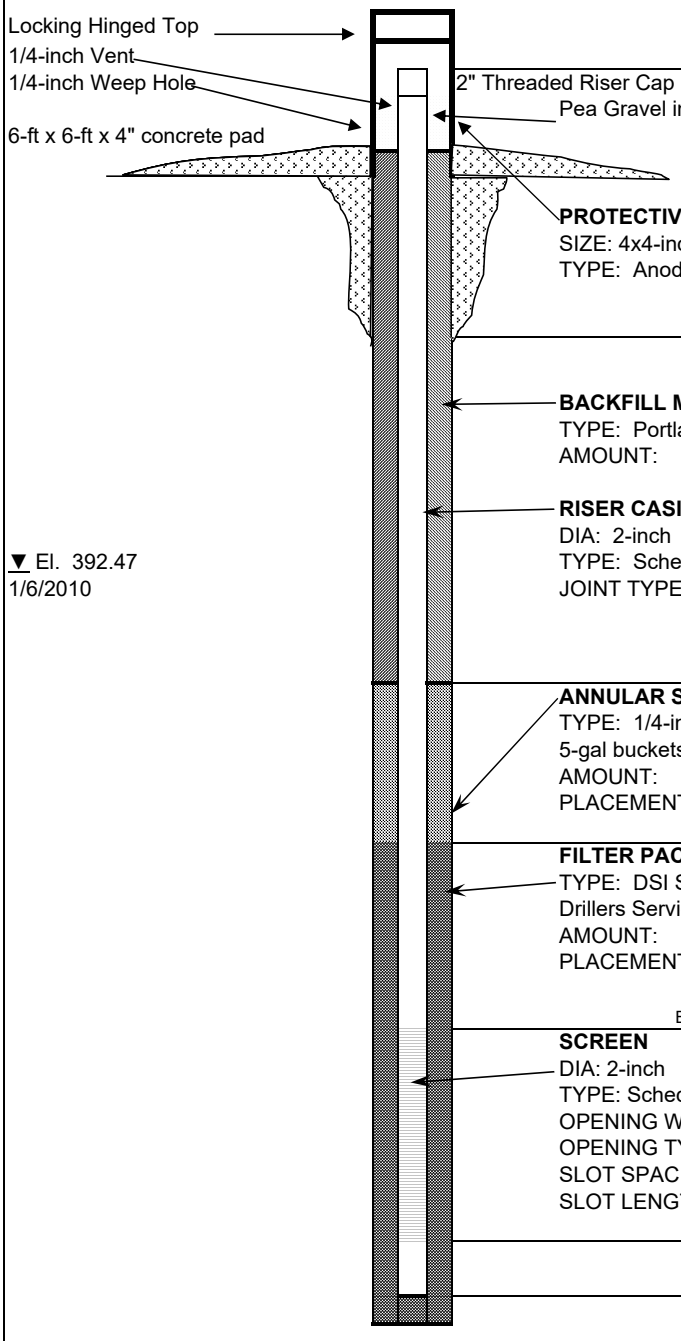
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Moist, silty SAND (SM); greenish black, white, yellow, and brown; fine grained; micaceous *(Con't)*	375.3					
		Bottom of borehole at 25.0 feet.						

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Ranger	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWC-14
DATE CONSTRUCTED: 11/4/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.40	403.6
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	400.2
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 4.05 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	10.07	390.13
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	12.17	388.03
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	14.07	386.13
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	24.07	376.13
BOTTOM OF CASING	24.13	376.07

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 11/4/2009 **COMPLETED** 11/4/2009 **SURF. ELEV.** 411.7 **COORDINATES:** N 1120009.40 E 2409282.43
CONTRACTOR Ranger **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY Ranger **LOGGED BY** W. Clanton **CHECKED BY** R. Tinsley **ANGLE** **BEARING**
BORING DEPTH 25 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) to silty SAND (SM)						
5								
10								
15								
20		Moist, SILT (ML) with silty SAND (SM); yellowish orange with black mottles; fine grained; micaceous		SS -1	18.5-20.0	10-10-15 (25)		
			389.8					
		Moist, silty SAND (SM); mottled light brown, orange, and black; fine grained; micaceous						

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

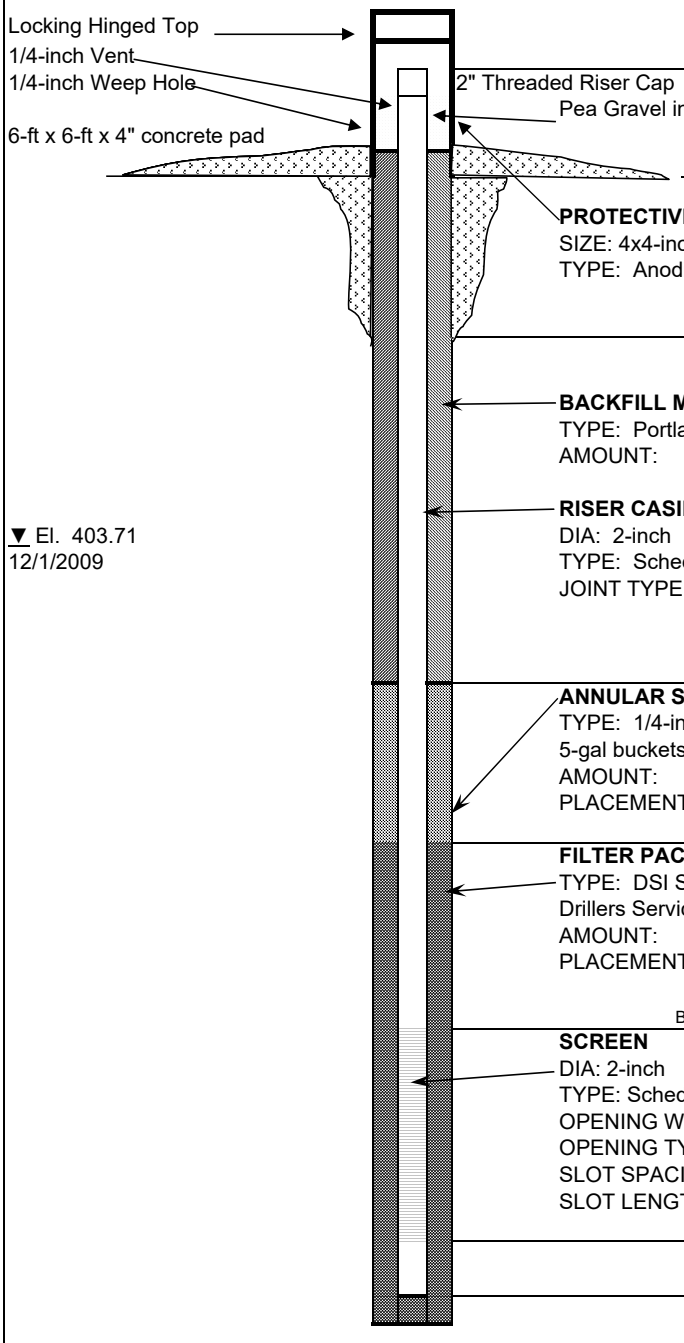
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
25		Moist, silty SAND (SM); mottled light brown, orange, and black; fine grained; micaceous *(Con't)*	386.8	SS -2	23.5-25.0	6-9-18 (27)		
		Bottom of borehole at 25.0 feet.						

30
35
40
45
50

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL NAME
CCB Storage Facility	DRILLER: Ranger	
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: W. Clanton	DRILLING METHODS: HSA	GWA-15
DATE CONSTRUCT 11/4/2009		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.31	415.01
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	411.7
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 4.5 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	11.69	400.01
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	13.94	397.76
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	16.19	395.51
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	26.19	385.51
BOTTOM OF CASING	26.18	385.52

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/13/2009 **COMPLETED** 10/13/2009 **SURF. ELEV.** 440.9 **COORDINATES:** N 1120248.68 E 2409579.75
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY P. Smith **LOGGED BY** D. Brooks **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 55 ft. **GROUND WATER DEPTH: DURING** 35 ft. **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) to silty SAND (SM)						
5								
10								
15								
			421.2					
20		Silty SAND (SM); mottled orange and black; fine grained; micaceous		SS -1	19.5-21.0	3-3-4 (7)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty SAND (SM); mottled orange and black; fine grained; micaceous *(Con't)*						
25				SS -2	24.5-26.0	3-3-6 (9)		
30		Silty SAND (SM) with trace amounts of light brown CLAY (CL); mottled orange, light yellowish brown and black; fine grained; micaceous		SS -3	29.5-31.0	2-3-4 (7)		
			406.2					
35		▽ Clayey silty SAND (SC-SM); mottled light brown, black and white; fine grained; micaceous; pyrite present; gneissic saprolite		SS -4	34.5-36.0	3-3-4 (7)		
			401.2					
40		SAND (SP); mottled black, white and orange; saprolite		SS -5	39.5-41.0	6-9-11 (20)		
45				SS -6	44.5-46.0	12-15-19 (34)		
50		SAND (SP); mottled black, white and orange; saprolite; harder than above		SS -7	49.5-51.0	23-36-43 (79)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SAND (SP); mottled black, white and orange; saprolite *(Con't)*						
55			385.7	SS -8	54.5-54.8	50/4" (100+)		auger refusal.
		Bottom of borehole at 55.0 feet.						
60								
65								
70								
75								

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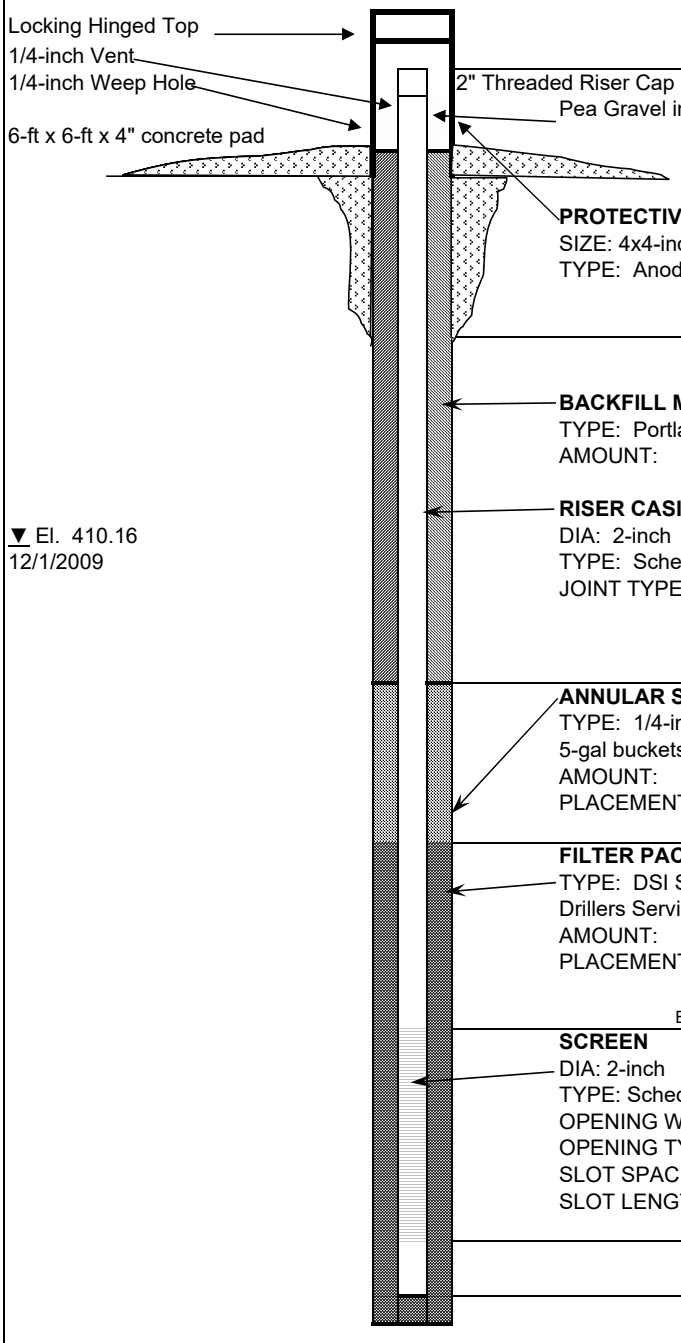
WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Phillip Smith	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: D. Brooks	DRILLING METHODS: HSA	GWA-16
DATE CONSTRUCTED: 10/13/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.34	444.24
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	440.9
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 18 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	39.70	401.20
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	42.20	398.70
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	44.20	396.70
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	54.20	386.70
BOTTOM OF CASING	54.48	386.42

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 9/28/2009 **COMPLETED** 9/28/2009 **SURF. ELEV.** 442.8 **COORDINATES:** N 1120210.57 E 2409946.73
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550X **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** J. Jordan **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 43.3 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Dark red, sandy LEAN CLAY (CL)						Auger cuttings used for soil classifications from 0-20 ft..
			439.2					
5		SILT (ML), yellowish red, micaceous, trace of fine sand						
10								
15								
20		Sandy, dry, yellowish brown, with black stringers		SS -1	19.5-21.0	2-3-4 (7)		

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

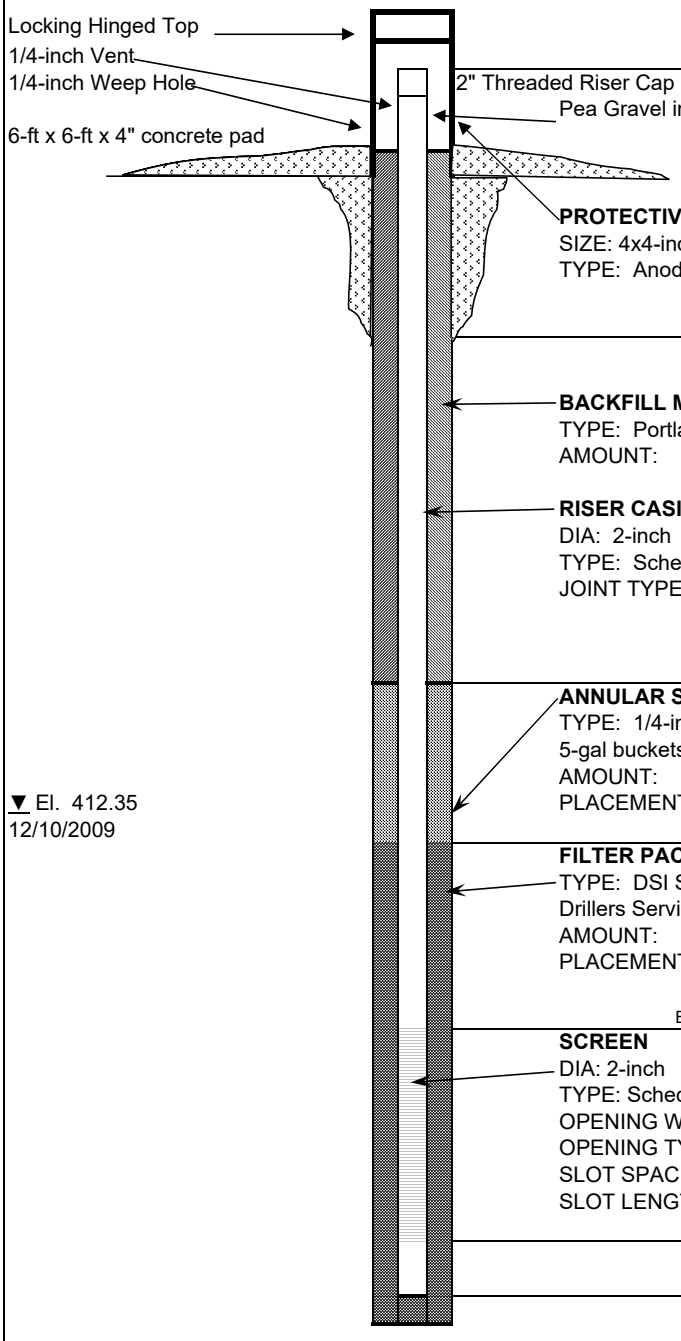
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		SILT (ML), yellowish red, micaceous, trace of fine sand *(Con't)*						
			418.2					
25		White to light olive brown, medium dense, SILTY SAND (SM), with relict structure and reddish black stringers		SS -2	24.5-26.0	7-11-10 (21)		
30		Very dense, moist		SS -3	29.5-31.0	17-28-34 (62)		
35		SAPROLITE		SS -4	34.5-34.8	50/4" (100+)		
40		Saturated		SS -5	39.5-39.8	50/4" (100+)		
		Auger refusal at 43.3 feet.	399.4					
		Bottom of borehole at 43.3 feet.						
45								
50								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Jordan	DRILLING METHODS: HSA	GWA-17
DATE CONSTRUCTED: 9/28/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.04	445.84
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	442.8
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 13.25 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	28.55	414.25
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	30.55	412.25
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	33.55	409.25
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	43.55	399.25
BOTTOM OF CASING	43.72	399.08

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 9/29/2009 **COMPLETED** 9/29/2009 **SURF. ELEV.** 436.3 **COORDINATES:** N 1119998.73 E 2410261.85
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550X **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** J. Jordan **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 59.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		LEAN CLAY (CL), silty, red, trace fine sand						Auger cuttings used for classifications from 0 -19.5 feet.
5		Grading silty, moist, yellowish red						
10		Strong brown						
15								
			408.8					
20		Firm, strong brown SILT (ML), with yellowish red layers, moist		SS -1	19.5-21.0	2-3-2 (5)		

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Firm, strong brown SILT (ML), with yellowish red layers, moist *(Con't)*						
			403.8					
25		Medium dense, reddish yellow SILTY SAND (SM), with weathered rock		SS -2	24.5-26.0	3-5-8 (13)		
30		Dark olive, white, and orange speckled SAPROLITE		SS -3	29.5-31.0	4-5-8 (13)		"Salt and pepper" appearance.
35		Dark olive and white		SS -4	34.5-36.0	5-6-5 (11)		
40				SS -5	39.5-41.0	7-8-10 (18)		
			383.8					
45		Alternating zones of olive, black, and white and zones of micaceous, strong brown SANDY SILT (ML) SAPROLITE, very moist		SS -6	44.5-46.0	3-5-9 (14)		
50		Gold, yellowish red, and dark olive, thinly layered		SS -7	49.5-51.0	6-16-9 (25)		Free water in rods.

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SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility

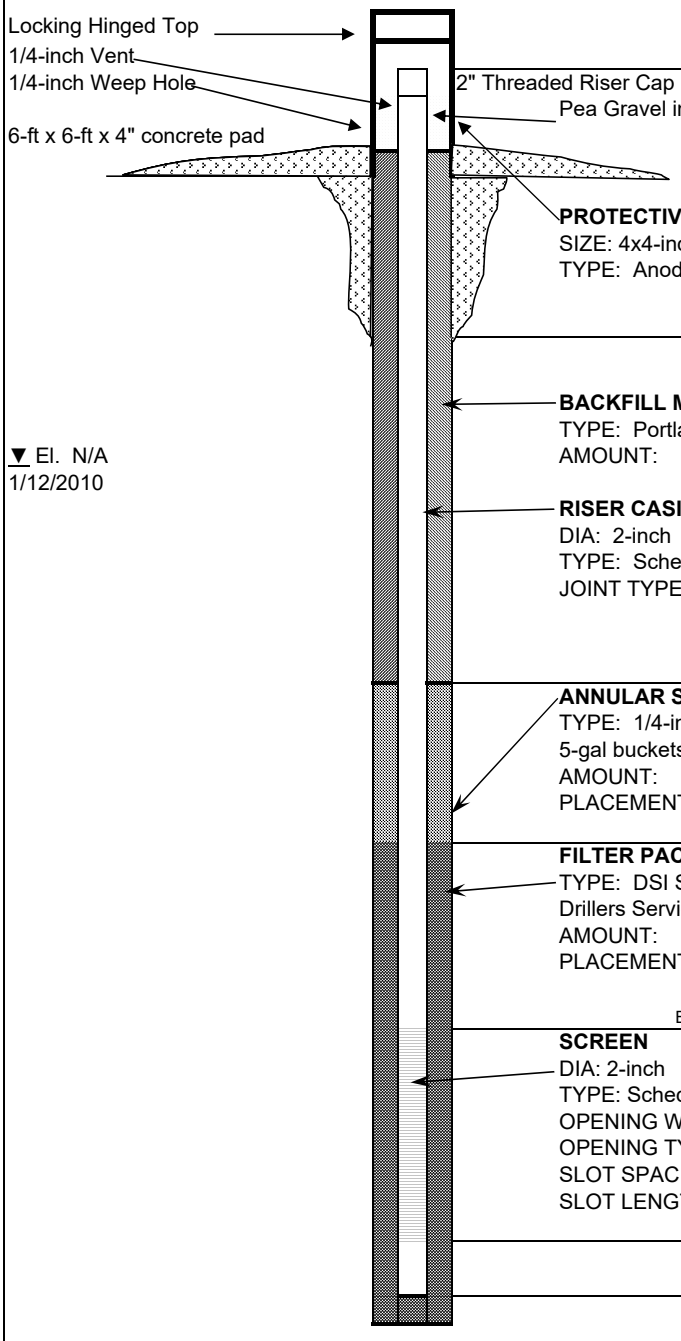
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		with white nodules of weathered calcite Alternating zones of olive, black, and white and zones of micaceous, strong brown SANDY SILT (ML) SAPROLITE, very moist *(Con't)*						
55				SS -8	54.5-56.0	12-17-21 (38)		
		Boring terminated at 61 feet.						
60			367.3	SS -9	59.5-61.0	19-30-48 (78)		
		Bottom of borehole at 59.5 feet.						
65								
70								
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Jordan	DRILLING METHODS: HSA	GWC-18
DATE CONSTRUCTED: 9/29/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.36	439.66
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	436.3
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 20 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	42.89	393.41
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	44.89	391.41
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	46.81	389.49
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	56.81	379.49
BOTTOM OF CASING	57.03	379.27

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/2/2009 **COMPLETED** 10/2/2009 **SURF. ELEV.** 426.3 **COORDINATES:** N 1119645.70 E 2410713.20
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** L. Millet **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 70 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) to silty SAND (SM)						
5								
10								
15								
			406.6					
20		Dry, silty SAND (SM); red with occassional white lenses and black mottles; very fine to fine grained; micaceous; friable		SS -1	19.5-21.0	2-3-2 (5)		

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Dry, silty SAND (SM); red with occassional white lenses and black mottles; very fine to fine grained; micaceous; friable *(Con't)*						
25				SS -2	24.5-26.0	3-2-3 (5)		
30				SS -3	29.5-31.0	4-4-6 (10)		
			391.6					
35		Dry, clayey SAND (SC); mottled green, black and light orangish brown; very fine to fine grained; micaceous; soft; gneissic saprolite		SS -4	34.5-36.0	4-5-7 (12)		
40		Dry, clayey SAND (SC); green, black and white with occassional dark orange mottling; very fine to fine grained; micaceous; soft; gneissic saprolite		SS -5	39.5-41.0	4-6-8 (14)		
45				SS -6	44.5-46.0	8-8-16 (24)		
50		Dry, clayey SAND (SC); white and dark tan; very fine to medium grained; micaceous; soft;		SS -7	49.5-51.0	18-25-25 (50)		

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

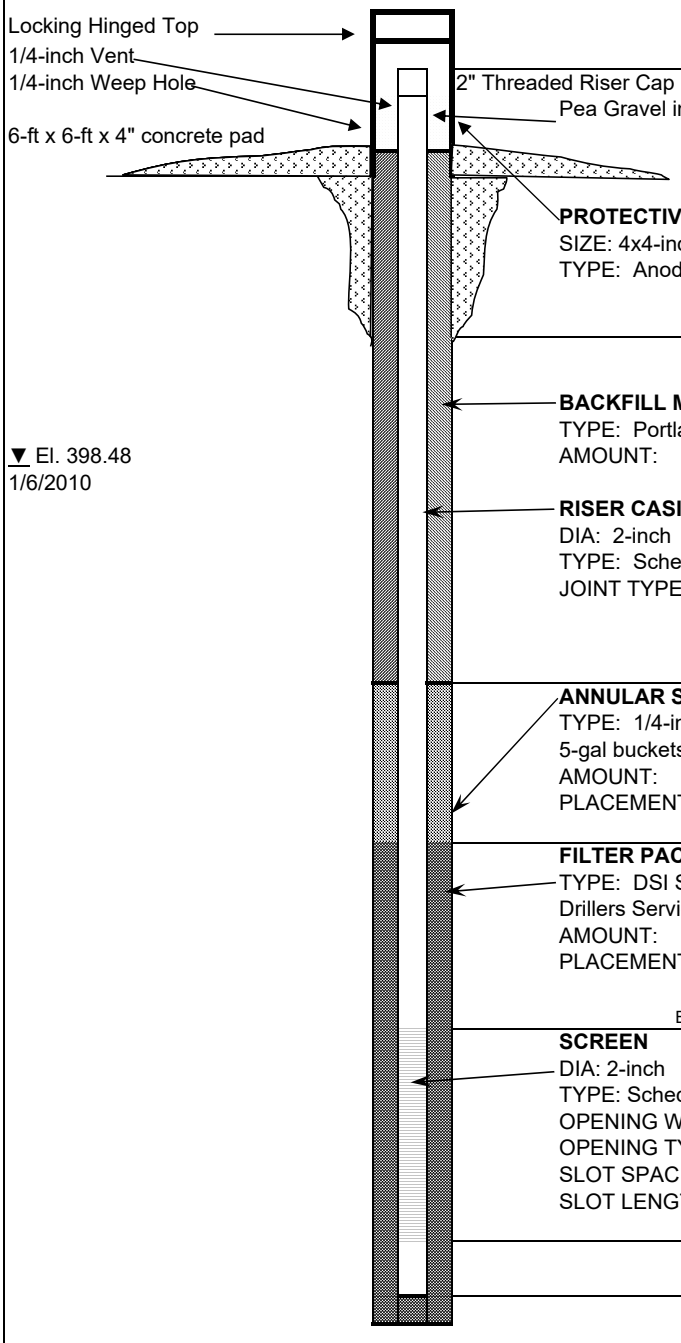
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		gneissic saprolite Dry, clayey SAND (SC); mottled green, black and light orangish brown; very fine to fine grained; micaceous; soft; gneissic saprolite *(Con't)*						
55		Dry, clayey SAND (SC); white and black with dark orange mottling; very fine to medium grained; micaceous		SS -8	54.5-56.0	21-35-49 (84)		
60				SS -9	59.5-59.8	50/4" (100+)		
			361.6					
65		Moist, sandy CLAY (CS); black and grey; sparse mica; soft		SS -10	64.5-64.6	50/1" (100+)		
			356.6					
70		Clayey SAND (SC); light brown and black with orange mottling; very fine to medium grained; micaceous	356.1	SS -11	69.5-69.7	50/2" (100+)		
		Bottom of borehole at 70.0 feet.						
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Millet	DRILLING METHODS: HSA	GWC-19
DATE CONSTRUCTED: 10/2/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.90	430.2
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	426.3
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 20.25 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	39.74	386.56
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	41.74	384.56
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	43.84	382.46
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	53.84	372.46
BOTTOM OF CASING	54.10	372.20

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DATE STARTED 10/6/2009 **COMPLETED** 10/6/2009 **SURF. ELEV.** 423.0 **COORDINATES:** N 1119950.51 E 2411195.38
CONTRACTOR SCS Field Services **EQUIPMENT** CME-550 **METHOD** Hollow Stem Auger
DRILLED BY S. Denty **LOGGED BY** L. Millet **CHECKED BY** R. Tinsley **ANGLE** _____ **BEARING** _____
BORING DEPTH 69.6 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) and silty SAND (SM)						
20		Dry, sandy SILT (MLS); orange with light brown and black mottles; friable		SS -1	19.5-21.0	4-5-6 (11)		

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy SILT (MLS) and silty SAND (SM) *(Con't)*						
25		Dry, sandy SILT (MLS); orange and light brown with black organics; friable; micaceous		SS -2	24.5-26.0	4-4-6 (10)		
			393.3					
30		Dry, silty SAND (SM); light orange and tan with occassional black mottles; friable; micaceous		SS -3	29.5-31.0	4-5-7 (12)		
			388.3					
35		Dry, clayey SAND (SC); black, green and light tan with occassional light orange mottling; very fine to fine grained; micaceous		SS -4	34.5-36.0	6-5-6 (11)		
40		Moist, clayey SAND (SC); black and white with black and orange mottling; very fine to fine grained; micaceous; gneissic saprolite		SS -5	39.5-41.0	6-7-9 (16)		
45		Moist, clayey SAND (SC); black and white with black and orange mottling; very fine to fine grained; micaceous; soft		SS -6	44.5-46.0	8-10-16 (26)		
			373.3					
50				SS -7	49.5-51.0	11-19-24 (43)		

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GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

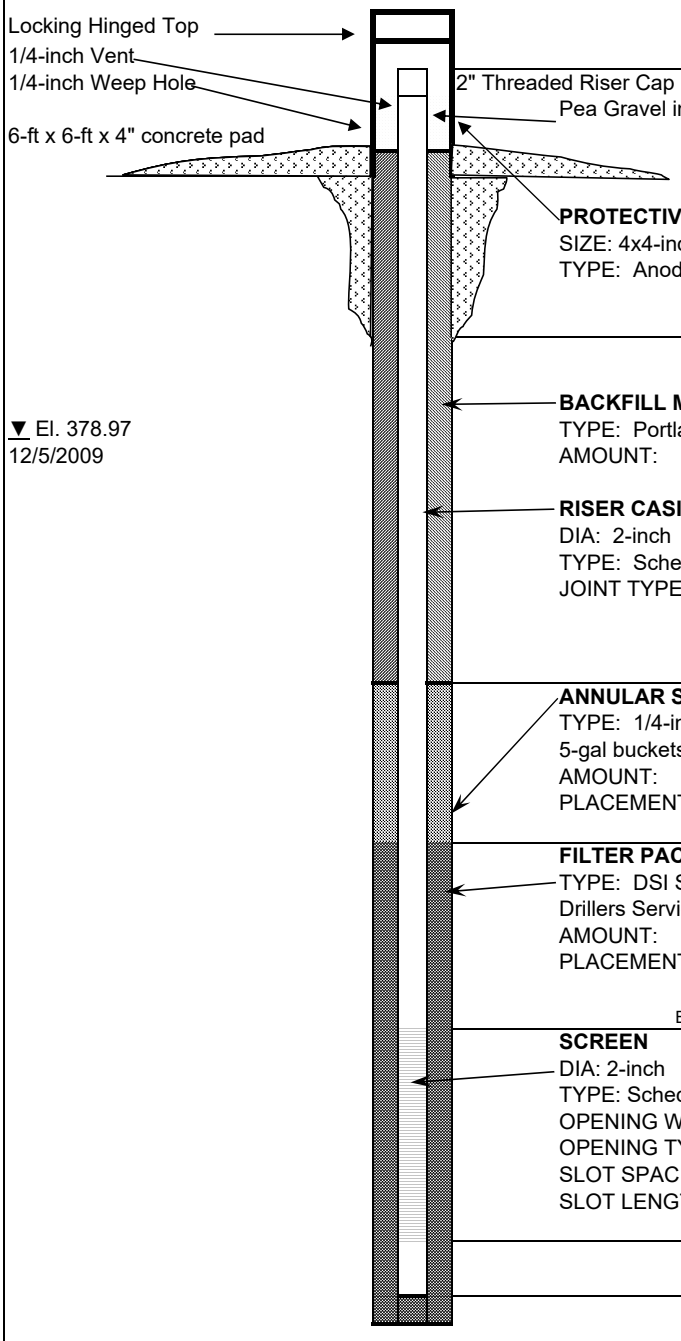
PROJECT Plant Scherer CCB Storage Facility
LOCATION Cell 1

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Moist, silty SAND (SM); brown and white striated with orange mottling; very fine to fine grained; micaceous *(Con't)*						
55		Wet, silty SAND (SM); black and white with dark brown mottling; very fine to fine grained; micaceous; gneissic saprolite		SS -8	54.5-56.0	19-18-20 (38)		
			363.3					
60		Wet, sandy SILT (MLS); black with light and dark orange mottling; micaceous		SS -9	59.5-61.0	34-45-48 (93)		
65		Wet, sandy SILT (MLS); black and white with occassional orange mottling; micaceous; garnets; gneissic saprolite		SS -10	64.5-66.0	15-20-19 (39)		
			353.3					
70		SLATE; gray	353.0	SS -11	69.5-69.7	50/2" (100+)		
		Bottom of borehole at 69.6 feet.						
75								

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 4/27/10 11:56 - T:\ESEE MAJOR PROJECTS\GINT SOFTWARE\SCHERER GYP.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: SCS, Inc.	WELL
CCB Storage Facility	DRILLER: Denty	NAME
LOCATION: Cell 1	RIG TYPE: CME 550	
LOGGER: Millet	DRILLING METHODS: HSA	GWC-20
DATE CONSTRUCTED: 10/6/09		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-3.30	426.3
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	423
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 15.3 cubic feet		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	55.10	367.90
ANNULAR SEAL TYPE: 1/4-inch coated bentonite pellets 5-gal buckets AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	57.03	365.97
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	59.13	363.87
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	69.13	353.87
BOTTOM OF CASING	69.40	353.60

APPENDIX A

PAC Ash Cell

Monitoring Well Logs and Construction Diagrams

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-21
Sheet 1 of 1

SITE: **Georgia Power Company Plant Scherer** HOLE DEPTH: 17 SURF.ELEV.: 419.70

LOCATION: PAC/Ash Cell COORDINATES N: 1120675.73 E: 2409462.7

ANGLE: 0 BEARING: 0 CONTRACTOR: Boart Longyear DRILL NO.: BL100C

DRILLING METHOD: Sonic NO. SAMPLES: Continuous NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: ELEV.: TIME AFTER COMP.: DATE TAKEN:

TYPE GROUT: QUANTITY: MIX: DRILLING START DATE: 6/29/2010

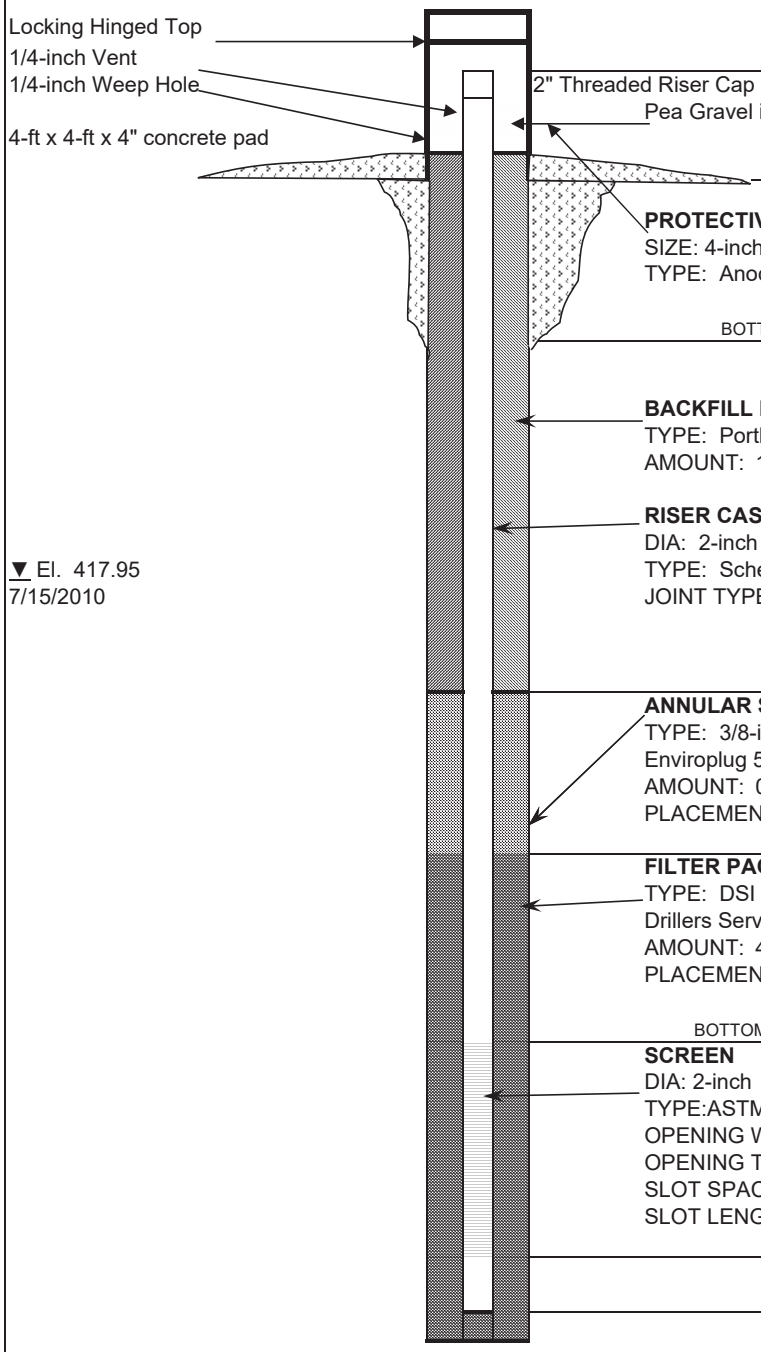
DRILLER: S. Gautney RECORDER: D. Brooks APPROVED: DRILLING COMP. DATE: 6/29/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	419.70	Sandy CLAY							
1	418.70								
2	417.70								
3	416.70								
4	415.70								
5	414.70	Clayey SAND							
6	413.70								
7	412.70								
8	411.70								
9	410.70								
10	409.70	Weathered rock							
11	408.70								
12	407.70								
13	406.70								
14	405.70								
15	404.70								
16	403.70								
17	402.70								
18	401.70	17' - Bottom of boring							
19	400.70								
20	399.70								
21	398.70								
22	397.70								
23	396.70								
24	395.70								

Form GS9901 8-19-2008

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: D. Brooks	DRILLING METHODS: Sonic	GWA-21
DATE CONSTRUCTED: 6/29/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.88	422.58
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	419.7
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	3.66	416.04
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	5.66	414.04
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	7.66	412.04
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	17.66	402.04
BOTTOM OF CASING	17.82	401.88

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-22
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** HOLE DEPTH: 40 SURF.ELEV.: 442.00

LOCATION: PAC/Ash Cell COORDINATES N: 1120962.12 E: 2409473.22

ANGLE: 0 BEARING: 0 CONTRACTOR: Boart Longyear DRILL NO.: BL100C

DRILLING METHOD: Sonic NO. SAMPLES: Continuous NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: ELEV.: TIME AFTER COMP.: DATE TAKEN:

TYPE GROUT: QUANTITY: MIX: DRILLING START DATE: 6/29/2010

DRILLER: S. Gautney RECORDER: D. Brooks APPROVED: DRILLING COMP. DATE: 6/30/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	442.00	Reddish orange sandy SILT, dry, micaceous							
1	441.00								
2	440.00								
3	439.00								
4	438.00								
5	437.00								
6	436.00								
7	435.00								
8	434.00								
9	433.00								
10	432.00	-Same as above							
11	431.00								
12	430.00	Orange, tan, and white clayey SILT, dry, micaceous							
13	429.00								
14	428.00								
15	427.00								
16	426.00								
17	425.00								
18	424.00								
19	423.00								
20	422.00	-Same as above							
21	421.00								
22	420.00								
23	419.00								
24	418.00								

SOUTHERN COMPANY
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-22

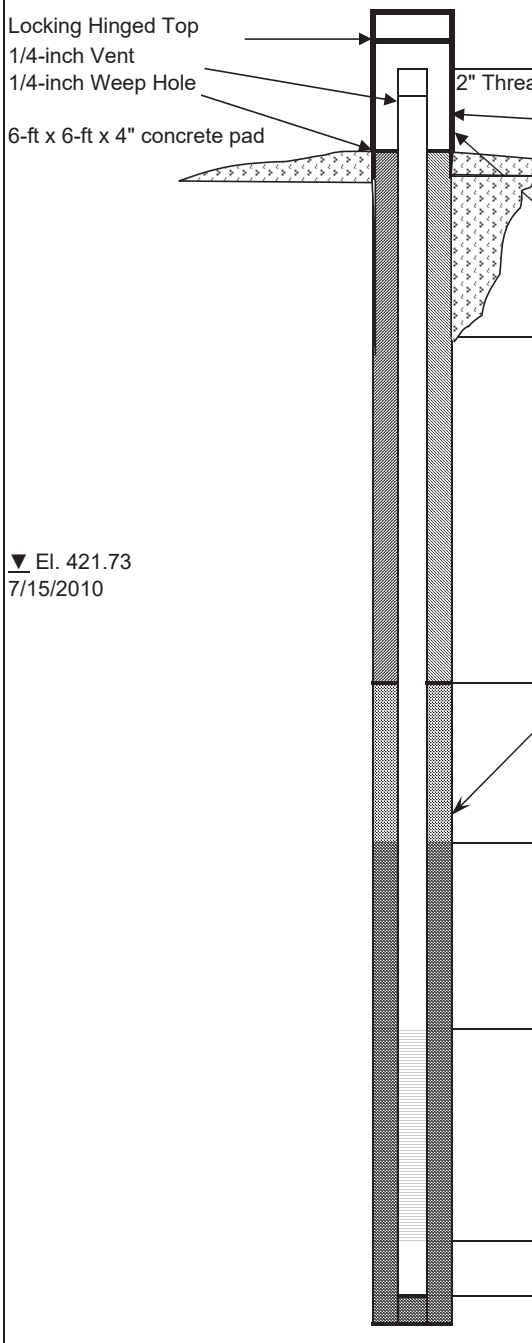
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **40** SURF.ELEV. 442

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	417.00	SAPROLITIC GNEISS, moist							
26	416.00								
27	415.00								
28	414.00								
29	413.00								
30	412.00								
31	411.00								
32	410.00								
33	409.00	Intact GNEISS, fractured with iron staining							
34	408.00								
35	407.00								
36	406.00								
37	405.00								
38	404.00								
39	403.00								
40	402.00								
41	401.00	40' - Bottom of boring							
42	400.00								
43	399.00								
44	398.00								
45	397.00								
46	396.00								
47	395.00								
48	394.00								
49	393.00								
50	392.00								
51	391.00								
52	390.00								
53	389.00								
54	388.00								
55	387.00								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: D. Brooks	DRILLING METHODS: Sonic	GWA-22
DATE CONSTRUCTED: 6/30/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.50	444.5
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	442.0
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	25.97	416.03
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	27.97	414.03
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	29.72	412.28
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	39.72	402.28
BOTTOM OF CASING	40.00	402.00

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-29
Sheet 1 of 1

SITE **Georgia Power Company Plant Scherer** HOLE DEPTH 25 SURF.ELEV. 396.90

LOCATION PAC/Ash Cell COORDINATES N 1119875.58 E 2408717.95

ANGLE 0 BEARING 0 CONTRACTOR Boart Longyear DRILL NO. BL100C

DRILLING METHOD Sonic NO. SAMPLES Continuous NO. U.D. SAMPLES 0

WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN

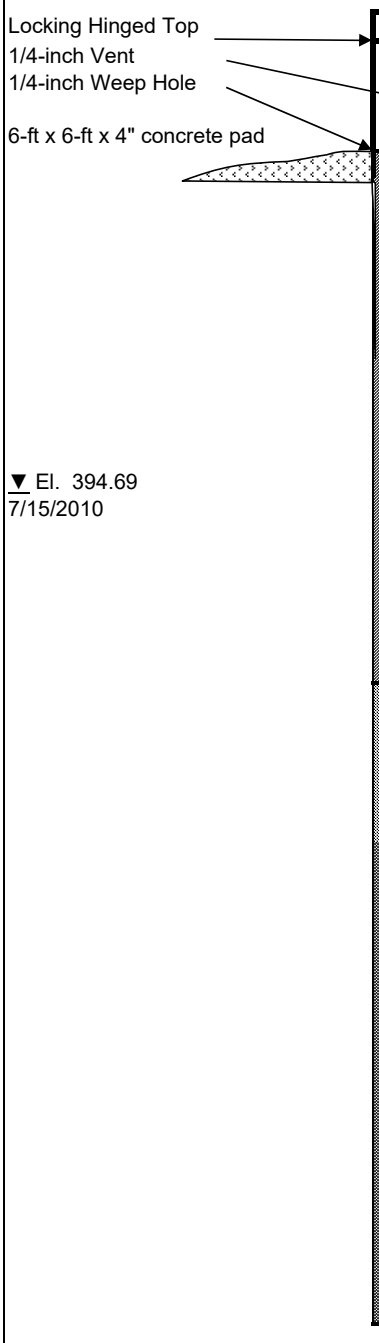
TYPE GROUT QUANTITY MIX DRILLING START DATE 6/28/2010

DRILLER S. Gautney RECORDER D. Brooks APPROVED DRILLING COMP. DATE 6/28/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	396.90	Orangish-red clayey SILT, dry, micaceous							
1	395.90								
2	394.90								
3	393.90								
4	392.90								
5	391.90								
6	390.90								
7	389.90								
8	388.90								
9	387.90								
10	386.90	-Same as above, tan and orange							
11	385.90								
12	384.90								
13	383.90								
14	382.90								
15	381.90								
16	380.90								
17	379.90								
18	378.90	Gray and white SAPROLITE, gneissic, wet, micaceous							
19	377.90								
20	376.90								
21	375.90								
22	374.90								
23	373.90								
24	372.90								
25	371.90	25' - Bottom of boring							

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: D. Brooks	DRILLING METHODS: Sonic	GWC-29
DATE CONSTRUCTED: 6/28/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.74	399.64
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	396.9
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	10.35	386.55
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	12.35	384.55
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	14.10	382.80
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	24.10	372.80
BOTTOM OF CASING	24.36	372.54

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-45
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** | HOLE DEPTH: 33 | SURF.ELEV.: 448.30

LOCATION: PAC/Ash Cell | COORDINATES N: 1120669.03 | E: 2407889.56

ANGLE: 0 | BEARING: 0 | CONTRACTOR: Boart Longyear | DRILL NO.: BL100C

DRILLING METHOD: Sonic | NO. SAMPLES: Continuous | NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:

TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 6/23/2010

DRILLER: S. Gautney | RECORDER: L. Millet | APPROVED: | DRILLING COMP. DATE: 6/23/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	448.30	Dark red silty CLAY, dry, hard, occasional black mottling, mica							
1	447.30								
2	446.30								
3	445.30								
4	444.30								
5	443.30								
6	442.30								
7	441.30								
8	440.30								
9	439.30								
10	438.30	Red, orange, and tan clayey SILT, black and white mottling, mica							
11	437.30								
12	436.30								
13	435.30								
14	434.30								
15	433.30								
16	432.30								
17	431.30								
18	430.30								
19	429.30								
20	428.30	Brown, tan, green, and orange silty SAND, saturated, with white mottling, high mica content							
21	427.30								
22	426.30								
23	425.30								
24	424.30								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-45

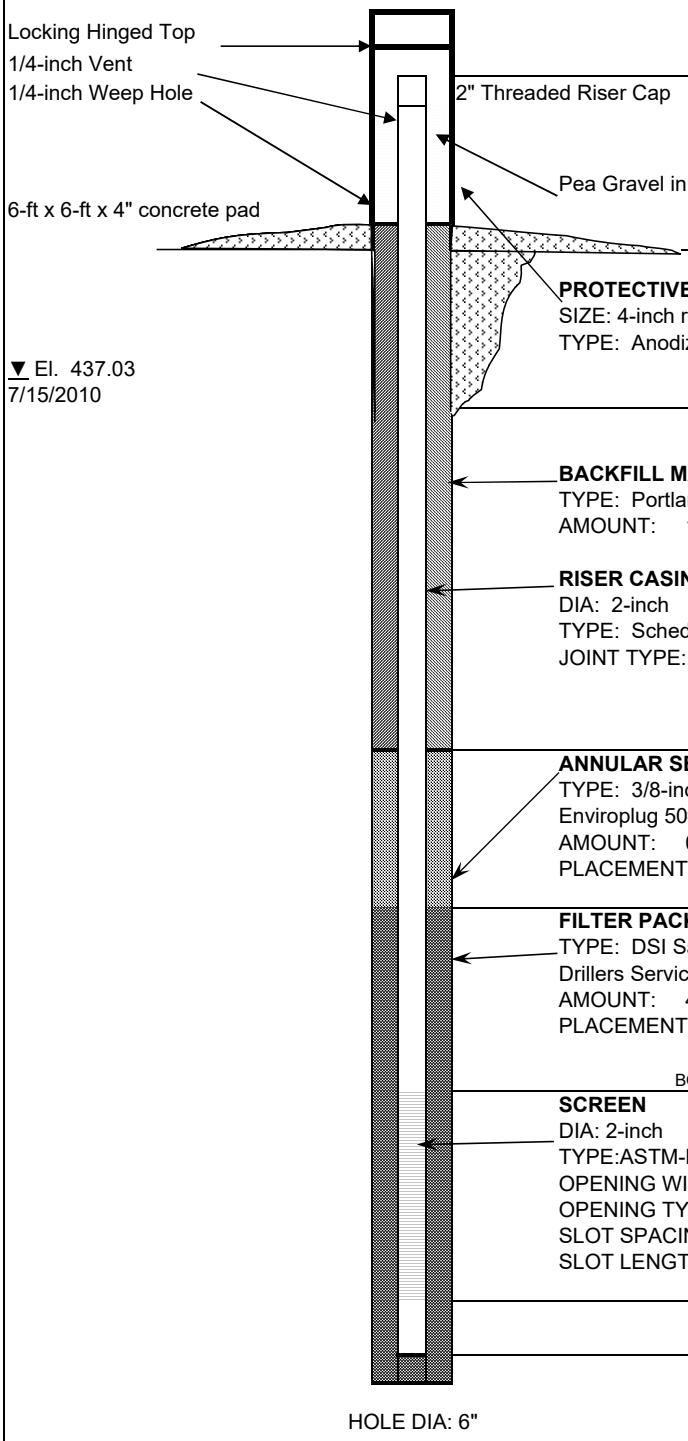
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **33** SURF.ELEV. 448.3

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	423.30								
26	422.30								
27	421.30								
28	420.30								
29	419.30								
30	418.30	Green and white SAND, wet, orange mottling, mica							
31	417.30								
32	416.30								
33	415.30								
34	414.30	33' - Bottom of boring							
35	413.30								
36	412.30								
37	411.30								
38	410.30								
39	409.30								
40	408.30								
41	407.30								
42	406.30								
43	405.30								
44	404.30								
45	403.30								
46	402.30								
47	401.30								
48	400.30								
49	399.30								
50	398.30								
51	397.30								
52	396.30								
53	395.30								
54	394.30								
55	393.30								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWA-45
DATE CONSTRUCTED: 6/23/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.78	451.08
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	448.3
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	18.29	430.01
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	20.29	428.01
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	22.29	426.01
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	32.29	416.01
BOTTOM OF CASING	32.72	415.58

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-46
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** HOLE DEPTH: 43.5 SURF.ELEV.: 458.30

LOCATION: PAC/Ash Cell COORDINATES N: 1120783.23 E: 2408235.69

ANGLE: 0 BEARING: 0 CONTRACTOR: Boart Longyear DRILL NO.: BL100C

DRILLING METHOD: Sonic NO. SAMPLES: Continuous NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: ELEV.: TIME AFTER COMP.: DATE TAKEN:

TYPE GROUT: QUANTITY: MIX: DRILLING START DATE: 6/23/2010

DRILLER: S. Gautney RECORDER: L. Millet APPROVED: DRILLING COMP. DATE: 6/23/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	458.30	Red silty CLAY, dry, hard, with occasional black mottling, mica							
1	457.30								
2	456.30								
3	455.30								
4	454.30								
5	453.30								
6	452.30								
7	451.30								
8	450.30								
9	449.30								
10	448.30	Orange clayey SILT, wet, with mica							
11	447.30								
12	446.30	Orange and pink silty CLAY, dry, with black and white mottling, trace mica							
13	445.30								
14	444.30								
15	443.30								
16	442.30								
17	441.30								
18	440.30								
19	439.30								
20	438.30	Tan sandy CLAY, wet, with black mottling, trace mica							
21	437.30								
22	436.30								
23	435.30								
24	434.30								

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DRILLING LOG
GEOLOGICAL SERVICES

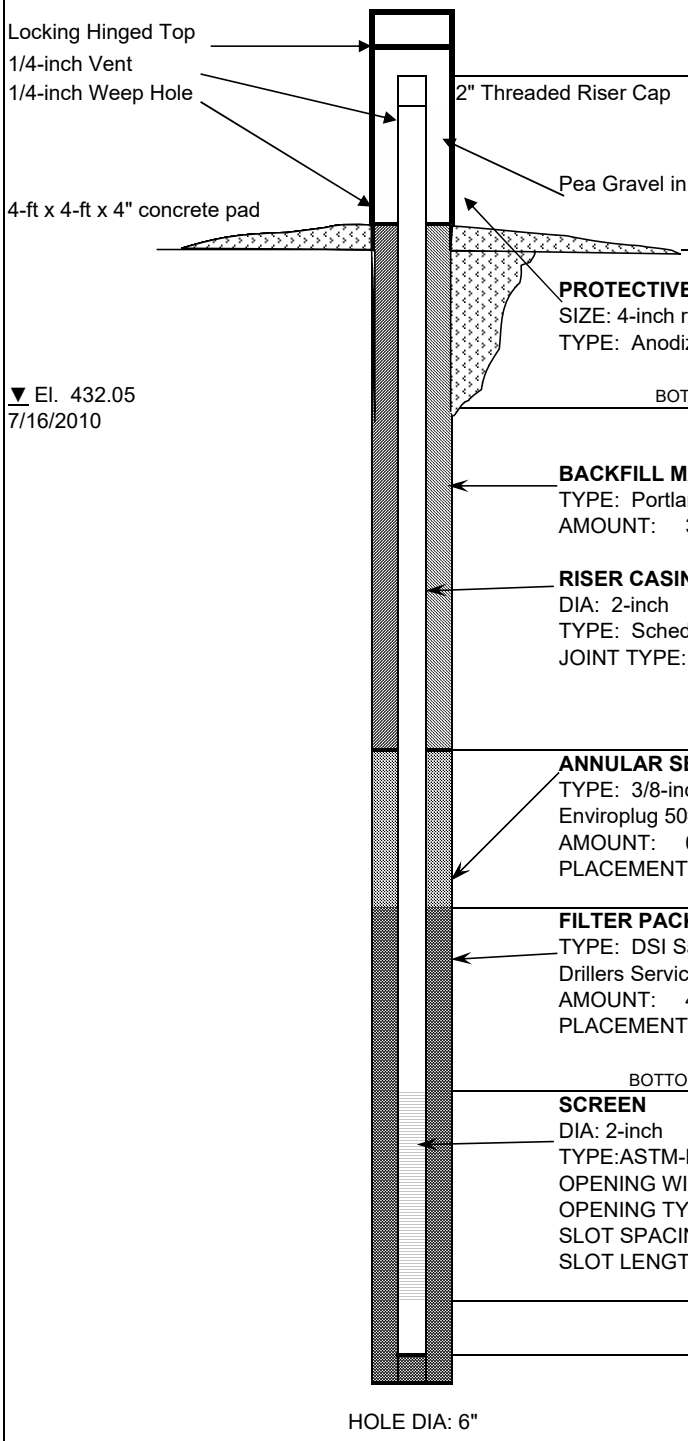
Hole No. GWA-46
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **43.5** SURF.ELEV. 458.3

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	433.30	Tan silty CLAY, wet, with heavy black mottling, trace mica							
26	432.30								
27	431.30								
28	430.30								
29	429.30								
30	428.30	Brown and orange silty SAND, wet, with black and white mottling							
31	427.30								
32	426.30								
33	425.30								
34	424.30								
35	423.30								
36	422.30								
37	421.30	Green and white SAND, wet, medium to coarse grained, with mica							
38	420.30								
39	419.30								
40	418.30	Green and brown sandy SILT, wet, with mica, clay							
41	417.30								
42	416.30								
43	415.30								
44	414.30	43.5' - Bottom of boring							
45	413.30								
46	412.30								
47	411.30								
48	410.30								
49	409.30								
50	408.30								
51	407.30								
52	406.30								
53	405.30								
54	404.30								
55	403.30								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWA-46
DATE CONSTRUCTED: 6/23/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.83	461.13
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	458.3
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 36 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	29.94	428.36
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	31.94	426.36
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	33.94	424.36
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	43.94	414.36
BOTTOM OF CASING	44.17	414.13

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-47
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** | HOLE DEPTH: 55 | SURF.ELEV.: 462.9
LOCATION: PAC/Ash Cell | COORDINATES N: 1120862.63 | E: 2408585.01
ANGLE: 0 | BEARING: 0 | CONTRACTOR: Boart Longyear | DRILL NO.: BL100C
DRILLING METHOD: Sonic | NO. SAMPLES: Continuous | NO. U.D. SAMPLES: 0
WATER TABLE DEPTH: | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 6/22/2010
DRILLER: S. Gautney | RECORDER: L. Millet | APPROVED: | DRILLING COMP. DATE: 6/22/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	462.90	Dark red silty CLAY, dry, hard, trace mica							
1	461.90								
2	460.90								
3	459.90								
4	458.90								
5	457.90								
6	456.90								
7	455.90								
8	454.90								
9	453.90								
10	452.90	Orange, tan, and pink sandy SILT, dry, with clay, mica							
11	451.90								
12	450.90								
13	449.90	Orange and white sandy CLAY, dry, with mica, pink and black mottling							
14	448.90								
15	447.90								
16	446.90	Orange and white sandy CLAY, dry, trace mica, dark brown and pink mottling							
17	445.90								
18	444.90								
19	443.90								
20	442.90								
21	441.90								
22	440.90								
23	439.90								
24	438.90								

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DRILLING LOG
GEOLOGICAL SERVICES

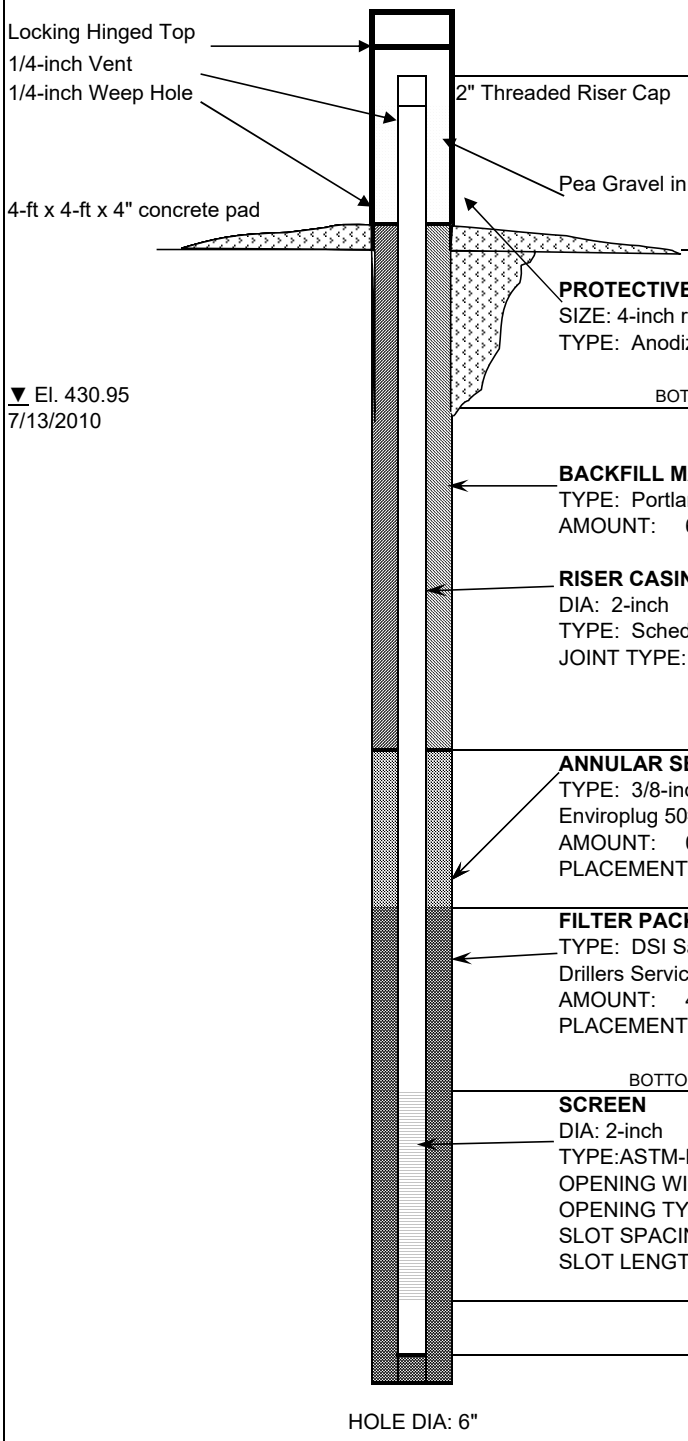
Hole No. GWA-47
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **55** SURF.ELEV. 462.9

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	437.90	-As above with black mottling, high mica content							
26	436.90								
27	435.90								
28	434.90								
29	433.90								
30	432.90	Tan sandy SILT, wet, loose, with clay							
31	431.90								
32	430.90								
33	429.90	Green and white SAPROLITIC GNEISS, with black and orange mottling, mica							
34	428.90								
35	427.90								
36	426.90								
37	425.90								
38	424.90								
39	423.90								
40	422.90	Gray and white SAPROLITIC GNEISS, wet, with occasional orange mottling, mica							
41	421.90								
42	420.90								
43	419.90								
44	418.90								
45	417.90								
46	416.90								
47	415.90								
48	414.90								
49	413.90								
50	412.90	Weathered black and white GNEISS, dry							
51	411.90								
52	410.90								
53	409.90								
54	408.90								
55	407.90								
		55' - Bottom of boring							

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWA-47
DATE CONSTRUCTED: 6/22/10		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.87	465.77
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	462.9
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 60 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	37.16	425.74
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	39.16	423.74
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	41.16	421.74
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	51.16	411.74
BOTTOM OF CASING	51.33	411.57

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-48
Sheet 1 of 3

SITE: **Georgia Power Company Plant Scherer** HOLE DEPTH: 72 SURF.ELEV.: 458.8

LOCATION: PAC/Ash Cell COORDINATES N: 1120953.42 E: 2408939.48

ANGLE: 0 BEARING: 0 CONTRACTOR: Boart Longyear DRILL NO.: BL100C

DRILLING METHOD: Sonic NO. SAMPLES: Continuous NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: ELEV.: TIME AFTER COMP.: DATE TAKEN:

TYPE GROUT: QUANTITY: MIX: DRILLING START DATE: 6/21/2010

DRILLER: S. Gautney RECORDER: L. Millet APPROVED: DRILLING COMP. DATE: 6/22/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	458.80	Dark red silty CLAY, dry, hard, trace mica							
1	457.80								
2	456.80								
3	455.80								
4	454.80								
5	453.80	Black and white GNEISS							
6	452.80								
7	451.80	Dark orange and red silty CLAY, dry, hard, black mottling trace mica							
8	450.80								
9	449.80								
10	448.80								
11	447.80	Orange and black silty CLAY, dry, trace mica							
12	446.80								
13	445.80								
14	444.80								
15	443.80								
16	442.80								
17	441.80								
18	440.80	Gneiss boulder, about 6"							
19	439.80	Orange sandy CLAY, dry, loose, trace mica							
20	438.80								
21	437.80								
22	436.80								
23	435.80								
24	434.80								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-48
Sheet 2 of 3

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **72** SURF.ELEV. 458.8

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	433.80	Orange sandy SILT, dry, loose with black, pink and white mottling, trace mica							
26	432.80								
27	431.80								
28	430.80								
29	429.80								
30	428.80								
31	427.80	Orange silty CLAY, moist, trace mica with black and tan mottling							
32	426.80								
33	425.80								
34	424.80								
35	423.80	Green, black and white saprolitic GNEISS							
36	422.80								
37	421.80								
38	420.80								
39	419.80								
40	418.80								
41	417.80	Light green and white relict GNEISS, high clay content, m							
42	416.80								
43	415.80								
44	414.80	-relict GNEISS							
45	413.80								
46	412.80								
47	411.80								
48	410.80	Dark green and white weathered GNEISS with orange mottling, dry							
49	409.80								
50	408.80	Black, white and green weathered GNEISS, dry							
51	407.80								
52	406.80								
53	405.80								
54	404.80								
55	403.80								
56	402.73								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-48

Sheet 3 of 3

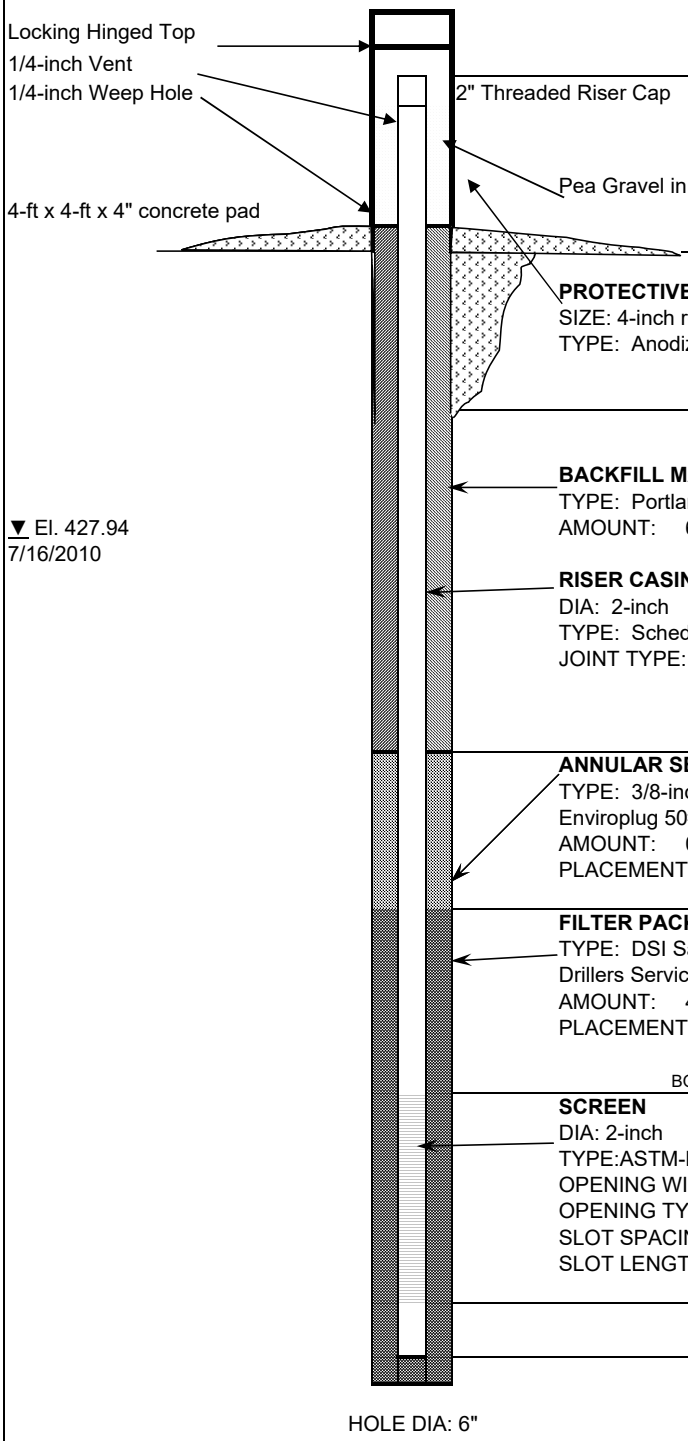
SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **72** SURF.ELEV. 458.8

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
57	401.80								
58	400.80								
59	399.80								
69	389.80								
61	397.80	Dark gray green clayey SILT, dry, hard, with mica, trace sand							
62	396.80								
63	395.80								
64	394.80								
65	393.80	Dark green gray clayey SAND, wet, very fine to fine-grained							
66	392.80								
67	391.80								
68	390.80	Intact black and white GNEISS							
69	389.80								
70	388.80								
71	387.80								
72	386.80								
		72' - Bottom of boring							

Form GS9901 8-19-2008

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWA-48
DATE CONSTRUCTED: 6/22/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.93	461.73
2" Threaded Riser Cap		
Pea Gravel in annular space		
GROUND SURFACE	0.00	458.8
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 64 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	47.11	411.69
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	49.11	409.69
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	51.11	407.69
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	61.11	397.69
BOTTOM OF CASING	61.22	397.58

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-49
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** | HOLE DEPTH: 37 | SURF.ELEV.: 429.9
LOCATION: PAC/Ash Cell | COORDINATES N: 1121030.08 | E: 2409288.38
ANGLE: 0 | BEARING: 0 | CONTRACTOR: Boart Longyear | DRILL NO.: BL100C
DRILLING METHOD: Sonic | NO. SAMPLES: Continuous | NO. U.D. SAMPLES: 0
WATER TABLE DEPTH: | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 6/21/2010
DRILLER: S. Gautney | RECORDER: L. Millet | APPROVED: | DRILLING COMP. DATE: 6/21/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	429.90	Orange and reddish orange silty CLAY, with mica, black organics							
1	428.90								
2	427.90								
3	426.90								
4	425.90								
5	424.90								
6	423.90	-As above with black mottling and increasing mica							
7	422.90								
8	421.90								
9	420.90	-As above with light green mottling and increasing mica							
10	419.90	Tan and black silty CLAY, high mica content, with dark orange mottling							
11	418.90								
12	417.90								
13	416.90								
14	415.90	-Pink, orange and white as above							
15	414.90								
16	413.90								
17	412.90	-As above with black mottling, moist							
18	411.90								
19	410.90	Orange and white sandy CLAY, moist, with pink and black mottling							
20	409.90								
21	408.90	Dark orange and white sandy CLAY, moist, with mica, black mottling							
22	407.90								
23	406.90								
24	405.90								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWA-49

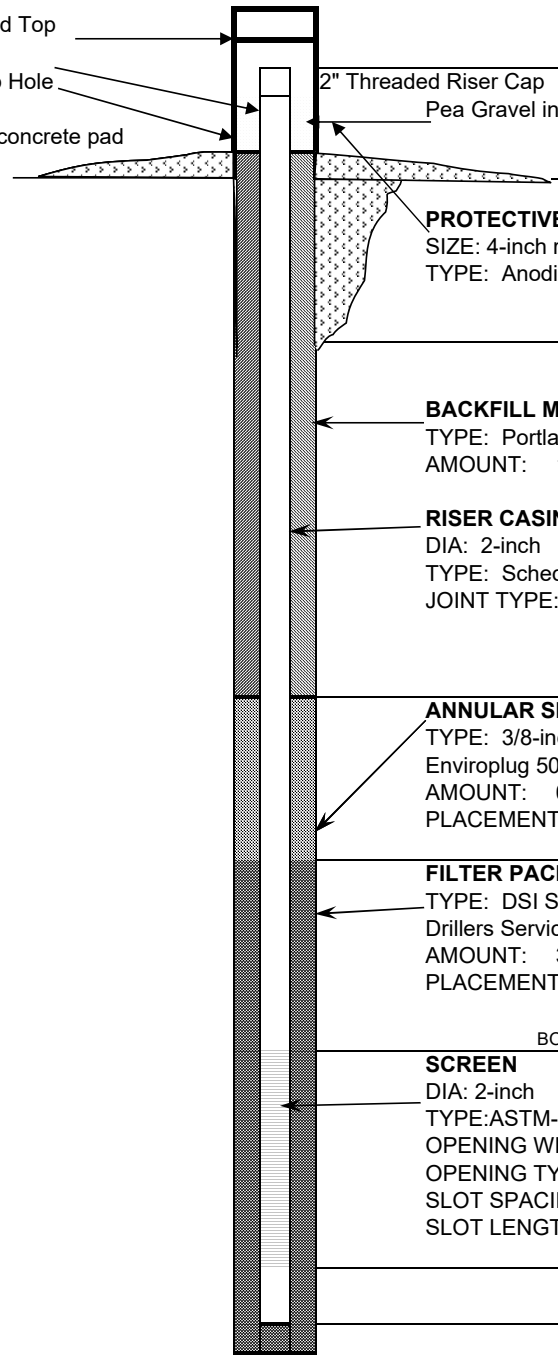
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **37** SURF.ELEV. 429.9

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	404.90	Dark green, black, and white SAPROLITIC GNEISS, with orange mottling, some mice							
26	403.90								
27	402.90								
28	401.90								
29	400.90								
30	399.90								
31	398.90	Dark green, black, and white clayey SAND, saturated, loose, medium to coarse grained							
32	397.90								
33	396.90	Dark green, black, and white SAPROLITIC GNEISS, dry							
34	395.90								
35	394.90								
36	393.90								
37	392.90								
38	391.90	37' - Bottom of boring							
39	390.90								
40	389.90								
41	388.90								
42	387.90								
43	386.90								
44	385.90								
45	384.90								
46	383.90								
47	382.90								
48	381.90								
49	380.90								
50	379.90								
51	378.90								
52	377.90								
53	376.90								
54	375.90								
55	374.90								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWA-49
DATE CONSTRUCTED: 6/21/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.98	432.88
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	429.9
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 10 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	24.05	405.85
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.75 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	26.05	403.85
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 3.5 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	28.05	401.85
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	38.05	391.85
BOTTOM OF CASING	38.02	391.88

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-50
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** | HOLE DEPTH: 35 | SURF.ELEV.: 404.3
LOCATION: PAC/Ash Cell | COORDINATES N: 1119917.51 | E: 2408956.1
ANGLE: 0 | BEARING: 0 | CONTRACTOR: Boart Longyear | DRILL NO.: BL100C
DRILLING METHOD: Sonic | NO. SAMPLES: Continuous | NO. U.D. SAMPLES: 0
WATER TABLE DEPTH: | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 6/28/2010
DRILLER: S. Gautney | RECORDER: D. Brooks | APPROVED: | DRILLING COMP. DATE: 6/28/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	404.30	Red sandy CLAY, dry, micaceous							
1	403.30								
2	402.30								
3	401.30								
4	400.30								
5	399.30								
6	398.30								
7	397.30								
8	396.30								
9	395.30								
10	394.30	Pink, tan, and orange sandy SILT, with clay, dry, micaceous							
11	393.30								
12	392.30								
13	391.30								
14	390.30								
15	389.30								
16	388.30								
17	387.30	White, orange, and tan sandy SILT, dry, micaceous							
18	386.30								
19	385.30								
20	384.30								
21	383.30								
22	382.30								
23	381.30								
24	380.30								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-50

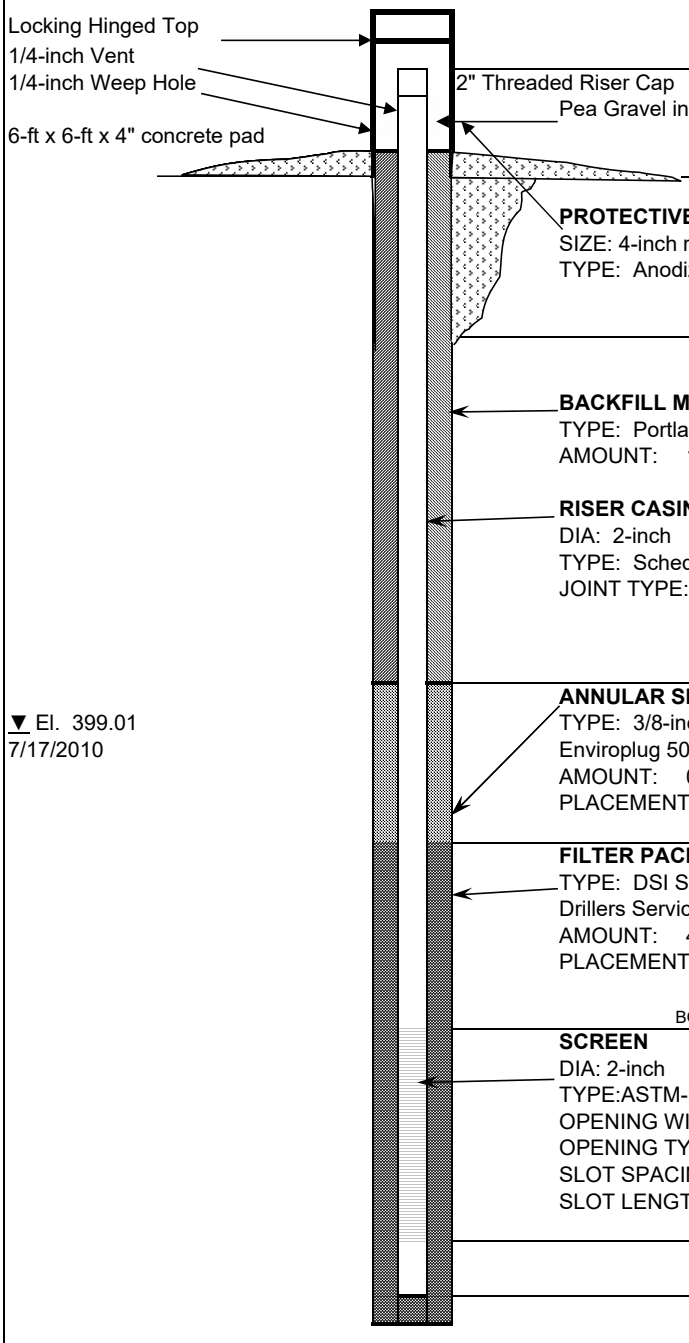
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **35** SURF.ELEV. 404.3

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	379.30	Gray and white gneissic SAPROLITE, wet, micaceous							
26	378.30								
27	377.30								
28	376.30								
29	375.30								
30	374.30	Hard saprolite							
31	373.30								
32	372.30								
33	371.30								
34	370.30								
35	369.30								
36	368.30	35' - Bottom of boring							
37	367.30								
38	366.30								
39	365.30								
40	364.30								
41	363.30								
42	362.30								
43	361.30								
44	360.30								
45	359.30								
46	358.30								
47	357.30								
48	356.30								
49	355.30								
50	354.30								
51	353.30								
52	352.30								
53	351.30								
54	350.30								
55	349.30								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: D. Brooks	DRILLING METHODS: Sonic	GWC-50
DATE CONSTRUCTED: 6/28/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.86	407.16
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	404.3
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	19.71	384.59
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	21.71	382.59
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	23.46	380.84
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	33.46	370.84
BOTTOM OF CASING	33.64	370.66

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-51
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** HOLE DEPTH: 26.5 SURF.ELEV.: 407.3

LOCATION: PAC/Ash Cell COORDINATES N: 1119835.51 E: 2408436.95

ANGLE: 0 BEARING: 0 CONTRACTOR: Ranger DRILL NO.: CME550

DRILLING METHOD: HSA NO. SAMPLES: 5 NO. U.D. SAMPLES: 0

WATER TABLE DEPTH: ELEV.: TIME AFTER COMP.: DATE TAKEN:

TYPE GROUT: QUANTITY: MIX: DRILLING START DATE: 7/26/2010

DRILLER: J. Crowe RECORDER: L. Garland APPROVED: DRILLING COMP. DATE: 7/27/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	407.30	reddish brown slightly sandy SILT micacous							
1	406.30								
2	405.30								
3	404.30								
4	403.30	yellow brown slightly sandy SILT micacous	1	3.5-5	4-5-6	11			
5	402.30								
6	401.30								
7	400.30								
8	399.30								
9	398.30	gary and orangish brown sandy SILT with some coarse to fine quartz	2	8.5-10	5-13-14	27			
10	397.30								
11	396.30								
12	395.30								
13	394.30								
14	393.30	saprolite medium to fine grained sandy SILT	3	13.5-15	4-6-7	13			
15	392.30								
16	391.30								
17	390.30								
18	389.30								
19	388.30	Saprolite slightly clayey SILT	4	18.5-20	6-10-16	26			
20	387.30								
21	386.30								
22	385.30								
23	384.30								
24	383.30								

SOUTHERN COMPANY
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-51

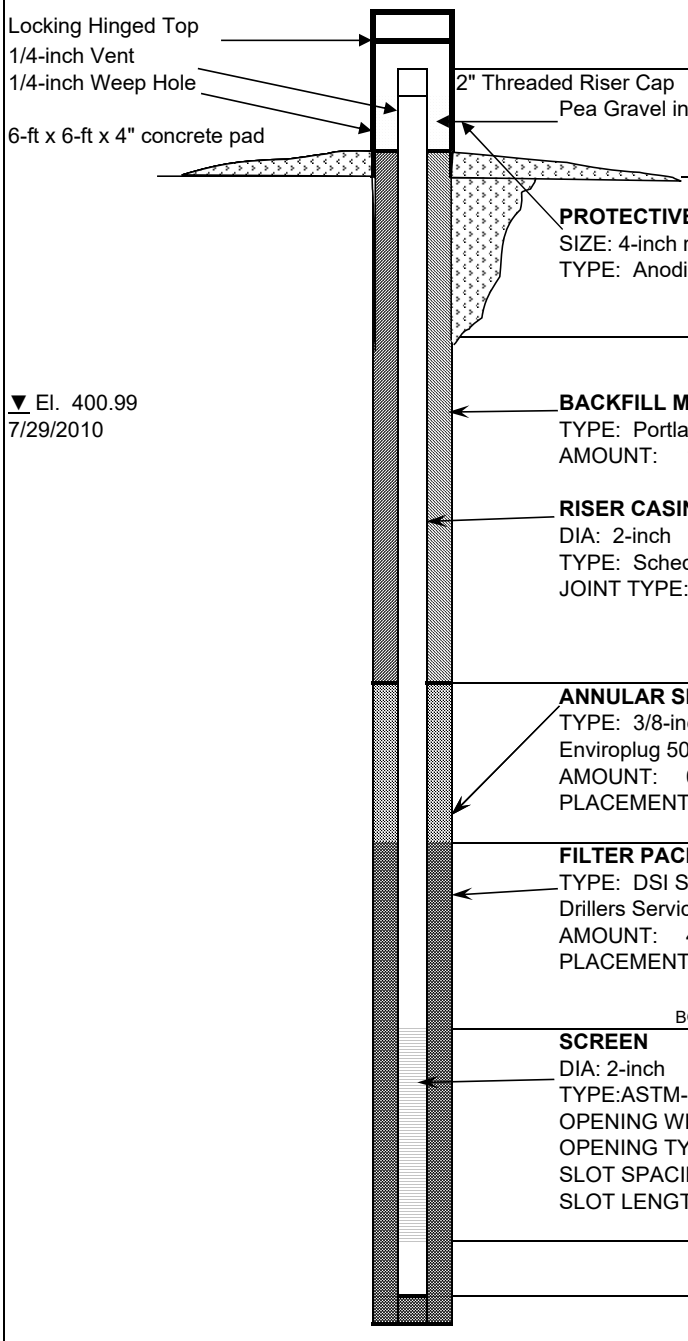
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **26.5** SURF.ELEV. 407.3

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	382.30	yellow and gray medium to fine grained sandy SILT	5	23.5-25	5-25-50	75			
26	381.30								
27	380.30								
		27' - Bottom of boring							
28	379.30								
29	378.30								
30	377.30								
31	376.30								
32	375.30								
33	374.30								
34	373.30								
35	372.30								
36	371.30								
37	370.30								
38	369.30								
39	368.30								
40	367.30								
41	366.30								
42	365.30								
43	364.30								
44	363.30								
45	362.30								
46	361.30								
47	360.30								
48	359.30								
49	358.30								
50	357.30								
51	356.30								
52	355.30								
53	354.30								
54	353.30								
55	352.30								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Ranger	WELL NAME
	DRILLER: J. Crowe	
LOCATION: PAC/Ash Cell	RIG TYPE CME 550	
LOGGER: L. Garland	DRILLING METHODS: Sonic	GWC-51
DATE CONSTRUCTED: 7/27/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.85	410.15
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	407.3
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	9.94	397.36
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	11.94	395.36
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	13.49	393.81
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	23.49	383.81
BOTTOM OF CASING	23.95	383.35

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-52
Sheet 1 of 2

SITE **Georgia Power Company Plant Scherer** HOLE DEPTH 30 SURF.ELEV. 414.4

LOCATION PAC/Ash Cell COORDINATES N 1119972.34 E 2408203.99

ANGLE 0 BEARING 0 CONTRACTOR Boart Longyear DRILL NO. BL100C

DRILLING METHOD Sonic NO. SAMPLES Continuous NO. U.D. SAMPLES 0

WATER TABLE DEPTH ELEV. TIME AFTER COMP. DATE TAKEN

TYPE GROUT QUANTITY MIX DRILLING START DATE 6/24/2010

DRILLER S. Gautney RECORDER L. Millet APPROVED DRILLING COMP. DATE 6/24/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	414.40	Orange clayey SILT, wet, sticky, with mica							
1	413.40								
2	412.40								
3	411.40								
4	410.40								
5	409.40								
6	408.40								
7	407.40	Orange and brown clayey SILT, wet, with green mottling, mica							
8	406.40								
9	405.40								
10	404.40	Tan and white clayey SILT, wet, mica							
11	403.40								
12	402.40								
13	401.40								
14	400.40								
15	399.40	-Dark brown, black, orange, and green as above							
16	398.40	Tan sandy SILT, wet, white and black mottling, mica							
17	397.40								
18	396.40								
19	395.40								
20	394.40	Brown silty SAND, saturated, very fine to fine grained, occasional black mottling, mica							
21	393.40								
22	392.40								
23	391.40								
24	390.40								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-52

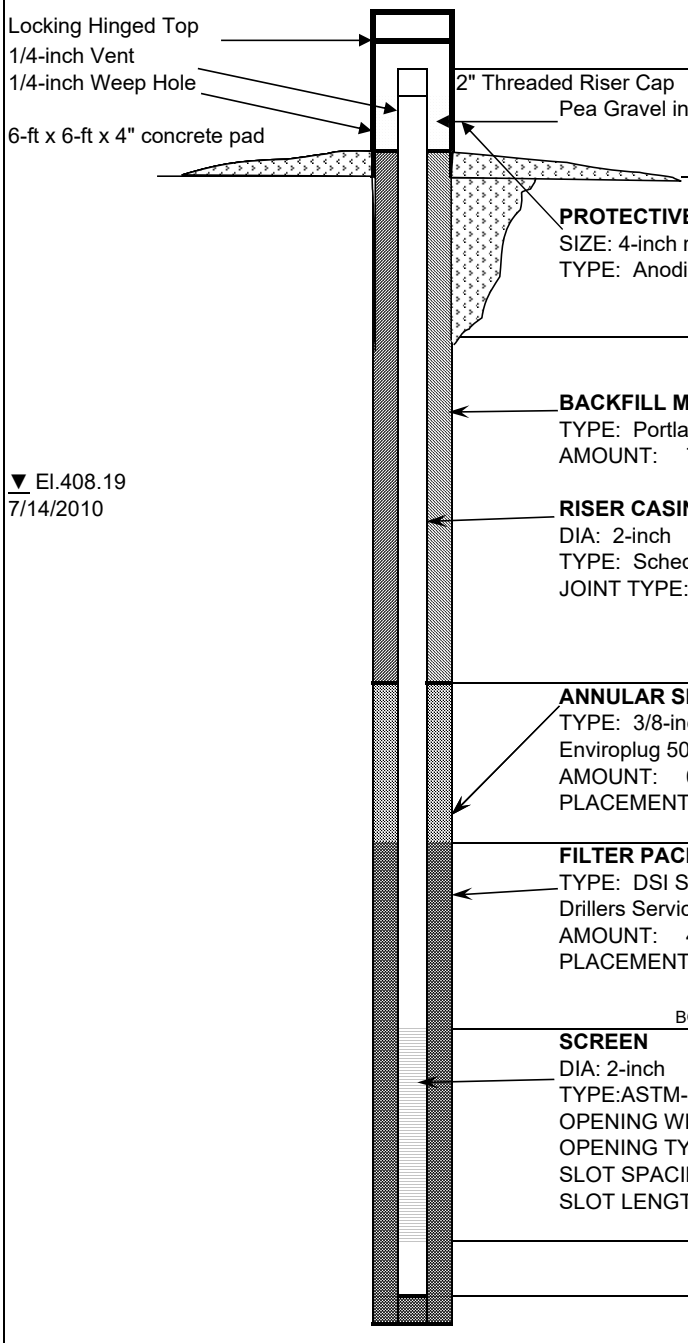
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **30** SURF.ELEV. 414.4

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	389.40	Green and white SAPROLITIC GNEISS, wet, with mica							
26	388.40								
27	387.40								
28	386.40								
29	385.40								
30	384.40								
		30' - Bottom of boring							
31	383.40								
32	382.40								
33	381.40								
34	380.40								
35	379.40								
36	378.40								
37	377.40								
38	376.40								
39	375.40								
40	374.40								
41	373.40								
42	372.40								
43	371.40								
44	370.40								
45	369.40								
46	368.40								
47	367.40								
48	366.40								
49	365.40								
50	364.40								
51	363.40								
52	362.40								
53	361.40								
54	360.40								
55	359.40								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWC-52
DATE CONSTRUCTED: 6/24/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.73	417.13
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	414.4
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 7 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	15.85	398.55
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	17.85	396.55
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	19.85	394.55
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	29.85	384.55
BOTTOM OF CASING	30.17	384.23

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-53
Sheet 1 of 2

SITE: **Georgia Power Company Plant Scherer** | HOLE DEPTH: 28 | SURF.ELEV.: 432.9
LOCATION: PAC/Ash Cell | COORDINATES N: 1120319.65 | E: 2407943.05
ANGLE: 0 | BEARING: 0 | CONTRACTOR: Boart Longyear | DRILL NO.: BL100C
DRILLING METHOD: Sonic | NO. SAMPLES: Continuous | NO. U.D. SAMPLES: 0
WATER TABLE DEPTH: | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 6/23/2010
DRILLER: S. Gautney | RECORDER: L. Millet | APPROVED: | DRILLING COMP. DATE: 6/23/2010

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0	432.90	Dark red silty CLAY, dry, hard, with mica							
1	431.90								
2	430.90								
3	429.90								
4	428.90								
5	427.90	Orange and tan silty CLAY, dry, hard, trace mica							
6	426.90								
7	425.90								
8	424.90								
9	423.90								
10	422.90	Tan, orange, and light green silty CLAY, dry, plastic, trace mica, occasional sandy zones							
11	421.90								
12	420.90								
13	419.90								
14	418.90								
15	417.90								
16	416.90								
17	415.90	Tan and brown silty CLAY, wet, with mica and dark brown mottling							
18	414.90								
19	413.90								
20	412.90	Green and tan clayey SAND, saturated, very fine to fine grained, with mica							
21	411.90								
22	410.90	Tan sandy CLAY, wet, white mottling, with mica							
23	409.90								
24	408.90								

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. GWC-53

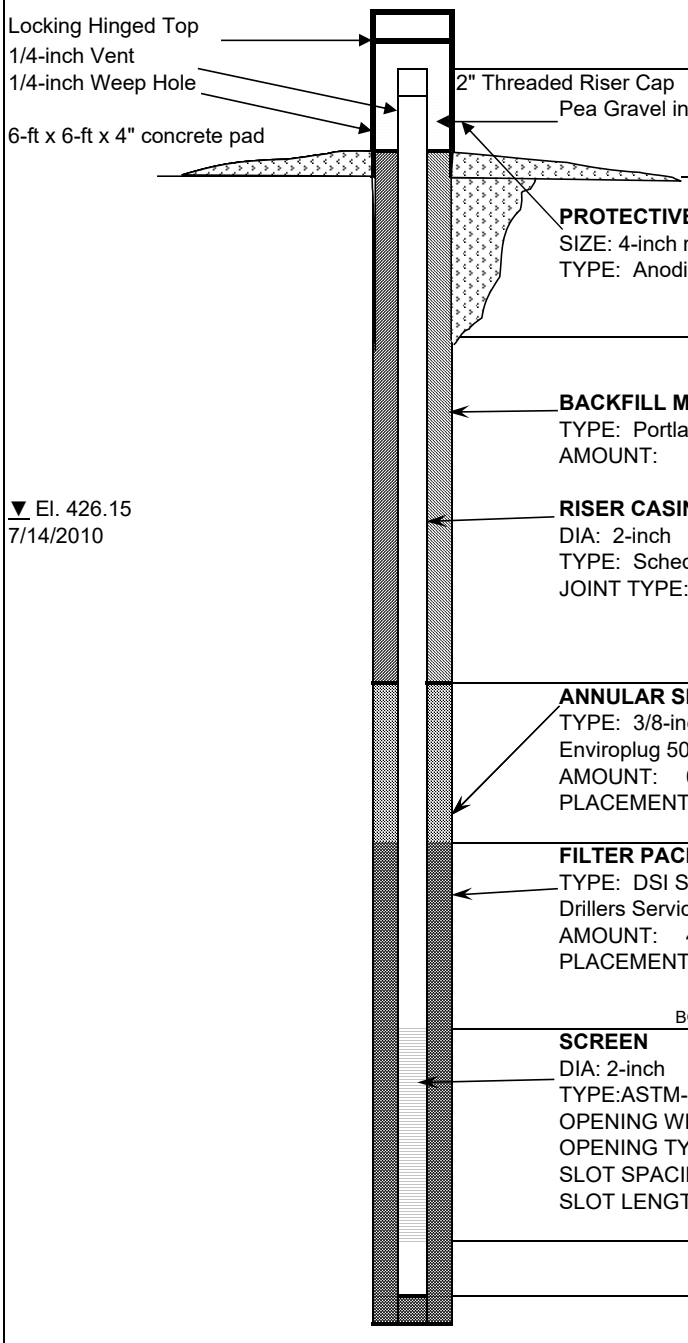
Sheet 2 of 2

SITE **Georgia Power Company Plant Scherer** TOTAL DEPTH **28** SURF.ELEV. 432.9

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25	407.90								
26	406.90	Green silty CLAY, wet, tan and white mottling, with mica							
27	405.90								
28	404.90								
29	403.90	28' - Bottom of boring							
30	402.90								
31	401.90								
32	400.90								
33	399.90								
34	398.90								
35	397.90								
36	396.90								
37	395.90								
38	394.90								
39	393.90								
40	392.90								
41	391.90								
42	390.90								
43	389.90								
44	388.90								
45	387.90								
46	386.90								
47	385.90								
48	384.90								
49	383.90								
50	382.90								
51	381.90								
52	380.90								
53	379.90								
54	378.90								
55	377.90								

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Plant Scherer	DRILLING CO.: Boart Longyear	WELL NAME
	DRILLER: S. Gautney	
LOCATION: PAC/Ash Cell	RIG TYPE: BL100C	
LOGGER: L. Millet	DRILLING METHODS: Sonic	GWC-53
DATE CONSTRUCTED: 6/23/2010		



	DEPTH FEET	ELEVATION FT, MSL
TOP OF RISER	-2.93	435.83
2" Threaded Riser Cap Pea Gravel in annular space		
GROUND SURFACE	0.00	432.9
PROTECTIVE CASING SIZE: 4-inch round TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 16 gal		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	16.06	416.84
ANNULAR SEAL TYPE: 3/8-inch bentonite pellets Enviroplug 50# bags AMOUNT: 0.5 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	18.06	414.84
FILTER PACK TYPE: DSI Sand - #2 Drillers Services, Inc. 0.5 cubic foot bags AMOUNT: 4 bags PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	20.06	412.84
SCREEN DIA: 2-inch TYPE:ASTM-NSF Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 0.25-inch SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	30.06	402.84
BOTTOM OF CASING	30.07	402.83

APPENDIX A

Cell 3

Monitoring Well Logs and Construction Diagrams

RECORD OF BOREHOLE GWC-30

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

DRILL RIG: Terrasonic 150C
DATE STARTED: 1/24/20
DATE COMPLETED: 1/24/20

NORTHING: 1,119,366.69
EASTING: 2,408,976.35
GS ELEVATION: 392.0
TOC ELEVATION: 394.49 ft

DEPTH W.L.:4.81'
ELEVATION W.L.: 389.3'
DATE W.L.:1/28/2020
TIME W.L.:910

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: SAMPLE NO.	TYPE	REC	MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
0	390	0.00 - 3.00 SILT, some sand and clay, fine sand, cohesive, brown, soft, w~PL medium to fine sand, non-cohesive, brown grey, loose, wet at 2'-3'	ML		389				Riser	**WELL CASING** Interval: 0' - 8' Material: Schedul 40 PVC Diameter: 2" Joint Type: Flush/Threaded
5	385	3.00 - 10.00 SAND, some silt, coarse sand, non-cohesive, grey with tan and black mottling, loose, wet	SP		3.00				Cement 3/8" Bentonite Pellets	**WELL SCREEN** Interval: 8' - 18' Material: Schedule 40 PVC Double Wall U-Pack Screen Diameter: 3"x2" Slot Size: 0.010" End Cap: 3"
10	380	10.00 - 19.00 Bedrock, gneiss, well foliated, with fractures at 12' and 15', quartz and mica, grey, slightly weathered	BR		382 10.00	1	ROTO SONIC	10.00 10.00	#1 Sand	**FILTER PACK** Interval: 6' - 8' Type: #1 Sand Quantity: 2.5 bags **FILTER PACK SEAL** Interval: 3' - 6' Type: 3/8" Bentonite Pellets Quantity: 1-5 gallon bucket
15	375				373				0.010" Slotted Schedule 40 PVC Double Wall U-Pack Screen	**ANNULUS SEAL** Interval: N/A Type: N/A Quantity: N/A
20	370	Boring completed at 19.00 ft								**WELL COMPLETION** Pad: 4'x4' Concrete Pad Protective Casing: Aluminum **DRILLING METHODS** Soil Drill: Sonic Rock Drill: Sonic
25	365									
30	360									
35	355									
40	350									
45	345									
50										

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-31

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

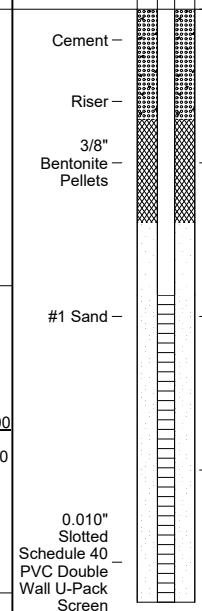
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/23/20
DATE COMPLETED: 1/23/20

NORTHING: 1,118,970.00
EASTING: 2,409,062.02
GS ELEVATION: 390.0
TOC ELEVATION: 392.78 ft

DEPTH W.L.:2.75'
ELEVATION W.L.: 389.76'
DATE W.L.:1/28/2020
TIME W.L.:910

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES SAMPLE NO.	SAMPLES TYPE	SAMPLES REC
0	390	0.00 - 2.00 SILT, some clay, sand and organics, cohesive, brown, w~PL, soft	ML		388			
		2.00 - 4.00 Clayey SILT, some sand, cohesive, grey mottled brown, low plasticity, w~PL, soft			2.00 386			
5	385	4.00 - 7.00 Clayey SILT, some sand, cohesive, tan brown, low plasticity, w>PL, soft			4.00 383			
		7.00 - 9.00 Silty SAND, some clay, non-cohesive, medium coarse sand, grey mottled brown, some 1" diameter gravel, wet, compact	SM		7.00 381			
10	380	9.00 - 12.00 SAND, some silt, fine sand, non-cohesive, grey with brown and white mottling, loose, moist	SP		9.00 378			
		12.00 - 14.00 SAND, some silt clay and transitonally weathered rock, fine sand, highly weathered, cohesive, grey with brown and white mottling, firm, w~PL	TWR		12.00 376	1	ROTO SONIC	10.00 10.00
15	375	14.00 - 19.00 SAND and Transitionally Weathered Rock, some silt, non-cohesive, grey and white/brown, fine sand, highly weathered, loose, moist	TWR		14.00 371			
		Boring completed at 19.00 ft						
20	370							
25	365							
30	360							
35	355							
40	350							
45	345							
50	340							

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 9.3'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 9.3' - 19.3'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 6.95' - 19.3'
Type: #1 Sand
Quantity: 3 bags

FILTER PACK SEAL
Interval: 3.60' - 6.95'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-32

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 39.00 ft
LOCATION: Juliette, GA

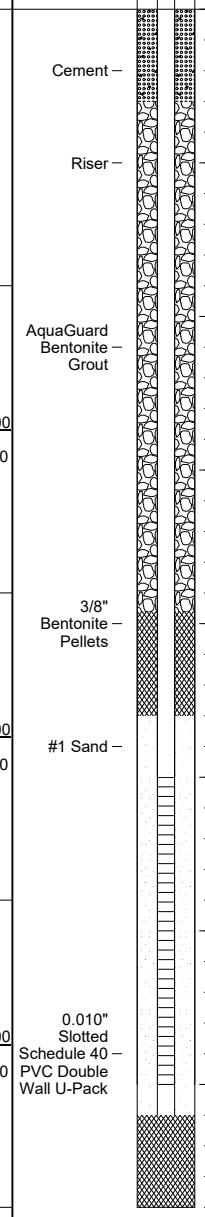
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/21/20
DATE COMPLETED: 1/21/20

NORTHING: 1,118,749.53
EASTING: 2,409,084.83
GS ELEVATION: 406.9
TOC ELEVATION: 410.03 ft

DEPTH W.L.:22.21'
ELEVATION W.L.: 387.28'
DATE W.L.:1/28/2020
TIME W.L.:905

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	405	0.00 - 3.50 Silty CLAY, some micaceous silt, cohesive, orange, medium to low plasticity, firm, w<PL, FILL	CL-ML		403.4			
		3.50 - 6.00 SILT, some sand, cohesive, fine sand, tan, w<PL, soft, FILL	ML		3.50 400.9			
5	400	6.00 - 9.00 SILT, some sand, clay and micaceous silt, cohesive to non-cohesive, tan brown, loose, dry, FILL			6.00 397.9			
		9.00 - 14.00 Clayey SILT, some micaceous silt, cohesive, orange, mottled white, medium plasticity, firm, w<PL to w~PL			9.00 392.9	1	ROTO SONIC	10.00 / 10.00
10	395	14.00 - 17.00 SILT, some sand and clay, cohesive, tan, medium plasticity, firm to soft, w~PL			14.00 389.9			
		17.00 - 19.00 SILT, some clay and sand, tan, mottled white, low plasticity, firm, w<PL			17.00 387.9			
15	390	19.00 - 26.00 Silty SAND, some clay and transitionally weathered rock, fine sand, highly weathered, tan mottled white, compact, moist, SAPROLITE	SM		19.00 380.9	2	ROTO SONIC	10.00 / 10.00
		26.00 - 29.00 SAND, some silt and transitionally weathered rock, fine sand, highly weathered, non-cohesive, tan and white mottled pink, dense, moist, SAPROLITE	TWR		26.00 377.9			
20	385	29.00 - 39.00 SAND and TWR, some gneiss with feldspar, coarse sand, highly weathered, foliated, white mottled tan, very dense, moist, SAPROLITE			29.00 367.9	3	ROTO SONIC	10.00 / 10.00
		Boring completed at 39.00 ft						
25	380							
30	375							
35	370							
40	365							
45	360							
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 25'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 25' - 35'
Material: Schedule 40 PVC Double Wall U-Pack
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 23' - 35'
Type: #1 Sand
Quantity: 3 bags

FILTER PACK SEAL
Interval: 19.6' - 23'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucet

ANNULUS SEAL
Interval: 3' - 19.6'
Type: Aquaguard Bentonite Grout
Quantity: 2 bags 30 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

Well Decommissioned May 26-27 2020

RECORD OF BOREHOLE GWC-33

SHEET 1 of 2

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 54.00 ft
LOCATION: Juliette, GA

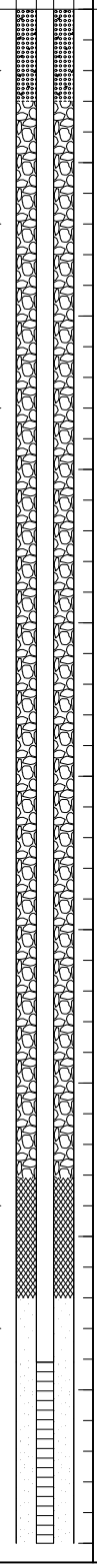
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/24/20
DATE COMPLETED: 1/25/20

NORTHING: 1,118,448.77
EASTING: 2,409,141.89
GS ELEVATION: 432.08
TOC ELEVATION: 434.87 ft

DEPTH W.L.:44.36'
ELEVATION W.L.: 390.51'
DATE W.L.:1/28/2020
TIME W.L.:900

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	430	0.00 - 2.00 Silty CLAY, cohesive, red, high plasticity, stiff, w>PL, FILL	CL-ML		430.08			
5	425	2.00 - 7.00 Clayey SILT, cohesive, orange tan, mottled black, some sand, fine sand, med to low plasticity, firm to soft, w~PL, w<PL	ML		2.00 425.08			
		7.00 - 9.00 SILT, some sand, fine sand, non-cohesive, orange, loose, dry			7.00 423.08			
10		9.00 - 11.00 SILT, some sand and clay, fine sand, cohesive, orange, soft, w~PL			9.00 421.08			
15	420 415	11.00 - 19.00 Sandy SILT, some clay, fine sand, tan mottled orange and black, some transitionally weathered rock 15'-19', non-cohesive, compact to loose, dry to moist	MLS		11.00 413.08	1	ROTO SONIC	10.00 10.00
20	410	19.00 - 29.00 SAND, some silt, transitionally weathered rock and clay, fine sand, highly weathered, tan beige, non-cohesive, loose, moist	TWR		19.00	2	ROTO SONIC	10.00 10.00
25	405				403.08			
30	400	29.00 - 39.00 Silty SAND, some transitionally weathered rock, fine sand, highly weathered, non-cohesive, tan grey, compact 29'-32', loose, moist, SAPROLITE			29.00 393.08	3	ROTO SONIC	10.00 10.00
35	395							
40	390	39.00 - 49.00 SAND and Transitionally Weathered Rock, some silt, fine sand, highly weathered feldspar, non-cohesive, tan grey mottled white orange and black, compact to dense, moist to wet, SAPROLITE			39.00 383.08	4	ROTO SONIC	10.00 10.00
45	385							
50		Log continued on next page			49.00	5	ROTO	5.00

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 44.1'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 44.1' - 54.1'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 42' - 54.4'
Type: #1 Sand
Quantity: 5 bags

FILTER PACK SEAL
Interval: 38.1' - 42'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 38.1'
Type: AquaGuard Bentonite Grout
Quantity: 3.5 bags 35 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

Well Decommissioned May 26-27 2020

RECORD OF BOREHOLE GWC-33

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 54.00 ft
LOCATION: Juliette, GA

DRILL RIG: Terrasonic 150C
DATE STARTED: 1/24/20
DATE COMPLETED: 1/25/20

NORTHING: 1,118,448.77
EASTING: 2,409,141.89
GS ELEVATION: 432.08
TOC ELEVATION: 434.87 ft

DEPTH W.L.:44.36'
ELEVATION W.L.: 390.51'
DATE W.L.:1/28/2020
TIME W.L.:900

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: SAMPLE NO.	SAMPLES: TYPE	SAMPLES: REC	MONITORING WELL DIAGRAM and NOTES
50		49.00 - 54.00 SAND and Transitionally Weathered Rock, some silt, fine sand, highly weathered feldspar, non-cohesive, tan grey mottled white orange and black, compact, moist to wet, SAPROLITE *(Continued)*					SONIC	5.00	0.010" Slotted Schedule 40 PVC Double Wall U-Pack Screen
	380					5	ROTO SONIC	5.00 5.00	
					378.08				
		Boring completed at 54.00 ft							
55	375								
60	370								
65	365								
70	360								
75	355								
80	350								
85	345								
90	340								
95	335								
100									

WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 44.1'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 44.1' - 54.1'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 42' - 54.4'
Type: #1 Sand
Quantity: 5 bags

FILTER PACK SEAL
Interval: 38.1' - 42'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 38.1'
Type: AquaGuard Bentonite Grout
Quantity: 3.5 bags 35 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

RECORD OF BOREHOLE GWC-33A

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 24.00 ft
LOCATION: Juliette, GA

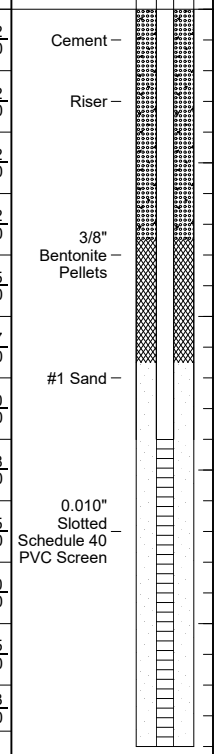
DRILL RIG: CME 550
DATE STARTED: 5/26/20
DATE COMPLETED: 5/27/20

NORTHING: 1,118,458.68
EASTING: 2,409,359.58
GS ELEVATION: 390.9
TOC ELEVATION: 393.96 ft

DEPTH W.L.:9.9
ELEVATION W.L.: 381
DATE W.L.:5/27/2020
TIME W.L.:0745

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N-VALUE	REC
0	390	0.00 - 2.25 sandy SILTY CLAY, medium plasticity, medium sand, brown, trace organics, homogenous, cohesive, w~pl, stiff	CL		388.65	1	SPT	2-2-3-2	5	0.92/2.00
		2.25 - 7.50 CLAY, high plasticity, light grey, spotted orange, some fine sand, cohesive, w>pl, very stiff	CH		2.25	2	SPT	2-2-4-5	6	1.92/2.00
5	385					3	SPT	5-8-8-10	16	1.92/2.00
					383.4	4	SPT	3-3-4-6	7	1.92/2.00
		7.50 - 8.90 CLAYEY SAND, medium sand, high plasticity, orange, iron-stained, non-cohesive, moist, loose	SC		7.50 382	5	SPT	3-5-4-6	9	1.75/2.00
10	380	8.90 - 14.00 SILTY SAND, fine to medium sand, no plasticity, laminated white & tan, micaceous, saprolitic, non-cohesive, moist, loose	SM		8.90	6	SPT	4-4-6-8	10	1.67/2.00
					376.9	7	SPT	4-6-8-12	14	1.50/2.00
15	375	14.00 - 18.00 SILTY SAND, fine to medium sand, no plasticity, laminated white & tan, micaceous, saprolitic, 0.5 foot green hornblende vein, non-cohesive, moist, loose	SM		14.00	8	SPT	6-10-12-18	22	1.58/2.00
					372.9	9	SPT	6-10-16-13	26	1.75/2.00
20	370	18.00 - 24.00 SILTY SAND, fine to medium sand, no plasticity, laminated white & tan, micaceous, saprolitic, hornblende interlayers at 18.6 (1-inch thick), 20.1 (0.25-inch thick) and 22.3-22.5, and pegmatitic interlayer 22.5-23.3 ft, non-cohesive, moist, dense	SM		18.00	10	SPT	9-12-22-29	34	1.50/2.00
						11	SPT	6-9-19-24	38	1.75/2.00
						12	SPT	7-14-19	33	1.33/1.50
					366.9					
25	365	Boring completed at 24.00 ft								
30	360									
35	355									
40	350									
45	345									
50										

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 14'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 14' - 24'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 4"

FILTER PACK
Interval: 11.5' - 24'
Type: #1 Sand
Quantity: 7.5

FILTER PACK SEAL
Interval: 7.5' - 11.5'
Type: 3/8" Bentonite Pellets
Quantity: 2-5 gal bucket

ANNULUS SEAL
Interval: 0' - 7.5'
Type: Portland Cement/Bentonite Powder/Water
Quantity: 1.5 bag (46.2 lb) Portland/1.5 bag (50 lb) Bentonite/17.5 gallons Water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Hollow Stem Auger
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: SCS Drilling Services
DRILLER: Jim Castelberry

GA INSPECTOR: Heather Brissey
CHECKED BY: Timothy Richards, PG
DATE: 6/4/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-34

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

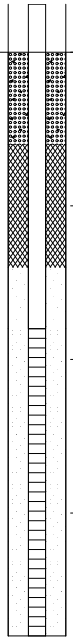
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/13/20
DATE COMPLETED: 1/13/20

NORTHING: 1,118,248.26
EASTING: 2,409,680.41
GS ELEVATION: 386.2
TOC ELEVATION: 389.29 ft

DEPTH W.L.:6.7'
ELEVATION W.L.: 382.49'
DATE W.L.:1/28/2020
TIME W.L.:855

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	385	0.00 - 3.00 Silty CLAY, some organics, cohesive, brown red, high plasticity, firm, w~PL	CL-ML		383.2			
		3.00 - 5.00 Silty CLAY, cohesive, brown, med plasticity, soft, w>PL			3.00 381.2			
5	380	5.00 - 11.00 CLAY with silt, some fine sand, layer of SAPROLITE at ~ 8, grey, med plasticity, soft to firm, w>PL			5.00			
10	375	11.00 - 16.00 SAND with clay and silt, some transitionally weathered rock with large gravel, non-cohesive, fine sand, grey, compact, moist	TWR		375.2 11.00	1	ROTO SONIC	10.00 10.00
15	370	16.00 - 19.30 SAND with silt and transitionally weathered rock, non-cohesive, fine sands, highly weathered, grey and white, loose, moist			370.2 16.00			
20	365	Boring completed at 19.00 ft			366.9 19.30			
25	360							
30	355							
35	350							
40	345							
45	340							
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 9'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 9'-19'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010" Slotted
End Cap: 3"

FILTER PACK
Interval: 7' - 19'
Type: GP #1 Sand
Quantity: 2.5 bags

FILTER PACK SEAL
Interval: 3' - 7'
Type: 3/8" Bentonite Pellets Pel-Plug
Quantity: 5 gallon bucket

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-35

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 25.00 ft
LOCATION: Juliette, GA

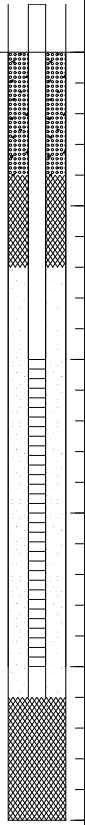
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/12/20
DATE COMPLETED: 1/12/20

NORTHING: 1,117,860.46
EASTING: 2,409,906.21
GS ELEVATION: 385.1
TOC ELEVATION: 387.90 ft

DEPTH W.L.:4.5'
ELEVATION W.L.: 383.30'
DATE W.L.:1/28/2020
TIME W.L.:850

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES SAMPLE NO.	SAMPLES TYPE	SAMPLES REC
0	385	0.00 - 5.00 Clayey SILT, some organics, cohesive, brown, high plasticity, stiff to very stiff, w~PL to w<PL	ML		380.1			
5	380	5.00 - 7.00 CLAY with silt, cohesive, tan, high plasticity, stiff, w~PL	CL-ML		5.00 378.1			
		7.00 - 8.00 Sandy SILT, some clay, fine to coarse sand, non-cohesive, grey, compact, wet	MLS		7.00 377.1			
			SM		8.00 376.1			
10	375	8.00 - 9.00 SAND, some silt, fine sands, non-cohesive, grey, loose, wet 9.00 - 12.00 SAND, some silt, fine sands, non-cohesive, grey, loose, moist			9.00 373.1	1	ROTO SONIC	10.00 10.00
15	370	12.00 - 15.00 SAND, some silty clay and transitionally weathered rock, non-cohesive, fine sand, highly weathered, grey and white, loose to compact, moist			12.00 370.1			
		15.00 - 17.00 SAND and SILT, some transitionally weathered rock, non-cohesive, fine sand, highly weathered, grey and white with grey mottling, loose to compact, dry			15.00 368.1			
20	365	17.00 - 22.00 SAND, some silt and transitionally weathered rock, non-cohesive, fine sand, grey with white and black mottling, compact, dry			17.00 363.1	2	ROTO SONIC	6.00 6.00
25	360	22.00 - 25.00 Transitionally weathered rock, Gneiss, weathered, grey, cobbled gneiss, dry	TWR		22.00 360.1			
		Boring completed at 25.00 ft						
30	355							
35	350							
40	345							
45	340							
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 10'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 10' - 20'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 8' - 20'
Type: #1 Sand
Quantity: 3.5 bags

FILTER PACK SEAL
Interval: 4' - 8'
Type: 3/8" Bentonite Pellets
Quantity: 1/2 50 lb bag

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-36

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 45.40 ft
LOCATION: Juliette, GA

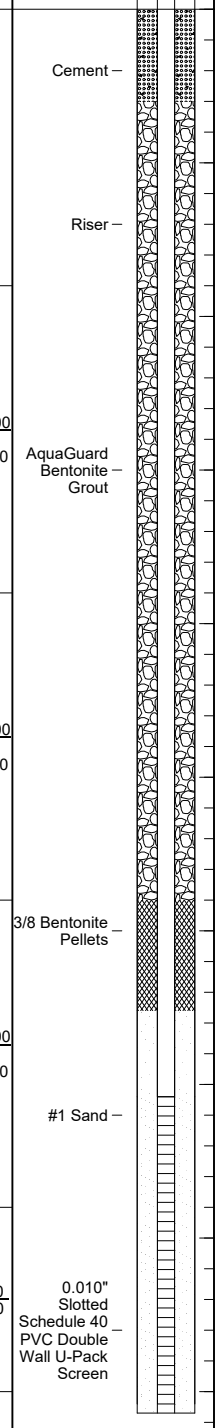
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/10/20
DATE COMPLETED: 1/10/20

NORTHING: 1,117,561.29
EASTING: 2,409,681.44
GS ELEVATION: 422.0
TOC ELEVATION: 425.12 ft

DEPTH W.L.:33.0'
ELEVATION W.L.: 391.94'
DATE W.L.:1/28/2020
TIME W.L.:845

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	420	0.00 - 6.00 CLAY, some micaceous silt and organics, cohesive, red, high to medium plasticity, stiff, w<PL	CH		416			
5	415	6.00 - 8.00 Silty CLAY, some micaceous silt, cohesive, red, hig plasticity, very stiff, w<PL	CL-ML		6.00 414			
		8.00 - 9.00 Clayey SILT, some micaceous silt, red, cohesive, medium to low plasticity, firm w<PL	ML		8.00 413 9.00			
10	410	9.00 - 11.00 Clayey SILT, cohesive, orange red mottled with black, low plasticity, soft, w<PL 11.00 - 16.00 SILT, some clay, cohesive, orange, low plasticity, soft, w<PL			411 11.00 406	1	ROTO SONIC	10.00 10.00
15	405	16.00 - 19.00 SILT, some sand and micaceous silt, fine sand, trace clay, cohesive to non-cohesive, very soft/loose dry			16.00 403			
20	400	19.00 - 21.00 Silty SAND, some clay at approximately 21', fine sand, non-cohesive, tan to brown, loose to compact, dry	SM		19.00 401			
		21.00 - 24.00 Silty SAND, tan, some transitionally weathered rock, fine sand, non-cohesive, loose, moist			21.00 398	2	ROTO SONIC	10.00 10.00
25	395	24.00 - 29.00 SAND, some silt and transitionally weathered rock, fine sand, poorly sorted, non-cohesive, tan, mottled white and brown, loose, moist	SP		24.00 393			
30	390	29.00 - 39.00 SAND, some silt, fine sand, grey mottled with brown, non-cohesive, loose to compact, moist to wet			29.00 383	3	ROTO SONIC	10.00 10.00
40	380	39.00 - 45.00 SAND, some transitionally weathered rock. fine sand, grey mottled tan and white, non-cohesive, loose to compact, moist to wet, SAPROLITE	TWR		39.00 377	4	ROTO SONIC	6.00 6.00
45	375	Boring completed at 45.40 ft			45.00			
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 35.4'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 35.4' - 45.4'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 32.6' - 45.7'
Type: #1 Sand
Quantity: 3.5 bags

FILTER PACK SEAL
Interval: 29' - 32.6'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 29'
Type: AquaGuard Bentonite Grout
Quantity: 2 bags 30 gallons of water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-37

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 49.00 ft
LOCATION: Juliette, GA

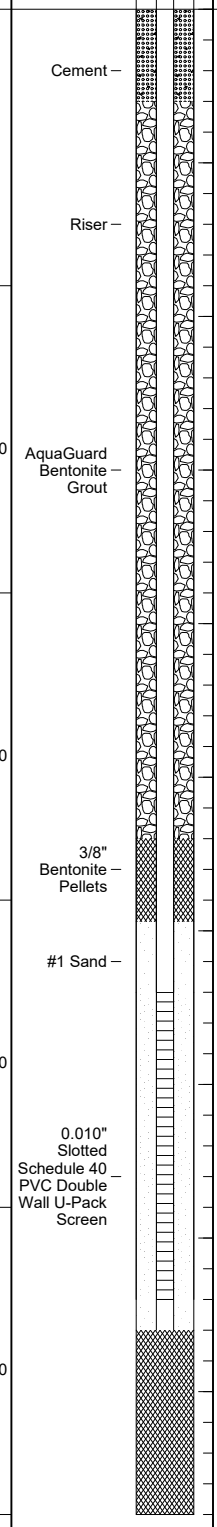
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/8/20
DATE COMPLETED: 1/8/20

NORTHING: 1,117,239.70
EASTING: 2,409,636.56
GS ELEVATION: 427.2
TOC ELEVATION: 429.80 ft

DEPTH W.L.:24.45
ELEVATION W.L.: 405.07'
DATE W.L.:1/28/2020
TIME W.L.:840

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	425	0.00 - 5.00 CLAY, some silt, trace organics and micaceous silt, cohesive, red brown, high plasticity, very stiff, w<PL	CH	422.2			
5		5.00 - 6.00 Silty CLAY, some micaceous silt, cohesive, orange, medium plasticity, very stiff to stiff, w<PL	CL-ML	5.00 421.2			
	420	6.00 - 9.00 Clayey SILT, some micaceous silt and sand, cohesive, medium plasticity, orange, firm, w<PL	ML	6.00 418.2			
10		9.00 - 11.00 Clayey SILT, cohesive, red orange, low to medium plasticity, soft, w<PL		9.00 416.2			
	415	11.00 - 13.00 SILT with clay, some sand, fine sand, cohesive, orange, soft to very soft, w<PL		11.00 414.2			
15		13.00 - 16.00 Clayey SILT, trace micaceous silt, cohesive, orange, soft to firm, w<PL		13.00 411.2	1	ROTO SONIC	10.00
	410	16.00 - 19.00 Clayey SILT, some sand, fine sand, cohesive, tan with brown grey mottling, soft to very soft, moist/w~PL		16.00 408.2			
20		19.00 - 24.00 Sandy SILT, some clay, fine sand, non-cohesive, grey, compact to dense, moist	MLS	19.00 403.2	2	ROTO SONIC	10.00
	405	24.00 - 29.00 Silty SAND, some clay, fine sand, non-cohesive, grey, mottled black and tan, compact, moist	SM	24.00 398.2			
25		29.00 - 34.00 Silty SAND, some micaceous silt and clay, fine sand, non-choesive, grey mottled white, compact to dense, moist		29.00 393.2	3	ROTO SONIC	10.00
	400	34.00 - 39.00 SAND with some silt, trace micaceous silt, fine sand, non-cohesive, tan grey, loose to compact, moist	SP	34.00 388.2			
30		39.00 - 42.00 SAND, some silt, fine sand, grey mottled with brown, non-cohesive, compact, moist to wet		39.00 385.2			
	395	42.00 - 44.00 SAND some silt, fine sand, dark grey, mottled tan brown, compact to dense, moist		42.00 383.2	4	ROTO SONIC	10.00
35		44.00 - 49.00 SAND, some silt, fine sand, grey with white mottling, poorly sorted, compact to loose, moist		44.00 378.2			
	390	Boring completed at 49.00 ft					
40							
	385						
45							
	380						
50							

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 32'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 32' - 42'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 29.7 - 42'
Type: #1 Sand
Quantity: 5 bags

FILTER PACK SEAL
Interval: 27' - 29.7'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 27'
Type: AquaGuard Bentonite Grout
Quantity: 2 bags, 30 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWC-38

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 49.00 ft
LOCATION: Juliette, GA

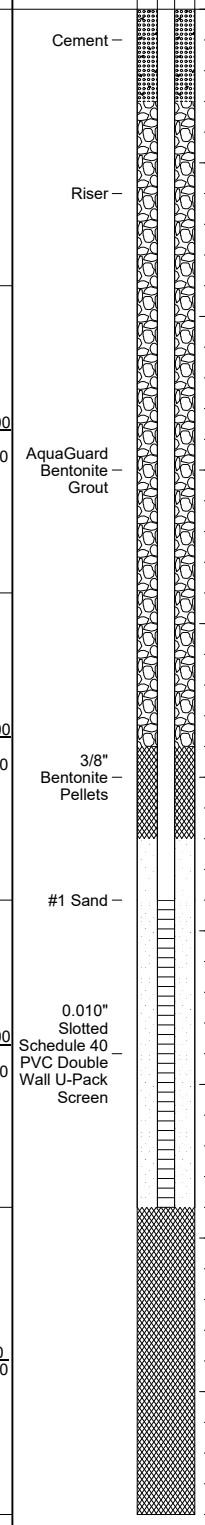
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/7/20
DATE COMPLETED: 1/7/20

NORTHING: 1,116,786.45
EASTING: 2,409,533.11
GS ELEVATION: 416.0
TOC ELEVATION: 418.68 ft

DEPTH W.L.:12.11'
ELEVATION W.L.: 406.33'
DATE W.L.:1/28/2020
TIME W.L.:835

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	415	0.00 - 5.00 CLAY, some silt, orange brown, cohesive, medium to high plasticity, stiff, w<PL	CH	411			
5	410	5.00 - 8.00 Clayey SILT, some micaceous silt, orange brown, cohesive, low plasticity, firm, w~PL	ML	5.00 408			
		8.00 - 9.00 Silty SAND, fine sand, some clay, brown tan, cohesive, w<PL	SM	8.00 407			
10	405	9.00 - 15.00 Silty CLAY, some micaceous silt, tan, cohesive, medium plasticity, firm to stiff, w~PL	CL-ML	9.00 401	1	ROTO SONIC	10.00 10.00
15	400	15.00 - 19.00 Sandy SILT, little clay, fine sand, cohesion variable mostly non-cohesive, low plasticity, grey, loose, moist to dry	MLS	15.00 397			
20	395	19.00 - 22.00 Sandy Clayey SILT, biotite/mica gneiss, SAPROLITE, fine sand, grey with brown mottling, compact to dense, dry		19.00 394			
		22.00 - 24.00 Silty SAND, fine to coarse, gravelly, poorly sorted, grey and grey brown, loose, dry	SM	22.00 392	2	ROTO SONIC	10.00 10.00
25	390	24.00 - 29.00 Silty SAND, fine sand, some gravel, poorly sorted, sand, non-cohesive, grey mottled white and black, dense to very dense, dry, SAPROLITE		24.00 387			
30	385	29.00 - 39.00 Gravelly Silty SAND, biotite gneiss to transitionally weathered rock, fine to coarse sand, highly weathered, up to 2" damter cobble, moderate to poorly foliated, grey, dry, SAPROLITE	TWR	29.00 377	3	ROTO SONIC	10.00 10.00
40	375	39.00 - 49.00 Bedrock, biotite gneiss, moderate to well foliated, and fractured, dark grey and black some white banding	BR	39.00 367	4	ROTO SONIC	3.00 10.00
50		Boring completed at 49.00 ft					

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 29'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 29' - 39'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 27' - 49'
Type: #1 Sand
Quantity: 3 bags

FILTER PACK SEAL
Interval: 24' - 27'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 24'
Type: AquaGuard Bentonite Grout
Quantity: 2 bags 30 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: Sonic

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-39

SHEET 1 of 2

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 59.30 ft
LOCATION: Juliette, GA

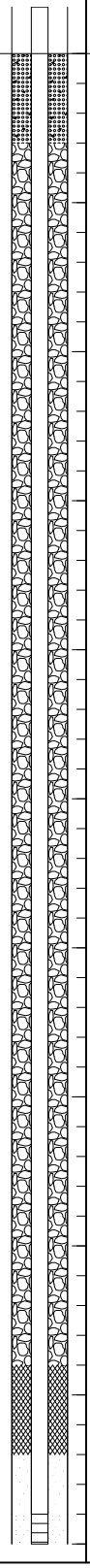
DRILL RIG: Terrasonic 150C
DATE STARTED: 12/20/19
DATE COMPLETED: 12/20/19

NORTHING: 1,116,967.57
EASTING: 2,408,671.68
GS ELEVATION: 454.2
TOC ELEVATION: 457.62 ft

DEPTH W.L.:19.21'
ELEVATION W.L.: 438.38'
DATE W.L.:1/28/2020
TIME W.L.:825

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0		0.00 - 6.00 CLAY and GRAVEL, some sand and silt, biotite gneiss gravel up to 1" diameter, red and red-brown, some dark orange brown, w<PL, very stiff, medium to high plasticity	GC		448.2			
5	450	6.00 - 9.00 SAND, non-cohesive, fine sand, some silt, tan and light orange brown, some white, dry	SP		6.00 445.2			
10	445	9.00 - 11.50 Sandy CLAY, some micaceous silt, fat clay, brown, mottled dark red-brown and dark red, sand increases with depth, high plasticity, w>PL	CLS		9.00 442.7			
15	440	11.50 - 19.00 Sandy SILT, some clay, fine sand, micaceous, mostly non-cohesive, tan-brown and light brown with some orange and mottled some white and black with some areas of finer cohesive (w<PL, low to no plasticity) material throughout, loose ,dry	MLS		11.50 435.2	1	ROTO SONIC	10.00 / 10.00
20	435	19.00 - 29.00 Sandy Clayey SILT, biotite/mica gneiss Saprolite, cohesive, fine sand, more clay less sand 24'-29', moderately foliated, brown and grey-brown mottled mostly white and tan brown, some black and orange brown, firm to stiff, w<PL	ML		19.00 425.2	2	ROTO SONIC	10.00 / 10.00
25	430							
30	425	29.00 - 39.00 Silty SAND, non-cohesive, fine to coarse, poorly sorted sand, some clay, moderate to well foliated mica/biotite, quartz, feldspar, gneissic SAPROLITE, grey mottled white and black, some orange-brown, dense to very dense, dry to moist	SM		29.00 415.2	3	ROTO SONIC	10.00 / 10.00
35	420							
40	415	39.00 - 44.00 SAND, some silt, trace clay and gravel, dark grey, some black, some white, biotite gneiss SAPROLITE, poorly foliated, fine to coarse poorly sorted sand, compact, dry	SP		39.00 410.2	4	ROTO SONIC	10.00 / 10.00
45	410	44.00 - 46.00 Gravelly SAND, biotite gneiss transitionally weathered rock, fine to coarse sand, poorly sorted, biotite gness gravel up to 2" diameter, moderate to poorly foliated, grey brown, grey and dark grey, some white and black, dense, dry	TWR		44.00 408.2			
		46.00 - 49.00 Bedrock, biotite gneiss, moderate to well foliated, highly weathered and fractured, dark grey and black with some white, som orange-brown staining along fractures	BR		46.00 405.2			
50	405	Log continued on next page	BR		49.00	5	ROTO	

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 49'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 49' - 59'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 47' - 59.3'
Type: #1 Sand
Quantity: 3.5 bags

FILTER PACK SEAL
Interval: 44' - 47'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 44'
Type: AquaGuard Bentonite Grout
Quantity: 4 bags, 60 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: Sonic

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: William Ballow
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-39

SHEET 2 of 2

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 59.30 ft
LOCATION: Juliette, GA

DRILL RIG: Terrasonic 150C
DATE STARTED: 12/20/19
DATE COMPLETED: 12/20/19

NORTHING: 1,116,967.57
EASTING: 2,408,671.68
GS ELEVATION: 454.2
TOC ELEVATION: 457.62 ft

DEPTH W.L.:19.21'
ELEVATION W.L.: 438.38'
DATE W.L.:1/28/2020
TIME W.L.:825

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC	MONITORING WELL DIAGRAM and NOTES
50		49.00 - 59.00 Bedrock, gneiss and partially weathered rock, moderately foliated, black with bands of white and osme pink, highly weathered and fractured, orange-brown staining around fractures *(Continued)*	BR			5	SONIC ROTO 10.00 SONIC 10.00		#1 Sand 0.010" Slotted Schedule 40 PVC Double Wall U-Pack Screen
55	400								
60	395	Boring completed at 59.30 ft			395.2 59.00				
65	390								
70	385								
75	380								
80	375								
85	370								
90	365								
95	360								
100	355								

WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 49'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 49' - 59'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 47' - 59.3'
Type: #1 Sand
Quantity: 3.5 bags

FILTER PACK SEAL
Interval: 44' - 47'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 44'
Type: AquaGuard Bentonite Grout
Quantity: 4 bags, 60 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: Sonic

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: William Ballow
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-40

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 44.80 ft
LOCATION: Juliette, GA

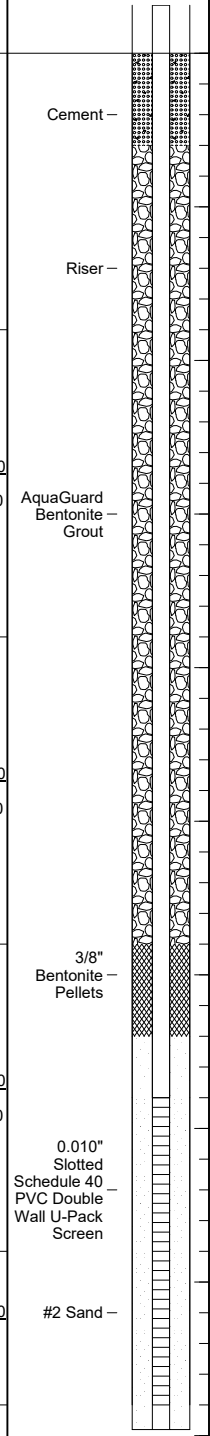
DRILL RIG: Terrasonic 150C
DATE STARTED: 12/18/19
DATE COMPLETED: 12/18/19

NORTHING: 1,117,365.24
EASTING: 2,408,730.04
GS ELEVATION: 461.2
TOC ELEVATION: 463.84 ft

DEPTH W.L.:31.49'
ELEVATION W.L.: 432.13'
DATE W.L.:1/28/2020
TIME W.L.:820

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	460	0.00 - 0.50 CLAY, some sand, orange-brown, some red, cohesive, w>PL, soft to very soft, high plasticity	CL		0.50			
		0.50 - 9.00 Sandy SILT and GRAVEL. gravel up to 1" diameter, orange, orange-brown and white, non-cohesive, dry, fine to coarse sands, poorly sorted	MLS		452.2			
10	450	9.00 - 10.00 CLAY, some silt, trace gravel, med to high plasticity, brown and orange, brown, some tan, firm to stiff, w~PL	CL		9.00 451.2	1	ROTO SONIC	10.00 / 10.00
		10.00 - 17.00 Clayey SILT, some fine sand, trace coarse sand and gravel, cohesive, red, orange-brown, orange, tan and some white, trace black staining, firm, w<PL	ML		10.00 444.2			
		17.00 - 19.00 Sandy SILT, well foliated Saprolite, trace gravel, non-cohesive, fine to coarse sand, poorly sorted, red, white, orange-brown with black staining, dry	MLS		17.00 442.2			
20	440	19.00 - 24.00 Silty CLAY, cohesive, tan mottled white, orange-tan, some black, firm, low plasticity, w<PL	CL-ML		19.00 437.2	2	ROTO SONIC	10.00 / 10.00
25	435	24.00 - 26.00 SAND, some clay, some gravel, mostly coarse angular quartz sand, red and white with some orange-brown clay, moist	SC		24.00 435.2			
		26.00 - 29.00 Silty CLAY, cohesive, tan mottled white, orange-tan, some black, firm, low plasticity, w<PL	CL-ML		26.00 432.2			
30	430	29.00 - 34.00 Sandy Silty CLAY, trace gravel, cohesive, low plasticity, higher plasticity from approximately 30'-32', w<PL, (w>PL approximately 30'-32'), orange-brown, orange, some dark brown, some white, increased sand and silt approximately 32'-34'.	CL		29.00 427.2	3	ROTO SONIC	10.00 / 10.00
35	425	34.00 - 37.00 Sandy SILT, some clay, cohesive, light grey and white, moderatley folited biotite and gneiss Saprolite, fine sand, some coarse, moist to wet, soft, w~PL, low to no plasticity	MLS		34.00 424.2			
40	420	37.00 - 44.80 Sandy CLAY to Clayey SAND, cohesive, orange-brown and brown mottled white, orange and black, sand content increases approximately 40'-44', fine to coarse sand, poorly sorted, trace gravel, med to hig plasticity, w>PL approximately 37'-40', very soft to firm	SC-SM		37.00 416.4	4	ROTO SONIC	10.00 / 5.00
45	415	Boring completed at 44.80 ft						
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 34
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 34' - 44'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 32' - 44.8'
Type: #2 Sand
Quantity: 3.75 bags

FILTER PACK SEAL
Interval: 29' - 32'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: 3' - 29'
Type: AquaGuard Bentonite Grout
Quantity: 2 bags, 50 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: William Ballow
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-41

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 44.00 ft
LOCATION: Juliette, GA

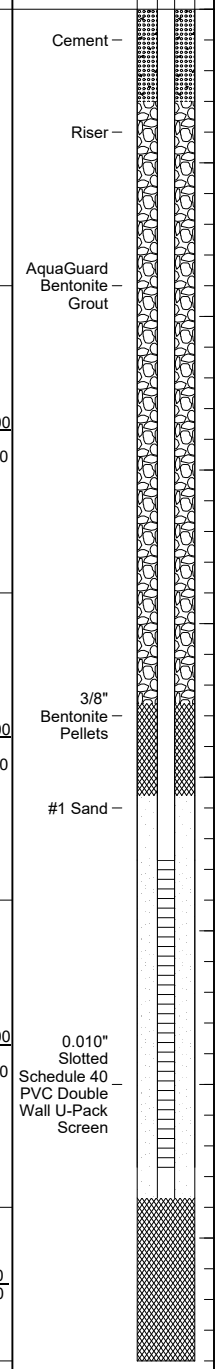
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/26/20
DATE COMPLETED: 1/26/20

NORTHING: 1,118,096.97
EASTING: 2,408,412.15
GS ELEVATION: 431.4
TOC ELEVATION: 434.12 ft

DEPTH W.L.:10.20'
ELEVATION W.L.: 423.65'
DATE W.L.:1/28/2020
TIME W.L.:1025

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES SAMPLE NO.	TYPE	REC
0	430	0.00 - 9.00 Silty CLAY, some micaceous silt, cohesive, red, medium plasticity, w<PL, very stiff	CL-ML		422.4			
10	420	9.00 - 16.00 Silty CLAY, cohesve, tan mottled grey and orange, medium plasticity, stiff, w<PL			9.00 415.4	1	ROTO SONIC	10.00 10.00
15	415	16.00 - 21.00 Silty SAND, some partially weathered rock, non-cohesive, fine sand, highly weathered, tan mottled white brown to grey at 18', loose, moist	SM		16.00 410.4			
20	410	21.00 - 23.00 SAND some silt and gravel, non-cohesive, fine sand, gravel 1"-2" in diameter, grey, loose, dry	SP		21.00 408.4			
25	405	23.00 - 29.00 SAND, non-cohesve, fine sand, grey black, moist to wet, loose to compact			23.00 402.4	2	ROTO SONIC	10.00 10.00
30	400	29.00 - 31.00 SAND, some silt and transitionally weathered rock, non-cohesive, fine sand, highly weathered, 1" diameter gravel, grey, loose, dry to moist			29.00 400.4			
35	395	31.00 - 35.00 SAND, some silt and transitionally weathered rock, non-cohesive, fine sand, cobble sized rock, highly weathered, loose to compact, dry			31.00 396.4	3	ROTO SONIC	10.00 10.00
		35.00 - 39.00 SAND, some silt, non-cohesive, fine sand, grey mottled brown, loose, wet			35.00 392.4			
40	390	39.00 - 43.00 Bedrock, transitionally weathered rock, gneiss and quartz, highly weathered, grey, competent rock 43'-44'	TWR		39.00 388.4	4	ROTO SONIC	5.00 5.00
45	385	43.00 - 44.00 Bedrock, gneiss and quartz, highly weahtered	BR		43.00 387.4			
50		Boring completed at 44.00 ft						

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 27.7'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 27.7' - 37.7'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 25.6' - 37.7'
Type: #1 Sand
Quantity: 4 bags

FILTER PACK SEAL
Interval: 22.6' - 25.6'
Type: 3/8" Bentonite Pellets
Quantity: 1-50lb bag

ANNULUS SEAL
Interval: 3' - 22.6'
Type: AquaGuard Bentonite Grout
Quantity: 2 bags 30 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: Sonic

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-42

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

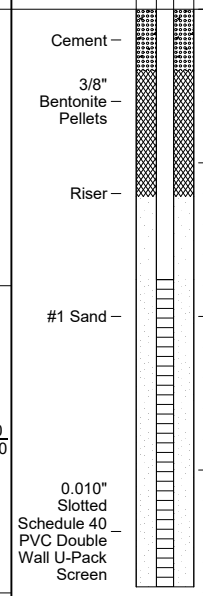
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/27/20
DATE COMPLETED: 1/27/20

NORTHING: 1,118,500.68
EASTING: 2,408,233.53
GS ELEVATION: 402.2
TOC ELEVATION: 405.19 ft

DEPTH W.L.:3.60'
ELEVATION W.L.: 401.49'
DATE W.L.:1/28/2020
TIME W.L.:1020

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	REC
0	400	0.00 - 2.00 Clayey SILT, some organics, cohesive, orange, med plasticity, firm, w~PL	ML		400.2 / 2.00			
		2.00 - 5.00 Clayey SILT, cohesive, grey tan, mottled orange, high plasticity, stiff, w>PL			397.2			
5		5.00 - 6.00 Silty CLAY, cohesive, orange, low plasticity, w>PL, soft	CL-ML		5.00 / 396.2			
	395	6.00 - 8.00 Clayey SILT, some sand, fine sand, non-cohesive, tan, wet, loose	ML		6.00 / 394.2			
		8.00 - 9.00 Silty SAND, medium to fine sand, some clay, non-cohesive, grey, wet, loose	SM		8.00 / 393.2			
10		9.00 - 11.00 Silty SAND, medium to fine sand, some clay, non-cohesive, grey, wet, compact to dense			9.00 / 391.2			
	390	11.00 - 14.00 SAND and transitionally weathered rock, fine sand, highly weathered, some gravel up to 2" in diameter, orange grey withwhite and black mottling, loose, moist to dry	TWR		11.00 / 388.2	1	ROTO SONIC	5.00 / 10.00
15		No recovery past 14', Likely dense TWR that required a lot of water to cut though but breaks it up too much to recover in barrell.			14.00			
	385	Boring completed at 19.00 ft						
20	380							
25	375							
30	370							
35	365							
40	360							
45	355							
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 8.8'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 8.8' - 18.8'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 6.1' - 18.8'
Type: #1 Sand
Quantity: 4 bags

FILTER PACK SEAL
Interval: 2 - 6.1'
Type: 3/8" Bentonite Pellets
Quantity: 1 - 50 lb bag

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-43

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

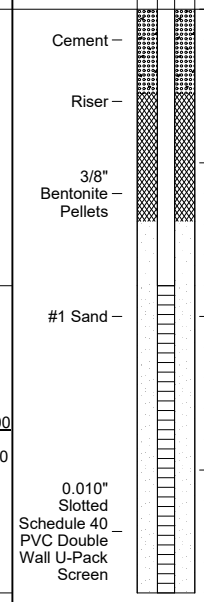
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/26/20
DATE COMPLETED: 1/26/20

NORTHING: 1,118,861.38
EASTING: 2,408,484.42
GS ELEVATION: 398.1
TOC ELEVATION: 400.94 ft

DEPTH W.L.:2.80'
ELEVATION W.L.: 397.89'
DATE W.L.:1/28/2020
TIME W.L.:1015

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: SAMPLE NO.	TYPE	REC
0	398	0.00 - 5.00 Silty CLAY, some organics, cohesive, brown, medium plasticity, w~PL, firm	CL-ML		393.1			
5	395	5.00 - 7.00 Silty CLAY, some organics, cohesive, grey, high plasticity, w>PL, firm			5.00 391.1			
10	390	7.00 - 11.00 Silty SAND, some clay, non-cohesive, medium to fine sand, grey, dense wet	SM		7.00 387.1			
15	385	11.00 - 16.00 SAND, some silt, non-cohesive, some transitionally weathered rock, fine sand, grey, mottled white and red to grey and white, moist, compact to dense, SAPROLITE	TWR		11.00 382.1	1	ROTO SONIC	10.00 / 10.00
20	380	16.00 - 19.00 SAND, some silt, non-cohesive, coarse sand, brown and grey, loose, moist	SP		16.00 379.1			
25	375	Boring completed at 19.00 ft						
30	370							
35	365							
40	360							
45	355							
50	350							

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 9'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 9' - 19'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 6.9' - 19'
Type: #1 Sand
Quantity: 4 bags

FILTER PACK SEAL
Interval: 2.75' - 6.9'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gallon bucket

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

Well Decommissioned May 20-21 2020

RECORD OF BOREHOLE GWA-44

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 19.00 ft
LOCATION: Juliette, GA

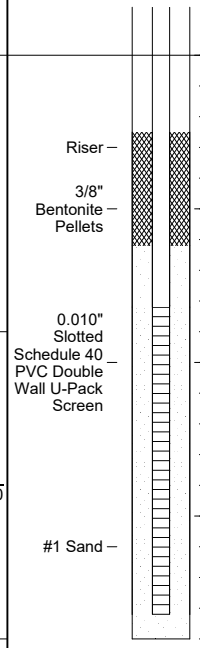
DRILL RIG: Terrasonic 150C
DATE STARTED: 1/27/20
DATE COMPLETED: 1/27/20

NORTHING: 1,119,303.20
EASTING: 2,408,629.39
GS ELEVATION: 396.58
TOC ELEVATION: 399.33 ft

DEPTH W.L.:1.40'
ELEVATION W.L.: 397.93'
DATE W.L.:1/28/2020
TIME W.L.:1010

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES: SAMPLE NO.	SAMPLES: TYPE	SAMPLES: REC
0	395	0.00 - 2.00 Silty CLAY, cohesive, some micaceous silt and organics, brown, high plasticity, w~PL, firm	CL-ML		394.58			
		2.00 - 7.00 Clayey SILT, cohesive, some organics, low plasticity, brown, soft, w>PL	ML		2.00 389.58			
5	390	7.00 - 9.00 Clayey Sandy SILT, cohesive, fine sand, medium plasticity, grey mottled orange and brown, stiff to very stiff, w>PL	MLS		7.00 387.58			
		9.00 - 10.00 Silty SAND, fine sand, non-cohesive, grey mottled black and brow, dense to very dense, moist to wet	SM		9.00 386.58			
10	385	10.00 - 19.00 Bedrock, gneiss with some quartz and feldspar, well foliated, coarse grained, partially weathered, some fractures, black and grey with white spots	BR		10.00	1	ROTO SONIC	7.00 / 10.00
15	380							
					377.58			
20	375	Boring completed at 19.00 ft						
25	370							
30	365							
35	360							
40	355							
45	350							
50								

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 8.2'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 8.2' - 18.2'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 6.2' - 18.2'
Type: #1 Sand
Quantity: 3 bags

FILTER PACK SEAL
Interval: 2.5' - 6.2'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gal bucket

ANNULUS SEAL
Interval: N/A
Type: N/A
Quantity: N/A

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: Darren Cox
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-44A

SHEET 1 of 1

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 20.80 ft
LOCATION: Juliette, GA

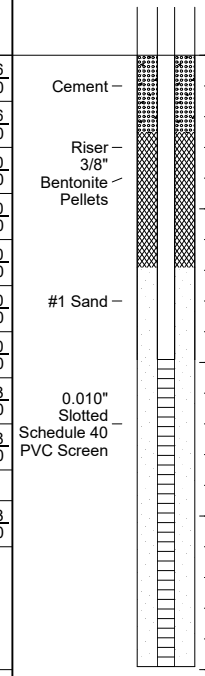
DRILL RIG: CME 550
DATE STARTED: 5/20/20
DATE COMPLETED: 5/21/20

NORTHING: 1,119,296.99
EASTING: 2,408,569.76
GS ELEVATION: 396.5
TOC ELEVATION: 399.62 ft

DEPTH W.L.:4.1'
ELEVATION W.L.: 392.4
DATE W.L.:5/21/2020
TIME W.L.:0800

DEPTH (ft)	ELEVATION (ft)	DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in (140 lb hammer 30 inch drop)	N-VALUE	REC
0	395	0.00 - 3.50 CLAY, high plasticity, red-brown, cohesive, w>pl, very stiff, residuum	CH		393	1	SPT	3-3-3	6	0.66 / 1.50
						2	SPT	5-5-6	11	0.66 / 1.50
5	390	3.50 - 7.50 Sandy CLAY, fine sand, mottled grey-brown, high plasticity, cohesive, w>pl, very stiff, residuum	CL		3.50 389	3	SPT	WH-5-4	9	1.50 / 1.50
						4	SPT	3-4-6	10	1.50 / 1.50
						5	SPT	5-6-6	12	1.50 / 1.50
		7.50 - 9.00 Sandy CLAY, fine sand, mottled grey-brown, increasing sand with depth, high plasticity, cohesive, w>pl, very stiff, residuum	ML		7.50 387.5	6	SPT	5-6-7	13	1.50 / 1.50
10	385		SC		9.00 386	7	SPT	5-6-50/4	56/10	1.30 / 1.50
		9.00 - 10.50 Clayey SAND, grey-white, fine grained sand, high plasticity fines, trace coarse gravel, non-cohesive, moist, very dense			10.50	8	SPT	50/4	50/4	0.33 / 1.50
						9	SPT	50/1	50/1	0.08 / 1.50
		10.50 - 20.80 SAND, fine to medium, grey-white, non-cohesive, moist to wet, oxidation from 14.5-16 feet, very dense	SP							
15	380					10	SPT	50/3	50/3	0.83 / 1.50
20	375				375.7	13	SPT	31-50/4	81/10	0.25 / 1.50
		Boring completed at 20.80 ft								
25	370									
30	365									
35	360									
40	355									
45	350									
50										

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 9.5'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 9.9' - 19.9'
Material: Schedule 40 PVC
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 4"

FILTER PACK
Interval: 6.9' - 19.9'
Type: #1 Sand
Quantity: 6 bags

FILTER PACK SEAL
Interval: 2.5' - 6.9'
Type: 3/8" Bentonite Pellets
Quantity: 2-5 gal bucket

ANNULUS SEAL
Interval: 0' - 2.5'
Type: Portland Cement/Bentonite Powder/Water
Quantity: 0.25 bag (46.2 lb) Portland/ 0.25 bag (50 lb) Bentonite/7.5 gallons Water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Hollow Stem Auger
Rock Drill: N/A

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: SCS Drilling Services
DRILLER: Jim Castelberry

GA INSPECTOR: Heather Brissey
CHECKED BY: Timothy Richards, PG
DATE: 6/4/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

RECORD OF BOREHOLE GWA-54

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 59.00 ft
LOCATION: Juliette, GA

DRILL RIG: Terrasonic 150C
DATE STARTED: 12/21/19
DATE COMPLETED: 12/21/19

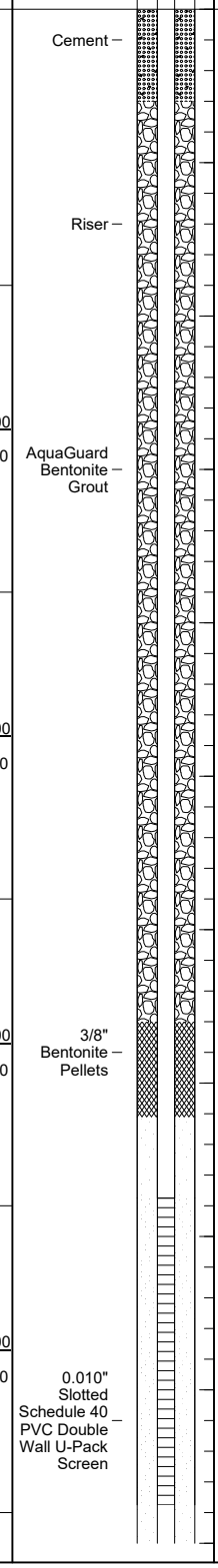
NORTHING: 1,117,751.40
EASTING: 2,408,588.52
GS ELEVATION: 448.6
TOC ELEVATION: 451.49 ft

DEPTH W.L.:25.65'
ELEVATION W.L.: 425.76'
DATE W.L.:1/28/2020
TIME W.L.:815

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE DESCRIPTION	USCS	GRAPHIC LOG	ELEV. / DEPTH (ft)	SAMPLES SAMPLE NO.	SAMPLES TYPE	SAMPLES REC
0	445	0.00 - 5.00 CLAY, some micaceous silt, brownish orange, fat clay, cohesive, med to high plasticity, stiff to very stiff, w>PL	CH		443.6			
5		5.00 - 7.00 Clayey SILT, micaceous silt with clay, some fine sand, dark orange-brown, cohesive, low plasticity, firm, w>PL	ML		5.00 441.6			
	440	7.00 - 9.00 Silty SAND, fine sand with silt, some medium sand, trace clay, dark orange brown and tan, non-cohesive, dry	SM		7.00 439.6			
10		9.00 - 10.00 CLAY, some silt, red-brown some dark red-brown, fat clay, cohesive, high plasticity, soft w>PL	CH		9.00 438.6			
	435	10.00 - 19.00 Sandy SILT, silt wth some cay and fine sand, some medium sand, moderate foliation 10'-11' and 17'-18', light grey brown, mottled tan and white, some black, micaceous slt, dark grey and grey & whie, 17'-18' mottled tan, orange, white, 10'-11' moist, loose, dry	MLS		10.00 429.6	1	ROTO SONIC	10.00 10.00
20	430	19.00 - 22.00 Silty SAND, micaceous silt, fine to coarse feldspar & quartz sand, poorly sorted, grey and grey-brown mottled tan, white, dark grey, trace gravel, moderately foliated, gneissic SAPROLITE, dry, loose to compact, non-cohesive	SM		19.00 426.6			
	425	22.00 - 29.00 Clayey SILT and fine sand, some medium sand, moderately foliated biotite gneiss SAPROLITE, brown and grey mottled white, tan, black some dark brown staining, mostly cohesive, low to no plasticity, w<PL, sands moist to dry	ML		22.00 419.6	2	ROTO SONIC	10.00 10.00
30	420	29.00 - 32.00 SAND gravelly SAND, fine to medium, some coarse, with gneiss gravel, some cobble sized pieces, transitionally weathered rock, grey, dry	TWR		29.00 416.6			
	415	32.00 - 39.00 GNEISS, biotite, feldspar, quartz, moderately well foliated, heavy to slightly weathered, separated by partially weathered rock above, PWR still dry, 38-39 wet and fractured with some staining, black white, tan, with some orange and brown			32.00 409.6	3	ROTO SONIC	10.00 10.00
40	410	39.00 - 59.00 Bedrock, GNEISS, biotite, mica, feldspar, quartz, well foliated, black to white with some tan, fractured with some orange staining along fractures, slightly weathered	BR		39.00			
	405					4	ROTO SONIC	10.00 10.00
50	400					5	ROTO	

Log continued on next page

MONITORING WELL DIAGRAM and NOTES



WELL CONSTRUCTION DETAILS

WELL CASING
Interval: 0' - 38.75'
Material: Schedule 40 PVC
Diameter: 2"
Joint Type: Flush/Threaded

WELL SCREEN
Interval: 38.75' - 48.75'
Material: Schedule 40 PVC Double Wall U-Pack Screen
Diameter: 3"x2"
Slot Size: 0.010"
End Cap: 3"

FILTER PACK
Interval: 36.10' - 59'
Type: #1 Sand
Quantity: 5 bags

FILTER PACK SEAL
Interval: 33 - 36.10'
Type: 3/8" Bentonite Pellets
Quantity: 1-5 gal bucket

ANNULUS SEAL
Interval: 3' - 33'
Type: AquaGuard Bentonite Grout
Quantity: 3 bags, 35 gallons water

WELL COMPLETION
Pad: 4'x4' Concrete Pad
Protective Casing: Aluminum

DRILLING METHODS
Soil Drill: Sonic
Rock Drill: Sonic

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: William Ballow
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

RECORD OF BOREHOLE GWA-54

PROJECT: Plant Scherer Cell 3
PROJECT NUMBER: 19127819
DRILLED DEPTH: 59.00 ft
LOCATION: Juliette, GA

DRILL RIG: Terrasonic 150C
DATE STARTED: 12/21/19
DATE COMPLETED: 12/21/19

NORTHING: 1,117,751.40
EASTING: 2,408,588.52
GS ELEVATION: 448.6
TOC ELEVATION: 451.49 ft

DEPTH W.L.:25.65'
ELEVATION W.L.: 425.76'
DATE W.L.:1/28/2020
TIME W.L.:815

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE: DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLES: SAMPLE NO.	SAMPLES: TYPE	SAMPLES: REC	MONITORING WELL DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
50		39.00 - 59.00 Bedrock, GNEISS, biotite, mica, feldspar, quartz, well foliated, black to white with some tan, fractured with some orange staining along fractures, slightly weathered *(Continued)*	BR			5	SONIC ROTO 10.00 SONIC 10.00		#1 Sand	**WELL CASING** Interval: 0' - 38.75' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Threaded **WELL SCREEN** Interval: 38.75' - 48.75' Material: Schedule 40 PVC Double Wall U-Pack Screen Diameter: 3"x2" Slot Size: 0.010" End Cap: 3" **FILTER PACK** Interval: 36.10' - 59' Type: #1 Sand Quantity: 5 bags **FILTER PACK SEAL** Interval: 33 - 36.10' Type: 3/8" Bentonite Pellets Quantity: 1-5 gal bucket **ANNULUS SEAL** Interval: 3' - 33' Type: AquaGuard Bentonite Grout Quantity: 3 bags, 35 gallons water **WELL COMPLETION** Pad: 4'x4' Concrete Pad Protective Casing: Aluminum **DRILLING METHODS** Soil Drill: Sonic Rock Drill: Sonic
55	395									
60	390	Boring completed at 59.00 ft			389.6					
65	385									
70	380									
75	375									
80	370									
85	365									
90	360									
95	355									
100	350									

LOG SCALE: 1 in = 6.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Ike Young

GA INSPECTOR: William Ballow
CHECKED BY: Timothy Richards, PG
DATE: 3/6/20

GOLDER

BOREHOLE RECORD SCHERER CELL 3 BORING LOGS_SURVEY UPDATED.GPJ PIEDMONT.GDT 9/17/20

APPENDIX A

Driller Bonds

PERFORMANCE BOND FOR WATER WELL CONTRACTORS
AND DRILLERS Bond No. 4993104

WATER WELL CONTRACTOR OR DRILLER ______

KNOW ALL MEN BY THESE PRESENTS,

That we SOUTHERN COMPANY SERVICES, INC. , as Principal, and SAFECO INSURANCE COMPANY OF AMERICA , as Surety, are held and firmly bound unto the Director of the Environmental Protection Division ("Director"), Department of Natural Resources, State of Georgia and his successor or successors in office, as Obligee, in the full sum of TEN THOUSAND & No/100 Dollars ($10,000.00), for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Water Well Standards Act of 1985 (Ga. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption, or modification.

This bond shall be effective from date of issuance or, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obligee; provided that the rights of the Obligee and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2003

IN WITNESS WHEREOF the Principal and Surety have caused these presents to be duly signed and sealed, this 30th day of October , 2001 .

Principal, By: _____ (L.S.)

Title: SAM H. DABBS, JR.
ASSISTANT SECRETARY

Approved as to sufficiency and accepted:

Environmental Protection Division,

Department of Natural Resources

SAFECO INSURANCE COMPANY OF AMERICA

Surety, By: _____ (L.S.)
Sandra J. Mathis, Attorney-In-Fact

SAFECO

POWER OF ATTORNEY

SAFECO INSURANCE COMPANY OF AMERICA
GENERAL INSURANCE COMPANY OF AMERICA
HOME OFFICE: SAFECO PLAZA
SEATTLE, WASHINGTON 98185

No. 6724

KNOW ALL BY THESE PRESENTS:

That SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA, each a Washington corporation, does each hereby appoint

*****SANDRA S. CARTER; JUDY GAY CERA; GARY D. EKLUND; JUDY S. FLEMING; VIRGINIA B. MCMANUS; BARBARA S. MACARTHUR; SANDRA J. MATHIS; EDWARD L. MITCHELL; NANCY NIX; BARBARA THOMPSON; CYNTHIA I. RODOLPH; Atlanta, Georgia**********

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and GENERAL INSURANCE COMPANY OF AMERICA have each executed and attested these presents

this 2nd day of February, 2001

R A Pierson
R.A. PIERSON, SECRETARY

Boh A Dickey
BOH A. DICKEY, PRESIDENT

CERTIFICATE

Extract from the By-Laws of SAFECO INSURANCE COMPANY OF AMERICA
and of GENERAL INSURANCE COMPANY OF AMERICA:

"Article V, Section 13. - FIDELITY AND SURETY BONDS ... the President, any Vice President, the Secretary, and any Assistant Vice President appointed for that purpose by the officer in charge of surety operations, shall each have authority to appoint individuals as attorneys-in-fact or under other appropriate titles with authority to execute on behalf of the company fidelity and surety bonds and other documents of similar character issued by the company in the course of its business... On any instrument making or evidencing such appointment, the signatures may be affixed by facsimile. On any instrument conferring such authority or on any bond or undertaking of the company, the seal, or a facsimile thereof, may be impressed or affixed or in any other manner reproduced; provided, however, that the seal shall not be necessary to the validity of any such instrument or undertaking."

Extract from a Resolution of the Board of Directors of SAFECO INSURANCE COMPANY OF AMERICA
and of GENERAL INSURANCE COMPANY OF AMERICA adopted July 28, 1970.

"On any certificate executed by the Secretary or an assistant secretary of the Company setting out,

(i) The provisions of Article V, Section 13 of the By-Laws, and
(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
(iii) Certifying that said power-of-attorney appointment is in full force and effect,

the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof."

I, R.A. Pierson, Secretary of SAFECO INSURANCE COMPANY OF AMERICA and of GENERAL INSURANCE COMPANY OF AMERICA, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power of Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power of Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

this 30th day of October, 2001

SAFECO INSURANCE COMPANY OF AMERICA CORPORATE SEAL 1953 STATE OF WASHINGTON

GENERAL INSURANCE COMPANY OF AMERICA CORPORATE SEAL 1929 State of Washington

R A Pierson
R.A. PIERSON, SECRETARY

® Registered trademark of SAFECO Corporatio
2/7/01 PC

AND DRILLERS BOND NO. 1450-17-087281

WATER WELL CONTRACTOR OR DRILLER QORE, INC.

KNOW ALL MEN BY THESE PRESENTS.

That we Qore, Inc., as Principal, and Employers Insurance of Wausau, A Mutual Company, as Surety, are held and firmly bound unto the Director of the Environmental Protection Division ("Director"), Department of Natural Resources, State of Georgia and his successor or successors in office, as Obligee, in the full sum of Ten Thousand and No/100 Dollars ($ 10,000.00) for the payment of which well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

WHEREAS, the Water Well Standards Act of 1985 (Ga. Laws 1985, p. 1192) (the "Act") requires that water well contractors and drillers file performance bonds with the Director to ensure compliance with the Act; and

WHEREAS, the above bound principal is subject to the terms and provisions of said Act.

NOW, THEREFORE, the conditions of this obligation are such that if the above bound Principal shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the Act as now or hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in any way discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption, or modification.

This bond shall be effective from date of issuance or, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obligee; provided that the rights of the Obligee and beneficiaries under this bond which arose prior to such termination shall continue.

Unless sooner terminated, this bond shall terminate June 30, 2003

IN WITNESS WHEREOF the Principal and Surety have caused these presents to be duly signed and sealed, this 15th day of May, 2001.

QORE, INC.
Principal, By: (L.S.)

Approved as to sufficiency and accepted:

Environmental Protection Division,

Department of Natural Resources

EMPLOYERS INSURANCE OF WAUSAU, A MUTUAL COMPANY
Surety, By: Barbara S. MacArthur (L.S.)
Barbara S. MacArthur, Attorney-in-Fact

Western Surety Company

CONTINUATION CERTIFICATE

Western Surety Company hereby continues in force Bond No. 68616636

briefly described as Water Well Contractor

for EVERETT ENVIRONMENTAL, INC.

, as Principal,

in the sum of $TEN THOUSAND AND NO/100 Dollars, for the term beginning

July 01, 2002, and ending June 30, 2003, subject to all

the covenants and conditions of the original bond referred to above.

This continuation is issued upon the express condition that the liability of Western Surety Company under said Bond and this and all continuations thereof shall not be cumulative and shall in no event exceed the total sum above written.

Dated this 07 day of March, 2002.

WESTERN SURETY COMPANY

By Stephen T. Pate

Stephen T. Pate, Executive Vice President

WESTERN SURETY COMPANY CORPORATE SEAL SOUTH DAKOTA

THIS "Continuation Certificate" MUST BE FILED WITH THE ABOVE BOND.

Form 90-A-4-2001

CNA SURETY

Transaction Report & Invoice

CNA SURETY
101 SO. PHILLIPS AVENUE
SIOUX FALLS, S.D. 57192

Principal Information: ID: 003019252
EVERETT ENVIRONMENTAL, INC.
P.O. BOX 763
ARMUCHEE, GA 30105-0763

STARR-MATHEWS AGENCY INC
P O BOX 1642
ROME GA 30162-1642

RECEIVED
8
STARR-MATHEWS AGENCY
ROME, GA 30161

Agency Code: 10-01912

Transaction Description: RENEWAL
Transaction Effective Date: 07/01/2002

Number: 68616636

SF

Written By: WESTERN SURETY COMPANY
Description: WATER WELL CONTRACTOR

Obligee: DEPT. OF NATURAL RESOURCES
205 BUTLER ST., STE. 1366
ATLANTA, GA 30334

Effective Date: 07-01-2002
Expiration Date: 06-30-2003
Current Penalty: $10,000.00
Renewal Method: CC

PREMIUM	$200.00	@ 20.000%
Gross Premium Charge:	$200.00	
Commission Amount:	$40.00	
Net Premium Due:	$160.00	

Change Detail:

Agent: You may remove stub below to use as a billing/ credit invoice

CNA Surety

INVOICE

FILE NO.	EFFECTIVE DATE	ANNIVERSARY DATE	PROCESS DATE	PENALTY
0601 68616636	07-01-02	06-30-03	03-07-02	$10,000.00

PRINCIPAL EVERETT ENVIRONMENTAL, INC.
P.O. BOX 763 ARMUCHEE, GA 30105-0763

RISK STATE GA [redacted] SF
DESCRIPTION WATER WELL CONTRACTOR

OBLIGEE STATE OF GEORGIA

AGENCY CODE 10-01912 CHARGE $200.00

Your agent is:

STARR-MATHEWS AGENCY INC
P O BOX 1642
ROME GA 30162-1642

Western Surety Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:

That WESTERN SURETY COMPANY, a corporation organized and existing under the laws of the State of South Dakota, and authorized and licensed to do business in the States of Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming, and the United States of America, does hereby make, constitute and appoint

Stephen T. Pate of Sioux Falls,
State of South Dakota, its regularly elected Executive Vice President,
as Attorney-in-Fact, with full power and authority hereby conferred upon him to sign, execute, acknowledge and deliver for and on its behalf as Surety and as its act and deed, all of the following classes of documents to-wit:

Indemnity Surety and undertakings that may be desired by contract, or may be given in any action or proceeding in any court of law or equity, policies indemnifying employers against loss or damage caused by the misconduct of their employees; official, bail, and surety and fidelity bonds. Indemnity in all cases where indemnity may be lawfully given; and with full power and authority to execute consents and waivers to modify or change or extend any bond or document executed for this Company, and to compromise and settle any and all claims or demands made or existing against said Company.

Western Surety Company further certifies that the following is a true and exact copy of Section 7 of the by-laws of Western Surety Company duly adopted and now in force, to-wit:

Section 7. All bonds, policies, undertakings, Powers of Attorney, or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys-in-Fact or agents who shall have authority to issue bonds, policies, or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile.

In Witness Whereof, the said WESTERN SURETY COMPANY has caused these presents to be executed by its Executive Vice President with the corporate seal affixed this 07 day of March 2002

ATTEST
L. Nelson
Assistant Secretary

WESTERN SURETY COMPANY
By Stephen T. Pate
Stephen T. Pate, Executive Vice President

STATE OF SOUTH DAKOTA }
COUNTY OF MINNEHAHA } ss

On this 07 day of March, 2002, before me, a Notary Public, personally appeared Stephen T. Pate and L. Nelson who, being by me duly sworn, acknowledged that they signed the above Power of Attorney as Executive Vice President and Assistant Secretary, respectively, of the said WESTERN SURETY COMPANY, and acknowledged said instrument to be the voluntary act and deed of said Corporation.

D. KRELL
NOTARY PUBLIC
SOUTH DAKOTA
SEAL SEAL

My Commission Expires November 30, 2006

D. Krell
Notary Public

Form F1875-4-2001

Cells 1 & 2

COPY

Bond Number K08315607

Performance Bond For Water Well Contractors And Drillers

Name of Water Well Contractor or Driller Michael C. Rice/Cascade Drilling, L.P.

Know All Men By These Present

That we Michael C. Rice/Cascade Drilling, L.P. AND ANY AND ALL EMPLOYEES, OFFICERS AND PARTNERS, as Principal, and Westchester Fire Insurance Company as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Obligee, in the full sum of **TWENTY THOUSAND AND NO/00 DOLLARS ($20.000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985, p. 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon sixty (60) days written notice to Principal and Obligee; provided that the rights of the obligee and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective 9/20/13 and unless sooner terminated, this bond shall terminate June 30, 2015. In Witness Thereof the Principal and Surety have caused these present to be duly signed and sealed, this 20th day of, September 2013.

Michael C. Rice/Cascade Drilling, L.P.

PRINCIPAL, BY _____ (L.S.) TITLE: _____

Westchester Fire Insurance Company

SURETY BY: Roxana Palacios

Roxana Palacios, Attorney-in-Fact

GEORGIA REGISTERED AGENT N/A SEAL:

Revised December 2012

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

S-0157/GEEF 11/99

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

By: KD Riley
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, 2014.

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.

CONTINUATION CERTIFICATE

Cells 9 & 10

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

S-0157/GEEF 11/99

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 Kieldosty; 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.

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, l… currency rate, interest rate or resi… …l value guarantees. …er of credit,

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.

Southern Company Services, Inc.
30 Ivan Allen Jr. Boulevard NW
Atlanta, Georgia 30308

SOUTHERN COMPANY
Energy to Serve Your World®

May 2, 2011

Mr. Tony McCook
Georgia Geologic Survey
19 Martin Luther King Jr. Dr. SW
Room 400
Atlanta, GA 30334

Re: Performance Bond for Water Well Contractors and Drillers
Safeco Bond #4993104

Attached is the original signed Continuation Certificate for the above referenced bond on behalf of Southern Company Services, Inc. This certificate keeps this bond in force until June 30, 2012.

Please let us know if you need additional information.

Sincerely,

Clementine Broaders

Clementine Broaders
Southern Company Services, Inc.
Risk Management Department

/cb

Enclosure

cc: Stacy Sprayberry, SCS

Liberty Mutual.

CONTINUATION CERTIFICATE

SAFECO Insurance Company of America, Surety upon

a certain Bond No. **4993104**

dated effective **June 30, 2005**
(MONTH-DAY-YEAR)

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

and in favor of **State of Georgia - Dept. of Natural Resources**
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on **June 30, 2011**
(MONTH-DAY-YEAR)

and ending on **June 30, 2012**
(MONTH-DAY-YEAR)

Amount of bond **$10,000.00**

Description of bond **License 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 21, 2011**
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By Barbara S. MacArthur

Barbara S. MacArthur, Attorney-In-Fact

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

4178633

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.

SAFECO INSURANCE COMPANY OF AMERICA
SEATTLE, WASHINGTON
POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS: That Safeco Insurance Company of America (the "Company"), a Washington stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint VIRGINIA B. MCMANUS, GARY D. EKLUND, BARBARA S. MACARTHUR, CHAUN M. WILSON, MICHAEL F. YADACH, ALL OF THE CITY OF ATLANTA, STATE OF GEORGIA

, 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 the penal sum not exceeding ONE HUNDRED MILLION AND 00/100***** ****** DOLLARS ($ 100,000,000.00********** ******), each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

ARTICLE IV - Execution of Contracts: Section 12. Surety Bonds and Undertakings.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitations 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 by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article IV, Section 12 of the By-laws, Garnet W. Elliott, Assistant Secretary of Safeco Insurance Company of America, is authorized to 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.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Safeco Insurance Company of America has been affixed thereto in Plymouth Meeting, Pennsylvania this 14th day of October 2010.

SAFECO INSURANCE COMPANY OF AMERICA

By Garnet W. Elliott
Garnet W. Elliott, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 14th day of October 2010, before me, a Notary Public, personally came Garnet W. Elliott, to me known, and acknowledged that he is an Assistant Secretary of Safeco Insurance Company of America; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Safeco Insurance Company of America thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires Mar. 28, 2013
Member, Pennsylvania Association of Notaries

By Teresa Pastella
Teresa Pastella, Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of 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, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article IV, Section 12 of the By-laws of Safeco Insurance Company of America.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Safeco Insurance Company of America at a meeting duly called and held on the 18th day of September, 2009.

VOTED that the 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.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 21st day of April, 2011.

David M. Carey, Assistant Secretary

Not valid for mortgage, note, bank deposit, 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.

MARSH

Barbara S. MacArthur
Assistant Vice President

Marsh USA Inc.
3560 Lenox Road, NE, Ste. 2400
Atlanta, GA 30326
404 995 2776 FAX: 404 760 5673
Barbara.Macarthur@marsh.com
www.marsh.com

April 21, 2011

RECEIVED
APR 2 6 2011
Risk Management Department

Ms. Clementine B. Broaders
Southern Company Services
30 Ivan Allen Jr. Blvd. NW
Bin SC1404
Atlanta, GA 30308

Subject: **Renewal Continuation Certificate**
Principal: **Southern Company Services, Inc.**
Obligee: **State of Georgia - Dept. of Natural Resources**
Bond Description: **License Bond - Water Well Contractors & Drillers**
Bond Amount: **$ 10,000.00**
Bond Number: **4993104**
Indemnity: **The Southern Company (Parental)**

Dear C.B.:

I am enclosing your continuation certificate for the above-referenced bond. I ask that you recheck the continuation certificate for accuracy before you file it with the obligee.

We will be sending you our invoice for the renewal premium due for this transaction in the amount of $100.00. Marsh will receive 27.50 % of this amount from the surety company. Your payment of this invoice constitutes your agreement to our compensation for this bond.

In the event that your organization no longer requires this bond, please return the enclosed documents to Marsh so that we may advise the surety company that this bond is no longer required and obtain a clean flat cancellation on this bond on your behalf.

If you have any questions, please feel free to contact me. Thank you for allowing Marsh to service your surety needs.

Best regards,

Barbara S. MacArthur
Assistant Vice President

Enclosure

/bsm

MARSH

BMA

Marsh USA Inc.
Atlanta, GA - 242
(404) 995-3000

Invoice No.
382424

Date: 4/21/11

Southern Company Services, Inc
RM Dept - BIN SC1404
30 Ivan Allen Jr. Blvd NW
Atlanta, GA 30308

Effective Date	Expiration Date	Client No.
6/30/11	6/30/12	J21970

Policyholder: Southern Compa

ORIGINAL Billing Effective Date: 6/30/11

Insurer	Policy No.	Type of Coverage / Item	Amount
SAFECO	4993104	MISC SURETY PREMIUM	100.00
		REMIT IN: UNITED STATES DOLLARS	
		RENEWAL Principal(s): Southern Company Services, Inc. Obligee(s): Georgia - Dept. of Natural Resources Bond Amount: $10,000.00 Bond Type - Water Well Contractors & Drillers Requester: Clementine B. Broaders Thank you! MacArthur/Atlanta/Surety	
Please indicate Invoice # 382424 on your remittance to: Marsh USA Inc. P.O. Box 100357 Atlanta, GA 30384-0357		TOTAL:	100.00

Invoice Is Payable In Full Upon Receipt

Marsh earns and retains interest income on premium payments held by Marsh on behalf of insurers during the period between receipt of such payments from clients and the time such payments are remitted to the applicable insurer, where permitted by law.

Liberty Mutual.

CONTINUATION CERTIFICATE

SAFECO Insurance Company of America, Surety upon

a certain Bond No. **4993104**

dated effective **June 30, 2005**
(MONTH-DAY-YEAR)

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

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

(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on **June 30, 2011**
(MONTH-DAY-YEAR)

and ending on **June 30, 2012**
(MONTH-DAY-YEAR)

Amount of bond **$10,000.00**

Description of bond **License 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 21, 2011**
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By Barbara S. MacArthur

Barbara S. MacArthur, Attorney-In-Fact

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND. 4178633

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.

SAFECO INSURANCE COMPANY OF AMERICA
SEATTLE, WASHINGTON
POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS: That Safeco Insurance Company of America (the "Company"), a Washington stock insurance company, pursuant to and by authority of the By-law and Authorization hereinafter set forth, does hereby name, constitute and appoint **VIRGINIA B. MCMANUS, GARY D. EKLUND, BARBARA S. MACARTHUR, CHAUN M. WILSON, MICHAEL F. YADACH, ALL OF THE CITY OF ATLANTA, STATE OF GEORGIA**

, 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 the penal sum not exceeding ONE HUNDRED MILLION AND 00/100**** ****** DOLLARS ($ 100,000,000.00**********) each, and the execution of such undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents, shall be as binding upon the Company as if they had been duly signed by the president and attested by the secretary of the Company in their own proper persons.

That this power is made and executed pursuant to and by authority of the following By-law and Authorization:

ARTICLE IV - Execution of Contracts: Section 12. Surety Bonds and Undertakings.
Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitations 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 by the secretary.

By the following instrument the chairman or the president has authorized the officer or other official named therein to appoint attorneys-in-fact:

Pursuant to Article IV, Section 12 of the By-laws, Garnet W. Elliott, Assistant Secretary of Safeco Insurance Company of America, is authorized to 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.

That the By-law and the Authorization set forth above are true copies thereof and are now in full force and effect.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Company and the corporate seal of Safeco Insurance Company of America has been affixed thereto in Plymouth Meeting, Pennsylvania this 14th day of October, 2010.

SAFECO INSURANCE COMPANY OF AMERICA

By Garnet W. Elliott
Garnet W. Elliott, Assistant Secretary

COMMONWEALTH OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 14th day of October, 2010, before me, a Notary Public, personally came Garnet W. Elliott, to me known, and acknowledged that he is an Assistant Secretary of Safeco Insurance Company of America; that he knows the seal of said corporation; and that he executed the above Power of Attorney and affixed the corporate seal of Safeco Insurance Company of America thereto with the authority and at the direction of said corporation.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.

Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires Mar. 29, 2013
Member, Pennsylvania Association of Notaries

By Teresa Pastella
Teresa Pastella, Notary Public

CERTIFICATE

I, the undersigned, Assistant Secretary of 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, is in full force and effect on the date of this certificate; and I do further certify that the officer or official who executed the said power of attorney is an Assistant Secretary specially authorized by the chairman or the president to appoint attorneys-in-fact as provided in Article IV, Section 12 of the By-laws of Safeco Insurance Company of America.

This certificate and the above power of attorney may be signed by facsimile or mechanically reproduced signatures under and by authority of the following vote of the board of directors of Safeco Insurance Company of America at a meeting duly called and held on the 18th day of September, 2009.

VOTED that the 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.

IN TESTIMONY WHEREOF, I have hereunto subscribed my name and affixed the corporate seal of the said company, this 21st day of April, 2011.

David M. Carey, Assistant Secretary

Not valid for mortgage, note, letter of credit, bank deposit, 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.

Bond Number KO8416809

Performance Bond For Water Well Contractors And Drillers

Name of Water Well Contractor or Driller Michael C. Rice dba Boart Longyear Company

Know All Men By These Present.
That we Michael C. Rice dba Boart Longyear Company and any and all Employees, Officers and Partners, as Principal, and Westchester Fire Insurance Company as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Obligee, in the full sum of **TWENTY THOUSAND AND NO/OO DOLLARS ($20.000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985.P 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance or, in the case of a water well contractor, date of licensure and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon 60 days written notice to Principal and Obligee; provided that the rights of the obligee and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective July 1, 2010 and unless sooner terminated, this bond shall terminate June 30, 2011. In Witness Thereof the Principal and Surety have caused these present to be duly signed and sealed, this 6th day of, July 20 10 .

Michael C. Rice dba Boart Longyear Company

PRINCIPAL, BY _____ (L.S.)

TITLE: Franchise Manager

Westchester Fire Insurance Company

SURETY BY: Cynthia L. Choren

Cynthia L. Choren, Attorney-In-Fact Non-Resident License No. 747470

GEORGIA REGISTERED AGENT N/A SEAL:

ACKNOWLEDGMENT BY SURETY

STATE OF Missouri }
County of St. Charles } ss.

On this 6th day of July, 2010, before me personally appeared Cynthia L. Choren, known to me to be the Attorney-in-Fact of Westchester Fire Insurance Company, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.

Debra C. Schneider
Notary Public in the State of Missouri
County of St. Charles

My Commission Expires: November 5, 2011

(Seal)

DEBRA C. SCHNEIDER
Notary Public/Notary Seal
State of Missouri
St. Charles County
COMMISSION #07419088
My Commission Expires: 11/05/2011

Power of Attorney

WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the State of New York, having its principal office in the City of Atlanta, Georgia pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

(1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.

(2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.

(3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

FURTHER RESOLVED, that the Resolution of the Board of Directors of the Company adopted at the meeting held on November 8, 1999 relating to the authorization of certain persons to execute, for and on behalf of the Company, Written Commitments and appointments and delegations, is hereby rescinded.

Does hereby nominate, constitute and appoint Cynthia L Choren, Debra C Schneider, Heidi A Notheisen, JoAnn R Frank, Karen L Roider, Pamela A Beelman, Sandra L Ham, all of the City of SAINT LOUIS, Missouri, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Twenty million dollars & zero cents ($20,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office.

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 1 day of December 2009.

WESTCHESTER FIRE INSURANCE COMPANY

Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PHILADELPHIA ss.

On this 1 day of December, A.D. 2009 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
KAREN E. BRANDT, Notary Public
City of Philadelphia, Phila. County
My Commission Expires September 26, 2010

Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 6th day of July, 2010.

William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 01, 2011.

CLIENT'S COPY

SURETY BOND CONTINUATION CERTIFICATE

TO: State of Georgia
Division of Environmental Protection
2 Martin Luther King Jr. Drive SE
Suite 1252
Atlanta, GA 30334

To be attached to and form a part of: Performance Bond for Well Contractors and Drillers

Principal on the Bond: Michael C. Rice/Cascade Drilling, L.P.

Surety Bond Number: K08315607

Bond Amount: Twenty Thousand and 00/100 Dollars ($20,000.00)

In consideration of the agreed premium charged for this bond, it is understood and agreed that the following change shall be made to this obligation:

[x] **CONTINUATION CERTIFICATE**

This certificate extends the life of the bond to June 30, 2017. It is executed upon the express condition that the surety's liability under said bond, together with this and all previous continuation certificates, shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond.

Signed, sealed and dated this 26th day of May , 2015 .

Westchester Fire Insurance Company

By: Katie J

Katie Snider, Attorney-in-Fact

Surety of Record: Westchester Fire Insurance Company
436 Walnut Street
Philadelphia, PA 19106
Phone: (415) 547-4513

Agent of Record: Kibble & Prentice, a USI Company
601 Union Street, Suite 1000
Seattle, WA 98101
Phone: (206) 441-6300

Power of Attorney

WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That **WESTCHESTER FIRE INSURANCE COMPANY,** a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

(1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.

(2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.

(3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(4) Each of the Chairman, the President and Vice Presidents of the Company in hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.

(5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

Does hereby nominate, constitute and appoint Heather Allen, Holly E Ulfers, Katie Snider, Nancy N Hill, Roxana Palacios, Steven W Palmer, all of the City of SEATTLE, Washington, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Fifteen million dollars & zero cents ($15,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said **WESTCHESTER FIRE INSURANCE COMPANY** this 22 day of December 2014.

WESTCHESTER FIRE INSURANCE COMPANY

Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF PHILADELPHIA ss.

On this 22 day of December, AD. 2014 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the **WESTCHESTER FIRE INSURANCE COMPANY** to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
KAREN E. BRANDT, Notary Public
City of Philadelphia, Phila. County
My Commission Expires Sept. 26, 2018

Notary Public

I, the undersigned Assistant Secretary of the **WESTCHESTER FIRE INSURANCE COMPANY,** do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 26th day of May, 2015.

William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 22, 2016.

DocuGard #04546 contains a security pantograph, blue background, heat-sensitive ink, coin-reactive watermark, and microtext printing on border.

HEAT SENSITIVE SHIELD • FADES WITH HEAT OR TOUCH •

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, 2016
(MONTH-DAY-YEAR)

and ending on June 30, 2017
(MONTH-DAY-YEAR)

Amount of bond $10,000.00

Description of bond Water Well Contractors & Drillers

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 07, 2016
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By _____

D-Ann Kleidosty, Attorney-in-Fact

S-0157/GEEF 11/99

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. 7310252

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, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; 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 1st day of April, 2016.

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

By: _____
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 1st day of April, 2016, before me personally appeared David M. Carey, 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 Plymouth Meeting, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: _____
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 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 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, Gregory W. Davenport, 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 7th day of April, 2016.

By: _____
Gregory W. Davenport, 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.

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, 2016
(MONTH-DAY-YEAR)

and ending on June 30, 2017
(MONTH-DAY-YEAR)

Amount of bond $10,000.00

Description of bond Water Well Contractors & Drillers

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 07, 2016
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By _____

D-Ann Kleidosty, Attorney-in-Fact

S-0157/GEEF 11/99

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. 7310252

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, Brooke A. Sharp; Christine Doczy; D-Ann Kleidosty; Gary D. Eklund; Sharon J. Potts; Sylvia M. Ogle; 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 1st day of April, 2016.

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

By: _____
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 1st day of April, 2016, before me personally appeared David M. Carey, 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 Plymouth Meeting, Pennsylvania, on the day and year first above written.

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: _____
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 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 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, Gregory W. Davenport, 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 7th day of April, 2016.

By: _____
Gregory W. Davenport, 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.

GENERAL PURPOSE RIDER

To be attached to and form part of Bond Number 09157828 effective June 30, 2015 issued by the Fidelity and Deposit Company of Maryland in the amount of Twenty Thousand and No/100 ($20,000.00), on behalf of Craig Penton dba Terracon Consultants, Inc. as Principal, and in favor of Director of the Environmental Protection Division, Department of Natural Resources, State of Georgia as Obligee:

NOW Therefore, it is agreed that:

The expiration date of the bond is hereby amended to:

June 30, 2017

It is further understood and agreed that all other terms and conditions of this bond shall remain unchanged.

This rider is to be effective the 30th day of June , 2015 .

Signed, sealed and dated this 4th day of November , 2015 .

Craig Penton dba Terracon Consultants, Inc.
Principal

_____

Fidelity and Deposit Company of Maryland
Surety

_____
Christy M. Braile, Attorney-in-Fact

6/4/14 sent to Craig Penton (Stacy Adams)

FOR YOUR RECORDS

Bond Number 09157828

Performance Bond For Water Well Contractors And Drillers

Name of Water Well Contractor or Driller Craig Penton dba Terracon Consultants, Inc.

Know All Men By These Present

That we Craig Penton dba Terracon Consultants, Inc. AND ANY AND ALL EMPLOYEES, OFFICERS AND PARTNERS, as Principal, and Fidelity and Deposit Company of Maryland as Surety, are held and firmly bound unto the Director of the Environmental Protection Division (Director), Department of Natural Resources, State of Georgia and his or her Successor or Successors in office, as Obligee, in the full sum of **TWENTY THOUSAND AND NO/00 DOLLARS ($20.000.00)** for the payment of which will and truly to be made, we bind ourselves, our heir, administrators, successors and assigns, jointly and severally, by the present.

WHEREAS, the WATER WELL STANDARDS ACT OF 1985 (Ga. Laws 1985, p. 1192) (the "ACT") requires that water well contractors and drillers file performance bonds with the director to ensure compliance with the ACT; and WHEREAS the above bound PRINCIPAL is subject to the terms and provisions of said ACT. NOW, THEREFORE, the conditions of this obligation are such that if the above bound PRINCIPAL shall fully and faithfully perform the duties and in all things comply with the procedures and standards set forth in the ACT as now and hereafter amended, and the rules and regulations promulgated pursuant thereto, including but not limited to the correction of any violation of such procedures and standards upon discovery, irrespective of whether such discovery is made before completion of any well subject to this bond, then this obligation shall be void; otherwise of full force and effect.

And Surety, for value received, agrees that no amendment to existing laws, rules or regulations, or adoption of new laws, rules or regulations shall in anyway discharge its obligation on this bond, and does hereby waive notice of any such amendment, adoption or modification.

This bond shall be effective from date of issuance and shall continue in effect until terminated by expiration, mutual agreement or cancellation upon sixty (60) days written notice to Principal and Obligee; provided that the rights of the obligee and beneficiaries under this bond which arose prior to such termination shall continue.

The bond is effective June 4, 2014 and unless sooner terminated, this bond shall terminate June 30, 2015. In Witness Thereof the Principal and Surety have caused these present to be duly signed and sealed, this 4th day of, June 2014.

PRINCIPAL, BY_____(L.S.) TITLE: _____

SURETY BY: _____
Christy M. McCart, Attorney-in-Fact

GEORGIA REGISTERED AGENT N/A SEAL:

Revised December 2012

COPY

CONTINUATION CERTIFICATE

Atlantic Specialty Insurance Company , Surety upon

a certain Bond No. **800031223**

dated effective June 30, 2017
(MONTH-DAY-YEAR)

on behalf of Michael C. Rice and Cascade Drilling, L.P., any and all employees, officers and partners
(PRINCIPAL)

and in favor of State of Georgia
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2019
(MONTH-DAY-YEAR)

and ending on June 30, 2021
(MONTH-DAY-YEAR)

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

Description of bond Water Well Contractor Performance Bond

Premium: $1,200.00

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 May 9, 2019
(MONTH-DAY-YEAR)
Atlantic Specialty Insurance Company

By _____
Attorney-in-Fact Elizabeth R. Hahn

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

OneBeacon
INSURANCE GROUP

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: **Deanna M. French, Susan B. Larson, Elizabeth R. Hahn, Jana M. Roy, Scott McGilvray, Mindee L. Rankin, Ronald J. Lange, John R. Claeys, Roger Kaltenbach, Guy Armfield, Scott Fisher, Andrew P. Larsen, Nicholas Fredrickson**, 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: **sixty million dollars ($60,000,000)** 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

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 twenty-sixth day of October, 2017.

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

By _____
Paul J. Brehm, Senior Vice President

STATE OF MINNESOTA
HENNEPIN COUNTY

On this twenty-sixth day of October, 2017, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he 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.

TARA JANELLE STAFFORD
NOTARY PUBLIC - MINNESOTA
My Commission Expires
January 31, 2020

_____
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 9 day of May 2019

ATLANTIC SPECIALTY INSURANCE COMPANY CORPORATE SEAL 1986 NEW YORK

This Power of Attorney expires
October 1, 2019

_____
Christopher V. Jerry, Secretary

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, 2019
(MONTH-DAY-YEAR)

and ending on June 30, 2020
(MONTH-DAY-YEAR)

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

Description of bond Water Well Contractors & Drillers

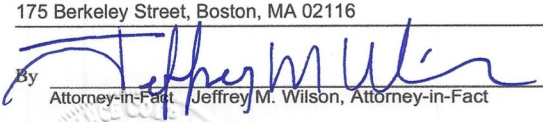
Premium: $100.00

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 11/10/2020
(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, Seibels & Williams, 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: **8201221-016032**

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, Anna Childress; Richard H. Mitchell; Sam Audia; Mark W. Edwards, II; Alisa B. Ferris; Robert R. Freel; William M. Smith; Jeffrey M. Wilson

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 8th day of May, 2019.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 8th day of May, 2019 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
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
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 10th day of November, 2020.

By: _____
Renee C. Llewellyn, 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.

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, 2020
(MONTH-DAY-YEAR)

and ending on June 30, 2021
(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 11/10/2020
(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, Seibels & Williams, 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

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.

Liberty Mutual SURETY

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

Certificate No: **8201221-016032**

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, Anna Childress; Richard H. Mitchell; Sam Audia; Mark W. Edwards, II; Alisa B. Ferris; Robert R. Freel; William M. Smith; Jeffrey M. Wilson

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 8th day of May, 2019.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 8th day of May, 2019 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
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
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 10th day of November, 2020.

By: _____
Renee C. Llewellyn, 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.

CONTINUATION CERTIFICATE

SAFECO Insurance Company of America , Surety upon

a certain Bond No. 4993104

dated effective 6/30/1987
(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, 2019
(MONTH-DAY-YEAR)

and ending on June 30, 2020
(MONTH-DAY-YEAR)

Amount of bond $15,000.00

Description of bond Water Well Contractors & Drillers

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 June 05, 2019
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By Loretta M. Jones

Loretta M. Jones, Attorney-in-Fact

S-0157/GEEF 11/99

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. 8200528-969358

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, Julie Karnes, Andrea Allman, Rachel A. Chaveriat, Jessica Frederick, Rebecca J. Hobbs, Loretta M. Jones, Sandra King, Thelma M. Lett, Michelle Lute-Heatherly, Sandy McElhaney, Vicki Nobinger, Bonnie Rice, Mariah Smith, Mary Y. Volmar, Carolyn E. Wheeler, Joy M. Williams

all of the city of Knoxville state of TN 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 February, 2019.

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

By: _____
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 15th day of February, 2019 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
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: _____
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 5th day of June, 2019.

By: _____
Renee C. Llewellyn, 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.

APPENDIX A

Certified Well Survey

Plant Scherer

3rd data set: LF Wells

Issued 7/29/20

NETWORK WELL ID	PVC CASING LATITUDE	PVC CASING LONGITUDE	CONTROL NAIL NORTHING	CONTROL NAIL EASTING	CONTROL NAIL ELEVATION	PVC CASING NORTHING	PVC CASING EASTING	TOP OF PVC CASING ELEV.	GROUND ELEVATION	COMMENTS
GWC-1	33.07878129 °	-83.79131155 °	No nail	No nail	371.77*	1120077.85	2411555.32	374.95	371.6	*Pad elev (no nail)
GWC-2	33.07806384 °	-83.79151634 °	No nail	No nail	377.02*	1119816.59	2411493.53	380.22	376.9	*Pad elev (no nail)
GWC-3	33.07750983 °	-83.79246763 °	No nail	No nail	407.36*	1119613.99	2411202.86	410.44	407.1	*Pad elev (no nail)
GWC-4	33.07652737 °	-83.79299751 °	No nail	No nail	408.50*	1119255.96	2411041.82	411.75	408.4	*Pad elev (no nail)
GWC-5	33.07554291 °	-83.79305371 °	1118898.01	2411024.23	393.37	1118897.72	2411025.88	396.69	393.3	
GWC-6	33.07465931 °	-83.79355797 °	1118575.49	2410871.44	412.48	1118575.69	2410872.56	415.80	412.4	
GWC-7	33.07374897 °	-83.79430173 °	1118244.68	2410644.68	414.51	1118243.67	2410645.91	418.27	414.4	
GWC-8A	33.07285463 °	-83.79518936 °	1117918.66	2410375.13	398.65	1117917.32	2410375.16	401.62	398.6	
GWC-9	33.07296130 °	-83.79586603 °	1117955.66	2410165.91	383.21	1117955.40	2410167.75	386.18	382.8	
GWC-10	33.07392850 °	-83.79634992 °	1118307.27	2410019.38	389.49	1118306.77	2410018.28	392.87	388.9	
GWC-11	33.07487138 °	-83.79712763 °	1118649.69	2409779.78	399.21	1118648.98	2409778.84	402.33	398.8	
GWC-12	33.07577749 °	-83.79785602 °	1118978.18	2409555.72	409.66	1118977.87	2409554.57	412.89	409.2	
GWC-13	33.07677077 °	-83.79838604 °	1119339.29	2409391.96	416.71	1119338.68	2409390.95	419.77	416.5	
GWC-14	33.07764300 °	-83.79929390 °	1119655.22	2409112.94	400.41	1119655.05	2409111.75	403.60	400.2	
GWA-15	33.07861529 °	-83.79873262 °	1120008.91	2409283.54	412.00	1120009.40	2409282.43	415.01	411.7	
GWA-16	33.07927008 °	-83.79775923 °	1120247.82	2409580.61	441.01	1120248.68	2409579.75	444.24	440.9	
GWA-17	33.07916177 °	-83.79656159 °	1120209.73	2409945.86	442.92	1120210.57	2409946.73	445.84	442.8	
GWC-18	33.07857646 °	-83.79553524 °	1119997.61	2410261.31	436.40	1119998.73	2410261.85	439.66	436.3	
GWC-19	33.07760179 °	-83.79406581 °	1119646.10	2410712.10	426.34	1119645.70	2410713.20	430.20	426.3	
GWC-20	33.07843484 °	-83.79248811 °	1119951.51	2411194.45	423.03	1119950.51	2411195.38	426.30	423.0	
GWA-21	33.08044495 °	-83.79813647 °	No nail	No nail	419.81*	1120675.73	2409462.70	422.58	419.7	*Pad elev (no nail)
GWA-22	33.08123199 °	-83.79809884 °	1120961.49	2409475.41	442.01	1120962.12	2409473.22	444.50	442.0	
GWC-29	33.07825289 °	-83.80057699 °	1119878.12	2408718.22	396.98	1119875.58	2408717.95	399.64	396.9	
GWC-30	33.07685172 °	-83.79973920 °	1119366.69	2408975.21	392.19	1119366.69	2408976.35	394.49	392.0	
GWC-31	33.07576062 °	-83.79946406 °	1118969.72	2409060.85	390.13	1118970.00	2409062.02	392.78	390.0	
GWC-32	33.07515444 °	-83.79939211 °	1118749.23	2409083.89	407.25	1118749.53	2409084.83	410.03	406.9	
GWC-33A	33.07435239 °	-83.79849852 °	1118457.51	2409359.70	391.32	1118458.68	2409359.58	393.96	390.9	
GWC-34	33.07377095 °	-83.79745357 °	1118247.67	2409679.54	386.48	1118248.26	2409680.41	389.29	386.2	
GWC-35	33.07270288 °	-83.79672091 °	1117860.31	2409905.20	385.35	1117860.46	2409906.21	387.90	385.1	
GWC-36	33.07188280 °	-83.79745810 °	1117561.62	2409680.48	422.52	1117561.29	2409681.44	425.12	422.0	
GWC-37	33.07099933 °	-83.79760828 °	1117239.61	2409635.60	427.38	1117239.70	2409636.56	429.80	427.2	
GWC-38	33.06975458 °	-83.79795117 °	1116787.37	2409532.78	416.23	1116786.45	2409533.11	418.68	416.0	
GWA-39	33.07026066 °	-83.80076113 °	1116968.30	2408672.39	454.59	1116967.57	2408671.68	457.62	454.2	

I certify that top of casing and PK nail elevations reflect a relative vertical accuracy of 0.01 feet referencing NAVD88 and were collected using a Topcon DL-502 digital level with closures meeting First Order, Class I level classification. Horizontal positions of casings and PK nails reflect accuracies of 0.50 feet or better and were collected using a JAVAD Triumph-LS dual-frequency RTK global positioning system receiver with eGPS VRS corrections referencing the Georgia State Plane, west zone, NAD83(2011) coordinate system in US survey feet.
Issued 7/29/20.

Reissued 8/10/20 to list Network Well ID

Plant Scherer

3rd data set: LF Wells

 Issued 7/29/20

NETWORK WELL ID	PVC CASING LATITUDE	PVC CASING LONGITUDE	CONTROL NAIL NORTHING	CONTROL NAIL EASTING	CONTROL NAIL ELEVATION	PVC CASING NORTHING	PVC CASING EASTING	TOP OF PVC CASING ELEV.	GROUND ELEVATION	COMMENTS
GWA-40	33.07135310 °	-83.80056612 °	1117365.04	2408731.04	461.25	1117365.24	2408730.04	463.84	461.2	
GWA-41	33.07336732 °	-83.80159552 °	1118096.35	2408413.11	431.70	1118096.97	2408412.15	434.12	431.4	
GWA-42	33.07447862 °	-83.80217405 °	1118501.16	2408234.42	402.57	1118500.68	2408233.53	405.19	402.2	
GWA-43	33.07546760 °	-83.80135092 °	1118860.39	2408484.93	398.42	1118861.38	2408484.42	400.94	398.1	
GWA-44A	33.07666407 °	-83.80106739 °	1119296.97	2408571.05	396.83	1119296.99	2408569.76	399.62	396.5	
GWA-45	33.08044161 °	-83.80327246 °	1120668.04	2407891.77	448.33	1120669.03	2407889.56	451.08	448.3	
GWA-46	33.08075220 °	-83.80214114 °	1120781.16	2408236.36	458.37	1120783.23	2408235.69	461.13	458.3	
GWA-47	33.08096707 °	-83.80099979 °	No nail	No nail	463.03*	1120862.63	2408585.01	465.77	462.9	*Pad elev (no nail)
GWA-48	33.08121322 °	-83.79984149 °	1120951.13	2408939.16	459.00	1120953.42	2408939.48	461.73	458.8	
GWA-49	33.08142057 °	-83.79870153 °	1121028.02	2409287.04	430.16	1121030.08	2409288.38	432.88	429.9	
GWC-50	33.07836585 °	-83.79979905 °	1119919.79	2408955.82	404.44	1119917.51	2408956.10	407.16	404.3	
GWC-51	33.07814547 °	-83.80149483 °	1119837.81	2408436.16	407.37	1119835.51	2408436.95	410.15	407.3	
GWC-52	33.07852375 °	-83.80225381 °	1119973.72	2408206.05	414.43	1119972.34	2408203.99	417.13	414.4	
GWC-53	33.07948082 °	-83.80310179 °	1120319.90	2407945.42	433.10	1120319.65	2407943.05	435.83	432.9	
GWA-54	33.07241582 °	-83.80102370 °	1117750.36	2408588.80	448.78	1117751.40	2408588.52	451.49	448.6	
LPZ-1	33.07044703 °	-83.83392205 °	1117001.26	2398512.52	550.47	1117001.58	2398513.19	553.29	550.0	Not included in list
LPZ-2	33.07861662 °	-83.83555064 °	1119973.02	2398005.15	511.42	1119972.34	2398004.93	514.52	511.1	
LPZ-3	33.07287074 °	-83.83344344 °	1117884.36	2398656.49	512.55	1117883.86	2398657.00	515.45	512.2	
LPZ-4	33.06760372 °	-83.83859982 °	1115963.25	2397083.50	458.31	1115962.59	2397083.47	461.24	458.1	
LPZ-5	33.06583940 °	-83.83007014 °	1115329.50	2399698.90	521.81	1115328.95	2399698.53	524.51	521.5	

I certify that top of casing and PK nail elevations reflect a relative vertical accuracy of 0.01 feet referencing NAVD88 and were collected using a Topcon DL-502 digital level with closures meeting First Order, Class I level classification. Horizontal positions of casings and PK nails reflect accuracies of 0.50 feet or better and were collected using a JAVAD Triumph-LS dual-frequency RTK global positioning system receiver with eGPS VRS corrections referencing the Georgia State Plane, west zone, NAD83(2011) coordinate system in US survey feet.
Issued 7/29/20.

Reissued 8/13/20 to list Network Well ID and rename 2 wells

Plant Scherer

Additional wells February 2022

 Issued 2/21/22

WELL ID	PVC CASING LATITUDE		PVC CASING LONGITUDE		CONTROL NAIL NORTHING	CONTROL NAIL EASTING	CONTROL NAIL ELEVATION	PVC CASING NORTHING	PVC CASING EASTING	TOP OF PVC CASING ELEV.	GROUND ELEVATION	COMMENTS
		°		°								
GWC-3	33.07750970	°	-83.79246913	°	1119615.01	2411201.98	409.97	1119613.94	2411202.40	412.66	409.6	
PZ-69I	33.08387832	°	-83.81578978	°	1121905.29	2404050.47	506.44	1121906.36	2404051.35	508.85	506.0	

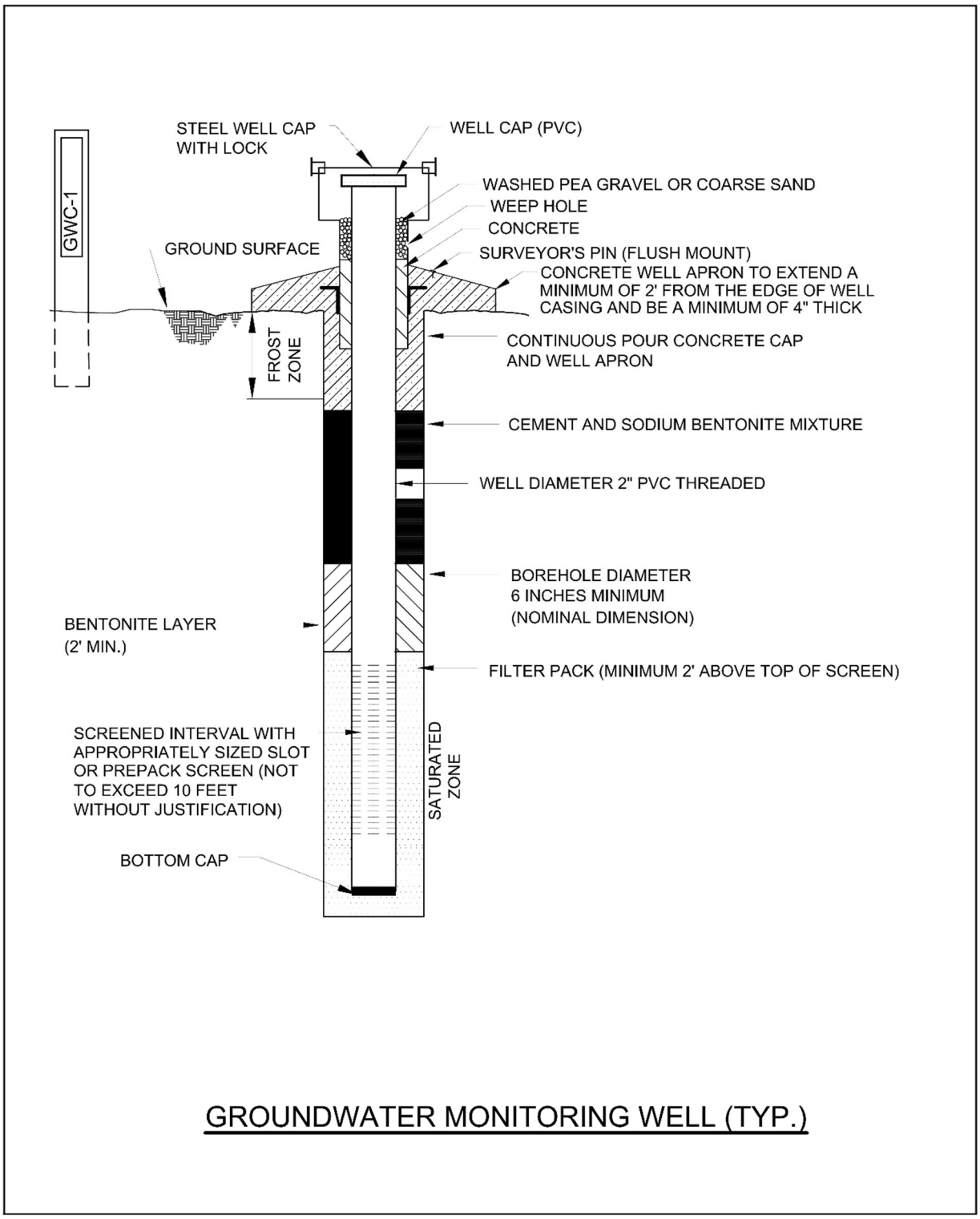
STREAM GAUGE ID	GAUGE LATITUDE		GAUGE LONGITUDE		GAUGE NORTHING	GAUGE EASTING	TOP OF GAUGE ELEVATION				COMMENTS
SG-1	33.08809120	°	-83.79524528	°	1123460.79	2410338.42	362.77				
SG-2	--	°	--	°	--	--	--				Gauge found uninstalled on stream bank
SG-3	33.09300955	°	-83.80451088	°	1125240.32	2407494.46	382.48				

I certify that top of casing and PK nail elevations reflect a relative vertical accuracy of 0.01 feet referencing NAVD88 and were collected using a Topcon DL-502 digital level with closures meeting First Order, Class I level classification. Horizontal positions of casings and PK nails reflect accuracies of 0.50 feet or better and were collected using a JAVAD Triumph-LS+ dual-frequency RTK global positioning system receiver with eGPS VRS corrections referencing the Georgia State Plane, west zone, NAD83(2011) coordinate system in US survey feet.
Issued 2/21/22.

APPENDIX B

GROUNDWATER MONITORING WELL DETAIL

B. GROUNDWATER MONITORING WELL DETAIL



APPENDIX C

GROUNDWATER SAMPLING PROCEDURES

C. GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling will be conducted using the most current USEPA Region 4 Field Quality and Technical Procedures as a guide. 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. To accomplish this objective, low-flow purging from the screened interval is recommended until target parameters listed below are stabilized and then, representative groundwater flowing from the geologic formation is collected. 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. Field log books and forms shall be kept for each sampling event, and should include, but not be limited to, the following: well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling. A sample well inspection form is included in this appendix.

The sampling team 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. Static water levels will be measured from each well, within a 24-hour period. The water level measuring device will consist of a probe and measuring tape capable of measuring water levels with accuracy to 0.01 feet.

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 (2) 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. Non-dedicated pumps and wiring will be decontaminated before use and between well locations using procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency Laboratory Services and Applied Science Division Operating Procedure for Field Equipment Cleaning and Decontamination as a guide.

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 ft. 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 S.U. for pH
   - ± 5% for specific conductance (conductivity)
   - ± 10% or 0.2 mg/L for DO where DO>0.5 mg/L. If DO<0.5 mg/L no stabilization criteria apply

- ≤ 5 NTUs 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 (USEPA, SESDPROC-301-R4) 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. 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, 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. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity. A new filter must be used for each well and each sampling event.

9) 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 non-dedicated equipment. Upon completion of field activity the well will be closed and locked.

13) Non-dedicated equipment will be decontaminated between wells in general accordance with US EPA LSASDPROC-205-R4 (US EPA, 2020).

14) Samples will be delivered to the laboratory following appropriate chain-of-custody (COC) and temperature control requirements. The goal for sample delivery will be within 48 hours of collection.

Throughout the sampling process new 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 NTUs however, samples may be collected where turbidity is less than 10 NTUs and the stabilization criteria described above are met.

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

- If turbidity remains above 5 NTUs but is less than 10 NTUs, and other parameters are stabilized, the well can be sampled.
- Where turbidity remains above 10 NTUs, 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 COC form.

A brief overview of purging and sampling methodologies, including the type of sampling equipment used will be provided in routine monitoring reports.

Groundwater Monitoring Well Integrity Form

Site Name:

Permit Number:

Well ID:

Date, field conditions	Yes	No	N/A
1) Location/Identification			
A Is the well visible and accessible?			
B Is the well properly identified with correct well ID?			
C Is the well in a high traffic area and does the well require protection from traffic?			
D Is the drainage around the well acceptable? (no standing water, nor is well located in obvious drainage flow path)			
2) Protective Casing			
A Is the protective casing free from apparent damage and able to be secured?			
B Is the casing free of degradation or deterioration?			
C Does the casing have a functioning weep hole?			
D Is the annular space between the casings clear of debris and water, or filled with pea gravel/sand?			
E Is the well locked and is the lock in good condition?			
3) Surface Pad			
A Is the well pad in good condition (not cracked/broken)?			
B Is the well pad sloped away from the protective casing?			
C Is the well pad in complete contact with the ground surface and stable?			
D Is the well pad in complete contact with the protective casing?			
E Is the pad surface clean (not covered with sediment or debris)?			
4) Internal Casing			
A Does the cap prevent entry of foreign material inot the well?			
B Is the casing free of kinks/bends, or any obstructions from foreign objects (such as bailers)?			
C Is the well properly vented for equilibration of air pressure?			
D Is the survey point clearly marked on the inner casing?			
E Is the depth of the well consistent with the original well log?			
F Is the casing stable? (Does PVC move easily when touched or can be taken apart by hand due to lack of grout or use of slip couplings in construction)			
5) Sampling: Groundwater Wells Only			
A Does water recharge adequately when purged?			
B If dedicated sampling equipment installed, is it in good condition and specified in the arppove groundwater monitoring plan for the facility?			
C Does the well require redevelopment (low flow/turbidity)?			
6) Based on professional judgement, is the well construction / location appropriate to **1)** achieve the objectives of the Groundwater Monitoring Program and **2)** comply with the applicable regulatory requirements?			
7) Corrective actions as needed, by date:			
Signature and Seal of PE/PG responsible for inspection			

APPENDIX D

SURFACE WATER SAMPLING AND ANALYSIS PROCEDURES

D. SURFACE WATER SAMPLING AND ANALYSIS PROCEDURES

Surface water samples will be collected in accordance with the general procedures outlined below if flowing water is observed at each sampling location. These procedures were developed using field sampling guidelines described in the *USEPA Region 4 Field Branches Quality System and Technical Procedures* (https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches). Surface water samples will be analyzed for the parameters contained in Table 5.

If a dipper or other transfer vessel other than the sample container is used, it must be composed of a non-porous inert material such as glass, PVC, polyethylene, or stainless steel. The following procedures will be used to collect surface water samples:

a) Hold the bottle near the base with one hand, and with the other, remove the cap.

a) Rinse the sample container with the water to be sampled prior to filling the container, unless the sample containers are pre-preserved. Pre-preserved sample containers should not be rinsed prior to sampling.

b) Hold the container underneath the water surface and allow the container to be filled with water. Remove the container from underneath the surface and place the cap back on the container.

c) Label the sample container to, at a minimum, include: Sample Number, Name of Collector, Date and Time of Collection, and Place/Point of Collection.

d) Place the samples in a cooler containing water-ice, if required, for courier or hand delivery to the laboratory within the sample hold times.

e) Follow COC and temperature protocols.

The minimum sampling frequency for surface water will be semi-annual.

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