GROUNDWATER MONITORING PLAN

PLANT WANSLEY – COAL COMBUSTION RESIDUALS (CCR) LANDFILL HEARD COUNTY, GEORGIA

FOR

Georgia Power

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Approved

Solid Waste Management Program

Approved By: Beverly Tipton

Digitally signed by Beverly Tipton
Date: 2022.10.25 13:29:58 -04'00'

SEPTEMBER 2022

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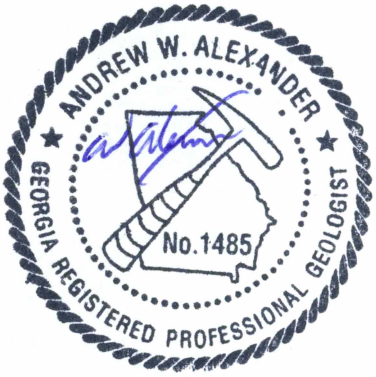
TABLE OF CONTENTS

I. CERTIFICATION

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, 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 Rules of Solid Waste Management, Chapter 391-3-4-.10(6).

Signature: AW Alexander

Date: 2022-09-29



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1. INTRODUCTION

Groundwater and surface water 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, surface water, and underdrain 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. Groundwater monitoring, surface water and underdrain sampling locations for Plant Wansley CCR Landfill are presented on Figure A1 of **Appendix A** and monitoring well construction details presented in **Appendix A**, Table A1 for the CCR unit.

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

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (§257.90), which is incorporated by Georgia State CCR Rule by reference, a detection monitoring well network for the Plant Wansley Landfill 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)(g), a minor modification will be submitted to the EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

The geology and hydrogeology of the Site was obtained from the Site Acceptability Report (SAR) prepared by Southern Company Services, Inc. in 2007 (SCS, 2007). Additional hydrogeological data was obtained from the most current semiannual sampling report prepared by Atlantic Coast Consulting, Inc. (ACC, 2021). Full report references to SCS, 2007 and ACC, 2021 are included below.

Geology:

The Site is located within the Southern Piedmont Physiographic province, which lies between the Blue Ridge Mountains and the Upper Coastal Plain. This province is underlain by Precambrian and Paleozoic age metamorphic rocks including mica schists and granitic gneisses. The Brevard Fault Zone, a major geological feature that cuts across the Piedmont, occurs approximately one mile north of the Site. The Brevard Zone is bounded by a thrust fault on the southeastern border and trends northeast, as do most of the geologic formations of the Piedmont.

Rock cores recovered from borings drilled on the Site are interbedded with granitic gneisses, garnet mica schists, augen schists and augen gneisses with occasional quartzite veins and accessory minerals of garnet, epidote, and calcite. The gneiss and schist bedrock are typical for the immediate area surrounding the Site.

Residual soil zones develop by the in-situ chemical weathering of bedrock. The typical residual soil profile consists of silty and clayey soils near the surface, where soil weathering is more advanced, underlain by micaceous sandy silts and silty sands. Residual soil that retains relict features of the parent rock, such as schistosity (schists) and banding (gneisses) but have the texture of a soil, are commonly referred to as "saprolite." The boundary between soil and rock is not sharply defined. Fractures, joints, and the presence of less resistant rock types facilitate weathering. Consequently, the profile of the partially weathered rock and hard rock is quite irregular and erratic, even over short horizontal distances.

Hydrogeology:

The uppermost aquifer at the Site consists of the residual soils, partially weathered rock, and the upper portion of the fractured bedrock. The aquifer is recharged locally by infiltration of precipitation. As described in the text of the SAR (SCS, 2007) and demonstrated by associated geotechnical data and boring logs, the top of rock is slightly to strongly weathered but becomes less weathered with depth. In general, core recovery increases significantly with depth as the rock becomes less weathered. Rock Quality Designation (RQD) increases significantly with depth. These site-specific data support and additional published data on bedrock hydrogeology describe a general decrease in size and occurrence of fractures with depth. Therefore, we infer that groundwater within the bedrock is primarily present in fractures that decrease in size and density with depth. Groundwater flows semi-radially from topographic highs near GWA-2 and GWA-28. Groundwater generally flows to the east and north across the entire Site.

Groundwater flow velocities were calculated for the Site based on hydraulic gradients (average of 0.042 ft/ft [ACC, 2021]), average horizontal hydraulic conductivity based on previous slug test data and an estimated effective porosity of 0.10 (provided in the SAR, SCS, 2007). The groundwater flow velocity was calculated to be approximately 0.48 feet per day during the March 2021 semiannual sampling event (ACC, 2021).

Table 1
Horizontal Groundwater Flow Velocity Calculations
March 2021
Plant Wansley CCR Landfill

Equation

$$v = \frac{K(i)}{P_e}$$

where: v = ground water velocity
K = hydraulic conductivity
i = hydraulic gradient
P_e = effective porosity

Values Used in Calculation

	Value		Source
K =	4.1E-04	cm/sec	See note 1.
	1.16	ft/day	
i_1 =	18.38/439	ft/ft	from GWA-4 to GWC-5
	0.042	unitless	
i_2 =	68.26/1458	ft/ft	from GWA-1 to GWC-19
	0.047	unitless	
i_3 =	93.20/2594	ft/ft	from GWA-2 to GWC-16
	0.036	unitless	
i =	0.042	unitless	Average (i_1, i_2, i_3)
P_e =	0.10	unitless	See note 1.

Calculation

$$v = \frac{(1.16)(0.042)}{0.10}$$

V = 0.48 ft/day

Notes

(1) Plant Wansley Proposed Combustion By-Product Disposal Facility - Site Acceptability Report (SCS, 2007)

3. SELECTION OF WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost occurrence of groundwater beneath the site. Locations are selected based on disposal cell layouts and site geologic and hydrogeologic considerations. Georgia Power follows the recommendation as stated in Chapter 2 of the Manual for Groundwater Monitoring (EPD, 1991) to determine well spacing based on site-specific conditions. Locations are chosen to serve as upgradient (GWA), or downgradient (GWC) based on groundwater flow direction determined by potentiometric evaluation. The well naming nomenclature is based on Georgia EPD's Industrial Waste Disposal Site Design and Operations Plan – Supplemental Data for Solid Waste Handling Permit (undated).

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.

A map depicting monitoring well locations is included in **Appendix A**, Monitoring System Details. **Appendix A** also includes a tabulated list of individual monitoring wells with well construction details such as location coordinates, top-of-casing elevation, well depths and screened intervals. Any change to the groundwater monitoring or surface water monitoring network must be made by a minor modification to the permit pursuant to 391-3-4-.10(6)(g).

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The monitoring well network described in this plan is already in place. The existing monitoring wells were installed following USEPA Region 4 Laboratory Services and Applied Science Division (LSASD) *Operating Procedure for Design and Installation of Monitoring Wells* (USEPA, SESDGUID-101-R1) as a general guide for best practices. 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 modification to the well network at the CCR Landfill.

4.1 DRILLING

A variety of well drilling methods are available for the purpose of 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 USEPA SESD SESDGUID-101-R# 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. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure SESDGUID-205-R# for Field Equipment Cleaning and Decontamination as a guide. Drilling and well installation activities will be directed by a qualified groundwater scientist.

Sampling and/or coring may be used to help determine the stratigraphy and geology. Samples will be logged by trained personnel working under the direction of a Professional Geologist/Engineer registered in the State of Georgia. Screen depths will be chosen based on the target installation depth.

All 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. Proof of bonding for wells installed at the Landfill, is included as **Attachment** A2 in **Appendix A.** For future installations, proof of bonding will be included in the well installation reports. Drilling and well installation activities will be directed by a qualified groundwater scientist registered in Georgia.

4.2 DESIGN AND CONSTRUCTION

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

<u>WELL CASINGS AND SCREENS</u>
American Society for Testing and Materials International (ASTM), National Science 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 USEPA-approved and appropriate materials may be used for construction.

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 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.

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 hole 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 approximately one to two feet above the top of the well screen.

The materials used to seal the annular space must prevent hydraulic communication between strata and prevent migration from overlying areas into the well screen interval. A minimum of two feet of bentonite (chips, pellets, or slurry) will be placed immediately above the filter pack. The bentonite seal will extend up to the base of any overlying confining zone or the top of the water-bearing zone to prevent 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.

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. For all future wells the surface cap will extend from the top of the grout to ground surface, where it will become a concrete apron extending outward with a radius of at least 2.0 feet from the edge of the well casing and sloped to drain water away from the well.

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

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

Well Construction and Boring Logs are included in **Appendix A**. The groundwater monitoring well details are attached in **Appendix B**, Groundwater Monitoring Well Detail, illustrates the general design and construction details for a monitoring well.

WELL DEVELOPMENT

Well development will be conducted under supervision of a certified groundwater professional. 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 turbidity less than 10 NTU is achieved. Additionally, the stabilization criteria contained in **Appendix C** should be met. A variety of techniques may be used to develop site groundwater monitoring wells. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. All development equipment will be decontaminated prior to first use and between wells.

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

Many geologic formations contain clay and silt particles that are small enough to work their way through 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 ABANDONMENT

Per Georgia Rule 391-3-4-.10(6)(g), monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the GA EPD. Monitoring wells will be abandoned using industry-accepted practices and using the *Manual for Groundwater Monitoring* (1991) and (O.C.G.A) 12-5-120, 1985 as guides. The wells will be abandoned under the supervision of a qualified groundwater scientist registered to practice in the State of Georgia. A well abandonment report will be submitted to EPD within 60 days of completion of well abandonment. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. Any piezometers or groundwater wells located within footprint of future CCR cells will be over-drilled prior to abandonment.

4.4 DOCUMENTATION

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

a. Well identification
b. Name of drilling contractor and type of drill rig
c. Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council
d. 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
e. Details of filter pack material/size, emplacement method (narrative), and volume
f. Seal emplacement method and type/volume of sealant
g. Borehole diameter and well casing diameter
h. Well Depth (±0.1 ft.)
i. Type of protective well cap
j. Surface seal and volumes/mix of annular seal material
k. Screen length and interval reported in feet below ground surface and elevation
l. Well location data given to within an accuracy of 0.5 feet based on survey data recorded from an acceptable survey point datum by a Georgia-registered professional surveyor
m. Well elevation data given to within an accuracy of 0.01 feet based on survey data recorded from an acceptable survey point datum by a Georgia-registered professional surveyor

n. Lithologic logs
o. Documentation that water quality field parameters meet well development criteria (Section 4.2)
p. Documentation of ground surface elevation (±0.01 feet)
q. Documentation of top of casing elevation (±0.01 feet)
r. Schematic of the well with dimensions for all components (e.g., casing, screen, sump, well pad)

In accordance with the Georgia Water Well Standards Act (O.C.G.A. § 12-5-134(5)(d)(vii)), at least once every five years, the owner of the property on which a monitoring well is constructed shall have the monitoring well(s) inspected by a 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 plan, the cost estimate based upon current year cost for the well inspections must be provided for as part of the cost calculations for the groundwater monitoring period.

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 2: Groundwater Monitoring Parameters & Frequency, 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 (a subset of the full list contained in 40 CFR 258), 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 III will be at least semi-annual during the active life of the facility and the post-closure care period. If required, 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.

As shown on Table 3, Groundwater Monitoring Analytical Methods, 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), American Society for Testing and Materials (ASTM), or other suitable analytical methods approved by the Georgia EPD. The method used will be able to reach a suitable practical quantification limit to detect natural background conditions at the facility. Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

TABLE 2			
GROUNDWATER MONITORING PARAMETERS & FREQUENCY			
MONITORING PARAMETER		**GROUNDWATER MONITORING**	
		Background	**Semi-Annual Events**
Field Parameters	Temperature	X	X
	pH	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
Appendix I and II (EPD-approved modified Appendix I and II 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	X	X
	Selenium	X	X
	Silver	X	X
	Thallium	X	X
	Vanadium	X	X
	Zinc	X	X
Appendix III (Detection test parameters from 40 CFR 257, Subpart D)	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
Appendix IV (Assessment test parameters from 40 CFR 257, Subpart D)	Antimony	X	
	Arsenic	X	
	Barium	X	
	Beryllium	X	
	Cadmium	X	
	Chromium	X	

	Cobalt	X	
	Fluoride	X	
	Lead	X	
	Lithium	X	
	Mercury	X	
	Molybdenum	X	
	Selenium	X	
	Thallium	X	
	Radium 226 & 228	X	

TABLE 3
GROUNDWATER MONITORING ANALYTICAL METHODS

Parameters	EPA Method Number
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	EPA 150.1/field/90405C
Sulfate	EPA 9035/9036/9038/300.0/300.1/9056A
Total Dissolved Solids (TDS)	EPA 160.1/Standard Method 2540C
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 6010D/6020B
Fluoride	EPA 300.0/300.1/9214/9056/9214
Lead	EPA 7420/7421/6010D/6020B
Lithium	EPA 6010D/6020B
Mercury	EPA 7470
Molybdenum	EPA 6010D/6020B
Nickel	EPA 6010D/6020B
Selenium	EPA 7740/7741A/6010D/6020B
Silver	EPA 6010D/6020B
Thallium	EPA 7840/7841/6010D/6020B
Vanadium	EPA 6010D/6020B
Zinc	EPA 6010D/6020B
Radium 226 and 228 combined	EPA 903/9320/9315

6. SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in **Appendix C** Groundwater Sampling Procedures, and **Appendix D**, Surface Water and Underdrain Sampling and Analysis Procedures. Sampling procedures were developed using standard industry practice and USEPA Region 4 Field Branches Quality System and Technical Procedures as a guide. Low-flow sampling methodology will be utilized for sample collection. EPA approved alternative industry accepted sampling techniques may be used when appropriate.

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

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

The applied groundwater purging, and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

During each sampling event, surface water samples will be collected and handled in accordance with the procedures specified in **Appendix D: Surface Water and Underdrain Sampling and Analysis Procedures.** These procedures were developed using field sampling guidelines described in the USEPA Region 4 Science and Ecosystem Support Division (SESD) Operating Procedure for Surface Water Sampling (SESDPROC-201-R#) and updates. For surface water and underdrain sampling, dedicated, non-dedicated, or disposable sampling equipment may be used.

7. CHAIN-OF-CUSTODY

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

- Sample identification numbers
- Signature of collector
- Date and time of collection
- Sample type
- Sample point identification
- Number of sample containers
- Signature of person(s) involved in the chain of possession
- Dates of possession by each individual
- 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, both documented on the COC.

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

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

8. FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL

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

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

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

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

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

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

9. REPORTING RESULTS

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

a. 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.

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

c. Discussion of results.

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

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

f. 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.

g. Groundwater flow rate and direction calculations.

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

i. 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).

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

k. Any alternate source demonstration completed during the previous monitoring period, if applicable.

l. Laboratory Reports.

m. COC documentation.

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

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

p. Documentation of non-functioning wells or dry surface water or underdrain locations.

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

r. Tabulated surface water table presents data for the current reporting period and all historical monitoring events associated with the surface water monitoring program.

s. Statistical analyses.

t. Certification by a qualified groundwater scientist.

10. STATISTICAL ANALYSIS

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

According to EPD rules (391-3-4-.10(6)(a) 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 will be used include:

1. A prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper 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) or §257.93(f)(5). A justification for an alternative method will be placed in the operating record and the Director notified of the use of an alternative test. The justification will demonstrate that the alternative method meets the performance standards of §257.93(g).

Based on site-specific conditions, the selected statistical methods include a combination of intrawell and interwell comparisons, or the approved two-step statistical method. Intrawell methods use background data for individual wells and may be overly sensitive to natural variation; therefore, statistically significant increases (SSIs) may occur as a result of natural variation rather than facility impacts. A second step can be 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 may be used 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. A SSI is not declared unless the resample also exceeds the intrawell/interwell prediction limits. Trend tests will continue to be included in Semi-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 site's operating record pursuant to 391-3-4-.10(6) and §257.93. Figure 1, Statistical Analysis Plan Overview, includes a flowchart that depicts the process that will be followed to develop the

site-specific plan. Figure 2, Decision Logic for Determining Appropriate Statistical Method, depicts the decision logic that will be used to determine the appropriate method as required by 391-3-4-.10(6) or or §257.93. Figure 3, Decision Logic for Computing Intrawell Prediction Limits, presents the logic that will be used to calculate site-specific statistical limits and test compliance results against those limits. Figure 4: Decision Logic for Computing Interwell Prediction Limits, presents the logic that will be used to calculate site-specific interwell statistical limits and test compliance results against those limits.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

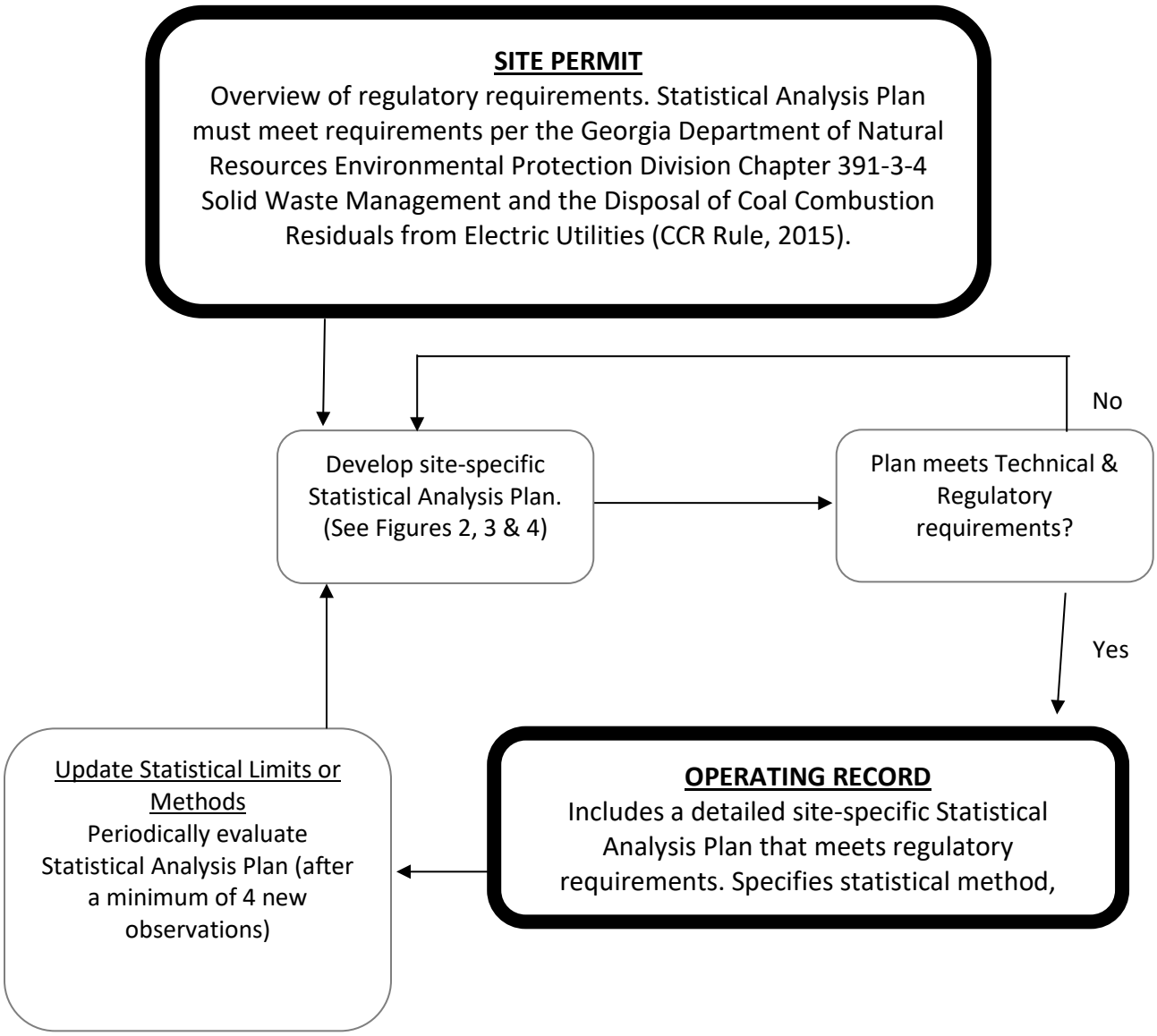


FIGURE 2. DECISION LOGIC FOR DETERMINING APPROPRIATE STATISTICAL METHOD

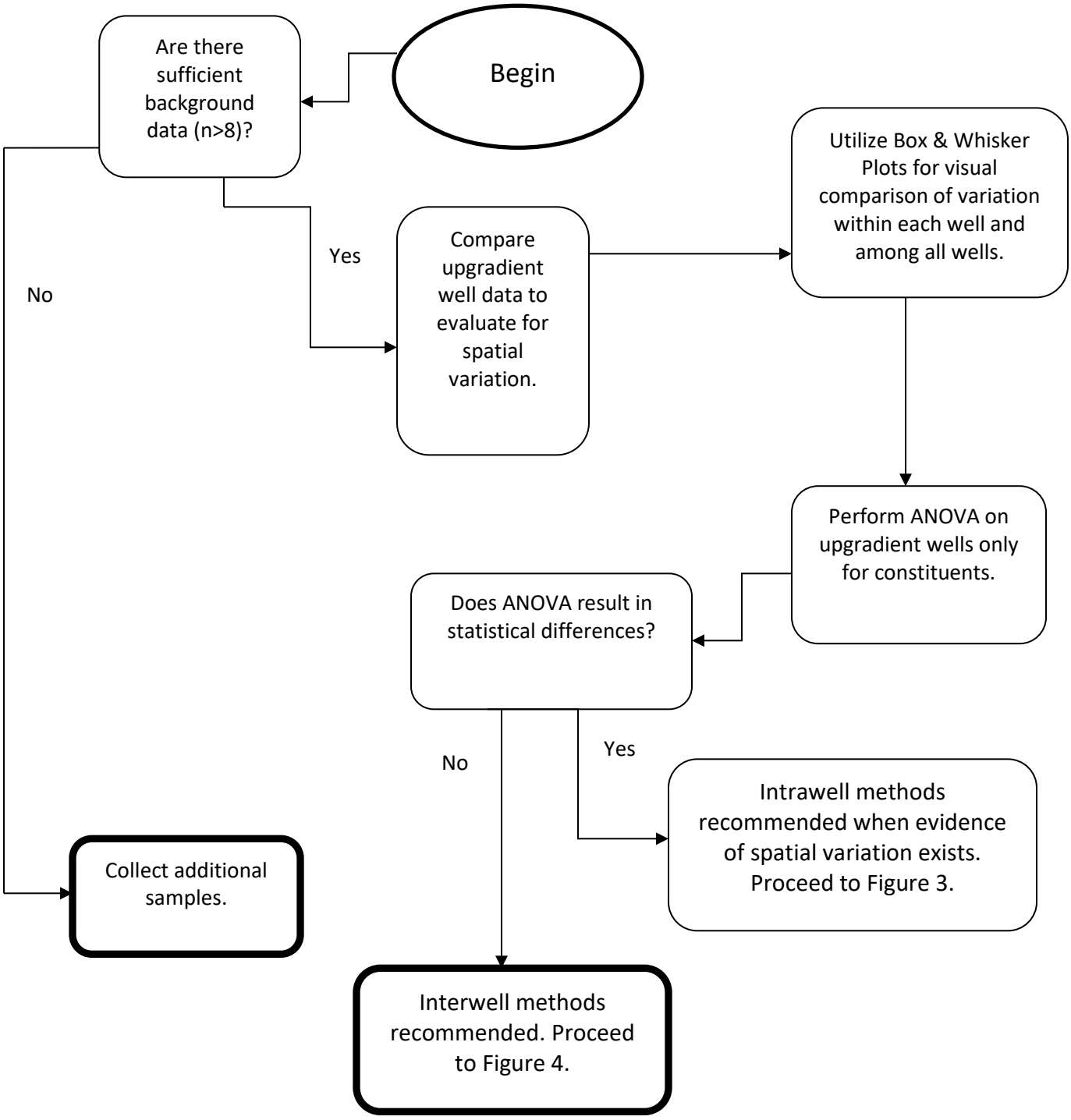


FIGURE 3. DECISION LOGIC FOR COMPUTING INTRAWELL PREDICTION LIMITS

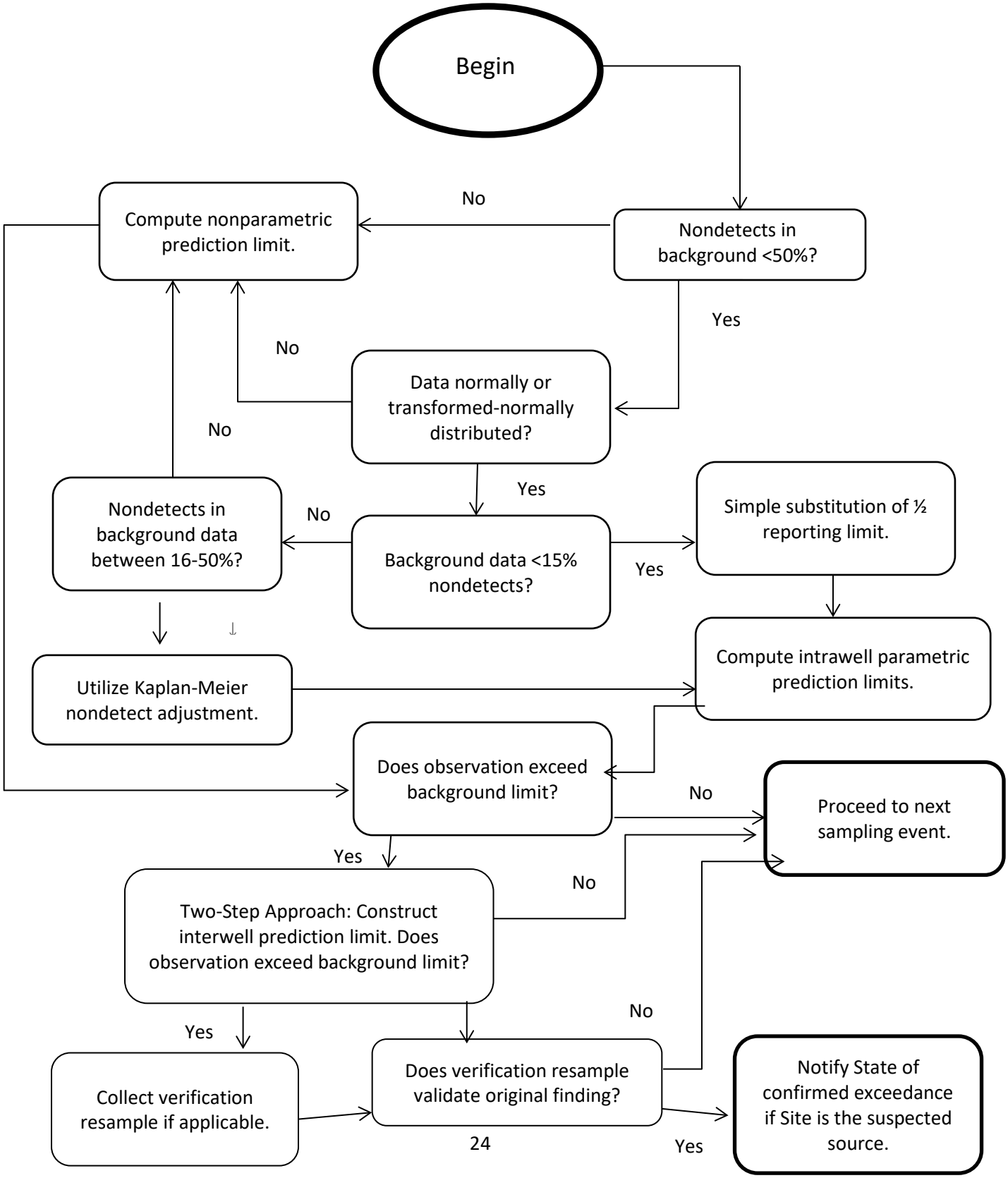
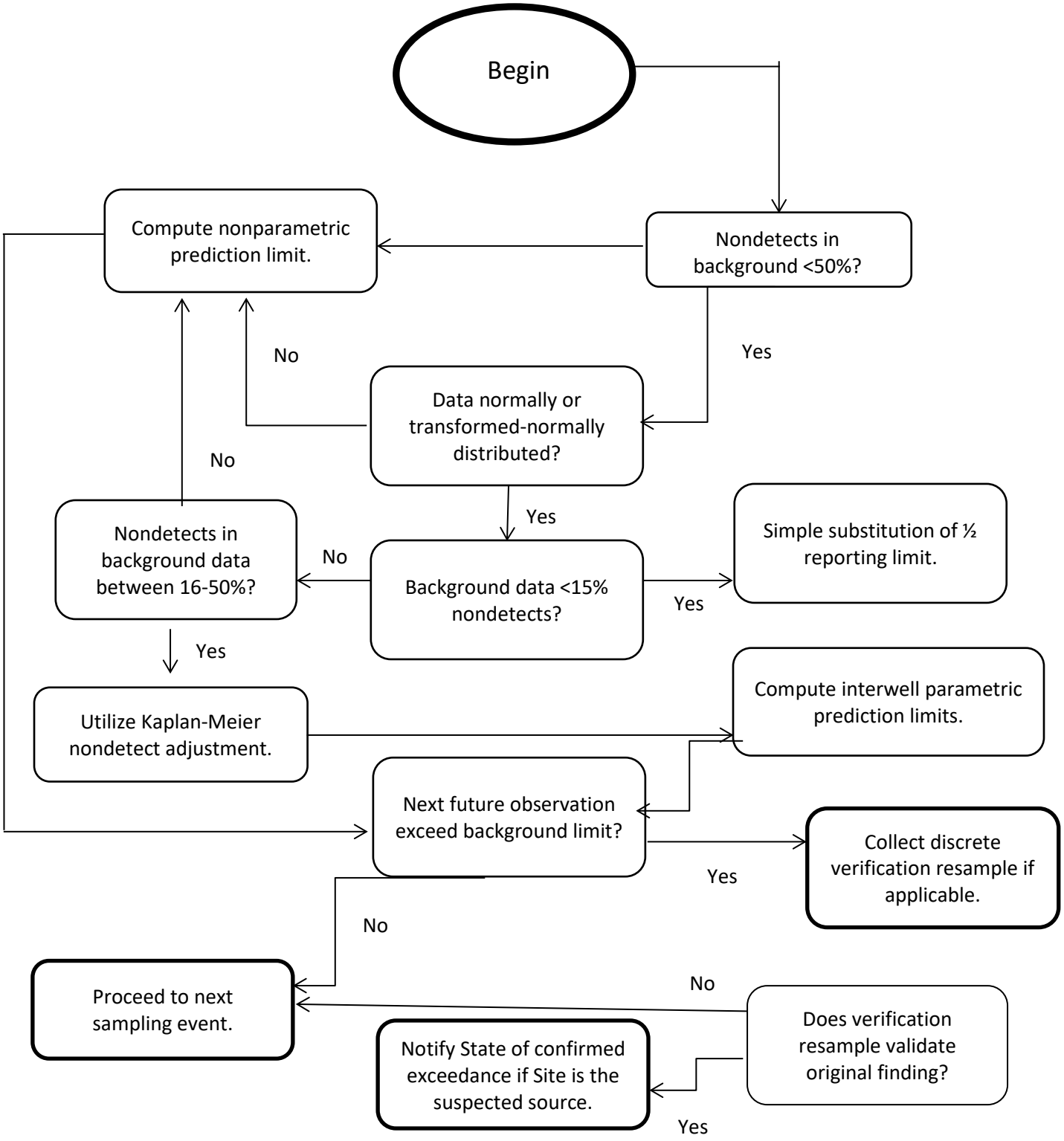


FIGURE 4. DECISION LOGIC FOR COMPUTING INTERWELL PREDICTION LIMITS



11. REFERENCES

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APPENDIX

A. MONITORING SYSTEM DETAILS
B. GROUNDWATER MONITORING WELL DETAILS
C. GROUNDWATER SAMPLING PROCEDURE
D. SURFACE WATER AND UNDERDRAIN SAMPLING AND ANALYSIS PROCEDURES

A. MONITORING SYSTEM DETAILS

Table A1: Well Construction Details
Figure A1: Well Location Map
Figure A2: Potentiometric Contour Map March
Attachment A1: Well Construction and Boring Logs
Attachment A2: Well Drilling Contractor Proof of Bonding
Attachment A3: Surveyor's Certification

TABLE A1 WELL CONSTRUCTION DETAILS

Table A1

Summary of Well Installation Dates, Coordinates, Elevation Screen Interval

Well ID	Hydraulic Location	Installation Date (mm/dd/yyyy)	Northing (NAD83)	Easting (NAD83)	Latitude (NAD83)	Longitude (NAD83)	Ground Surface Elevation (NAVD)	Top of Casing Elevation (NAVD)	Top of Screen Elevation (NAVD)	Bottom of Screen Elevation (NAVD)	Well Depth (ft BTOC)	Screen Interval Length (feet)	Top of Seal Elevation (NAVD)	Top of Filter Pack Elevation (NAVD)	Bottom of Well Elevation (NAVD)	Screened Media
GWA-1	Upgradient	3/3/2011	1236940.49	2027869.31	33.3974179	-85.0471283	774.93	778.02	738.53	728.53	49.79	10	742.93	740.93	728.23	PWR
GWA-2	Upgradient	3/3/2011	1237147.60	2027481.39	33.3979780	-85.0484050	813.07	816.16	766.37	756.37	60.09	10	773.57	770.57	756.07	Rock
GWA-3	Upgradient	3/3/2011	1237240.36	2027158.40	33.3982254	-85.0494658	787.27	790.64	769.57	759.57	31.37	10	773.87	771.77	759.27	Rock
GWA-4	Upgradient	2/14/2011	1237254.83	2026747.92	33.3982556	-85.0508110	776.51	779.54	749.31	739.31	40.53	10	752.61	750.61	739.01	PWR
GWC-5	Downgradient	2/10/2011	1237692.42	2026716.41	33.3994574	-85.0509264	753.08	755.91	725.38	715.38	40.83	10	733.58	731.08	715.08	Rock
GWC-6	Downgradient	2/10/2011	1237924.67	2027012.89	33.4001026	-85.0499615	746.86	749.98	729.16	719.16	31.12	10	735.86	731.86	718.86	PWR
GWC-7	Downgradient	2/10/2011	1238261.86	2027268.99	33.4010352	-85.0491318	728.13	731.15	715.43	705.43	26.02	10	719.33	717.33	705.13	Rock
GWC-8	Downgradient	2/22/2011	1238501.55	2027640.45	33.4017025	-85.0479215	720.35	723.46	713.65	703.65	20.11	10	717.85	715.85	703.35	Rock
GWC-9	Downgradient	2/23/2011	1238673.12	2027891.35	33.4021798	-85.0471042	709.71	712.65	703.51	693.51	19.44	10	709.71	705.71	693.21	Rock
GWC-10	Downgradient	7/12/2011	1238950.81	2028309.04	33.4029527	-85.0457433	705.84	709.41	697.74	687.74	21.97	10	704.84	700.64	687.44	PWR/Rock
GWC-11	Downgradient	2/23/2011	1238930.02	2028592.08	33.4029021	-85.0448154	697.89	701.05	693.19	683.19	18.16	10	697.89	694.89	682.89	Soil
GWC-12	Downgradient	2/24/2011	1238738.52	2028921.56	33.4023835	-85.0437306	721.02	724.06	693.82	683.82	40.54	10	698.52	697.02	683.52	Rock
GWC-13	Downgradient	2/28/2011	1238622.44	2029289.86	33.4020730	-85.0425207	691.12	694.08	613.92	603.92	90.46	10	617.92	615.92	603.62	Rock
GWC-14	Downgradient	6/28/2011	1238428.07	2029551.52	33.4015449	-85.0416580	688.59	692.63	678.59	668.59	24.34	10	683.39	681.09	668.29	Soil
GWC-15	Downgradient	2/28/2011	1238163.93	2029814.36	33.4008251	-85.0407896	684.38	687.44	646.68	636.68	51.06	10	652.48	650.38	636.38	Rock/PWR
GWC-16	Downgradient	6/28/2011	1237809.03	2029989.71	33.3998538	-85.0402053	687.13	690.32	673.73	663.73	26.89	10	678.13	674.33	663.43	Soil
GWC-17	Downgradient	6/28/2011	1237469.64	2029801.29	33.3989168	-85.0408133	701.65	704.55	661.65	651.65	53.20	10	666.65	664.65	651.35	Soil
GWC-18	Downgradient	3/1/2011	1237097.77	2029691.53	33.3978924	-85.0411626	697.42	700.31	680.22	670.22	30.39	10	685.42	682.92	669.92	PWR
GWC-19	Downgradient	7/13/2011	1236841.16	2029323.11	33.3971787	-85.0423626	694.54	698.47	670.34	660.34	38.43	10	675.54	673.54	660.04	Soil/PWR
GWC-20	Downgradient	3/1/2011	1236645.57	2029149.57	33.3966371	-85.0429258	703.33	706.29	645.63	635.63	70.96	10	650.33	647.63	635.33	PWR
GWC-21	Downgradient	7/12/2011	1236230.06	2028634.08	33.3954833	-85.0446031	717.32	721.02	693.02	683.02	38.30	10	699.52	697.32	682.72	Soil
GWC-22	Downgradient	3/2/2011	1236396.22	2028325.64	33.3959328	-85.0456182	741.04	744.17	677.34	667.34	77.13	10	682.04	680.04	667.04	PWR
GWC-23	Downgradient	3/2/2011	1236657.67	2028089.81	33.3966458	-85.0463981	770.46	773.41	715.76	705.76	67.95	10	721.76	719.46	705.46	Soil
GWC-24	Downgradient	2/15/2011	1237355.54	2026407.92	33.3985244	-85.0519278	787.48	790.37	749.58	739.58	51.09	10	754.08	751.68	739.28	PWR
GWC-25	Downgradient	2/15/2011	1237404.61	2026089.46	33.3986518	-85.0529725	809.37	812.36	761.37	751.37	61.29	10	768.37	765.37	751.07	Rock
GWC-26	Downgradient	2/16/2011	1237625.00	2025790.42	33.3992505	-85.0539584	782.56	785.60	736.36	726.36	59.54	10	740.56	738.56	726.06	PWR
GWC-27	Downgradient	2/16/2011	1237829.15	2025522.92	33.3998052	-85.0548405	811.38	814.32	753.68	743.68	70.94	10	758.88	756.38	743.38	PWR
GWA-28	Upgradient	2/22/2011	1237995.74	2025182.65	33.4002551	-85.0559600	846.33	849.16	813.63	803.63	45.83	10	817.33	815.33	803.33	Rock
GWA-29	Upgradient	6/27/2011	1238288.93	2024984.27	33.4010561	-85.0566182	831.70	834.67	787.90	777.90	57.07	10	795.70	790.10	777.60	Rock
GWC-30	Downgradient	2/17/2011	1238565.49	2025118.88	33.4018193	-85.0561849	788.46	791.10	751.76	741.76	49.64	10	757.16	755.06	741.46	Soil
GWC-31	Downgradient	6/21/2011	1238701.92	2025618.17	33.4022059	-85.0545528	793.57	797.50	769.97	759.97	38.03	10	780.57	775.57	759.47	Rock
GWC-32	Downgradient	2/18/2011	1238774.04	2025876.12	33.4024102	-85.0537097	782.17	785.38	764.47	754.47	31.21	10	770.37	767.67	754.17	Rock
GWC-33	Downgradient	2/18/2011	1238818.01	2026322.50	33.4025414	-85.0522484	757.02	760.05	746.32	736.32	24.03	10	750.32	748.32	736.02	PWR/Rock
GWC-34	Downgradient	2/21/2011	1238558.69	2026569.25	33.4018346	-85.0514327	732.49	735.40	694.99	684.99	50.91	10	699.49	697.49	684.49	PWR/Rock
GWC-35	Downgradient	2/8/2011	1238243.50	2026822.29	33.4009743	-85.0505949	728.11	730.64	700.41	690.41	40.53	10	705.61	703.11	690.11	PWR/Rock

Notes:

1. Northings and Eastings are feet relative to North American Datum 1983 (NAD83), State Plane Georgia West Zone.
2. Latitudes and longitudes are decimal degrees relative to North American Datum 1983.
3. Elevations are feet relative to North American Vertical Datum of 1988 (NAVD).
4. ft BTOC indicates feet below top of casing.
5. PWR indicates partially weathered rock.
6. Wells resurveyed December 2020.
7. Table provided by ACC and taken from 1st 2021 Semiannual Groundwater Monitoring and Corrective Action Report dated August 31, 2021.

FIGURE A1: WELL LOCATION MAP

ATLANTIC COAST CONSULTING, INC.

500 0 250 500

SCALE (IN FEET)

LEGEND:

EXISTING	DESCRIPTION
	APPROXIMATE PROPERTY BOUNDARY
	APPROXIMATE LANDFILL/CELL BOUNDARY
GWC–10	MONITORING WELL
SWA–1	SURFACE WATER MONITORING POINT

NOTE:
1. SURFACE WATER MONITORING POINTS SWC-2, SWC-3, SWC-4, SWC-5, SWC-8, AND SWC-9 ARE UNDERDRAIN SAMPLING LOCATIONS.

PROJECT

Georgia Power

GEORGIA POWER COMPANY
PLANT WANSLEY LANDFILL

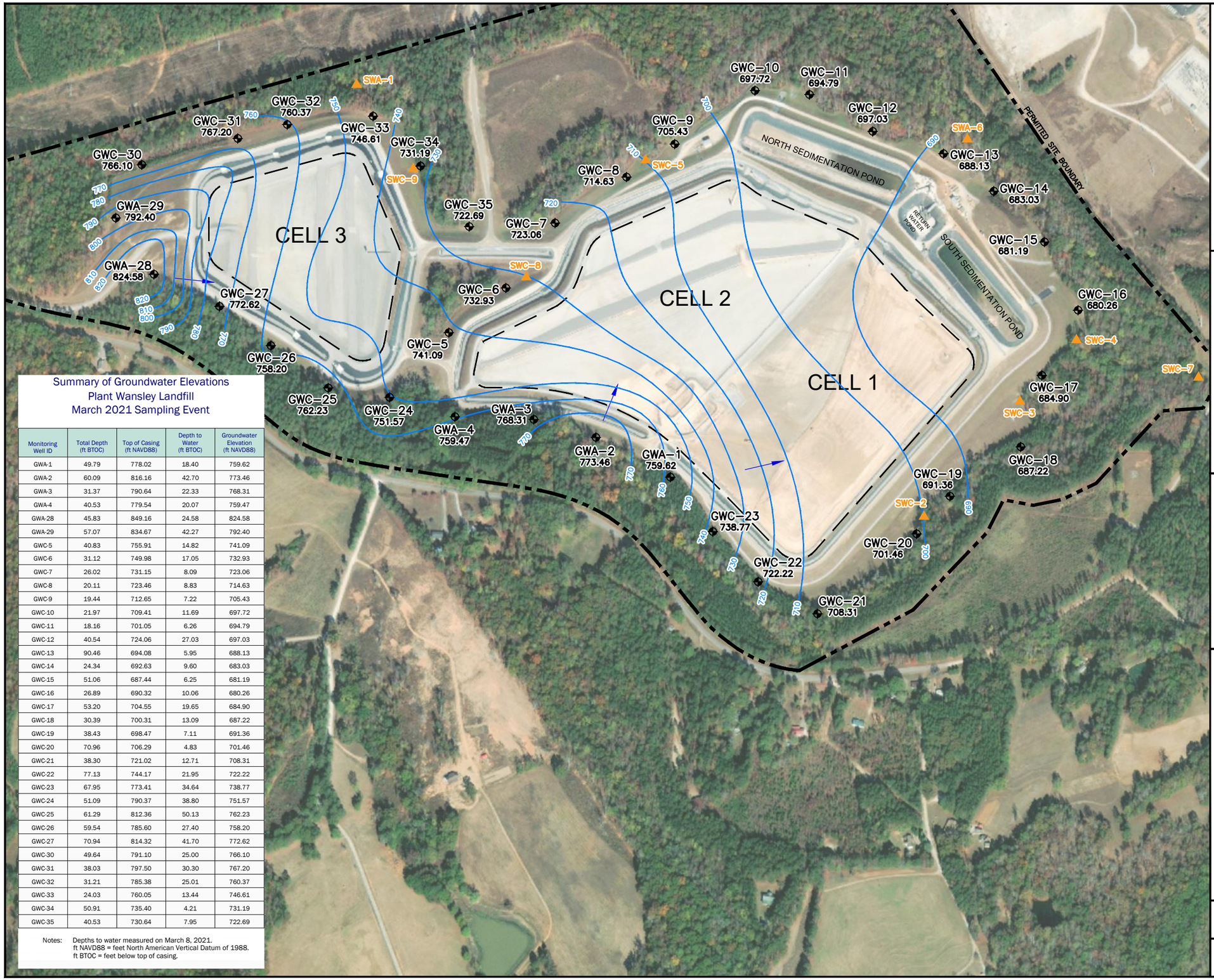
2021 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

WELL LOCATION MAP

PROJECT NO. I054-110 January 2022

DRAWN BY:	RW	FIGURE:
CHECKED BY:	MM	A1

FIGURE A2: POTENTIOMETRIC CONTOUR MAP MARCH



Summary of Groundwater Elevations
Plant Wansley Landfill
March 2021 Sampling Event

Monitoring Well ID	Total Depth (ft BTOC)	Top of Casing (ft NAVD88)	Depth to Water (ft BTOC)	Groundwater Elevation (ft NAVD88)
GWA-1	49.79	778.02	18.40	759.62
GWA-2	60.09	816.16	42.70	773.46
GWA-3	31.37	790.64	22.33	768.31
GWA-4	40.53	779.54	20.07	759.47
GWA-28	45.83	849.16	24.58	824.58
GWA-29	57.07	834.67	42.27	792.40
GWC-5	40.83	755.91	14.82	741.09
GWC-6	31.12	749.98	17.05	732.93
GWC-7	26.02	731.15	8.09	723.06
GWC-8	20.11	723.46	8.83	714.63
GWC-9	19.44	712.65	7.22	705.43
GWC-10	21.97	709.41	11.69	697.72
GWC-11	18.16	701.05	6.26	694.79
GWC-12	40.54	724.06	27.03	697.03
GWC-13	90.46	694.08	5.95	688.13
GWC-14	24.34	692.63	9.60	683.03
GWC-15	51.06	687.44	6.25	681.19
GWC-16	26.89	690.32	10.06	680.26
GWC-17	53.20	704.55	19.65	684.90
GWC-18	30.39	700.31	13.09	687.22
GWC-19	38.43	698.47	7.11	691.36
GWC-20	70.96	706.29	4.83	701.46
GWC-21	38.30	721.02	12.71	708.31
GWC-22	77.13	744.17	21.95	722.22
GWC-23	67.95	773.41	34.64	738.77
GWC-24	51.09	790.37	38.80	751.57
GWC-25	61.29	812.36	50.13	762.23
GWC-26	59.54	785.60	27.40	758.20
GWC-27	70.94	814.32	41.70	772.62
GWC-30	49.64	791.10	25.00	766.10
GWC-31	38.03	797.50	30.30	767.20
GWC-32	31.21	785.38	25.01	760.37
GWC-33	24.03	760.05	13.44	746.61
GWC-34	50.91	735.40	4.21	731.19
GWC-35	40.53	730.64	7.95	722.69

Notes: Depths to water measured on March 8, 2021.
ft NAVD88 = feet North American Vertical Datum of 1988.
ft BTOC = feet below top of casing.

ATLANTIC COAST CONSULTING, INC.

500 0 250 500

SCALE (IN FEET)

LEGEND:

EXISTING	DESCRIPTION
	APPROXIMATE PROPERTY BOUNDARY
	APPROXIMATE LANDFILL/CELL BOUNDARY
GWC-10 697.52	MONITORING WELL GROUNDWATER ELEVATION
SWA-1	SURFACE WATER MONITORING POINT
700 700	GROUNDWATER ELEVATION CONTOUR
	GROUNDWATER FLOW DIRECTION

EVAN B. PERRY
GEORGIA REGISTERED PROFESSIONAL GEOLOGIST
No. 1744

PROJECT

Georgia Power

GEORGIA POWER COMPANY
PLANT WANSLEY LANDFILL

2021 SEMIANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

POTENTIOMETRIC CONTOUR MAP MARCH 2021

PROJECT NO. 1054-110 AUGUST 2021

DRAWN BY: RW

CHECKED BY: MM

FIGURE: A2

ATTACHMENT A1: WELL CONSTRUCTION AND BORING LOGS

BORING GWA-1
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/3/2011 **COMPLETED** 3/3/2011 **SURF. ELEV.** 774.93 **COORDINATES:** N - 1236940.49, E - 2027869.31
CONTRACTOR Boart Longyear **EQUIPMENT** _____ **METHOD** Rotosonic
DRILLED BY _____ **LOGGED BY** C. Sellers **CHECKED BY** _____ **ANGLE** _____ **BEARING** _____
BORING DEPTH 46.7 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - red (10R 4/8) damp, trace gravel		
5		**(PWR)** - very pale brown / very pale orange (10YR 8/2) saprolite micaceous		
10		- PWR: pale red purple (5RP 6/2) saprolite damp - PWR: reddish brown / moderate brown (5YR 4/4) saprolite micaceous		
15		- PWR: brown (10YR 5/3) saprolite wet, micaceous		
20				
25		- PWR: very dark grayish brown (10YR 3/2) saprolite wet, micaceous		
30				
35				
40		- PWR: very pale brown / very pale orange (10YR 8/2) saprolite wet, micaceous		
45				
50		Bottom of borehole at 46.7 feet.		

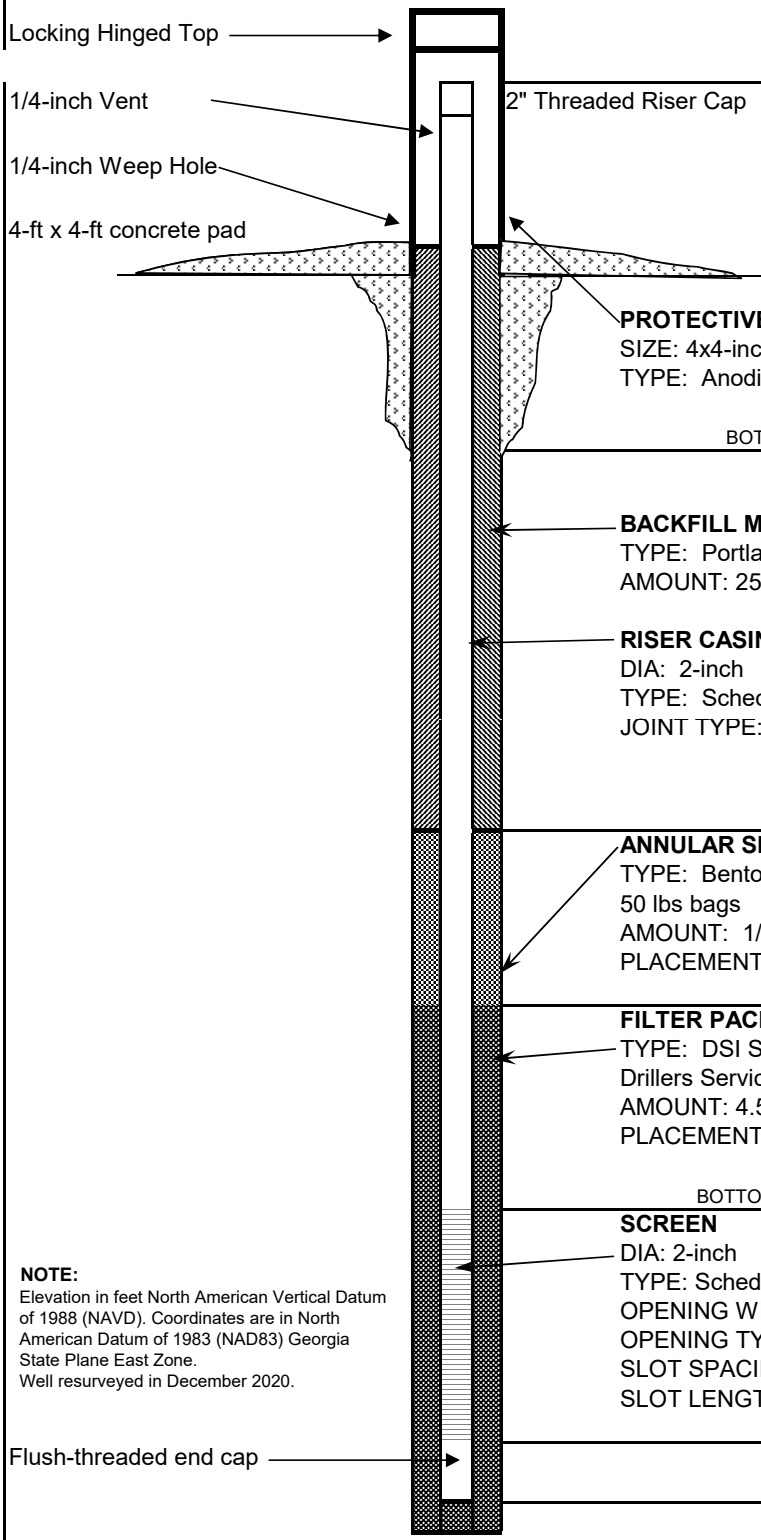
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:54 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWA-1
LOGGER: Sellers	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 3-3-11			

N - 1236940.49, E - 2027869.31



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.09	778.02
GROUND SURFACE	0.00	774.93
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 25 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	32.00	742.93
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	34.00	740.93
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	36.40	738.53
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	46.40	728.53
BOTTOM OF CASING	46.70	728.23

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWA-2
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/3/2011 COMPLETED 3/3/2011 SURF. ELEV. 813.07 COORDINATES: N - 1237147.60, E - 2027481.39
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 57 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Silty Sand (SM) - light red / moderate reddish orange (10R 6/6) trace gravel		
		(PWR) - reddish brown / moderate brown (5YR 4/4) saprolite micaceous		
10		- PWR: red (10R 4/8) saprolite wet		
		- PWR: brown (10YR 5/3) saprolite damp, micaceous		
20				
		- black (10YR 2/1) wet, (drilled without water)		
30				
40		- black (10YR 2/1) wet, (drilled without water)		
		- Red Staining (drilled with water)		
50				
		- No red staining		
60		Bottom of borehole at 57.0 feet.		

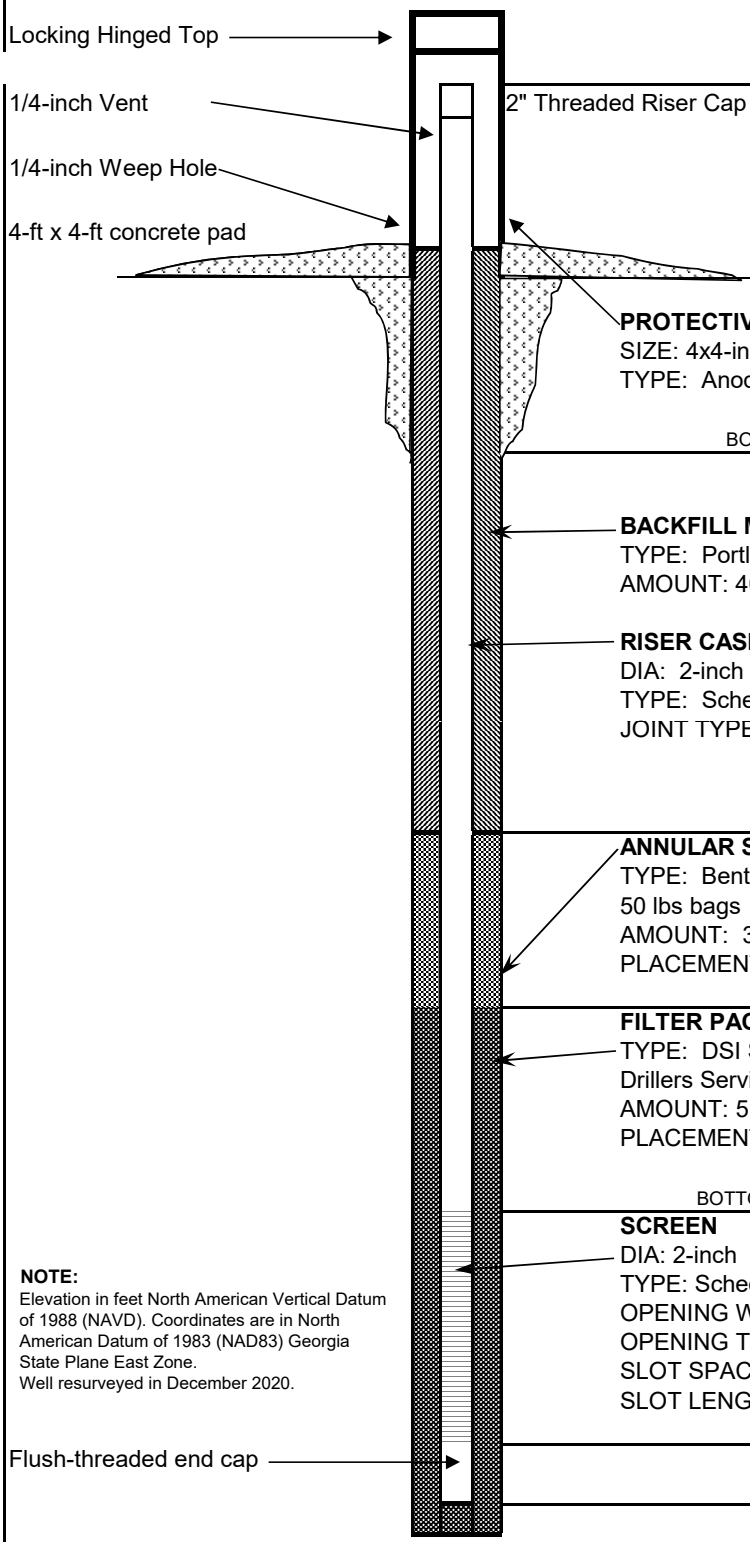
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWA-2
LOGGER: Sellers	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 3-3-11			

N - 1237147.60, E - 2027481.39



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.09	816.16
GROUND SURFACE	0.00	813.07
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 40 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	39.50	773.57
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	42.50	770.57
FILTER PACK TYPE: DSI Sand - 1A (20/30) Drillers Services, Inc. AMOUNT: 5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	46.70	766.37
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	56.70	756.37
BOTTOM OF CASING	57.00	756.07

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWA-3
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/3/2011 COMPLETED 3/3/2011 SURF. ELEV. 787.27 COORDINATES: N - 1237240.36, E - 2027158.40
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD _____
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 27 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Lean Clay (CL) - red, wet, w/ trace organics					
5		**Sandy Lean Clay (SP-SC)** - yellow to orange					
10		**Partially Weathered Rock** - red, clayey saprolite					
		- red, clayey saprolite; wet					
15		- gray to brown, saprolite; wet					
		Quartzite - tan, vein, dry					
20		**Schist** - brown, grey, red, wet					
25							
30		Bottom of borehole at 27.0 feet.					

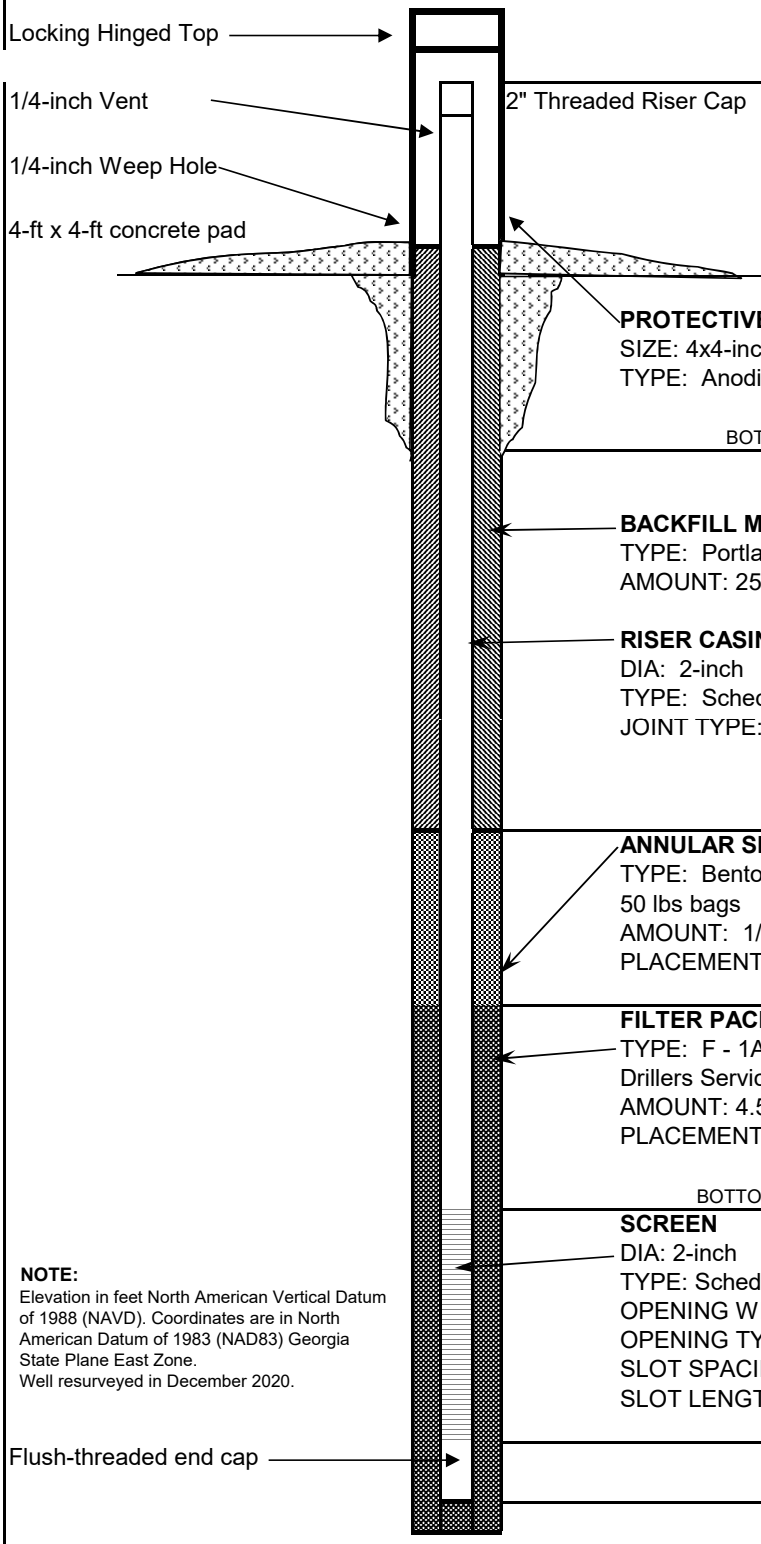
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWA-3
LOGGER: Sellers	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 3-3-11			

N - 1237240.36, E - 2027158.40



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.37	790.64
GROUND SURFACE	0.00	787.27
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 25 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	13.40	773.87
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	15.50	771.77
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	17.70	769.57
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	27.70	759.57
BOTTOM OF CASING	28.00	759.27

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/11/2011 COMPLETED 2/11/2011 SURF. ELEV. 776.51 COORDINATES: N - 1237254.83, E - 2026747.92
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD _____
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 34 ft. GROUND WATER DEPTH: DURING 33 ft. COMP. _____ DELAYED _____
NOTES _____

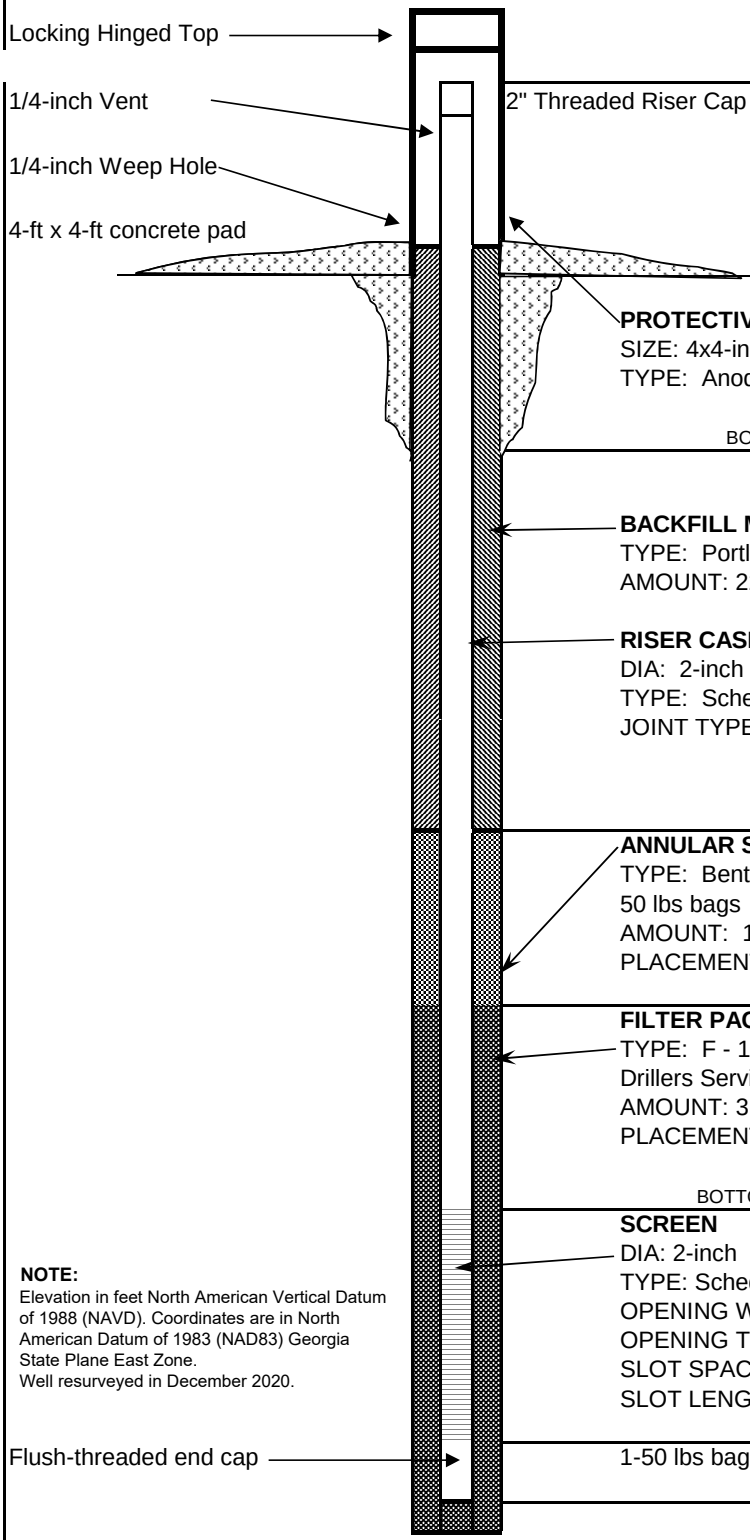
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM) - damp, sediments are very micaceous					
5		**Sandy Lean Clay (SP-SC)** - orange, moist, low plasticity					
10		**Clayey Sand (SC)** - orange to tan, damp, w/ small pieces of highly weathered schist (white) - tan, damp, w/ more prevalent pieces of weathered schist - orange, damp, micaceous, no pieces of schist					
15		**Silty Clay (CL-ML)** - orange, brown, and gray, damp to wet, medium plasticity, w/ depth, pieces of competent quartz included in core sample					
20		**Partially Weathered Rock** - orange, tan, saprolite; saprolite is derived from schist and has weathered to silt and sand, micaceous, moisture content changes with depth (damp to dry) - tan, saprolite; fewer sands and saprolite is more competent, dry - mottled tan, light brown, grey, highly weathered, saprolite					
25		**Silty Clay (CL-ML)** - light brown, damp, low plasticity					
30		**Clayey Sand (SC)** - tan, very moist, prevalent gravel size pieces of weathered schist/gneiss					
		Gneiss - mottled tan, orange, highly weathered, geniss is weathering to a lightly clayey sand sediment, some pieces of gneiss are very competent					
35		Bottom of borehole at 34.0 feet.					

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWA-4
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-14-11			

N - 1237254.83, E - 2026747.92



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.03	779.54
GROUND SURFACE	0.00	776.51
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 22 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	23.90	752.61
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	25.90	750.61
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.75 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	27.20	749.31
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	37.20	739.31
1-50 lbs bag of sand at bottom of hole		
BOTTOM OF CASING	37.50	739.01

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-5
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/10/2011 COMPLETED 2/10/2011 SURF. ELEV. 753.08 COORDINATES: N - 1237692.42, E - 2026716.41
CONTRACTOR _____ EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 38 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

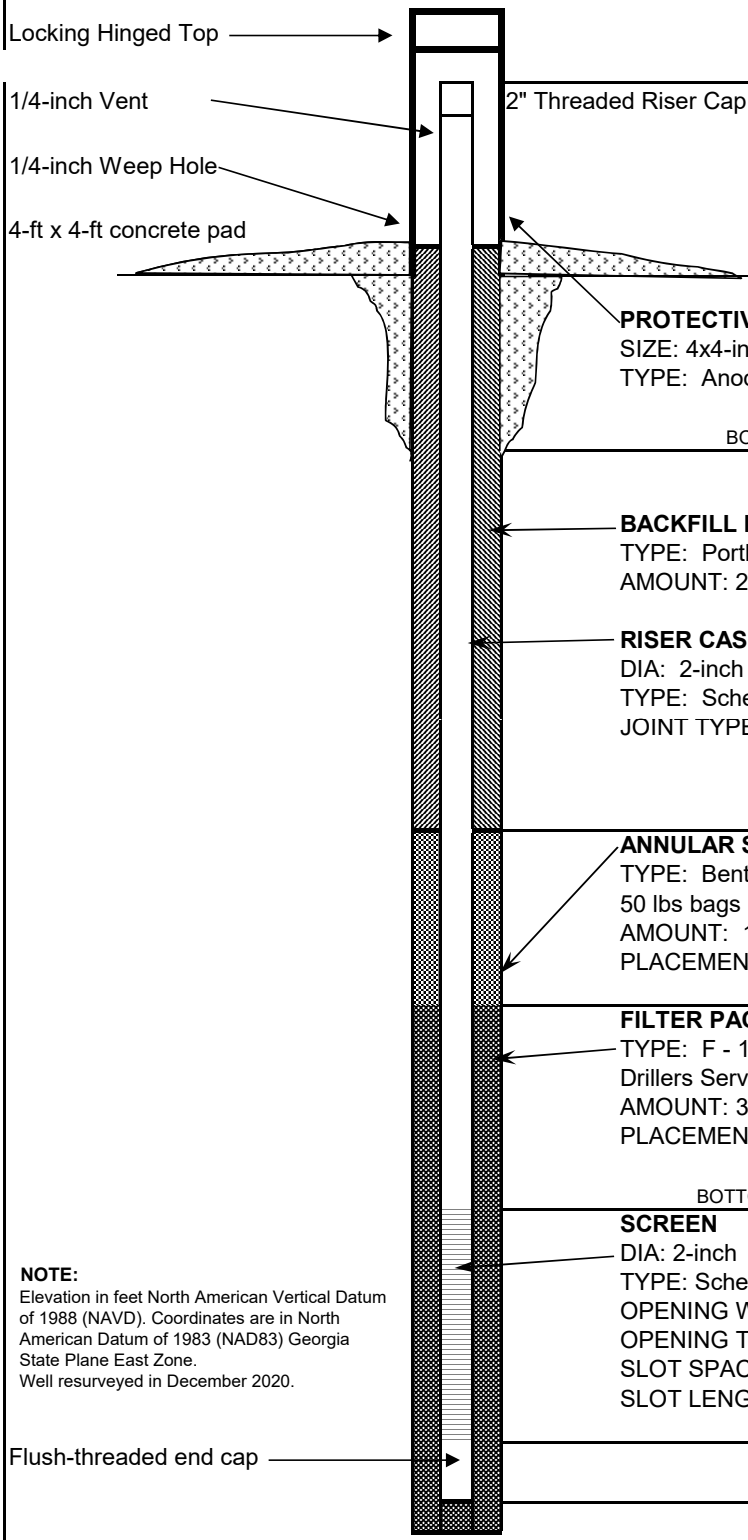
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		**(SM)** - orange to tan, dry, w/ angular pieces of partially weathered schist, trace organics					
10		- Schist: dark grey, weathered schist/gneiss, high percentage of grey silt and sand, dry					
15		**Partially Weathered Rock** - tan, grey, brown, saprolite; grain size is predominantly gravel w/ smaller amounts of sand and silt, dry					
		Silty Clay (CL-ML) - orange, wet, w/ gravel size angular gneissic rock					
		Partially Weathered Rock - tan to brown, saprolite; mostly gravel to boulder szied weathered schist w/ some geniss, damp					
20		**Clayey Gravel (GC)** - brown, grey, wet, gravel is composed of consolidated gneissic fragments					
25							missing section.
		Gneiss - dark grey, partially weathered with clay to sand, dry					
		Partially Weathered Rock - orange to tan, saprolite; highly weathered geniss, damp					
30		**Gneiss** - grey, consolidated, foliations and structure intact					covered with water.
35							**NOTE:** Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in December 2020.
40		Bottom of borehole at 38.0 feet.					

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-5
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-10-11			

N - 1237692.42, E - 2026716.41



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.83	755.91
GROUND SURFACE	0.00	753.08
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 25 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	19.50	733.58
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	22.00	731.08
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	27.70	725.38
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	37.70	715.38
BOTTOM OF CASING	38.00	715.08

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-6
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/10/2011 COMPLETED 2/10/2011 SURF. ELEV. 746.86 COORDINATES: N - 1237924.67, E - 2027012.89
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD _____
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 28 ft. GROUND WATER DEPTH: DURING 21 ft. COMP. _____ DELAYED 17.7 ft. after 2 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy Lean Clay (SP-SC) - orange, wet, medium plasticity, slighty sandy					
5		**Partially Weathered Rock** - orange to tan, saprolite; mostly gravel, but some is weathered to silt and sand, sediments consist of highly micaceous schist, coarsening downward, poorly sorted, moist					
10		**(SM)** - orange, dry, pieces of more consistent schist - tan, w/ some clay and large angular pieces of geniss present					
15		**Poorly-graded Sandy Gravel (GP)** - mottled tan to brown, dry, sandy gravel; w/ some muds, gravel is angular and derived from gneiss - light tan, dry, sandy gravel; gravel is smaller and more elongate (gneissic parent) - dark grey, dry, sandy gravel (saprolitic); w/ some silts and sands (gneissic parent rock)					
20		**Partially Weathered Rock** - white to orange, saprolite; sandy gravel with higher percentage of silt, damp - tan to brown, highly weathered, saprolite; moist - orange to tan, saprolite; high gravel content with sandy clay matrix, gravel is very large and angular, wet					
25		**Gneiss** - grey, partially weathered gneiss with fine mud matrix, grading down to more unweathered grey gneiss, damp - grey, consolidated, foliations and structures intact, large angular quartz fragments					23' to 28' water was used for drilling.
30		Bottom of borehole at 28.0 feet.					

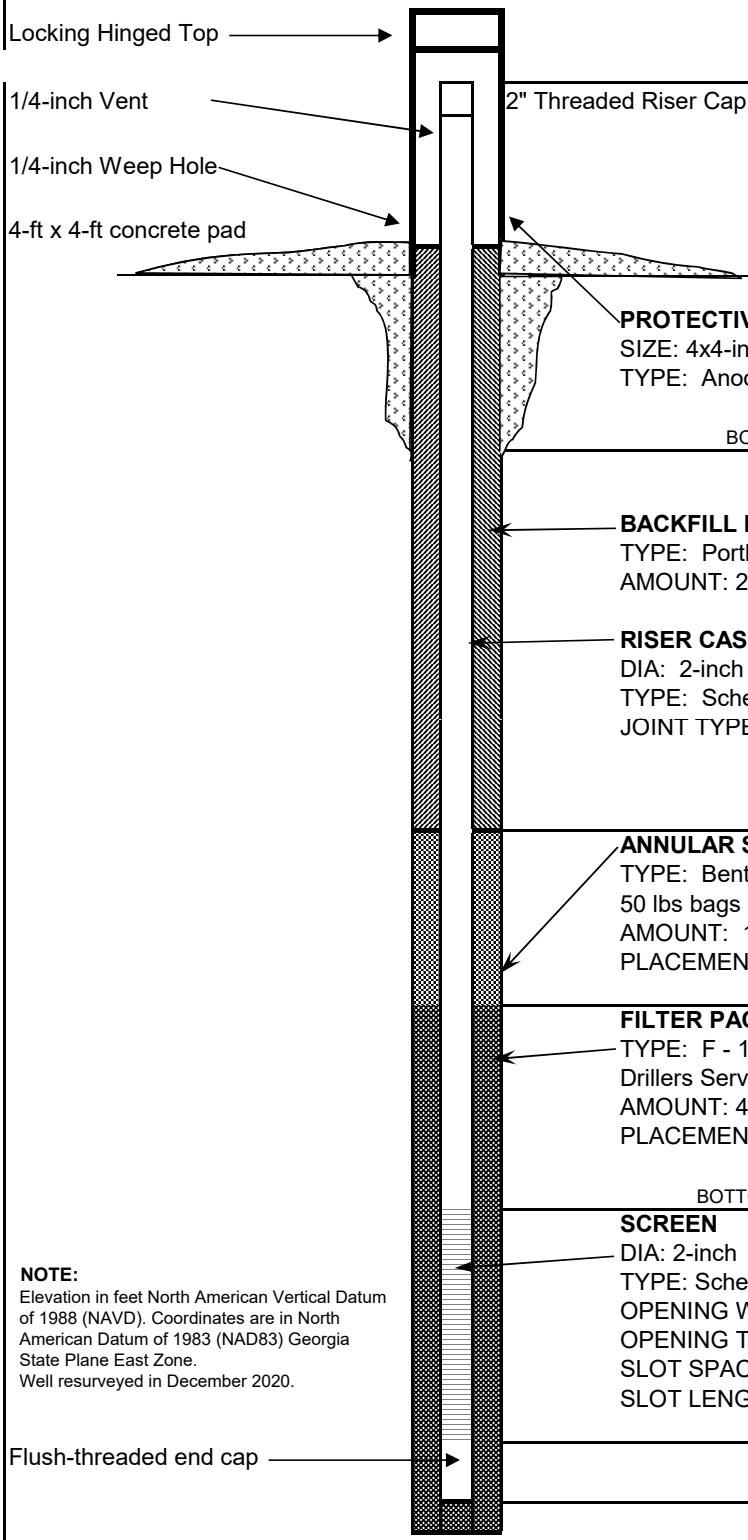
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-6
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-10-11			

N - 1237924.67, E - 2027012.89



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.12	749.98
GROUND SURFACE	0.00	746.86
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 25 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	11.00	735.86
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	15.00	731.86
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	17.70	729.16
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	27.70	719.16
BOTTOM OF CASING	28.00	718.86

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED _____ COMPLETED 2/10/2011 SURF. ELEV. 728.13 COORDINATES: N - 1238261.86 , E - 2027268.99
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD _____
DRILLED BY _____ LOGGED BY _____ CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 23 ft. GROUND WATER DEPTH: DURING 12 ft. COMP. _____ DELAYED 12.2 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

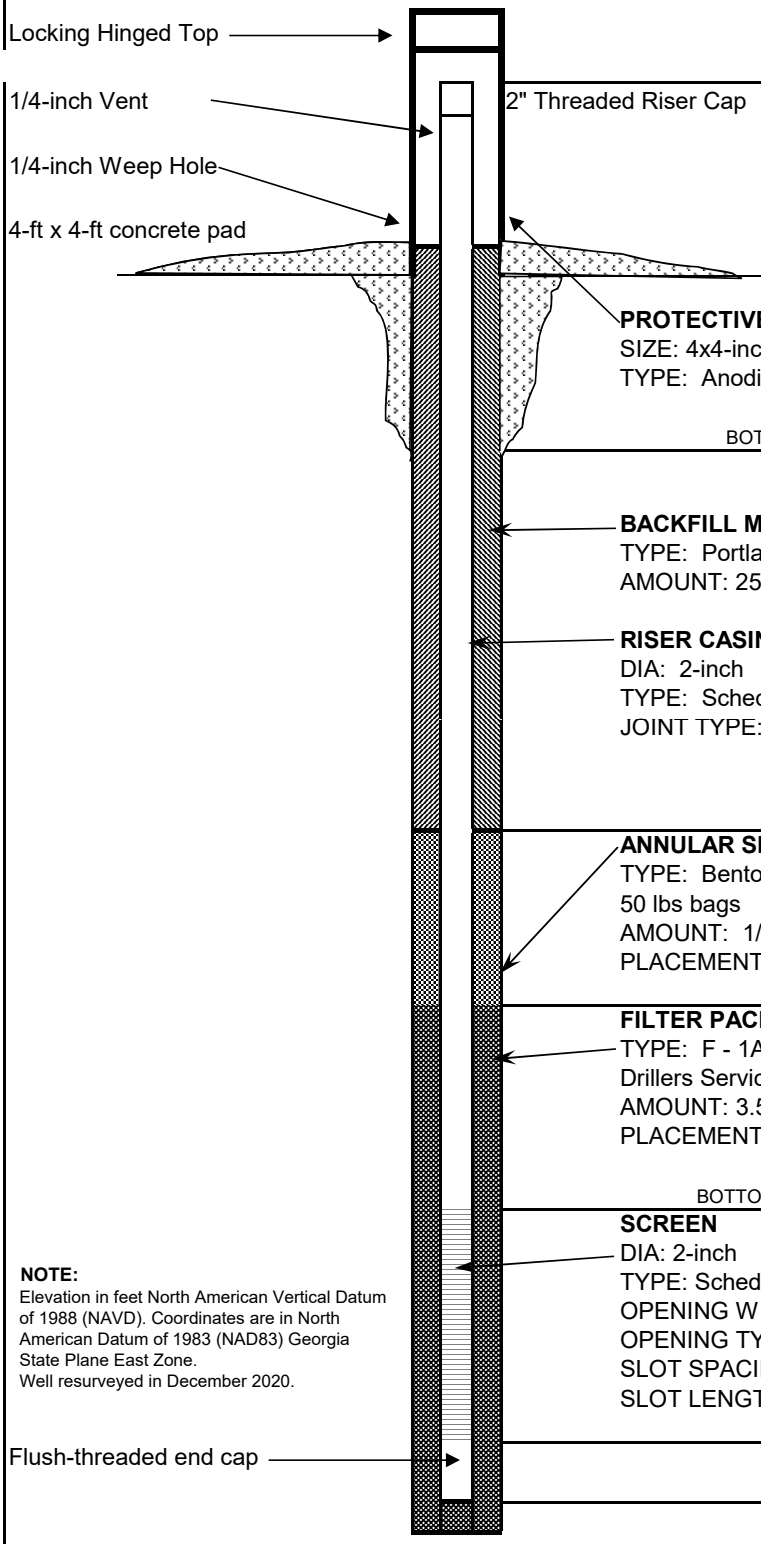
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		**Partially Weathered Rock** - brown to tan, orange, saprolite/regolith, fine silt to sand matrix w/ partially schist clasts. Clasts are angular and partially oxidized, grey zonations are present at 3' and 6', dry. Orange saprolite weatheres to sands, gravel, and silt - finer than 0-7'.					
5							
10		**Gneiss** - light grey, partially weathered gneiss and schist, mainly sand and silt sized matrix					
15							no sample.
20		- grey, consolidated, foliations and structure intact					**NOTE:** Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in December 2020.
25		Bottom of borehole at 23.0 feet.					

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-7
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-10-11			

N - 1238261.86, E - 2027268.99



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.02	731.15
GROUND SURFACE	0.00	728.13
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 25 gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	8.80	719.33
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	10.80	717.33
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	12.70	715.43
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	22.70	705.43
BOTTOM OF CASING	23.00	705.13

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/22/2011 COMPLETED 2/22/2011 SURF. ELEV. 720.35 COORDINATES: N - 1238501.55, E - 2027640.45
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 17 ft. GROUND WATER DEPTH: DURING 7 ft. COMP. _____ DELAYED 7.5 ft. after 18 hrs.
NOTES Well installed. Refer to well data sheet.

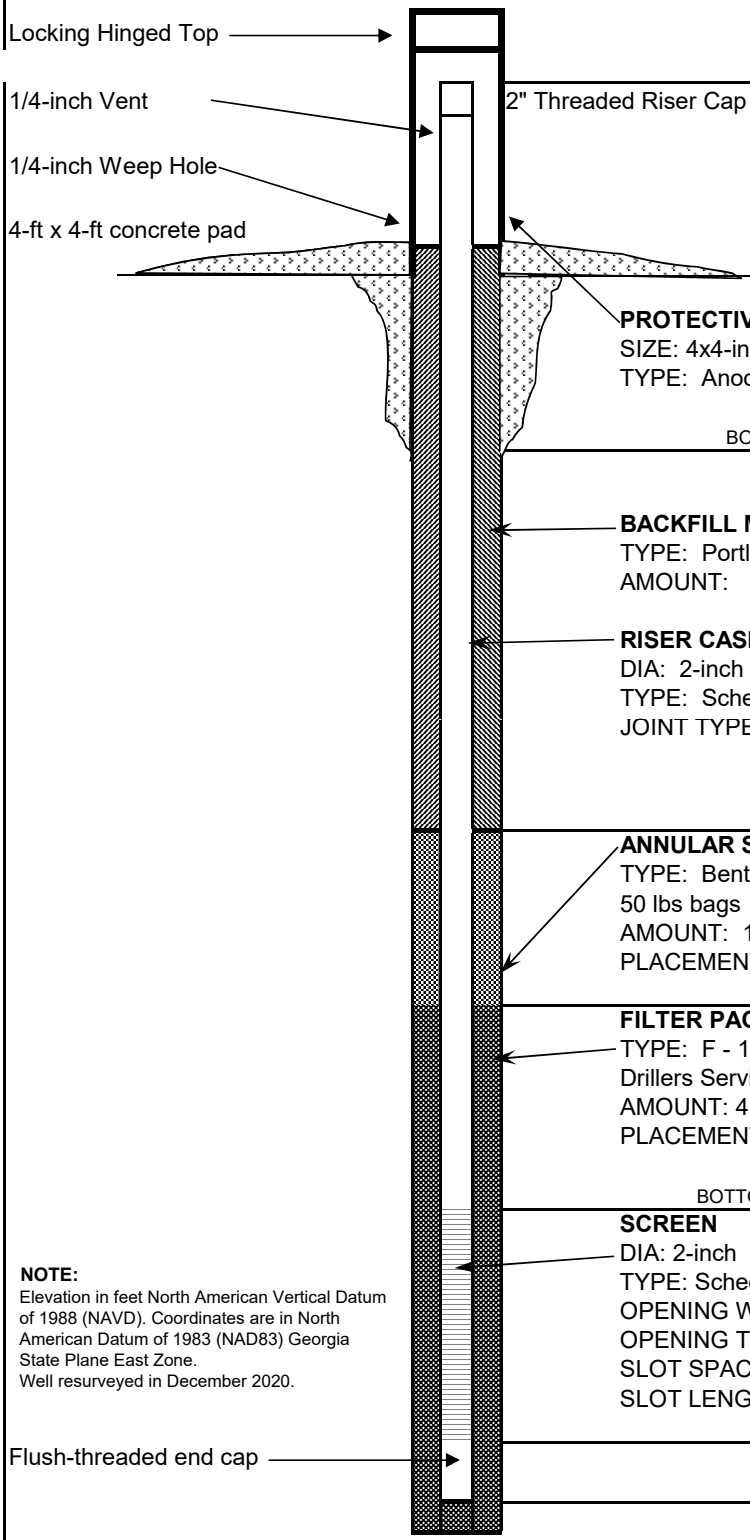
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Gneiss - brown to dark grey, slightly weathered granitic gneiss; sandy gravel, fragments are competent grades to mottled gray and tan sand w/ small gravels; slightly damp					
5		**Silty Sand (SM)** - mottled brown, grey, tan, wet, w/ fewer gravel sized seps, possible small clayey silt layer					
		Gneiss - tan to brown, slightly weathered gneiss; very competent, sandy gravel, very moist - grey, white, very hard, sample is extremely competent, displays ideal gneissic bonding w/ pink (feldspar) and white bands (quartz) up to .5" thick, lacks fractures and oxide staining, dry					possible solid rock content, possible confining layer - 20% clay to 40% clay. 8' to 10' minor amounts of oxide staining.
10							
15							
20		Bottom of borehole at 17.0 feet.					

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-8
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-22-11			

N - 1238501.55, E - 2027640.45



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.11	723.46
GROUND SURFACE	0.00	720.35
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	2.50	717.85
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	4.50	715.85
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	6.70	713.65
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	16.70	703.65
BOTTOM OF CASING	17.00	703.35

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/23/2011 COMPLETED 2/23/2011 SURF. ELEV. 709.71 COORDINATES: N - 1238673.12, E - 2027891.35
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 16.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 4.2 ft. after 20 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silt (SM) - tan, brown, wet, low to medium plasticity, fine sand; few gravel sized pieces of quartz, clay fraction = 10%					
5		**Poorly-graded Sandy Gravel (SP)** - mottled tan, brown, dark grey, moist, low plasticity, medium to coarse grain, w/ gravel, gravel is comprised of quartz/gneissic fragments, some clay (approximately 9%)					
10		**Gneiss** - grey, white, hard, very competent, MOP iron oxide staining, some gold staining, quartz and feldspar bands 2" thick - grey, white, hard, very competent, small amounts of iron staining w/ some gold staining, no fractures					
15		**Poorly-graded Gravel (GP)** - zone of angular gravel, oxide staining					gravel resembles that of stream bed.
		Gneiss - grey, white, hard, some oxide staining, competent Bottom of borehole at 16.5 feet.					
20							

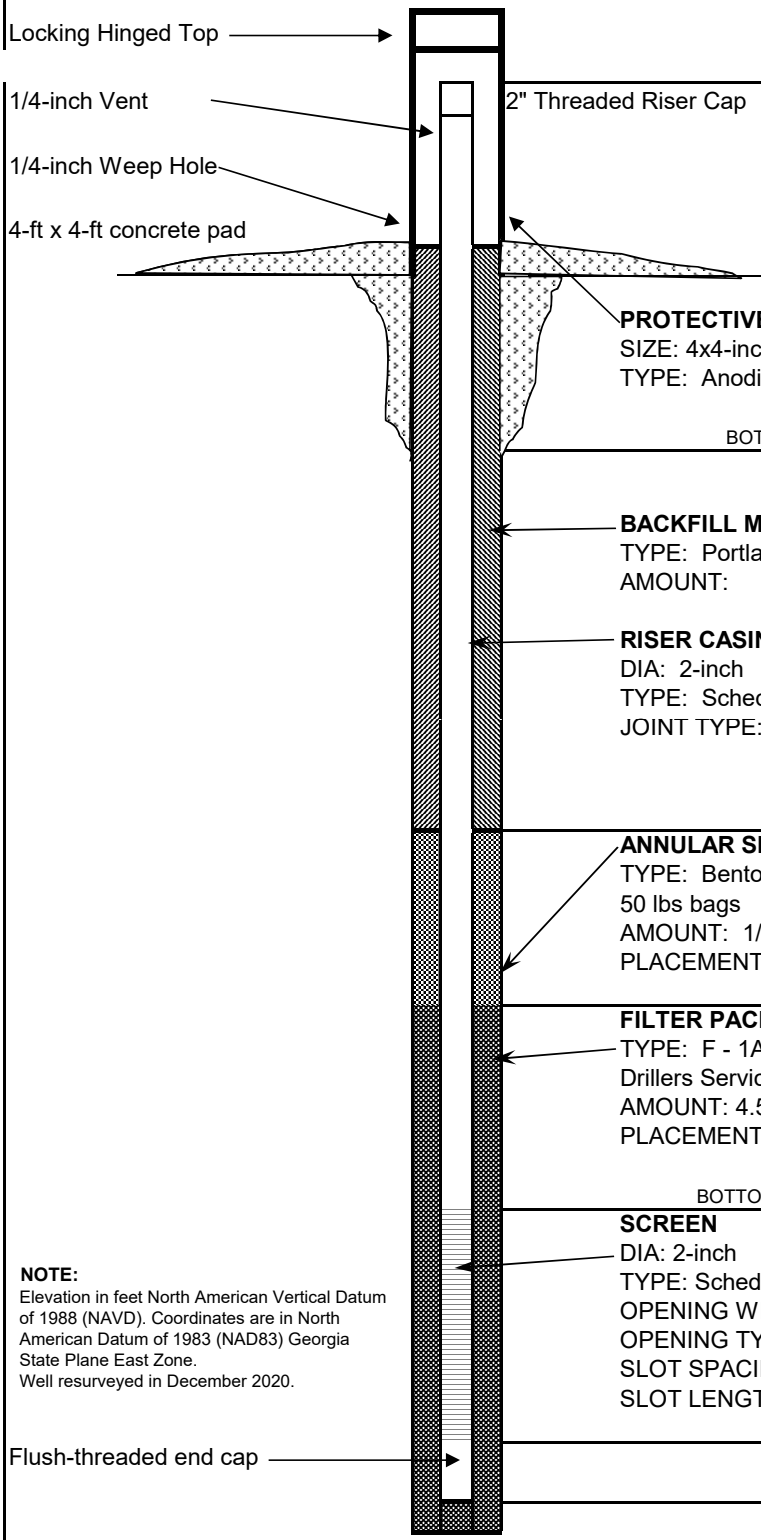
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-9
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-23-11			

N - 1238673.12, E - 2027891.35



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.94	712.65
GROUND SURFACE	0.00	709.71
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	Surface	709.71
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	4.00	705.71
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	6.20	703.51
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	16.20	693.51
BOTTOM OF CASING	16.50	693.21

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 7/12/2011 **COMPLETED** 7/12/2011 **SURF. ELEV.** 705.84 **COORDINATES:** N - 1238950.81, E - 2028309.04
CONTRACTOR SCS Field Services **EQUIPMENT** 550X **METHOD** HQ Casing; HQ Rock Core
DRILLED BY _____ **LOGGED BY** B. Gallagher **CHECKED BY** _____ **ANGLE** _____ **BEARING** _____
BORING DEPTH 20.5 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** 8.5 ft. after 18 hrs.
NOTES Well installed. Refer to well data sheet.

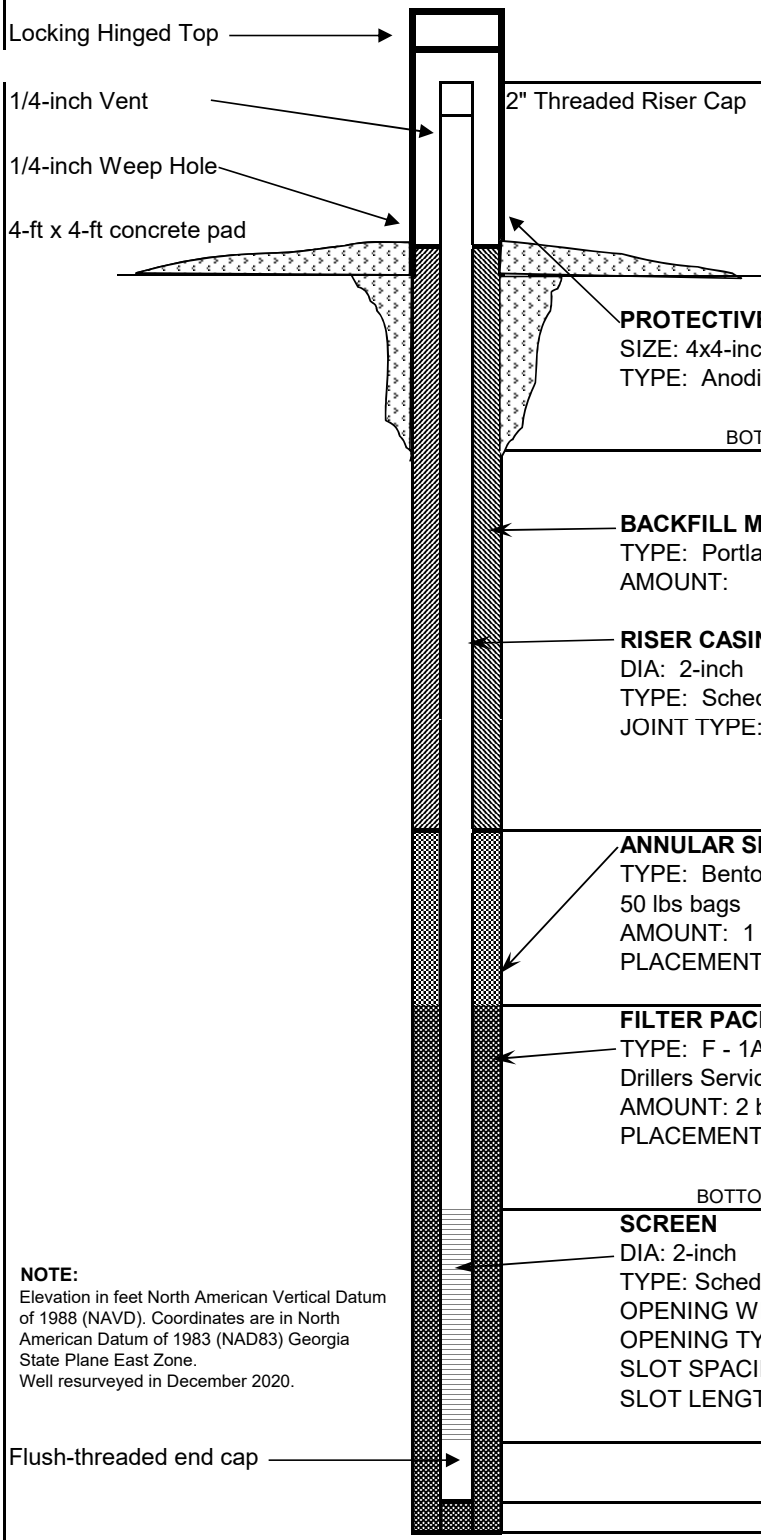
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		**(ML)** - dark brown, damp, medium dense, thin layer of silty fill over silty, sand residuum to partially weathered rock					
5							
10							
15		**Gneiss** - white and black, hard, slightly weathered, schistose with quartz phenocrysts - healed joint at 12.2 ft.	RC -1	12.0-15.5	WR-WR-WR (0)	100 (100)	Auger Refusal at 12.0 ft.
20			RC -2	15.5-20.5	WR-WR-WR (0)	100 (100)	
25		Bottom of borehole at 20.5 feet.					
30							
35							
40							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-10
LOGGER: Brooks	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 7-12-11			

N - 1238950.81, E - 2028309.04



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.57	709.41
GROUND SURFACE	0.00	705.84
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	1.00	704.84
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	5.20	700.64
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 2 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	8.10	697.74
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	18.10	687.74
BOTTOM OF CASING	18.40	687.44
BOTTOM OF HOLE	20.50	685.34
2.1' of Sand fill		

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/23/2011 COMPLETED 2/23/2011 SURF. ELEV. 697.89 COORDINATES: N- 1238930.02, E - 2028592.08
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 28 ft (15 ft well) GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 3.4 ft. after 16 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM) - orange, red, damp, w/ organics					
		Poorly-graded Sandy Gravel (SP) - light grey, wet, coarse grain, w/ gravel (stream bed deposit), gravels are angular and small					2' - 6' high yield zone.
5							
		Silty Sand (SM) - orange, moist, w/ some clay (approximately 5%)					6' - 11' moderate yield zone.
		- orange, tan, damp, increased consolidation, orginal gneissic foliations (relic structures observed in sediment) , less H2O					
10							
15							

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

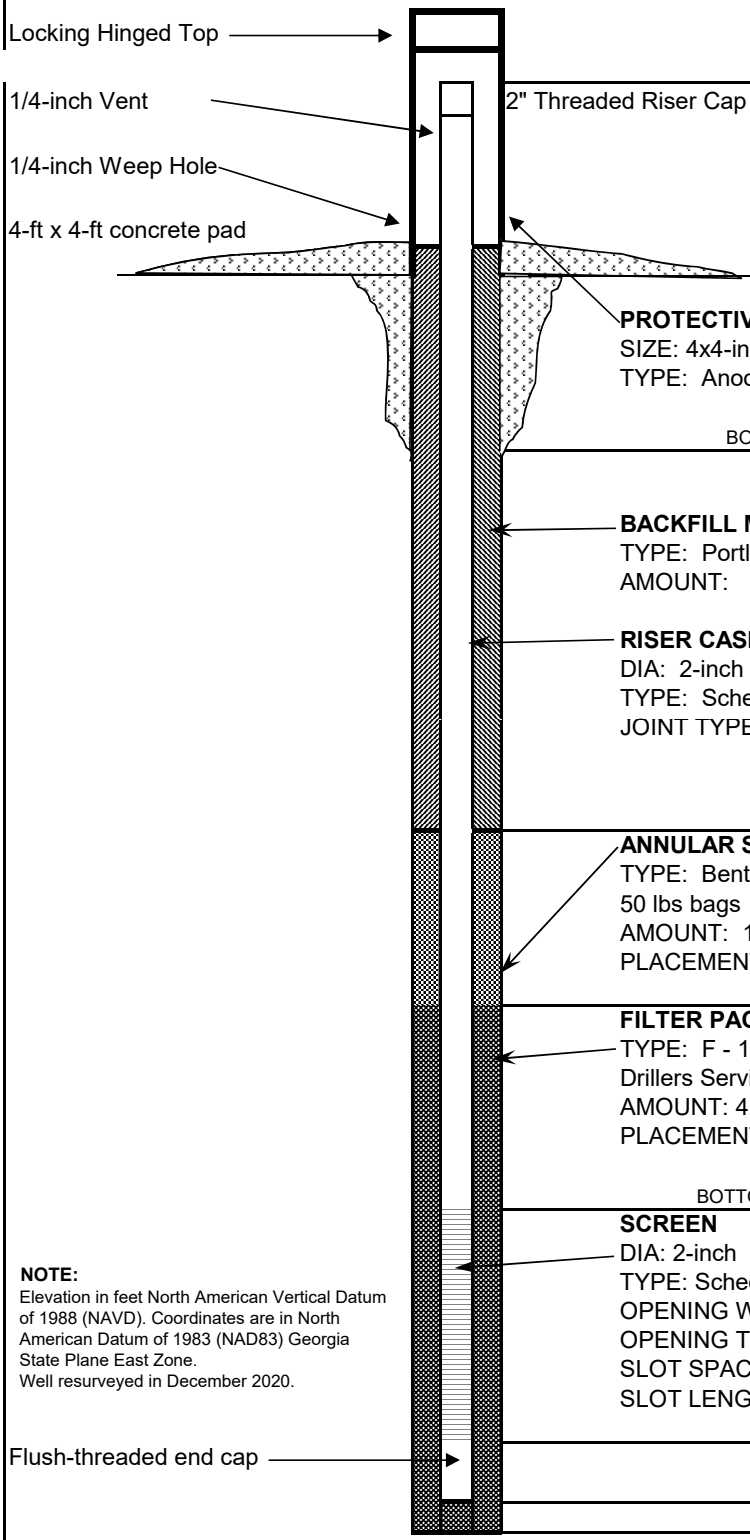
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM)*(con't)*					
		- less consolidation then 8' - 16' section, finer grained, and more clay (approximately 10%)					
		Partially Weathered Rock					sanded up to 18'.
20		- mottled red, brown, tan, highly weathered, saprolite					
		Gneiss					
25		Bottom of borehole at 28.0 feet.					
30							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	GWC-11
DATE CONSTRUCTED: 2-23-11			

N - 1238930.02, E - 2028592.08



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.16	701.05
GROUND SURFACE	0.00	697.89
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	Surface	697.89
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	3.00	694.89
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	4.70	693.19
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	14.70	683.19
BOTTOM OF CASING	15.00	682.89

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-12
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/23/2011 COMPLETED 2/24/2011 SURF. ELEV. 721.02 COORDINATES: N - 1238738.52, E - 2028921.56
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 37.5 ft. GROUND WATER DEPTH: DURING 17 ft. COMP. _____ DELAYED _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Poorly-graded Sand (SP) - orange, damp, w/ trace organics					
5		**Poorly-graded Sand with Silt (SP-SM)** - mottled dark brown, tan, damp, w/ some medium sized gravels: sand = 70%, silt = 20%, and gravels = 10%. gravels are weathered gneiss, not very competent mod well sorted and poorly graded, potentially trace clays					7' - 8' more dry.
10		- zonation of more tan sediment from 12' to 13'					
15		▽					
20		- red, wet, w/ few clays (approximately 5%) - damp					
25		**Poorly-graded Sandy Gravel (SP)** - brown, red, slightly damp, w/ gravel					
30		**Gneiss** - grey, white, slightly weathered gneiss weathering to silt, competent, some iron staining and pyrite staining w/ increasing depth - grey, white, moderate amounts of Fe oxide staining, heavy pyrite staining					
35							
40		Bottom of borehole at 37.5 feet.					

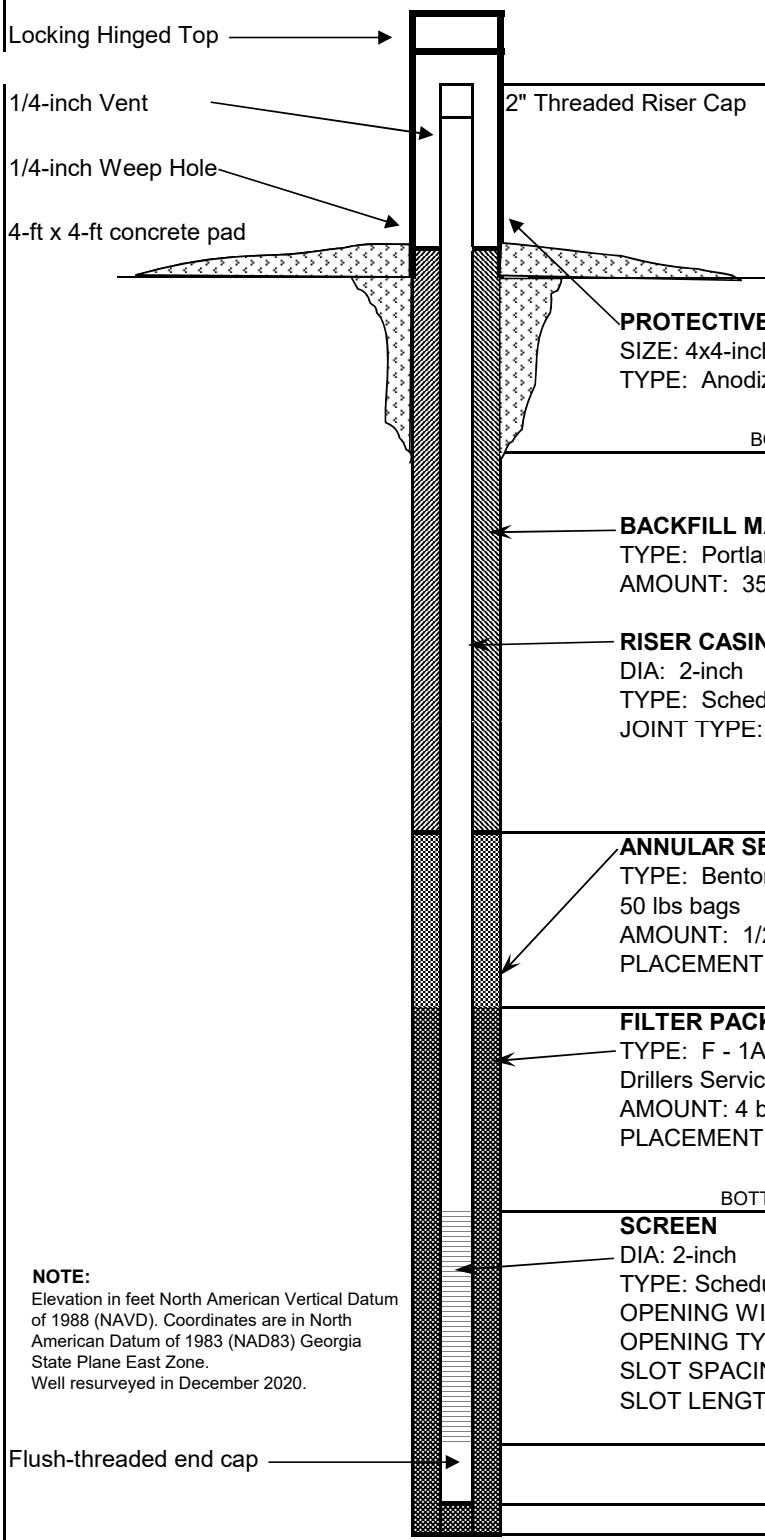
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-12
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-24-11			

N - 1238738.52, E - 2028921.56



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.04	724.06
GROUND SURFACE	0.00	721.02
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 35 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	22.50	698.52
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	24.00	697.02
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	27.20	693.82
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	37.20	683.82
BOTTOM OF CASING	37.50	683.52

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/24/2011 COMPLETED 2/24/2011 SURF. ELEV. 691.12 COORDINATES: N - 1238622.44, E - 2029289.86
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 87.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
5		**Poorly-graded Sandy Gravel (GP)** - light red / moderate reddish orange (10R 6/6) very moist, Sand is course, Gravel is angular, poorly sorted - GP: brown (10YR 5/3) and black (10YR 2/1) moist, Highly micaceous, gravel is partially weathered SCHIST		
10		- GP: brown (10YR 5/3) and black (10YR 2/1) moist, Highly micaceous, gravel is partially weathered SCHIST		
15		**SCHIST** - brown (10YR 4/3), light brown (7.5YR 6/3) and black (10YR 2/1) moderately weathered, moist		
20		**Mica SCHIST** - brown (10YR 4/3), light brown (7.5YR 6/3) and black (10YR 2/1) moderately to highly weathered, Relic Structures visible, moist		
25		- SAA, more H20 content		
30		**Poorly-graded Sand (SP)** - brown (10YR 4/3), light brown (7.5YR 6/3) and black (10YR 2/1) wet, coarse micaceous sands		
35		**Poorly-graded Sandy Gravel (GP)** - brown (10YR 4/3), light brown (7.5YR 6/3) and black (10YR 2/1) moist, medium to coarse grained sands with SCHIST gravel		
40		- GP: brown (10YR 4/3) and light brown (7.5YR 6/3) wet		
45		**Poorly-graded Sand (SP)** - brown (10YR 4/3) and light brown (7.5YR 6/3) damp, mostly sand, fewer gravel than previous intervals		
50		**Poorly-graded Sandy Gravel (GP)** - gray (10YR 6/1) and white (10R 8/1) GNEISS 60% gravel, 40% sand		

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley

LOCATION Carrollton, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Poorly-graded Sandy Gravel (GP) *(Con't)*		
		GNEISS - gray (10YR 6/1) and white (10YR 8/1) not weathered, hard and competent		
55		- brown (10YR 4/3), light brown (7.5YR 6/3) and black (10YR 2/1) completely weathered, most likely a fractured or fault zone, very micaceous, wet		
		GNEISS - gray (10YR 6/1) slightly weathered, hard, very competent, dry		
60				
65				
		Poorly-graded Sandy Gravel (GP) - brown (10YR 4/3), light brown (7.5YR 6/3) and dark grayish brown / dark yellowish brown (10YR 4/2) damp, highly weathered SCHIST		
70				
75				
		GNEISS - gray (10YR 6/1) and white (10YR 8/1) slightly weathered, competent, hard, prevalent Fe-oxide staining		
80				
85				
		Bottom of borehole at 87.5 feet.		
90				
95				
100				
105				
110				

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-13
LOGGER: Dyer	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-28-11			

N - 1238622.44, E - 2029289.86

	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.96	694.08
2" Threaded Riser Cap		
GROUND SURFACE	0.00	691.12
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 35 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	73.20	617.92
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	75.20	615.92
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	77.20	613.92
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	87.20	603.92
BOTTOM OF CASING	87.50	603.62

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 6/28/2011 COMPLETED 6/28/2011 SURF. ELEV. 688.59 COORDINATES: N - 1238428.07, E - 2029551.52
CONTRACTOR SCS Field Services EQUIPMENT _____ METHOD 3 1/4" Hollow Stem Auger
DRILLED BY _____ LOGGED BY D. Brooks CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 20.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 5.97 ft. after 12 hrs.
NOTES Well installed. Refer to well data sheet.

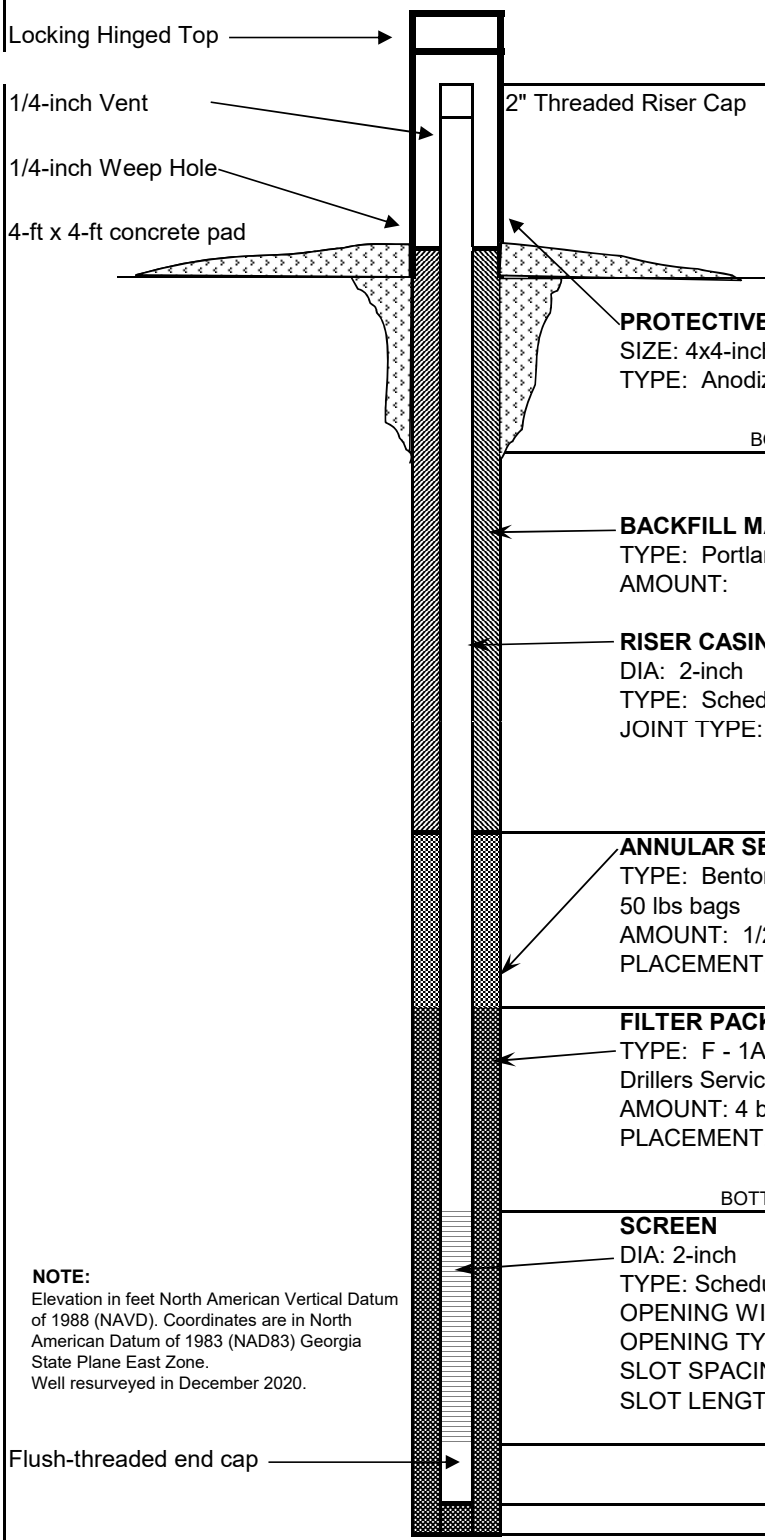
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Poorly-graded Sand (SP) - brown and gray, moist, loose					
5		▼	SS -1	4.5-6.0	2-3-4 (7)		
10		**Silty Sand (SM)** - gray and brown, wet, very dense	SS -2	9.5-10.7	15-10-50/2" (100+)		
15			SS -3	14.5-14.8	50-WR-WR/-8" (100+)		
20							
		Bottom of borehole at 20.5 feet.					
25							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:	
LOCATION: Plant Wansley	RIG TYPE:	GWC-14
LOGGER: Brooks	DRILLING METHODS:	
DATE CONSTRUCTED: 6-28-11		

N - 1238428.07, E - 2029551.52



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	4.04	692.63
GROUND SURFACE	0.00	688.59
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	5.20	683.39
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bucket of coated pellets PLACEMENT: Tremie		
TOP OF FILTER PACK	7.50	681.09
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	10.00	678.59
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	20.00	668.59
BOTTOM OF CASING	20.30	668.29

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

BORING GWC-15
PAGE 1 OF 1

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/28/2011 COMPLETED 2/28/2011 SURF. ELEV. 684.38 COORDINATES: N - 1238163.93, E - 2029814.36
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 48 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Silty Sand (SM) - brown (10YR 4/3) and light red / moderate reddish orange (10R 6/6) trace of gravel		
5		**Silty Sand (SM)** - light red / moderate reddish orange (10R 6/6) damp		
		(PWR) - gray (10YR 5/1) saprolite damp, very micaceous		
10				
15				
20		- PWR: gray (10YR 5/1) saprolite wet, micaceous		
25		- PWR: gray (10YR 5/1) saprolite wet, micaceous, *From 20-28 orange bandind every 1.5'		
30				
35		**SCHIST** - gray (10YR 5/1) moderately weathered, damp		
40		- SCHIST: gray (10YR 5/1) damp		
45		**(PWR)** - gray (10YR 5/1) saprolite		
		SCHIST - black (2.5Y 2.5/1)		
50		Bottom of borehole at 48.0 feet.		

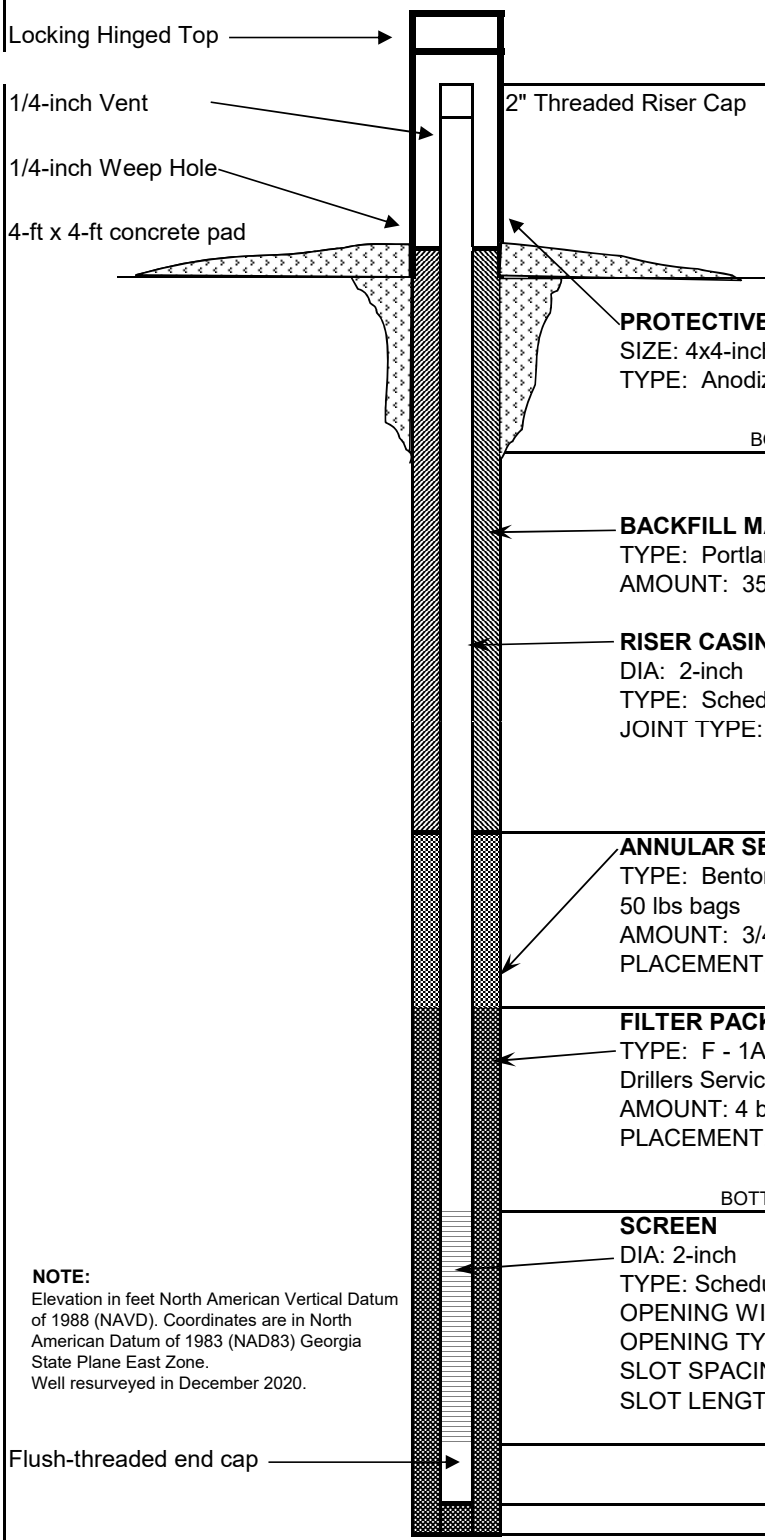
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-15
LOGGER: Sellers	DRILLING METHODS:	Roto Sonic	
DATE CONSTRUCTED: 2-28-11			

N - 1238163.93, E - 2029814.36



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.06	687.44
GROUND SURFACE	0.00	684.38
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 35 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	31.90	652.48
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	34.00	650.38
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	37.70	646.68
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	47.70	636.68
BOTTOM OF CASING	48.00	636.38

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

BORING GWC-16
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 6/28/2011 COMPLETED 6/28/2011 SURF. ELEV. 687.13 COORDINATES: N - 1237809.03, E - 2029989.71
CONTRACTOR SCS Field Services EQUIPMENT 550X METHOD 3 1/4" Hollow Stem Auger
DRILLED BY _____ LOGGED BY D. Brooks CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 24.9 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

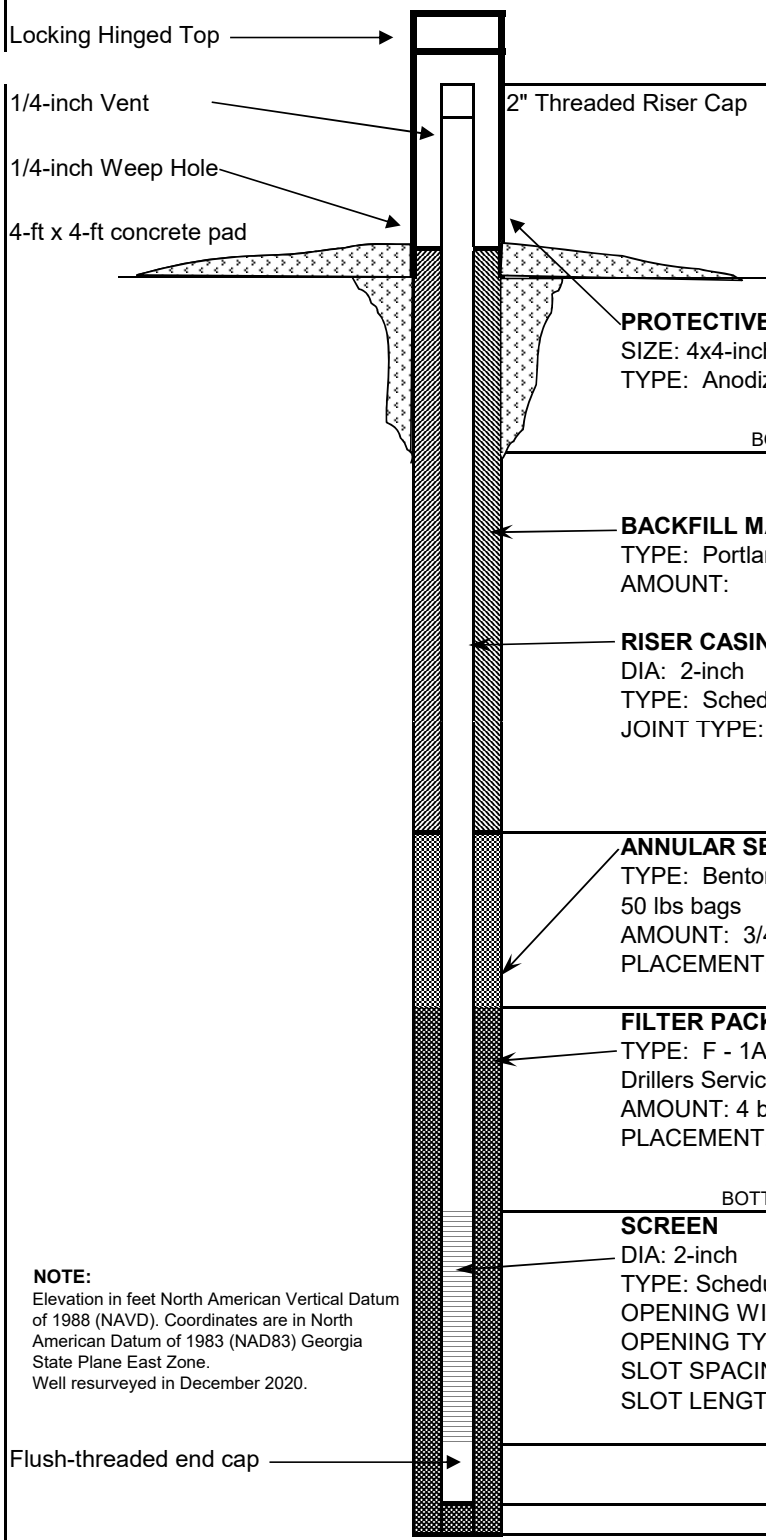
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		**Clayey Sand (SC)** - reddish brown, damp, medium dense, with wood chips					
5			SS -1	4.5-6.0	7-13-10 (23)		
10			SS -2	9.5-11.0	7-7-5 (12)		
15		**Silty Sand (SM)** - gray, wet, very dense, saprolite	SS -3	14.5-15.3	17-50-WR/-2" (100+)		
20			SS -4	19.5-20.3	30-50-WR/-2" (100+)		
25		Bottom of borehole at 24.9 feet.	SS -5	24.5-24.9	50-WR-WR/-7" (100+)		
30							
35							
40							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:	
LOCATION: Plant Wansley	RIG TYPE:	GWC-16
LOGGER: Brooks	DRILLING METHODS:	
DATE CONSTRUCTED: 6-28-11		

N - 1237809.03, E - 2029989.71



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.19	690.32
GROUND SURFACE	0.00	687.13
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	9.00	678.13
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	12.80	674.33
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	13.40	673.73
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	23.40	663.73
BOTTOM OF CASING	23.70	663.43

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 6/27/2011 COMPLETED 6/28/2011 SURF. ELEV. 701.65 COORDINATES: N - 1237469.64, E - 2029801.29
CONTRACTOR SCS Field Services EQUIPMENT 550X METHOD 3 1/4" Hollow Stem Auger
DRILLED BY _____ LOGGED BY D. Brooks CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 50.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 18.5 ft. after 4 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Clayey Sand (SC) - brown, damp, loose, fine grain, with pieces of wood					
			SS -1	4.5-6.0	2-5-6 (11)		
10			SS -2	9.5-11.0	2-3-4 (7)		
			SS -3	14.5-16.0	3-1-3 (4)		
20		▼ - yellowish red below 19.5 ft	SS -4	19.5-21.0	2-3-3 (6)		
			SS -5	24.5-26.0	3-3-4 (7)		
30			SS -6	29.5-31.0	2-2-3 (5)		
		(SC) - yellowish red, wet, dense, saprolite					
40							
50							
		Bottom of borehole at 50.5 feet.					
60							

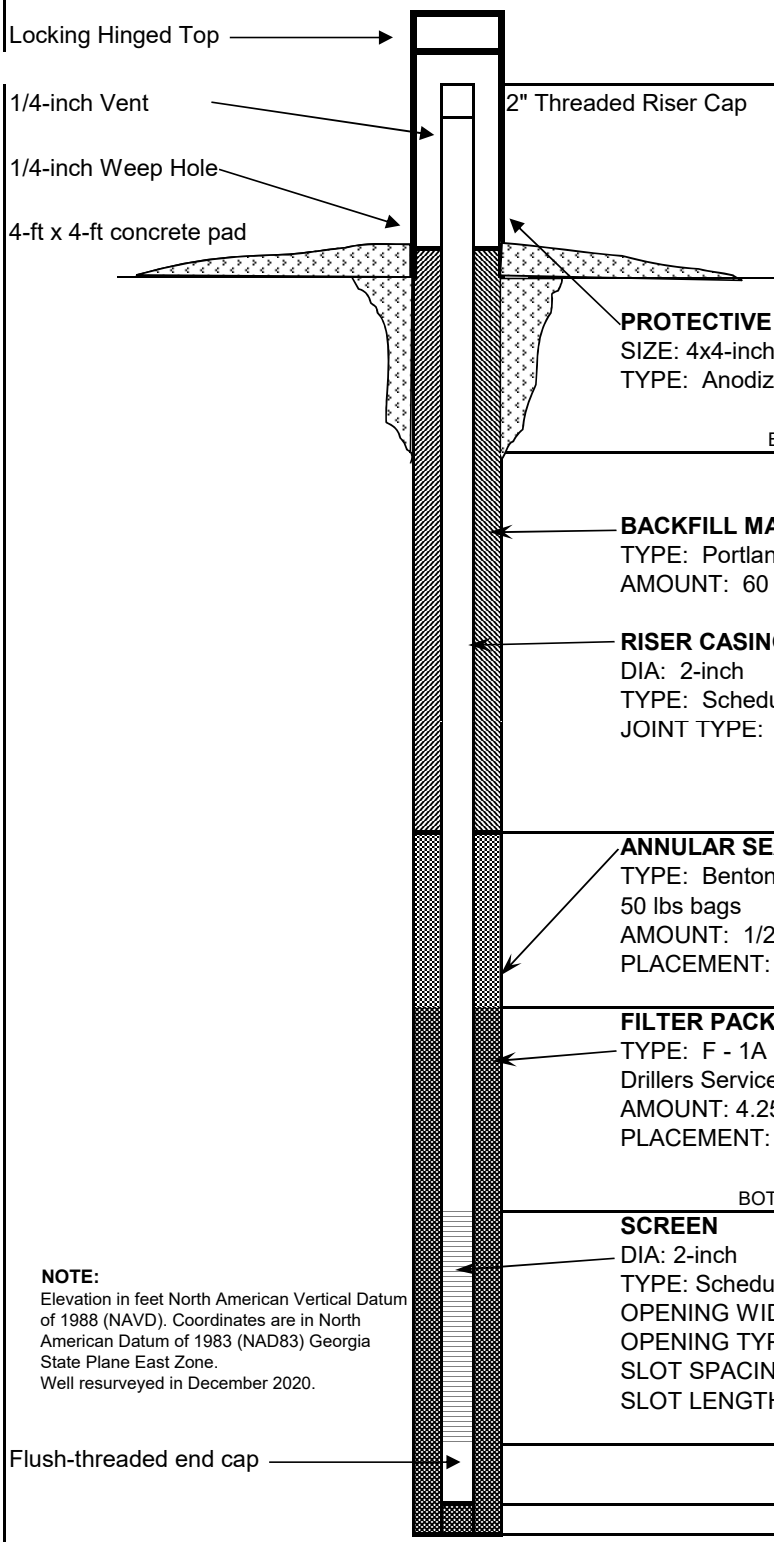
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/8/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	SCS Field Services	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	CME 550X	GWC-17
LOGGER: Brooks	DRILLING METHODS:	Hollow Stem Auger	
DATE CONSTRUCTED: 6-28-11			

N - 1237469.64, E - 2029801.29



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.90	704.55
GROUND SURFACE	0.00	701.65
BOTTOM OF PROTECTIVE CASING		
TOP OF SEAL	35.00	666.65
TOP OF FILTER PACK	37.00	664.65
BOTTOM OF RISER / TOP OF SCREEN	40.00	661.65
BOTTOM OF SCREEN	50.00	651.65
BOTTOM OF CASING	50.30	651.35

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/1/2011 COMPLETED 3/1/2011 SURF. ELEV. 697.42 COORDINATES: N - 1237097.77 , E - 2029691.53
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 27.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Lean Clay (CL) - red (10R 4/8) small amount of sand		
5		**Silty Sand (SM)** - light yellowish brown (10YR 6/4) wet, mica at 7.5', black organics throughout		
10				
15				
		Silty Sand (SM) - gray (10YR 5/1) wet, traces of gravel		
20		**(PWR)** - gray (10YR 5/1) saprolite wet		
25				
		SCHIST - black (2.5Y 2.5/1)		
30		Bottom of borehole at 27.5 feet.		
35				
40				

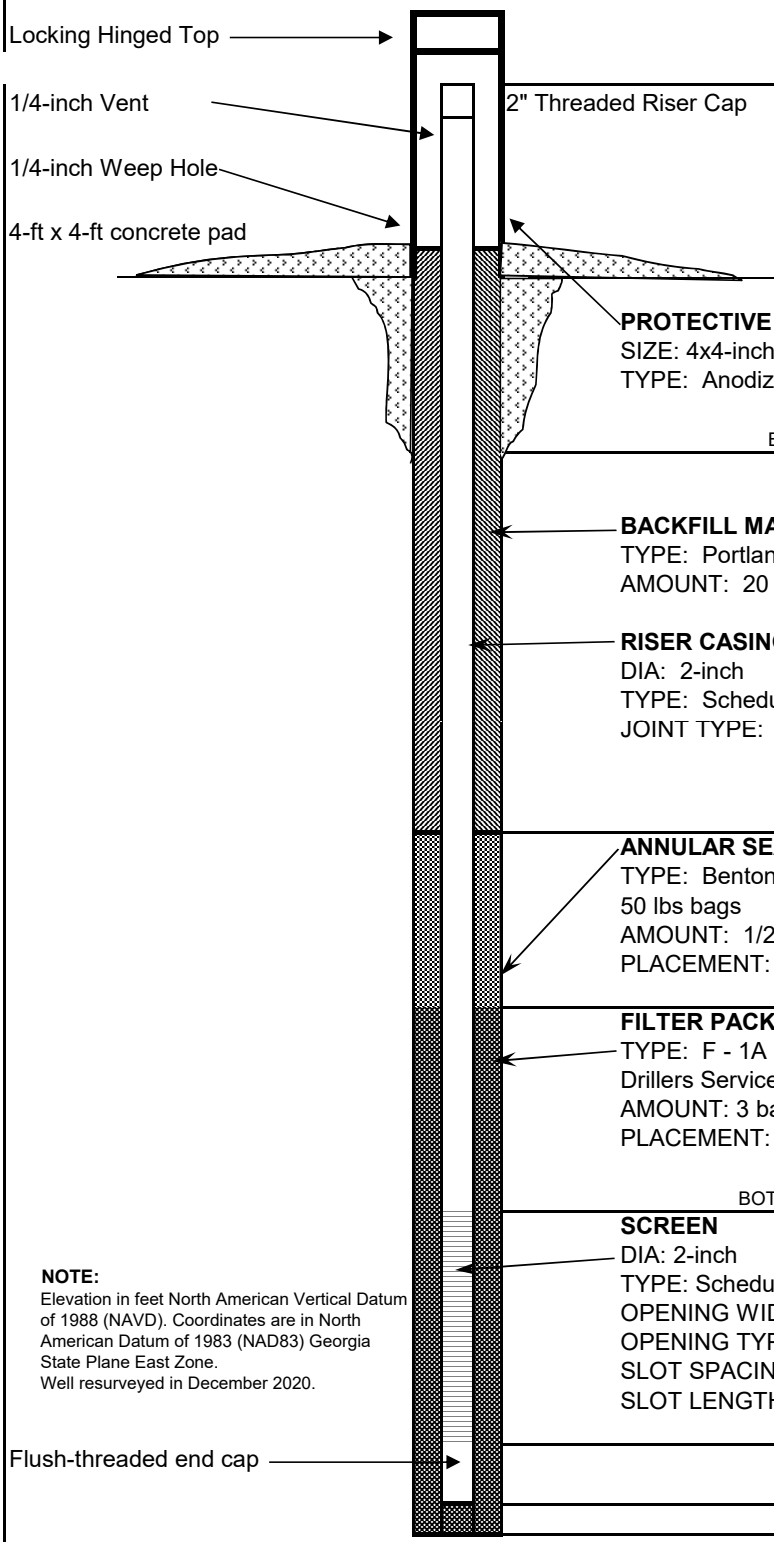
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-18
LOGGER: Sellers	DRILLING METHODS:	Sonic	
DATE CONSTRUCTED: 3-1-11			

N - 1237097.77, E - 2029691.53



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.89	700.31
GROUND SURFACE	0.00	697.42
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 20 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	12.00	685.42
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	14.50	682.92
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	17.20	680.22
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	27.20	670.22
BOTTOM OF CASING	27.50	669.92

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 7/13/2011 COMPLETED 7/13/2011 SURF. ELEV. 694.54 COORDINATES: N - 1236841.16, E - 2029323.11
CONTRACTOR SCS Field Services EQUIPMENT 550X METHOD 3 1/4" Hollow Stem Auger; HQ Casing; HQ Rock Core
DRILLED BY _____ LOGGED BY B. Gallagher CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 34.7 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		**Sandy Lean Clay (CL)** - tan and gray, damp, medium stiff, low plasticity, fine grain, sandy	SS -1	4.5-6.0	2-3-4 (7)		
10		- with mica and faint rock texture	SS -2	9.5-11.0	2-2-3 (5)		
15		**Silt (ML)** - olive an ddark gray, moist, loose, faint rock texture	SS -3	14.5-16.0	2-2-2 (4)		
20		- reddish orange and tan	SS -4	19.5-21.0	3-4-7 (11)		
25			SS -1	24.5-26.0	6-8-10 (18)		
30		**Partially Weathered Rock** - dark gray, moist, silty, trace fine sand	SS -1	29.5-30.2	38-50-WR/-4" (100+)		
35		Bottom of borehole at 34.7 feet.	SS -1	34.5-34.7	50-WR-WR/-10" (100+)		
40							
45							
50							

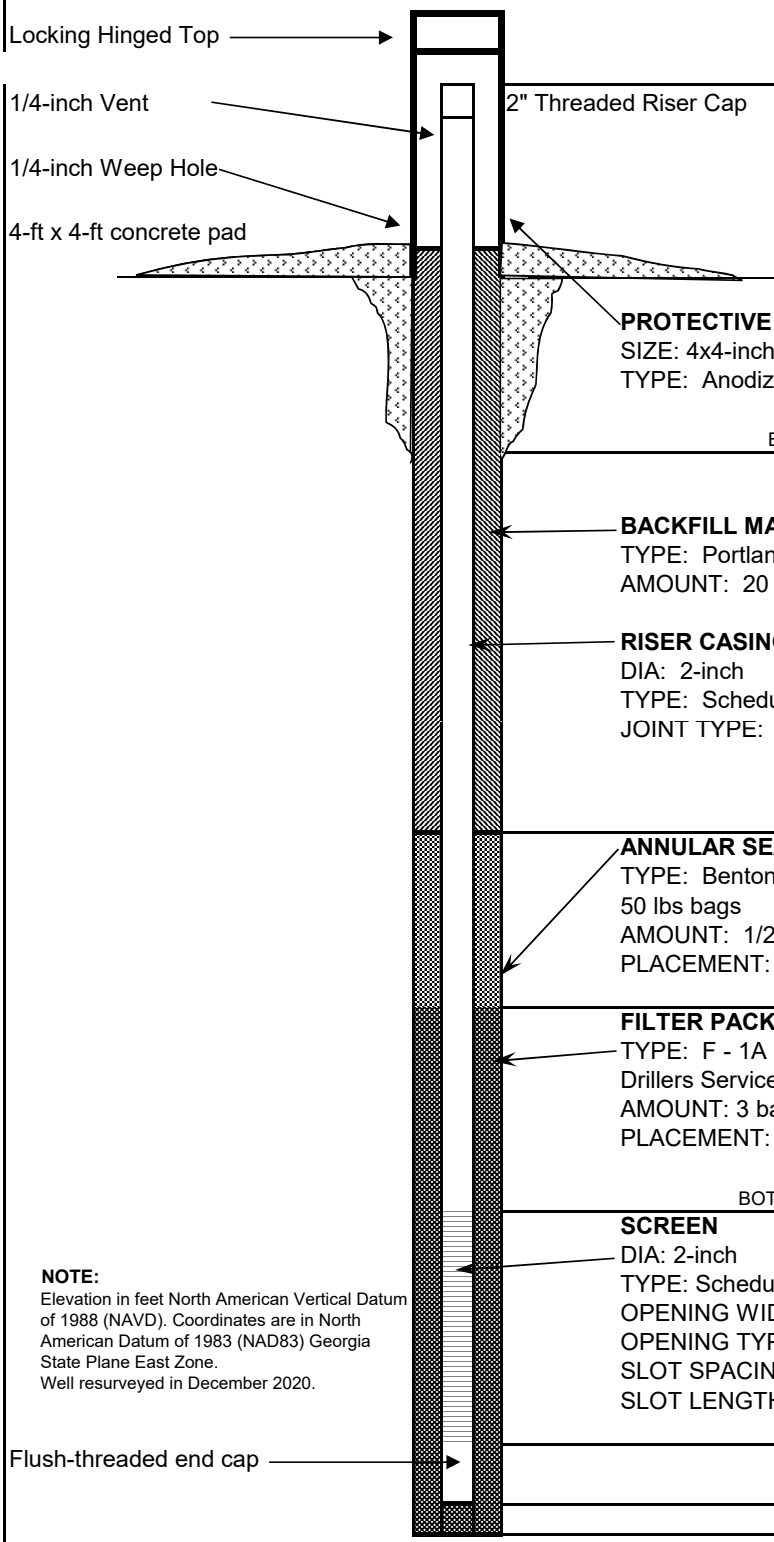
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	SCS Field Services	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	CME 550X	GWC-19
LOGGER: Gallagher	DRILLING METHODS:	Hollow Stem Auger	
DATE CONSTRUCTED: 7-13-11			

N - 1236841.16, E - 2029323.11



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.93	698.47
GROUND SURFACE	0.00	694.54
BOTTOM OF PROTECTIVE CASING		
TOP OF SEAL	19.00	675.54
TOP OF FILTER PACK	21.00	673.54
BOTTOM OF RISER / TOP OF SCREEN	24.20	670.34
BOTTOM OF SCREEN	34.20	660.34
BOTTOM OF CASING	34.50	660.04

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/1/2011 COMPLETED 3/1/2011 SURF. ELEV. 703.33 COORDINATES: N - 1236645.57, E - 2029149.57
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 68 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		(OL) - black (10YR 2/1) topsoil		
		Lean Clay (CL) - light red / moderate reddish orange (10R 6/6) from Dyke runoff		
5		**Silty Sand (SM)** - gray (10YR 5/1) contains yellow staining, mica throughout, trace gravel		
10		**(PWR)** - light red / moderate reddish orange (10R 6/6) saprolite - black organics - CL: light green (5G 7/4) damp, found within saprolite		
15				
20		- light red / moderate reddish orange (10R 6/6) saprolite		
25		**(PWR)** - light red / moderate reddish orange (10R 6/6) and gray (10YR 5/1) saprolite damp, trace gravel		
		(PWR) - gray (10YR 5/1) saprolite dry		
30		**(PWR)** - light red / moderate reddish orange (10R 6/6) saprolite wet, top 2" are black		
35				
40		- PWR: gray (10YR 5/1) and light red / moderate reddish orange (10R		

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
45		6/6) saprolite wet, grey with orange streaks **(PWR)** *(Con't)*		
50		**(PWR)** - saprolite wet, 30% recovery, consolidated		
55				
60		**(PWR)** - gray (10YR 5/1) saprolite wet		
65				
70		**SCHIST** - contains garnets and mica		
		Bottom of borehole at 68.0 feet.		
75				
80				
85				

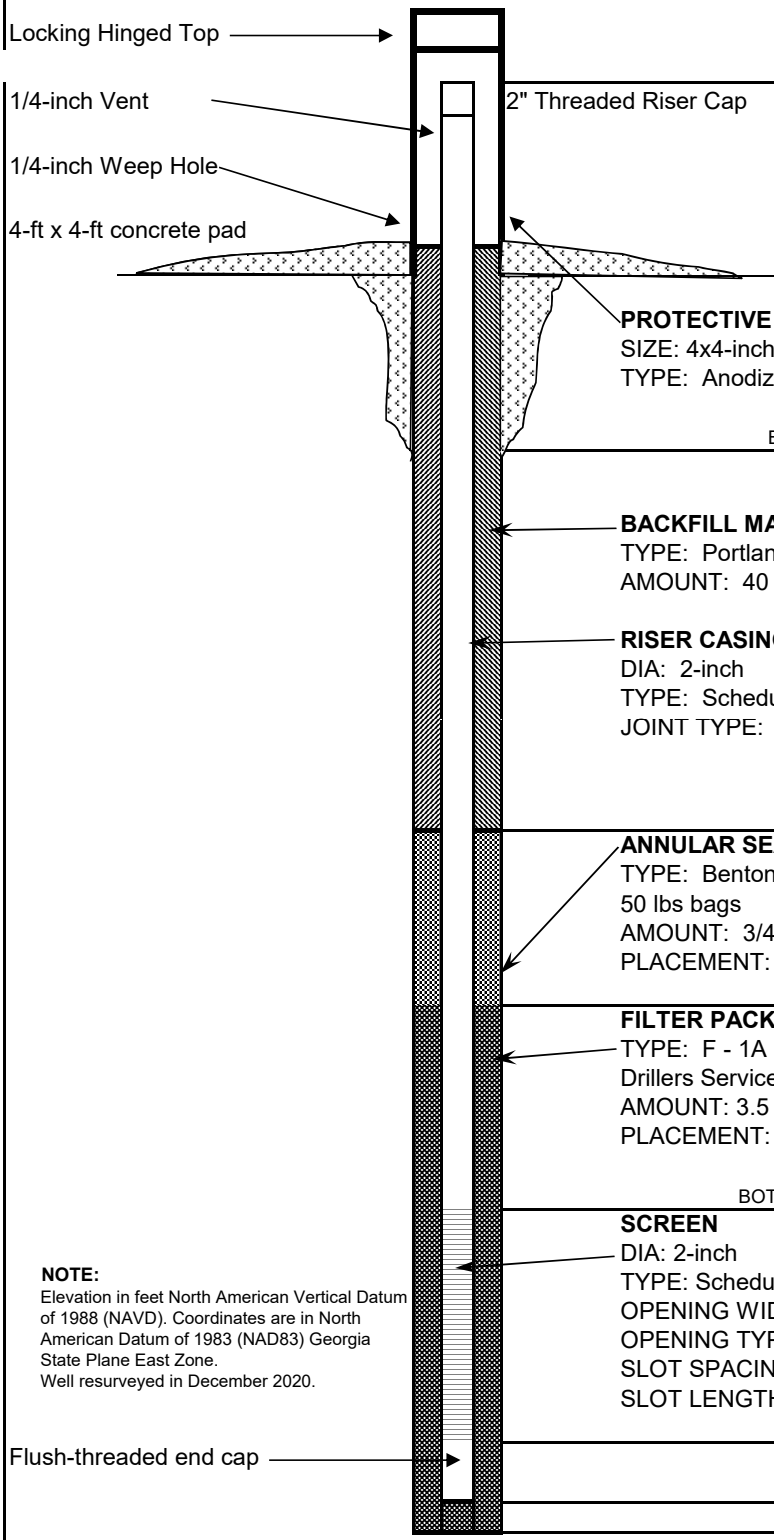
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-20
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 3-1-11			

N - 1236645.57, E - 2029149.57



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.96	706.29
GROUND SURFACE	0.00	703.33
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 40 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	53.00	650.33
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	55.70	647.63
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	57.70	645.63
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	67.70	635.63
BOTTOM OF CASING	68.00	635.33

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 7/12/2011 COMPLETED 7/12/2011 SURF. ELEV. 717.32 COORDINATES: N - 1236230.06, E - 2028634.08
CONTRACTOR SCS Field Services EQUIPMENT 550X METHOD 3 1/4" Hollow Stem Auger; HQ Casing; HQ Rock Core
DRILLED BY _____ LOGGED BY B. Gallagher CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 34.6 ft. GROUND WATER DEPTH: DURING 14.5 ft. COMP. _____ DELAYED 15.1 ft. after 14 hrs.
NOTES Well installed. Refer to well data sheet.

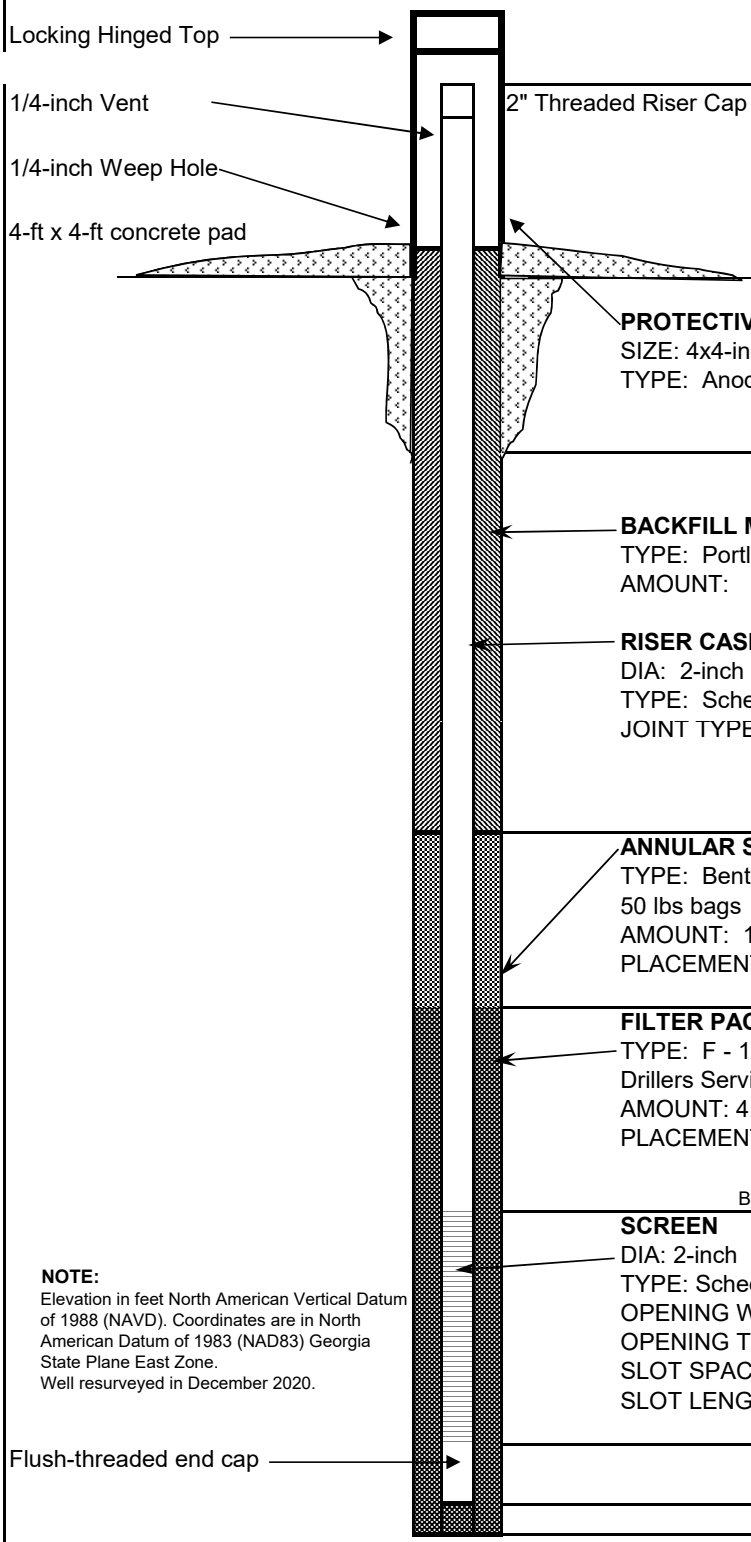
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
0		**Silt (ML)** - brown and gray, damp, loose, low plasticity					
5			SS -1	4.5-6.0	4-4-4 (8)		
10		**Lean Clay (CL)** - gray, moist, medium stiff, low plasticity, with pieces of black schist (possible fill)	SS -2	9.5-11.0	4-6-6 (12)		
15		▽ **Clayey Sand (SC)** - orangish brown, wet, loose, fine grain	SS -3	14.5-16.0	2-2-3 (5)		
20		**Silty Sand (SM)** - varigated black white and orangish tan, wet, loose to medium dense, with schist texture	SS -4	19.5-21.0	3-2-4 (6)		
25			SS -5	24.5-26.0	5-6-7 (13)		
30			SS -6	29.5-31.0	5-7-12 (19)		
35		Bottom of borehole at 34.6 feet.					
40							
45							
50							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	SCS Field Services	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	CME 550X	GWC-21
LOGGER: Gallagher	DRILLING METHODS:	Hollow Stem Auger	
DATE CONSTRUCTED: 7-12-11			

N - 1236230.06, E - 2028634.08



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.70	721.02
GROUND SURFACE	0.00	717.32
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	17.80	699.52
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	20.00	697.32
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	24.30	693.02
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	34.30	683.02
BOTTOM OF CASING	34.60	682.72

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/2/2011 COMPLETED 3/2/2011 SURF. ELEV. 741.04 COORDINATES: N - 1236396.22, E - 2028325.64
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 79 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
5		**Sandy Lean Clay (SC)** - red (10R 5/8) damp		
10		- SC: red (10R 5/8) damp, trace gravel		
15				
20		**Silty Sand (SM)** - light yellowish brown (10YR 6/4) wet, micaceous with gravel		
25		- SM: light yellowish brown (10YR 6/4) micaceous with gravel and biotite		
30		- SM: light yellowish brown (10YR 6/4) wet, micaceous with gravel and biotite		
35		**(PWR)** - yellow (10YR 7/6) and gray (10YR 5/1) saprolite damp		
40				

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley

LOCATION Carrollton, Georgia

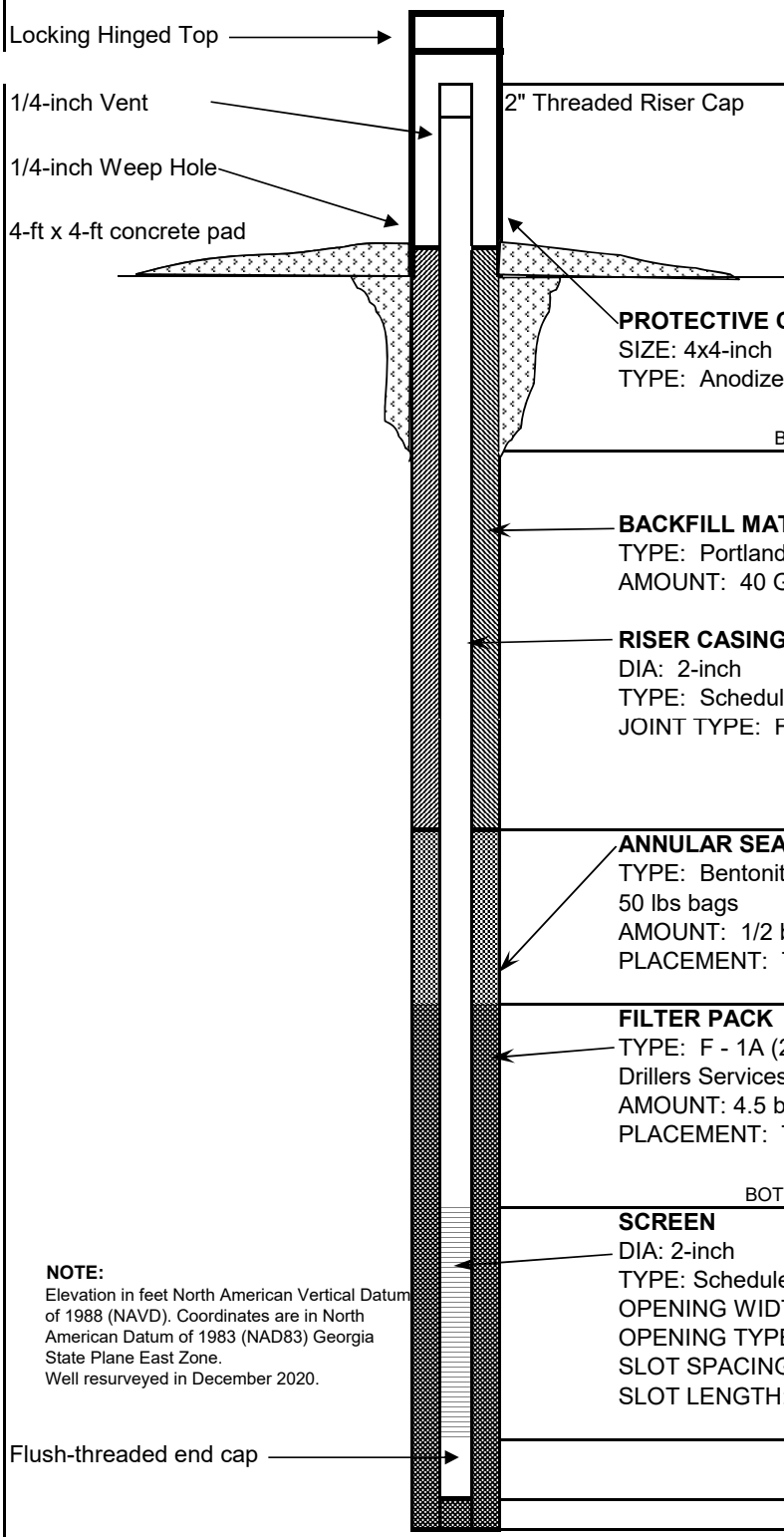
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		(PWR) *(Con't)* - PWR: light yellowish brown (10YR 6/4) saprolite damp, with Forest Green streaking		
45		**(PWR)** - brilliant green (5G 6/6) saprolite damp, contains brittle white banding layers		
		(PWR) - brilliant green (5G 6/6) and light brown (7.5YR 6/4) saprolite damp		
50		**(PWR)** - brown (7.5YR 5/3) saprolite		
		(PWR) - brilliant green (5G 6/6) saprolite		
55		**(PWR)** - light brown (7.5YR 6/4) and brilliant green (5G 6/6) saprolite damp, very brittle		
60				
		(PWR) - light brown (7.5YR 6/4) and light red / moderate reddish orange (10R 6/6) saprolite damp		
65		**(PWR)** - brown (7.5YR 4/4) saprolite damp		
70				
75				
80		Bottom of borehole at 79.0 feet.		
85				

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-22
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 3-2-11			

N - 1236396.22, E - 2028325.64



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.13	744.17
GROUND SURFACE	0.00	741.04
BOTTOM OF PROTECTIVE CASING		
TOP OF SEAL	59.00	682.04
TOP OF FILTER PACK	61.00	680.04
BOTTOM OF RISER / TOP OF SCREEN	63.70	677.34
BOTTOM OF SCREEN	73.70	667.34
BOTTOM OF CASING	74.00	667.04
BOTTOM OF HOLE	79.00	662.04

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 3/2/2011 COMPLETED 3/2/2011 SURF. ELEV. 770.46 COORDINATES: N - 1236657.67, E - 2028089.81
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 65 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - red (10R 5/6)		
		(PWR) - red (10R 5/6) and brown (7.5YR 5/3) saprolite dry, micaceous		
5				
10		- PWR: light brownish gray / pale yellowish brown (10YR 6/2) saprolite dry, micaceous		
15				
20		- PWR: light brownish gray / pale yellowish brown (10YR 6/2) saprolite damp, more consolidated		
25				
30		- PWR: very dark gray (10YR 3/1) saprolite damp		
35		**SCHIST** - very dark gray (10YR 3/1)		
		(PWR) - light brown (7.5YR 6/4) saprolite damp, micaceous		
		(PWR) - brown (7.5YR 4/4) and gray (10YR 5/1) saprolite wet		
40				

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

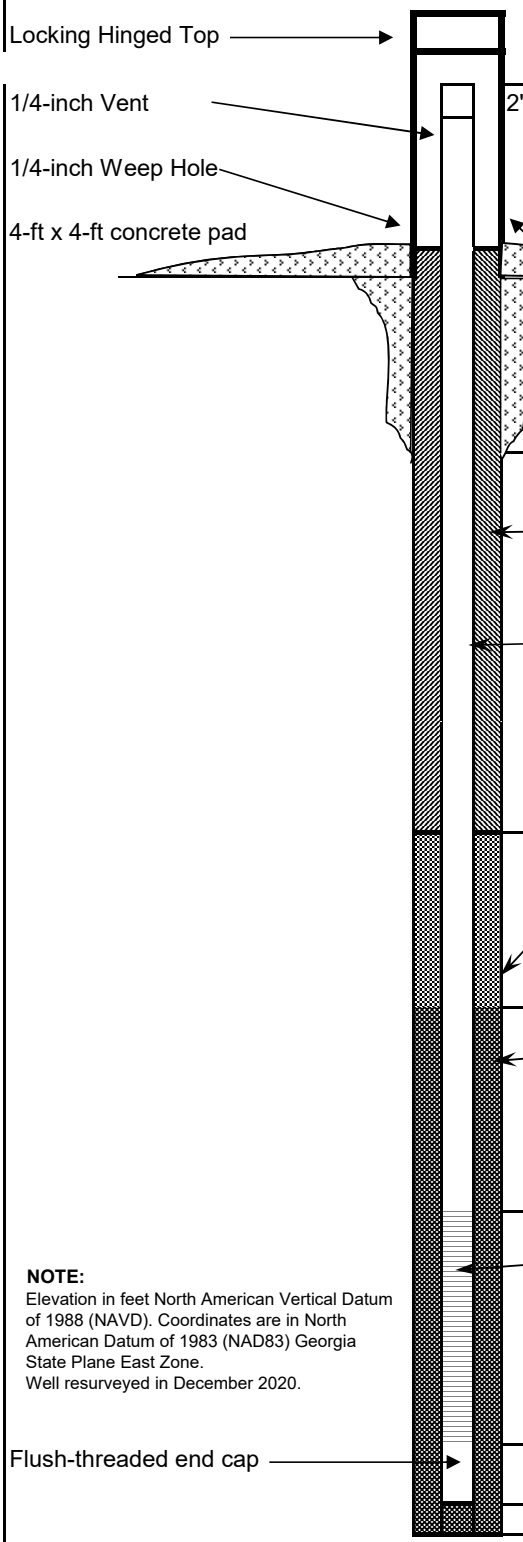
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
45		**Silty Sand (SM)** - gray (2.5Y 5/1) **(PWR)** - brown (7.5YR 4/4) and gray (10YR 5/1) saprolite wet		
50		**Silty Sand (SM)** - very dark gray (10YR 3/1) dry - gray (10YR 6/1) and light brown (7.5YR 6/3) saprolite wet, micaceous		
65		**SCHIST** - contains garnets and mica Bottom of borehole at 65.0 feet.		

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-23
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 3-2-11			

N - 1236657.67, E - 2028089.81



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.95	773.41
2" Threaded Riser Cap		
GROUND SURFACE	0.00	770.46
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 60 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	48.70	721.76
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	51.00	719.46
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	54.70	715.76
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	64.70	705.76
BOTTOM OF CASING	65.00	705.46

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/15/2011 COMPLETED 2/15/2011 SURF. ELEV. 787.48 COORDINATES: N - 1237355.54, E - 2026407.92
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers/ Gallagher CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 48.2 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

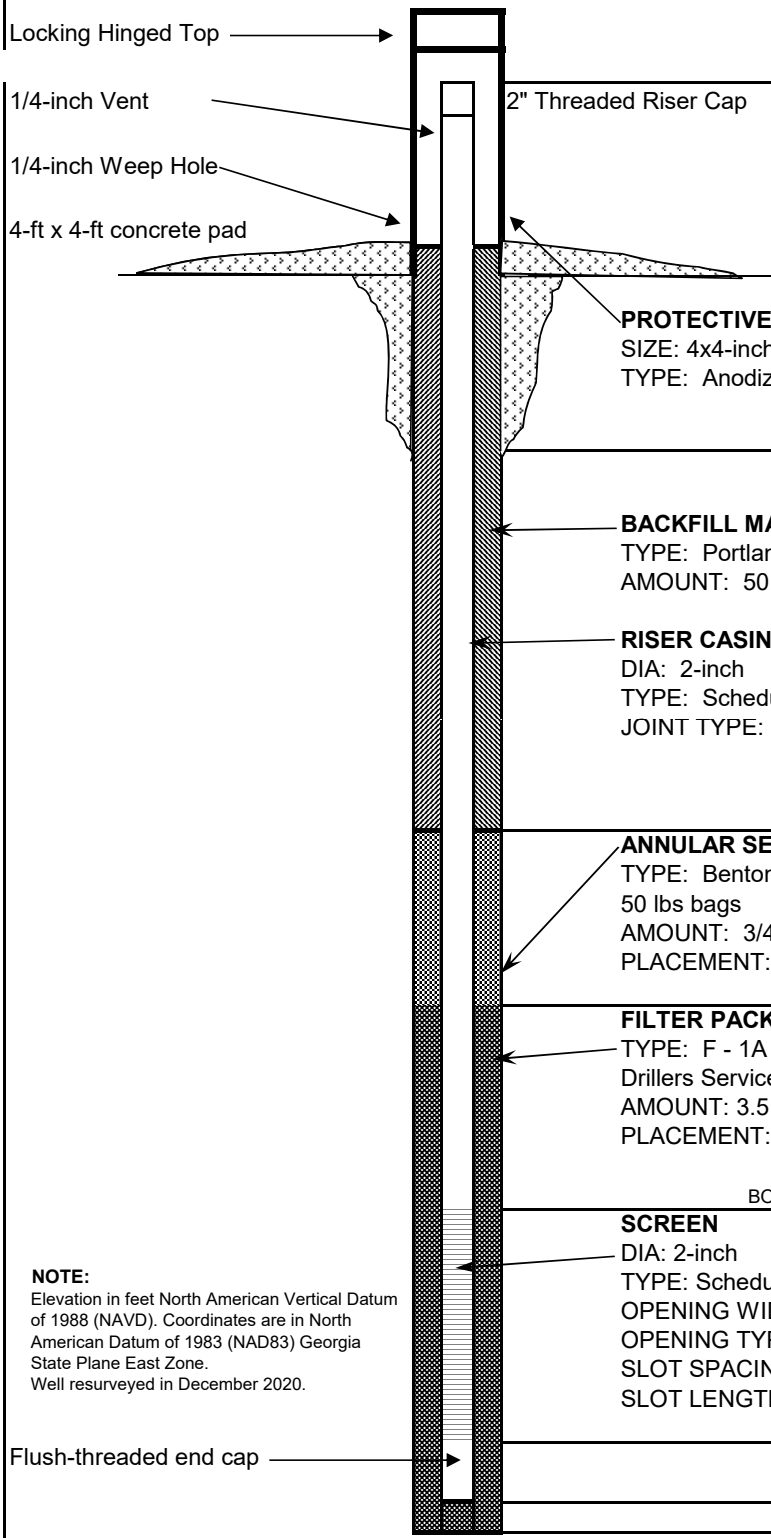
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - reddish brown (5YR 5/3) damp		
		Poorly-graded Sand (SP) - light brown (7.5YR 6/3)		
5		**Clayey Sand (SC)** - saprolite contains mica		
		Poorly-graded Sandy Gravel (SP) - white (10R 8/1) feldspar rich sands, trace gravels		
10		**Silty Sand (SM)** - pale brown (10YR 6/3) saprolite contains mica, gravel		
		Clayey Sand (SP) - red (10R 5/6) trace clay		
15		**Lean Clay (CL)** - brown (7.5YR 4/3) and red (10R 5/8)		
		Silty Sand (SM) - red (10R 5/8) and yellow (10YR 7/6) micaceous, trace gravel		
20				
		Silty Sand (SM) - yellow (10YR 7/6) and brown (7.5YR 4/3) micaceous, trace schist gravel		
25				
		Silty Sand (SM) - saprolite micaceous, schist gravel, (5' of recovery: start water @ 29' and stoped @ 35')		
30				
35				
		(PWR) - black (5YR 2.5/1) (4' of recovery)		
40				
45				
50		Bottom of borehole at 48.2 feet.		

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-24
LOGGER: Sellers/Gallagher	DRILLING METHODS:		
DATE CONSTRUCTED: 2-15-11			

N - 1237355.54, E - 2026407.92



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.89	790.37
GROUND SURFACE	0.00	787.48
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 50 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	33.40	754.08
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	35.80	751.68
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	37.90	749.58
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	47.90	739.58
BOTTOM OF CASING	48.20	739.28

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-25
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/15/2011 COMPLETED 2/15/2011 SURF. ELEV. 809.37 COORDINATES: N - 1237404.61, E - 2026089.46
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY B. Gallagher/ Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 58.3 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Silty Sand (SM) - red (2.5YR 4/6) and yellow (2.5Y 8/8) trace gravel		
		Silty Sand (SM) - red (2.5YR 4/6) and brown (7.5YR 5/4)		
10		**Poorly-graded Sand (SP)** - white (10YR 8/1) weathered feldspar		
		Silty Sand (SM) - red (2.5YR 4/6) and brown (7.5YR 5/4) streaks of mica, beginning to be clayey		
20		**Clayey Sand (SC)** - red (2.5YR 4/6) with mica		
		Silty Sand (SM) - red / moderate reddish brown (10R 4/6) and brown (7.5YR 5/4)		
		Clayey Sand (SC) - red (2.5YR 4/6) saprolite micaceous		
		Silty Sand (SM) - dark yellowish brown (10YR 4/6) micaceous, with trace schist		
30		**Clayey Sand (SC)** - red (2.5YR 4/6) contains some gravel		
		Clayey Sand (SC) - brown (7.5YR 5/4) with white gravel throughout		
		Silty Sand (SM) - yellow (2.5Y 8/8) and white (10YR 8/1) saprolite		
40		**Silty Sand (SM)** - brown (7.5YR 4/2) 50% recovery		
		(PWR) - gray (10YR 5/1)		
50		**GNEISS**		
60		Bottom of borehole at 58.3 feet.		

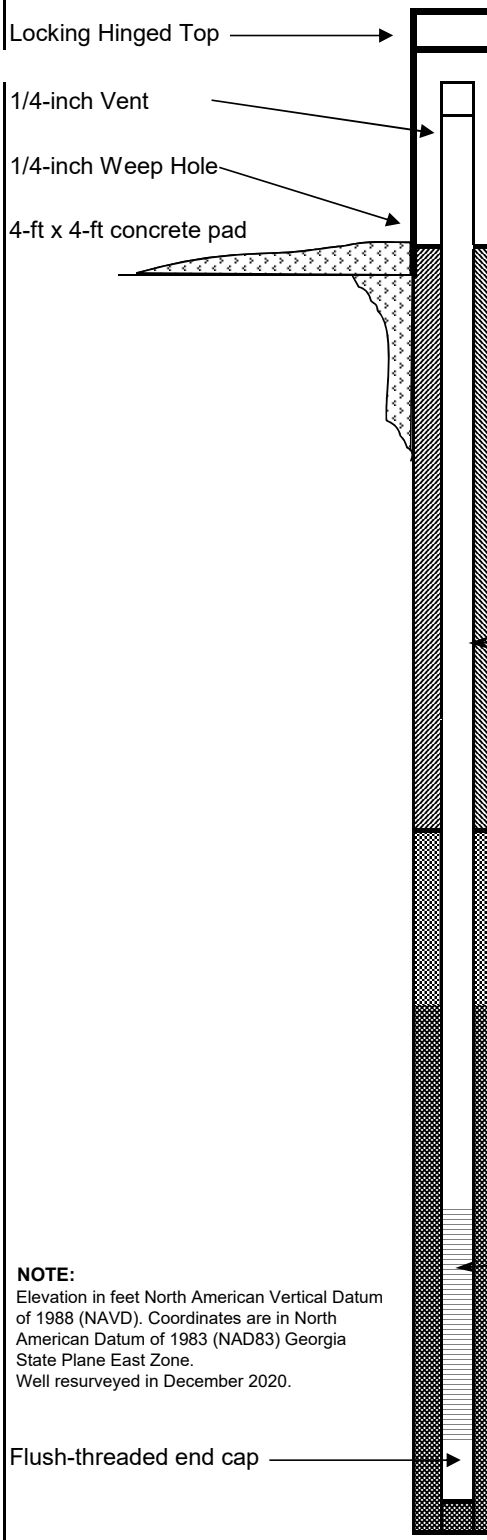
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-25
LOGGER: Sellers/Gallagher	DRILLING METHODS:		
DATE CONSTRUCTED: 2-15-11			

N - 1237404.61, E - 2026089.46



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.99	812.36
2" Threaded Riser Cap		
GROUND SURFACE	0.00	809.37
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 60 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	41.00	768.37
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	44.00	765.37
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	48.00	761.37
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	58.00	751.37
BOTTOM OF CASING	58.30	751.07

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/16/2011 COMPLETED 2/16/2011 SURF. ELEV. 782.56 COORDINATES: N - 1237625.00, E - 2025790.42
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY B. Gallagher/ C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 56.5 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

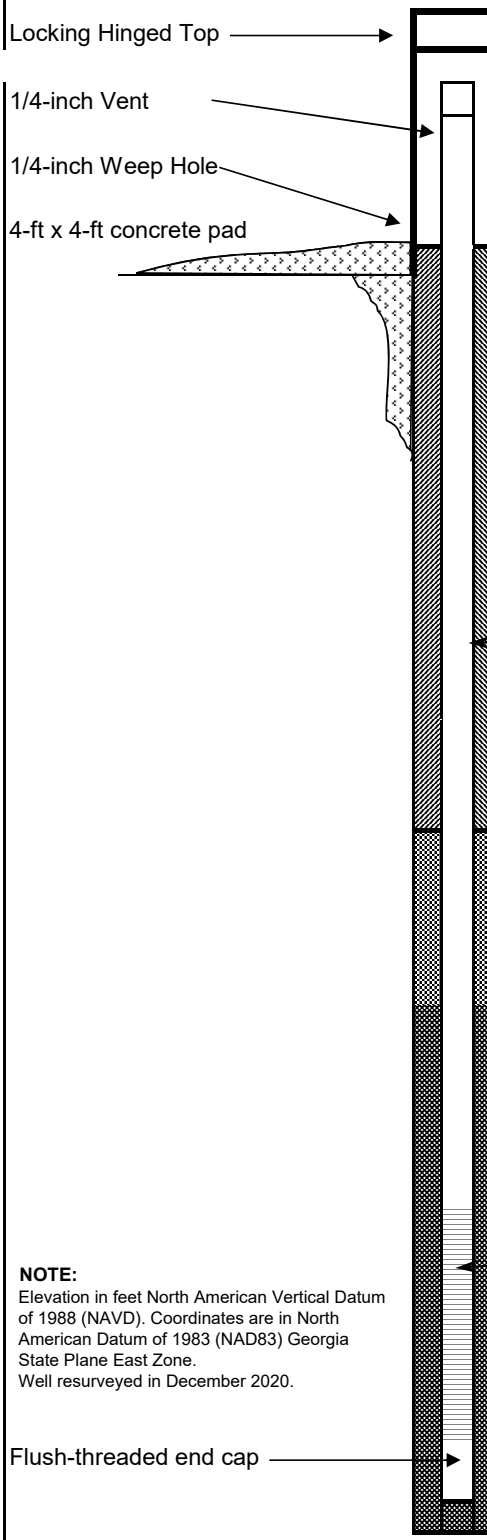
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		(OH)		
		Lean Clay (CL) - red (10R 4/8) very damp, Low Plasticity, trace sand		
		Silty Sand (SM) - red (10R 4/8) with mica		
		(PWR) - light brown (7.5YR 6/4) and white (10YR 8/1) feldspar layers, contains mica		
10		**Silty Sand (SM)** - light brown (7.5YR 6/4) very micaceous, contains PWR		
		Silty Sand (SM) - reddish brown (2.5YR 4/4) micaceous with PWR		
20				
		Silty Sand (SM) - yellowish brown / moderate yellowish brown (10YR 5/4) wet, perched water, some PWR streaks		
30				
		Silty Sand (SM) - dark red (10R 3/6) micaceous - wet		
40				
		(PWR) - white (10YR 8/1) dry, feldspar		
		Poorly-graded Sandy Gravel (SM) - trace gravel - SM: yellowish brown / moderate yellowish brown (10YR 5/4) trace gravel - SM: pale yellow / grayish yellow (5Y 8/4) trace gravel		
50				
		(PWR) - saprolite		
		Bottom of borehole at 56.5 feet.		
60				

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-26
LOGGER: Sellers/Gallagher	DRILLING METHODS:		
DATE CONSTRUCTED: 2-16-11			

N - 1237625.00, E - 2025790.42



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.04	785.60
2" Threaded Riser Cap		
GROUND SURFACE	0.00	782.56
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 45 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	42.00	740.56
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 3/4 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	44.00	738.56
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	46.20	736.36
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	56.20	726.36
BOTTOM OF CASING	56.50	726.06

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/16/2011 COMPLETED 2/16/2011 SURF. ELEV. 811.38 COORDINATES: N - 1237829.15, E - 2025522.92
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 68 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Silty Sand (SM) - red (10R 5/6) dry		
		(PWR) - white (10YR 8/1)		
5		**Silty Sand (SM)** - red (10R 5/6)		
		Clayey Sand (SC) - red (10R 5/6)		
10		**Silty Sand (SM)** - red (10R 5/6) micaceous		
15		**(PWR)** - red (10R 5/6) saprolite 0.5" white layer at 16.5'		
20		**Silty Sand (SM)** - yellowish brown / moderate yellowish brown (10YR 5/4) micaceous with red streaks		
25		**(PWR)** - yellowish brown / moderate yellowish brown (10YR 5/4) saprolite trace gravel		
30		**(PWR)** - red (10R 5/6) saprolite damp		
35		**(PWR)** - yellowish brown / moderate yellowish brown (10YR 5/4) saprolite damp		
40				

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

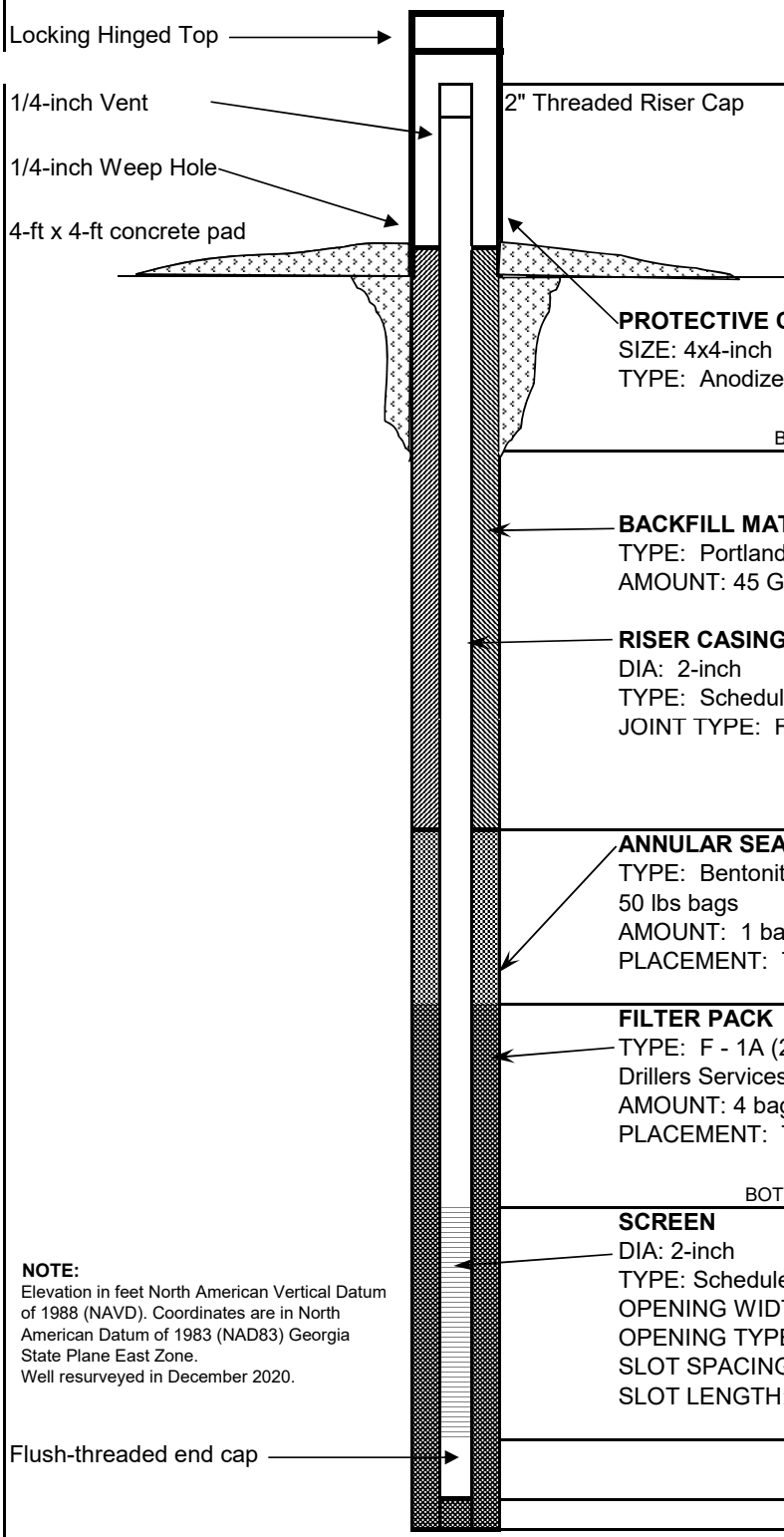
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		(PWR) *(Con't)*		
45		**(PWR)** - white (2.5Y 8/1) dry		
		(PWR) - yellowish brown / moderate yellowish brown (10YR 5/4) saprolite damp		
50		**(PWR)** - yellow (10YR 7/6) saprolite damp		
55		**(PWR)** - yellowish brown / moderate yellowish brown (10YR 5/4) saprolite damp		
60		**(PWR)** - yellowish brown / moderate yellowish brown (10YR 5/4) saprolite wet, with gravel		
65		**GNEISS**		
		Bottom of borehole at 68.0 feet.		
70				
75				
80				
85				

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-27
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 2-16-11			

N - 1237829.15, E - 2025522.92



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.94	814.32
GROUND SURFACE	0.00	811.38
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 45 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	52.50	758.88
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	55.00	756.38
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	57.70	753.68
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	67.70	743.68
BOTTOM OF CASING	68.00	743.38

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWA-28
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/22/2011 COMPLETED 2/22/2011 SURF. ELEV. 846.16 COORDINATES: N - 1237995.74, E - 2025182.65
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 43 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 19.4 ft. after 24 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM) - orange, damp, low plasticity, w/ gravel sized pieces of quartz - quartz is angular - sample is weathered from schist, some clay found (approximately 10%), micas weathering to white clay minerals					
5		- orange, slightly damp, orange grading down to white; fewer clay minerals (approximately 5%), sediment is less consolidated than 0' - 4' section. white material is highly weathered schist, relic cleavages and foliations can barely be discerned					no quartz, orange grades to white.
		Schist					perched 8' - 10' H2O.
10		- white, tan, has weathered to medium grained sands w/ less than 10% silt, wet					
		- mottled tan, brown, weathered, coarse sand to gravel sized, poorly sorted and graded, gravel sized pieces are structually intact schist. grades to more tan, sand and gravel sized regolith, preferential bands of more competent schist found (dark), dry					
15							
		- banded tan, orange, white, weathered, coarse sand to gravel sized, white sediments contain larger fragments of schist, dry					tan. orange. white/grey.
		Silty Sand (SM)					
20		- tan, wet, medium grain					
		Poorly-graded Sand (SP) - mottled white, tan, orange, dry, fine to medium grain, w/ angular, gravel sized schist fragments					
25		**Silty Sand (SM)** - mottled tan, white, dry, clay particles present less than 2%, angular gravel to boulder sized fragments of schist					
		Partially Weathered Rock					
30		- brown, orange, saprolite (schist/gneiss contact), zoned					
		Gneiss - banded grey, white, competent, relic structures and foliations intact, sugary pegmatic quartz coating on cuttings, prevalent zones of oxidation suggesting fractures, fractures identified parallel to cleavage planes					last 10' drilled w/ water.
35							
40							
45		Bottom of borehole at 43.0 feet.					

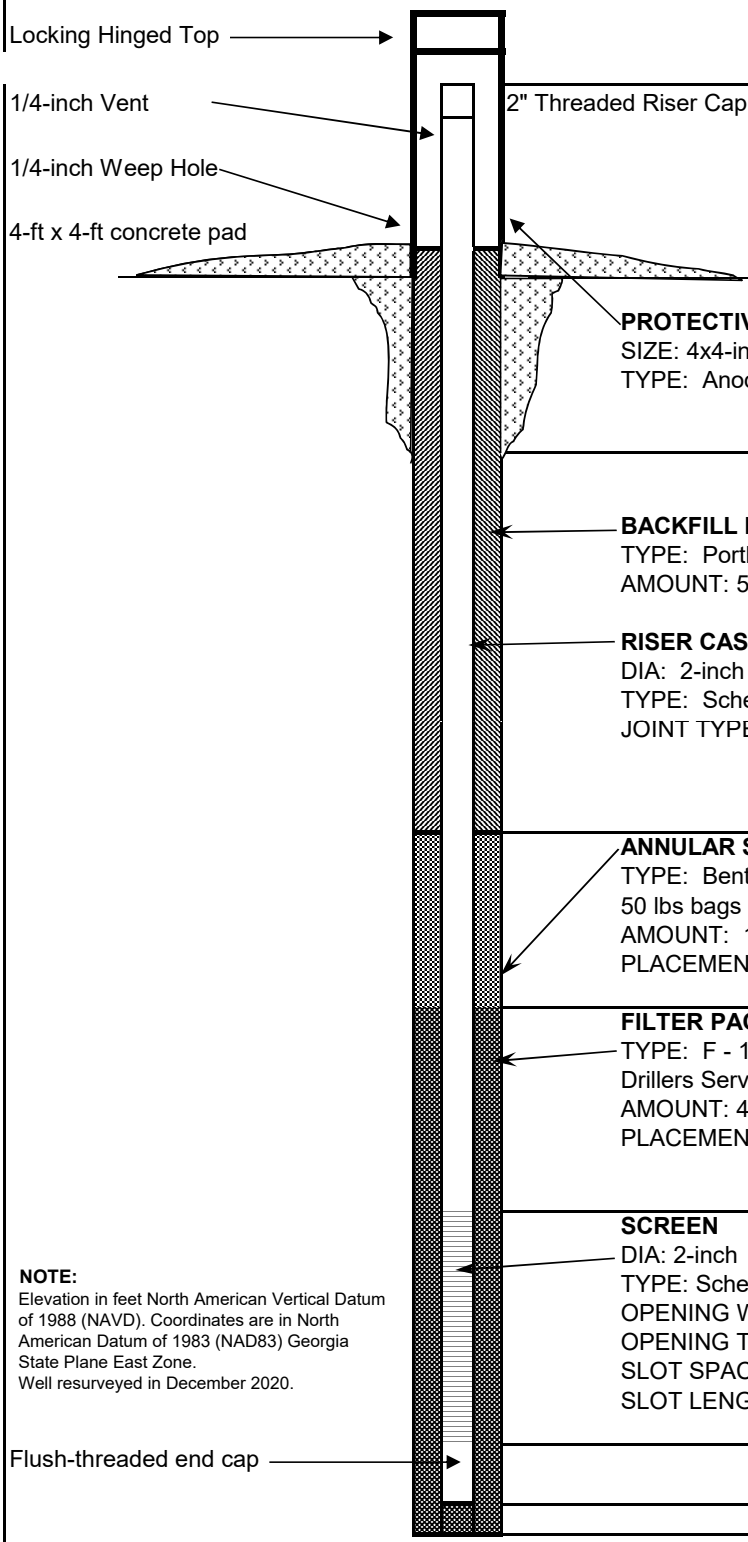
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWA-28
LOGGER: Dyer	DRILLING METHODS:		
DATE CONSTRUCTED: 2-22-11			

N - 1237995.74, E - 2025182.65



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.83	849.16
GROUND SURFACE	0.00	846.33
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 50 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	29.00	817.33
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	31.00	815.33
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	32.70	813.63
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	42.70	803.63
BOTTOM OF CASING	43.00	803.33

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWA-29
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 6/21/2011 **COMPLETED** 6/26/2011 **SURF. ELEV.** 831.70 **COORDINATES:** N - 1238288.93, E - 2024984.27
CONTRACTOR SCS Field Services **EQUIPMENT** 550X **METHOD** 3 1/4" Hollow Stem Auger; HQ Casing; HQ Rock Core
DRILLED BY _____ **LOGGED BY** B. Gallagher/D. Brook **CHECKED BY** _____ **ANGLE** _____ **BEARING** _____
BORING DEPTH 54.7 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** 39.8 ft. after 1 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Sandy Silt (ML) - brown, damp					
		Silty Sand (SM) - tan, damp					
		Poorly-graded Sand (SP) - tand and white, damp					
10		**Gneiss** - gray and pink, medium to fine grain, soft, highly weathered - quartz bands at 10.6 ft - stained joint at 11 ft - medium hard, slightly weathered, slightly stained below 11.5 ft - stained joint at 13.2 ft - stained joint at 13.7 ft - hard, slightly weathered, below 15.2 ft - 9 stained joints from 15.7 to 19.7 ft - hard, not weathered, below 19.7 ft - 3 partially healed, slightly stained joints from 20.9 to 24.6 ft - hard, slightly weathered, below 24.3 ft - soft to hard, highly to slightly weathered, with 11 weathered, stained joints from 24.7 to 26.5 ft - hard, slightly weathered, below 26.5 ft - slightly weathered, stained joints from 29.7 to 34.7 - healed fractures broken by coring from 33.7 to 34.7 ft - high-angle joint with dry gray clay coating from 35.9 to 36.5 - stained, healed, high-angle joint from 37.2 to 37.7 - stained, high-angle joint from 38.7 to 39.7 - heavily stained, high-angle joint at 41.7 ft - heavily stained, high-angle joint at 43.7 ft - heavily stained, high-angle joint at 44.2 ft	RC -1	9.5-14.7	WR-WR-WR (0)	96 (17)	Auger Refusal at 9.5 ft.
			RC -2	14.7-19.7	WR-WR-WR (0)	100 (52)	
20			RC -3	19.7-24.7	WR-WR-WR (0)	100 (96)	
			RC -4	24.7-29.7	WR-WR-WR (0)	100 (42)	
30			RC -5	29.7-34.7	WR-WR-WR (0)	100 (74)	
			RC -6	34.7-39.7	WR-WR-WR (0)	100 (60)	
40			RC -7	39.7-44.7	WR-WR-WR (0)	100 (68)	Lost circulation at 39.5 ft. 50% return begining at 40 ft. Lost circulation at 40.5 ft.
			RC -8	44.7-49.7	WR-WR-WR (0)	90 (16)	
50			RC -9	49.7-54.7	WR-WR-WR (0)		
		Bottom of borehole at 54.7 feet.					
60							

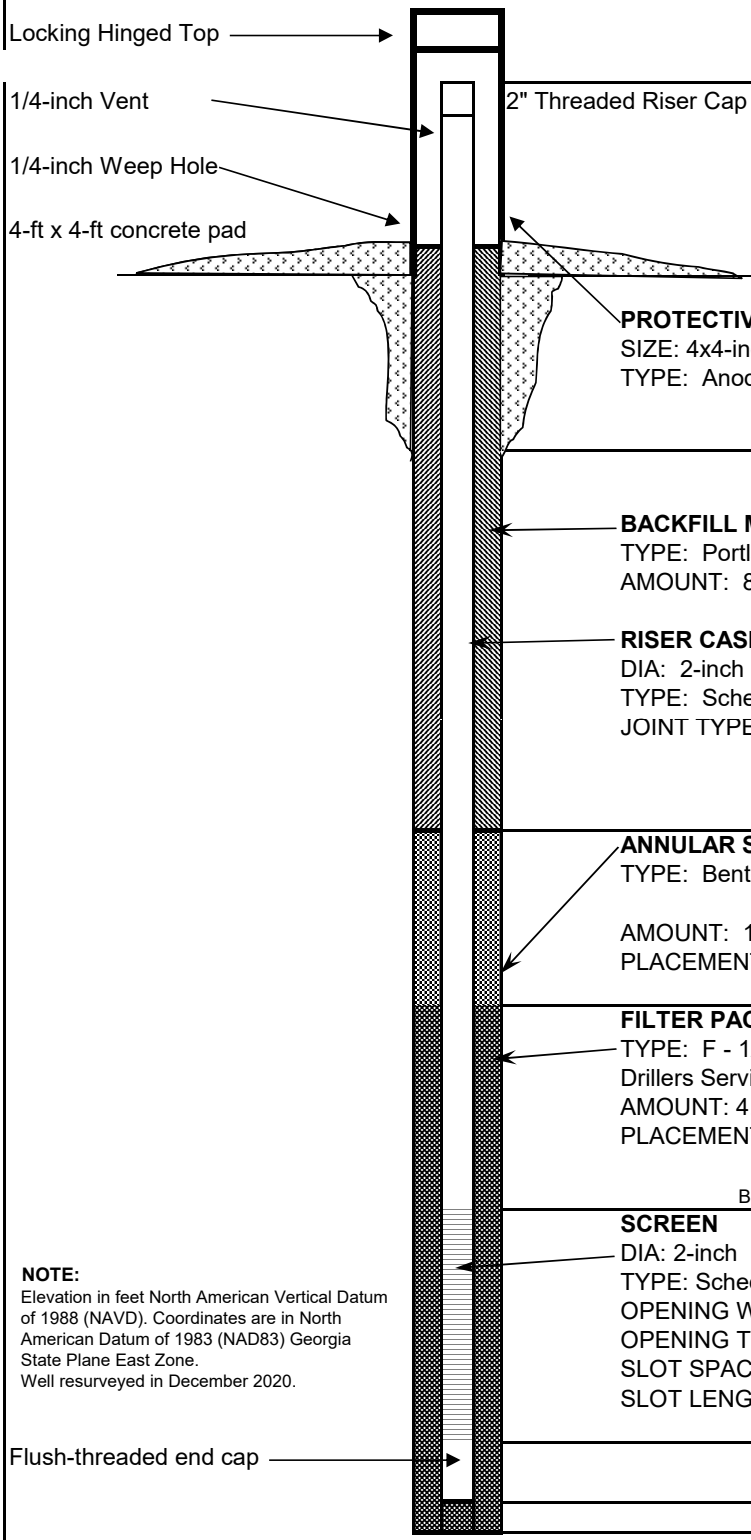
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

GEOTECH ENGINEERING LOGS - ESEE DATABASE.GDT - 11/9/11 15:48 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	SCS Field Services	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	CME 550X	GWA-29
LOGGER: Gallagher	DRILLING METHODS:	Hollow Stem Auger	
DATE CONSTRUCTED: 6-27-11			

N - 1238288.93, E - 2024984.27



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.97	834.67
GROUND SURFACE	0.00	831.70
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 80 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	36.00	795.70
ANNULAR SEAL TYPE: Bentonite Chips AMOUNT: 1/4 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	41.60	790.10
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	43.80	787.90
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	53.80	777.90
BOTTOM OF CASING	54.10	777.60

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/17/2011 COMPLETED 2/17/2011 SURF. ELEV. 788.46 COORDINATES: N - 1238565.49, E - 2025118.88
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 47 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

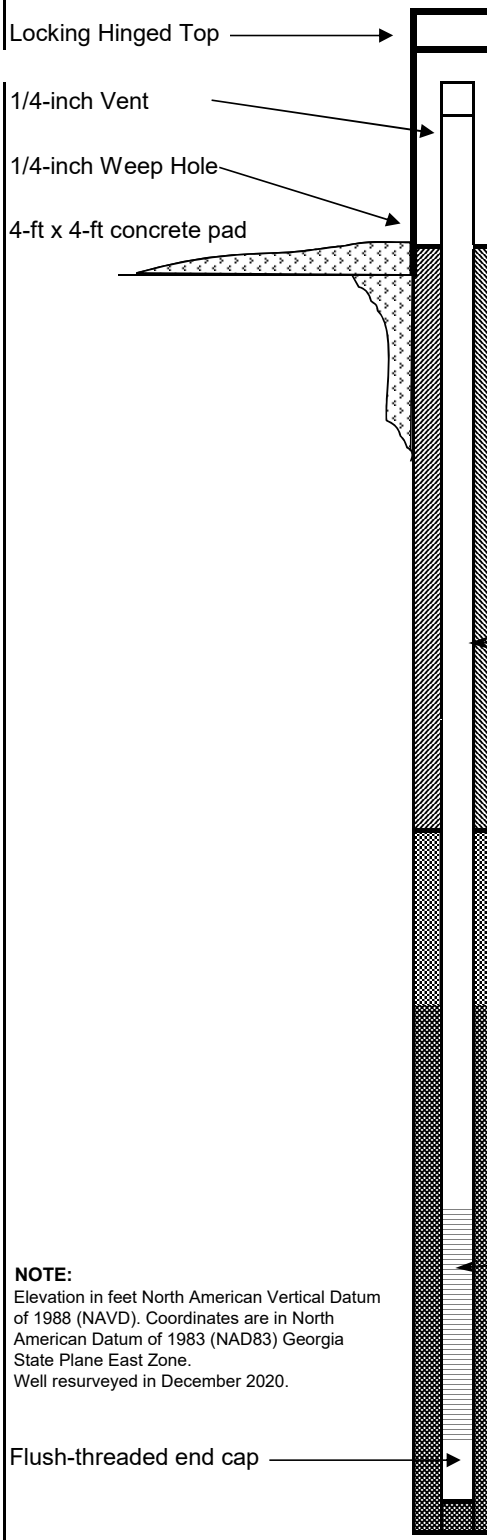
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - very pale brown / grayish orange (10YR 7/4) damp, fine to medium grained, with trace gravel		
5		**Clayey Sand (SC)** - light red / moderate reddish orange (10R 6/6) damp, fine to medium grained		
10		**Clayey Sand (SC)** - light red / moderate reddish orange (10R 6/6) damp, micaceous		
		SCHIST - slightly weathered, crushed		
15		**SCHIST** - crushed		
		(PWR) - brown (7.5YR 4/3) saprolite clayey and micaceous		
20		**(PWR)** - light yellowish brown (10YR 6/4) saprolite wet		
25				
30				
		Silty Sand (SM) - very pale brown / grayish orange (10YR 7/4) wet		
35				
		Silty Sand (SM) - very pale brown / grayish orange (10YR 7/4) wet		
40				
45				
50		Bottom of borehole at 47.0 feet.		

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-30
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 2-17-11			

N - 1238565.49, E - 2025118.88



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.64	791.10
2" Threaded Riser Cap		
GROUND SURFACE	0.00	788.46
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 45 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	31.30	757.16
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	33.40	755.06
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	36.70	751.76
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	46.70	741.76
BOTTOM OF CASING	47.00	741.46

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-31
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 6/20/2011 COMPLETED 6/21/2011 SURF. ELEV. 793.57 COORDINATES: N - 1238701.92, E - 2025618.17
CONTRACTOR SCS Field Services EQUIPMENT 550X METHOD 3 1/4" Hollow Stem Auger; HQ Casing; HQ Rock Core
DRILLED BY _____ LOGGED BY B. Gallagher CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 34.2 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

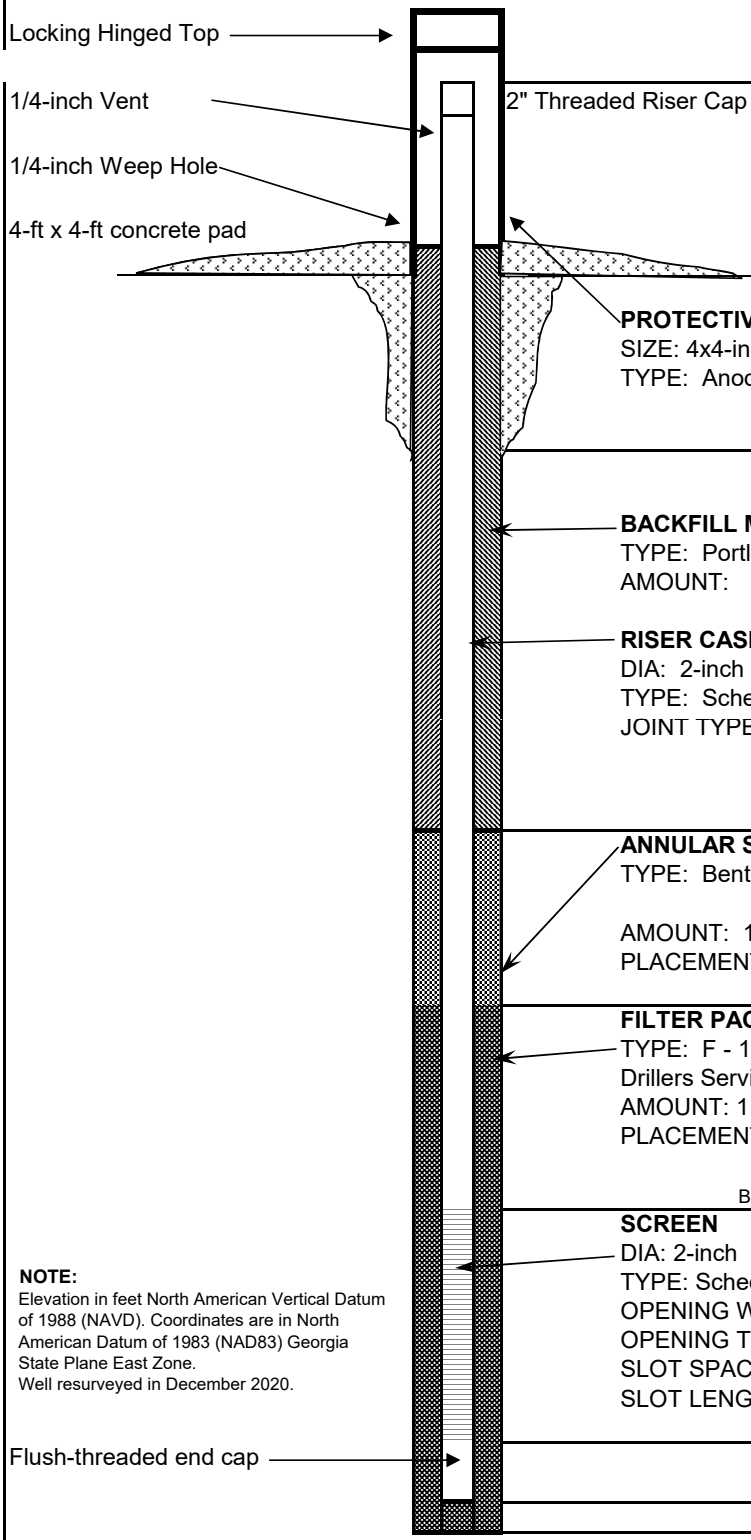
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
		Silty Sand (SM) - brown, damp, medium dense, fine grain					
		Sandy Silt (ML) - tan, damp, medium dense					
5		**Gneiss** - pink and white, medium to fine grain, hard, slightly weathered, granitoid; with 7 stained slightly weathered joints from 4.7 to 7.4 ft. - 0.25" quartz vein at 5.9 ft. - 4 coated joints from 7.4 to 9.2 ft.	RC -1	4.7-9.2	WR-WR-WR (0)	96 (49)	Auger refusal at 4.7 ft.
10		- stained, semi-vertical joint from 11.6 to 12.2 ft.	RC -2	9.2-14.2	WR-WR-WR (0)	100 (84)	
15		- pink and gray, no weathering below 14.2 ft - horizontal, slightly weathered joint at 14.8 ft - horizontal, slightly weathered joint at 15.2 ft - sub-horizontal, slightly weathered joint at 17.6 ft - sub-horizontal, slightly weathered joint at 18.4 ft	RC -3	14.2-19.2	WR-WR-WR (0)	100 (86)	
20		- slighty weathered, stained joint at 20 ft - slightly weathered with 0.1 ft quartz lens from 21 to 21.5 ft - healed joint at 22.2 ft.	RC -4	19.2-24.2	WR-WR-WR (0)	100 (90)	Lost Circulation at 21 ft.
25		- slighty weathered, stained joint at 23.9 ft - slighty weathered, stained joint at 25.4 ft - slightly weathered from 26.2 to 26.7 ft - slighty weathered, stained joint at 27.2 ft	RC -5	24.2-29.2	WR-WR-WR (0)	100 (88)	
30		- slightly weathered from 30.3 to 31.9 ft - slightly weathered, medium hard joint at 31.3 ft. - stained, near vertical joint from 32.2 to 32.5 ft.	RC -6	29.2-34.2	WR-WR-WR (0)	100 (76)	
35		Bottom of borehole at 34.2 feet.					
40							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	SCS Field Services	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	CME 550X	GWC-31
LOGGER: Gallagher	DRILLING METHODS:	Hollow Stem Auger	
DATE CONSTRUCTED: 6-21-11			

N - 1238701.92, E - 2025618.17



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.93	797.50
GROUND SURFACE	0.00	793.57
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT:		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	13.00	780.57
ANNULAR SEAL TYPE: Bentonite Chips AMOUNT: 1/2 bucket PLACEMENT: Tremie		
TOP OF FILTER PACK	18.00	775.57
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 1.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	23.60	769.97
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	33.60	759.97
BOTTOM OF CASING	34.10	759.47

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

BORING GWC-32
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/18/2011 COMPLETED 2/18/2011 SURF. ELEV. 782.17 COORDINATES: N - 1238774.04, E - 2025876.12
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 30 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

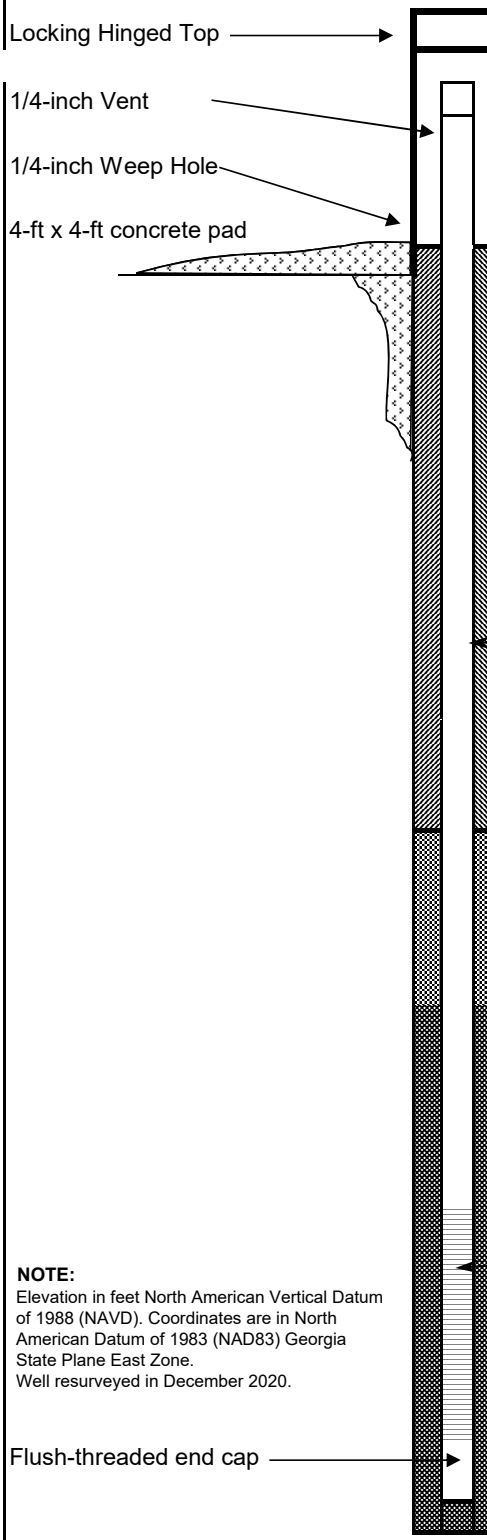
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - light red / moderate reddish orange (10R 6/6)		
5		**Clayey Sand (SC)** - weak red / pale reddish brown (10R 5/4) with weathered SCHIST gravel		
10		**Clayey Sand (SC)** - yellowish brown / moderate yellowish brown (10YR 5/4) damp		
		Clayey Sand (SC) - brown (7.5YR 4/2) damp		
15		**Silty Sand (SM)** - light gray (10YR 7/1) with large SCHIST gravel		
20		**SCHIST** - and gray (10YR 5/1) slightly weathered, heavy red stain		
25				
30		**GNEISS** - and gray (10YR 5/1)		
35		Bottom of borehole at 30.0 feet.		
40				

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-32
LOGGER: Sellers	DRILLING METHODS:		
DATE CONSTRUCTED: 2-18-11			

N - 1238774.04, E - 2025876.12



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.21	785.38
2" Threaded Riser Cap		
GROUND SURFACE	0.00	782.17
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 20 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	11.80	770.37
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	14.50	767.67
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	17.70	764.47
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	27.70	754.47
BOTTOM OF CASING	28.00	754.17
BOTTOM OF HOLE	30.00	752.17
2ft of sand		

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-33
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/18/2011 COMPLETED 2/18/2011 SURF. ELEV. 757.02 COORDINATES: N - 1238818.01, E - 2026322.50
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY C. Sellers CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 21 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
0		**Lean Clay (CL)** - red (10R 4/8)		
		Clayey Sand (SC) - light red / moderate reddish orange (10R 6/6)		
5		**(PWR)** - brown (7.5YR 5/4) and light red / moderate reddish orange (10R 6/6)		
10		**(PWR)** - white (10YR 8/1) weathered		
		(PWR) - red (10R 4/8) and brown (7.5YR 5/4) very damp, micaceous		
15		**SCHIST**		
		GNEISS		
20				
		Bottom of borehole at 21.0 feet.		
25				
30				
35				
40				

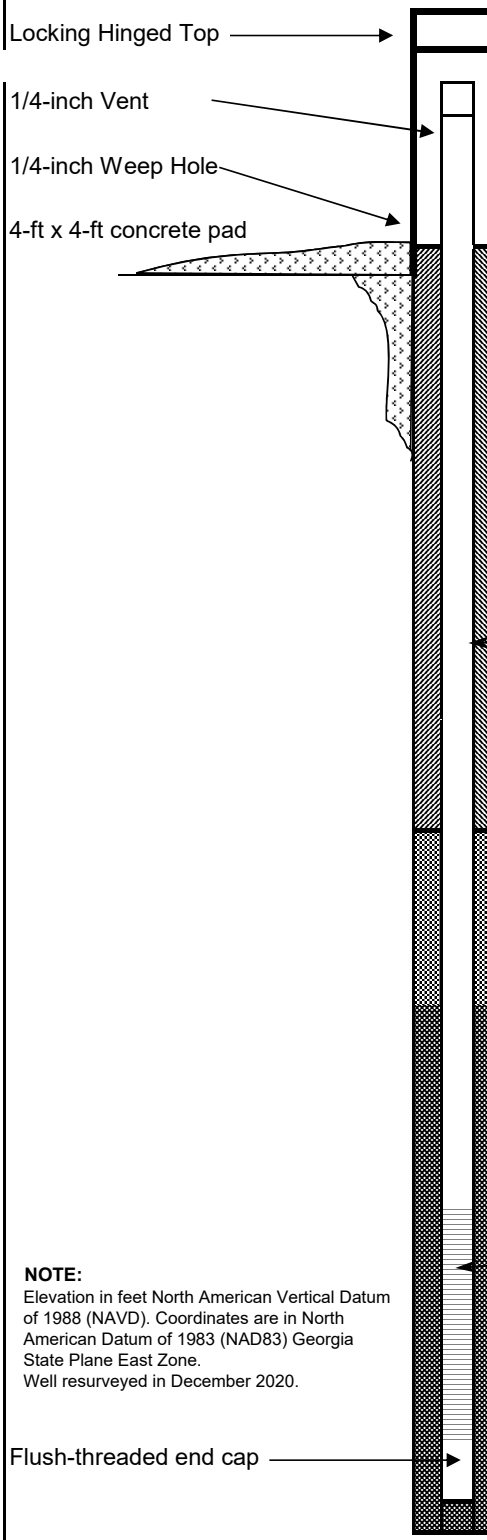
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-33
LOGGER: Sellers/Dyer	DRILLING METHODS:		
DATE CONSTRUCTED: 2-18-11			

N - 1238818.01, E - 2026322.50



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	3.03	760.05
2" Threaded Riser Cap		
GROUND SURFACE	0.00	757.02
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: To Surface		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	6.70	750.32
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	8.70	748.32
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 3.5 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	10.70	746.32
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	20.70	736.32
BOTTOM OF CASING	21.00	736.02

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

HOLE DIA: 6"

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/21/2011 COMPLETED 2/21/2011 SURF. ELEV. 732.49 COORDINATES: N - 1238558.69, E - 2026569.25
CONTRACTOR Boart Longyear EQUIPMENT _____ METHOD Rotosonic
DRILLED BY _____ LOGGED BY G. Dyer CHECKED BY _____ ANGLE _____ BEARING _____
BORING DEPTH 56 ft (well at 48 ft GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED 0.5 ft. after 18 hrs.
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
5		▼ - lost sample to 8'					
10		**Silty Sand (SM)** - orange, tan. black, wet, fine grain, w/ cobble to boulder sized pieces of quartz and highly weathered schist - tan, white, very moist, coarse grain, appears to be highly weathered granific gneiss, some clay material					water 8.5' - 15'. stark color contrast.
15		**Clayey Silty Sand (SC-SM)** - orange, tan, damp, less than 10% clay					
20		**Partially Weathered Rock** - brown, tan, saprolite; moderately consolidated, prevalent mica, and some relic structure - grades to less consolidated and more sand (micaceous) - tan, brown, schist parent rock; brown to black mica streaks; relic structures; medium well consolidated, damp low strength, weathering to fine sand - tan, orange, mod, well consolidated, damp, some relic structures preserved					
25		- tan, brown, highly weathered, highly weathered to sand and silt, some relic structures, damp; grades to more orange and tan also more highly weathered					
30		**Silty Sand (SM)** - tan, very damp, fairly well consolidated, well sorted					crator?.
35		**Partially Weathered Rock** - brown, tan, black, saprolite; schist moderately weathered, some competency, weathering to fine sand, very micaceous, slightly damp - mottled brown, black, tan, not competent, moist, weathered to sand and gravel sized schist? mica flakes dry (70% sand, 30% gravel)					
40		**Poorly-graded Sand (SP)** - light grey, white, very dry, gravel sized schist, gravels are elongate and angular (very competent)					
45		**Granite** - grey, consolidated, relic structures intact, lacks oxide staining, quartz veining					
50		- grey, consolidated, relic structures, lacks oxidation, quartz veining					

(Continued Next Page)

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

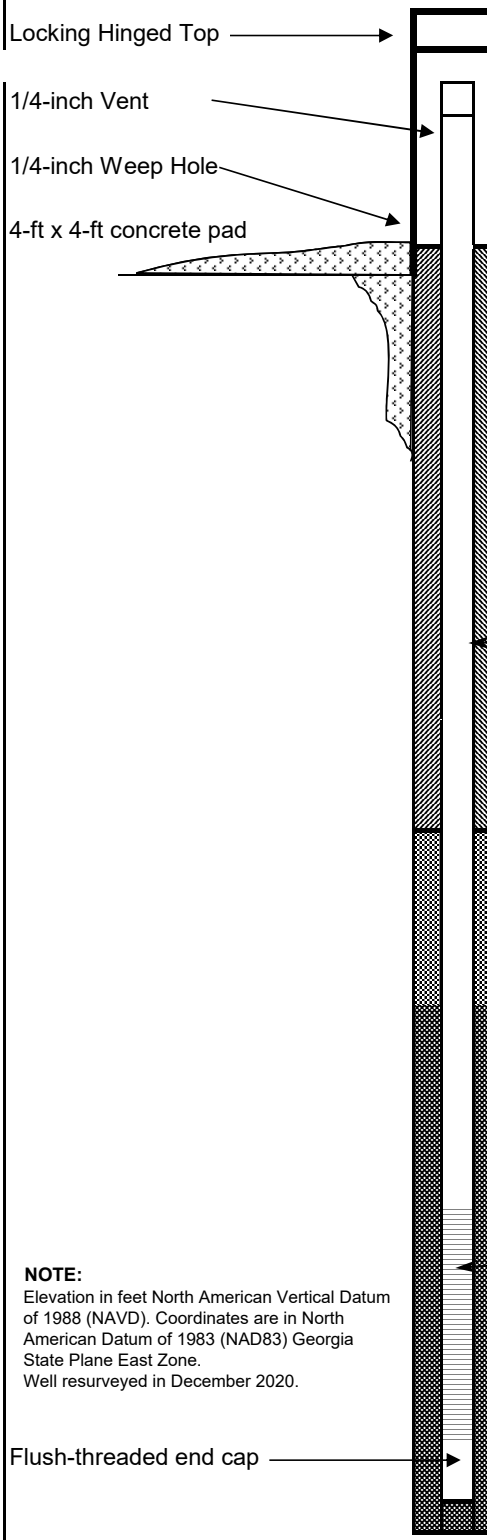
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	SAMPLE DEPTH (ft.)	BLOW COUNTS (N VALUE)	RECOVERY % (RQD)	COMMENTS
55		**Granite***(con't)*					
		Bottom of borehole at 56.0 feet.					
60							
65							
70							
75							
80							
85							
90							
95							
100							
105							

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83)
Georgia State Plane East Zone.
Well resurveyed in December 2020.

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-34
LOGGER: Dyer	DRILLING METHODS:		
DATE CONSTRUCTED: 2-21-11			

N - 1238558.69, E - 2026569.25



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.91	735.40
GROUND SURFACE	0.00	732.49
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 30 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	33.00	699.49
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1/2 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	35.00	697.49
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	37.50	694.99
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	47.50	684.99
BOTTOM OF CASING	48.00	684.49

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

BORING GWC-35
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Wansley
LOCATION Carrollton, Georgia

DATE STARTED 2/7/2011 **COMPLETED** 2/7/2011 **SURF. ELEV.** 728.11 **COORDINATES:** N - 1238243.50, E - 2026822.29
CONTRACTOR Boart Longyear **EQUIPMENT** _____ **METHOD** Rotosonic
DRILLED BY _____ **LOGGED BY** G. Dyer/ D. Brooks **CHECKED BY** _____ **ANGLE** _____ **BEARING** _____
BORING DEPTH 38 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES Well installed. Refer to well data sheet.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	COMMENTS
		Clayey Sand (SC) - black (10YR 2/1) moist, very fine to fine grained		
5		**Clayey Sand (SC)** - light red / moderate reddish orange (10R 6/6) wet, medium plasticity, very fine grained sand		
10		**Silty Sand (SM)** - pale brown (10YR 6/3) saprolite some relic structures 10'-12' - SM: brown (7.5YR 4/3) saprolite 12'-15'		
15		- SM: brown (7.5YR 4/3) SAA except micaceous		
20		**Poorly-graded Gravel with Clay (GP-GC)** - dusky red / dark reddish brown (10R 3/4) fine grained sand with quartz gravel		
25		**(PWR)** - brown (7.5YR 4/3) saprolite SAND, silty and micaceous		
		Clayey Sand (SC) - brown (7.5YR 4/3) micaceous with large quartz pebbles		
30		**(PWR)** - dark gray (10YR 4/1) saprolite wet, SAND, silty, clayey with highly weathered GNEISS		
35		**GNEISS**		
40		Bottom of borehole at 38.0 feet.		

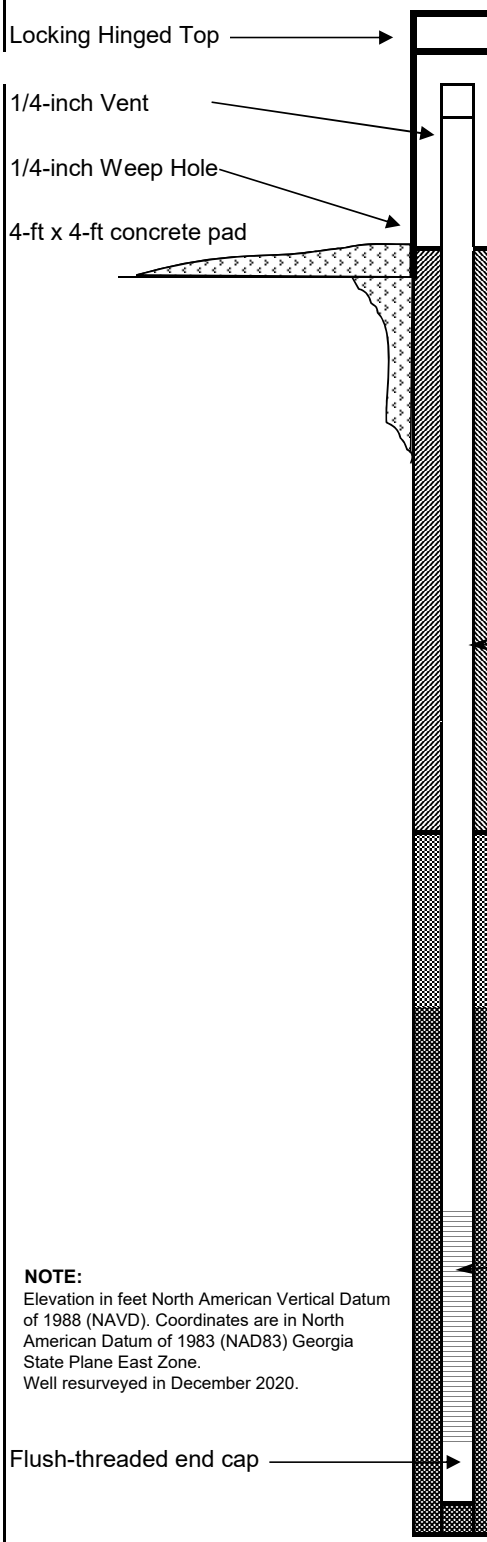
NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD).
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

SIMPLE GEOLOGY LOG - ESEE DATABASE.GDT - 11/9/11 15:55 - T:\ESEE MAJOR PROJECTS\PROJECTS\WANSLEY\WANSLEY 2011\PLANT WANSLEY WELL LOGS.GPJ

WELL CONSTRUCTION LOG — Southern Company Generation

PROJECT: Coal Combustion By-Product	DRILLING CO.:	Boart Longyear	WELL NAME
Private Industry Solid Waste Disposal Facility	DRILLER:		
LOCATION: Plant Wansley	RIG TYPE:	Roto Sonic	GWC-35
LOGGER: Brooks/Dyer	DRILLING METHODS:		
DATE CONSTRUCTED: 2-8-11			

N - 1238243.50, E - 2026822.29



	DEPTH FEET	ELEVATION FT NAVD
TOP OF RISER	2.53	730.64
2" Threaded Riser Cap		
GROUND SURFACE	0.00	728.11
PROTECTIVE CASING SIZE: 4x4-inch TYPE: Anodized Aluminum		
BOTTOM OF PROTECTIVE CASING		
BACKFILL MATERIAL TYPE: Portland Cement Grout AMOUNT: 30 Gallons		
RISER CASING DIA: 2-inch TYPE: Schedule 40 PVC JOINT TYPE: Flush Threaded		
TOP OF SEAL	22.50	705.61
ANNULAR SEAL TYPE: Bentonite Chips 50 lbs bags AMOUNT: 1 bag PLACEMENT: Tremie		
TOP OF FILTER PACK	25.00	703.11
FILTER PACK TYPE: F - 1A (20/30) Drillers Services, Inc. AMOUNT: 4 bags; 50 lbs/bag PLACEMENT: Tremie; wash with water		
BOTTOM OF RISER / TOP OF SCREEN	27.70	700.41
SCREEN DIA: 2-inch TYPE: Schedule 40 PVC Prepack OPENING WIDTH: 0.01-inch OPENING TYPE: Slotted SLOT SPACING: 1/8" SLOT LENGTH: 1.5-inch		
BOTTOM OF SCREEN	37.70	690.41
BOTTOM OF CASING	38.00	690.11

NOTE:
Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.
Well resurveyed in December 2020.

ATTACHMENT A2: WELL DRILLING CONTRACTOR PROOF OF BONDING

Liberty Mutual.

CONTINUATION CERTIFICATE

COPY

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, 2010**
(MONTH-DAY-YEAR)

and ending on **June 30, 2011**
(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 15, 2010**
(MONTH-DAY-YEAR)

SAFECO Insurance Company of America

By Barbara S. MacArthur

Barbara S. MacArthur, Attorney-In-Fact

S-0157/GEEF 11/99

COPY

POWER
OF ATTORNEY

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

**********GARY D. EKLUND; BARBARA S. MACARTHUR; VIRGINIA B. MCMANUS; CHAUN M. WILSON; MICHAEL F. YADACH; 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 2010

Dexter R. Legg

Dexter R. Legg, Secretary

T A Mikolajewski

Timothy A. Mikolajewski, Vice 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, Dexter R. Legg , 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 15th day of April 2010

SAFECO INSURANCE COMPANY OF AMERICA CORPORATE SEAL 1953 STATE OF WASHINGTON

GENERAL INSURANCE COMPANY OF AMERICA CORPORATE SEAL 1923 State of Washington

Dexter R. Legg

Dexter R. Legg, Secretary

WEB PDF

S-0974/DS 3/09

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

COPY

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

S-0157/GEEF 11/99

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
David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, 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.

ATTACHMENT A3: SURVEYOR'S CERTIFICATION

DATE: December 3-10, 2020

REQUESTED BY: Kristen Jurinko

LOCATION: Plant Wansley
Franklin, GA

Southern Company
T&PS CIVIL FIELD SERVICES
SURVEY & MAPPING

WELL	NAIL NORTHING	NAIL EASTING	NAIL LATITUDE DEC. DEG.	NAIL LONGITUDE DEC. DEG.	NAIL ELEVATION	CASING NORTHING	CASING EASTING	CASING (KERF) ELEVATION	GROUND ELEVATION
GWA 1	1236940.49	2027869.31	33.3974179	-85.0471283	775.22	1236939.09	2027869.61	778.02	774.93
GWA 2	1237147.60	2027481.39	33.3979780	-85.0484050	813.36	1237146.23	2027481.93	816.16	813.07
GWA 3	1237240.36	2027158.40	33.3982254	-85.0494658	787.56	1237239.46	2027159.37	790.64	787.27
GWA 4	1237254.83	2026747.92	33.3982556	-85.0508110	776.80	1237253.84	2026749.02	779.54	776.51
GWC 5	1237692.42	2026716.41	33.3994574	-85.0509264	753.37	1237691.25	2026715.49	755.91	753.08
GWC 6	1237924.67	2027012.89	33.4001026	-85.0499615	747.15	1237923.26	2027012.57	749.98	746.86
GWC 7	1238261.86	2027268.99	33.4010352	-85.0491318	728.42	1238262.28	2027267.53	731.15	728.13
GWC 8	1238501.55	2027640.45	33.4017025	-85.0479215	720.64	1238500.95	2027639.02	723.46	720.35
GWC 9	1238673.12	2027891.35	33.4021798	-85.0471042	710.00	1238673.29	2027890.01	712.65	709.71
GWC 10	1238950.81	2028309.04	33.4029527	-85.0457433	706.13	1238950.84	2028307.55	709.41	705.84
GWC 11	1238930.02	2028592.08	33.4029021	-85.0448154	698.18	1238931.36	2028591.42	701.05	697.89
GWC 12	1238738.52	2028921.56	33.4023835	-85.0437306	721.31	1238739.92	2028921.04	724.06	721.02
GWC 13	1238622.44	2029289.86	33.4020730	-85.0425207	691.41	1238623.64	2029288.99	694.08	691.12
GWC 14	1238428.07	2029551.52	33.4015449	-85.0416580	688.88	1238429.69	2029551.53	692.63	688.59
GWC 15	1238163.93	2029814.36	33.4008251	-85.0407896	684.67	1238164.50	2029813.08	687.44	684.38
GWC 16	1237809.03	2029989.71	33.3998538	-85.0402053	687.42	1237810.57	2029990.04	690.32	687.13
GWC 17	1237469.64	2029801.29	33.3989168	-85.0408133	701.94	1237469.49	2029802.77	704.55	701.65
GWC 18	1237097.77	2029691.53	33.3978924	-85.0411626	697.71	1237098.50	2029692.94	700.31	697.42
GWC 19	1236841.16	2029323.11	33.3971787	-85.0423626	694.83	1236840.20	2029324.43	698.47	694.54
GWC 20	1236645.57	2029149.57	33.3966371	-85.0429258	703.62	1236646.30	2029150.80	706.29	703.33
GWC 21	1236230.06	2028634.08	33.3954833	-85.0446031	717.61	1236231.26	2028634.91	721.02	717.32
GWC 22	1236396.22	2028325.64	33.3959328	-85.0456182	741.33	1236394.53	2028325.67	744.17	741.04
GWC 23	1236657.67	2028089.81	33.3966458	-85.0463981	770.75	1236656.05	2028089.81	773.41	770.46
GWC 24	1237355.54	2026407.92	33.3985244	-85.0519278	787.77	1237354.41	2026408.90	790.37	787.48
GWC 25	1237404.61	2026089.46	33.3986518	-85.0529725	809.66	1237403.18	2026090.13	812.36	809.37
GWC 26	1237625.00	2025790.42	33.3992505	-85.0539584	782.85	1237623.24	2025790.83	785.60	782.56
GWC 27	1237829.15	2025522.92	33.3998052	-85.0548405	811.67	1237827.67	2025523.40	814.32	811.38
GWA 28	1237995.74	2025182.65	33.4002551	-85.0559600	846.62	1237994.26	2025183.21	849.16	846.33
GWA 29	1238288.93	2024984.27	33.4010561	-85.0566182	831.99	1238288.80	2024982.84	834.67	831.70
GWC 30	1238565.49	2025118.88	33.4018193	-85.0561849	788.75	1238566.13	2025117.62	791.10	788.46
GWC 31	1238701.92	2025618.17	33.4022059	-85.0545528	793.86	1238700.65	2025617.57	797.50	793.57
GWC 32	1238774.04	2025876.12	33.4024102	-85.0537097	782.46	1238775.13	2025874.97	785.38	782.17
GWC 33	1238818.01	2026322.50	33.4025414	-85.0522484	757.31	1238819.23	2026321.58	760.05	757.02
GWC 34	1238558.69	2026569.25	33.4018346	-85.0514327	732.78	1238559.24	2026570.02	735.40	732.49
GWC 35	1238243.50	2026822.29	33.4009743	-85.0505949	728.40	1238244.47	2026822.29	730.64	728.11

NOTES:

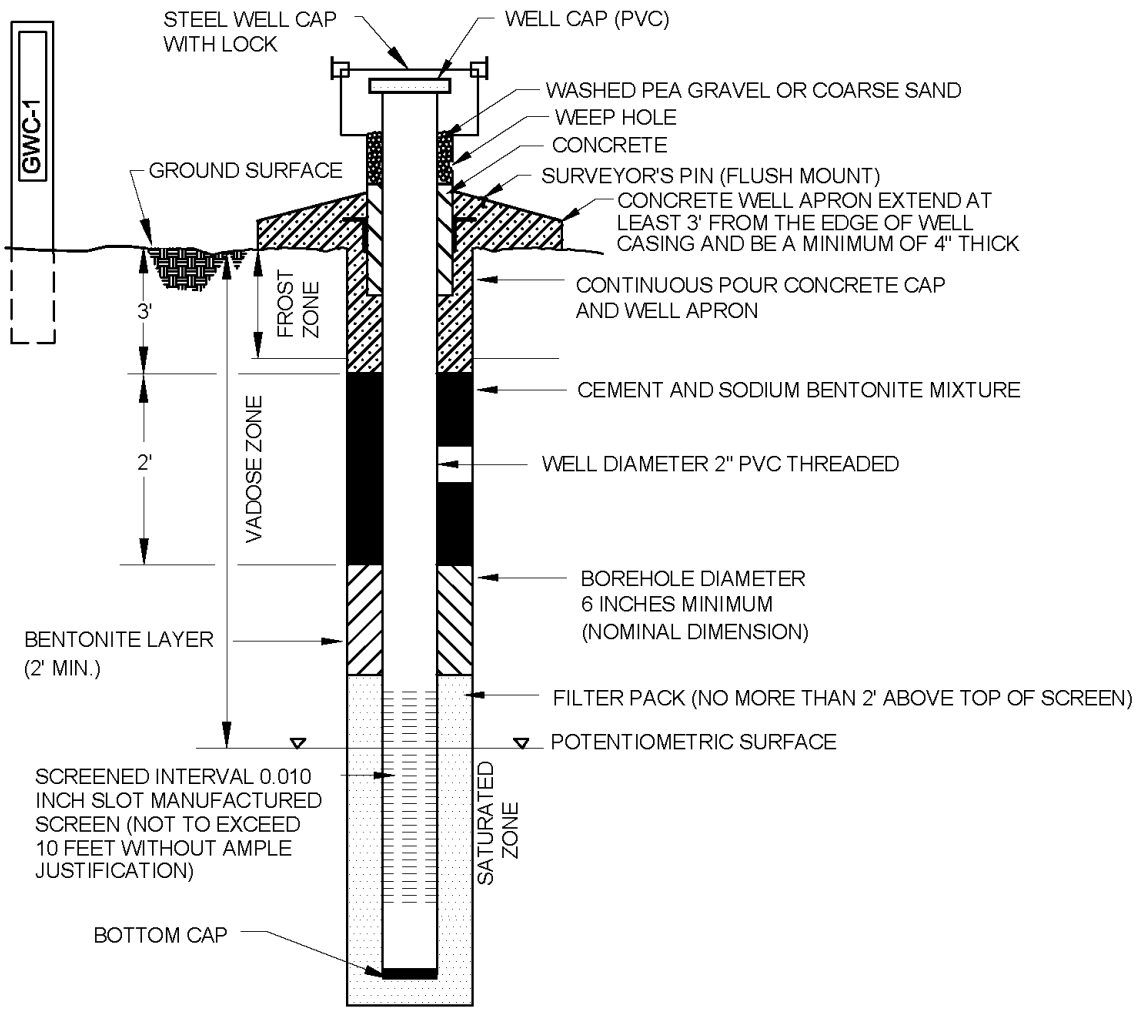
1) Georgia West NAD 1983 Horizontal Datum, NAVD 1988 Vertical Datum

2) Survey was performed using Leica GS 14 RTK GPS, Leica Sprinter 150

3) Reference Monument - TP2 Elevation 773.243'

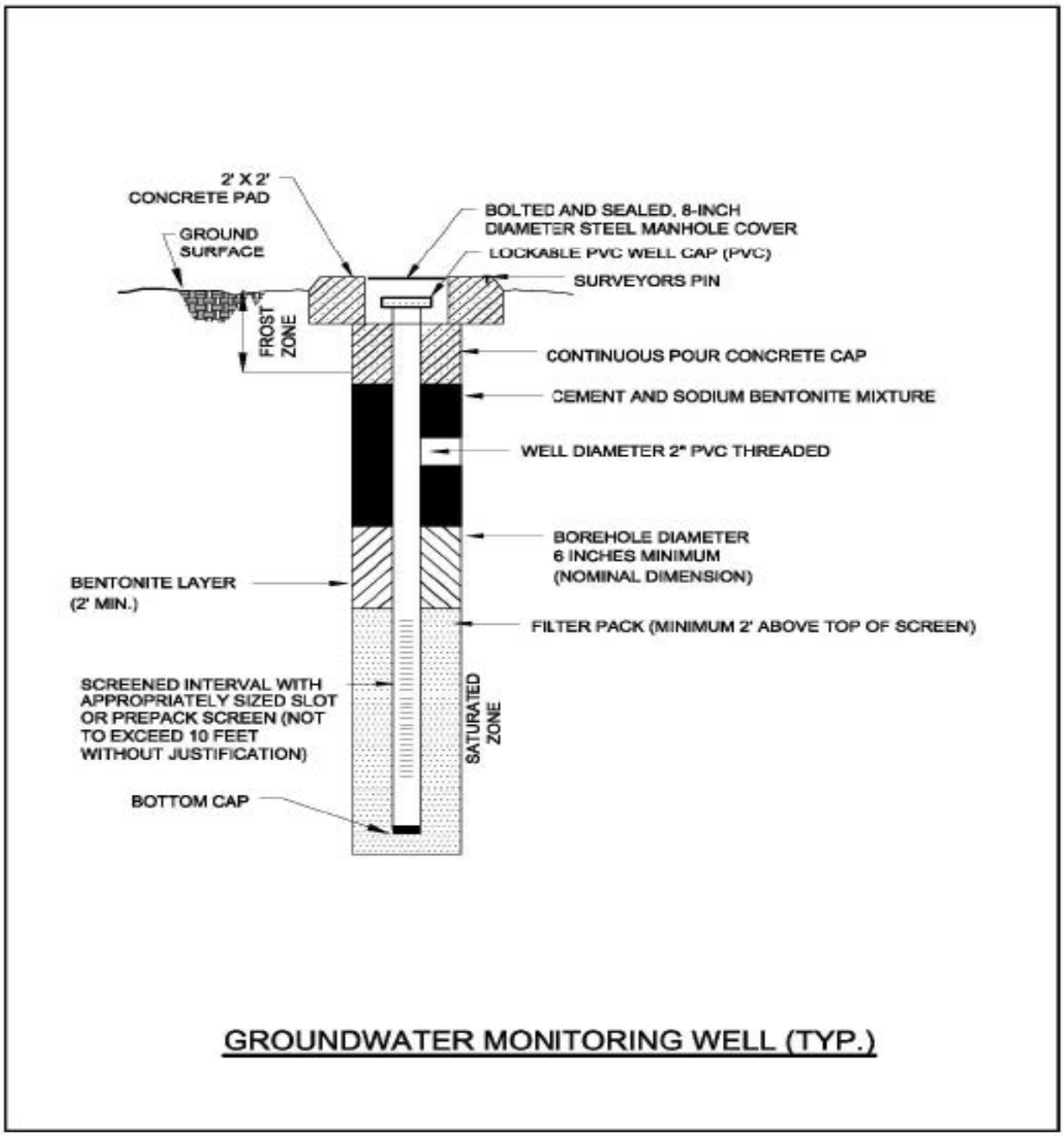
I, a Professional Land Surveyor in the State of Georgia do hereby certify that the horizontal position and vertical elevation values given for the control point nail at the base of the well & PVC casing have been performed under my direct supervision with positional tolerance of 0.5' horizontal and 0.01' vertical. Elevation of surveyed point was established based upon a level loop from stated reference monument.

B. GROUNDWATER MONITORING WELL DETAILS



GROUNDWATER MONITORING WELL (TYP.)

B2. GROUNDWATER MONITORING WELL DETAIL FLUSH-MOUNT SURFACE COMPLETION



C. GROUNDWATER SAMPLING PROCEDURE

Groundwater sampling will be conducted using 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. Any item coming in contact with the inside of the well casing or the well water will be kept in a clean container and handled only with gloved hands.

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

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

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

3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two (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. All 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 Science and Ecosystem Support Division (SESD) Operating Procedure for Field Equipment Cleaning and Decontamination as a guide. (SESDGUID-205-R#)

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:

    a. ±0.1 for pH

    b. ±5% for specific conductance (conductivity)

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

d. ≤5 for turbidity

e. Temperature – Record only, not used for stabilization criteria

f. ORP – Record only, not used for stabilization criteria.

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

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

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

10. Sample containers and preservative will be appropriate for the analytical method being used.
11. Information contained on sample container labels will include:

    a. Name of facility

    b. Date and time of sampling

    c. Sample description (well number)

    d. Sampler's initials

    e. Preservatives

    f. Analytical method(s)

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

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

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

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

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

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

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

A brief overview of purging and sampling methodologies, including the type of sampling equipment used will be provided in routine monitoring reports.

D. SURFACE WATER & UNDERDRAIN SAMPLING AND ANALYSIS PROCEDURES

Surface water and underdrain samples will be collected in accordance with the general procedures outlined below. These procedures were developed using field sampling guidelines described in the USEPA Region 4 Field Branches Quality System and Technical Procedures for Surface Water Sampling (SESDPROC-201-R#) and updates (https://www.epa.gov/quality/quality-system-and-technical-procedures-sesd-field-branches). Surface water and underdrain samples will be analyzed for the parameters contained in Table 2.

Surface water and underdrain samples will be monitored for the same parameters and at the same frequency as groundwater. Surface water and underdrain samples will be analyzed for the same parameters using the same analytical methods as the groundwater samples listed in Table 2 of this plan. Samples will be collected from flowing water and not from ponded water that collects on the ground surface. 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 and underdrain samples:

a. Hold the bottle near the base with one hand, and with the other, remove the cap.

b. 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.

c. Hold the container within the stream flow or underneath the outfall and allow the container to be filled with water. Remove the container from underneath the flow or the outfall and place the cap back on the container.

d. Label the sample container to, at a minimum, include: Sample Number, Name of Collector, Date and Time of Collection, and Place/Point of Collection.

e. Place the samples in a cooler containing water-ice, if required, for courier or hand delivery to the laboratory within the sample hold times.

f. Follow COC and temperature protocols.

The minimum sampling frequency for surface water will be semiannual.