GROUNDWATER MONITORING PLAN

PLANT MCINTOSH – ASH POND 1 (AP-1)
EFFINGHAM COUNTY, GEORGIA

FOR

Georgia Power

November 2019

GEI Consultants

GEI Consultants, Inc., 1375 Peachtree Street NE, Suite A15, Atlanta, GA, 404.592.0050

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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 Georgia Environmental Protection Division (EPD) Rules of Solid Waste Management, Chapter 391-3-4.10(6). According to 391-3-4-.01(57), 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 EPD Rules of Solid Waste Management, Chapter 391-3-4.10(6).

Signature:

Date: 11.1.19

1. INTRODUCTION

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

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 (EPA) Coal Combustion Rule (§257.90), which is incorporated in the Georgia State CCR Rule by reference, a detection monitoring well network for AP-1 has been installed and certified by a qualified professional engineer. This certification has been placed in the Site's operating record, per EPA Rule requirements and is included in Part B of the permit application. The 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 installation or unscheduled abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Plant McIntosh is in southeast Effingham County, Georgia, on the west bank of the Savannah River at Big Kiffer Point (Appendix A, Figure A-1, Compliance Monitoring Network Map). The plant is located within the Coastal Plain Province of Georgia. Coastal Plain sediments are composed of stratified clay, silt, sand, and limestone, resting on much older igneous and metamorphic basement rocks (Cooke, 1943). These older, crystalline rocks dip to the south and east causing the overlying sediments to form a wedge-shaped deposit, which is thickest to the east and the south. The Coastal Plain deposits crop out at the land surface in bands, from the oldest to the most recent, from the Fall Line to the coast. Pleistocene-aged deposits are at the surface in this region. Recharge to the major aquifers in the area is to the northeast of Plant McIntosh, where these formations outcrop (Cooke, 1943).

The uppermost aquifer at Plant McIntosh is the surficial aquifer, characterized by silty to sandy clays, clayey silts, silty sands, and fine to medium grained sands. Boring logs (Appendix A) describe soils at AP-1 as interbedded clays, silts, and sands typical of Coastal Plain sediments. Groundwater at AP-1 flows from the southwest to the northeast across the Site (Appendix A, Figure A-2, Potentiometric Surface Map – July 2018). Based on slug test data collected in a subset of AP-1 wells in March 2016, hydraulic conductivity measurements were calculated. Hydraulic conductivity values ranged from 0.14 to 2.84 feet/day (ft/day), and the average hydraulic conductivity was 0.962 ft/day.

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 pond layouts and Site geologic and hydrogeologic considerations. GPC 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. A more detailed discussion of the hydrogeological investigations conducted in support of monitoring well placement is provided in Part B of the permit application (Hydrogeologic Assessment Report (GEI, 2018)).

Locations are chosen to serve as upgradient (MGWA) or downgradient (MGWC) based on groundwater flow direction determined by potentiometric evaluation. The well naming nomenclature is based on EPD's Industrial Waste Disposal Site Design and Operations Plan – *Supplemental Data for Solid Waste Handling Permit* (EPD, undated). Four wells (MGWA-5, MGWA-6, MGWA-10, and MGWA-11) are designated for monitoring upgradient Site conditions and six wells (MGWC-1, MGWC-2, MGWC-3, MGWC-7, MGWC-8, and MGWC-12) are designated for monitoring groundwater quality downgradient of AP-1. The downgradient monitoring wells are positioned to provide adequate coverage to detect potential impacts from AP-1.

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 Compliance Monitoring Network Map Monitoring System Details. Appendix A Table A-1 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 network will be made by a minor modification to the permit pursuant to Georgia Rules of Solid Waste Management, Chapter 391-3-4-.02(4)(b)7.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT, AND REPORTING

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. Drilling equipment shall be decontaminated before use and between borehole locations using the procedures described in the most current version of the EPA Region 4 Science and Ecosystem Support Division (SESD) *Operating Procedure for Field Equipment Cleaning and Decontamination* (EPA, SESDGUID-205-R3, 2015) as a general guide for best practices.

Sampling and/or coring may be used to help determine the stratigraphy and geology. Samples will be logged by a qualified groundwater scientist. Screen depths will be chosen based on the desired groundwater sampling interval.

All drilling for any subsurface hydrologic investigation or installation or abandonment of groundwater monitoring wells will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council. Monitoring wells shall be installed using the most current version of the EPA Region 4 SESD Guidance Document - Design and Installation of Monitoring Wells (EPA, SESDGUID-101-R1, 2013) as a general guide for best practices.

As required by 391-3-4.10(6)(g), a minor modification will be submitted to the EPD prior to the installation or decommissioning of monitoring wells. Well installation must be directed by a qualified groundwater scientist.

4.2 DESIGN AND CONSTRUCTION

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

4.2.1 Well Casings and Screens

American Society for Testing 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 Site.

4.2.2 Well Intake Design

The design and construction of the intake of the groundwater wells shall: (1) allow sufficient groundwater flow to the well for sampling; (2) minimize the passage of formation materials (turbidity) into the well; and (3) ensure sufficient structural integrity to prevent the collapse of the intake structure.

Each groundwater monitoring well will include a well screen designed to limit the amount of formation material passing into the well when it is purged and sampled. Screens with 0.010-inch slots have proven effective for the earth materials at the Site and will be used unless geologic conditions discovered at the time of installation dictate a different size. Screen length shall not exceed 10 feet without justification as to why a longer screen is necessary (e.g., significant variation in groundwater level). If the above steps 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 dual-wall well screens combine a centralized inner well screen, a developed filter sand pack, and an outer conductor screen in one integrated unit composed of inert materials. If utilized, pre-packed dual-wall well screens will be installed following general industry standards and using the current version of the EPA Region 4 SESD Guidance Document - *Operating Procedure for Design and Installation of Monitoring Wells* (EPA, SESDGUID-205-R1, 2013) as a general guide for best practices.

4.2.3 Filter Pack and Annular Seal

The materials used to construct the filter pack will be clean quartz sand of a size that is appropriate for the screened formation. Fabric filters will not be used as filter pack material. Sufficient filter material will be placed in the 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 cementitious grout from entering the water-bearing or screened zone. If dry bentonite is used, the bentonite must be hydrated with potable water prior to grouting the remaining annulus.

The annulus above the bentonite seal will be grouted with a cement and bentonite mixture (approximately 94 pounds cement / 3 to 5 pounds bentonite / 6.5 gallons of potable water) placed via tremie pipe from the top of the bentonite seal. During grouting, care will be taken to assure that the bentonite seal is not disturbed by locating the base of the tremie pipe approximately 2 feet above the bentonite seal and injecting grout at low pressure/velocity.

4.2.4 Protective Casing and Well Completion

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

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

Protective bollards will be installed around each above-grade groundwater monitoring well. Well construction in high traffic areas will generally be limited unless Site conditions warrant otherwise. The groundwater monitoring well detail attached in Appendix B, Groundwater Monitoring Well Detail, illustrates the general design and construction details for a monitoring well.

4.2.5 Well Development

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. 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.

4.3 ABANDONMENT

Monitoring wells will be abandoned using industry-accepted practices, the most current version of the Region 4 EPA SESD Guidance Document – *Operating Procedure for Design and Installation of Monitoring Wells* (EPA, SESDGUID-205-R1, 2013) and using the Manual for Groundwater Monitoring (EPD, 1991) and Georgia's Well Water Standards Act of 1985 (EPD, 1985) as guides. The wells will be abandoned under the direction of a qualified groundwater scientist. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. Piezometers or groundwater wells located within footprint of Ash Pond 1 will be over-drilled prior to abandonment.

4.4 DOCUMENTATION

The following information documenting the construction and development of each well will be submitted to EPD by a qualified groundwater scientist after completing all planned well installations. Planned well installations logs shall include:

- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Advisory Council
- Dates of drilling and initial well emplacement
- Well Identification
- Well development date
- Well turbidity following development Drilling method and drilling fluid if used
- Well location (±0.5 ft)
- Borehole diameter and well casing diameter
- Well depth (±0.1 ft)
- Lithologic logs
- Well casing materials
- Screen materials and design (i.e., interval in feet below ground surface and elevation)
- Screen length
- Screen slot size
- Type of protective well cap and sump dimensions for each well.
- Screened Interval in feet below ground surface and elevation Filter pack material/size and volume (placement narrative)
- Sealant materials and volume
- Documentation of ground surface elevation (±0.01 ft)
- Documentation of top of casing elevation (±0.01 ft)
- Schematic of the well with dimensions
- Seal emplacement method and type/volume of sealant
- Surface seal and volumes/mix of annular seal material
- Narrative of well development method- specific well development procedure

A Georgia-registered professional surveyor shall certify that the horizontal accuracy for the installed monitoring wells is 0.5 feet, and vertical accuracy for elevations to 0.01 feet using a known datum. Within 60 days of the construction, development or abandonment of each groundwater monitoring well, a well installation/abandonment report will be submitted to the EPD by a qualified groundwater scientist or engineer.

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 1, Groundwater Monitoring Parameters and Frequency, presents the groundwater monitoring parameters and sampling frequency. Eight independent samples from each groundwater well were collected and analyzed for 40 CFR 257, Subpart D, Appendix III, and Appendix IV test parameters to establish a background statistical dataset. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semiannual during closure activities and the post-CCR removal monitoring period. Assessment monitoring will be performed per Georgia Chapter 391-3-4-.10, Rules for Solid Waste Management. When referenced throughout this plan, Appendix III and Appendix IV parameters refer to the parameters contained in Appendix III and Appendix IV of 40 CFR 257, Subpart D, 80 Fed. Reg. 21468 (EPD, 2015).

As shown on Table 2, Analytical Methods, the groundwater samples will be analyzed using methods specified in EPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), EPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), ASTM, or other suitable analytical methods approved by the Georgia EPD. The method used will be able to reach a practical quantification limit to detect natural background conditions at the Site. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP). Field instruments used to measure pH must be accurate and reproducible to within 0.2 Standard Units (S.U.).

Groundwater monitoring program well inspections performed by a professional engineer or professional geologist shall be completed at least once every five years and documented in accordance with the Georgia Water Well Standards Act (O.C.G.A. § 12-5-120).

TABLE 1
GROUNDWATER MONITORING PARAMETERS & FREQUENCY

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

TABLE 2
ANALYTICAL METHODS

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

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. Sampling procedures were developed using standard industry practice and EPA Region 4 SESD Operating Procedure- Groundwater Sampling (EPA, SESDPROC-301-R#). Low-flow sampling methodology will be utilized for sample collection. Alternative industry accepted sampling techniques may be used when appropriate with prior EPD approval.

For groundwater sampling, positive gas displacement Teflon™ or stainless-steel bladder pumps will be used for purging. If dedicated bladder pumps are not used, portable bladder pumps or peristaltic pumps (with dedicated or disposable tubing) may be used. All non-dedicated equipment will be decontaminated between wells in general accordance with USEPA SESDPROC-2015-R3. Per Georgia Rule 391-3-4-.10(6)(g): Monitoring wells require replacement after two dry consecutive sampling events. Well installation must be directed by a qualified groundwater scientist.

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 and times of possession by each individual

The samples will remain in the custody of assigned personnel, an assigned agent, or the laboratory. If the samples are transferred to other employees for delivery or transport, the sampler or possessor must relinquish possession and the samples must be received by the new owner. If the samples are being shipped, a hard copy COC will be signed and enclosed within the shipping container. Samplers must use COC forms provided by the analytical laboratory or use a COC form similarly formatted and containing the information listed above.

8. FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL

All field quality control samples will be prepared the same as compliance samples regarding 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 will be 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 will be collected in the field using the same water source that is used for decontamination. The water will be poured directly into the supplied sample containers in the field and submitted to the laboratory for analysis of target constituents. One field blank will be collected for every 20 samples.

The groundwater samples will be analyzed by licensed and accredited laboratories through NELAP.

Instrument Calibration Program - Calibration of field instruments will occur daily and follows the required (specific) instrument calibration requirements. Daily calibration will be documented on field forms and these field forms will be included in all groundwater monitoring reports.

Quality Control Sampling - Calibration of field instruments occurs daily and follows the required (specific) instrument calibration requirements.

9. REPORTING RESULTS

A semiannual groundwater report that documents the results of sampling and analysis will be submitted to EPD. At a minimum, semiannual reports will include:

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

2. A brief overview of purging/sampling methodologies, and a narrative of purging/sampling methodologies, which includes type of sampling equipment used.

3. Discussion of results.

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

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

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

7. Groundwater flow rate and direction calculations.

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

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

10. If applicable, semiannual assessment monitoring results.

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

12. Laboratory reports.

13. COC documentation.

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

15. Documentation of non-functioning wells.

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

17. Statistical analyses.

18. 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 are consistent with the Unified Guidance (EPA, 2009).

According to EPD rules (391-3-4-.10(6)(a)), the Site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. The statistical test chosen shall be conducted separately for each hazardous 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) ((§257.93(f)(5)). A justification for an alternative method will be placed in the operating record and the Director notified of the use of an alternative test. The justification will demonstrate that the alternative method meets the performance standards of §257.93(g).

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

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

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

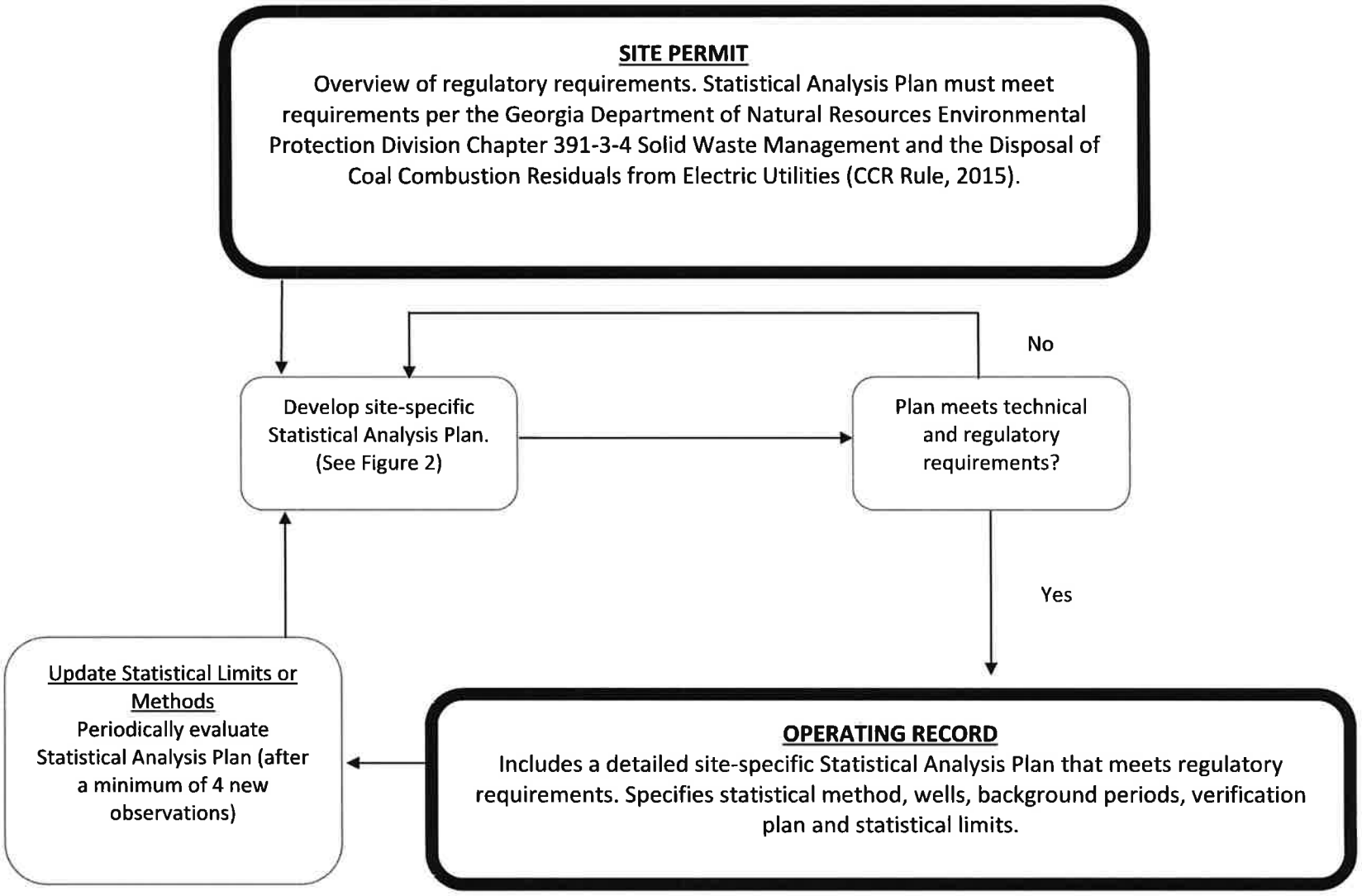
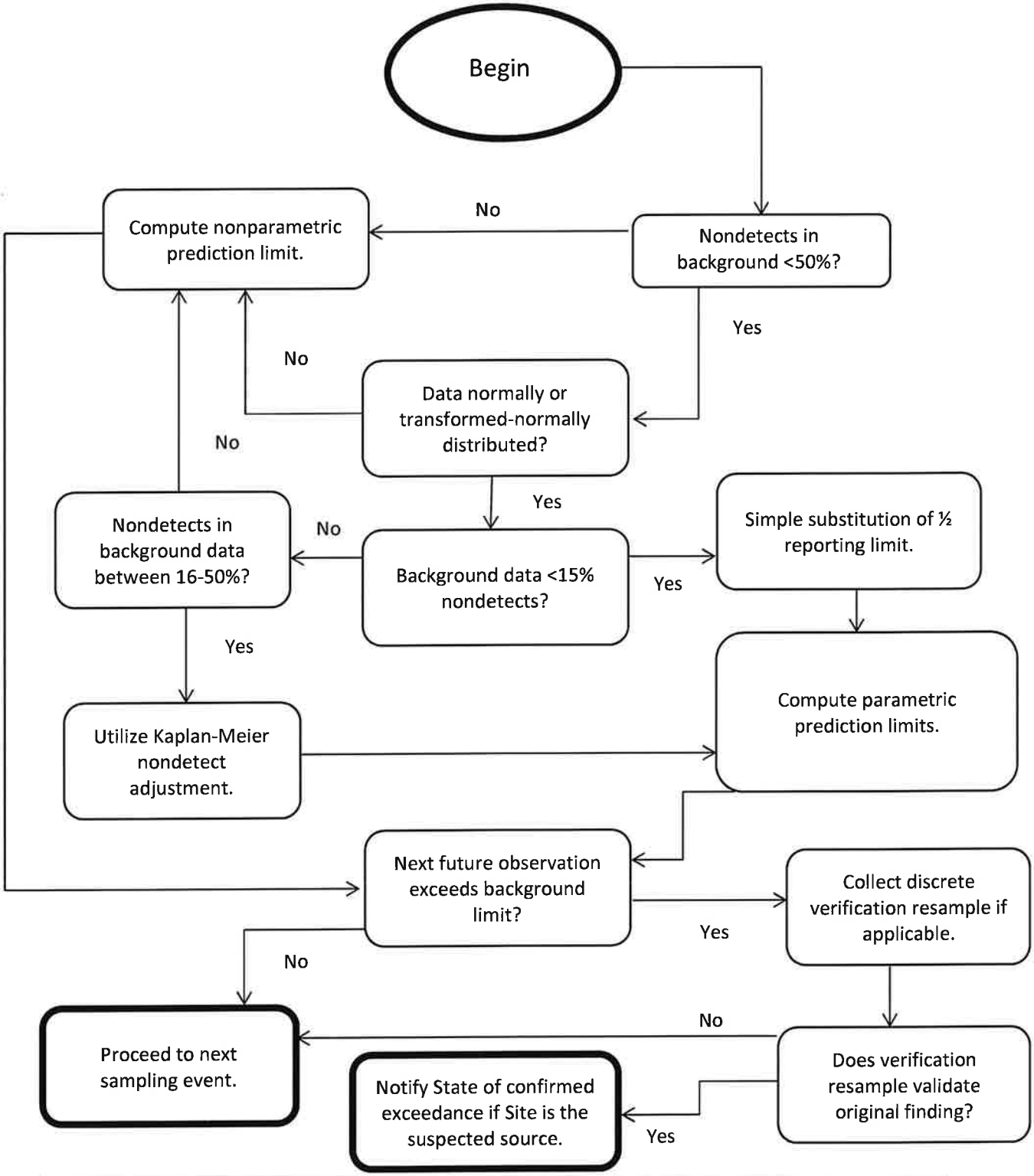


FIGURE 2. DECISION LOGIC FOR COMPUTING PREDICTION LIMITS



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APPENDICES

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

Appendix A – Monitoring System Details

FIGURE A-1 COMPLIANCE MONITORING NETWORK MAP

FIGURE A-2 POTENTIOMETRIC SURFACE MAP – JULY 2018

TABLE A-1 MONITORING NETWORK WELL DETAILS

TABLE A-2 WATER LEVEL MONITORING NETWORK PIEZOMETER DETAILS

BORING AND WELL CONSTRUCTION LOGS

Groundwater Monitoring Plan
Plant McIntosh Ash Pond 1
Effingham County, Georgia

Georgia Power Company
Atlanta, Georgia

GEI Consultants

ASH POND 1
COMPLIANCE MONITORING
NETWORK MAP

Project No. 1800205 | Prepared November 2018 Fig. A-1

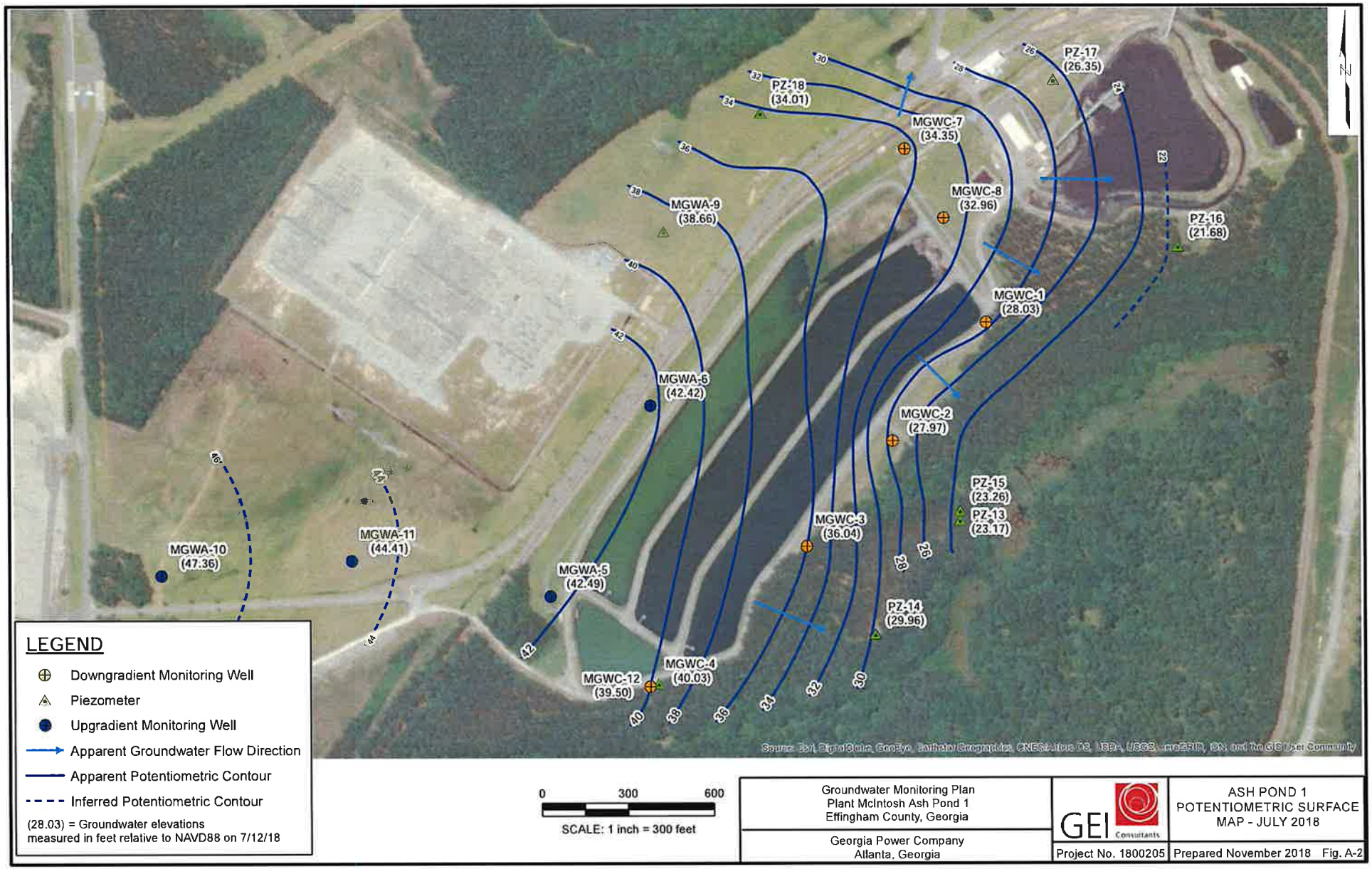

PZ-17
(26.35)
PZ-18
(34.01)
MGWC-7
(34.35)
MGWC-8
(32.96)
MGWA-9
(38.66)
PZ-16
(21.68)
MGWC-1
(28.03)
MGWA-6
(42.42)
MGWC-2
(27.97)
PZ-15
(23.26)
PZ-13
(23.17)
MGWC-3
(36.04)
MGWA-11
(44.41)
MGWA-10
(47.36)
MGWA-5
(42.49)
PZ-14
(29.96)
MGWC-4
(40.03)
MGWC-12
(39.50)
LEGEND
Downgradient Monitoring Well
Piezometer
Upgradient Monitoring Well
Apparent Groundwater Flow Direction
Apparent Potentiometric Contour
Inferred Potentiometric Contour
(28.03) = Groundwater elevations
measured in feet relative to NAVD88 on 7/12/18
0
300
600
SCALE: 1 inch = 300 feet
Groundwater Monitoring Plan
Plant McIntosh Ash Pond 1
Effingham County, Georgia
Georgia Power Company
Atlanta, Georgia
GEI Consultants
ASH POND 1
POTENTIOMETRIC SURFACE
MAP - JULY 2018
Project No. 1800205
Prepared November 2018 Fig. A-2

Table A-1 Monitoring Network Well Details
Groundwater Monitoring Plan
Georgia Power Company
Ash Pond 1
Plant McIntosh
Effingham County, Georgia

Well ID	Northing	Easting	Ground Surface Elevation (ft)	Top of Casing Elevation (ft)	Total Depth (ft bTOC)	Bottom of Well Elevation (ft)	Depth to Top of Screen (ft bTOC)	Top of Screen Elevation (ft)	Bottom of Screen Elevation (ft)	Purpose	Installation Date
MGWC-1	856813.32	964287.17	62.00	65.08	55.78	9.30	45.78	19.30	9.30	Downgradient Monitoring	11/10/2015
MGWC-2	856400.70	963958.28	44.90	48.26	37.06	11.20	27.06	21.20	11.20	Downgradient Monitoring	11/11/2015
MGWC-3	856033.91	963658.13	49.60	52.34	38.44	13.90	28.44	23.90	13.90	Downgradient Monitoring	11/11/2015
MGWA-5	855860.77	962763.08	61.00	64.09	62.79	1.30	52.79	11.30	1.30	Upgradient Monitoring	11/12/2015
MGWA-6	856527.64	963130.05	57.90	60.83	41.63	19.20	31.63	29.20	19.20	Upgradient Monitoring	11/12/2015
MGWC-7	857417.67	964007.37	50.90	54.19	41.99	12.20	31.99	22.20	12.20	Downgradient Monitoring	11/13/2015
MGWC-8	857177.15	964141.60	59.30	62.36	52.26	10.10	42.26	20.10	10.10	Downgradient Monitoring	11/10/2015
MGWA-10	855934.18	961406.35	61.60	64.69	52.79	11.90	42.79	21.90	11.90	Upgradient Monitoring	11/17/2015
MGWA-11	855985.27	962070.17	64.70	67.51	55.61	11.90	45.61	21.90	11.90	Upgradient Monitoring	5/27/2016
MGWC-12	855545.62	963110.10	63.90	66.80	52.70	14.10	42.70	24.10	14.10	Downgradient Monitoring	5/26/2016

Notes:
Horizontal datum NAD83 Georgia State Plane East Zone, Vertical Datum NAVD88
ft - feet
bTOC - Below top of casing
Well construction information taken from the October 2017 Ash Pond Well Design, Installation, Development, and Decommissioning Report, revised in February 2018

Table A-2 Water Level Monitoring Piezometer Details
Groundwater Monitoring Plan
Georgia Power Company
Ash Pond 1
Plant McIntosh
Effingham County, Georgia

Well ID	Northing	Easting	Ground Surface Elevation (ft)	Top of Casing Elevation (ft)	Total Depth (ft bTOC)	Bottom of Well Elevation (ft)	Depth to Top of Screen (ft bTOC)	Top of Screen Elevation (ft)	Bottom of Screen Elevation (ft)	Purpose	Installation Date
MGWC-4	855555.10	963139.29	60.70	64.05	67.05	-3.00	57.05	7.00	-3.00	Water Level	11/18/2015
MGWA-9	857129.76	963164.52	56.00	59.05	42.75	16.30	32.75	26.30	16.30	Water Level	11/17/2015
PZ-13	856124.06	964192.33	37.79	40.66	26.36	14.30	17.28	23.38	13.38	Water Level	6/3/2016
PZ-14	855727.29	963896.00	43.83	46.90	41.10	5.80	31.72	15.18	5.18	Water Level	6/4/2016
PZ-15	856157.15	964192.87	39.01	42.28	28.90	13.41	18.57	23.71	13.71	Water Level	6/26/2018
PZ-16	857077.20	964956.17	51.23	54.62	42.56	12.23	32.09	22.53	12.53	Water Level	6/26/2018
PZ-17	857656.21	964525.25	54.04	57.46	45.20	12.34	34.82	22.64	12.64	Water Level	6/27/2018
PZ-18	857542.85	963505.27	50.11	53.31	41.90	11.61	31.40	21.91	11.91	Water Level	6/27/2018

Notes:
Horizontal datum NAD83 Georgia State Plane East Zone, Vertical Datum NAVD88
ft - feet
bTOC - Below top of casing
Well construction information for MGWC-4 and MGWA-9 taken from the October 2017 Ash Pond Well Design, Installation, Development, and Decommissioning Report, revised in February 2018
PZ-15, PZ-16, PZ-17, and PZ-18 surveyed by Thomas & Hutton in August 2018

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/10/2015 **COMPLETED** 11/10/2015 **SURF. ELEV.** 62.0 **COORDINATES:** N:32.351760 E:-81.168876
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** 34 ft. **COMP.** **DELAYED** 31.9 ft. after 24 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			62.0
		Poorly-graded Sand with Silt (SP-SM) dark grayish brown (2.5Y 4/2) topsoil	61.0
		Sandy Lean Clay (CL) mottled red (2.5YR 4/8), light gray (2.5Y 7/2) and reddish brown (2.5YR 4/3) damp, stiff to very stiff, low to medium	
5			57.0
		Poorly-graded Sand with Clay (SP-SC) reddish yellow (7.5YR 6/6) dry, fine-grained	56.0
		Sandy Lean Clay (CL) mottled red (2.5YR 5/6), brownish yellow / dark yellowish orange (10YR 6/6) and gray / light olive gray (5Y 6/1) dry, medium stiff, low to medium plascticity	
10			48.0
		Lean Clay (CL) mottled light gray / yellowish gray (5Y 7/2), red (2.5YR 4/8) and olive yellow (2.5Y 6/6) damp, interbedded with fine-sand lenses (<1" thick)	
15			45.0
		Fat Clay (CH) mottled light gray / yellowish gray (5Y 7/2) and reddish yellow (7.5YR 6/8) damp, medium stiff, medium to high, interbedded with coarse-sand lenses	
20			42.0
		Sandy Fat Clay (CH) mottled light gray / yellowish gray (5Y 7/2) and brownish yellow (10YR 6/8) damp, medium stiff, medium to high, interbedded with pale gray (5Y 8/2) fine-sand lenses (1-2" thick)	
25			
30			

Natural Gamma: 75 | 150 | 225

WELL DATA
Top of casing Elev. = 65.08
Surface Seal
Annular Fill

(Continued Next Page)

SOUTHERN COMPANY

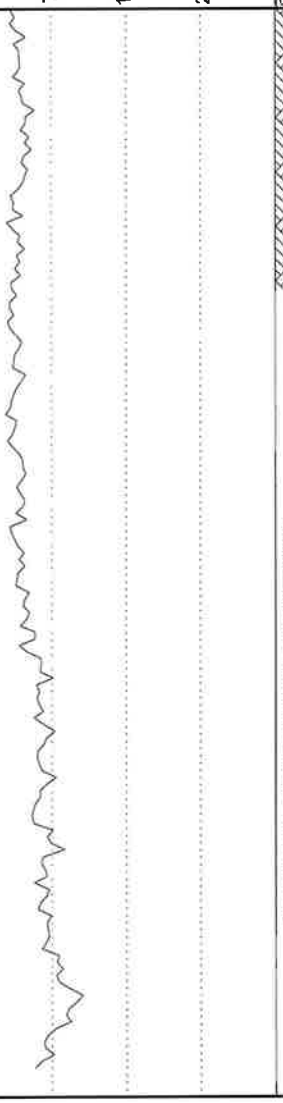
BORING LOG

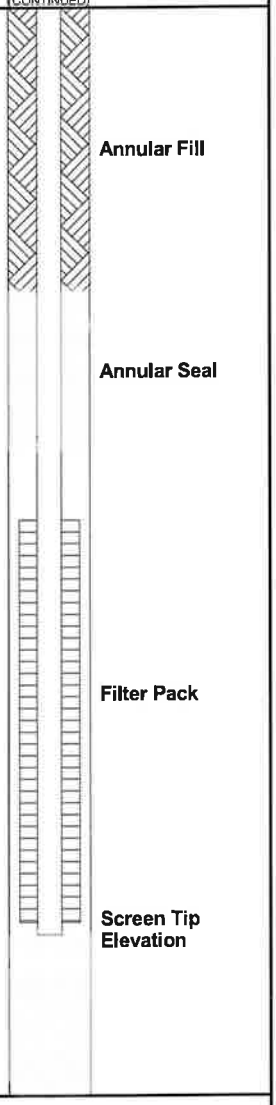
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			62.0
35		**Sandy Fat Clay (CH)** mottled light gray / yellowish gray (5Y 7/2) and brownish yellow (10YR 6/8) damp, medium stiff, medium to high, interbedded with pale gray (5Y 8/2) fine-sand lenses (1-2" thick)*(Con't)*	
40			22.0
		Fat Clay (CH) dark greenish gray (10GY 4/1) soft, high	19.0
45		**Well-graded Sand with Clay (SW-SC)** strong brown (7.5YR 5/6) wet, fine to coarse-grained	17.0
		Poorly-graded Sand with Silt (SP-SM) light gray / yellowish gray (5Y 7/2) wet, fine-grained, shell fragments up to 1/2"	13.0
50		**Poorly-graded Sand (SP)** light yellowish brown (2.5Y 6/3) wet, fine-grained	11.0
		Poorly-graded Sand with Silt (SP-SM) light olive brown (2.5Y 5/6) wet, fine-grained	9.0
55		**Silt (ML)** dark greenish gray (10Y 4/1) dry, with clay and fine sand, mica	5.0

Bottom of borehole at 57.0 feet.





BORING MGWC-01
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/10/2015 **COMPLETED** 11/10/2015 **SURF. ELEV.** 62.0 **COORDINATES:** N:32.351760 E:-81.168876
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** 34 ft. **COMP.** _____ **DELAYED** 31.9 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		62.0
	Poorly-graded Sand with Silt (SP-SM)	61.0
5	Sandy Lean Clay (CL)	57.0
	Poorly-graded Sand with Clay (SP-SC)	56.0
10	Sandy Lean Clay (CL)	
		48.0
15	Lean Clay (CL)	45.0
20	Fat Clay (CH)	42.0
25	Sandy Fat Clay (CH)	
30		
35		
40		22.0
	Fat Clay (CH)	19.0
45	Well-graded Sand with Clay (SW-SC)	17.0
	Poorly-graded Sand with Silt (SP-SM)	13.0
50	Poorly-graded Sand (SP)	11.0
	Poorly-graded Sand with Silt (SP-SM)	9.0
55	Silt (ML)	5.0

Bottom of borehole at 57.0 feet.

WELL DATA

Top of casing Elev. = 65.08

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	37.0
Annular Seal:	Bentonite pellets	41.0
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	52.7
Backfill:	Haliburton Baroid 3/8 chips	53.0

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 46.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/11/2015 **COMPLETED** 11/11/2015 **SURF. ELEV.** 44.9 **COORDINATES:** N:32.350634 E:-81.169953
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 37 ft. **GROUND WATER DEPTH: DURING** 17 ft. **COMP.** **DELAYED** 16 ft. after 24 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Poorly-graded Sand with Clay (SP-SC) mottled dark yellowish brown (10YR 4/4), reddish brown (5YR 5/4) and light olive brown (2.5Y 5/4) very damp, topsoil	44.9
		41.9
5	**Sandy Lean Clay (CL)** red (2.5YR 4/6), yellowish brown (10YR 5/6) and light olive gray (5Y 6/2) damp, stiff, low to medium	
		37.9
	Fat Clay (CH) mottled reddish brown (2.5YR 4/4), pale red (2.5YR 7/2) and light gray (5Y 7/1) damp, medium to high	35.9
10	**Sandy Fat Clay (CH)** dark red (2.5YR 3/6), gray / light brownish gray (5YR 6/1) and light olive brown (2.5Y 5/6) damp, medium stiff, medium plasticity	
15	mottled yellowish brown (10YR 5/6), light gray (5Y 7/1) and red (2.5YR 4/6) damp, stiff, cohesive, interbedded zone of SP-SC sand @approx. 15'	
		27.9
20	**Sandy Elastic Silt (MH)** light gray (5Y 7/1), pinkish gray / grayish orange pink (5YR 7/2) and red (2.5YR 5/6) wet, soft, high, with clay, some fine-sand, increase sand content with depth	
		22.9
	Poorly-graded Sand with Silt (SP-SM) brownish yellow / dark yellowish orange (10YR 6/6) wet, fine-grained	20.9
25	**Poorly-graded Sand (SP)** light gray (2.5Y 7/2) wet, fine-grained, few shell fragments, grain size getting finer with depth	
		17.9
30	**Poorly-graded Sand with Silt (SP-SM)** light gray (2.5Y 7/2), dark olive gray / olive gray (5Y 3/2) and olive (5Y 5/3) wet, with shell fragments up to 2"	
		11.9
35	**Elastic Silt (MH)** olive yellow (2.5Y 6/8), light olive brown (2.5Y 5/6) and dark gray (N3) very moist, 1" concretions, some sand	
		7.9

Bottom of borehole at 37.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 48.26
Surface Seal
Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWC-02
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/11/2015 **COMPLETED** 11/11/2015 **SURF. ELEV.** 44.9 **COORDINATES:** N:32.350634 E:-81.169953
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 37 ft. **GROUND WATER DEPTH: DURING** 17 ft. **COMP.** _____ **DELAYED** 16 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		44.9
	Poorly-graded Sand with Clay (SP-SC)	41.9
5	Sandy Lean Clay (CL)	37.9
	Fat Clay (CH)	35.9
10	Sandy Fat Clay (CH)	
15		27.9
20	Sandy Elastic Silt (MH)	22.9
	Poorly-graded Sand with Silt (SP-SM)	20.9
25	Poorly-graded Sand (SP)	17.9
30	Poorly-graded Sand with Silt (SP-SM)	11.9
35	Elastic Silt (MH)	7.9

Bottom of borehole at 37.0 feet.

WELL DATA

Top of casing Elev. = 48.26

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	18.9
Annular Seal:	Bentonite pellets	21.9
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	33.7
		34.0
Backfill:	Haliburton Baroid 3/8 chips	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 26.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/11/2015 COMPLETED 11/11/2015 SURF. ELEV. 49.6 COORDINATES: N:32.349634 E:-81.170936
CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotosonic
DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY B. Smelser
BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING 17 ft. COMP. DELAYED 12 ft. after 24 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Clayey Sand (SC) strong brown (7.5YR 5/8) and grayish brown (2.5Y 5/2) fill moist, fine to coarse-grained	49.6
		46.6
5	**Sandy Lean Clay (CL)** mottled red (10R 5/6) and brownish yellow / dark yellowish orange (10YR 6/6) damp, medium stiff, low	
		42.6
10	**Fat Clay (CH)** mottled red (2.5YR 4/8), brownish yellow / dark yellowish orange (10YR 6/6) and light gray (10YR 7/1) damp, medium stiff, medium to high, interbedded with pale brown (2.5Y 7/3) sand lenses	
15		33.6
	Lean Clay (CL) mottled light olive brown (2.5Y 5/3) and light yellowish brown (2.5Y 6/4) very damp	32.6
20	**Fat Clay (CH)** light olive brown (2.5Y 5/3) and yellowish red (5YR 5/8) wet, medium stiff, interbedded with light gray (5Y 7/1) fine-sand lenses (<1" thick), oxidized sand lenses	
25		23.6
	Poorly-graded Sand with Silt (SP-SM) light gray (5Y 7/1) and gray (5Y 5/1) wet, cohesive, fine to medium-grained	
30		
35		13.6
	Sandy Silt (ML) light greenish gray (10Y 7/1) very damp	12.6

Bottom of borehole at 37.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 52.34

Surface Seal
Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWC-03
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/11/2015 **COMPLETED** 11/11/2015 **SURF. ELEV.** 49.6 **COORDINATES:** N:32.349634 E:-81.170936
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 37 ft. **GROUND WATER DEPTH: DURING** 17 ft. **COMP.** _____ **DELAYED** 12 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
	Clayey Sand (SC)	49.6
	Sandy Lean Clay (CL)	46.6
	Fat Clay (CH)	42.6
	Lean Clay (CL)	33.6 / 32.6
	Fat Clay (CH)	23.6
	Poorly-graded Sand with Silt (SP-SM)	13.6
	Sandy Silt (ML)	12.6
	Bottom of borehole at 37.0 feet.	

WELL DATA

Top of casing Elev. = 52.34

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	21.0
Annular Seal:	Bentonite pellets	24.1
Filter Pack:	1A Silica Sand	35.7
Screen Tip Elevation:	0.30 ft.	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 26.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/18/2015 **COMPLETED** 11/18/2015 **SURF. ELEV.** 60.7 **COORDINATES:** N:32.348331 E:-81.172630
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 67 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 13.4 ft. after 24 hrs.
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
		Sandy Fat Clay (CH) reddish brown (5YR 5/4) wet, high, interbedded with olive-yellow (2.4y 6/6) clayey sand	60.7
			56.7
5		**Sandy Lean Clay (CL)** mottled reddish brown (5YR 5/4), light brownish gray (2.5Y 6/2) and brown (7.5YR 5/3) dry, very stiff to hard, low to medium, interbedded with sand lenses	
10			50.7
		Fat Clay (CH) mottled light gray (5Y 7/1) and light brown (7.5YR 6/3) very damp, soft to medium stiff, medim to high	
15			43.7
		Sandy Fat Clay (CH) light olive gray (5Y 6/2) damp, medium stiff, medium plasticity	
20			39.7
		Lean Clay (CL) mottled light yellowish brown (2.5Y 6/3) and strong brown (7.5YR 5/6) damp, medium stiff, low, bioturbation	37.7
		Sandy Fat Clay (CH) mottled light gray (5Y 7/1) and light brown (7.5YR 6/3) very damp, soft, high, interbedded with thin white fine-sand lenses	
25			33.7
		Clayey Silty Sand (SC-SM) pale yellow (2.5Y 7/4) fine-grained	
30			28.7
		Fat Clay (CH) mottled light olive brown (2.5Y 5/4), dark grayish brown (2.5Y 4/2) and strong brown (7.5YR 5/6) damp, stiff, medium plasticity, interbedded with thin white fine-sand lenses	
35			23.7

Natural Gamma: 75 | 150 | 225

WELL DATA
Top of casing Elev. = 64.05
Surface Seal
Annular Fill

(Continued Next Page)

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

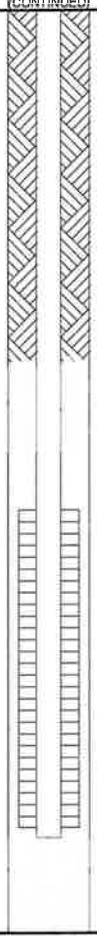
PROJECT Plant McIntosh
LOCATION Rincon, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			60.7
40		**Lean Clay (CL)** mottled olive brown (2.5Y 4/3) and light gray (5Y 7/1) damp, low, interbedded with thin white fine-sand lenses*(Con't)*	20.7
45		**Fat Clay (CH)** dark greenish gray (10GY 4/1) and greenish black (10GY 2.5/1) damp, medium stiff, medium to high, interbedded with light gray fine-sand lenses	13.7
		Poorly-graded Sand with Clay (SP-SC) very dark greenish gray (5GY 3/1) wet	11.7
50		**Poorly-graded Sand (SP)** greenish gray (10Y 5/1) wet, medium dense to loose, fine-grained, some silt	
55			
60			-1.3
65		**Sandy Silt (ML)** greenish gray (10Y 5/1) damp, hard	-6.3

Bottom of borehole at 67.0 feet.

Natural Gamma
75 150 225

WELL DATA
Top of casing Elev. = 64.05
(CONTINUED)



Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWC-04
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SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/18/2015 **COMPLETED** 11/18/2015 **SURF. ELEV.** 60.7 **COORDINATES:** N:32.348331 E:-81.172630
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 67 ft. **GROUND WATER DEPTH: DURING** 15 ft. **COMP.** _____ **DELAYED** 13.4 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		60.7
5	Sandy Fat Clay (CH)	56.7
10	Sandy Lean Clay (CL)	50.7
15	Fat Clay (CH)	43.7
20	Sandy Fat Clay (CH)	39.7
	Lean Clay (CL)	37.7
25	Sandy Fat Clay (CH)	33.7
30	Clayey Silty Sand (SC-SM)	28.7
35	Fat Clay (CH)	23.7
40	Lean Clay (CL)	20.7
45	Fat Clay (CH)	13.7
50	Poorly-graded Sand with Clay (SP-SC)	11.7
55	Poorly-graded Sand (SP)	-1.3
60		
65	Sandy Silt (ML)	-6.3

Bottom of borehole at 67.0 feet.

WELL DATA

Top of casing Elev. = 64.05

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	49.0
Annular Seal:	Bentonite pellets	52.0
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	63.7
Backfill:	Haliburton Baroid 3/8 chips	64.0

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 56.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/12/2015 **COMPLETED** 11/12/2015 **SURF. ELEV.** 61.0 **COORDINATES:** N:32.349181 E:-81.173839
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 67 ft. **GROUND WATER DEPTH: DURING** 33 ft. **COMP.** _____ **DELAYED** 17.4 ft. after 24 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Low Plastic Organic Silt or Clay (OL) mottled black (5Y 2.5/1) and olive gray (5Y 4/2) fill damp	61.0
		59.0
5	**Clayey Sand (SC)** mottled dark gray / olive gray (5Y 4/1), dark yellowish brown (10YR 4/6) and black (5Y 2.5/1) fill moist, cohesive	
		55.0
	Sandy Lean Clay (CL) mottled dark grayish brown (2.5Y 4/2), grayish brown (2.5Y 5/2) and olive yellow (2.5Y 6/6) damp, medium stiff to stiff, low to medium	
10		51.0
	Fat Clay (CH) mottled light olive gray (5Y 6/2), light olive brown (2.5Y 5/4) and greenish gray (5GY 6/1) damp, medium stiff, medium plasticity to high, interbedded with fine-sand lenses (<1/2" thick)	
15		
		43.0
	Sandy Fat Clay (CH) mottled light gray (5Y 7/1) and brownish yellow (10YR 6/8) soft, medium dense, high	
20		
		37.0
25	**Poorly-graded Sand with Silt (SP-SM)** greenish gray (5GY 6/1) wet, fine-grained	35.0
	Fat Clay (CH) olive / light olive brown (5Y 5/6) moist, soft, high	33.0
30	**Lean Clay (CL)** dark greenish gray (10GY 4/1) medium stiff, low, some fine sand	30.0
	Sandy Lean Clay (CL) dark greenish gray (10GY 4/1) and yellowish brown (10YR 5/8) dry	28.0
35	**Poorly-graded Sand with Clay (SP-SC)** greenish gray (5GY 5/1) and light greenish gray (10Y 7/1) wet, cohesive, interbedded with fine-sand lenses	26.0
	Sandy Fat Clay (CH) dark greenish gray (5GY 4/1), greenish gray (5GY 5/1) and strong brown (7.5YR 5/8) moist, medium stiff, low to medium plasticity, interbedded with fine-sand lenses	
40		21.0

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 64.09
Surface Seal
Annular Fill

(Continued Next Page)

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			61.0
		Fat Clay (CH) very dark greenish gray (10Y 3/1) very moist, soft, high	
			17.0
45		**Sandy Fat Clay (CH)** dark greenish gray (5GY 4/1) and very light gray (N8) very moist, stiff	
			14.0
		Poorly-graded Sand with Silt (SP-SM) dark greenish gray (10Y 4/1) damp	
50			11.0
		Sandy Silt (ML) greenish gray (10Y 6/1) damp, hard	
			9.0
		Poorly-graded Sand with Silt (SP-SM) dark greenish gray (10Y 4/1) wet	
55			
		dark greenish gray (10Y 4/1) wet, fine-grained	4.0
		Sandy Silt (ML) dark greenish gray (10Y 4/1) damp, stiff	
60			
			-1.0
		Lean Clay (CL) dark greenish gray (10Y 4/1) dry, medium stiff	-2.0
		Sandy Silt (ML) dark greenish gray (10Y 4/1) damp, stiff, with clay	
65			
			-6.0

Bottom of borehole at 67.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA

Top of casing Elev. = 64.09

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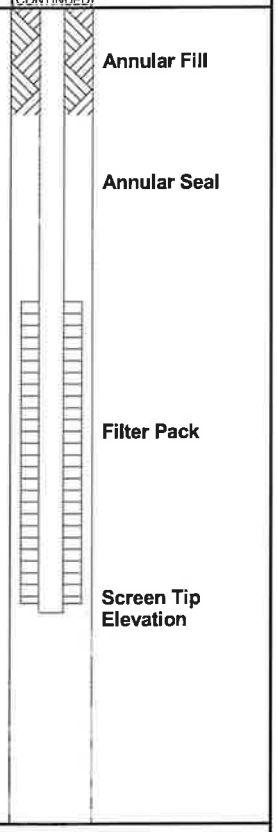

BORING MGWA-05
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SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/12/2015 **COMPLETED** 11/12/2015 **SURF. ELEV.** 61.0 **COORDINATES:** N:32.349181 E:-81.173839
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 67 ft. **GROUND WATER DEPTH: DURING** 33 ft. **COMP.** **DELAYED** 17.4 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		61.0
	Low Plastic Organic Silt or Clay (OL)	59.0
5	Clayey Sand (SC)	55.0
10	Sandy Lean Clay (CL)	51.0
15	Fat Clay (CH)	43.0
20	Sandy Fat Clay (CH)	37.0
25	Poorly-graded Sand with Silt (SP-SM)	35.0
	Fat Clay (CH)	33.0
30	Lean Clay (CL)	30.0
	Sandy Lean Clay (CL)	28.0
35	Poorly-graded Sand with Clay (SP-SC)	26.0
40	Sandy Fat Clay (CH)	21.0
	Fat Clay (CH)	17.0
45	Sandy Fat Clay (CH)	14.0
50	Poorly-graded Sand with Silt (SP-SM)	11.0
	Sandy Silt (ML)	9.0
55	Poorly-graded Sand with Silt (SP-SM)	4.0
60	Sandy Silt (ML)	-1.0
	Lean Clay (CL)	-2.0
65	Sandy Silt (ML)	-6.0

Bottom of borehole at 67.0 feet.

WELL DATA

Top of casing Elev. = 64.09

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	
		43.5
Annular Seal:	Bentonite pellets	48.0
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	59.7 60.0
Backfill:	Haliburton Baroid 3/8 chips	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 56.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

BORING MGWA-06
PAGE 1 OF 1

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/12/2015 **COMPLETED** 11/12/2015 **SURF. ELEV.** 57.9 **COORDINATES:** N:32.351004 E:-81.172631
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** _____ **DELAYED** 13.1 ft. after 24 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Clayey Sand (SC) mottled grayish brown (2.5Y 5/2), reddish yellow (7.5YR 6/6) and brownish yellow (10YR 6/8) fill dry, fine to coarse-grained	57.9
		51.9
	Sandy Lean Clay (CL) mottled gray (2.5Y 6/1), red (2.5YR 4/8) and light gray (5Y 7/1) dry, medium stiff to stiff, low to medium	
10		47.9
	Sandy Fat Clay (CH) mottled light gray (5Y 7/1) and red (2.5YR 5/8) damp, medium stiff, medium plasticity, interbedded with brown-yellow (10YR 6/8) sand lense 3-4" thick	
		43.9
	Fat Clay (CH) mottled red (2.5YR 5/8) and light reddish brown (5YR 6/3) damp, medium stiff, interbedded with brown-yellow sand lenses	40.9
	Lean Clay (CL) mottled light reddish brown / light brown (5YR 6/4) and red (2.5YR 5/6) damp, stiff, low	
20		37.9
	Well-graded Sand with Clay (SW-SC) pale olive (5Y 6/3) and strong brown (7.5YR 5/8) very moist, cohesive, fine to coarse-grained	34.9
	Poorly-graded Sand (SP) light gray (10YR 7/2) and reddish yellow (7.5YR 6/8) saturated, fine-grained	32.9
	Poorly-graded Sand with Silt (SP-SM) yellow (2.5Y 7/6), light gray (2.5Y 7/2) and gray (2.5Y 6/1) saturated, fine-grained	
30		
40		16.9
	Sandy Silt (ML) light olive brown (2.5Y 5/4) damp	12.9
	Poorly-graded Sand (SP) olive (5Y 5/4) wet, fine-grained	10.9

Bottom of borehole at 47.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 60.83

Surface Seal
Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWA-06
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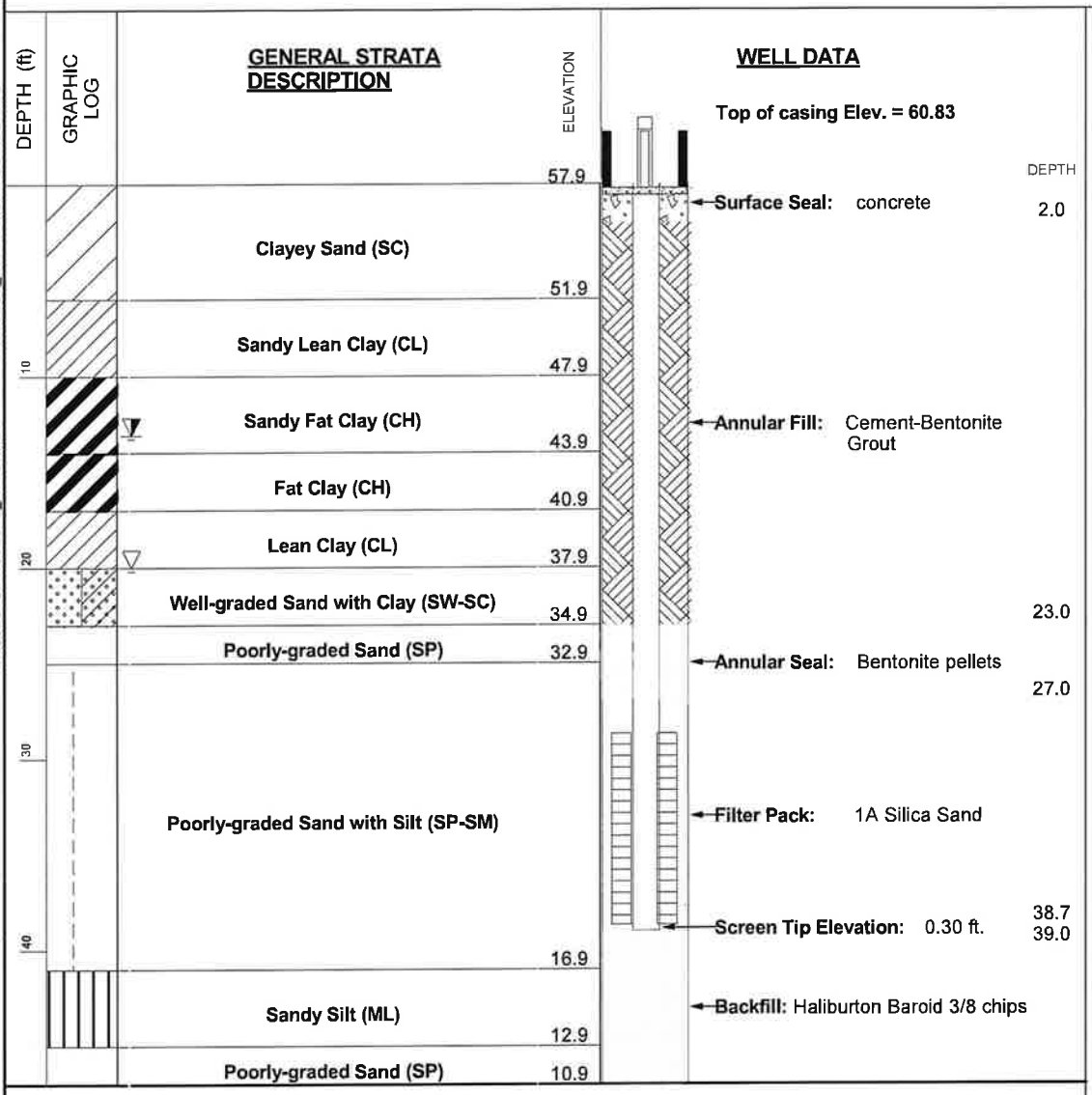
SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/12/2015 **COMPLETED** 11/12/2015 **SURF. ELEV.** 57.9 **COORDINATES:** N:32.351004 E:-81.172631
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 20 ft. **COMP.** _____ **DELAYED** 13.1 ft. after 24 hrs.
NOTES



Bottom of borehole at 47.0 feet.

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 36.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

BORING MGWC-07
PAGE 1 OF 1

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/13/2015 **COMPLETED** 11/13/2015 **SURF. ELEV.** 50.9 **COORDINATES:** N:32.353428 E:-81.169763
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 18 ft. **COMP.** _____ **DELAYED** 15.7 ft. after 100 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Silt (ML) mottled light gray / yellowish gray (5Y 7/2), red / moderate reddish brown (10R 4/6) and dark yellowish brown (10YR 4/6) dry, stiff, trace interbedded clayey sand	50.9
		45.9
	Sandy Lean Clay (CL) mottled pale yellow (5Y 8/2) and reddish yellow (5YR 6/6) stiff, low	43.9
	Sandy Fat Clay (CH) mottled light gray (5Y 7/1) and dark red (2.5YR 3/6) wet, soft, high	41.9
10	**Fat Clay (CH)** mottled light gray (5Y 7/1) and red (10R 5/6) damp, stiff, medium plasticity, interbedded with thin fine-sand lenses	
		32.9
20	**Poorly-graded Sand with Clay (SP-SC)** mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/8) and light red (2.5YR 6/8) wet	30.9
	Poorly-graded Sand (SP) mottled pale yellow (5Y 7/3) and yellow / moderate yellow (5Y 7/6) wet, fine to coarse-grained	27.9
30	**Poorly-graded Sand with Silt (SP-SM)** mottled yellowish brown (10YR 5/6), yellow (2.5Y 7/6) and light gray / yellowish gray (5Y 7/2) wet, fine-grained	
		12.9
40	**Poorly-graded Sand (SP)** pale olive (5Y 6/3) wet, fine-grained	10.9
	Poorly-graded Sand with Silt (SP-SM) light olive brown (2.5Y 5/6) and dark yellowish brown (10YR 3/4) wet	7.9
	Poorly-graded Sand (SP) light olive brown (2.5Y 5/4) wet, fine-grained	5.9
	Poorly-graded Sand with Silt (SP-SM) dark greenish gray (10Y 4/1) fine-grained	3.9

Bottom of borehole at 47.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 54.19

Surface Seal
Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/13/2015 **COMPLETED** 11/13/2015 **SURF. ELEV.** 50.9 **COORDINATES:** N:32.353428 E:-81.169763
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 18 ft. **COMP.** **DELAYED** 15.7 ft. after 100 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		50.9
	Silt (ML)	45.9
	Sandy Lean Clay (CL)	43.9
	Sandy Fat Clay (CH)	41.9
10	Fat Clay (CH)	32.9
20	Poorly-graded Sand with Clay (SP-SC)	30.9
	Poorly-graded Sand (SP)	27.9
30	Poorly-graded Sand with Silt (SP-SM)	12.9
40	Poorly-graded Sand (SP)	10.9
	Poorly-graded Sand with Silt (SP-SM)	7.9
	Poorly-graded Sand (SP)	5.9
	Poorly-graded Sand with Silt (SP-SM)	3.9

Bottom of borehole at 47.0 feet.

WELL DATA

Top of casing Elev. = 54.19

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	
		22.5
Annular Seal:	Bentonite pellets	
		27.0
Filter Pack:	1A Silica Sand	
		38.7
Screen Tip Elevation:	0.30 ft.	39.0
Backfill:	Haliburton Baroid 3/8 chips	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 36.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

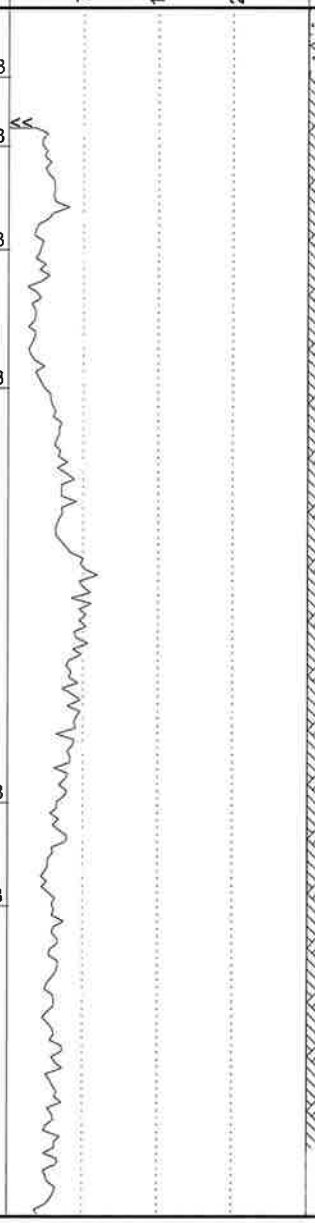
BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/10/2015 **COMPLETED** 11/10/2015 **SURF. ELEV.** 59.3 **COORDINATES:** N:32.352764 E:-81.169336
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 52 ft. **GROUND WATER DEPTH: DURING** 23 ft. **COMP.** _____ **DELAYED** 25.4 ft. after 24 hrs.
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			59.3
		Fat Clay (CH) mottled light brownish gray (2.5Y 6/2) and yellowish red (5YR 5/8) damp, medium to high	57.3
		Poorly-graded Sand (SP) pale yellow (2.5Y 7/4) and yellow (2.5Y 7/6) wet, fine-grained	55.3
5		**Clayey Sand (SC)** mottled light gray (2.5Y 7/1), strong brown (7.5YR 5/8) and red (2.5YR 5/8) dry, cohesive, fine to coarse-grained	52.3
10		**Sandy Lean Clay (CL)** mottled light gray (5Y 7/1) and red (2.5YR 4/8) dry, hard, low	48.3
15		**Sandy Fat Clay (CH)** mottled light gray (5Y 7/1) and red (2.5YR 4/8) moist, medium stiff, medium to high, interbedded with wet 1/4-1/2" fine-sand lenses	
20			
			36.3
25		**Poorly-graded Sand with Clay (SP-SC)** pale yellow (5Y 7/3) wet, fine-grained, interbedded with 1-2" clay lenses	33.3
30		**Sandy Fat Clay (CH)** mottled light yellowish brown (2.5Y 6/3) and olive / light olive brown (5Y 5/6) wet, high, interbedded with wet 1/4-1/2" fine-sand lenses, sand lenses thickness increasing with depth	
35			



WELL DATA
Top of casing Elev. = 62.36

Surface Seal
Annular Fill
Annular Seal

(Continued Next Page)

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			59.3
		Sandy Fat Clay (CH) mottled light yellowish brown (2.5Y 6/3) and olive / light olive brown (5Y 5/6) wet, high, interbedded with wet 1/4-1/2" fine-sand lenses, sand lenses thickness increasing with depth*(Con't)*	
40			
			18.3
		Well-graded Sand with Clay (SW-SC) mottled light gray / yellowish gray (5Y 7/2), light yellowish brown (2.5Y 6/4) and yellowish brown (10YR 5/6) wet, fine to coarse-grained, zones of 4" thick fat clay lenses near bottom	
45			
			13.3
		Well-graded Sand with Silt (SW-SM) grayish brown (2.5Y 5/2) wet, fine to coarse-grained, trace of fine well-rounded gravel	12.3
		Poorly-graded Sand with Silt (SP-SM) pale olive (5Y 6/3) wet, fine-grained	
50			9.3
		Sandy Silt (ML) olive yellow (2.5Y 6/6) dry	8.3
		Poorly-graded Sand with Silt (SP-SM) yellowish brown (10YR 5/6) moist, fine-grained	7.3

Bottom of borehole at 52.0 feet.

Natural Gamma

75 150 225

WELL DATA

Top of casing Elev. = 62.36

(CONTINUED)

Annular Seal

Filter Pack

Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWC-08
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SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/10/2015 **COMPLETED** 11/10/2015 **SURF. ELEV.** 59.3 **COORDINATES:** N:32.352764 E:-81.169336
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 52 ft. **GROUND WATER DEPTH: DURING** 23 ft. **COMP.** _____ **DELAYED** 25.4 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		59.3
	Fat Clay (CH)	57.3
	Poorly-graded Sand (SP)	55.3
5	Clayey Sand (SC)	52.3
10	Sandy Lean Clay (CL)	48.3
15	Sandy Fat Clay (CH)	
20		36.3
25	Poorly-graded Sand with Clay (SP-SC)	33.3
30	Sandy Fat Clay (CH)	
35		
40		18.3
45	Well-graded Sand with Clay (SW-SC)	13.3
	Well-graded Sand with Silt (SW-SM)	12.3
50	Poorly-graded Sand with Silt (SP-SM)	9.3
	Sandy Silt (ML)	8.3
	Poorly-graded Sand with Silt (SP-SM)	7.3
	Bottom of borehole at 52.0 feet.	

WELL DATA

Top of casing Elev. = 62.36

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	33.0
Annular Seal:	Bentonite pellets	37.3
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	49.2
Backfill:	Haliburton Baroid 3/8 chips	49.5

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 41.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWA-09
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SOUTHERN COMPANY

BORING LOG

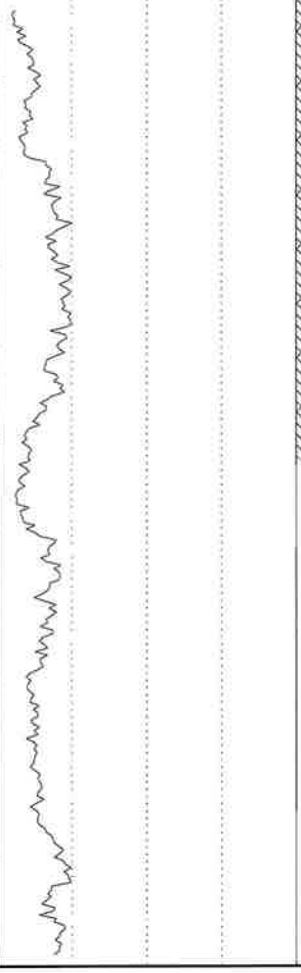
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

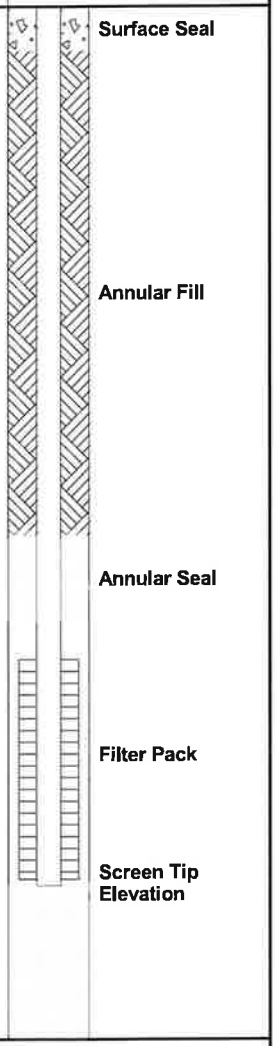
PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/17/2015 **COMPLETED** 11/17/2015 **SURF. ELEV.** 56.0 **COORDINATES:** N:32.352659 E:-81.172501
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 19 ft. **COMP.** **DELAYED** 15.8 ft. after 24 hrs.
NOTES

DEPTH (ft)	MATERIAL DESCRIPTION	ELEVATION
	Silty Sand (SM) very dark grayish brown (2.5Y 3/2) damp, topsoil	56.0 / 54.0
	Poorly-graded Sand (SP) pale yellow (2.5Y 7/3) wet, fine-grained	52.0
	Sandy Lean Clay (CL) mottled brownish yellow / dark yellowish orange (10YR 6/6) and red (10R 5/6) dry, medium stiff, low	50.0
	Clayey Sand (SC) mottled light gray (2.5Y 7/1), olive yellow (2.5Y 6/6) and reddish yellow (5YR 6/8) dry, hard	48.0
10	**Sandy Lean Clay (CL)** mottled light gray (5Y 7/1), dark red (10R 3/6) and yellow (10YR 7/8) dry, stiff, low, few fine-sand lenses	
	mottled light gray (5Y 7/1) and red (10R 4/8) moist, medium stiff, medium to high	41.0
	Fat Clay (CH) mottled light gray (5Y 7/1) and red (10R 4/8) moist, medium stiff, medium to high	
		37.0
20	**Well-graded Sand with Clay (SW-SC)** mottled light gray (5Y 7/1), strong brown (7.5YR 5/6) and pale yellow (5Y 7/3) wet, fine to coarse-grained, less clay content with depth	33.0
	Well-graded Sand (SP) light gray / yellowish gray (5Y 7/2), pale yellow (2.5Y 7/4) and light olive brown (2.5Y 5/3) wet, fine-grained	29.0
30	**Poorly-graded Sand with Silt (SP-SM)** light gray (2.5Y 7/2), dark yellowish brown (10YR 4/6) and light gray / yellowish gray (5Y 7/2) wet, fine-grained, some coarse-sand, shell fragments up to 1/2", trace of fine well-rounded gravel	
40		14.0
	Sandy Silt (ML) olive yellow (2.5Y 6/6) damp, low	9.0

Bottom of borehole at 47.0 feet.





BORING MGWA-09
PAGE 1 OF 1

SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/17/2015 **COMPLETED** 11/17/2015 **SURF. ELEV.** 56.0 **COORDINATES:** N:32.352659 E:-81.172501
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** 19 ft. **COMP.** _____ **DELAYED** 15.8 ft. after 24 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	GENERAL STRATA DESCRIPTION	ELEVATION
			56.0
		Silty Sand (SM)	54.0
		Poorly-graded Sand (SP)	52.0
		Sandy Lean Clay (CL)	50.0
		Clayey Sand (SC)	48.0
10		Sandy Lean Clay (CL)	41.0
		Fat Clay (CH)	37.0
20		Well-graded Sand with Clay (SW-SC)	33.0
		Well-graded Sand (SP)	29.0
30		Poorly-graded Sand with Silt (SP-SM)	14.0
40		Sandy Silt (ML)	9.0
		Bottom of borehole at 47.0 feet.	

WELL DATA

Top of casing Elev. = 59.05

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	24.0
Annular Seal:	bentonite pellets	28.0
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	39.7
		40.0
Backfill:	Haliburton Baroid 3/8 chips	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 36.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

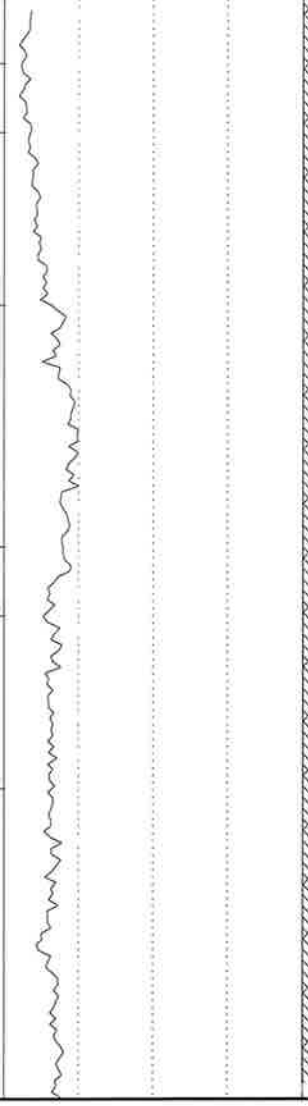
BORING LOG

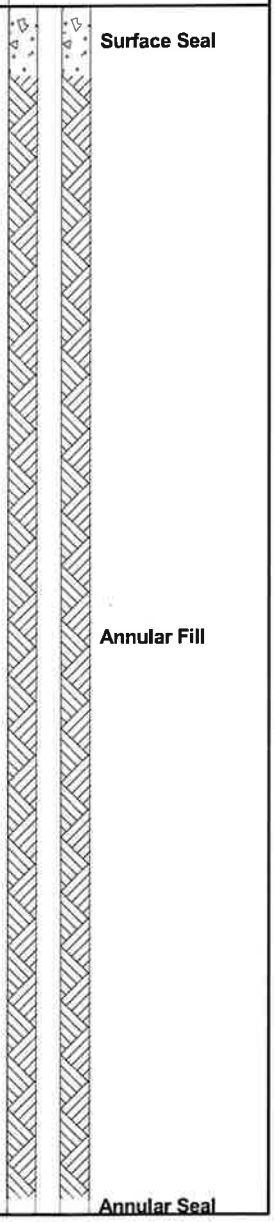
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/17/2015 **COMPLETED** 11/17/2015 **SURF. ELEV.** 61.6 **COORDINATES:** N:32.349417 E:-81.178230
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** 13 ft. **COMP.** _____ **DELAYED** 11.1 ft. after 24 hrs.
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
		Clayey Sand (SC) strong brown (7.5YR 4/6) damp fine to coarse-grained	61.6 / 60.6
		Silty Sand (SM) dark grayish brown (2.5Y 4/2) damp fine to coarse-grained	58.6
5		**Poorly-graded Sand (SP)** pale yellow (2.5Y 7/4) wet fine-grained	56.6
		Poorly-graded Sand with Clay (SP-SC) mottled light gray (2.5Y 7/1) and red (2.5YR 5/8) damp	54.6
10		**Sandy Lean Clay (CL)** mottled light gray (2.5Y 7/1) and red (2.5YR 5/8) dry, stiff to medium stiff, low to medium, interbedded with yellow-brown (10YR 5/8) clayey sand	49.6
15		**Sandy Fat Clay (CH)** pale yellow (5Y 7/3) and olive yellow (2.5Y 6/6) wet, medium stiff, medium to high, interbedded with white fine-sand lenses <1/2" thick	42.6
20		**Well-graded Sand with Clay (SW-SC)** light yellowish brown (2.5Y 6/3) wet, cohesive, fine to coarse-grained	40.6
25		**Lean Clay (CL)** light olive gray (5Y 6/2) and strong brown (7.5YR 5/8) dry, medium stiff, low, interbedded with fine-sand lenses	35.6
30		**Well-graded Sand with Clay (SW-SC)** mottled pale olive (5Y 6/3) and reddish yellow (7.5YR 6/8) wet, increased sand content with depth, 4" thick fat clay lens near bottom	
35			





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SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			61.6
		Well-graded Sand with Clay (SW-SC) mottled pale olive (5Y 6/3) and reddish yellow (7.5YR 6/8) wet, increased sand content with depth, 4" thick fat clay lens near bottom*(Con't)*	24.6
40		**Poorly-graded Sand with Clay (SP-SC)** light yellowish brown (2.5Y 6/4) and brownish yellow (10YR 6/8) wet, cohesive	17.6
45		**Well-graded Sand with Clay (SW-SC)** very dark greenish gray (10GY 3/1) wet	15.6
		Sandy Elastic Silt (MH) greenish black (10Y 2.5/1) wet	14.6
50		**Poorly-graded Sand with Silt (SP-SM)** dark greenish gray (5GY 4/1) wet, fine-grained	10.6
55		**Sandy Silt (ML)** greenish gray (5GY 5/1) damp	4.6

Bottom of borehole at 57.0 feet.

Natural Gamma
75 150 225

WELL DATA
Top of casing Elev. = 64.69
(CONTINUED)

Annular Seal
Filter Pack
Screen Tip Elevation

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 10/16/17 15:26 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

BORING MGWA-10
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SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 11/17/2015 **COMPLETED** 11/17/2015 **SURF. ELEV.** 61.6 **COORDINATES:** N:32.349417 E:-81.178230
CONTRACTOR Cascade **EQUIPMENT** Prosonic **METHOD** Rotosonic
DRILLED BY F. Krauss **LOGGED BY** W. Shaughnessy **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** 13 ft. **COMP.** _____ **DELAYED** 11.1 ft. after 24 hrs.
NOTES

DEPTH (ft)	GENERAL STRATA DESCRIPTION	ELEVATION
		61.6
	Clayey Sand (SC)	60.6
	Silty Sand (SM)	58.6
5	Poorly-graded Sand (SP)	56.6
	Poorly-graded Sand with Clay (SP-SC)	54.6
10	Sandy Lean Clay (CL)	49.6
15	Sandy Fat Clay (CH)	42.6
20	Well-graded Sand with Clay (SW-SC)	40.6
25	Lean Clay (CL)	35.6
30	Well-graded Sand with Clay (SW-SC)	24.6
35		
40	Poorly-graded Sand with Clay (SP-SC)	17.6
45	Well-graded Sand with Clay (SW-SC)	15.6
	Sandy Elastic Silt (MH)	14.6
50	Poorly-graded Sand with Silt (SP-SM)	10.6
55	Sandy Silt (ML)	4.6

Bottom of borehole at 57.0 feet.

WELL DATA

Top of casing Elev. = 64.69

		DEPTH
Surface Seal:	concrete	2.0
Annular Fill:	Cement-Bentonite Grout	34.5
Annular Seal:	bentonite pellets	38.0
Filter Pack:	1A Silica Sand	
Screen Tip Elevation:	0.30 ft.	49.7 50.0
Backfill:	Haliburton Baroid 3/8 chips	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: 46.7 feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 5/26/2016 **COMPLETED** 5/27/2016 **SURF. ELEV.** 64.7 **COORDINATES:** N:32.349541 E:-81.176079
CONTRACTOR Cascade Drilling **EQUIPMENT** Sonic **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** A. Henry **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** 13.5 ft. **DELAYED** _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			64.7
		(OL) topsoil	64.0
		Well-graded Sand (SW) gray (10YR 5/1) moist, loose, no, fine grained	62.1
		Lean Clay (CL) white / yellowish gray (5Y 8/1) and yellowish red (5YR 4/6) damp, stiff, medium, micaceous	
10			53.7
		Poorly-graded Sand with Clay (SP-SC) white (10YR 8/1), light reddish brown (2.5YR 6/3) and light gray (2.5Y 7/2) moist, loose, no, very fine grained	53.1
		Lean Clay (CL) light olive gray (5Y 6/2) and pale olive (5Y 6/3) damp, stiff, medium, little mica	
20			43.1
		Clayey Sand (SC) light brownish gray (2.5Y 6/2) moist, loose, low	42.5
		Lean Clay (CL) light olive gray (5Y 6/2) and pale olive (5Y 6/3) damp, medium stiff, medium, sandy zone (SW-SC) @ 23' to 24.1'; wet	
		light olive gray (5Y 6/2) and pale olive (5Y 6/3) damp, medium stiff, medium	
30			29.3
		Silt (ML) gray / light olive gray (5Y 6/1) and olive (5Y 4/3) moist, soft, low, little mica and shells	27.7
		Lean Clay (CL) dark bluish gray (5B 4/1) damp, stiff, low, little shells; trace mica	
40		dark greenish gray (5GY 4/1) damp, very stiff, medium, trace mica	22.0
		Silty Sand (SM) dark bluish gray (5PB 4/1) damp, medium stiff, no, trace mica	19.7
		Silt (ML) greenish gray (10Y 5/1) damp, medium stiff, no, trace mica	16.7
		Well-graded Sand with Silt (SW-SM) greenish gray (10Y 5/1) damp, loose, no, very fine grained; trace mica	
50			10.7
		Silt (ML) grayish olive (10Y 4/2) damp, stiff, no, trace mica	7.7
		Bottom of borehole at 57.0 feet.	

Natural Gamma
75 150 225

WELL DATA
Top of casing Elev. = 67.51

Surface Seal
Annular Fill
Annular Seal
Filter Pack
Screen Tip Elevation

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BORING MGWA-11
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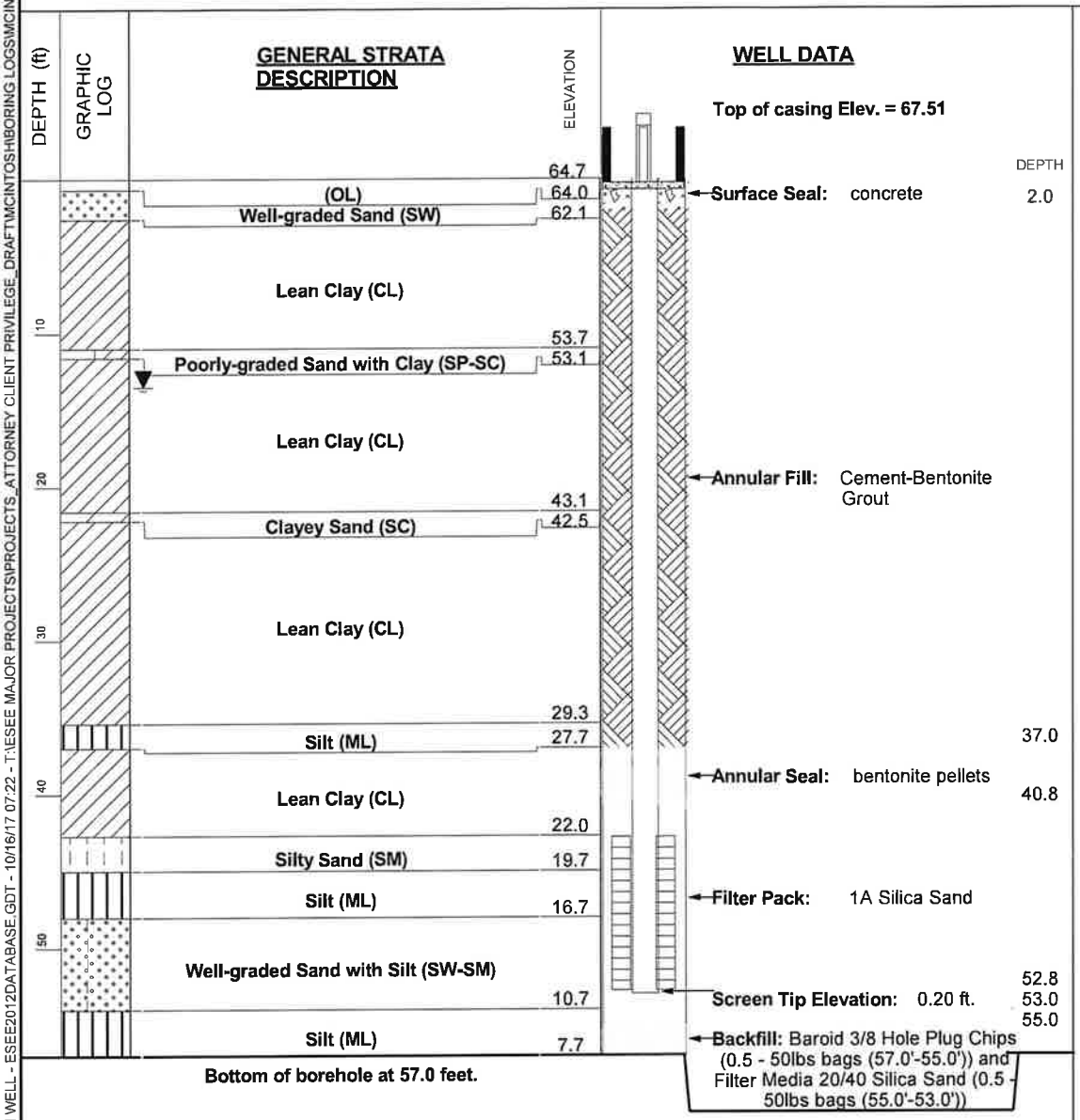
SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 5/26/2016 **COMPLETED** 5/27/2016 **SURF. ELEV.** 64.7 **COORDINATES:** N:32.349541 E:-81.176079
CONTRACTOR Cascade Drilling **EQUIPMENT** Sonic **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** A. Henry **CHECKED BY** B. Smelser
BORING DEPTH 57 ft. **GROUND WATER DEPTH: DURING** ____ **COMP.** 13.5 ft. **DELAYED** ____
NOTES ____



NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 5/23/2016 COMPLETED 5/26/2012 SURF. ELEV. 63.9 COORDINATES: N:32.348306 E:-81.172725
CONTRACTOR Cascade Drilling EQUIPMENT Sonic METHOD Rotosonic
DRILLED BY T. Ardito LOGGED BY A. Henry CHECKED BY B. Smelser
BORING DEPTH 61 ft. GROUND WATER DEPTH: DURING ____ COMP. 12 ft. DELAYED ____
NOTES ____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			63.9
		Low Plastic Organic Silt or Clay (OL)	63.3
		Lean Clay (CL) mottled very light gray (N8), reddish yellow (7.5YR 7/8) and red / moderate reddish brown (10R 4/6) dry, stiff, low, micaceous	
10		▼	
			49.4
		Lean Clay (CL) mottled red / moderate reddish brown (10R 4/6), pale yellow (2.5Y 7/4) and medium light gray (N6) damp, stiff, low, micaceous; fine grained	
20		gray (10YR 6/1) and bluish gray (5PB 6/1) damp, stiff, low	
		light gray / yellowish gray (5Y 7/2) and strong brown (7.5YR 5/6) damp, stiff, low	
		pinkish gray (7.5YR 6/2) and light gray (2.5Y 7/1) very damp, stiff, low	37.9
		Poorly-graded Sand (SP) light gray (2.5Y 7/2) moist, loose, no	35.9
30		**Well-graded Sand with Clay (SW-SC)** gray (2.5Y 6/1) very moist, loose, no	
			29.9
		Lean Clay (CL) olive gray / light olive gray (5Y 5/2) damp, stiff, low	
40			
		mottled dark greenish gray (10GY 4/1) and reddish yellow (7.5YR 6/6) moist, stiff, low	
			17.9
		Silt (ML) dark gray (N3) damp, stiff, no, some mica	
50			
		medium dark gray (N4) damp, stiff, no, some mica	
		greenish gray (10Y 5/1) damp, stiff, no, some mica	
60			
			2.9

Bottom of borehole at 61.0 feet.

Natural Gamma: 75, 150, 225

WELL DATA
Top of casing Elev. = 66.80

- Surface Seal
- Annular Fill
- Annular Seal
- Filter Pack
- Screen Tip Elevation

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BORING MGWC-12
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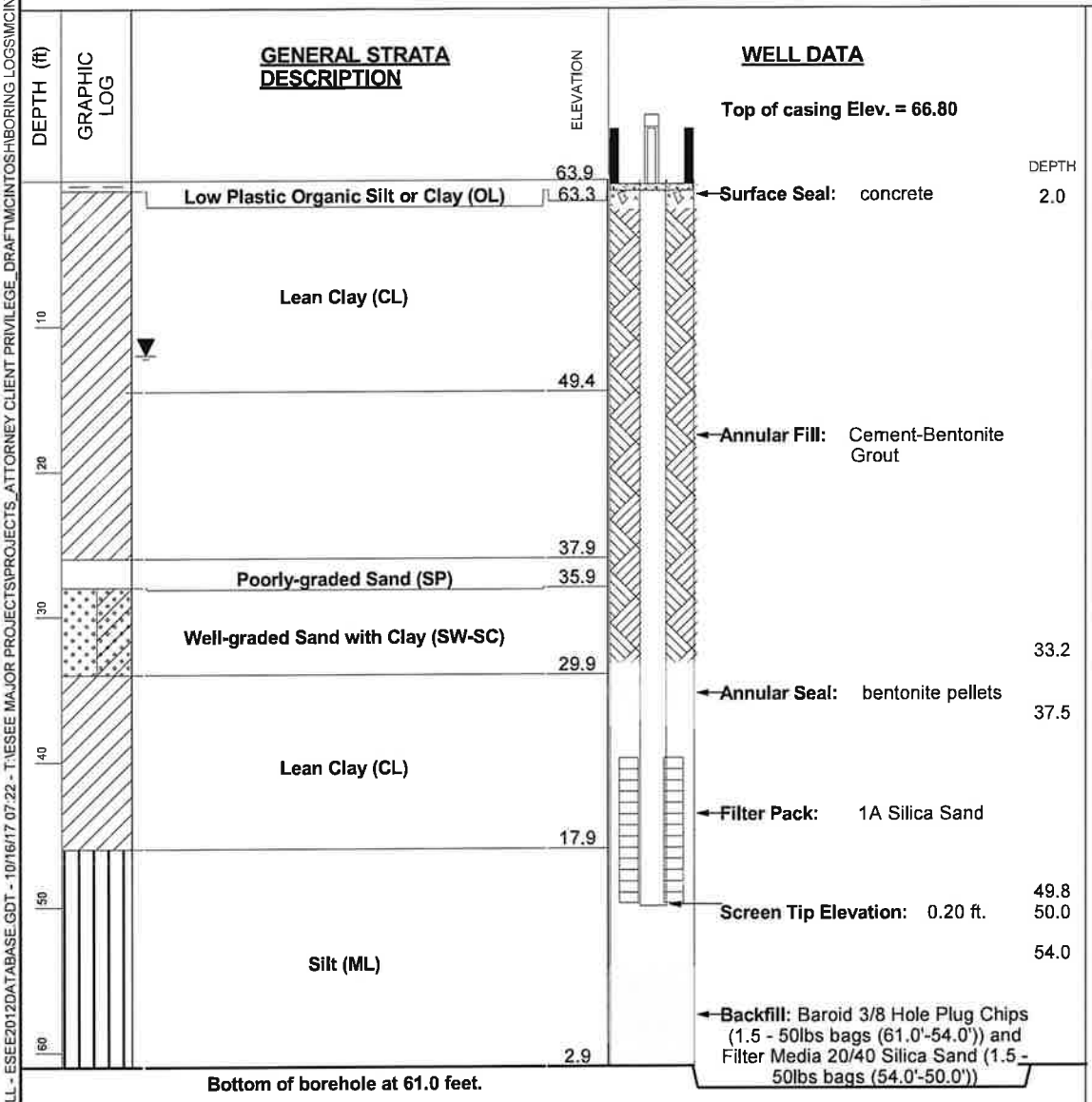
SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 5/23/2016 **COMPLETED** 5/26/2012 **SURF. ELEV.** 63.9 **COORDINATES:** N:32.348306 E:-81.172725
CONTRACTOR Cascade Drilling **EQUIPMENT** Sonic **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** A. Henry **CHECKED BY** B. Smelser
BORING DEPTH 61 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** 12 ft. **DELAYED** _____
NOTES _____



NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

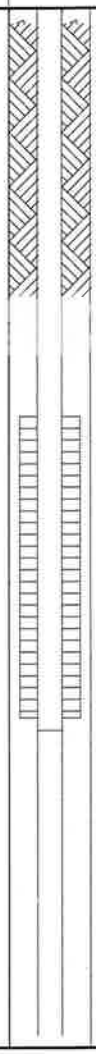
DATE STARTED 6/3/2016 COMPLETED 6/3/2016 SURF. ELEV. 37.8 COORDINATES: N:32.349868 E:-81.169204
CONTRACTOR TTL Inc EQUIPMENT CME 75 METHOD Hollow Stem Auger
DRILLED BY _____ LOGGED BY L. Petty CHECKED BY _____
BORING DEPTH 34.4 ft. GROUND WATER DEPTH: DURING _____ COMP. _____ DELAYED _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
			37.8
		Lean Clay (CL) soft, moist, gray	37.3
		Well-graded Sand (SW) well graded sand with trace clay, soft, light brown, moist	34.8
5		**Clayey Sand (SC)** sandy clay, soft, friable, light brown, dry	29.3
		Silt (ML) light brown to gray, soft, dry	28.8
10		**Silty Sand (SM)** very fine grain, orange to gray, soft/friagle, wet at 18' bls - rest of sample is damp	
15			19.3
20		no recovery - wet	14.8
		Silty Sand (SM) very fine, soft, friable/ loose, light gray	10.8
25		**Silt (ML)** silt with trace clay, orange, hard, moist	8.8
30		**Silty Sand (SM)** silty sand, very fine grain, light brown, soft, wet	
		silty sand, very fine grain, dark gray, soft, wet	3.4

Bottom of borehole at 34.4 feet.

Natural Gamma: 75 | 150 | 225

WELL DATA
Top of casing Elev. = 40.66



BORING PZ-13
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SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 6/3/2016 **COMPLETED** 6/3/2016 **SURF. ELEV.** 37.8 **COORDINATES:** N:32.349868 E:-81.169204
CONTRACTOR TTL Inc **EQUIPMENT** CME 75 **METHOD** Hollow Stem Auger
DRILLED BY _____ **LOGGED BY** L. Petty **CHECKED BY** _____
BORING DEPTH 34.4 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	GENERAL STRATA DESCRIPTION	ELEVATION
			37.8
		Lean Clay (CL)	37.3
		Well-graded Sand (SW)	34.8
5		Clayey Sand (SC)	
			29.3
		Silt (ML)	28.8
10		Silty Sand (SM)	
15			
			19.3
20			
			14.8
25		Silty Sand (SM)	
			10.8
		Silt (ML)	8.8
30		Silty Sand (SM)	
			3.4

Bottom of borehole at 34.4 feet.

WELL DATA

Top of casing Elev. = 40.66

		DEPTH
Surface Seal:	concrete	0.5
Annular Fill:	cement-bentonite grout	9.5
Annular Seal:	bentonite pellets	11.5
Filter Pack:	silica filter sand	23.5
Screen Tip Elevation:	0.40 ft.	23.9
Backfill:	Silica Sand	

NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS_ATTORNEY CLIENT PRIVILEGE_DRAFT\MCINTOSH\BORING LOGS\MCINTOSH AP.GPJ

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SOUTHERN COMPANY

BORING LOG

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 6/4/2016 **COMPLETED** 6/4/2016 **SURF. ELEV.** 43.8 **COORDINATES:** N:32.348785 E:-81.170175
CONTRACTOR TTL Inc **EQUIPMENT** CME 75 **METHOD** Hollow Stem Auger
DRILLED BY _____ **LOGGED BY** L. Petty **CHECKED BY** _____
BORING DEPTH 38.4 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma (75 / 150 / 225)	WELL DATA (Top of casing Elev. = 46.90)
			43.8		
		Silty Sand (SM) very fine grain, light brown, moist, loose	43.3		Surface Seal
		Silt (ML) light gray, moist, soft			
5		fine grained with muscovite, soft/friable, moist	38.8		
		Silt (ML) clayey silt w/ trace sand, light gray, soft, friable, moist			
10			33.8		
		Lean Clay (CL) clay w/ weathered lenses @ 11.5 & 12.5 (approxiamately 6" thick), light brown, somewhat stiff, moist			Annular Fill
15			28.8		
		Silt (ML) orange, friable, moist, soft clayey silt w/ sand lenses throughout, sand lenses are very thin <1" & sand is very fine & white, ML is light gray with olice gray @ 21.5' to dark blue gray @ 24', wet, soft			
20					
25		dark blue gray, soft, wet, fine sand throughout trace mica			Annular Seal
			14.8		
30		**Poorly-graded Sand (SP)** very fine sand, dark gray, trace mica, wet, moderaltely loose			Filter Pack
35			5.4		Screen Tip Elevation

Bottom of borehole at 38.4 feet.

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BORING PZ-14
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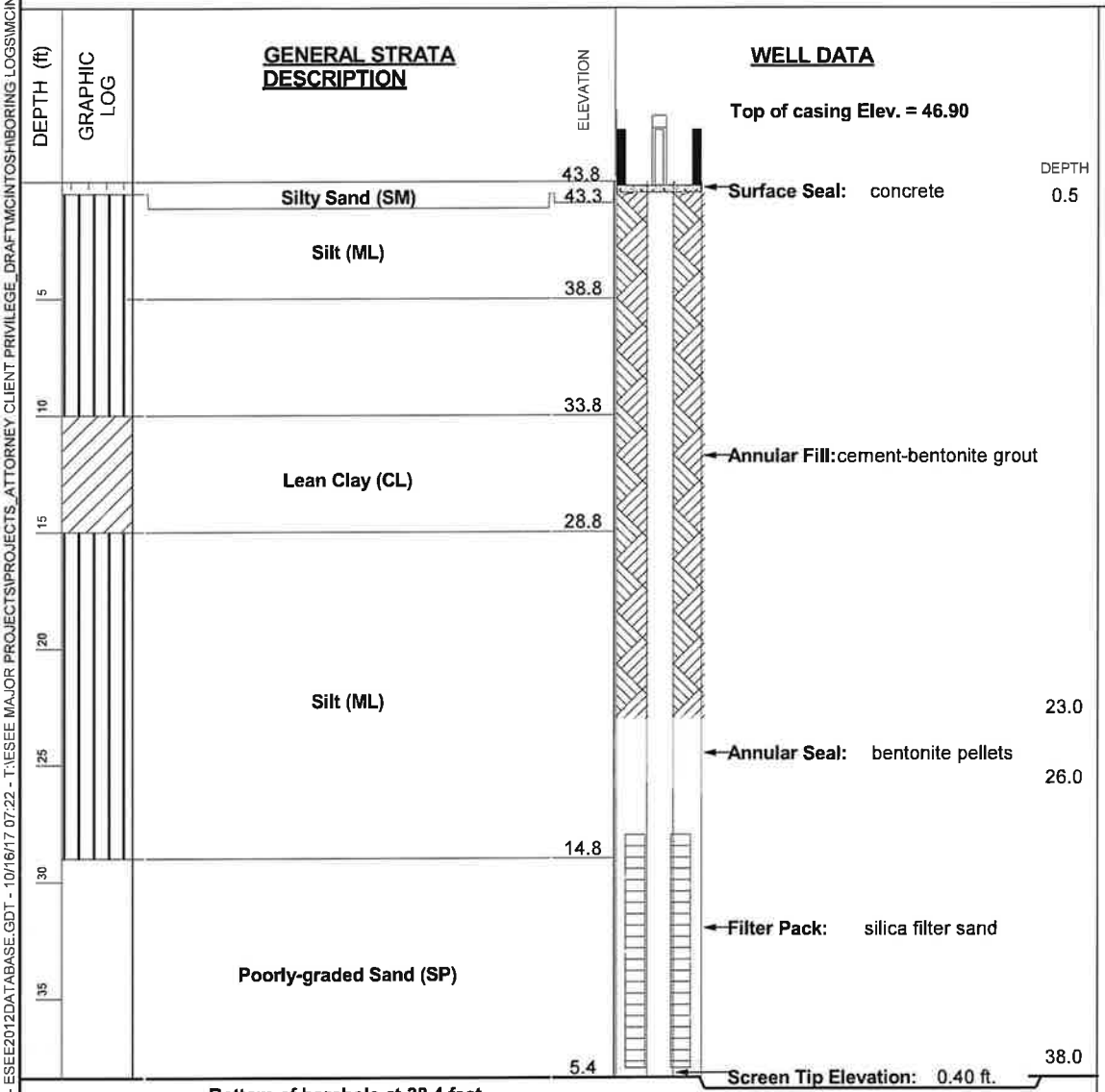
SOUTHERN COMPANY

LOG OF WELL INSTALLATION

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant McIntosh
LOCATION Rincon, GA

DATE STARTED 6/4/2016 **COMPLETED** 6/4/2016 **SURF. ELEV.** 43.8 **COORDINATES:** N:32.348785 E:-81.170175
CONTRACTOR TTL Inc **EQUIPMENT** CME 75 **METHOD** Hollow Stem Auger
DRILLED BY _____ **LOGGED BY** L. Petty **CHECKED BY** _____
BORING DEPTH 38.4 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** _____
NOTES _____



NOTES:

WELL SPECIFICATIONS

Casing Diameter: 2 inches
Casing Material: Schedule 40 PVC
Casing Length: feet
Screen Diameter: 2 inches
Screen Length: 10 feet
Screen Mesh: 0.010"
Screen Material: PVC
PrePack Screen: Yes

BORING INFORMATION

LOCATION: Ash Pond, Northeast of PZ-13
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM:
TOTAL DEPTH (ft): 28.0
LOGGED BY: P. Adams
DATE START/END: 6/26/2018 - 6/26/2018
DRILLING COMPANY: Cascade
DRILLER NAME: Ray Whitt
RIG TYPE: MiniSonic 110CC

BORING

PZ-15

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D/O.D.: NA / NA
DRILLING METHOD: Sonic Drilling
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 6 inch/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D.: 4 inch / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140 lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
			0 to 5	60/60		Hand-augered to 5 feet.		(0-0.2'): TOPSOIL
								(0.2-2'): FAT CLAY (CH); ~85% high plasticity fines, ~15% fine sand. Hard. Moist. Grey-brown.
								(2-4'): SANDY LEAN CLAY (CL); ~70% medium plasticity fines, ~30% fine sand. Stiff. Moist. Brown.
	5	SC1	5 to 8	36/36				(4-8'): CLAYEY SAND (SC); ~70% fine to medium sand, ~30% low to medium plasticity fines. Medium dense. Moist. Brown.
		SC2	8 to 18	120/120				(9-11'): SILTY SAND (SM); ~70% fine sand, ~30% nonplastic fines. Medium dense. Moist. Brown.
	10							(11-14'): SANDY SILT (ML); ~60% nonplastic to low plasticity fines, ~40% fine sand. Stiff. Moist. Brown.
	15							(14-16'): CLAYEY SAND (SC); ~60% fine to medium sand, ~40% low plasticity fines. Medium dense. Moist. Grey-brown.
								(16-25'): SILTY SAND (SM); ~85% fine to coarse sand, ~15% nonplastic fines. Dense. Wet. Grey.
	20	SC3	18 to 28	120/120				
	25							(25-28'): CLAYEY SAND (SC); ~60% fine to medium sand, ~40% low plasticity fines. Dense. Moist. Grey-brown.
								Bottom of boring at depth 28 ft.

NOTES: Monitoring well PZ-15 installed here, see installation log for details.

PROJECT NAME: Georgia Power Company - Plant McIntosh
CITY/STATE: Effingham County, GA
GEI PROJECT NUMBER: 1800205

GEI Consultants

GEI WOBURN STD 2-LOCATION-GRAPHIC LOG MCINTOSH_BORING_LOGS_JUNE2018.GPJ 8/7/18

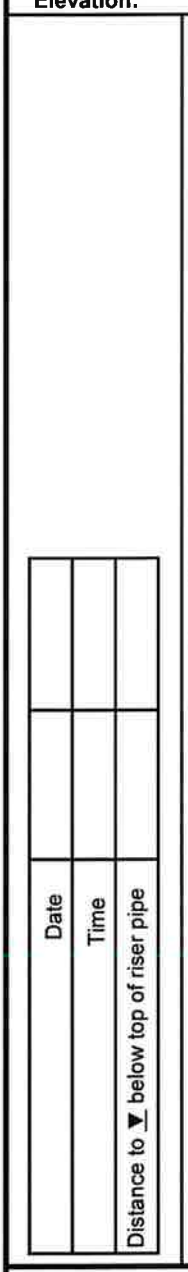
Groundwater Well Installation Log

PZ-15

Project	Plant McIntosh	**GEI Proj. No.**	1800205
City / Town	Effingham County, GA	**Location**	Ash Pond
Client	Georgia Power Company		Northeast of PZ-13
Contractor	Cascade Drilling		
Driller	Ray Whitt	**GEI Rep.** Peter Adams	**Install Date** 6/26/2018

Survey Datum: Awaiting survey

Ground Elevation:



Length of PVC Riser above Ground	Awaiting survey
Dist. Top of Surf. Casing to Top of Riser Pipe	~ 2 inches
Type of Seal around Surface Casing	Concrete
ID of Surface Casing	4-inch square
Type of Surface Casing	Steel
Depth Bottom of Surface Casing	~ 2 feet
ID and OD of Riser Pipe	2-inch OD
Type of Riser Pipe	Sch. 40 PVC
Type of Backfill around Riser Pipe	bentonite grout
Diameter of Borehole	6 inches
Depth Top of Seal	11.0 feet
Type of Seal	3/8-inch bentonite pellets
Depth Bottom of Seal	13.0 feet
Depth Top of Screened Section	15.3 feet
Type of Screen	Sch. 40 PVC
Description of Screen Openings	0.010 inches
ID and OD of Screened Section	2-inch OD with a 3.4-inch OD Pre-packed outer screen
Type of Filter Material	20/40 quartz sand
Depth Bottom of Screened Section	25.3 feet
Depth Bottom of Silt Trap	25.6 feet
Depth Bottom of Filter Material	28.0 feet
Depth Top of Seal	N/A
Type of Seal	N/A
Depth Bottom of Seal	N/A
Type of Backfill below Filter Material	N/A
Bottom of Borehole	28.0 feet

Notes:

Pre-packed 3.4-inch OD screen sealed around the 2-inch screen

All depths are measured below ground surface (bgs).

GEI Consultants

BORING INFORMATION

LOCATION: Ash Pond, South of the coal pile
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM:
TOTAL DEPTH (ft): 40.0
LOGGED BY: P. Adams
DATE START/END: 6/26/2018 - 6/26/2018
DRILLING COMPANY: Cascade
DRILLER NAME: Ray Whitt
RIG TYPE: MiniSonic 110CC

BORING
PZ-16
PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D/O.D.: NA / NA
DRILLING METHOD: Sonic Drilling
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 6 inch/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D.: 4 inch / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140 lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
			0 to 5	60/60		Hand-augered to 5 feet		(0-0.2'): TOPSOIL (0.2-2'): LEAN CLAY WITH SAND (CL); ~85% medium plasticity fines, ~15% fine sand. Very stiff. Moist. Organics throughout. Red-brown. (2-4'): SANDY LEAN CLAY (CL); ~60% low to medium plasticity fines, ~40% fine sand. Stiff. Moist. Red-brown.
	5	SC1	5 to 10	60/60				(4-8'): SILTY SAND (SM); ~80% fine to medium sand, ~20% nonplastic fines. Dense. Moist. Grey.
	10	SC2	10 to 20	120/120				(8-15'): FAT CLAY (CH); ~90% high plasticity fines, ~10% fine sand. Very hard. Moist. Red-brown.
	15							(15-18'): SANDY LEAN CLAY (CL); ~70% medium plasticity fines, ~30% fine sand. Very stiff. Moist. Red-brown.
								(18-20'): CLAYEY SAND (SC); ~60% fine sand, ~40% low to medium plasticity fines. Medium dense. Moist. Grey.
	20	SC3	20 to 30	120/48				(20-26'): NO RECOVERY
	25							
								(26-28'): SANDY LEAN CLAY (CL); ~60% medium plasticity fines, ~40% fine sand. Stiff. Moist. Light brown.
								(28-30'): CLAYEY SAND (SC); ~80% fine sand, ~20% low to medium plasticity fines. Dense. Moist. Light brown.
	30	SC4	30 to 40	120/120				(30-39'): SILTY SAND WITH GRAVEL (SW-SM); ~75% fine to coarse sand, ~15% nonplastic fines, ~10% fine to coarse angular to subrounded gravel including shells. Dense. Wet. Grey-brown.
	35							
	40							(39-40'): CLAYEY SAND (SC); ~70% fine sand, ~30% low plasticity fines. Dense. Wet. Grey. Bottom of boring at depth 40 ft.

NOTES: Boring terminated at 40 feet, hole collapsed to 39 feet. Monitoring well PZ-16 installed here, see installation log for details.

PROJECT NAME: Georgia Power Company - Plant McIntosh
CITY/STATE: Effingham County, GA
GEI PROJECT NUMBER: 1800205

GEI Consultants

GEI WOBURN STD 2-LOCATION-GRAPHIC LOG MCINTOSH_BORING_LOGS_JUNE2018.GPJ 8/7/18

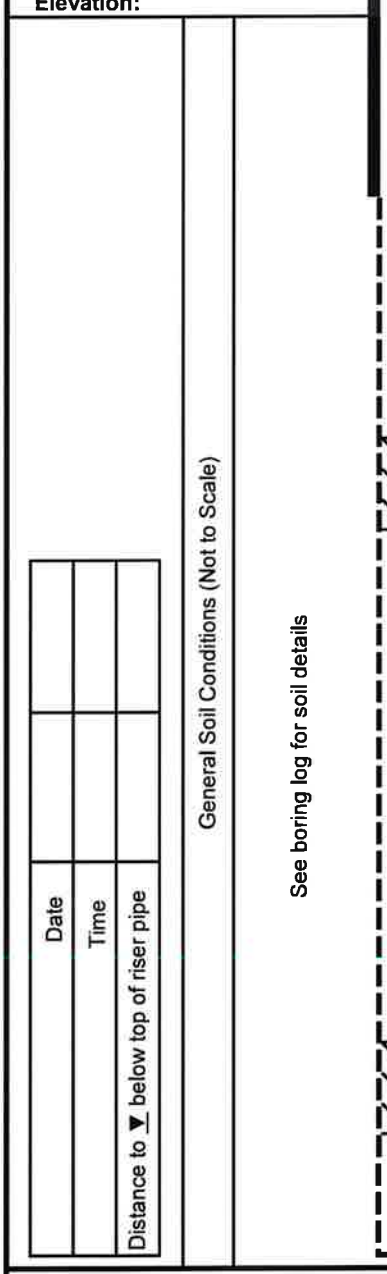
Groundwater Well Installation Log

PZ-16

Project	Plant McIntosh	**GEI Proj. No.**	1800205
City / Town	Effingham County, GA	**Location**	Ash Pond
Client	Georgia Power Company		South of the coal pile
Contractor	Cascade Drilling		
Driller	Ray Whitt **GEI Rep.** Peter Adams	**Install Date**	6/26/2018

Survey Datum: Awaiting survey

Ground Elevation:



Length of PVC Riser above Ground	Awaiting survey
Dist. Top of Surf. Casing to Top of Riser Pipe	~ 2 inches
Type of Seal around Surface Casing	Concrete
ID of Surface Casing	4-inch square
Type of Surface Casing	Steel
Depth Bottom of Surface Casing	~ 2 feet
ID and OD of Riser Pipe	2-inch OD
Type of Riser Pipe	Sch. 40 PVC
Type of Backfill around Riser Pipe	bentonite grout
Diameter of Borehole	6 inches
Depth Top of Seal	23.2 feet
Type of Seal	3/8-inch bentonite pellets
Depth Bottom of Seal	26.3 feet
Depth Top of Screened Section	28.7 feet
Type of Screen	Sch. 40 PVC
Description of Screen Openings	0.010 inches
ID and OD of Screened Section	2-inch OD with a 3.4-inch OD Pre-packed outer screen
Type of Filter Material	20/40 quartz sand
Depth Bottom of Screened Section	38.7 feet
Depth Bottom of Silt Trap	39.0 feet
Depth Bottom of Filter Material	39.0 feet
Depth Top of Seal	N/A
Type of Seal	N/A
Depth Bottom of Seal	N/A
Type of Backfill below Filter Material	N/A
Bottom of Borehole	39.0 feet

Notes:

Pre-packed 3.4-inch OD screen sealed around the 2-inch screen

All depths are measured below ground surface (bgs).

GEI Consultants

BORING INFORMATION

LOCATION: Ash Pond, North of the coal pile
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM:
TOTAL DEPTH (ft): 44.0
LOGGED BY: P. Adams
DATE START/END: 6/27/2018 - 6/27/2018
DRILLING COMPANY: Cascade
DRILLER NAME: Ray Whitt
RIG TYPE: MiniSonic 110CC

BORING
PZ-17
PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D/O.D.: NA / NA
DRILLING METHOD: Sonic Drilling
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 6 inch/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D.: 4 inch / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140 lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
			0 to 5	60/60		Hand-augered to 5 feet		(0-0.2'): TOPSOIL (0.2-5'): CLAYEY SAND (SC); ~60% fine sand, ~40% medium plasticity fines. Medium dense. Moist. Red-brown.
	5	SC1	5 to 10	60/60				(5-10'): LEAN CLAY WITH SAND (CL); ~85% medium plasticity fines, ~15% fine sand. Stiff. Moist. Red-brown with grey mottling.
	10	SC2	10 to 20	120/120				(10-13'): FAT CLAY (CH); ~90% high plasticity fines, ~10% fine sand. Very hard. Moist. Red-brown with grey mottling. (13-20'): SANDY FAT CLAY (CH); ~75% high plasticity fines, ~25% fine sand. Hard. Moist. Grey.
	15							
	20	SC3	20 to 30	120/120				
	25							(25-30'): CLAYEY SAND (SC); ~75% fine to coarse sand, ~25% low to medium plasticity fines. Medium dense. Wet. Grey.
	30	SC4	30 to 35	60/60				(30-43'): SILTY SAND WITH GRAVEL (SM); ~75% fine to coarse sand, ~15% nonplastic to low plasticity fines, ~10% fine to coarse angular to subrounded gravel including shells. Dense. Wet. Grey.
	35	SC5	35 to 40	60/60				
	40	SC6	40 to 44	48/48				(43-44'): CLAYEY SAND (SC); ~80% fine sand, ~20% medium plasticity fines. Dense. Very Moist. Brown-grey. Bottom of boring at depth 44 ft.
	45							

NOTES: Monitoring well PZ-17 installed here, see installation log for details.

PROJECT NAME: Georgia Power Company - Plant McIntosh
CITY/STATE: Effingham County, GA
GEI PROJECT NUMBER: 1800205

GEI Consultants

GEI WOBURN STD 2-LOCATION-GRAPHIC LOG MCINTOSH_BORING_LOGS_JUNE2018.GPJ 8/7/18

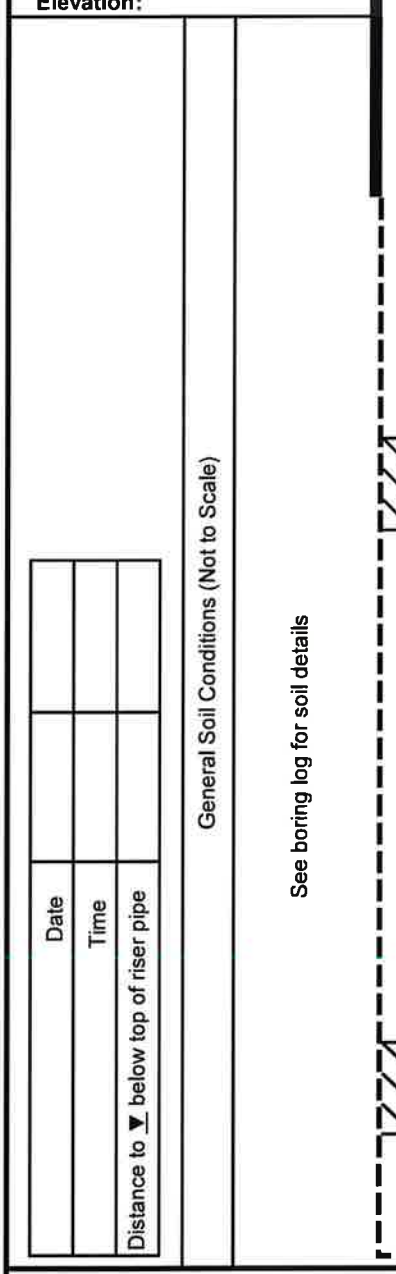
Groundwater Well Installation Log

PZ-17

Project	Plant McIntosh	**GEI Proj. No.**	1800205
City / Town	Effingham County, GA	**Location**	Ash Pond
Client	Georgia Power Company		North of the coal pile
Contractor	Cascade Drilling		
Driller	Ray Whitt **GEI Rep.** Peter Adams	**Install Date**	6/27/2018

Survey Datum: Awaiting survey

Ground Elevation:



Length of PVC Riser above Ground	Awaiting survey
Dist. Top of Surf. Casing to Top of Riser Pipe	~ 2 inches
Type of Seal around Surface Casing	Concrete
ID of Surface Casing	4-inch square
Type of Surface Casing	Steel
Depth Bottom of Surface Casing	~ 2 feet
ID and OD of Riser Pipe	2-inch OD
Type of Riser Pipe	Sch. 40 PVC
Type of Backfill around Riser Pipe	bentonite grout
Diameter of Borehole	6 inches
Depth Top of Seal	26.0 feet
Type of Seal	3/8-inch bentonite pellets
Depth Bottom of Seal	28.8 feet
Depth Top of Screened Section	31.4 feet
Type of Screen	Sch. 40 PVC
Description of Screen Openings	0.010 inches
ID and OD of Screened Section	2-inch OD with a 3.4-inch OD Pre-packed outer screen
Type of Filter Material	20/40 quartz sand
Depth Bottom of Screened Section	41.4 feet
Depth Bottom of Silt Trap	41.7 feet
Depth Bottom of Filter Material	44.0 feet
Depth Top of Seal	N/A
Type of Seal	N/A
Depth Bottom of Seal	N/A
Type of Backfill below Filter Material	N/A
Bottom of Borehole	44.0 feet

Notes:

Pre-packed 3.4-inch OD screen sealed around the 2-inch screen

All depths are measured below ground surface (bgs).

GEI Consultants

BORING INFORMATION

LOCATION: Ash Pond, Northeast of MGWA-9
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM:
TOTAL DEPTH (ft): 40.0
LOGGED BY: P. Adams
DATE START/END: 6/27/2018 - 6/27/2018
DRILLING COMPANY: Cascade
DRILLER NAME: Ray Whitt
RIG TYPE: MiniSonic 110CC

BORING
PZ-18
PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D/O.D.: NA / NA
DRILLING METHOD: Sonic Drilling
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: 6 inch/ NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D.: 4 inch / NA

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140 lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
			0 to 5	60/60		Hand-augered to 5 feet.		(0-0.3'): TOPSOIL (0.2-13'): FAT CLAY (CH); ~85% high plasticity fines, ~15% fine sand. Very hard. Moist. Red-brown with grey mottling.
	5	SC1	5 to 10	60/60				
	10	SC2	10 to 20	120/120				(13-14'): SANDY LEAN CLAY (CL); ~70% medium plasticity fines, ~30% fine sand. Hard. Moist. Grey-brown. (14-15'): CLAYEY SAND (SC); ~60% fine to medium sand, ~40% low to medium plasticity fines. Medium dense. Moist. Brown-grey. (15-18'): CLAYEY SAND (SC); ~80% fine to coarse sand, ~20% low plasticity fines. Dense. Moist. Grey.
	15							
	20	SC3	20 to 30	120/120				(18-22'): SANDY CLAY (CL); ~60% low to medium plasticity fines, ~40% fine sand. Stiff. Moist. Brown. (22-28'): CLAYEY SAND (SC); ~60% fine sand, ~40% low to medium plasticity fines. Medium dense. Very moist. Brown-grey.
	25							
	30	SC4	30 to 40	120/120				(28-39'): SILTY SAND WITH GRAVEL (SM); ~70% fine to coarse sand, ~20% nonplastic to low plasticity fines, ~10% fine to coarse angular to subrounded gravel including shells. Dense. Wet. Grey.
	35							
	40							(39-40'): CLAYEY SAND (SC); ~70% fine sand, ~30% low to medium plasticity fines. Dense. Moist. Grey-brown. Bottom of boring at depth 40 ft.

NOTES: Monitoring well PZ-18 installed here, see installation log for details.

PROJECT NAME: Georgia Power Company - Plant McIntosh
CITY/STATE: Effingham County, GA
GEI PROJECT NUMBER: 1800205

GEI Consultants

GEI WOBURN STD 2-LOCATION-GRAPHIC LOG MCINTOSH_BORING_LOGS_JUNE2018.GPJ 8/7/18

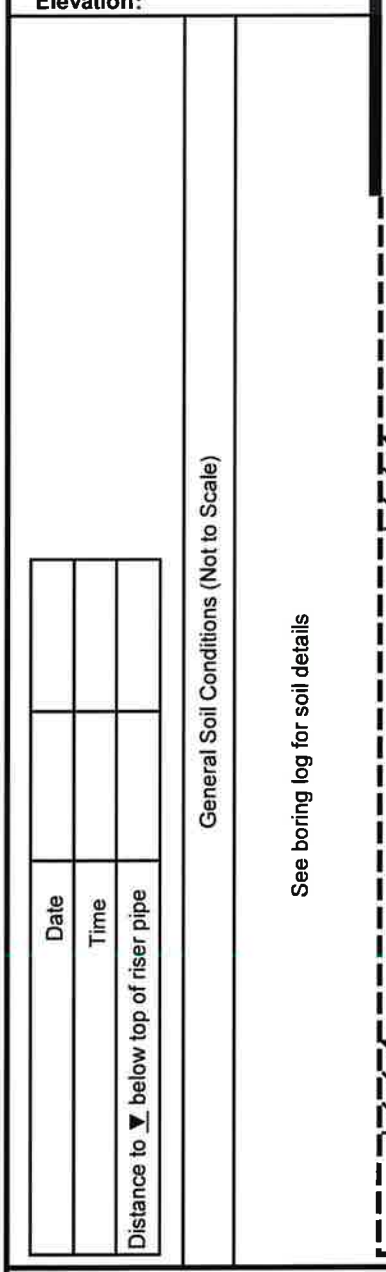
Groundwater Well Installation Log

PZ-18

Project	Plant McIntosh	**GEI Proj. No.**	1800205
City / Town	Effingham County, GA	**Location**	Ash Pond
Client	Georgia Power Company		Northeast of MGWA-9
Contractor	Cascade Drilling		
Driller	Ray Whitt **GEI Rep.** Peter Adams	**Install Date**	6/27/2018

Survey Datum: Awaiting survey

Ground Elevation:



Length of PVC Riser above Ground	Awaiting survey
Dist. Top of Surf. Casing to Top of Riser Pipe	~ 2 inches
Type of Seal around Surface Casing	Concrete
ID of Surface Casing	4-inch square
Type of Surface Casing	Steel
Depth Bottom of Surface Casing	~ 2 feet
ID and OD of Riser Pipe	2-inch OD
Type of Riser Pipe	Sch. 40 PVC
Type of Backfill around Riser Pipe	bentonite grout
Diameter of Borehole	6 inches
Depth Top of Seal	23.0 feet
Type of Seal	3/8-inch bentonite pellets
Depth Bottom of Seal	25.8 feet
Depth Top of Screened Section	28.2 feet
Type of Screen	Sch. 40 PVC
Description of Screen Openings	0.010 inches
ID and OD of Screened Section	2-inch OD with a 3.4-inch OD Pre-packed outer screen
Type of Filter Material	20/40 quartz sand
Depth Bottom of Screened Section	38.2 feet
Depth Bottom of Silt Trap	38.5 feet
Depth Bottom of Filter Material	40.0 feet
Depth Top of Seal	N/A
Type of Seal	N/A
Depth Bottom of Seal	N/A
Type of Backfill below Filter Material	N/A
Bottom of Borehole	40.0 feet

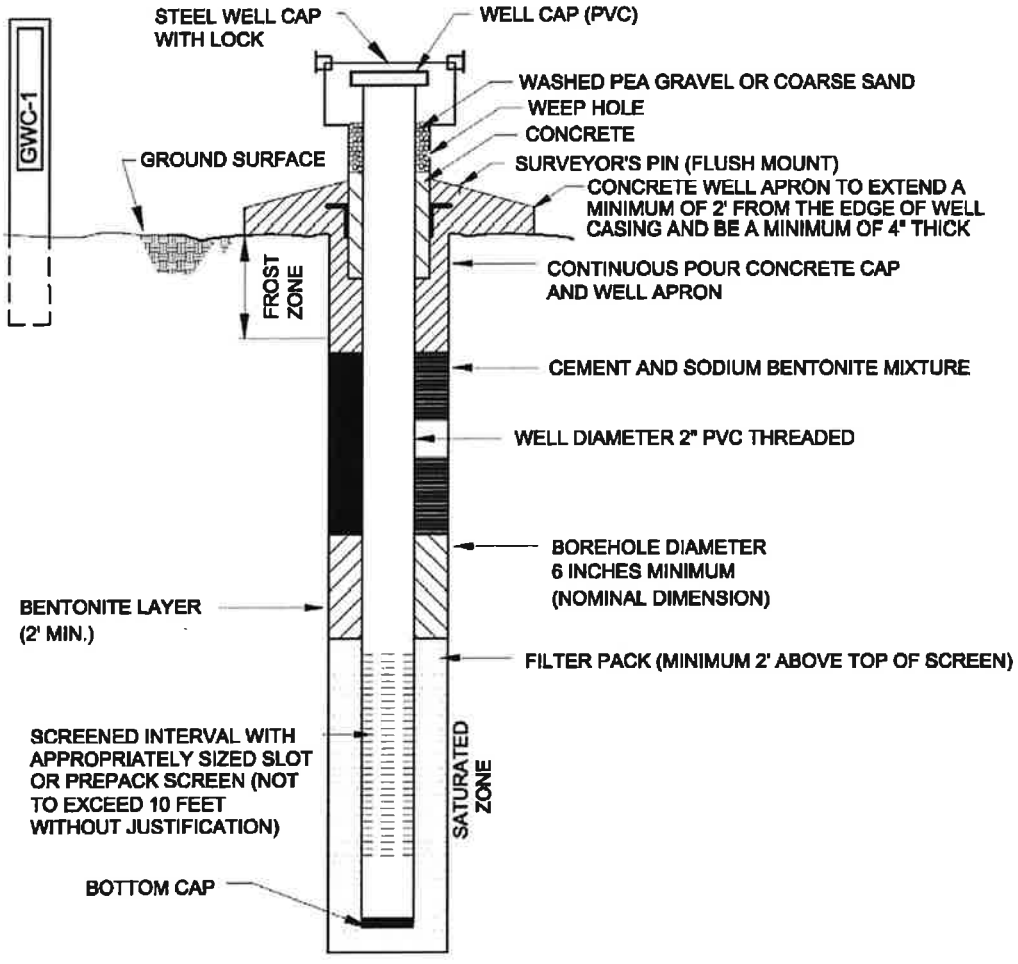
Notes:

Pre-packed 3.4-inch OD screen sealed around the 2-inch screen

All depths are measured below ground surface (bgs).

GEI Consultants

Appendix B - Groundwater Monitoring Well Detail



GROUNDWATER MONITORING WELL (TYP.)

Appendix C - Groundwater Sampling Procedure

Field log books and forms shall be kept for each sampling event, and should include the following, but not limited to, well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling. Groundwater sampling will be conducted using the most current version of EPA Region 4 SESD Operating Procedure - Groundwater Sampling (EPA, SESDPROC-301-R#) 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.

GPC 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 GPC if it appears that the well has been compromised.

2. Measure and record the depth to water in all wells to be sampled prior to purging. Static water levels will be measured from each well, within a 24-hour period. The water measuring device shall consist of a probe and measuring tape capable of measuring water levels with accuracy to 0.1 feet. 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 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 most current version of the Region 4 EPA SESD Operating Procedure - Field Equipment Cleaning and Decontamination (EPA, SESDPROC-205-R#) as a guide.

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

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

6. Monitor Indicator Parameters: Monitor and record the field indicator parameters (pH, specific conductance, dissolved oxygen [DO]), turbidity, temperature, and oxidation reduction potential [ORP]) approximately every 3 to 5 minutes. With the exception of temperature and ORP, which do not have stabilization criteria, the well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:

    - ±0.1 for pH
    - ± 5% for specific conductance (conductivity)

- ±10% or ±0.2 mg/L (whichever is greater) for DO where DO>0.5mg/L. If DO<0.5mg/L no stabilization criteria apply
- Temperature – Record only, not used for stabilization criteria
- ORP – Record only, not used for stabilization criteria.
- ≤10 for turbidity (see additional details below)

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 1 additional hour in order to reduce the turbidity to 5 NTU or less.

- If turbidity remains above 5 NTU but is less than 10 NTU after the additional hour of purging, 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.

7. Collect samples at a flow rate between 50 and 250 mL/min 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, duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.

9. All sample bottles will be filled, capped, and placed in a cooler containing ice 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 Site

    b. Date and time of sampling

    c. Sample description (well number)

    d. Sampler's initials

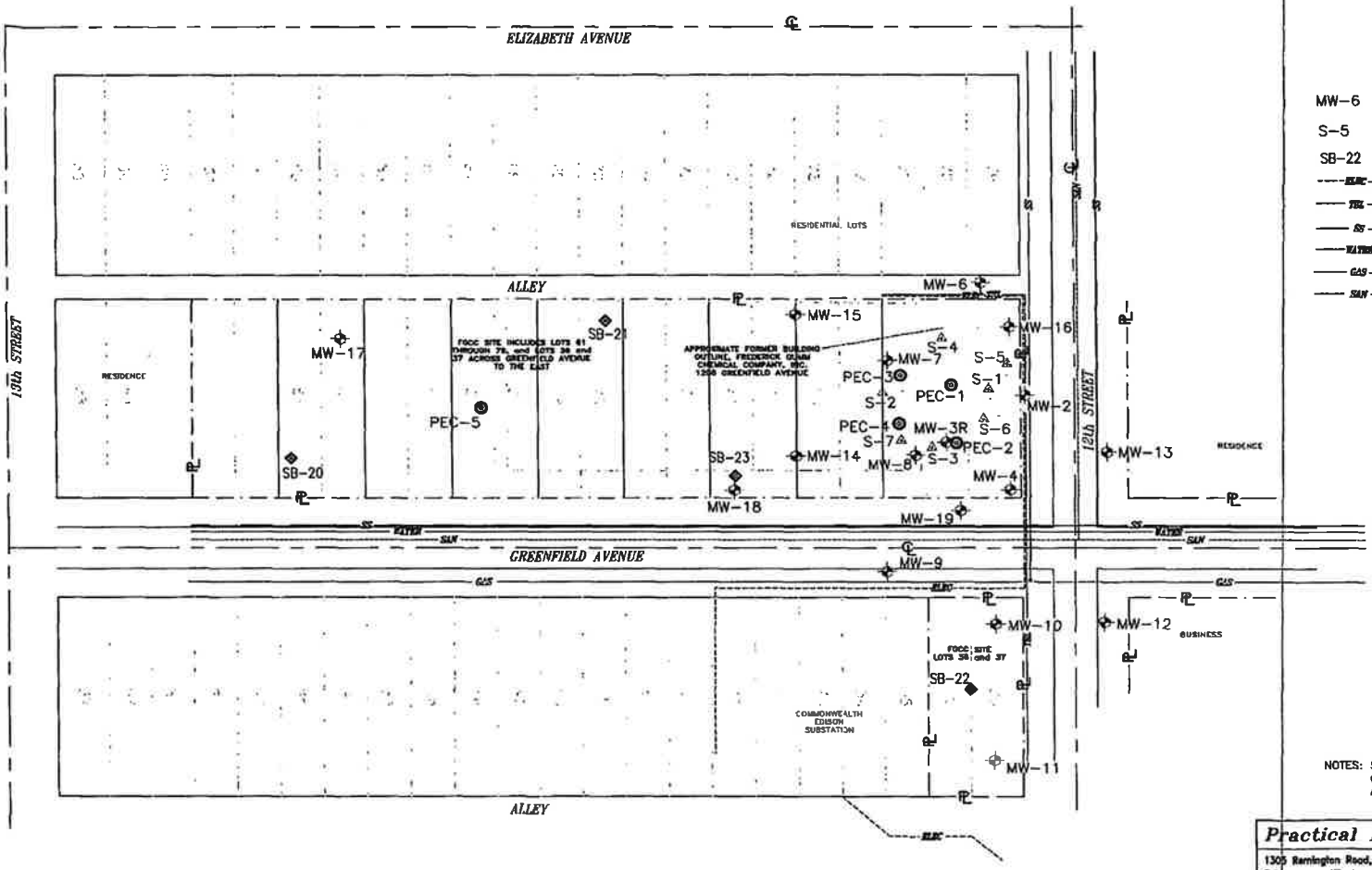
e. Preservatives

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; however, at no time will samples be analyzed after the method-prescribed hold time.

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.



LEGEND :

- MW-6 — MONITORING WELL LOCATION
- S-5 — SOIL SAMPLE LOCATION
- SB-22 — SOIL BORING LOCATION
- ELECTRICAL LINE
- TELEPHONE LINE
- STORM SEWER LINE
- WATER LINE
- GAS LINE
- SANITARY SEWER

RELEASABLE

DEC 7 2006

REVIEWER

APPROXIMATE SCALE IN FEET

0 30' 60'

NOTES: SOURCE– URS DRAWING DATED 2003
CITY OF WAUKEGAN PLAT OF SURVEY DATED 12.31.2002
ALL UTILITY AND WELL LOCATIONS ARE APPROXIMATE.

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SOIL BORING, SOIL SAMPLE, AND MONITORING WELL LOCATIONS

PEC

FREDERICK GUMM CHEM. CO.
1208 GREENFIELD AVE.
WAUKEGAN, ILLINOIS

DATE	SCALE	APPROVED	DWN. BY	FIGURE
11/07/2006	AS SHOWN	WES	WES	2

PEC_WACD_LAYOUT_NO2.DWG