

# GROUNDWATER MONITORING PLAN

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PLANT MCINTOSH – ASH POND 1 (AP-1)  
COAL COMBUSTION RESIDUAL (CCR)  
SURFACE IMPOUNDMENT  
5 YEAR PERMIT REVIEW  
EFFINGHAM COUNTY, GEORGIA

FOR



Georgia  
Power

October 2024 (Revision 1)



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**Approved**  
**Solid Waste Management Program**

Approved By: \_\_\_\_\_

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## CERTIFICATION

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

Signature: \_\_\_\_\_

Date: 10/9/2024



## 1. INTRODUCTION

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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 Groundwater 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 (CCR) (§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 groundwater scientist. 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

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Geologic and hydrogeologic conditions for this site are described in the Hydrogeological Assessment Report (GEI, 2018) in Part B of this permit application.

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 2023). Based on aquifer 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 per day (ft/day), and the average hydraulic conductivity was 0.962 ft/day.

The horizontal hydraulic gradient across AP-1 was measured during the July 2023 groundwater monitoring event from MGWA-10 to PZ-15, from MGWA-6 to PZ-16, and from MGWA-9 to PZ-17 resulting with estimated maximum and minimum horizontal gradients of 0.0083 ft/ft, 0.0082 ft/ft, and 0.0077 ft/ft, respectively.

Average groundwater flow velocity for AP-1 is based on  $K$ , lateral gradient ( $i$ ) and effective porosity ( $P_e$ ). The average horizontal  $K$  for the site is 0.962 feet/day, and the average sitewide gradient across AP-1 (July 2023) was 0.0081 ft/ft (based on average of 0.0083 ft/ft from MGWA-10 to PZ-15, 0.0082 ft/ft from MGWA-6 to PZ-16, and 0.0077 ft/ft from MGWA-9 to PZ-17), and the effective porosity ( $P_e$ ) was estimated at 0.20. The average groundwater velocity is calculated as:

### Equation

$$v = \frac{K (dh/dl)}{P_e} \quad \text{where: } \begin{array}{l} v = \text{groundwater velocity} \\ K = \text{hydraulic conductivity} \\ dh/dl = \text{hydraulic gradient} \\ P_e = \text{effective porosity} \end{array}$$

### Values Used in Calculation

Value	Source
K = 3.39E-04 cm/sec 0.962 ft/day	See note 1.
dh/dl <sub>1</sub> = 22.84/2796 ft/ft 0.0082 unitless	Hydraulic gradient from MGWA-10 to PZ-15
dh/dl <sub>2</sub> = 15.79/1898 ft/ft 0.0083 unitless	MGWA-6 to PZ-16
dh/dl <sub>3</sub> = 11/1458 ft/ft 0.0075 unitless	MGWA-9 to PZ-17
dh/dl <sub>avg</sub> = 0.0080 unitless	Average of dh/dl <sub>1,2,3</sub>
P <sub>e</sub> = 0.20 unitless	See note 2.

### Calculated Flow Velocity

$$v = \frac{(0.962)(0.008)}{0.20}$$

$$v = 0.039 \text{ ft/day, or } 14 \text{ ft/year}$$

### Notes

- (1) Aquifer tests from Hydrogeologic Assessment Report (Revision 01), Plant McIntosh Ash Pond 1 (AP 1) November 2018, Revised December 2019.
- (2) Default value for silty sands from Interim Final RCRA Investigation (EPA, 1989)

### 3. SELECTION OF WELL LOCATIONS

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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). Five wells are designated for monitoring upgradient Site conditions and six wells 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. The comprehensive list of upgradient and downgradient wells is included in Table A1 of Appendix A.

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(3)(b)6.

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

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The existing monitoring wells were installed following EPA Region 4 Science and Ecosystem Support Division (SESD), Operating Procedure – *Design and Installation of Monitoring Wells* (EPA, SESDGUID101-R2, 2018) as a general guide for best practices. Boring logs and well construction diagrams are provided in Appendix A. Copies of the driller’s bond continuation certificates from the period of well installation (2015 – 2019) and July 2020 and July 2021 well re-survey data certified by a Georgia Registered Land Surveyor are also included in Appendix A.

### 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 roto sonic 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 Laboratory Services and Applied Science Division (LSASD), Operating Procedure – *Field Equipment Cleaning and Decontamination* (EPA, LSASDPROC-205-R4, 2020) 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-R2, 2018) 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-R2, 2018) 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 a minimum of 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**

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

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**

Per Georgia Rule 391-3-4-.10(6)(g): monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the Georgia EPD. Monitoring wells will be abandoned using industry-accepted practices, the most current version of the Region 4 EPA SEDS, Guidance Document – *Operating Procedure for Design and Installation of Monitoring Wells* (EPA,

SESDGUID-205-R2, 2018) 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 and in accordance with the Official Code of Georgia Annotated (O.C.G.A) §§ 12-5-120 – 12-5-138, 1985. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole. Piezometers or groundwater wells located within the footprint of Ash Pond 1 will be over-drilled prior to abandonment.

#### **4.4 DOCUMENTATION**

The following information documenting the abandonment, construction, development, and survey of each well will be submitted to EPD by a qualified groundwater scientist within 60 days after completing all planned well installations and abandonments. The following information will be documented in this report.:

- Well identification,
- Name of drilling contractor and type of drill rig,
- Documentation stating that a Georgia-registered professional surveyor shall certify that the horizontal accuracy for the installed monitoring wells is 0.5 feet, and vertical accuracy for top of casing elevations to 0.01 feet from an acceptable survey point datum,
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Standards Advisory Council,
- Type of protective well cap and sump dimensions for each well,
- Dates of drilling and initial well emplacement,
- Drilling method and drilling fluid, if applicable,
- Borehole diameter and well casing diameter,
- Well depth given to within an accuracy of 0.01 feet based upon survey from acceptable survey point,
- Lithologic logs,
- Well casing materials,
- Screen materials and design (i.e., interval in feet below ground surface and elevation),
- Screen length,
- Screen slot size and joint type,
- Filter pack material/size and volume (placement narrative),
- Seal emplacement method and type/volume of sealant,
- Surface seal and volumes/mix of annular seal material,
- Well development date and documentation that water quality field parameters meet well development criteria,
- Sealant materials and volume,

- Well turbidity following development,
- Narrative of well development method - specific well development,
- Documentation of ground surface elevation ( $\pm 0.01$  feet),
- Documentation of top of casing elevation ( $\pm 0.01$  feet), and
- Schematic of the well with dimensions

In accordance with the Georgia Water Well Standards Act (O.C.G.A. § 12-5-120), at least once every five years, the owner of the property on which a monitoring well is constructed shall have the monitoring well(s) inspected by a professional engineer or professional geologist, who shall direct appropriate remedial corrective work to be performed if the well does not conform to standards. Well inspection records and records of remedial corrective work are subject to review by EPD. Additionally, as part of the closure and post-closure plan, the cost estimate based upon current year cost for the well inspections must be provided for as part of the cost calculations for the groundwater monitoring period.

## 5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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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 Code of Federal Regulations (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 0.1 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 - 12-5-138).

**TABLE 1**  
**GROUNDWATER MONITORING PARAMETERS & FREQUENCY**

MONITORING PARAMETER		GROUNDWATER MONITORING	
		Background	Semiannual Events
<b>Field Parameters</b>	Temperature	X	X
	pH	X	X
	ORP	X	X
	Turbidity	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
<b>Appendix III (Detection)</b>	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
<b>Appendix IV (Assessment)</b>	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

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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 Field Branches Quality System and Technical Procedures as a guide. 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 the Region 4 EPA, LSASD Operating Procedure – *Field Equipment Cleaning and Decontamination* (EPA, LSASDPROC-205-R4, 2020). The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

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



## 7. CHAIN-OF-CUSTODY

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

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

The samples will remain in the custody of assigned personnel, an assigned agent, or the laboratory. If the samples are transferred to other employees for delivery or transport, the sampler or possessor 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

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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.

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

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

## 9. REPORTING RESULTS

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A semiannual groundwater report that documents the results of sampling and analysis will be submitted to EPD. Semiannual groundwater monitoring reports will be submitted to the EPD within 90 days of receipt and analysis of the groundwater analytical data from the laboratory. At a minimum, 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 reported 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. Field logs and forms for each sampling event to include, but not limited to, well signage, well access, sampling and purging equipment condition, and any site conditions that may affect sampling.
16. Documentation of non-functioning wells.
17. Table of current analytical results for each well, highlighting statistically significant increases, and concentrations above maximum contaminant level (MCL).
18. Statistical analyses.
19. Certification by a qualified groundwater scientist.
20. An iso-concentration map of Appendix IV constituents (if applicable based on exceedances of groundwater protection standards).
21. Potable water well survey (annually, if applicable based on exceedances of groundwater protection standards).

## 10. STATISTICAL ANALYSIS

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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 EPA document Statistical Analysis of Groundwater Data at RCRA Facilities Unified Guidance (EPA, 2009).

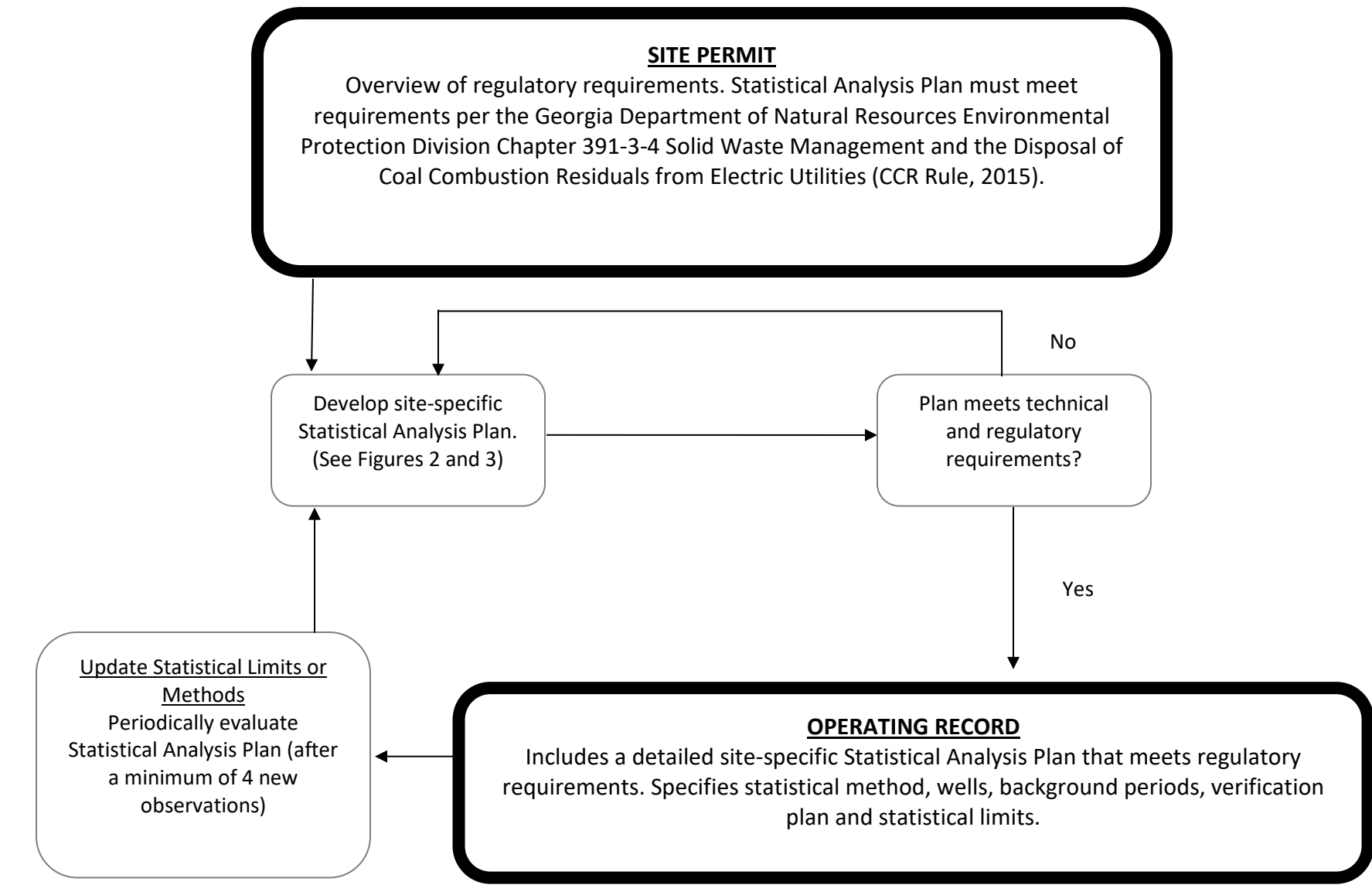
According to EPD rules (391-3-4-.10(6)(a)), which incorporates the statistical analysis requirements of 40 CFR 257.93 by reference, the Site must specify in the operating record the statistical methods to be used in evaluating groundwater monitoring data for each hazardous constituent. The statistical 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).

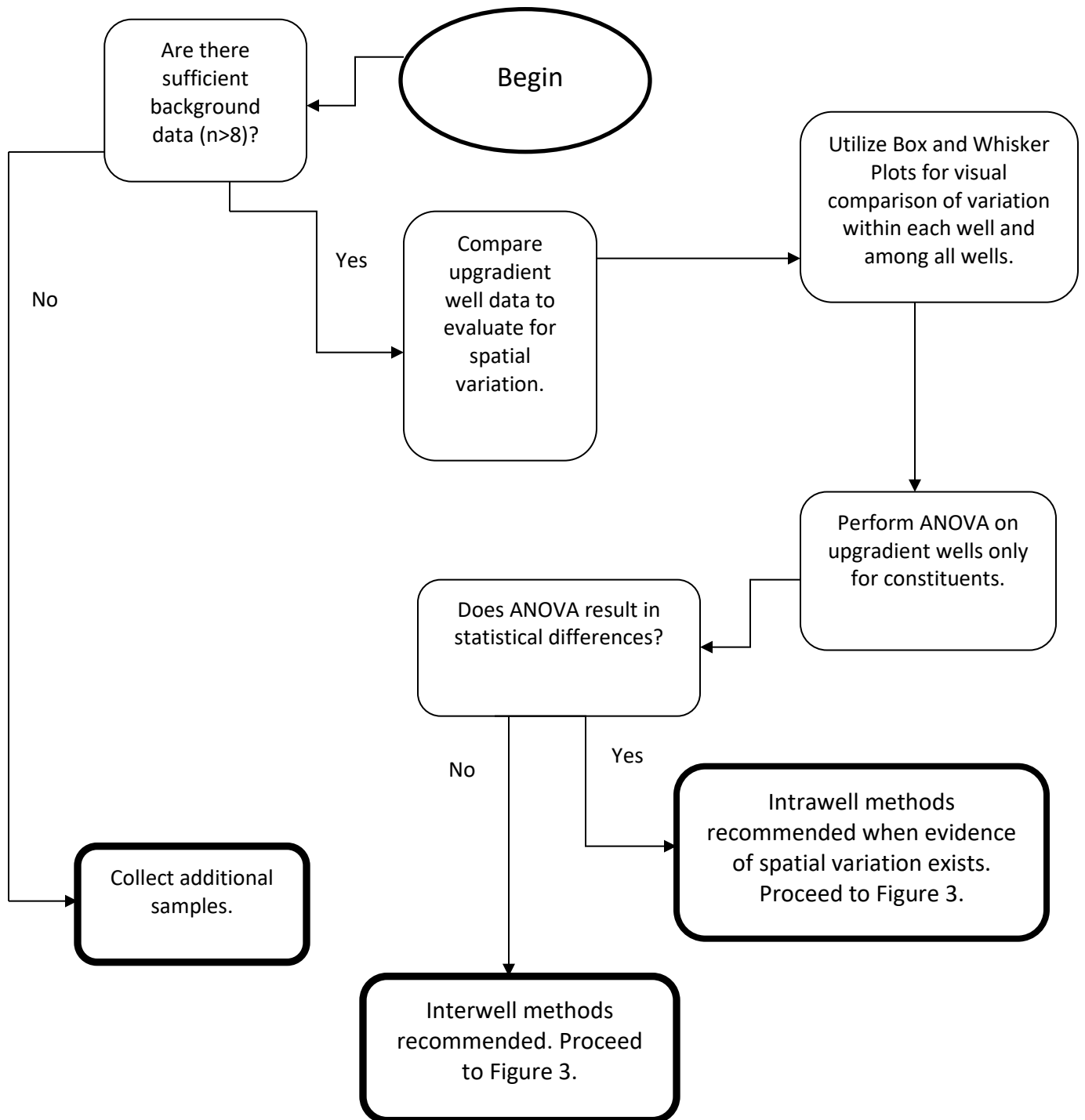
Based on site-specific conditions, statistical methods may be intra-well, inter-well, or a combination of both.

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 Determining Appropriate Statistical Methods, depicts the decision logic that will be used to determine the appropriate method as required by 391-3-4-.10(6). Figure 3, 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**

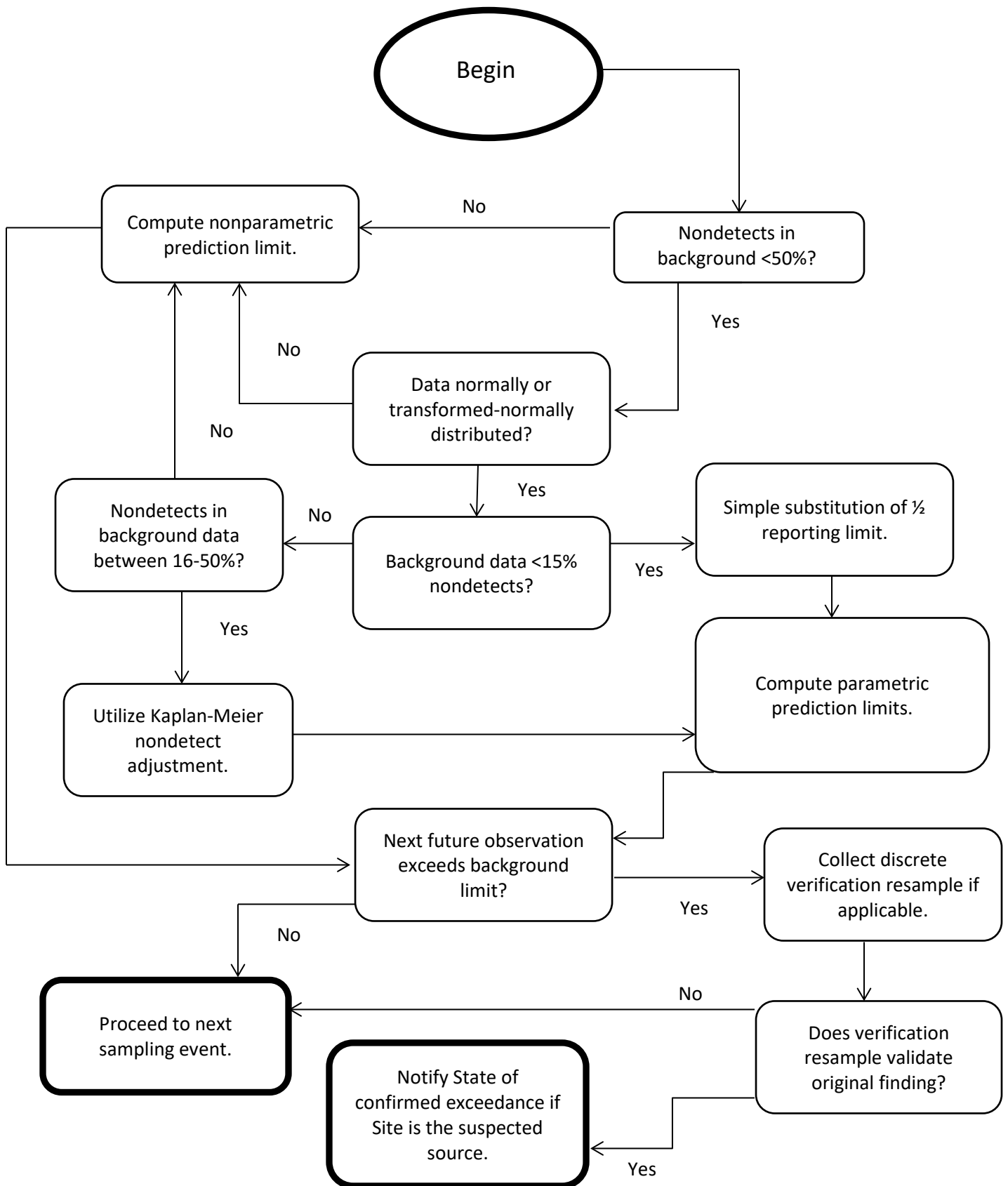


**FIGURE 2. DECISION LOGIC FOR DETERMINING APPROPRIATE STATISTICAL METHOD**



n = Number of sampling events  
ANOVA = Analysis of Variance Test

**FIGURE 3. DECISION LOGIC FOR COMPUTING PREDICTION LIMITS**





## 11. REFERENCES

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- EPA, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007. Office of Resource Conservation and Recovery –Program Implementation and Information Division, March 2009.
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- GEI, 2018. *Hydrogeologic Assessment Report, Plant McIntosh – Ash Pond 1 (AP-1)*, prepared for Georgia Power, prepared by GEI Consultants, November 2018.

## APPENDICES

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- A. MONITORING SYSTEM DETAILS
- B.1 GROUNDWATER MONITORING WELL DETAIL
- B.2 GROUNDWATER MONITORING WELL DETAIL FLUSH-MOUNT DETAIL
- C. GROUNDWATER SAMPLING PROCEDURE

## Appendix A – Monitoring System Details

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FIGURE A-1 COMPLIANCE MONITORING NETWORK MAP

FIGURE A-2 POTENTIOMETRIC SURFACE MAP – FEBRUARY 2024




TABLE A-1 MONITORING NETWORK WELL DETAILS

TABLE A-2 PIEZOMETER CONSTRUCTION DETAILS

BORING AND WELL CONSTRUCTION LOGS, DRILLER’S BONDS, AND SURVEY DATA

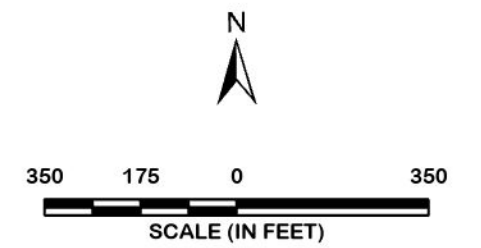


**LEGEND**

-  APPROXIMATE AP-1 BOUNDARY
-  DETECTION WELL
-  PIEZOMETER

**NOTES:**

1. AERIAL DATED JANUARY 22, 2024, PROVIDED BY SAM, LLC. ADDITIONAL PHOTOGRAPHY SOURCED FROM NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED APRIL 15, 2023.

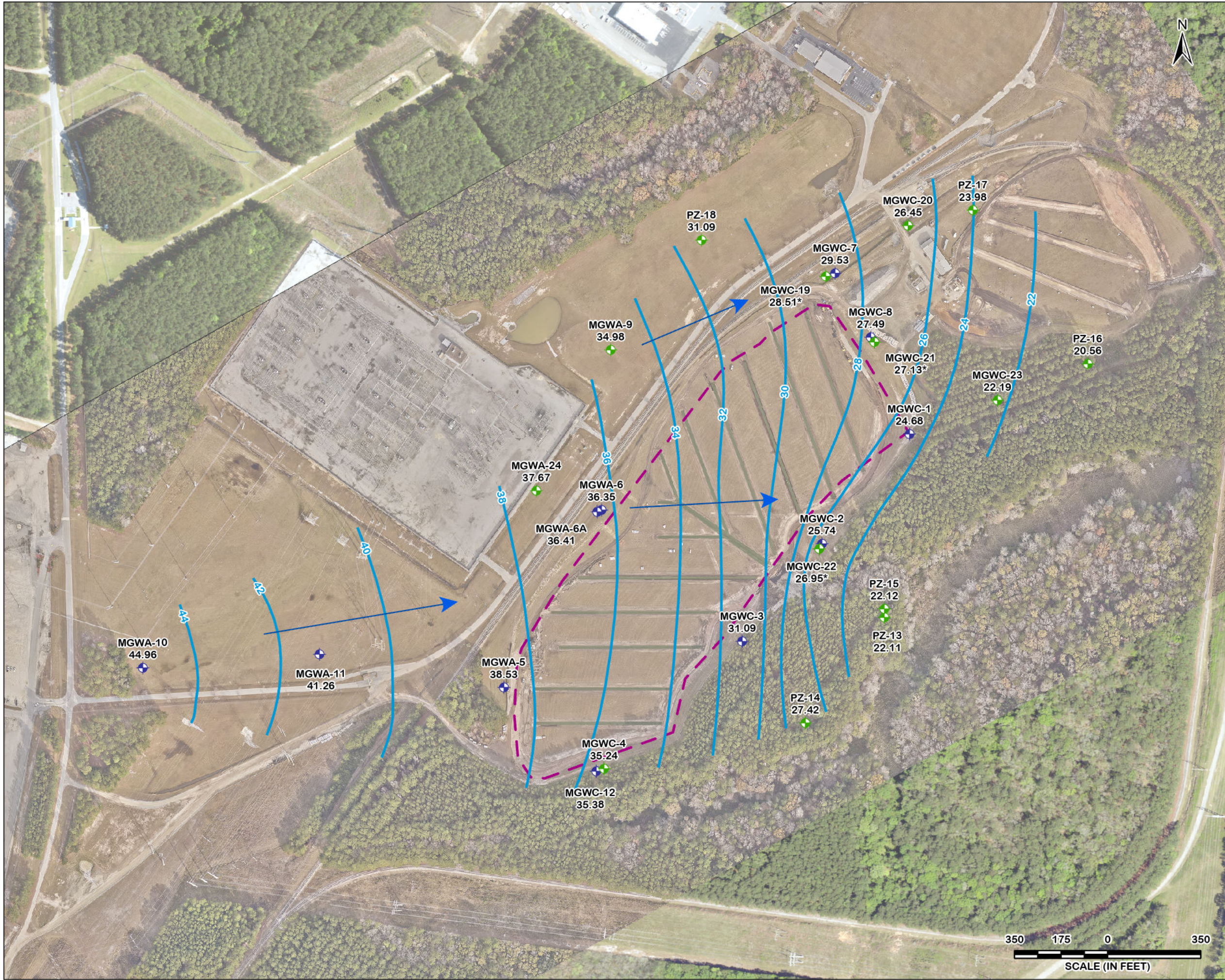



GROUNDWATER MONITORING PLAN

COMPLIANCE MONITORING  
NETWORK MAP

FIGURE  
A-1








GEORGIA POWER COMPANY  
PLANT McINTOSH ASH POND 1


**LEGEND**

- APPROXIMATE AP-1 BOUNDARY
- GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- DETECTION WELL
- PIEZOMETER

**NOTES:**

1. AERIAL DATED JANUARY 22, 2024, PROVIDED BY SAM, LLC. ADDITIONAL PHOTOGRAPHY SOURCED FROM NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP) DATED APRIL 15, 2023.
2. \* = ELEVATIONS FOR MGWC-19, MGWC-21, AND MGWC-22 ARE NOT USED TO CALCULATE POTENTIOMETRIC CONTOURS.





ATLANTIC COAST  
CONSULTING, INC.

GROUNDWATER MONITORING PLAN

POTENTIOMETRIC CONTOUR MAP  
JULY 2023

FIGURE  
A-2



**Table A-1**  
**Monitoring Network Well Details**  
**Plant McIntosh Ash Pond 1**  
**Effingham County, Georgia**

Well	Installation Date (mm/dd/yyyy)	Northing	Easting	Top of Casing Elevation (NAVD88)	Bottom Depth (ft BTOC)	Bottom Elevation (NAVD88)	Depth to Top of Screen (ft BTOC)	Top of Screen Elevation (NAVD88)	Hydraulic Conductivity Feet/Day	Groundwater Zone Screened	Purpose
MGWC-1	11/10/2015	856813.08	964287.47	65.26	56.08	9.18	45.78	19.48	0.3141	SW-SC, SP-SM, SP, ML	Downgradient Detection
MGWC-2	11/11/2015	856400.69	963958.38	48.54	37.36	11.18	27.06	21.48	0.2938	SP, SP-SM	Downgradient Detection
MGWC-3	11/11/2015	856033.79	963658.28	52.65	38.74	13.91	28.44	24.21	1.148	SP-SM	Downgradient Detection
MGWA-5	11/12/2015	855860.82	962763.17	64.36	63.09	1.27	52.79	11.57	0.4143	ML, SP-SM, SP, ML	Upgradient Detection
MGWA-6	11/12/2015	856527.73	963130.08	61.08	41.93	19.15	31.63	29.45	1.44	SP-SM	Upgradient Detection
MGWA-6A	1/16/2019	856520.82	963113.65	59.76	39.67	20.09	29.40	30.36	NM	SP, SW-SC	Upgradient Detection
MGWC-7	11/13/2015	857417.68	964007.53	54.40	42.29	12.11	31.99	22.41	1.298	SP-SM	Downgradient Detection
MGWC-8	11/10/2015	857177.10	964141.67	62.61	52.56	10.05	42.26	20.35	2.837	CH, SW-SC, SW- SM, SP-SM, ML	Downgradient Detection
MGWA-10	11/17/2015	855934.25	961406.49	65.07	53.09	11.98	42.79	22.28	0.3362	SP-SC, SW-SC, SP- SM	Upgradient Detection
MGWA-11	5/27/2016	855985.31	962070.22	64.91	55.81	9.10	45.61	19.30	NM	SM, ML, SW-SM	Upgradient Detection
MGWC-12	5/26/2016	855545.67	963110.24	64.1	52.90	11.20	42.7	21.40	NM	CL, ML	Downgradient Detection

Notes:

1. Northings and Eastings are Georgia State Plane East Zone in feet relative to North American Datum 1983 (NAD83).
2. NAVD88 indicates feet relative to North American Vertical Datum of 1988.
3. ft BTOC indicates feet below top of casing.
4. Well MGWC-1 surveyed July 23, 2021. All other wells surveyed July 2, 2020.
5. Groundwater Zone Screened designations are ASTM D2487-17e1 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
6. Hydraulic conductivity from rising head aquifer tests. NM = not measured.

**Table A-2**  
**Piezometer Construction Details**  
**Plant McIntosh Ash Pond 1**  
**Effingham County, Georgia**

Well	Installation Date (mm/dd/yyyy)	Northing	Easting	Top of Casing Elevation (NAVD88)	Bottom Depth (ft BTOC)	Bottom Elevation (NAVD88)	Depth to Top of Screen (ft BTOC)	Top of Screen Elevation (NAVD88)	Hydraulic Conductivity Feet/Day	Groundwater Zone Screened	Purpose
MGWC-4	11/18/2015	855555.05	963139.37	64.33	67.35	-3.02	57.05	7.28	0.1395	ML, SP	Piezometer
MGWA-9	11/17/2015	857129.70	963164.58	59.29	43.05	16.24	32.75	26.54	2.178	SP-SM	Piezometer
PZ-13	6/3/2016	856123.86	964192.52	40.91	26.76	14.15	16.36	24.55	NM	SM	Piezometer
PZ-14	6/4/2016	855727.20	963895.98	47.11	41.50	5.61	31.10	16.01	NM	SP	Piezometer
PZ-15	6/26/2018	856156.03	964192.45	42.37	28.87	13.50	18.57	23.8	NM	SM, SC	Piezometer
PZ-16	6/26/2018	857077.14	964957.28	54.71	42.39	12.32	32.09	22.62	NM	SC, SW-SM	Piezometer
PZ-17	6/27/2018	857655.05	964525.72	57.51	45.12	12.39	34.82	22.69	NM	SM	Piezometer
PZ-18	6/27/2018	857542.34	963505.91	53.48	41.70	11.78	31.40	22.08	NM	SC, SM	Piezometer
MGWC-19	10/4/2018	857406.16	963972.44	53.98	72.70	-18.72	62.40	-8.42	NM	SM-ML	Deep Piezometer
MGWC-20	10/3/2018	857596.86	964281.59	51.56	54.77	-3.21	44.47	7.09	NM	SP-SM, SP	Piezometer
MGWC-21	11/28/2018	857159.04	964155.3	62.65	82.68	-20.03	72.38	-9.73	NM	SM-ML	Deep Piezometer
MGWC-22	11/29/2018	856381.60	963948.23	47.53	67.56	-20.03	57.26	-9.73	NM	SM-ML	Deep Piezometer
MGWC-23	11/30/2018	856940.45	964617.96	57.47	42.90	14.57	32.60	24.87	NM	SC, SM	Piezometer
MGWA-24	1/17/2019	856600.28	962885.22	60.53	47.00	13.53	35.80	24.73	NM	SM	Piezometer

**Notes:**

1. Northings and Eastings are Georgia State Plane East Zone in feet relative to North American Datum 1983 (NAD83).
2. NAVD88 indicates feet relative to North American Vertical Datum of 1988.
3. ft BTOC indicates feet below top of casing.
4. Well MGWC-1 surveyed July 23, 2021. All other wells surveyed July 2, 2020.
5. Groundwater Zone Screened designations are ASTM D2487-17e1 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
6. Hydraulic conductivity from rising head aquifer tests. NM = not measured.



# LOG OF TEST BORING

**BORING MGWC-1**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/10/2015 COMPLETED 11/10/2015 SURF. ELEV. 62.18 COORDINATES: N - 856813.08, E - 964287.47

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 57 ft. GROUND WATER DEPTH: DURING 34 ft. COMP. DELAYED 31.9 ft. after 24 hrs.

NOTES TOC Elevation: 65.26

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Poorly-graded Sand with Silt (SP-SM)</b> - SP-SM: dark grayish brown (2.5Y 4/2) topsoil <b>Sandy Lean Clay (CL)</b> - mottled red (2.5YR 4/8) and light gray (2.5Y 7/2) damp, very stiff - stiff - mottled light gray (2.5Y 7/1) and reddish brown (2.5YR 4/3) low to medium plasticity			
10		<b>Poorly-graded Sand with Clay (SP-SC)</b> - reddish yellow (7.5YR 6/6) dry, fine-grained <b>Sandy Lean Clay (CL)</b> - mottled light gray (5Y 7/1) and olive / light olive brown (5Y 5/6) dry, medium stiff, low to medium plasticity - mottled red (2.5YR 5/6), brownish yellow / dark yellowish orange (10YR 6/6) and gray / light olive gray (5Y 6/1) - mottled yellowish brown / moderate yellowish brown (10YR 5/4), red (2.5YR 4/8) and light gray (5Y 7/1) - mottled dusky red (10R 3/2) and yellow / moderate yellow (5Y 7/6) - mottled reddish gray (2.5YR 5/1), yellow / moderate yellow (5Y 7/6) and red (2.5YR 4/8)			
15		<b>Lean Clay (CL)</b> - 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)			
20		<b>Fat Clay (CH)</b> - mottled light gray / yellowish gray (5Y 7/2) and reddish yellow (7.5YR 6/8) damp, medium stiff, medium to high plasticity, interbedded with coarse-sand lenses <b>Sandy Fat Clay (CH)</b> - mottled light gray / yellowish gray (5Y 7/2) and brownish yellow (10YR 6/8) damp, medium stiff, medium to high plasticity, interbedded with pale gray (5Y 8/2) fine-sand lenses (1-2" thick) - light olive brown (2.5Y 5/3) - mottled light yellowish brown (2.5Y 6/3) and light gray (2.5Y 7/1) damp			Annular Fill: cement-bentonite grout
25					
30					
35		<b>Annular Seal:</b> bentonite pellets			
40					

(Continued Next Page)

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCFF01\WSHAUGHNESSY\PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\MGWC-1\BORING LOGS\MCINTOSH CCR IMPOUNDMENT\MGWC-1.GPJ



SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF01\WSHAUGNE\$DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH CCR IMPOUNDMENT\WWS.GPJ



# LOG OF TEST BORING

**BORING MGWC-1**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
					(CONTINUED)
		<b>Fat Clay (CH)</b> - dark greenish gray (10GY 4/1) soft, high plasticity			
45		<b>Well-graded Sand with Clay (SW-SC)</b> - strong brown (7.5YR 5/6) wet, fine to coarse-grained			Filter: silica filter sand
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - light gray / yellowish gray (5Y 7/2) wet, fine-grained, shell fragments up to 1/2"			
50		<b>Poorly-graded Sand (SP)</b> - light yellowish brown (2.5Y 6/3) wet, fine-grained			<b>Standpipe:</b> 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - light olive brown (2.5Y 5/6) wet, fine-grained			
55		<b>Silt (ML)</b> - dark greenish gray (10Y 4/1) dry, with clay and fine sand, mica			Sump: 0.299999999999997 ft.
					Backfill: Bentonite Chips
		Bottom of borehole at 57.0 feet.			
60					
65					
70					
75					
80					
85					
		<b>NOTE:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in July 2021			



# LOG OF TEST BORING

**BORING MGWC-2**  
PAGE 1 OF 1

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/11/2015 COMPLETED 11/11/2015 SURF. ELEV. 45.32 COORDINATES: N - 856400.69, E - 963958.38

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 37 ft. GROUND WATER DEPTH: DURING 17 ft. COMP. DELAYED 16 ft. after 24 hrs.

NOTES TOC Elevation: 48.54

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		<b>Poorly-graded Sand with Clay (SP-SC)</b> - dark yellowish brown (10YR 4/4) topsoil very damp - mottled reddish brown (5YR 5/4) and light olive brown (2.5Y 5/4)			
5		<b>Sandy Lean Clay (CL)</b> - red (2.5YR 4/6) damp, stiff, low plasticity - yellowish brown (10YR 5/6) and light olive gray (5Y 6/2) low to medium plasticity			
10		<b>Fat Clay (CH)</b> - mottled reddish brown (2.5YR 4/4), pale red (2.5YR 7/2) and light gray (5Y 7/1) damp, medium to high plasticity <b>Sandy Fat Clay (CH)</b> - 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			Annular Fill: cement-bentonite grout
15					
20		<b>Poorly-graded Sand with Clay (SP-SC)</b> - olive brown (2.5Y 4/4) damp, cohesive <b>Sandy Fat Clay (CH)</b> - mottled yellowish brown (10YR 5/6), light gray (5Y 7/1) and red (2.5YR 4/6) damp, stiff <b>Sandy Elastic Silt (MH)</b> - light gray (5Y 7/1), pinkish gray / grayish orange pink (5YR 7/2) and red (2.5YR 5/6) wet, soft, high plasticity, with clay, some fine-sand - increase sand content with depth			Annular Seal: bentonite pellets
25		<b>Poorly-graded Sand with Silt (SP-SM)</b> - brownish yellow / dark yellowish orange (10YR 6/6) wet, fine-grained <b>Poorly-graded Sand (SP)</b> - light gray (2.5Y 7/2) wet, fine-grained, few shell fragments - fining downward			Filter: silica filter sand
30		<b>Poorly-graded Sand with Silt (SP-SM)</b> - light gray (2.5Y 7/2) wet, with shell fragments up to 2" - dark olive gray / olive gray (5Y 3/2) - olive (5Y 5/3)			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
35		<b>Sandy Elastic Silt (MH)</b> - olive yellow (2.5Y 6/8) very moist - light olive brown (2.5Y 5/6) 1" concretions - dark gray (N3) very damp			Sump: 0.299999999999997 ft. Backfill: Bentonite Chips
40		<b>NOTE:</b> Bottom of borehole at 37.0 feet. Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.			

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF001\WSHAUGHNESSY\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\MGWC-2\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ





# LOG OF TEST BORING

**BORING MGWC-4**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/18/2015 COMPLETED 11/18/2015 SURF. ELEV. 61.05 COORDINATES: N - 855555.05, E - 963139.37

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 67 ft. GROUND WATER DEPTH: DURING 15 ft. COMP. DELAYED 13.4 ft. after 24 hrs.

NOTES TOC Elevation: 64.33

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
		<b>Sandy Fat Clay (CH)</b> - reddish brown (5YR 5/4) wet, high plasticity, interbedded with olive-yellow (2.4y 6/6) clayey sand			Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Poorly-graded Sand with Clay (SP-SC)</b> - grayish brown (10YR 5/2) wet, fine-grained			
		<b>Sandy Lean Clay (CL)</b> - mottled reddish brown (5YR 5/4) and light brownish gray (2.5Y 6/2) dry, very stiff, low plasticity - hard, low plasticity - brown (7.5YR 5/3) and brown (7.5YR 4/2) medium stiff, low to medium plasticity			
10		- mottled light gray (2.5Y 7/2) and red (2.5YR 4/8) interbedded with sand lenses			
		<b>Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and light brown (7.5YR 6/3) very damp, soft, high plasticity			
15		- mottled reddish gray (2.5YR 5/1) and red (2.5YR 5/8) medium stiff, medium plasticity			
		<b>Sandy Fat Clay (CH)</b> - light olive gray (5Y 6/2) damp, medium stiff, medium plasticity			
20		<b>Lean Clay (CL)</b> - mottled light yellowish brown (2.5Y 6/3) and strong brown (7.5YR 5/6) damp, medium stiff, low plasticity, bioturbation			
25		<b>Sandy Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and light brown (7.5YR 6/3) very damp, soft, high plasticity - interbedded with thin white fine-sand lenses			
30		<b>Clayey Silty Sand (SC-SM)</b> - pale yellow (2.5Y 7/4) fine-grained			
		<b>Fat Clay (CH)</b> - light olive brown (2.5Y 5/4) and dark grayish brown (2.5Y 4/2) damp, stiff, medium plasticity, interbedded with thin white fine-sand lenses - mottled strong brown (7.5YR 5/6) - mottled gray / light olive gray (5Y 6/1) and light brownish gray (2.5Y 6/2)			Annular Fill: cement-bentonite grout
35		<b>Lean Clay (CL)</b> - mottled olive brown (2.5Y 4/3) and light gray (5Y 7/1) damp, low plasticity, interbedded with thin white fine-sand lenses			
40					

(Continued Next Page)

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\WGS.GPJ



# LOG OF TEST BORING

**BORING MGWC-4**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF001\WSHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
					(CONTINUED)
45		<b>Fat Clay (CH)</b> - dark greenish gray (10GY 4/1) damp, medium stiff, medium to high plasticity, interbedded with light gray fine-sand lenses  - greenish black (10GY 2.5/1)			Annular Fill: cement-bentonite grout
50		<b>Poorly-graded Sand with Clay (SP-SC)</b> - very dark greenish gray (5GY 3/1) wet			
		<b>Sandy Silt (ML)</b> - greenish gray (10Y 5/1) damp			Annular Seal: bentonite pellets
		<b>Poorly-graded Sand (SP)</b> - greenish gray (10Y 5/1) wet, fine-grained			Filter: silica filter sand
55		<b>Sandy Silt (ML)</b> - greenish gray (10Y 5/1) damp  - with clay  - increasing sand content with depth			
60		<b>Poorly-graded Sand (SP)</b> - dark greenish gray (10Y 4/1) wet, fine-grained			<b>Standpipe:</b> 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
65		<b>Sandy Silt (ML)</b> - greenish gray (10Y 5/1) damp, hard			Sump: 0.299999999999997 ft.
					Backfill: Bentonite Chips
		Bottom of borehole at 67.0 feet.			
70					
75					
80					
85					

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



# LOG OF TEST BORING

**BORING MGWA-5**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/12/2015 COMPLETED 11/12/2015 SURF. ELEV. 61.42 COORDINATES: N - 855860.82, E - 962763.17

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 67 ft. GROUND WATER DEPTH: DURING 33 ft. COMP. DELAYED 17.4 ft. after 24 hrs.

NOTES TOC Elevation: 64.36

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCP01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Low Plastic Organic Silt or Clay (OL)</b> - fill - mottled black (5Y 2.5/1) and olive gray (5Y 4/2) damp			
		<b>Clayey Sand (SC)</b> - mottled dark gray / olive gray (5Y 4/1) and dark yellowish brown (10YR 4/6) fill moist, cohesive - mottled black (5Y 2.5/1) and olive (5Y 5/4)			
10		<b>Low Plastic Organic Silt or Clay (OL)</b> - mottled olive gray (5Y 4/2) and black (5Y 2.5/1) matted leaves			
		<b>Sandy Lean Clay (CL)</b> - dark grayish brown (2.5Y 4/2) damp, medium stiff, low plasticity - stiff			
15		- mottled grayish brown (2.5Y 5/2) and olive yellow (2.5Y 6/6) dry, low to medium plasticity			
		<b>Fat Clay (CH)</b> - mottled light olive gray (5Y 6/2) and light olive brown (2.5Y 5/4) damp, medium stiff, medium plasticity, interbedded with fine-sand lenses (<1/2" thick) - increased sand lenses thicknesses (1-2")			
20		- greenish gray (5GY 6/1) high plasticity			
		▽ - light gray (5Y 7/1) soft, high plasticity, with silt			
25		<b>Sandy Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and brownish yellow (10YR 6/8) soft, medium to high plasticity			
					Annular Fill: cement-bentonite grout
30		<b>Poorly-graded Sand with Silt (SP-SM)</b> - greenish gray (5GY 6/1) wet, fine-grained			
		<b>Fat Clay (CH)</b> - olive / light olive brown (5Y 5/6) moist, soft, high plasticity			
35		<b>Lean Clay (CL)</b> - dark greenish gray (10GY 4/1) medium stiff, low plasticity, some fine sand			
		<b>Sandy Lean Clay (CL)</b> - dark greenish gray (10GY 4/1) and yellowish brown (10YR 5/8) dry			
40		<b>Poorly-graded Sand with Clay (SP-SC)</b> - greenish gray (5GY 5/1) and light greenish gray (10Y 7/1) wet, cohesive, interbedded with fine-sand lenses			
		<b>Sandy Fat Clay (CH)</b> - dark greenish gray (5GY 4/1) and greenish gray (5GY 5/1) moist, medium stiff, low to medium plasticity, interbedded with fine-sand lenses - strong brown (7.5YR 5/8) and olive brown (2.5Y 4/4) bioturbation			

(Continued Next Page)





# LOG OF TEST BORING

**BORING MGWA-5**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF001\WSHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
					(CONTINUED)
		<b>Fat Clay (CH)</b> - very dark greenish gray (10Y 3/1) very moist, soft, high plasticity			Annular Fill: cement-bentonite grout
45		<b>Sandy Fat Clay (CH)</b> - dark greenish gray (5GY 4/1) and very light gray (N8) very moist, stiff			Annular Seal: bentonite pellets
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - dark greenish gray (10Y 4/1) damp, fine-grained			Filter: silica filter sand
50		<b>Sandy Silt (ML)</b> - greenish gray (10Y 6/1) damp, hard			
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - dark greenish gray (10Y 4/1) wet, fine-grained			
55		<b>Poorly-graded Sand (SP)</b> - greenish gray (10Y 6/1) wet, fine-grained			<b>Standpipe:</b> 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - dark greenish gray (10Y 4/1) wet, fine-grained			
		<b>Sandy Silt (ML)</b> - dark greenish gray (10Y 4/1) damp, stiff			Sump: 0.299999999999997 ft.
60		- hard			
		<b>Lean Clay (CL)</b> - dark greenish gray (10Y 4/1) dry, medium stiff			
65		<b>Sandy Silt (ML)</b> - dark greenish gray (10Y 4/1) damp, stiff			Backfill: Bentonite Chips
		- dry, hard, with clay			
		Bottom of borehole at 67.0 feet.			
70					
75					
80					
85					
		<b>NOTE:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020			



# LOG OF TEST BORING

**BORING MGWA-6**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/12/2015 COMPLETED 11/12/2015 SURF. ELEV. 58.24 COORDINATES: N - 856527.73, E - 963130.08

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 47 ft. GROUND WATER DEPTH: DURING 20 ft. COMP. DELAYED 13.1 ft. after 24 hrs.

NOTES TOC Elevation: 61.08

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Clayey Sand (SC)</b> - mottled grayish brown (2.5Y 5/2) and reddish yellow (7.5YR 6/6) fill wet, fine to coarse-grained - mottled gray (2.5Y 6/1), brownish yellow (10YR 6/8) and red (2.5YR 4/8) dry, cohesive			
10		<b>Sandy Lean Clay (CL)</b> - mottled gray (2.5Y 6/1) and red (2.5YR 4/8) dry, medium stiff, low plasticity - mottled light gray (5Y 7/1) and red (2.5YR 5/8) stiff, medium plasticity			
15		<b>Sandy Fat Clay (CH)</b> - 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 <b>Fat Clay (CH)</b> - mottled red (2.5YR 5/8) and light reddish brown (5YR 6/3) damp, medium stiff - interbedded with brown-yellow sand lenses			Annular Fill: cement-bentonite grout
20		<b>Lean Clay (CL)</b> - mottled light reddish brown / light brown (5YR 6/4) and red (2.5YR 5/6) damp, stiff, low plasticity <b>Well-graded Sand with Clay (SW-SC)</b> - pale olive (5Y 6/3) and strong brown (7.5YR 5/8) very moist, cohesive, fine to coarse-grained			
25		<b>Poorly-graded Sand (SP)</b> - light gray (10YR 7/2) and reddish yellow (7.5YR 6/8) saturated, fine-grained <b>Poorly-graded Sand with Silt (SP-SM)</b> - yellow (2.5Y 7/6) and light gray (2.5Y 7/2) saturated, fine-grained			Annular Seal: bentonite pellets
30		- grayish brown (2.5Y 5/2)			Filter: silica filter sand

(Continued Next Page)

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCFF01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\MGWA-6.GPJ



SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCFP01\WSHAUGNE\$DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ



# LOG OF TEST BORING

**BORING MGWA-6**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		<b>Poorly-graded Sand with Silt (SP-SM) (Con't)</b> - pale yellow (2.5Y 7/4) concretions			(CONTINUED)
35		- light gray (2.5Y 7/2)			
40		- gray (2.5Y 6/1)			
45		<b>Sandy Silt (ML)</b> - light olive brown (2.5Y 5/4) damp			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
		<b>Poorly-graded Sand (SP)</b> - olive (5Y 5/4) wet, fine-grained			Sump:0.299999999999997 ft.
		Bottom of borehole at 47.0 feet.			Backfill:Bentonite Chips
50					
55					
60					
65					

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

# Groundwater Well Installation Log

# MGWA-6A

<b>Project</b>	Plant McIntosh		
<b>City / Town</b>	Effingham County, GA		
<b>Client</b>	Georgia Power Company		
<b>Contractor</b>	Cascade Drilling		
<b>Driller</b>	Matt Pope	<b>GEI Rep.</b>	Peter Adams

<b>GEI Proj. No.</b>	<u>1800205</u>
<b>Location</b>	<u>Ash Pond 1,</u>
<b>N -</b>	<u>856520.82</u>
<b>E -</b>	<u>963113.65</u>
<b>Install Date</b>	<u>1/16/2019</u>

## TOC

**Elevation:** 59.76

Length of PVC Riser above Ground 2.87 feet

## Ground

**Elevation:** 56.89

Dist. Top of Surf. Casing to Top of Riser Pipe      ~ 1 inch

Type of Seal around Surface Casing	Concrete
------------------------------------	----------

ID of Surface Casing	4-inch
----------------------	--------

Type of Surface Casing	Steel square
------------------------	--------------

Depth Bottom of Surface Casing ~ 3 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 22.5 ft

Type of Seal	<u>3/8-inch bentonite pellets</u>
--------------	-----------------------------------

Depth Bottom of Seal	24.5 ft
----------------------	---------

Depth Top of Screened Section 26.5 ft

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	36.5 ft
----------------------------------	---------

Depth Bottom of Silt Trap	36.8 ft
---------------------------	---------

Depth Bottom of Filter Material	36.8 ft
---------------------------------	---------

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	36.8 ft
--------------------	---------

Date	1/16/2019
Time	15:00
Distance to <u>▼</u> below ground surface	13.5 feet

General Soil Conditions (Not to Scale)

See boring log for soil details

**NOTE:**

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



**BORING INFORMATION**

LOCATION: Ash Pond, adjacent to MGWA-6

N: 856520.82, E: 963113.65

GROUND SURFACE EL. (ft): 56.89

DATE START/END: 1/16/2019 - 1/16/2019

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 39.7

DRILLER NAME: Matt Pope

LOGGED BY: P. Adams

RIG TYPE: 2001 ProSonic Full-Size ATV

**BORING****MGWA-6A**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE: Sonic

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): 13.5 1/16/2019 3:00 pm

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
56.89								
		SC1	0 to 7	84/84				(0-0.3'): TOPSOIL
51.89	5							(0.3-2'): CLAYEY SAND (SC); ~70% fine quartz/feldspar sand with mica, ~30% medium plasticity fines. Organics throughout. Medium dense. Moist. Grey-brown.
46.89	10	SC2	7 to 17	120/120				(2-17'): SANDY FAT AND LEAN CLAY (CL-CH); ~70% medium to high plasticity fines, ~30% fine quartz/feldspar sand with mica. Hard. Moist. Grey with red mottling.
41.89	15					Qp @ 14' = 2.0 tsf		
36.89	20	SC3	17 to 27	120/120				(17-20'): SILTY SAND WITH CLAY (SC-SM); ~60% fine to coarse quartz/feldspar sand with mica, ~40% nonplastic to low plasticity fines. Trace angular fine to coarse gravel and shell fragments. Dense. Wet. Light brown.
31.89	25							(20-27'): POORLY GRADED SAND (SP); ~90% fine to coarse quartz/feldspar sand with mica, ~10% nonplastic fines, trace angular to subrounded fine to medium gravel and shell fragments. Dense. Wet. Grey with black flecks.
26.89	30	SC4	27 to 37	120/120				(27-29'): GRAVELLY SAND WITH CLAY (SW-SC); ~80% fine to coarse quartz sand with mica, ~15% nonplastic to low plasticity fines, ~5% subrounded cobbles, trace subrounded fine to coarse gravel. Shell fragments throughout. Dense. Wet. Brown.
21.89	35							(29-39.7'): POORLY GRADED SAND (SP); ~90% fine grained quartz sand with mica, ~10% nonplastic fines. Shell fragments throughout. Medium dense. Wet. Grey with black flecks.
17.19	40	SC5	37 to 39.7	32/32				
								Bottom of boring at depth 39.7 ft.

**NOTES:** Monitoring well MGWA-6A installed here on 1/16/19, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205





# LOG OF TEST BORING

**BORING MGWC-7**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/13/2015 COMPLETED 11/13/2015 SURF. ELEV. 51.28 COORDINATES: N - 857417.68, E - 964007.53

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 47 ft. GROUND WATER DEPTH: DURING 18 ft. COMP. DELAYED 15.7 ft. after 100 hrs.

NOTES TOC Elevation: 54.40

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
		- hand-auger to 3' to verify utility clearance			Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Sandy Lean Clay (CL)</b> - mottled light gray / yellowish gray (5Y 7/2), red / moderate reddish brown (10R 4/6) and dark yellowish brown (10YR 4/6) dry, stiff, no plasticity			
		<b>Clayey Sand (SC)</b> - mottled dark yellowish brown (10YR 3/6) and strong brown (7.5YR 5/8) wet			
		<b>Sandy Lean Clay (CL)</b> - mottled pale yellow (5Y 8/2) and reddish yellow (5YR 6/6) stiff, low plasticity			
10		<b>Sandy Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and dark red (2.5YR 3/6) wet, soft, high plasticity			
		<b>Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and red (10R 5/6) damp, stiff, medium plasticity - interbedded with thin fine-sand lenses			
15		- mottled very pale brown (10YR 7/3) and strong brown (7.5YR 4/6) medium stiff - coarse-sand lense 6" thick			
		▽ - mottled very pale brown (10YR 8/3) and strong brown (7.5YR 4/6)			
		▽			
20		<b>Poorly-graded Sand with Clay (SP-SC)</b> - mottled light brownish gray (2.5Y 6/2), yellowish brown (10YR 5/8) and light red (2.5YR 6/8) wet			
		<b>Poorly-graded Sand (SP)</b> - mottled pale yellow (5Y 7/3) and yellow / moderate yellow (5Y 7/6) saturated, medium to coarse-grained - fine to medium-grained			
25		<b>Poorly-graded Sand with Silt (SP-SM)</b> - mottled yellowish brown (10YR 5/6) and yellow (2.5Y 7/6) saturated			
		<b>Poorly-graded Sand (SP)</b> - pale yellow (2.5Y 7/4) saturated, fine-grained			
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - pale yellow (2.5Y 7/3) saturated, fine-grained			
30					

Annular Fill:  
cement-bentonite grout

Annular Seal:  
bentonite pellets

Filter:  
silica filter sand

(Continued Next Page)

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF01\WSHAUGNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\MGWC-7\BORING LOGS\MCINTOSH\CCR IMPOUNDMENT\MGWC-7.GPJ

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCFF01\WSHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ



# LOG OF TEST BORING

**BORING MGWC-7**  
PAGE 2 OF 2

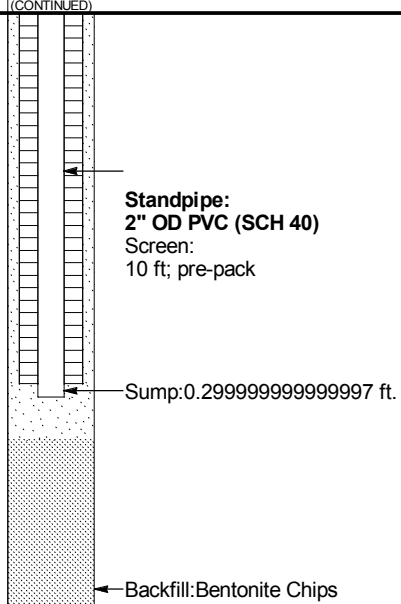
SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
					(CONTINUED)
35		<b>Poorly-graded Sand with Silt (SP-SM) (Con't)</b>  - light gray / yellowish gray (5Y 7/2)   - olive yellow (2.5Y 6/6)  - light gray (5Y 7/1)			
40		<b>Poorly-graded Sand (SP)</b>  - pale olive (5Y 6/3) saturated, fine-grained			
		<b>Poorly-graded Sand with Silt (SP-SM)</b>  - light olive brown (2.5Y 5/6) saturated, concretions  - dark yellowish brown (10YR 3/4)			
45		<b>Poorly-graded Sand (SP)</b>  - light olive brown (2.5Y 5/4) saturated, fine-grained			
		<b>Poorly-graded Sand with Silt (SP-SM)</b>  - dark greenish gray (10Y 4/1) fine-grained			
		Bottom of borehole at 47.0 feet.			
50					
55					
60					
65					

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





# LOG OF TEST BORING

**BORING MGWC-8**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/10/2015 COMPLETED 11/10/2015 SURF. ELEV. 59.69 COORDINATES: N - 857177.10, E - 964141.67

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 52 ft. GROUND WATER DEPTH: DURING 23 ft. COMP. DELAYED 25.4 ft. after 24 hrs.

NOTES TOC Elevation: 62.61

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
		<b>Fat Clay (CH)</b> - mottled light brownish gray (2.5Y 6/2) and yellowish red (5YR 5/8) damp, medium to high plasticity			Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Poorly-graded Sand (SP)</b> - pale yellow (2.5Y 7/4) and yellow (2.5Y 7/6) wet, fine-grained			
		<b>Clayey Sand (SC)</b> - 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			
10		<b>Sandy Lean Clay (CL)</b> - mottled light gray (5Y 7/1) and red (2.5YR 4/8) dry, hard, low plasticity			
15		<b>Sandy Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and red (2.5YR 4/8) moist, medium stiff, medium to high plasticity - interbedded with wet 1/4-1/2" fine-sand lenses			
20					Annular Fill: cement-bentonite grout
25		<b>Poorly-graded Sand with Clay (SP-SC)</b> - pale yellow (5Y 7/3) wet, fine-grained - interbedded with 1-2" clay lenses			
30		<b>Sandy Fat Clay (CH)</b> - mottled light yellowish brown (2.5Y 6/3) and olive / light olive brown (5Y 5/6) wet, high plasticity, interbedded with wet 1/4-1/2" fine-sand lenses - olive yellow (2.5Y 6/6) - 4" wet sand lense - 1" wet sand lenses			
35					Annular Seal: bentonite pellets
40		- 3" wet sand lenses			Filter: silica filter sand

(Continued Next Page)

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCFP01\WSHAUGHNESS\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\ECSS80075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF01\WSHAUGNE\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH CCR IMPOUNDMENT\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ



# LOG OF TEST BORING

**BORING MGWC-8**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		<b>Sandy Fat Clay (CH) (Con't)</b>			(CONTINUED)
		<b>Well-graded Sand with Clay (SW-SC)</b> - mottled light gray / yellowish gray (5Y 7/2) and light yellowish brown (2.5Y 6/4) saturated, fine to coarse-grained - light yellowish brown (2.5Y 6/4) - yellowish brown (10YR 5/6) - light olive brown (2.5Y 5/3) 4" thick fat clay lense			
45		<b>Well-graded Sand with Silt (SW-SM)</b> - grayish brown (2.5Y 5/2) saturated, fine to coarse-grained, trace of fine well-rounded gravel			
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - pale olive (5Y 6/3) saturated, fine-grained			
50		<b>Sandy Silt (ML)</b> - olive yellow (2.5Y 6/6) dry, with mica			
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - yellowish brown (10YR 5/6) very moist, fine-grained			
		Bottom of borehole at 52.0 feet.			
55					
60					
65					
70					
75					
80					
85					
<b>NOTE:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020					

Standpipe:  
2" OD PVC (SCH 40)  
Screen:  
10 ft; pre-pack

Sump: 0.2999999999999997 ft.

Backfill: Bentonite Chips



# LOG OF TEST BORING

**BORING MGWA-9**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/17/2015 COMPLETED 11/17/2015 SURF. ELEV. 56.25 COORDINATES: N - 857129.70, E - 963164.58

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 47 ft. GROUND WATER DEPTH: DURING 19 ft. COMP. DELAYED 15.8 ft. after 24 hrs.

NOTES TOC Elevation: 59.29

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
		<b>Silty Sand (SM)</b> - very dark grayish brown (2.5Y 3/2) topsoil damp			Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		<b>Poorly-graded Sand (SP)</b> - pale yellow (2.5Y 7/3) saturated, fine-grained			
5		<b>Sandy Lean Clay (CL)</b> - mottled brownish yellow / dark yellowish orange (10YR 6/6) and red (10R 5/6) dry, medium stiff, low plasticity			Annular Fill: cement-bentonite grout
		<b>Clayey Sand (SC)</b> - mottled light gray (2.5Y 7/1), olive yellow (2.5Y 6/6) and reddish yellow (5YR 6/8) dry, hard, with mica			
10		<b>Sandy Lean Clay (CL)</b> - mottled light gray (5Y 7/1), dark red (10R 3/6) and yellow (10YR 7/8) dry, stiff, low plasticity, few fine-sand lenses			
		<b>Sandy Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and red (10R 4/8) moist, high plasticity, medium stiff, medium			
15		<b>Fat Clay (CH)</b> - mottled light gray (5Y 7/1) and red (10R 4/8) moist, high plasticity, medium stiff, medium			
20		<b>Well-graded Sand with Clay (SW-SC)</b> - mottled light gray (5Y 7/1) and strong brown (7.5YR 5/6) saturated, fine to coarse-grained  - pale yellow (5Y 7/3) less clay content with depth			
25		<b>Well-graded Sand (SP)</b> - light gray / yellowish gray (5Y 7/2) saturated, fine-grained  - pale yellow (2.5Y 7/4) and light olive brown (2.5Y 5/3)			
		<b>Poorly-graded Sand with Silt (SP-SM)</b> - light gray (2.5Y 7/2) saturated, fine-grained  - olive yellow (2.5Y 6/8) and dark yellowish brown (10YR 4/6)			
30					
					Annular Seal: bentonite pellets
					Filter: silica filter sand

(Continued Next Page)

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCP01\WSHAUGHNESSY\PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\WWS.GPJ





# LOG OF TEST BORING

**BORING MGWA-9**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF001\WSHAUGNE\$DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT ECS380075\BORING LOGS\MCINTOSH CCR IMPOUNDMENT MWS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		<b>Poorly-graded Sand with Silt (SP-SM) (Con't)</b> - yellow (2.5Y 7/6) and olive yellow (2.5Y 6/6) with shell fragments up to 2"			(CONTINUED)
35		- light gray / yellowish gray (5Y 7/2) some coarse-sand, shell fragments up to 1/2", trace of fine well-rounded gravel			
40					
		<b>Sandy Silt (ML)</b> - olive yellow (2.5Y 6/6) damp, low plasticity, concretions			
45					
		Bottom of borehole at 47.0 feet.			
50					
55					
60					
65					

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

Standpipe:  
2" OD PVC (SCH 40)  
Screen:  
10 ft; pre-pack

Sump: 0.299999999999997 ft.

Backfill: Bentonite Chips

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCP01\WSHAUGNES\DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH\CCR IMPOUNDMENT\WWS.GPJ



# LOG OF TEST BORING

**BORING MGWA-10**  
PAGE 1 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DATE STARTED 11/17/2015 COMPLETED 11/17/2015 SURF. ELEV. 62.05 COORDINATES: N - 855934.25, E - 961406.49

CONTRACTOR Cascade EQUIPMENT Prosonic METHOD Rotasonic

DRILLED BY F. Krauss LOGGED BY W. Shaughnessy CHECKED BY ANGLE BEARING

BORING DEPTH 57 ft. GROUND WATER DEPTH: DURING 13 ft. COMP. DELAYED 11.1 ft. after 24 hrs.

NOTES TOC Elevation: 65.07

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		<b>Clayey Sand (SC)</b> - strong brown (7.5YR 4/6) damp, fine to coarse-grained <b>Silty Sand (SM)</b> - dark grayish brown (2.5Y 4/2) damp, fine to coarse-grained <b>Poorly-graded Sand (SP)</b> - pale yellow (2.5Y 7/4) wet, fine-grained, wet			
		<b>Poorly-graded Sand with Clay (SP-SC)</b> - mottled light gray (2.5Y 7/1) and red (2.5YR 5/8) damp			
10		<b>Sandy Lean Clay (CL)</b> - mottled light gray (2.5Y 7/1) and red (2.5YR 5/8) dry, stiff, low plasticity, interbedded with yellow-brown (10YR 5/8) clayey sand - medium stiff, medium plasticity			
15		<b>Sandy Fat Clay (CH)</b> - pale yellow (5Y 7/3) and olive yellow (2.5Y 6/6) wet, medium stiff, medium to high plasticity, interbedded with white fine-sand lenses <1/2" thick			
20		<b>Well-graded Sand with Clay (SW-SC)</b> - light yellowish brown (2.5Y 6/3) wet, cohesive, fine to coarse-grained <b>Lean Clay (CL)</b> - light olive gray (5Y 6/2) and strong brown (7.5YR 5/8) dry, medium stiff, low plasticity, interbedded with fine-sand lenses			Annular Fill: cement-bentonite grout
25		<b>Well-graded Sand with Clay (SW-SC)</b> - pale olive (5Y 6/3) wet			
30		- mottled pale olive (5Y 6/3) and reddish yellow (7.5YR 6/8) increased sand content with depth - interbedded with thin white fine-sand lenses			
35		- 4" fat clay seam			Annular Seal: bentonite pellets
40		<b>Poorly-graded Sand with Clay (SP-SC)</b> - light yellowish brown (2.5Y 6/4) and brownish yellow (10YR 6/8) saturated, cohesive			Filter: silica filter sand

(Continued Next Page)

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE GDT - 12/6/15 20:34 - \\ALTRCF001\WSHAUGNE\$DESKTOP\PLANTS PROJECTS\GEORGIA POWER\MCINTOSH CCR IMPOUNDMENT\WWS.GPJ



# LOG OF TEST BORING

**BORING MGWA-10**  
PAGE 2 OF 2

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT CCR Impoundment

LOCATION Plant McIntosh

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION  Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Poorly-graded Sand with Clay (SP-SC) (Con't)			(CONTINUED)
45		Well-graded Sand with Clay (SW-SC) - very dark greenish gray (10GY 3/1) saturated			
		Sandy Elastic Silt (MH) - greenish black (10Y 2.5/1) wet, with mica			Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack
50		Poorly-graded Sand with Silt (SP-SM) - dark greenish gray (5GY 4/1) saturated, fine-grained			Sump:0.299999999999997 ft.
		Sandy Silt (ML) - greenish gray (5GY 5/1) damp			Backfill:Bentonite Chips
55					
		Bottom of borehole at 57.0 feet.			
60					
65					
70					
75					
80					
85					
		<b>NOTE:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020			

GEOLOGY LOG COLOR GAMMA - ESEE DATABASE GDT - 7/6/16 12:39 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-MCINTOSH\MCINTOSH REPLACEMENT AND ABANDONMENT (2016)\BORING LOGS\MCH



# LOG OF TEST BORING

BORING MGWA-11

PAGE 1 OF 1  
ECS38075

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT McIntosh CCR PZ Install (2016)

LOCATION Plant McIntosh

DATE STARTED 5/26/2016 COMPLETED 5/27/2016 SURF. ELEV. 62.04 COORDINATES: N - 855985.31, E - 962070.22

CONTRACTOR Cascade Drilling EQUIPMENT Sonic METHOD Rotasonic

DRILLED BY T. Ardito LOGGED BY A. Henry CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 57 ft. GROUND WATER DEPTH DURING COMP. 13.5 ft. DELAYED

NOTE TOC Elevation: 64.91

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION  Weak Moderate Strong	COMMENTS	Natural Gamma		
						55	110	165
10		(OL) - topsoil <b>Well-graded Sand (SW)</b> - gray (10YR 5/1) moist, loose, no, fine grained <b>Lean Clay (CL)</b> - white / yellowish gray (5Y 8/1) and yellowish red (5YR 4/6) damp, stiff, medium, micaceous						
20		<b>Poorly-graded Sand with Clay (SP-SC)</b> ▼ - white (10YR 8/1), light reddish brown (2.5YR 6/3) and light gray (2.5Y 7/2) moist, loose, no, very fine grained <b>Lean Clay (CL)</b> - light olive gray (5Y 6/2) and pale olive (5Y 6/3) damp, stiff, medium, little mica						
30		<b>Clayey Sand (SC)</b> - light brownish gray (2.5Y 6/2) moist, loose, low <b>Lean Clay (CL)</b> - 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 <b>Lean Clay (CL)</b> - light olive gray (5Y 6/2) and pale olive (5Y 6/3) damp, medium stiff, medium						
40		<b>Silt (ML)</b> - gray / light olive gray (5Y 6/1) and olive (5Y 4/3) moist, soft, low, little mica and shells <b>Lean Clay (CL)</b> - dark bluish gray (5B 4/1) damp, stiff, low, little shells; trace mica <b>Lean Clay (CL)</b> - dark greenish gray (5GY 4/1) damp, very stiff, medium, trace mica						
50		<b>Silty Sand (SM)</b> - dark bluish gray (5PB 4/1) damp, medium stiff, no, trace mica <b>Silt (ML)</b> - greenish gray (10Y 5/1) damp, medium stiff, no, trace mica <b>Well-graded Sand with Silt (SW-SM)</b> - greenish gray (10Y 5/1) damp, loose, no, very fine grained; trace mica <b>Silt (ML)</b> - grayish olive (10Y 4/2) damp, stiff, no, trace mica						
		Bottom of borehole at 57.0 feet.						

**NOTE:**

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



# LOG OF WELL INSTALLATION

**BORING MGWA-11**  
PAGE 1 OF 1

**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.** 62.04 **COORDINATES:** N: 855985.31 E: 962070.22

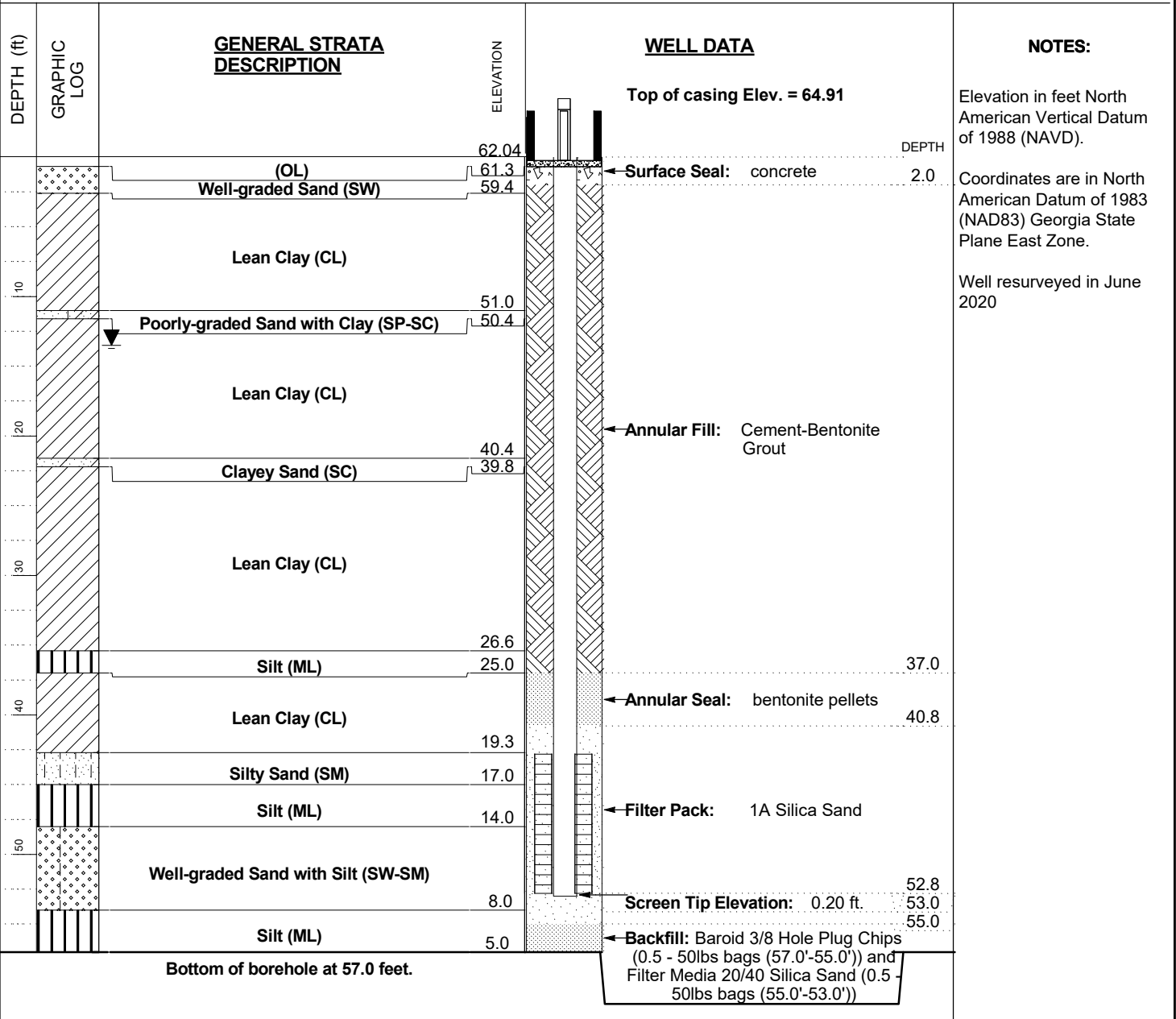
**CONTRACTOR** Cascade Drilling **EQUIPMENT** Sonic **METHOD** Rotasonic

**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**

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS - ATTORNEY CLIENT PRIVILEGE - DRAFT\MCMINTOSH\BORING LOGS\MCMINTOSH AP.GPJ



## 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

GEOLOGY LOG COLOR GAMMA - ESEE DATABASE.GDT - 7/6/16 12:39 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLINGPROJECTS\GA-MCINTOSH\MCINTOSH REPLACEMENT AND ABANDONMENT (2016)\BORING LOGS\MCMC



# LOG OF TEST BORING

**BORING MGWC-12**  
PAGE 1 OF 1  
ECS38075

SOUTHERN COMPANY SERVICES, INC.  
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT McIntosh CCR PZ Install (2016)

LOCATION Plant McIntosh

DATE STARTED 5/23/2016 COMPLETED 5/26/2012 SURF. ELEV. 61.24 COORDINATES: N - 855545.67, E - 963110.24  
CONTRACTOR Cascade Drilling EQUIPMENT Sonic METHOD Rotasonic  
DRILLED BY T. Ardito LOGGED BY A. Henry CHECKED BY B. Smelser ANGLE BEARING  
BORING DEPTH 61 ft. GROUND WATER DEPTH DURING COMP. 12 ft. DELAYED  
NOTES TOC Elevation: 64.10

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS	Natural Gamma 55 110 165
10		<b>Low Plastic Organic Silt or Clay (OL)</b> <b>Lean Clay (CL)</b> - mottled very light gray (N8), reddish yellow (7.5YR 7/8) and red / moderate reddish brown (10R 4/6) dry, stiff, low, micaceous				
20		<b>Lean Clay (CL)</b> - 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 <b>Lean Clay (CL)</b> - gray (10YR 6/1) and bluish gray (5PB 6/1) damp, stiff, low <b>Lean Clay (CL)</b> - light gray / yellowish gray (5Y 7/2) and strong brown (7.5YR 5/6) damp, stiff, low <b>Lean Clay (CL)</b> - pinkish gray (7.5YR 6/2) and light gray (2.5Y 7/1) very damp, stiff, low				
30		<b>Poorly-graded Sand (SP)</b> - light gray (2.5Y 7/2) moist, loose, no <b>Well-graded Sand with Clay (SW-SC)</b> - gray (2.5Y 6/1) very moist, loose, no <b>Lean Clay (CL)</b> - olive gray / light olive gray (5Y 5/2) damp, stiff, low				
40		<b>Lean Clay (CL)</b> - mottled dark greenish gray (10GY 4/1) and reddish yellow (7.5YR 6/6) moist, stiff, low				
50		<b>Silt (ML)</b> - dark gray (N3) damp, stiff, no, some mica <b>Silt (ML)</b> - medium dark gray (N4) damp, stiff, no, some mica <b>Silt (ML)</b> - greenish gray (10Y 5/1) damp, stiff, no, some mica				
60						

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

Bottom of borehole at 61.0 feet.



# LOG OF WELL INSTALLATION

**BORING MGWC-12**  
PAGE 1 OF 1

**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.** 61.24 **COORDINATES:** N: 855545.67 E: 963110.24

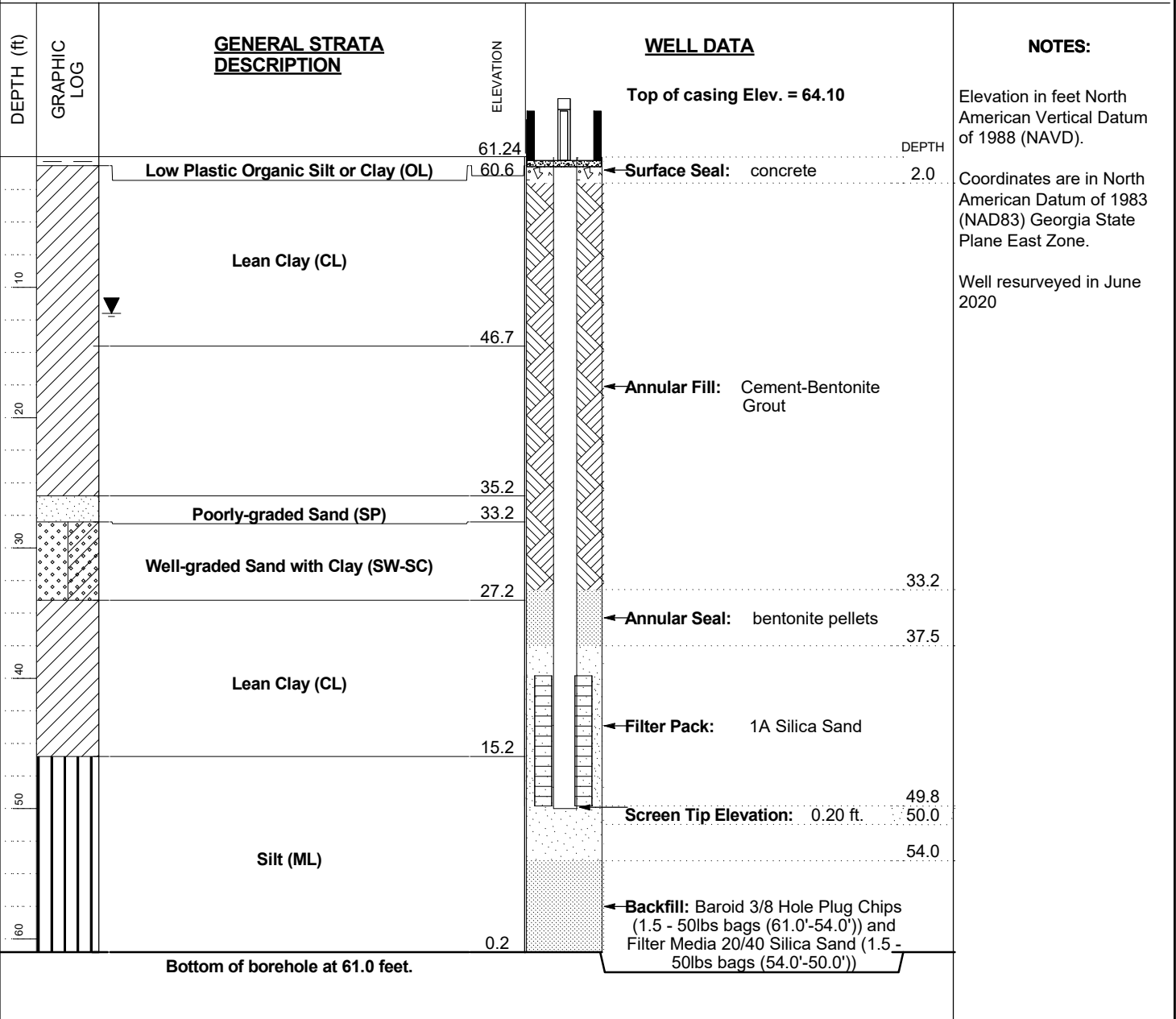
**CONTRACTOR** Cascade Drilling **EQUIPMENT** Sonic **METHOD** Rotosonic

**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**

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS\_ATTORNEY CLIENT PRIVILEGE\_DRAFT\MCMINTOSH\BORING LOGS\MCMINTOSH.AP.GPJ



## 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



# LOG OF WELL INSTALLATION

**BORING PZ-13**  
PAGE 1 OF 1

**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.** 38.02 **COORDINATES:** N - 856123.86, E - 964192.52

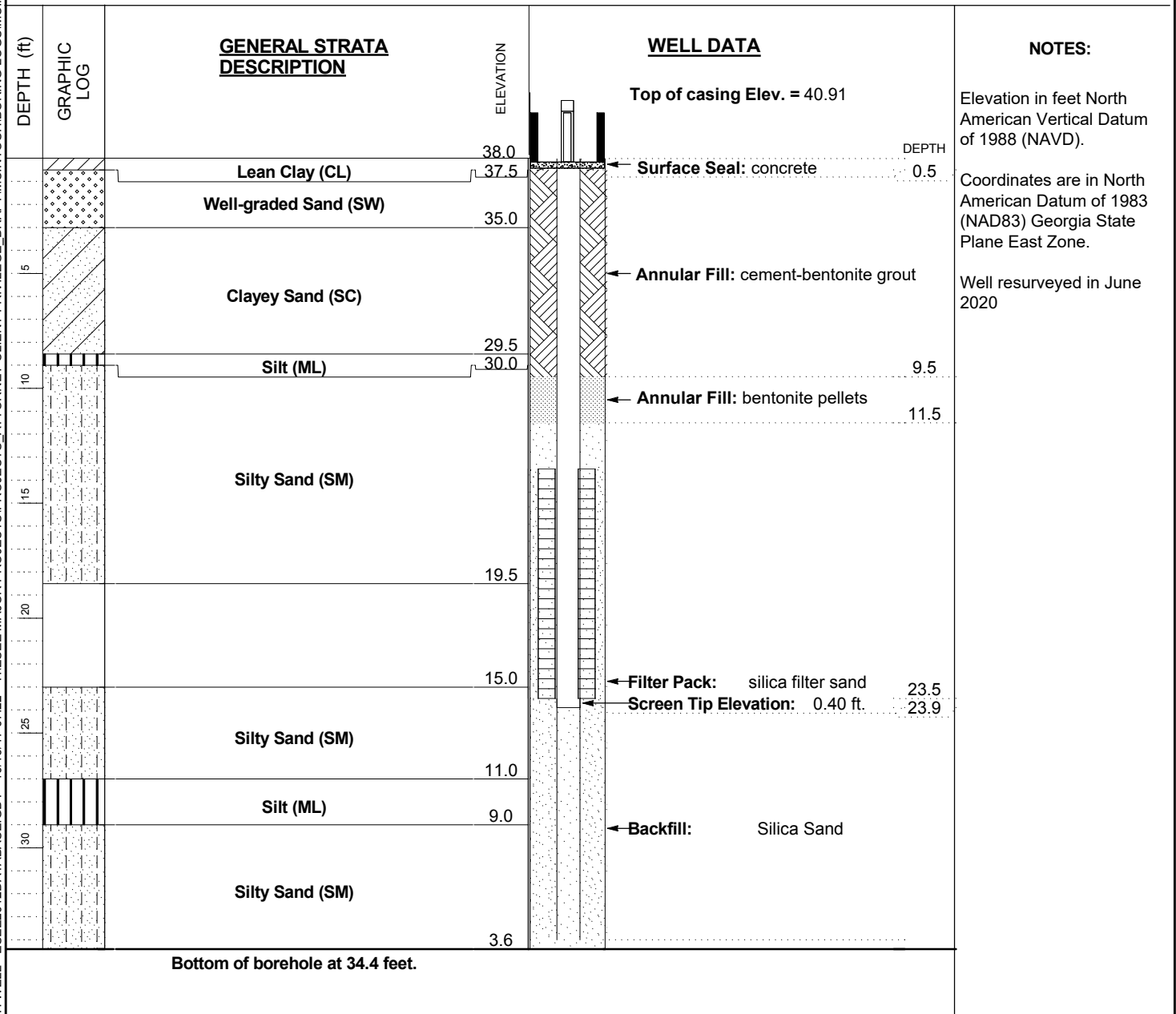
**CONTRACTOR** TTL Inc **EQUIPMENT** CME 75 **METHOD** Hollow Stem Auger

**DRILLED BY** **LOGGED BY** L. Petty **CHECKED BY**

**BORING DEPTH** 34.4 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**

**NOTES**

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS - ATTORNEY CLIENT PRIVILEGE - DRAFT\MCMINTOSH BORING LOGS\MCMINTOSH AP.GPJ



## 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 LOG

**BORING PZ-13**  
PAGE 1 OF 1

**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.** 38.02 **COORDINATES:** N:856123.86 E:964192.52

**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**

S:\ESEE MAJOR PROJECTS\PROJECTS\_ATTORNEY CLIENT PRIVILEGE\_DRAFT\MCMINTOSH\BORING LOGS\MCMINTOSH AP.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA	
				75	150	225	Top of casing Elev. = 40.91	
			38.02					
		Lean Clay (CL) soft, moist, gray	37.5					Surface Seal
		Well-graded Sand (SW) well graded sand with trace clay, soft, light brown, moist	35.0					
5		Clayey Sand (SC) sandy clay, soft, friable, light brown, dry						Annular Fill
			29.5					
10		Silt (ML) light brown to gray, soft, dry	30.0					Annular Seal
		Silty Sand (SM) very fine grain, orange to gray, soft/friable, wet at 18' bls - rest of sample is damp						
15								
			19.5					
20		no recovery - wet						
			15.0					
25		Silty Sand (SM) very fine, soft, friable/ loose, light gray						Filter Pack Screen Tip Elevation
			11.0					
30		Silt (ML) silt with trace clay, orange, hard, moist	9.0					
		Silty Sand (SM) silty sand, very fine grain, light brown, soft, wet						
		silty sand, very fine grain, dark gray, soft, wet						
			3.6					

Bottom of borehole at 34.4 feet.

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



# LOG OF WELL INSTALLATION

**BORING PZ-14**  
PAGE 1 OF 1

**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.** 43.99 **COORDINATES:** N - 855727.20, E - 963895.98

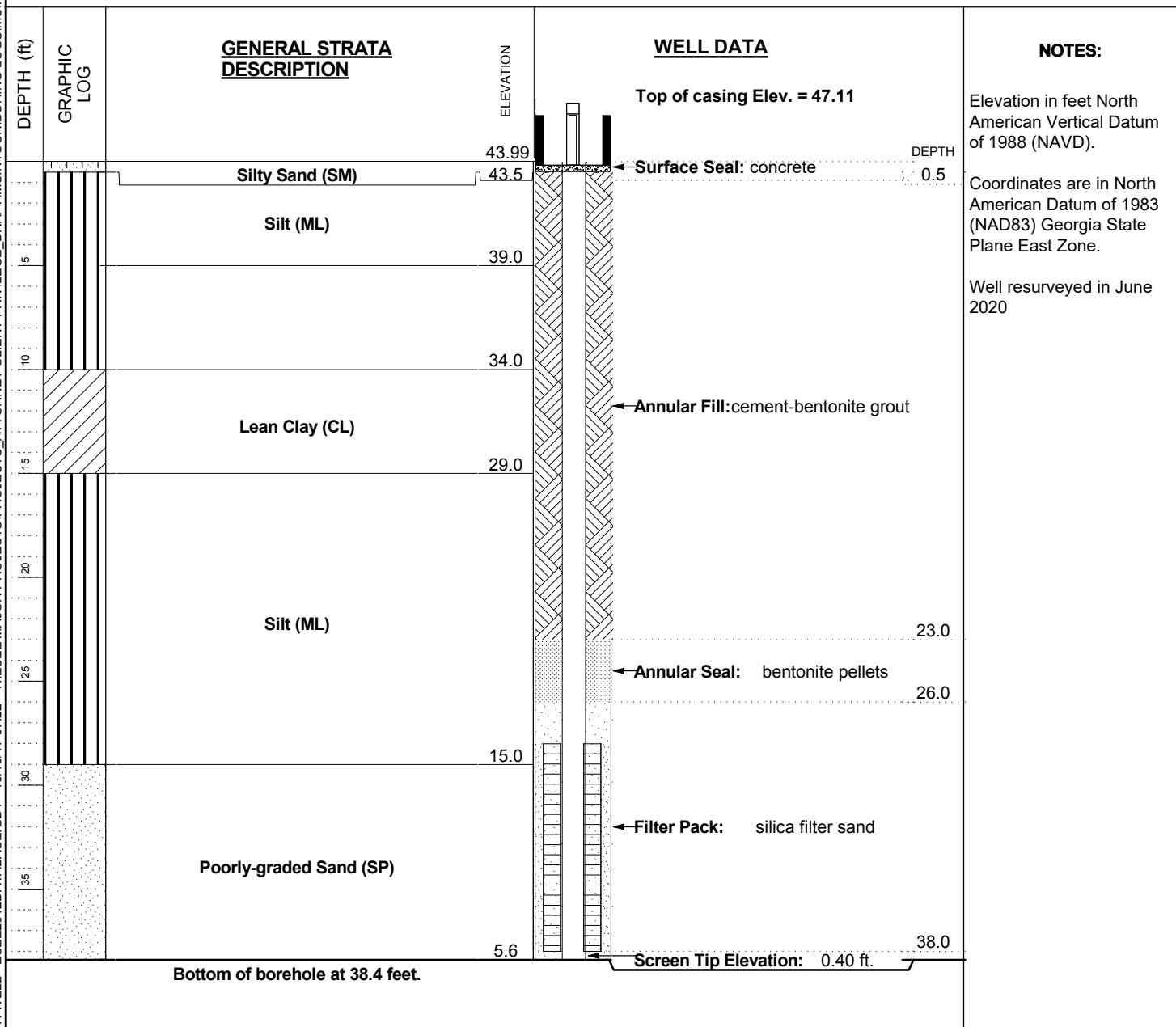
**CONTRACTOR** TTL Inc **EQUIPMENT** CME 75 **METHOD** Hollow Stem Auger

**DRILLED BY** **LOGGED BY** L. Petty **CHECKED BY**

**BORING DEPTH** 38.4 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED**

**NOTES**

2012 GEOTECH LOG WITH WELL - ESEE2012DATABASE.GDT - 10/16/17 07:22 - T:\ESEE MAJOR PROJECTS\PROJECTS\_ATTORNEY CLIENT PRIVILEGE\_DRAFT\MCMINTOSH BORING LOGS\MCMINTOSH AP.GPJ



## 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

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	Natural Gamma			WELL DATA	
				75	150	225	Top of casing Elev. = 47.11	
			43.99					
		<b>Silty Sand (SM)</b> very fine grain, light brown, moist, loose	43.5					<b>Surface Seal</b>
		<b>Silt (ML)</b> light gray, moist, soft						
5		fine grained with muscovite, soft/friable, moist	39.0					
		<b>Silt (ML)</b> clayey silt w/ trace sand, light gray, soft, friable, moist						<b>Annular Fill</b>
10			34.0					
		<b>Lean Clay (CL)</b> clay w/ weathered lenses @ 11.5 & 12.5 (approximately 6" thick), light brown, somewhat stiff, moist						
15			29.0					<b>Annular Seal</b>
		<b>Silt (ML)</b> orange, friable, moist, soft						
20		clayey silt w/ sand lenses throughout, sand lenses are very thin <1" & sand is very fine & white, ML is light gray with olive gray @ 21.5' to dark blue gray @ 24', wet, soft						
25								<b>Filter Pack</b>
		dark blue gray, soft, wet, fine sand throughout trace mica						
30		<b>Poorly-graded Sand (SP)</b> very fine sand, dark gray, trace mica, wet, moderately loose	15.0					
35								<b>Screen Tip Elevation</b>
		<b>NOTES:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020						
			5.6					
Bottom of borehole at 38.4 feet.								

# Groundwater Well Installation Log

**PZ-15**

**Project** Plant McIntosh  
**City / Town** Effingham County, GA  
**Client** Georgia Power Company  
**Contractor** Cascade Drilling  
**Driller** Ray Whitt **GEI Rep.** Peter Adams

**GEI Proj. No.** 1800205  
**Location** Ash Pond  
 N - 856156.03  
 E - 964192.45  
**Install Date** 6/26/2018

**TOC**

**Elevation:** 42.37

**Ground**

**Elevation:** 39.07

Date		
Time		
Distance to ▼ below top of riser pipe		

General Soil Conditions (Not to Scale)

See boring log for soil details

Length of PVC Riser above Ground	3.30 feet
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:**

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



**BORING INFORMATION**

LOCATION: Ash Pond, Northeast of PZ-13

N: 856156.03 E: 964192.45

GROUND SURFACE EL. (ft): 39.07

DATE START/END: 6/26/2018 - 6/26/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 28.0

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: MiniSonic 110CC

**BORING****PZ-15**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
39.07						Hand-augered to 5 feet.		(0-0.2'): TOPSOIL
			0 to 5	60/60				(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.
34.07	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.
29.07	10	SC2	8 to 18	120/120				(9-11'): SILTY SAND (SM); ~70% fine sand, ~30% nonplastic fines. Medium dense. Moist. Brown.
								(11-14'): SANDY SILT (ML); ~60% nonplastic to low plasticity fines, ~40% fine sand. Stiff. Moist. Brown.
24.07	15							(14-16'): CLAYEY SAND (SC); ~60% fine to medium sand, ~40% low plasticity fines. Medium dense. Moist. Grey-brown.
19.07	20	SC3	18 to 28	120/120				(16-25'): SILTY SAND (SM); ~85% fine to coarse sand, ~15% nonplastic fines. Dense. Wet. Grey.
14.07	25							(25-28'): CLAYEY SAND (SC); ~60% fine to medium sand, ~40% low plasticity fines. Dense. Moist. Grey-brown.
11.07								Bottom of boring at depth 28 ft.

**NOTES:** Monitoring well PZ-15 installed here, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

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



# Groundwater Well Installation Log

**PZ-16**

**Project** Plant McIntosh  
**City / Town** Effingham County, GA  
**Client** Georgia Power Company  
**Contractor** Cascade Drilling  
**Driller** Ray Whitt **GEI Rep.** Peter Adams

**GEI Proj. No.** 1800205  
**Location** Ash Pond  
 N - 857077.14  
 E - 964957.28  
**Install Date** 6/26/2018

**TOC**

**Elevation:** 54.71

**Ground**

**Elevation:** 51.29

Date		
Time		
Distance to ▼ below top of riser pipe		

General Soil Conditions (Not to Scale)

See boring log for soil details

Length of PVC Riser above Ground	3.42 feet
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

**NOTE:**

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



**BORING INFORMATION**

LOCATION: Ash Pond, South of the coal

N: 857077.14, E: 964957.28

pile GROUND SURFACE EL. (ft): 51.29

DATE START/END: 6/26/2018 - 6/26/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 40.0

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: MiniSonic 110CC

**BORING****PZ-16**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
51.29						Hand-augered to 5 feet		(0-0.2'): TOPSOIL
			0 to 5	60/60				(0.2-2'): LEAN CLAY WITH SAND (CL); ~85% medium plasticity fines, ~15% fine sand. Very stiff. Moist. Organics throughout. Red-brown.
46.29	5	SC1	5 to 10	60/60				(2-4'): SANDY LEAN CLAY (CL); ~60% low to medium plasticity fines, ~40% fine sand. Stiff. Moist. Red-brown.
41.29	10	SC2	10 to 20	120/120				(4-8'): SILTY SAND (SM); ~80% fine to medium sand, ~20% nonplastic fines. Dense. Moist. Grey.
36.29	15							(8-15'): FAT CLAY (CH); ~90% high plasticity fines, ~10% fine sand. Very hard. Moist. Red-brown.
31.29	20	SC3	20 to 30	120/48				(15-18'): SANDY LEAN CLAY (CL); ~70% medium plasticity fines, ~30% fine sand. Very stiff. Moist. Red-brown.
26.29	25							(18-20'): CLAYEY SAND (SC); ~60% fine sand, ~40% low to medium plasticity fines. Medium dense. Moist. Grey.
21.29	30	SC4	30 to 40	120/120				(20-26'): NO RECOVERY
16.29	35							(26-28'): SANDY LEAN CLAY (CL); ~60% medium plasticity fines, ~40% fine sand. Stiff. Moist. Light brown.
11.29	40							(28-30'): CLAYEY SAND (SC); ~80% fine sand, ~20% low to medium plasticity fines. Dense. Moist. Light brown.
								(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.
								(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.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: Georgia Power Company - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205



# Groundwater Well Installation Log

**PZ-17**

**Project** Plant McIntosh  
**City / Town** Effingham County, GA  
**Client** Georgia Power Company  
**Contractor** Cascade Drilling  
**Driller** Ray Whitt **GEI Rep.** Peter Adams

**GEI Proj. No.** 1800205  
**Location** Ash Pond  
 N - 857655.05  
 E - 964525.72  
**Install Date** 6/27/2018

**TOC**

**Elevation:** 57.51

**Ground**

**Elevation:** 54.07

Date		
Time		
Distance to ▼ below top of riser pipe		

General Soil Conditions (Not to Scale)

See boring log for soil details

Length of PVC Riser above Ground	3.44 feet
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

**NOTE:**

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





**BORING INFORMATION**

LOCATION: Ash Pond, North of the coal pile

N: 857655.05, E: 964525.72

GROUND SURFACE EL. (ft): 54.07

DATE START/END: 6/27/2018 - 6/27/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 44.0

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: MiniSonic 110CC

**BORING****PZ-17**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
54.07						Hand-augered to 5 feet		(0-0.2'): TOPSOIL
49.07	5	SC1	5 to 10	60/60				(0.2-5'): CLAYEY SAND (SC); ~60% fine sand, ~40% medium plasticity fines. Medium dense. Moist. Red-brown.
44.07	10	SC2	10 to 20	120/120				(5-10'): LEAN CLAY WITH SAND (CL); ~85% medium plasticity fines, ~15% fine sand. Stiff. Moist. Red-brown with grey mottling.
39.07	15							(10-13'): FAT CLAY (CH); ~90% high plasticity fines, ~10% fine sand. Very hard. Moist. Red-brown with grey mottling.
34.07	20	SC3	20 to 30	120/120				(13-20'): SANDY FAT CLAY (CH); ~75% high plasticity fines, ~25% fine sand. Hard. Moist. Grey.
29.07	25							(25-30'): CLAYEY SAND (SC); ~75% fine to coarse sand, ~25% low to medium plasticity fines. Medium dense. Wet. Grey.
24.07	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.
19.07	35	SC5	35 to 40	60/60				
14.07	40	SC6	40 to 44	48/48				
10.07	45							(43-44'): CLAYEY SAND (SC); ~80% fine sand, ~20% medium plasticity fines. Dense. Very Moist. Brown-grey. Bottom of boring at depth 44 ft.

**NOTES:** Monitoring well PZ-17 installed here, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

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



GEI WOBURN STD 2-1 LOCATION-GRAPHIC LOG MCINTOSH BORING LOG JUNE 2018 GPJ 8/7/18

# Groundwater Well Installation Log

**PZ-18**

**Project** Plant McIntosh  
**City / Town** Effingham County, GA  
**Client** Georgia Power Company  
**Contractor** Cascade Drilling  
**Driller** Ray Whitt **GEI Rep.** Peter Adams

**GEI Proj. No.** 1800205  
**Location** Ash Pond  
 N - 857542.34  
 E - 963505.91  
**Install Date** 6/27/2018

**TOC**

**Elevation:** 53.48

**Ground**

**Elevation:** 50.26

Date		
Time		
Distance to ▼ below top of riser pipe		

General Soil Conditions (Not to Scale)

See boring log for soil details

Length of PVC Riser above Ground	3.22 feet
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

**NOTE:**

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



**BORING INFORMATION**

LOCATION: Ash Pond, Northeast of MGWA-9

N: 857542.34, E: 963505.91

GROUND SURFACE EL. (ft): 50.26

DATE START/END: 6/27/2018 - 6/27/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 40.0

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: MiniSonic 110CC

**BORING****PZ-18**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
50.26						Hand-augered to 5 feet.		(0-0.3'): TOPSOIL
			0 to 5	60/60				(0.2-13'): FAT CLAY (CH); ~85% high plasticity fines, ~15% fine sand. Very hard. Moist. Red-brown with grey mottling.
45.26	5	SC1	5 to 10	60/60				
40.26	10	SC2	10 to 20	120/120				
35.26	15							(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.
30.26	20	SC3	20 to 30	120/120				(18-22'): SANDY CLAY (CL); ~60% low to medium plasticity fines, ~40% fine sand. Stiff. Moist. Brown.
25.26	25							(22-28'): CLAYEY SAND (SC); ~60% fine sand, ~40% low to medium plasticity fines. Medium dense. Very moist. Brown-grey.
20.26	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.
15.26	35							
10.26	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.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

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



Groundwater Well Installation Log				MGWC-19	
<b>Project</b>	Plant McIntosh			<b>GEI Proj. No.</b>	1800205
<b>City / Town</b>	Effingham County, GA			<b>Location</b>	Ash Pond
<b>Client</b>	Georgia Power Company			N - 857406.16	
<b>Contractor</b>	Cascade Drilling			E - 963972.44	
<b>Driller</b>	Ray Whitt	<b>GEI Rep.</b>	Peter Adams		
				<b>Install Date</b>	10/4/2018

<b>TOC Elevation:</b>	53.98				Length of PVC Riser above Ground	3.24 feet
<b>Ground Elevation:</b>	50.74				Dist. Top of Surf. Casing to Top of Riser Pipe	~ 1 inch


					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	55.4 FT
					Type of Seal	3/8-inch bentonite pellets
					Depth Bottom of Seal	57.4 ft
					Depth Top of Screened Section	59.2 ft
					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	69.2 ft
					Depth Bottom of Silt Trap	69.5 ft
					Depth Bottom of Filter Material	69.5 ft
					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	69.5 ft

Date	Time	Distance to ▼ below ground surface	General Soil Conditions (Not to Scale)			
10/3/2018	17:15	27.4 feet	See boring log for soil details			

**NOTE:**  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.  
Well resurveyed in June 2020.  
Boring completed 10/03/2018.



**BORING INFORMATION**

LOCATION: Ash Pond, adjacent to MGWC-7

N: 857406.16, E: 963972.44

GROUND SURFACE EL. (ft): 50.74

DATE START/END: 10/3/2018 - 10/3/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 69.5

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: TerraSonic 150 Compact Crawler

**BORING****MGWC-19**

PAGE 1 of 2

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): 27.4 10/3/2018





**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
50.74						Air-vac to 10 feet		(0-10'): NO RECOVERY
45.74	5		0 to 10	120/0				
40.74	10	SC1	10 to 20	120/120		Qp @ 13' = 2.0 tsf		(10-17'): FAT CLAY (CH); ~90% high plasticity fines, ~10% fine quartz/feldspar sand. Very stiff. Moist. Grey.
35.74	15							(17-20'): POORLY-GRADED SAND WITH CLAY (SP-SC); ~70% fine quartz/feldspar sand, ~30% low to medium plasticity fines. Dense. Moist. Grey with red mottling.
30.74	20	SC2	20 to 30	120/120				(20-30'): SILTY SAND (SM); ~80% fine to coarse quartz/feldspar sand, ~15% nonplastic to low plasticity fines, ~5% fine to medium subrounded to rounded brown gravel. Trace angular shells, <1 inch wide. Dense. Wet. Tan-grey.
25.74	25							
20.74	30	SC3	30 to 40	120/120				(30-37'): WELL-GRADED SAND (SW); ~85% fine to coarse quartz/feldspar sand with trace mica, 10% nonplastic fines, ~5% fine to coarse angular, subrounded, and rounded black gravel. Trace medium black sand throughout. Trace angular shells, <2 inch wide. Dense. Wet. Tan with brown mottling.

**NOTES:** Monitoring well MGWC-19 installed here on 10/04/2018, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205





LOCATION: Ash Pond, adjacent to MGWC-7

GROUND SURFACE EL. (ft): NM

DATE START/END: 10/3/2018 - 10/3/2018

VERTICAL DATUM:

DRILLING COMPANY: Cascade

# BORING MGWC-19

PAGE 2 of 2

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
10.74	40	SC4	40 to 50	120/120				(37-46'): SILTY SAND WITH GRAVEL (SPG); ~60% fine quartz/feldspar sand with mica, ~25% nonplastic to low plasticity fines, ~10% coarse angular, subrounded, and rounded brown gravel, ~5% rounded cobbles. Trace angular shells, <2 inch wide. Dense. Wet. Tan-Brown.
5.74	45							
0.74	50	SC5	50 to 60	120/120				(46-55'): SILTY SAND AND SANDY SILT (SM-ML); ~60% fine limestone-derived sand with mica, ~40% nonplastic to low plasticity fines. Trace fine to medium angular to subrounded gravel. No visible shells. Very dense. Moist-wet. Grey.
-4.26	55							
-9.26	60	SC6	60 to 69.5	114/114				(55-69.5'): SILTY SAND AND SANDY SILT (SM-ML); ~60% fine limestone-derived sand with mica, ~40% nonplastic to low plasticity fines. Trace fine to medium subangular to subrounded gravel. No visible shells. Extremely dense, limestone texture. Moist. Grey.
-14.26	65							
-18.76	70							Bottom of boring at depth 69.5 ft.
	75							
	80							

**NOTES:** Monitoring well MGWC-19 installed here on 10/04/2018, see installation log for details.  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

**PROJECT NAME:** GPC - Plant McIntosh

**CITY/STATE:** Effingham County, GA

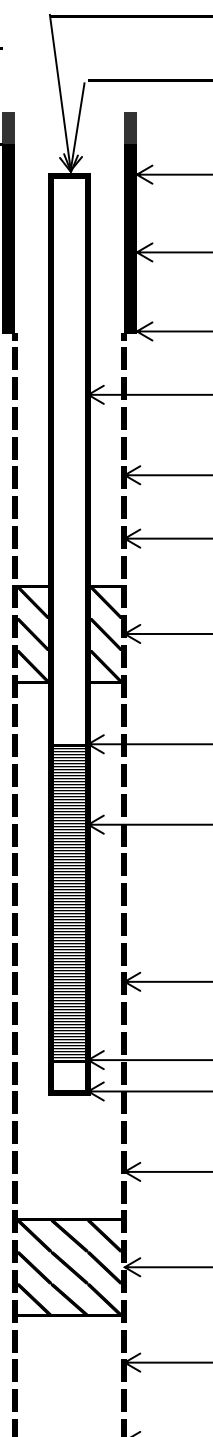
**GEI PROJECT NUMBER:** 1800205



GEI WOBURN STD 2-1 LOCATION GRAPHIC LOG MCINTOSH BORING LOGS OCT2018.GPJ 10/16/18


Groundwater Well Installation Log				MGWC-20	
<b>Project</b> <u>Plant McIntosh</u>		<b>GEI Proj. No.</b> <u>1800205</u>		<b>Location</b> <u>Ash Pond</u> <b>N - 857596.86</b> <b>E - 964281.59</b> <b>Install Date</b> <u>10/3/2018</u>	
<b>City / Town</b> <u>Effingham County, GA</u>		<b>Location</b> <u>Ash Pond</u>			
<b>Client</b> <u>Georgia Power Company</u>		<b>N - 857596.86</b>			
<b>Contractor</b> <u>Cascade Drilling</u>		<b>E - 964281.59</b>			
<b>Driller</b> <u>Ray Whitt</u>		<b>GEI Rep.</b> <u>Peter Adams</u>		<b>Install Date</b> <u>10/3/2018</u>	

<b>TOC</b> <b>Elevation:</b> <u>51.56</u>		<b>Length of PVC Riser above Ground</b> <u>2.79 feet</u>	
<b>Ground</b> <b>Elevation:</b> <u>48.77</u>		<b>Dist. Top of Surf. Casing to Top of Riser Pipe</b> <u>~ 1 inch</u>	
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 10px;"> General Soil Conditions (Not to Scale)   See boring log for soil details </div>  </div>		<b>Type of Seal around Surface Casing</b> <u>Concrete</u>	
		<b>ID of Surface Casing</b> <u>4-inch square</u>	
		<b>Type of Surface Casing</b> <u>Steel</u>	
		<b>Depth Bottom of Surface Casing</b> <u>~ 2 feet</u>	
		<b>ID and OD of Riser Pipe</b> <u>2-inch OD</u>	
		<b>Type of Riser Pipe</b> <u>Sch. 40 PVC</u>	
		<b>Type of Backfill around Riser Pipe</b> <u>bentonite grout</u>	
		<b>Diameter of Borehole</b> <u>6 inches</u>	
		<b>Depth Top of Seal</b> <u>38.0 ft</u>	
		<b>Type of Seal</b> <u>3/8-inch bentonite pellets</u>	
		<b>Depth Bottom of Seal</b> <u>40.0 feet</u>	
		<b>Depth Top of Screened Section</b> <u>41.7 ft</u>	
		<b>Type of Screen</b> <u>Sch. 40 PVC</u>	
		<b>Description of Screen Openings</b> <u>0.010 inches</u>	
		<b>ID and OD of Screened Section</b> <u>2-inch OD with a 3.4-inch OD Pre-packed outer screen</u>	
<b>Type of Filter Material</b> <u>20/40 quartz sand</u>			
<b>Depth Bottom of Screened Section</b> <u>51.7 ft</u>			
<b>Depth Bottom of Silt Trap</b> <u>52.0 ft</u>			
<b>Depth Bottom of Filter Material</b> <u>52.0 ft</u>			
<b>Depth Top of Seal</b> <u>N/A</u>			
<b>Type of Seal</b> <u>N/A</u>			
<b>Depth Bottom of Seal</b> <u>N/A</u>			
<b>Type of Backfill below Filter Material</b> <u>N/A</u>			
<b>Bottom of Borehole</b> <u>52.0 ft</u>			

**NOTE:**  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.  
Well resurveyed in June 2020.  
Boring completed 10/03/2018.



**BORING INFORMATION**

LOCATION: Ash Pond, NE of MGWC-7

N: 857596.86, E: 964281.59

GROUND SURFACE EL. (ft): 48.77

DATE START/END: 10/3/2018 - 10/3/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 52.0

DRILLER NAME: Ray Whitt

LOGGED BY: P. Adams

RIG TYPE: TerraSonic 150 Compact Crawler

**BORING****MGWC-20**

PAGE 1 of 2

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): 27.0 10/3/2018

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
48.77			0 to 10	120/0		Air-vac to 10 feet		(0-10'): NO RECOVERY
43.77	5							
38.77	10	SC1	10 to 20	120/120		Qp @ 12' = 1.5-2.0 tsf		(10-13'): FAT CLAY (CH); ~75% medium to high plasticity fines, ~25% fine quartz/feldspar sand. Very stiff. Moist. Brown.
33.77	15							(13-17'): LEAN CLAY (CL); ~70% low to medium plasticity fines, ~30% fine quartz/feldspar sand. Stiff. Moist. Grey.
28.77	20	SC2	20 to 30	120/120		Qp @ 20' = 1.5-2.0 tsf		(17-20'): CLAYEY SAND (SC); ~60% fine quartz/feldspar sand with mica, ~40% low to medium plasticity fines. Medium dense. Moist. Brown.
23.77	25					Qp @ 25' = 2.0 tsf		(20-30'): FAT CLAY WITH SAND (CH); ~85% high plasticity fines, ~15% fine quartz/feldspar sand with mica. Trace angular shells, <0.5 inch wide. Very stiff. Moist-wet. Grey.

**NOTES:** Monitoring well MGWC-20 installed here on 10/03/2018, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205



LOCATION: Ash Pond, NE of MGWC-7

GROUND SURFACE EL. (ft): 48.77

VERTICAL DATUM: NAVD 88

DATE START/END: 10/3/2018 - 10/3/2018

DRILLING COMPANY: Cascade

# **BORING MGWC-20**

PAGE 2 of 2

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
13.77	35	SC3	30 to 40	120/120		Qp @ 30' = 1.5 tsf		(30-39'): FAT CLAY WITH SAND (CH); ~70% medium to high plasticity fines, ~25% fine quartz/feldspar sand with mica, ~5% fine subrounded black gravel. Trace angular shells, <0.5 inch wide. Stiff. Moist. Grey.
8.77	40	SC4	40 to 50	120/120		Qp @ 37' = 1.5 tsf		(39-45'): WELL SORTED SAND WITH SILT (SP-SM); ~80% fine to coarse quartz/feldspar sand with mica, ~15% nonplastic to low plasticity fines, ~5% fine to medium rounded black gravel. Trace angular shells, <0.5 inch wide. Medium dense. Wet. Brown with grey mottling.
3.77	45							(45-52'): POORLY SORTED SAND (SP); ~85% coarse quartz/feldspar sand with mica, ~15% nonplastic fines. Trace rounded black gravel. No visible shells. Dense. Wet. Tan-grey.
-1.23	50	SC5	50 to 52	24/24				
-3.23	52							Bottom of boring at depth 52 ft.
	55							
	60							
	65							

**NOTES:** Monitoring well MGWC-20 installed here on 10/03/2018, see installation log for details.  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

**PROJECT NAME:** GPC - Plant McIntosh

**CITY/STATE:** Effingham County, GA

**GEI PROJECT NUMBER:** 1800205



GEI\WOBURN STD 2-1\LOCATION-GRAPHIC LOG MCINTOSH BORING LOGS OCT2018.GPJ 10/16/18

Groundwater Well Installation Log				MGWC-21	
<b>Project</b> <u>Plant McIntosh</u>				<b>GEI Proj. No.</b> <u>1800205</u>	
<b>City / Town</b> <u>Effingham County, GA</u>				<b>Location</b> <u>Ash Pond</u>	
<b>Client</b> <u>Georgia Power Company</u>				<b>N - 857159.04</b>	
<b>Contractor</b> <u>Cascade Drilling</u>				<b>E - 964155.30</b>	
<b>Driller</b> <u>Mike Rodrigues</u> <b>GEI Rep.</b> <u>Peter Adams</u>				<b>Install Date</b> <u>11/28/2018</u>	

<b>TOC</b> <b>Elevation:</b> <u>62.65</u>		Length of PVC Riser above Ground <u>2.76 feet</u>	
<b>Ground</b> <b>Elevation:</b> <u>59.89</u>		Dist. Top of Surf. Casing to Top of Riser Pipe <u>~ 1 inch</u>	
<div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small; margin-right: 10px;"> General Soil Conditions (Not to Scale)   See boring log for soil details </div> </div>		Type of Seal around Surface Casing <u>Concrete</u>	
		ID of Surface Casing <u>4-inch square</u>	
		Type of Surface Casing <u>Steel</u>	
		Depth Bottom of Surface Casing <u>~ 2 feet</u>	
		ID and OD of Riser Pipe <u>2-inch OD</u>	
		Type of Riser Pipe <u>Sch. 40 PVC</u>	
		Type of Backfill around Riser Pipe <u>bentonite grout</u>	
		Diameter of Borehole <u>6 inches</u>	
		Depth Top of Seal <u>64.7 ft</u>	
		Type of Seal <u>3/8-inch bentonite pellets</u>	
		Depth Bottom of Seal <u>67.4 ft</u>	
		Depth Top of Screened Section <u>69.4 ft</u>	
		Type of Screen <u>Sch. 40 PVC</u>	
		Description of Screen Openings <u>0.010 inches</u>	
		ID and OD of Screened Section <u>2-inch OD with a 3.4-inch OD Pre-packed outer screen</u>	
Type of Filter Material <u>20/40 quartz sand</u>			
Depth Bottom of Screened Section <u>79.4 ft</u>			
Depth Bottom of Silt Trap <u>79.7 ft</u>			
Depth Bottom of Filter Material <u>79.7 ft</u>			
Depth Top of Seal <u>N/A</u>			
Type of Seal <u>N/A</u>			
Depth Bottom of Seal <u>N/A</u>			
Type of Backfill below Filter Material <u>N/A</u>			
Bottom of Borehole <u>79.7 ft</u>			

**NOTE:**  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.  
Well resurveyed in June 2020.  
Boring completed 11/28/2018.



**BORING INFORMATION**

LOCATION: Ash Pond, adjacent to MGWC-8

N: 857159.04, E: 964155.30

GROUND SURFACE EL. (ft): 59.89

DATE START/END: 11/28/2018 - 11/28/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 80.0

DRILLER NAME: Mike Rodrigues

LOGGED BY: P. Adams

RIG TYPE: Geoprobe 8140LC Mini

**BORING****MGWC-21**

PAGE 1 of 2

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL ELEVATIONS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
59.89								
		SC1	0 to 10	120/120				(0-1.0'): TOPSOIL
								(1-4'): FAT CLAY (CH); ~90% medium to high plasticity fines, ~10% fine quartz sand. Very stiff. Moist. Brown-grey with red mottling.
54.89	5							(4-7'): CLAYEY SAND (SC); ~60% fine to medium quartz sand, ~40% low to medium plasticity fines. Medium dense. Moist. Grey-brown with red mottling.
								(7-11'): SANDY LEAN CLAY (CL); ~70% medium plasticity fines, ~30% fine quartz sand. Hard. Moist. Grey.
49.89	10	SC2	10 to 20	120/120				(11-23'): SANDY FAT CLAY (CH); ~80% medium to high plasticity fines, ~20% fine quartz sand. Hard. Wet. Grey with red mottling.
44.89	15							
39.89	20	SC3	20 to 30	120/120				(23-26'): CLAYEY SAND (SC); ~60% fine quartz sand, ~40% medium plasticity fines. Dense. Wet. Light brown.
34.89	25							(26-41'): SANDY FAT CLAY (CH); ~70% medium to high plasticity fines, ~30% fine quartz sand. Hard. Wet. Grey-brown. 1/2" - 1" lenses of coarse sand throughout.
29.89	30	SC4	30 to 40	120/120				
24.89	35							

**NOTES:** Monitoring well MGWC-21 installed here, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205



LOCATION: Ash Pond, adjacent to MGWC-8

GROUND SURFACE EL. (ft): 59.89









VERTICAL DATUM: NAVD 88

DATE START/END: 11/28/2018 - 11/28/2018

DRILLING COMPANY: Cascade

**BORING  
MGWC-21**

PAGE 2 of 2

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
14.89	45	SC4	40 to 50	120/120				(41-45'): CLAYEY SAND (SC); ~75% fine quartz sand, ~25% nonplastic to low plasticity fines. Trace fine to medium rounded gravel. Dense. Moist. Light brown.
9.89	50							(45-50'): SANDY SILT WITH CLAY (ML); ~75% nonplastic to low plastic fines, ~25% fine quartz sand. Trace fine to medium rounded gravel. Trace angular shells. Very stiff. Moist. Brown-orange.
4.89	55	SC5	50 to 60	120/120				(50-54'): SILTY SAND WITH GRAVEL (SM); ~70% fine quartz sand, ~20% nonplastic fines, ~10% fine to medium angular gravel. Mica throughout. Trace angular shells. Dense. Moist. Brown.
-0.11	60							(54-80'): SILTY SAND AND SANDY SILT (SM-ML); ~50% fine limestone-derived sand with mica, ~50% nonplastic to low plasticity fines. Trace fine to medium subangular to subrounded brittle gravel. No visible shells. Extremely dense, limestone texture. Moist from 54-60', very moist from 60-70', wet from 70-80'. Grey.
-5.11	65	SC6	60 to 70	120/120				
-10.11	70							
-15.11	75	SC7	70 to 80	120/120				
-20.11	80							
	85							
	90							
								Bottom of boring at depth 80 ft.

**NOTES:** Monitoring well MGWC-21 installed here, see installation log for details.  
Elevation in feet North American Vertical Datum of 1988 (NAVD).  
Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

**PROJECT NAME:** GPC - Plant McIntosh

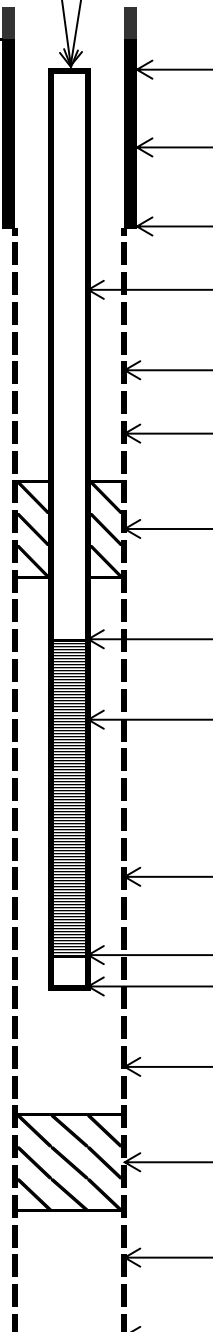
**CITY/STATE:** Effingham County, GA

**GEI PROJECT NUMBER:** 1800205



Groundwater Well Installation Log				MGWC-22	
<b>Project</b> <u>Plant McIntosh</u>			<b>GEI Proj. No.</b> <u>1800205</u>		
<b>City / Town</b> <u>Effingham County, GA</u>			<b>Location</b> <u>Ash Pond</u>		
<b>Client</b> <u>Georgia Power Company</u>			<b>N - 856381.60</b>		
<b>Contractor</b> <u>Cascade Drilling</u>			<b>E - 963948.23</b>		
<b>Driller</b> <u>Mike Rodrigues</u>			<b>GEI Rep.</b> <u>Peter Adams</u>		
<b>Install Date</b> <u>11/29/2018</u>					


<b>TOC</b> <b>Elevation:</b> <u>47.53</u>		Length of PVC Riser above Ground <u>2.44 feet</u>	
<b>Ground</b> <b>Elevation:</b> <u>45.09</u>		Dist. Top of Surf. Casing to Top of Riser Pipe <u>~ 1 inch</u>	
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">General Soil Conditions (Not to Scale)</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; margin-right: 10px;">See boring log for soil details</div>  </div>		Type of Seal around Surface Casing <u>Concrete</u>	
		ID of Surface Casing <u>4-inch square</u>	
		Type of Surface Casing <u>Steel</u>	
		Depth Bottom of Surface Casing <u>~ 2 feet</u>	
		ID and OD of Riser Pipe <u>2-inch OD</u>	
		Type of Riser Pipe <u>Sch. 40 PVC</u>	
		Type of Backfill around Riser Pipe <u>bentonite grout</u>	
		Diameter of Borehole <u>6 inches</u>	
		Depth Top of Seal <u>49.9 ft</u>	
		Type of Seal <u>3/8-inch bentonite pellets</u>	
		Depth Bottom of Seal <u>52.7 ft</u>	
		Depth Top of Screened Section <u>54.8 ft</u>	
		Type of Screen <u>Sch. 40 PVC</u>	
		Description of Screen Openings <u>0.010 inches</u>	
		ID and OD of Screened Section <u>2-inch OD with a 3.4-inch OD Pre-packed outer screen</u>	
Type of Filter Material <u>20/40 quartz sand</u>			
Depth Bottom of Screened Section <u>64.8 ft</u>			
Depth Bottom of Silt Trap <u>65.1 ft</u>			
Depth Bottom of Filter Material <u>65.1 ft</u>			
Depth Top of Seal <u>N/A</u>			
Type of Seal <u>N/A</u>			
Depth Bottom of Seal <u>N/A</u>			
Type of Backfill below Filter Material <u>N/A</u>			
Bottom of Borehole <u>65.1 ft</u>			

Date	11/29/2018	Time	15:15	Distance to ▼ below ground surface	13.4 feet
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**NOTE:**  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.  
 Well resurveyed in June 2020.  
 Boring completed 11/29/2018.



**BORING INFORMATION**

LOCATION: Ash Pond, adjacent to MGWC-2

N: 856381.60, E: 963948.23

GROUND SURFACE EL. (ft): 45.09

DATE START/END: 11/29/2018 - 11/29/2018

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 65.2

DRILLER NAME: Mike Rodrigues

LOGGED BY: P. Adams

RIG TYPE: Geoprobe 8140LC Mini

**BORING****MGWC-22**

PAGE 1 of 2

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE:

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL ELEVATIONS (ft): Not measured

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
45.09								
		SC1	0 to 10	120/120				(0-1.0'): TOPSOIL
40.09	5							(1-7'): SANDY LEAN CLAY (CL); ~60% low to medium plasticity fines, ~40% fine quartz sand. Stiff. Moist. Red-brown with grey mottling.
35.09	10	SC2	10 to 20	120/120				(7-17'): SANDY FAT CLAY (CH); ~80% medium to high plasticity fines, ~20% fine quartz sand. Stiff. Moist. Red-brown with grey mottling.
30.09	15							
25.09	20	SC3	20 to 30	120/120				(17-22'): SANDY ELASTIC SILT (MH); ~85% high plasticity fines, ~15% fine quartz sand. Increased sand content with depth. Soft. Wet. Grey with red mottling.
20.09	25							(22-30'): POORLY GRADED SAND WITH SILT (SP-SM); ~85% fine grained quartz sand, ~15% nonplastic fines. Trace shell fragments. Dense. Wet. Grey-brown.
15.09	30	SC4	30 to 40	120/120				(30-36'): SILTY SAND (SM); ~70% fine quartz sand, ~30% nonplastic to low plasticity fines. Trace shell fragments. Dense. Wet. Light brown.

**NOTES:** Monitoring well MGWC-22 installed here, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205



LOCATION: Ash Pond, adjacent to MGWC-2

GROUND SURFACE EL. (ft): 45.09

VERTICAL DATUM: NAVD 88

DATE START/END: 11/29/2018 - 11/29/2018

DRILLING COMPANY: Cascade

**BORING  
MGWC-22**

PAGE 2 of 2

Elev. (ft)	Depth (ft)	Sample Information				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
5.09	40	SC4	40 to 50	120/120				(36-50'): SILTY SAND AND SANDY SILT (SM-ML); ~50% fine limestone-derived sand with mica, ~50% nonplastic to low plasticity fines. No visible shells. Very dense, limestone texture. Wet. Grey.
0.09	45							
-4.91	50	SC5	50 to 60	120/120				(50-65.2'): SILTY SAND AND SANDY SILT (SM-ML); ~50% fine limestone-derived sand, ~50% nonplastic to low plasticity fines. Very micaceous. Trace rounded brittle gravel. No visible shells. Extremely dense, limestone texture. Wet. Grey.
-9.91	55							
-14.91	60	SC6	60 to 65.2	62/62				
-20.11	65							Bottom of boring at depth 65.2 ft.
	70							
	75							
	80							

NOTES: Monitoring well MGWC-22 installed here, see installation log for details.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205





# Groundwater Well Installation Log

# MGWC-23

<b>Project</b>	Plant McIntosh		
<b>City / Town</b>	Effingham County, GA		
<b>Client</b>	Georgia Power Company		
<b>Contractor</b>	Cascade Drilling		
<b>Driller</b>	Mike Rodrigues	<b>GEI Rep.</b>	Peter Adams

<b>GEI Proj. No.</b>	1800205
<b>Location</b>	Ash Pond
N - 856940.45	
E - 964617.96	
<b>Install Date</b>	11/30/2018

## TOC

**Elevation:** 57.47

Length of PVC Riser above Ground 2.63 feet

## Ground

**Elevation:** 54.84

Dist. Top of Surf. Casing to Top of Riser Pipe ~ 1 inch

Type of Seal around Surface Casing	Concrete
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ID of Surface Casing	4-inch square
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Type of Surface Casing	Steel
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Depth Bottom of Surface Casing ~ 2 feet

ID and OD of Riser Pipe	2-inch OD
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Type of Riser Pipe	Sch. 40 PVC
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Type of Backfill around Riser Pipe	bentonite grout
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Diameter of Borehole	6 inches
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Depth Top of Seal	25.0 ft
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Type of Seal	3/8-inch bentonite pellets
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Depth Bottom of Seal	28.0 ft
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Depth Top of Screened Section 30.0 ft

Type of Screen Sch. 40 PVC

Description of Screen Openings	0.010 inches
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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
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Depth Bottom of Screened Section	40.0 ft
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Depth Bottom of Silt Trap 40.3 ft

Depth Bottom of Filter Material	40.3 ft
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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	40.3 ft
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General Soil Conditions (Not to Scale)

See boring log for soil details

Date	11/30/2018
Time	12:05
Distance to ▾ below ground surface	30.69 feet

**NOTE:**

Elevation in feet North American Vertical Datum of 1988 (NAVD).

Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone.

Well resurveyed in June 2020.

Boring completed 11/29/2018.



**BORING INFORMATION**

LOCATION: Ash Pond, between MGWC-1 and PZ-16  
 GROUND SURFACE EL. (ft): 54.84  
 VERTICAL DATUM: NAVD 88  
 TOTAL DEPTH (ft): 40.3  
 LOGGED BY: P. Adams

N: 856940.45, E: 964617.96  
 DATE START/END: 11/29/2018 - 11/29/2018  
 DRILLING COMPANY: Cascade  
 DRILLER NAME: Mike Rodrigues  
 RIG TYPE: Geoprobe 8140LC Mini

**BORING****MGWC-23**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA  
 AUGER I.D./O.D.: NA / NA  
 DRILLING METHOD: Sonic Drilling  
 WATER LEVEL ELEVATIONS (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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
54.84								
		SC1	0 to 10	120/120				(0-1'): TOPSOIL
								(1-4'): SILTY SAND (SM); ~80% fine to medium quartz sand, ~20% nonplastic fines. Organics and roots throughout. Loose to medium dense. Moist. Light brown.
49.84	5							(4-8'): FAT CLAY (CH); ~90% medium to high plasticity fines, ~10% fine quartz sand. Roots throughout. Very hard. Moist. Red-brown.
44.84	10	SC2	10 to 20	120/120				(8-15'): SANDY FAT CLAY (CH); ~70% medium to high plasticity fines, ~30% fine quartz sand. Very hard. Moist. Red-brown with grey mottling.
39.84	15							(15-19'): FAT CLAY (CH); ~90% medium to high plasticity fines, ~10% fine quartz sand. Very hard. Moist. Red-brown with grey mottling.
34.84	20	SC3	20 to 30	120/120				(19-27'): SANDY LEAN CLAY (CL); ~60% low to medium plasticity fines, ~40% fine to coarse quartz sand. Hard. Wet. Light brown.
29.84	25							(27-31'): CLAYEY SAND (SC); ~70% fine quartz sand, ~30% low to medium plasticity fines. Trace shell fragments. Dense. Wet. Grey-brown.
24.84	30	SC4	30 to 40.3	124/124				(31-40.3'): SILTY SAND (SM); ~80% fine to coarse quartz sand, ~20% nonplastic fines. Trace rounded gravel. Trace shell fragments. Dense. Wet. Brown.
19.84	35							
14.54	40							Bottom of boring at depth 40.3 ft.

**NOTES:** Monitoring well MGWC-23 installed here 11/30/18, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205



Groundwater Well Installation Log				MGWA-24	
<b>Project</b> <u>Plant McIntosh</u>		<b>GEI Proj. No.</b> <u>1800205</u>		<b>Location</b> <u>Ash Pond 1,</u>	
<b>City / Town</b> <u>Effingham County, GA</u>		<b>N -</b> <u>856600.28</u>		<b>E -</b> <u>962885.22</u>	
<b>Client</b> <u>Georgia Power Company</u>		<b>Install Date</b> <u>1/17/2019</u>			
<b>Contractor</b> <u>Cascade Drilling</u>		<b>Driller</b> <u>Matt Pope</u>		<b>GEI Rep.</b> <u>Peter Adams</u>	
<div style="display: flex; justify-content: space-between;"> <div> <b>TOC Elevation:</b> <u>60.53</u>   <b>Ground Elevation:</b> <u>57.55</u> </div> <div style="flex-grow: 1; text-align: center;"> </div> <div style="width: 30%;"> <p>Length of PVC Riser above Ground <u>2.98 feet</u></p> <p>Dist. Top of Surf. Casing to Top of Riser Pipe <u>~ 1 inch</u></p> <p>Type of Seal around Surface Casing <u>Concrete</u></p> <p>ID of Surface Casing <u>4-inch</u></p> <p>Type of Surface Casing <u>Steel square</u></p> <p>Depth Bottom of Surface Casing <u>~ 3 feet</u></p> <p>ID and OD of Riser Pipe <u>2-inch OD</u></p> <p>Type of Riser Pipe <u>Sch. 40 PVC</u></p> <p>Type of Backfill around Riser Pipe <u> bentonite grout</u></p> <p>Diameter of Borehole <u>6 inches</u></p> <p>Depth Top of Seal <u>27.9 feet</u></p> <p>Type of Seal <u>3/8-inch bentonite pellets</u></p> <p>Depth Bottom of Seal <u>31.4 feet</u></p> <p>Depth Top of Screened Section <u>33.7 feet</u></p> <p>Type of Screen <u>Sch. 40 PVC</u></p> <p>Description of Screen Openings <u>0.010 inches</u></p> <p>ID and OD of Screened Section <u>2-inch OD</u></p> <p><u>with a 3.4-inch OD Pre-packed outer screen</u></p> <p>Type of Filter Material <u>20/40 quartz sand</u></p> <p>Depth Bottom of Screened Section <u>43.7 feet</u></p> <p>Depth Bottom of Silt Trap <u>44.0 feet</u></p> <p>Depth Bottom of Filter Material <u>47.0 feet</u></p> <p>Depth Top of Seal <u>N/A</u></p> <p>Type of Seal <u>N/A</u></p> <p>Depth Bottom of Seal <u>N/A</u></p> <p>Type of Backfill below Filter Material <u>N/A</u></p> <p>Bottom of Borehole <u>47.0 feet</u></p> </div> </div>					
<div style="display: flex;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> <div style="text-align: center;">Date</div> <div style="text-align: center;">Time</div> <div style="text-align: center;">Distance to ▼ below ground surface</div> </div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"> <div style="text-align: center;">1/17/2019</div> <div style="text-align: center;">8:30</div> <div style="text-align: center;">13.2 feet</div> </div> </div>		<div style="display: flex;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); padding: 5px; border: 1px solid black;">General Soil Conditions (Not to Scale)</div> <div style="flex-grow: 1; text-align: center; padding: 5px;">See boring log for soil details</div> </div>			
<b>NOTE:</b> Elevation in feet North American Vertical Datum of 1988 (NAVD). Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020. Boring Completed 1/16/2019.					

**BORING INFORMATION**

LOCATION: Ash Pond, adjacent to switchyard

N: 856600.28, E: 962885.22

GROUND SURFACE EL. (ft): 57.55

DATE START/END: 1/16/2019 - 1/16/2019

VERTICAL DATUM: NAVD 88

DRILLING COMPANY: Cascade

TOTAL DEPTH (ft): 47.0

DRILLER NAME: Matt Pope

LOGGED BY: P. Adams

RIG TYPE: 2001 ProSonic Full-Size ATV

**BORING****MGWA-24**

PAGE 1 of 1

**DRILLING INFORMATION**

HAMMER TYPE: NA

CASING I.D./O.D.: 6 inch/ NA

CORE BARREL TYPE: Sonic

AUGER I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL I.D./O.D.: 4 inch / NA

DRILLING METHOD: Sonic Drilling

WATER LEVEL DEPTHS (ft): 13.2 1/17/2019 8:30 am

**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				Drilling Remarks/ Field Test Data	Graphic Log	Soil and Rock Description
		Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD			
57.55						Air-vac to 10 feet		(0-10'): NO RECOVERY
52.55	5		0 to 10	120/0				
47.55	10	SC1	10 to 17	84/84				(10-12'): SANDY CLAY (CL-CH); ~60% medium to high plasticity fines, ~40% fine quartz/feldspar sand. Medium stiff. Wet. Brown-grey.
42.55	15							(12-17'): SANDY FAT CLAY (CH); ~75% high plasticity fines, ~25% fine quartz/feldspar sand with mica. Hard. Wet. Grey.
37.55	20	SC2	17 to 27	120/120		Qp @ 15' = 2.5 tsf		(17-20'): CLAYEY SAND (SC); ~70% fine to coarse quartz/feldspar sand with mica, ~30% low to medium plasticity fines, trace angular to subrounded gravel. Dense. Moist. Grey.
32.55	25							(20-30): SANDY CLAY (CH); ~60% high plasticity fines, ~40% fine to coarse quartz/feldspar sand with mica, trace subrounded fine to medium gravel. Shell fragments throughout. Very stiff. Moist. Grey-brown.
27.55	30	SC3	27 to 37	120/120				(30-44'): SILTY SAND (SM); ~80% fine to coarse quartz sand with mica, ~20% nonplastic to low plasticity fines, trace cobbles and rounded fine to medium gravel. Shell fragments throughout. Dense. Wet. Grey.
22.55	35							
17.55	40	SC4	37 to 47	120/120				
12.55	45							(44-47'): SILTY SAND AND SANDY SILT (SM-ML); ~50% fine limestone-derived sand, ~50% nonplastic to low plasticity fines. Very micaceous. Trace rounded brittle gravel. Trace shell fragments. Extremely dense, limestone texture. Wet. Grey with brown mottling.
10.55								Bottom of boring at depth 47 ft.

**NOTES:** Monitoring well MGWA-24 installed here on 1/17/19, see installation log for details.  
 Elevation in feet North American Vertical Datum of 1988 (NAVD).  
 Coordinates are in North American Datum of 1983 (NAD83) Georgia State Plane East Zone. Well resurveyed in June 2020.

PROJECT NAME: GPC - Plant McIntosh

CITY/STATE: Effingham County, GA

GEI PROJECT NUMBER: 1800205





**CLIENT'S COPY**

**SURETY BOND CONTINUATION CERTIFICATE**

TO: State of Georgia  
Division of Environmental Protection  
2 Martin Luther King Jr. Drive SE  
Suite 1252  
Atlanta, GA 30334

To be attached to and form a part of: Performance Bond for Well Contractors and Drillers

Principal on the Bond: Michael C. Rice/Cascade Drilling, L.P.

Surety Bond Number: K08315607

Bond Amount: Twenty Thousand and 00/100 Dollars ( \$20,000.00)

In consideration of the agreed premium charged for this bond, it is understood and agreed that the following change shall be made to this obligation:

**[ x ] CONTINUATION CERTIFICATE**

This certificate extends the life of the bond to June 30, 2017. It is executed upon the express condition that the surety's liability under said bond, together with this and all previous continuation certificates, shall not be cumulative and shall in no event exceed the amount specifically set forth in said bond or any existing certificate changing the amount of said bond.

Signed, sealed and dated this 26th day of May , 2015 .

Westchester Fire Insurance Company

By: Katie Snider

Katie Snider, Attorney-in-Fact

Surety of Record: Westchester Fire Insurance Company  
436 Walnut Street  
Philadelphia, PA 19106  
Phone: (415) 547-4513

Agent of Record: Kibble & Prentice, a USI Company  
601 Union Street, Suite 1000  
Seattle, WA 98101  
Phone: (206) 441-6300



# Power of Attorney

## WESTCHESTER FIRE INSURANCE COMPANY

Know all men by these presents: That WESTCHESTER FIRE INSURANCE COMPANY, a corporation of the Commonwealth of Pennsylvania pursuant to the following Resolution, adopted by the Board of Directors of the said Company on December 11, 2006, to wit:

"RESOLVED, that the following authorizations relate to the execution, for and on behalf of the Company, of bonds, undertakings, recognizances, contracts and other written commitments of the Company entered into the ordinary course of business (each a "Written Commitment"):

- (1) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise.
- (2) Each duly appointed attorney-in-fact of the Company is hereby authorized to execute any Written Commitment for and on behalf of the Company, under the seal of the Company or otherwise, to the extent that such action is authorized by the grant of powers provided for in such persons written appointment as such attorney-in-fact.
- (3) Each of the Chairman, the President and the Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to appoint in writing any person the attorney-in-fact of the Company with full power and authority to execute, for and on behalf of the Company, under the seal of the Company or otherwise, such Written Commitments of the Company as may be specified in such written appointment, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (4) Each of the Chairman, the President and Vice Presidents of the Company is hereby authorized, for and on behalf of the Company, to delegate in writing any other officer of the Company the authority to execute, for and on behalf of the Company, under the Company's seal or otherwise, such Written Commitments of the Company as are specified in such written delegation, which specification may be by general type or class of Written Commitments or by specification of one or more particular Written Commitments.
- (5) The signature of any officer or other person executing any Written Commitment or appointment or delegation pursuant to this Resolution, and the seal of the Company, may be affixed by facsimile on such Written Commitment or written appointment or delegation.

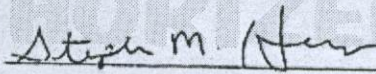
FURTHER RESOLVED, that the foregoing Resolution shall not be deemed to be an exclusive statement of the powers and authority of officers, employees and other persons to act for and on behalf of the Company, and such Resolution shall not limit or otherwise affect the exercise of any such power or authority otherwise validly granted or vested.

Does hereby nominate, constitute and appoint Heather Allen, Holly E Ulfers, Katie Snider, Nancy N Hill, Roxana Palacios, Steven W Palmer, all of the City of SEATTLE, Washington, each individually if there be more than one named, its true and lawful attorney-in-fact, to make, execute, seal and deliver on its behalf, and as its act and deed any and all bonds, undertakings, recognizances, contracts and other writings in the nature thereof in penalties not exceeding Fifteen million dollars & zero cents (\$15,000,000.00) and the execution of such writings in pursuance of these presents shall be as binding upon said Company, as fully and amply as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its principal office,

IN WITNESS WHEREOF, the said Stephen M. Haney, Vice-President, has hereunto subscribed his name and affixed the Corporate seal of the said WESTCHESTER FIRE INSURANCE COMPANY this 22 day of December 2014.

WESTCHESTER FIRE INSURANCE COMPANY

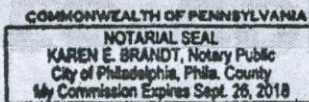


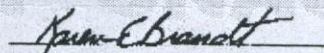
  
Stephen M. Haney, Vice President

COMMONWEALTH OF PENNSYLVANIA  
COUNTY OF PHILADELPHIA ss.

On this 22 day of December, AD. 2014 before me, a Notary Public of the Commonwealth of Pennsylvania in and for the County of Philadelphia came Stephen M. Haney, Vice-President of the WESTCHESTER FIRE INSURANCE COMPANY to me personally known to be the individual and officer who executed the preceding instrument, and he acknowledged that he executed the same, and that the seal affixed to the preceding instrument is the corporate seal of said Company; that the said corporate seal and his signature were duly affixed by the authority and direction of the said corporation, and that Resolution, adopted by the Board of Directors of said Company, referred to in the preceding instrument, is now in force.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal at the City of Philadelphia the day and year first above written.

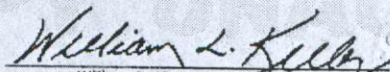


  
Notary Public

I, the undersigned Assistant Secretary of the WESTCHESTER FIRE INSURANCE COMPANY, do hereby certify that the original POWER OF ATTORNEY, of which the foregoing is a substantially true and correct copy, is in full force and effect.

In witness whereof, I have hereunto subscribed my name as Assistant Secretary, and affixed the corporate seal of the Corporation, this 26<sup>th</sup> day of May, 2015.



  
William L. Kelly, Assistant Secretary

THIS POWER OF ATTORNEY MAY NOT BE USED TO EXECUTE ANY BOND WITH AN INCEPTION DATE AFTER December 22, 2016.





**COPY**

CONTINUATION  
CERTIFICATE

Atlantic Specialty Insurance Company

, Surety upon

a certain Bond No. **800031223**

dated effective June 30, 2017  
(MONTH-DAY-YEAR)

on behalf of Michael C. Rice and Cascade Drilling, L.P., any and all employees, officers and partners  
(PRINCIPAL)

and in favor of State of Georgia  
(OBLIGEE)

does hereby continue said bond in force for the further period

beginning on June 30, 2019  
(MONTH-DAY-YEAR)

and ending on June 30, 2021  
(MONTH-DAY-YEAR)

Amount of bond Thirty Thousand and Zero/100 (\$30,000.00)

Description of bond Water Well Contractor Performance Bond

Premium: \$1,200.00

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

Signed and dated on May 9, 2019  
(MONTH-DAY-YEAR)  
Atlantic Specialty Insurance Company

By \_\_\_\_\_  
Attorney-in-Fact Elizabeth R. Hahn

Parker, Smith & Feek, Inc.  
Agent

2233 112th Ave NE Bellevue, WA 98004  
Address of Agent

(425) 709-3600  
Telephone Number of Agent

## Power of Attorney

KNOW ALL MEN BY THESE PRESENTS, that ATLANTIC SPECIALTY INSURANCE COMPANY, a New York corporation with its principal office in Plymouth, Minnesota, does hereby constitute and appoint: **Deanna M. French, Susan B. Larson, Elizabeth R. Hahn, Jana M. Roy, Scott McGilvray, Mindee L. Rankin, Ronald J. Lange, John R. Claeys, Roger Kaltenbach, Guy Armfield, Scott Fisher, Andrew P. Larsen, Nicholas Fredrickson**, each individually if there be more than one named, its true and lawful Attorney-in-Fact, to make, execute, seal and deliver, for and on its behalf as surety, any and all bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof; provided that no bond or undertaking executed under this authority shall exceed in amount the sum of: **sixty million dollars (\$60,000,000)** and the execution of such bonds, recognizances, contracts of indemnity, and all other writings obligatory in the nature thereof in pursuance of these presents, shall be as binding upon said Company as if they had been fully signed by an authorized officer of the Company and sealed with the Company seal. This Power of Attorney is made and executed by authority of the following resolutions adopted by the Board of Directors of ATLANTIC SPECIALTY INSURANCE COMPANY on the

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

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

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

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

IN WITNESS WHEREOF, ATLANTIC SPECIALTY INSURANCE COMPANY has caused these presents to be signed by an Authorized Officer and the seal of the Company to be affixed this twenty-sixth day of October, 2017.

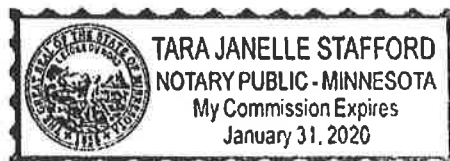
STATE OF MINNESOTA  
HENNEPIN COUNTY



By

Paul J. Brehm, Senior Vice President

On this twenty-sixth day of October, 2017, before me personally came Paul J. Brehm, Senior Vice President of ATLANTIC SPECIALTY INSURANCE COMPANY, to me personally known to be the individual and officer described in and who executed the preceding instrument, and he acknowledged the execution of the same, and being by me duly sworn, that he is the said officer of the Company aforesaid, and that the seal affixed to the preceding instrument is the seal of said Company and that the said seal and the signature as such officer was duly affixed and subscribed to the said instrument by the authority and at the direction of the Company.



Notary Public

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

Signed and sealed. Dated 9 day of May 2019

This Power of Attorney expires  
October 1, 2019



Christopher V. Jerry, Secretary

107 Mountain Brook Dr., Ste. 104  
Canton, GA 30115



www.gunninsurvey.com  
678.880.7502

DATE: July 2, 2020

TO: Atlantic Coastal Consulting, Inc  
1150 Northmeadow Parkway  
Suite 100  
Roswell, GA 30076

ATTN: Evan Perry of Atlantic Coastal Consulting

SUBJECT: Plant McIntosh Ash Pond 1: 19 wells / 6 piezometers

The following data has been established on the existing wells using Georgia State Plane East Zone (NAD 83 horizontal and NAVD 88 vertical). Wells were surveyed to the following tolerances: 0.01' vertical and 0.5' horizontal via conventional survey methods, GPS, OPUS processing, and level loops. Each well was cross-checked for horizontal and vertical accuracy.

WELL ID	NORTHING	EASTING	ELEVATION	ELEVATION	ELEVATION
	NAIL	NAIL	NAIL	TOP OF CASE	TOP OF PVC
MGWA-5	855860.82	962763.17	61.42	64.57	64.36
MGWA-6	856527.73	963130.08	58.24	61.22	61.08
MGWA-6A	856520.82	963113.65	56.89	59.90	59.76
MGWA-9	857129.70	963164.58	56.25	59.44	59.29
MGWA-10	855934.25	961406.49	62.05	65.23	65.07
MGWA-11	855985.31	962070.22	62.04	65.11	64.91
MGWA-24	856600.28	962885.22	57.55	60.75	60.53
MGWC-1	856813.23	964287.35	62.20	65.36	65.23
MGWC-2	856400.69	963958.38	45.32	48.72	48.54
MGWC-3	856033.79	963658.28	50.09	52.78	52.65
MGWC-4	855555.05	963139.37	61.05	64.46	64.33
MGWC-7	857417.68	964007.53	51.28	54.55	54.40
MGWC-8	857177.10	964141.67	59.69	62.75	62.61
MGWC-12	855545.67	963110.24	61.24	64.32	64.10
MGWC-19	857406.16	963972.44	50.74	54.13	53.98
MGWC-20	857596.86	964281.59	48.77	51.84	51.56

MGWC-21	857159.04	964155.30	59.89	62.85	62.65
MGWC-22	856381.60	963948.23	45.09	47.73	47.53
MGWC-23	856940.45	964617.96	54.84	57.63	57.47
<b>WELL ID</b>	<b>NORTHING</b>	<b>EASTING</b>	<b>ELEVATION</b>	<b>ELEVATION</b>	<b>ELEVATION</b>
	<b>NAIL</b>	<b>NAIL</b>	<b>NAIL</b>	<b>TOP OF CASE</b>	<b>TOP OF PVC</b>
PZ-13	856123.86	964192.52	38.02	41.11	40.91
PZ-14	855727.20	963895.98	43.99	47.34	47.11
PZ-15	856156.03	964192.45	39.07	42.50	42.37
PZ-16	857077.14	964957.28	51.29	54.85	54.71
PZ-17	857655.05	964525.72	54.07	57.64	57.51
PZ-18	857542.34	963505.91	50.26	53.61	53.48

Sincerely yours,

Gunnin Land Surveying, LLC.



Jesse R. Gunnin, L.S. Principal Surveyor

107 Mountain Brook Dr., Ste. 104  
Canton, GA 30115



www.gunninsurvey.com  
678.880.7502

DATE: July 23, 2021

TO: Atlantic Coastal Consulting, Inc  
1150 Northmeadow Parkway  
Suite 100  
Roswell, GA 30076

ATTN: Evan Perry of Atlantic Coastal Consulting

SUBJECT: Plant McIntosh Ash Pond 1: Repair of MGWC-1

The following data has been established on the existing wells using Georgia State Plane East Zone (NAD 83 horizontal and NAVD 88 vertical). Wells were surveyed to the following tolerances: 0.01' vertical and 0.5' horizontal via conventional survey methods, GPS, OPUS processing, and level loops. Each well was cross-checked for horizontal and vertical accuracy.

WELL ID	NORTHING	EASTING	ELEVATION	ELEVATION	ELEVATION
	NAIL	NAIL	NAIL	TOP OF CASE	TOP OF PVC
MGWC-1	856813.08	964287.47	62.18	65.47	65.26

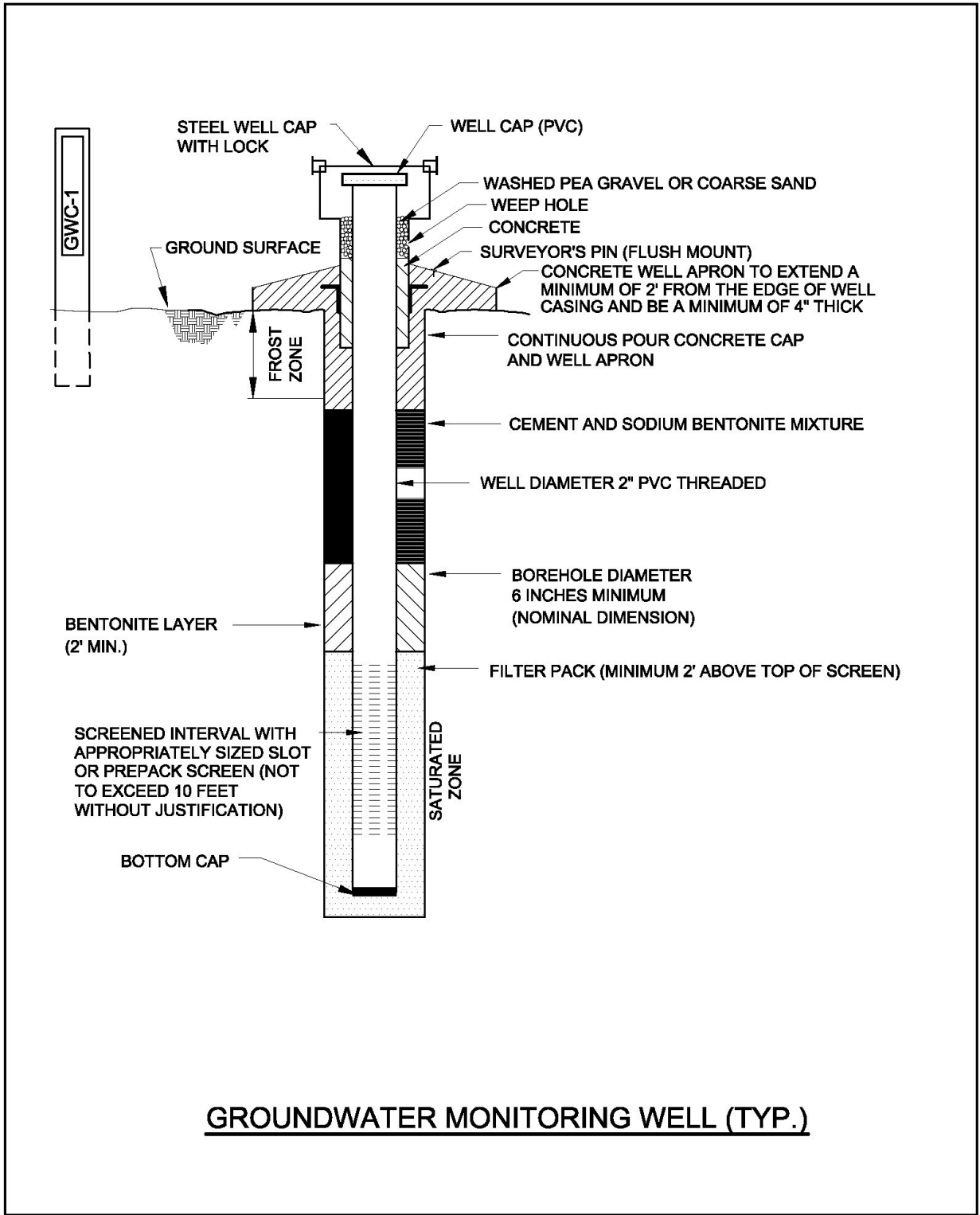
Sincerely yours,

Gunnin Land Surveying, LLC.



Jesse R. Gunnin, L.S. Principal Surveyor

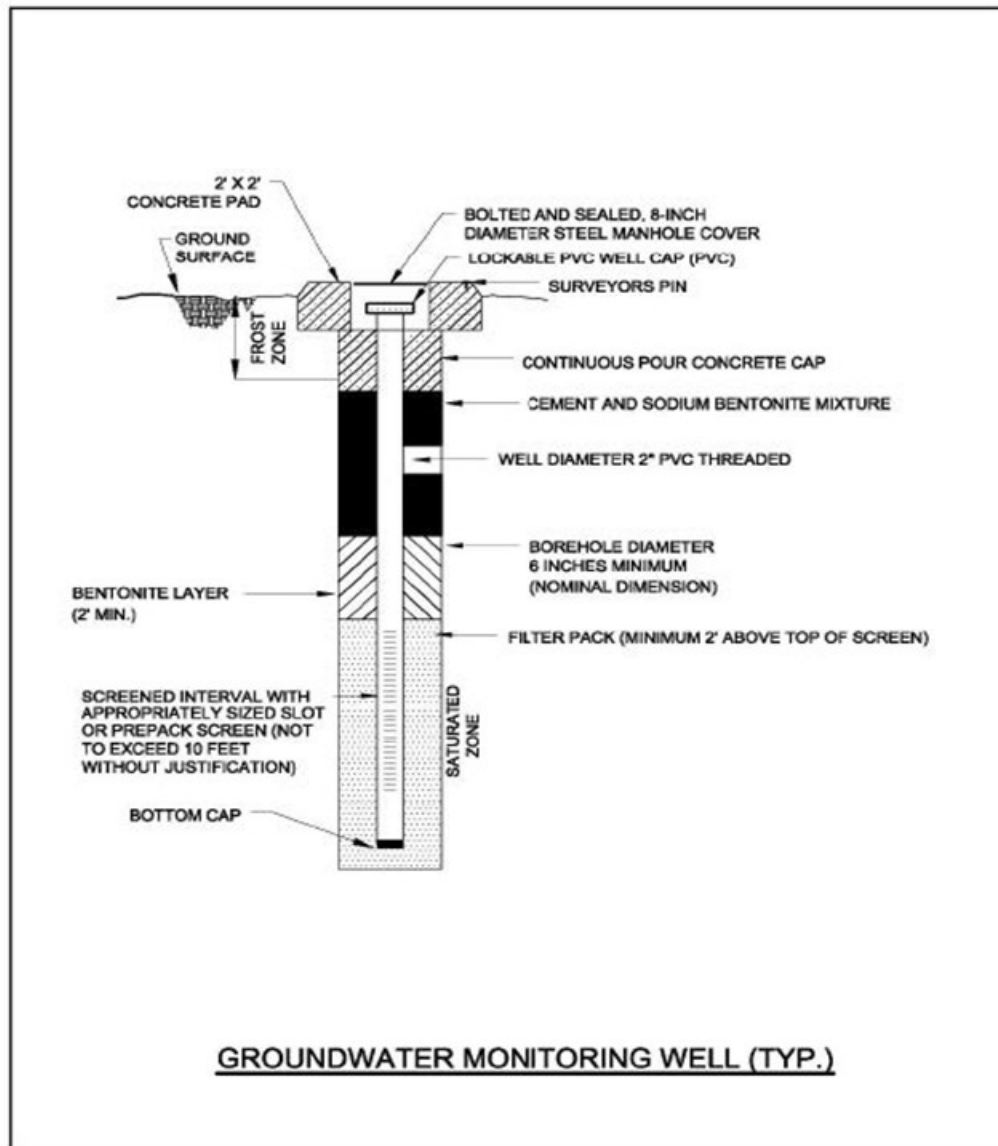
## Appendix B - Groundwater Monitoring Well Detail





## Appendix B Groundwater Monitoring Well Detail Flush-Mount Surface

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## Appendix C - Groundwater Sampling Procedure

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Field logs 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 EPA Region 4 Field Quality and Technical Procedures as a guide. The following procedures describe the general methods associated with groundwater sampling at the Site. Prior to sampling, the well must be evacuated (purged) to ensure that representative groundwater is obtained. Any item coming in contact with the inside of the well casing or the well water will be kept in a clean container and handled only with gloved hands.

Sampling personnel 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 0.01 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 two feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. All non-dedicated 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 LSASD, Operating Procedure – *Field Equipment Cleaning and Decontamination* (EPA, LSASDPROC-205-R4, 2020) 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:
    - $\pm 0.1$  for pH
    - $\pm 5\%$  for specific conductance (conductivity)
-

- $\pm 10\%$  or  $\pm 0.2$  mg/L (whichever is greater) for DO where  $DO > 0.5$  mg/L. If  $DO < 0.5$  mg/L no stabilization criteria apply
- Temperature – Record only, not used for stabilization criteria
- ORP – Record only, not used for stabilization criteria.
- $\leq 5$  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 up to 3 additional hours in order to reduce the turbidity to less than 10 NTU.

- If turbidity remains above 5 NTU but is less than 10 NTU after the additional 3 hours 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 100 and 200 mL/min, according to the most current version of the EPA Region 4 LSASD, Operating Procedure – *Groundwater Sampling* (LSASDPROC-301-R6, 2023), such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.
  8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results (i.e.,  $> 10$  NTU), duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. A new filter must be used for each well and each sampling event. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.
  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.

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