

GROUNDWATER MONITORING PLAN

PLANT SCHERER
ASH POND 1
MONROE COUNTY, GEORGIA

FOR



Georgia
Power

NOVEMBER 2018



GOLDER

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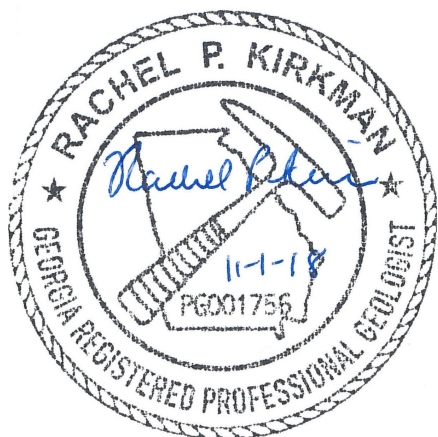
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CERTIFICATION

This Groundwater Monitoring Plan, Georgia Power Company - Plant Scherer Ash Pond AP-1 has been prepared to meet the requirements of the Georgia Solid Waste Management Rule by a qualified groundwater scientist or engineer with Golder Associates Inc. References to the appropriate 391-3-4 Rules are incorporated throughout this document.

I certify that I am a qualified groundwater scientist as defined in 391-3-4-.01(57) who 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 me to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action. I further certify that this Groundwater Monitoring Plan was prepared by myself or by a subordinate working under my direction. The design of the groundwater monitoring system was developed in compliance with Georgia Environmental Protection Division (EPD) Rules of Solid Waste Management, Chapter 391-3-4-.10(6).

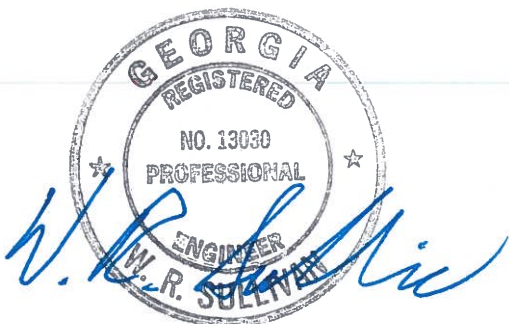
Golder Associates Inc.



11/1/2018

Rachel P. Kirkman, PG
Georgia Registered Professional Geologist No. 1756

Date



11/1/2018

W. Randall Sullivan, PE
Georgia Registered Professional Engineer No. 13030

Date

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1.0 INTRODUCTION

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

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

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (§257.90), a detection monitoring well network for AP-1 has been installed and certified by a qualified professional engineer. This certification has been placed in the facility's operating record and is included in Part B of the permit application. The existing monitoring wells were installed following the guidelines presented herein. Additionally, this plan documents the methods for future monitoring well installation and/or replacement, and procedures for well abandonment. As required by 391-3-4.10(6)(g), a minor modification will be submitted to the EPD prior to the unscheduled installation or abandonment of monitoring wells. Well installation and/or abandonment must be directed by a qualified groundwater scientist.

2.0 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic and hydrogeologic conditions for this site are described in a report, *Geologic and Hydrogeologic Summary Report*, prepared by Golder Associates Inc., November 2018. Key elements of this report are summarized below.

2.1 Site Geology

The site is underlain by regolith consisting of residual soils and saprolite overlying fractured, crystalline bedrock. Bedrock at the site consists of interlayered feldspathic biotite gneiss with discontinuous layers and lenses of chlorite/actinolite schist and feldspathic hornblende gneiss/amphibolite. Large, discontinuous lenses or pods of mafic bodies were locally observed to be interlayered with the gneiss near the central and eastern portions of the site.

The metamorphic and igneous rocks that underlie the area have been subjected to physical and chemical weathering which has created a landscape dissected by creeks and streams forming a dendritic drainage pattern. These rocks are deeply weathered due to the humid climate and bedrock is typically overlain by a variably thick blanket of residual soils and saprolite. Because of such variations in rock types and topography, the depth of weathering can vary significantly over short horizontal distances. Based on boring logs, residual soils, primarily sandy silt, silty sand, sandy clay and silty clay, occur as a variably-thick blanket overlying bedrock across most of the site. The thickness of the residual soil encountered in the borings is variable, ranging from a minimum of approximately 17 feet to as much as 168 feet, with an average residual soil thickness of about 57 feet. Thickness of saprolitic soils and/or saprolitic rock range in thickness across the site.

2.2 Site Hydrogeology

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

Local complexities in groundwater flow within this aquifer are influenced by topographic and related top of rock variations on site, which produces an uppermost aquifer surface that is generally a subdued reflection of topography. Groundwater flow is north toward unnamed tributaries to Berry Creek, east toward Berry Creek and the Ocmulgee River, and south toward the settling (Recycle) pond and Lake Juliette. Topographically higher areas west of AP-1 represent the only upgradient locations on the property. The first zone of groundwater saturation is generally present in the regolith; however, the water table at topographic highs may occur in the upper bedrock at higher land elevations.

Based on review of the potentiometric contours, horizontal hydraulic gradient is also variable and reflects topography at the site. The horizontal gradient appears to be steeper around the perimeter of the pond, particularly along the embankment where groundwater flow lines are influenced by the constructed slope for the dam. Field hydraulic conductivity tests (i.e., slug tests) performed in a variety of geologic materials indicate an average hydraulic conductivity on the order of 10^{-4} centimeters per second [(cm/s); Backup data includes 58 slug test measurements across the site with an average of 2.356 feet/day (ft/day); median 1.305 ft/day]. This hydraulic conductivity is generally consistent with regional measurements within Piedmont overburden. In general, groundwater flow is potentially faster through the transitionally weathered zone; however, the magnitude of difference is nominal enough to not be considered relevant at this site.

2.3 Uppermost Groundwater Aquifer

At the site, groundwater within the (saturated) overburden represents the uppermost aquifer. This uppermost aquifer is comprised of both residual soils and transitionally weathered rock and is generally unconfined. It is recharged by precipitation stored in residual soils and typically discharges into major streams and rivers.

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

Local complexities in groundwater flow within this aquifer are influenced by topographic and related top of rock variations on site. The water table surface is a subdued reflection of topography at the site, with groundwater generally flowing radially from the ash pond because it is situated on a topographic high. It appears that groundwater flow is toward the pond from the west and eventually flows north, east and south.

3.0 SELECTION OF WELL LOCATIONS

Groundwater monitoring wells are installed to monitor the uppermost aquifer beneath the site. Locations are selected based on unit configurations, site geologic and hydrogeologic considerations, proximity to unit boundaries, and access to well locations. Locations are chosen to serve as upgradient (SGWA), lateral or downgradient (SGWC) based on groundwater flow direction determined by potentiometric evaluation.

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

The current monitoring well network consists of 25 wells located around AP-1 targeted to capture groundwater flow away from AP-1 and serve as detection monitoring network in the uppermost aquifer. A map depicting monitoring well locations for monitoring AP-1 is included as Figure A1, Groundwater Detection Monitoring Well Location Map, in Appendix A, Monitoring System Details. Appendix A also includes a tabulated list of individual monitoring wells with well construction details such as location coordinates, top-of-casing elevation, well depths and screened intervals. Any modification that involves the addition of or a change to the detection monitoring network will be made by a minor modification to the permit pursuant to 391-3-4-.02(3)(b)6.

4.0 MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The existing detection monitoring well network for AP-1 is in place. Existing monitoring wells were installed following Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells as a general guide for best practices. Monitoring well logs, for the existing monitoring well network, are included in Appendix A. The following sections describe the methods used for well drilling, construction, abandonment, and reporting for modifications to the well network at the site.

4.1 Drilling

A variety of well drilling methods are available for installing groundwater wells. Drilling methodology may include, but not be limited to: hollow stem augers, direct push, air rotary, mud rotary, or rotosonic techniques. The drilling method will 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 latest version of the *Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Field Equipment Cleaning and Decontamination* as a guide.

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

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

4.2 Design and Construction

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

4.2.1 Well Casings and Screens

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

4.2.2 Well Intake Design

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

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

Pre-packed dual-wall well screens may be used for well construction. Pre-packed well screens combine a centralized inner well screen, a developed filter sand pack, and an outer conductor screen in one integrated unit composed of inert materials. Pre-packed well screens will be installed following general industry standards and using the latest version of the Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells as a general guide. If the dual-wall pre-packed-screened wells do not yield sufficient water or are excessively turbid after development, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

4.2.3 Filter Pack and Annular Seal

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

The materials used to seal the annular space must prevent hydraulic communication between strata and prevent migration from overlying areas into the well screen interval. A minimum of two feet of bentonite (i.e., chips, pellets,

or slurry) will be placed immediately above the filter pack. The bentonite seal will extend up to the base of any overlying confining zone or the top of the water-bearing zone to prevent 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 cement grout to ground surface, where it will become a concrete apron extending outward with a radius of at least 2 feet from the well casing and sloped to drain water away from the well.

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

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

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

4.2.5 Well Development

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 10 nephelometric turbidity units (NTUs); however, formation-specific conditions may not allow this target to be accomplished. Additionally, the stabilization criteria contained in Appendix C, Groundwater Sampling Procedures, should be met. A variety of techniques may be used to develop site groundwater monitoring wells. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. Development equipment will be decontaminated prior to first use and between wells.

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

Many geologic formations contain clay and silt particles that are small enough to work their way through the wells' filter packs over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, the monitoring wells may have to be redeveloped periodically

to remove the silt and clay that has worked its way into the filter pack of the monitoring wells. Each monitoring well should be redeveloped when sample turbidity values have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above.

4.3 Well Abandonment

Monitoring wells will be abandoned using industry-accepted practices and using the Manual for Groundwater Monitoring (1991) and Georgia Water Well Standards Act (1985) as guides. The wells will be abandoned under the direction of a geologist or engineer registered in Georgia. Neat Portland cement or bentonite will be used as appropriate to complete abandonment and seal the well borehole.

4.4 Documentation

The following information documenting the construction and development of each well is provided in the boring logs for the existing monitoring system (Appendix A) and would be provided for any new wells in the future will be submitted to EPD by a qualified groundwater scientist within 30 days after completing well installations.

- Name of drilling contractor and type of drill rig
- Documentation that the driller, at the time the monitoring wells were installed, had a bond on file with the Water Well Advisory Council
- Dates of drilling and initial well emplacement
- Drilling method and drilling fluid if used
- Well location (± 0.5 ft.)
- Borehole diameter and well casing diameter
- Well depth (± 0.1 ft.)
- Lithologic logs
- Well casing materials
- Screen materials and design
- Screen length
- Screen slot size
- Filter pack material/size and volume
- Sealant materials and volume
- Documentation of ground surface elevation (± 0.01 ft.)
- Documentation of top of casing elevation (± 0.01 ft.)
- Schematic of the well with dimensions

5.0 GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 1, Groundwater Monitoring Parameters and Frequency presents the groundwater monitoring parameters and sampling frequency. A minimum of eight independent samples from each groundwater well will be collected and analyzed for 40 CFR 257, Subpart D, Appendix III and Appendix IV test parameters to establish a background statistical dataset. Subsequently, in accordance with 391-3-4-.10(6), the monitoring frequency for the Appendix III parameters will be at least semi-annual during the active life of the facility and the post-closure care period. If required, assessment monitoring will be performed per Georgia Chapter 391-3-4-.10, Rules for Solid Waste Management. GPC may petition for an alternate monitoring schedule for the site pursuant to applicable rules.

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

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

Table 1: GROUNDWATER MONITORING PARAMETERS & FREQUENCY

MONITORING PARAMETER		GROUNDWATER MONITORING		
		BACKGROUND	1 ST SEMI-ANNUAL EVENT	2 ND SEMI-ANNUAL EVENT
FIELD PARAMETERS	Temperature	X	X	X
	pH	X	X	X
	Specific Conductance	X	X	X
	Turbidity	X	X	X
	Dissolved Oxygen	X	X	X
APPENDIX III (DETECTION)	Boron	X	X	X
	Calcium	X	X	X
	Chloride	X	X	X
	Fluoride	X	X	X
	pH (field)	X	X	X
	Sulfate	X	X	X
	Total Dissolved Solids	X	X	X
APPENDIX IV (ASSESSMENT)	Antimony	X	Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4.10(6)	
	Arsenic	X		
	Barium	X		
	Beryllium	X		
	Cadmium	X		
	Chromium	X		
	Cobalt	X		
	Fluoride	X		
	Lead	X		
	Lithium	X		
	Mercury	X		
	Molybdenum	X		
	Selenium	X		
	Thallium	X		
	Radium 226 & 228	X		

Table 2: ANALYTICAL METHODS

PARAMETERS	EPA METHOD NUMBER
APPENDIX III	
Boron	EPA 6010B/6020
Calcium	EPA 6010B/6020
Chloride	EPA 300.0/300.1/9250/9251/9253/9056A
Fluoride	EPA 300.0/300.1/9214/9056A
pH	150.1 field
Sulfate	EPA 9035/9036/9038300.0/300.1/9056A
Total Dissolved Solids (TDS)	EPA 160/2540C
APPENDIX IV	
Antimony	EPA 7040/7041/6010B/6020
Arsenic	EPA 7060A/7061A/6010B/6020
Barium	EPA 7080A/7081/6010B/6020
Beryllium	EPA 7090/7091/6010B/6020
Cadmium	EPA 7130/7131A/6020
Chromium	EPA 7190/7191/6010B/6020
Cobalt	EPA 7200/7201/6010B/6020
Fluoride	EPA 300.0/300.1/9214/9056/9214
Lead	EPA 7420/7421/6010B/6020
Lithium	EPA 6010/6020B
Mercury	EPA 7470
Molybdenum	EPA 6010/6020B
Selenium	EPA 7740/7741A/6010B/6020
Thallium	EPA 7840/7841/6010/6020
Radium 226 and 228 combined	EPA 903/9320/9315

6.0 SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in Appendix C, Groundwater Sampling Procedures. Sampling procedures were developed using standard industry practice and USEPA 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. When non-dedicated equipment is used, it will be decontaminated prior to use and between wells.

Groundwater wells that are determined to be dry for two consecutive semi-annual sampling events should be replaced, unless an alternate schedule has been approved by EPD.

7.0 CHAIN-OF-CUSTODY

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

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

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

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

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

8.0 FIELD AND LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

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

Field Equipment Rinsate Blanks - Where sampling equipment is not new or dedicated, an equipment rinsate blank will be collected at a rate of one blank per 20 samples using non-dedicated equipment.

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

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

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

9.0 REPORTING RESULTS

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

- 1) A narrative describing sampling activities and findings including a summary of the number of samples collected, the dates the samples were collected and whether the samples were required by the detection or assessment monitoring programs
- 2) A brief overview of purging/sampling methodologies
- 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 PG or PE.
- 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 recently installed or decommissioned, along with a narrative description of why these actions were taken
- 9) A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels
- 10) If applicable, semi-annual assessment monitoring results
- 11) Any alternate source demonstration completed during the previous monitoring period, if applicable
- 12) Laboratory reports
- 13) COC documentation
- 14) Field sampling logs including field instrument calibration, indicator parameters and parameter stabilization data
- 15) Documentation of non-functioning wells
- 16) Table of current analytical results for each well, highlighting statistically significant increases and concentrations above maximum contaminant level (MCL)
- 17) Statistical analyses
- 18) Certification by a qualified groundwater scientist.

10.0 STATISTICAL ANALYSES

Groundwater quality data from each sampling event will be statistically evaluated to determine if there has been a statistically significant change in groundwater chemistry. Historical background data will be used to determine statistical limits

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

- 1) A prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit. (§257.93(f)(3)).
- 2) A control chart approach that gives control limits for each constituent. ((§257.93(f)(4)).
- 3) Another statistical test method (such as prediction limits or control charts) that meets the performance standards of §257.93(g). A justification for an alternative method will be placed in the operating record and the Director notified of the use of an alternative test. The justification will demonstrate that the alternative method meets the performance standards of §257.93(g).

Based on site-specific conditions, statistical methods may be intra-well, inter-well, or 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 PLAN OVERVIEW

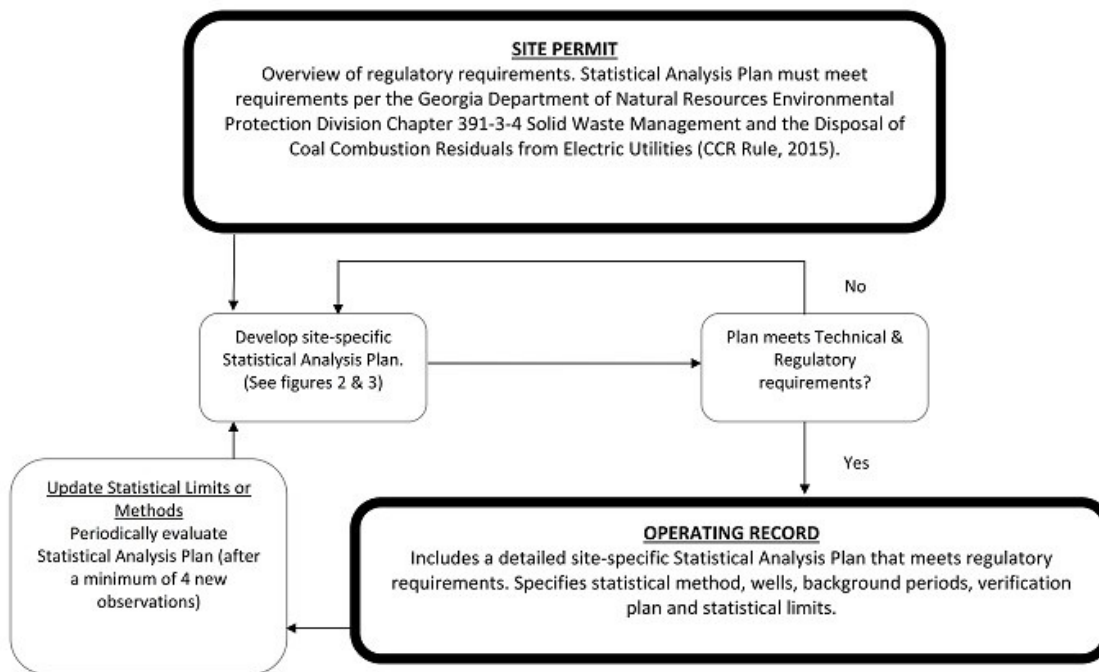


Figure 2: DECISION LOGIC FOR DETERMINING APPROPRIATE STATISTICAL METHOD

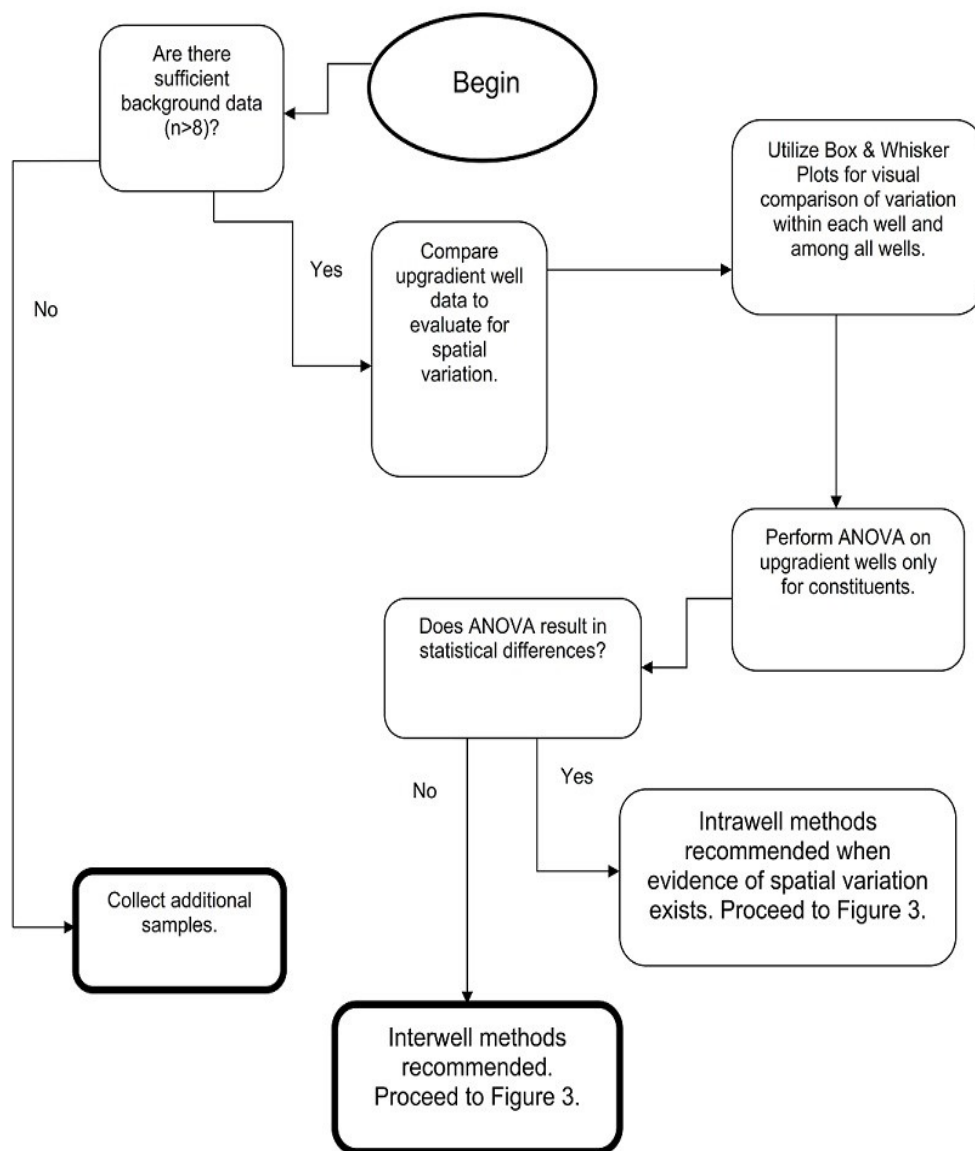
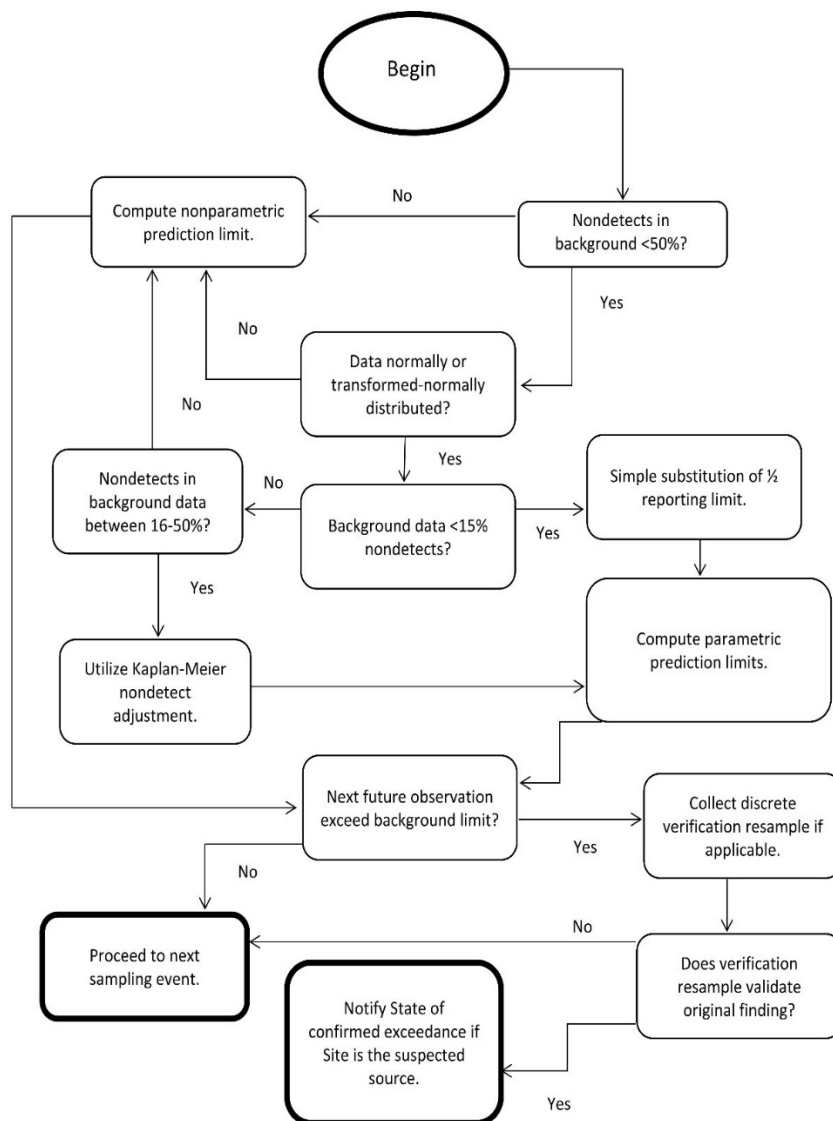


Figure 3: DECISION LOGIC FOR COMPUTING PREDICTION LIMITS



11.0 REFERENCES

American Society for Testing and Materials (ASTM)

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

Georgia Water Well Standards Act (1985)

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

Manual for Groundwater Monitoring (1991)

National Environmental Laboratory Accreditation Program (NELAP)

Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division, Operating Procedure for Design and Installation of Monitoring Wells

Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division, Operating Procedure for Field Equipment Cleaning and Decontamination

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

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

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

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

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

APPENDIX A

MONITORING SYSTEM DETAILS

- A1 SITE PLAN AND DETECTION MONITORING WELL LOCATION MAP
- A2 AP-1 POTENTIOMETRIC SURFACE ELEVATION CONTOUR MAP - JUNE 2018
- A3 GROUNDWATER MONITORING WELL NETWORK DETAILS
- A4 PIEZOMETER NETWORK DETAILS
- A5 MONITORING WELL CONSTRUCTION LOGS
- A6 PIEZOMETER CONSTRUCTION LOGS

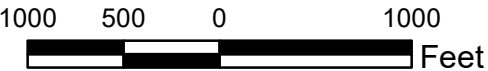


LEGEND

 MONITORING WELL LOCATION

ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.

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



CLIENT
GEORGIA POWER COMPANY



PROJECT
GROUNDWATER MONITORING PROGRAM
AP-1

TITLE
SITE PLAN AND DETECTION MONITORING
WELL LOCATION MAP

CONSULTANT



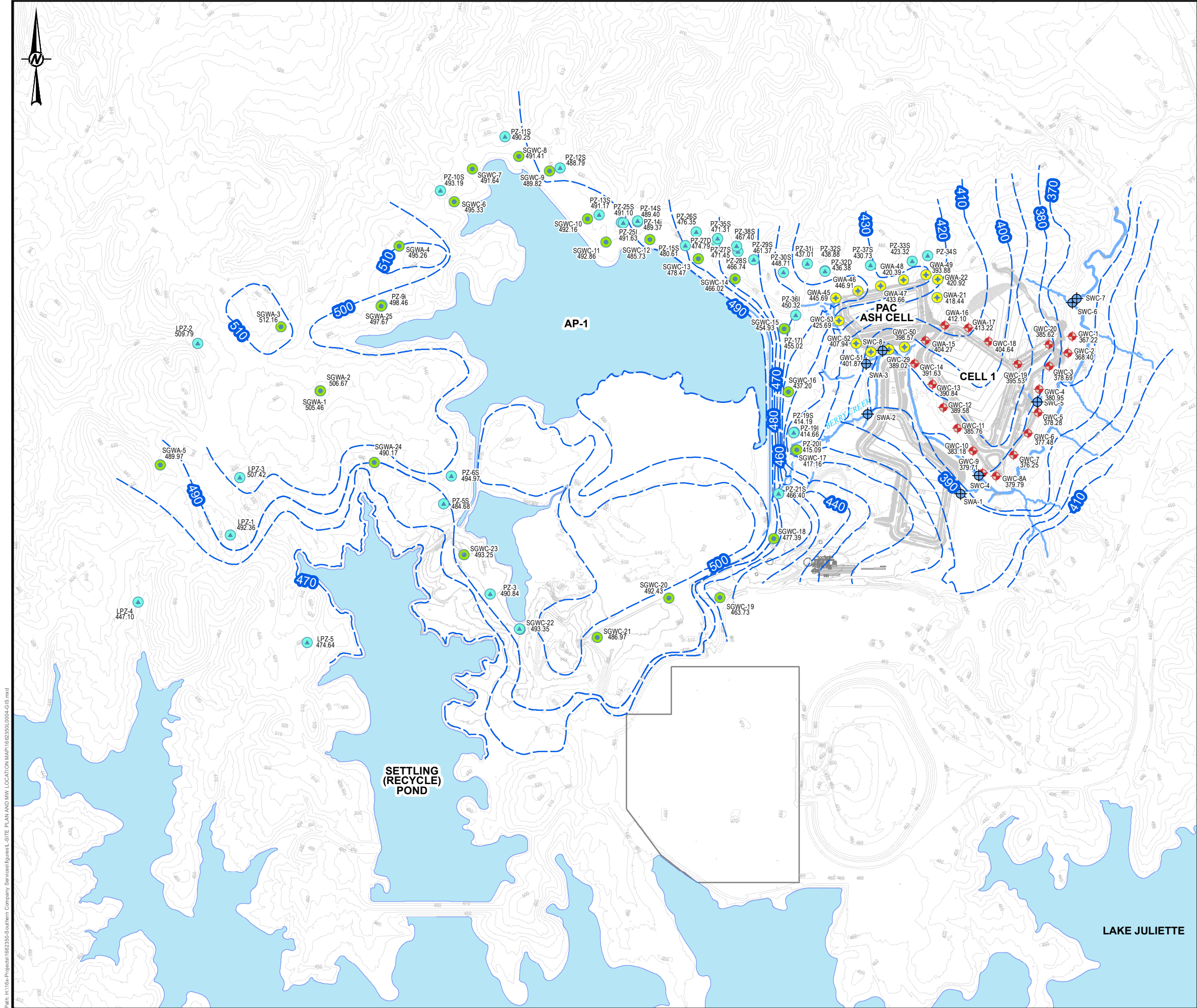
YYYY-MM-DD	2018-10-24
PREPARED	DJC
DESIGN	DLP
REVIEW	DLP
APPROVED	RPK

PROJECT No.
1662350

CONTROL
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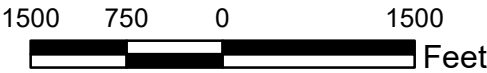
FIGURE
A1



- LEGEND**
- SCHERER ASH POND-CCR MONITORING WELL
 - ◆ CELL 1 LANDFILL MONITORING WELL
 - PAC ASH LANDFILL MONITORING WELL
 - PIEZOMETER
 - GROUNDWATER ELEVATION CONTOUR (FAMSL)
 - PONDS

- NOTES**
1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
 2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED JUNE 4, 2018 BY GOLDER ASSOCIATES.
 3. GROUNDWATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FAMSL).
 4. DEEP AND INTERMEDIATE WELL GROUNDWATER ELEVATIONS WERE NOT USED TO GENERATE GROUNDWATER CONTOURS.

- REFERENCE**
1. COORDINATE SYSTEM: NAD 1983 STATE PLAN GEORGIA WEST (U.S. FEET).
 2. MONITORING WELL/PIEZOMETER LOCATIONS PROVIDED BY SOUTHERN COMPANY SERVICES.



CLIENT
GEORGIA POWER COMPANY, INC.
PLANT SCHERER



PROJECT
GROUNDWATER MONITORING PLAN
AP-1

TITLE
**AP-1 POTENTIOMETRIC SURFACE ELEVATION CONTOUR MAP
JUNE 4, 2018**

CONSULTANT	YYYY-MM-DD	2018-10-24
	PREPARED	DJC
	DESIGN	DLP
	REVIEW	DLP
	APPROVED	RPK



PROJECT No.
1662350

CONTROL
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FIGURE
A2

TABLE A3.
GROUNDWATER MONITORING WELL NETWORK DETAILS
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Former Designation(s)	Hydraulic Location	Geologic Unit Screened	Latitude	Longitude	Top of Casing Elevation (feet msl)	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Screen Elevation (feet msl)	Bottom of Screen Elevation (feet msl)	Screen Length (feet)	Date of Installation
AP-1 DETECTION MONITORING WELL NETWORK												
SGWA-1	APA-1/PZ-8S	Upgradient	Saprolite	33.07657	-83.82937	546.81	543.97	50.2	503.8	493.8	10.0	2/11/2015
SGWA-2	APA-11/PZ-8I	Upgradient	Bedrock	33.07658	-83.82935	546.81	543.79	51.1	502.7	492.7	10.0	2/17/2015
SGWA-3	APA-2	Upgradient	Saprolite	33.07930	-83.83133	545.65	542.47	60.5	492.0	482.0	10.0	11/18/2015
SGWA-4	APA-3	Upgradient	Saprolite	33.08273	-83.82535	547.27	544.25	60.5	493.8	483.8	10.0	11/17/2015
SGWA-5	APA-4	Upgradient	Saprolite	33.07344	-83.83746	508.11	505.32	30.2	485.1	475.1	10.0	11/18/2015
SGWC-6	APC-1	Downgradient	Saprolite	33.08462	-83.82255	510.57	507.94	25.0	492.94	482.94	10.0	11/12/2015
SGWC-7	APC-2	Downgradient	Bedrock	33.08599	-83.82163	506.05	503.32	35.0	478.3	468.3	10.0	11/11/2015
SGWC-8	APC-3	Downgradient	Bedrock	33.08653	-83.81928	513.93	511.05	40.0	481.05	471.05	10.0	11/10/2015
SGWC-9	APC-4	Downgradient	Saprolite	33.08589	-83.81773	510.37	507.61	35.0	482.61	472.61	10.0	11/6/2015
SGWC-10	APC-5	Downgradient	Saprolite	33.08385	-83.81580	509.22	506.3	30.0	486.3	476.3	10.0	11/5/2015
SGWC-11	APC-6	Downgradient	Saprolite	33.08288	-83.81488	511.28	508.3	40.0	478.3	468.3	10.0	10/29/2015
SGWC-12	APC-7	Downgradient	Saprolite	33.08296	-83.81267	500.29	497.35	47.0	460.35	450.35	10.0	10/30/2015
SGWC-13	APC-8	Downgradient	Saprolite	33.08213	-83.81022	482.58	479.75	35.0	454.75	444.75	10.0	11/4/2015
SGWC-14	APC-9/PZ-16S	Downgradient	Saprolite	33.08127	-83.80836	476.48	473.30	34.8	448.5	438.5	10.0	2/24/2015
SGWC-15	APC-10/PZ-17S	Downgradient	Saprolite	33.07914	-83.80588	483.27	480.04	44.5	445.5	435.5	10.0	2/26/2015
SGWC-16	APC-11/PZ-18S	Downgradient	Saprolite	33.07647	-83.80569	460.03	456.90	38.8	428.1	418.1	10.0	3/3/2015
SGWC-17	APC-12/PZ-20S	Downgradient	Saprolite	33.07396	-83.80533	417.96	414.8	24.1	400.7	390.7	10.0	3/11/2015
SGWC-18	APC-13/PZ-22S	Downgradient	Saprolite	33.07022	-83.80644	513.18	510.3	44.1	476.2	466.2	10.0	3/17/2015
SGWC-19	APC-14/PZ-23S	Downgradient	Saprolite	33.06769	-83.80918	478.67	475.8	34.2	451.6	441.6	10.0	3/18/2015
SGWC-20	APC-15	Downgradient	Saprolite	33.06769	-83.81175	504.44	501.12	25.0	486.12	476.12	10.0	11/19/2015
SGWC-21	APC-16/PZ-1S	Downgradient	Saprolite	33.06602	-83.81538	487.54	484.8	24.5	470.3	460.3	10.0	5/6/2015
SGWC-22	APC-17/PZ-2S	Downgradient	Saprolite	33.06639	-83.81928	518.07	515.2	46.5	479.1	468.7	10.4	1/22/2015
SGWC-23	APC-18/PZ-4I	Downgradient	Bedrock	33.06957	-83.82211	523.07	520.1	49.3	480.8	470.8	10.0	2/3/2015
SGWA-24	APA-5/PZ-7S	Upgradient	Saprolite	33.07352	-83.82663	503.86	500.9	37.7	473.2	463.2	10.0	2/10/2015
SGWA-25	APA-6/PZ-9S	Upgradient	Saprolite	33.08020	-83.82623	526.39	523.4	44.6	488.8	478.8	10.0	2/18/2015

Notes:

1. feet msl = feet mean sea level
2. feet bgs = feet below ground surface

TABLE A4.
PIEZOMETER NETWORK DETAILS
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Geologic Unit Screened	Latitude	Longitude	Top of Casing Elevation (feet msl)	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Screen Elevation (feet msl)	Bottom of Screen Elevation (feet msl)	Screen Length (feet)	Date of Installation
PZ-2I	Bedrock	33.06640517	83.81931975	517.61	515.1	83.9	441.2	431.2	10	1/27/2015
PZ-3S	Saprolite	33.067894	-83.820805	517.29	514.6	49.6	475.0	465.0	10	1/28/2015
PZ-5I	Saprolite	33.07174453	83.82312963	523.24	520.7	47.2	483.5	473.5	10	2/4/2015
PZ-6S	Saprolite/PWR	33.07291573	83.82273659	531.48	529.2	54.4	484.8	474.8	10	2/4/2015
PZ-9I	Bedrock	33.08021581	83.82621624	527.49	523.5	79.8	453.7	443.7	10	2/19/2015
PZ-10S	Saprolite	33.08508695	83.82323921	516.81	514.2	34.5	489.7	479.7	10	5/5/2015
PZ-11S	Saprolite	33.0873611	83.81996837	529.21	526.1	45.5	490.6	480.6	10	4/6/2015
PZ-12S	Saprolite	33.08602396	83.81719277	517.65	514.7	44.0	480.7	470.7	10	4/1/2015
PZ-13S	Saprolite	33.08401471	83.81521209	520.21	517.4	44.9	482.5	472.5	10	4/1/2015
PZ-14S	Saprolite	33.08372361	83.81327948	511.86	508.8	44.5	474.3	464.3	10	3/26/2015
PZ-15S	Saprolite	33.0827095	83.81087103	499.06	496.1	39.7	466.4	456.4	10	4/28/2015
PZ-17I	Bedrock	33.07913383	83.80583497	483.23	480.4	96.7	393.7	383.7	10	2/27/2015
PZ-19I	Bedrock	33.07473161	83.805379	417.48	414.5	71.5	353.0	343.0	10	3/4/2015
PZ-19S	Saprolite	33.07472776	83.80541209	417.67	414.7	24.6	400.1	390.1	10	3/4/2015
PZ-20I	Bedrock	33.07398602	83.80531396	417.11	414.1	79.2	344.9	334.9	10	3/10/2015
PZ-21S	Saprolite	33.07212133	83.80618598	473.42	470.5	23.0	457.5	447.5	10	3/12/2015
PZ-25I	Saprolite	33.08368	-83.814	528.09	525.7	125.0	410.7	400.7	10	5/24/2016
PZ-25S	Saprolite	33.08371	-83.8141	527.91	525.5	55.0	480.5	470.5	10	5/25/2016
PZ-26S	Saprolite	33.08328	-83.8103	491.36	488.9	45.0	453.9	443.9	10	6/1/2016
PZ-27D	Bedrock	33.0829	-83.8093	475.18	472.4	125.0	367.4	347.4	20	6/17/2016
PZ-27S	PWR	33.08291	-83.8093	475.57	473.0	45.0	438.0	428.0	10	5/26/2016
PZ-28I	Bedrock	33.08244	-83.8082	483.91	481.3	69.0	422.3	412.3	10	6/3/2016
PZ-29S	Saprolite	33.08209	-83.8074	491.02	488.4	45.0	453.4	443.4	10	5/26/2016
PZ-30I	Bedrock	33.08155	-83.8059	478.03	475.4	85.0	400.4	390.4	10	6/2/2016
PZ-31I	Bedrock	33.08191	-83.8047	466.56	463.8	75.0	398.8	388.8	10	6/2/2016
PZ-32D	Bedrock	33.08159	-83.8038	465.18	462.3	126.0	366.3	336.3	30	6/1/2016
PZ-32S	Saprolite/PWR	33.0816	-83.8038	464.82	462.3	55.0	417.3	407.3	10	6/1/2016
PZ-33I	Saprolite/Bedrock	33.08201	-83.7994	469.08	466.3	76.0	400.3	390.3	10	6/8/2016
PZ-34S	PWR	33.08224	-83.7986	443.37	440.8	45.5	405.3	395.3	10	6/4/2016
PZ-35I	Saprolite/Bedrock	33.083012	-83.809238	474.17	474.5	55.5	429.0	419.0	10	6/22/2016

TABLE A4.
PIEZOMETER NETWORK DETAILS
Georgia Power - Plant Scherer
Juliette, GA

Well ID	Geologic Unit Screened	Latitude	Longitude	Top of Casing Elevation (feet msl)	Ground Surface Elevation (feet msl)	Total Depth (feet bgs)	Top of Screen Elevation (feet msl)	Bottom of Screen Elevation (feet msl)	Screen Length (feet)	Date of Installation
PZ-36I	Bedrock	33.07973	-83.8053	481.42	478.9	95.0	393.9	383.9	10	6/5/2016
PZ-36S	Saprolite	33.07970929	-83.80537273	482.19	479.21	55.0	434.21	424.21	10	8/22/2018
PZ-37I	TWR/Bedrock	33.08183	-83.8015	482.02	479.5	71.0	418.5	408.5	10	6/2/2016
PZ-38I	Bedrock	33.082673	-83.808276	481.96	482.1	74.0	418.1	408.1	10	6/23/2016
PZ-39S	Saprolite	33.07909393	-83.80464495	474.49	471.87	76.0	405.87	395.87	10	8/21/2018
PZ-40I	Bedrock	33.07025497	-83.80633546	512.22	509.76	83.0	436.76	426.76	10	8/15/2018
PZ-41S	Saprolite	33.06981269	-83.80580804	491.35	488.44	45.0	415.44	405.44	10	8/16/2018
PZ-42I	Bedrock	33.06767345	-83.8117964	502.97	500.38	96.0	427.38	417.38	10	8/21/2018
PZ-43S	Saprolite	33.06652778	-83.81110404	504.00	501.27	50.5	428.27	418.27	10	8/17/2018
PZ-44I	Bedrock	33.08280082	-83.81487968	510.19	507.69	114.0	434.69	424.69	10	9/5/2018
LPZ-01	PWR/Bedrock	33.070446	-83.833923	553.16	549.84	64.0	495.84	485.84	10	11/10/2015
LPZ-02	Saprolite	33.078618	-83.835549	513.96	510.46	20.0	500.46	490.46	10	11/20/2015
LPZ-03	Saprolite	33.072872	-83.833445	515.11	511.48	35.0	486.48	476.48	10	11/17/2015
LPZ-04	Saprolite	33.067606	-83.838599	461.06	457.83	28.0	439.83	429.83	10	11/18/2015
LPZ-05	Saprolite	33.065842	-83.830069	524.28	520.97	52.1	478.87	468.87	10	11/3/2015

Notes:

1. feet msl = feet mean sea level
2. feet bgs = feet below ground surface

APPENDIX A5

Monitoring Well Construction Logs

(Continued Next Page)



LOG OF TEST BORING

BORING PZ-08S / SGWA-1

PAGE 2 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION	COMMENTS
				Weak Moderate Strong	
		Sandy Silt (ML) (Con't)			
30		Sandy Elastic Silt (MH) - mottled light red (2.5YR 6/8) and reddish yellow (7.5YR 6/8) saprolite moist, stiff, trace muscovite, biotite, residual quartz, hornblende			SPT N=11bpf(@28.5ft.)(LL=55; PI=13; FC = 51.3%; Gravel = 0%) (MC = 58.3%; UW(d) = 64.4pcf; PERM. = 5.57E-5cm/sec)
35		Silty Sand (SM) - mottled reddish yellow (5YR 6/8) and red (10R 4/8) saprolite moist, medium dense, very fine to fine grained, with residual quartz, muscovite, biotite, hornblende			SPT N=11bpf(@33.5ft.)
40		- strong brown (7.5YR 5/8) saprolite wet, medium dense, very fine to fine grained			SPT N=19bpf(@38.5ft.)
45		- strong brown (7.5YR 5/8) saprolite wet, medium dense, very fine to fine grained			SPT N=12bpf(@43.5ft.)
50		- gray (7.5YR 5/1) saprolite wet, medium dense, very fine to fine grained, micaceous, with residual quartz, feldspar, muscovite, biotite, weathered rock fragments			SPT N=14bpf(@48.5ft.)
		Bottom of borehole at 50.9 feet.			
55					

S:\WORKGROUP\SPC\GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ DRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

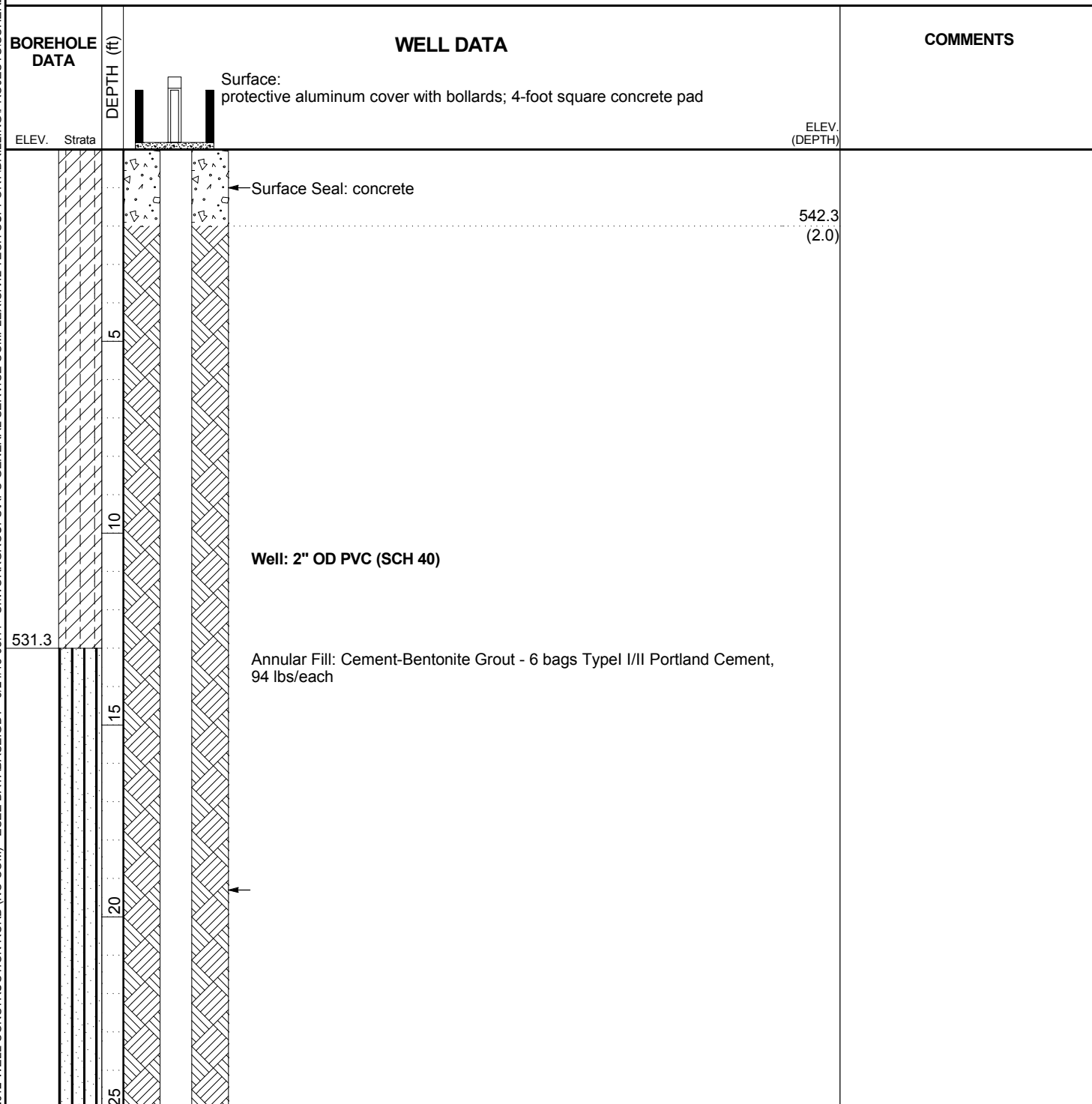
WELL: SGWA-1/PZ-08S
PAGE 1 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/11/2015 COMPLETED 2/11/2015 SURF. ELEV. 544.3 COORDINATES: N:33.076567 E:-83.829374
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 50.9 ft. GROUND WATER DEPTH: DURING 35 ft. COMP. 37.3 ft. DELAYED 37.2 ft. after 24 hrs.
NOTES _____



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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRIFT LOGS\ISCHERER LOGS.GPJ



RECORD OF
WELL CONSTRUCTION

WELL: SGWA-1/PZ-08S
PAGE 2 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
516.3		30	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
511.3		35	Annular Fill: Cement-Bentonite Grout - 6 bags Type I/II Portland Cement, 94 lbs/each	
		40	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	507.7 (36.6)
		45	Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	505.7 (38.6)
		50	Screen: 10 ft. pre-pack	503.8 (40.5)
493.4			Sump: 0.40 ft.	493.8

(Continued Next Page)



LOG OF TEST BORING

BORING PZ-08I / SGWA-2

PAGE 2 OF 3

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPAPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
35		Silty Sand (SM) (Con't) - mottled reddish yellow (7.5YR 6/8) and red (10R 4/8) saprolite moist, loose, very fine to fine grained			SPT N=6bpf(@33.5ft.)
40		- mottled greenish gray (10Y 5/1), grayish olive green (5GY 3/2) and red (10R 4/8) saprolite wet, medium dense, very fine to fine grained, trace mica, residual quartz, feldspar, hornblende			SPT N=13bpf(@38.5ft.)
45		- mottled greenish gray (10Y 5/1), grayish olive green (5GY 3/2) and brownish yellow / dark yellowish orange (10YR 6/6) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, feldspar, chlorite, biotite			SPT N=18bpf(@43.5ft.)
50		- mottled reddish yellow (7.5YR 6/8) and very dark greenish gray (10BG 3/1) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, feldspar, chlorite, muscovite, biotite			SPT N=14bpf(@48.5ft.)
55		- mottled white / yellowish gray (5Y 8/1) and very dark brown / dusky yellowish brown (10YR 2/2) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, feldspar, muscovite, biotite, chlorite			SPT N=26bpf(@53.5ft.)
60		- mottled yellow (10YR 7/6) and very dark greenish gray (10BG 3/1) saprolite wet, medium dense, very fine to fine grained, trace medium residual quartz grains, feldspar, biotite, muscovite, hornblende			SPT N=26bpf(@58.5ft.)
65		- mottled very dark bluish gray (5PB 3/1) and white (10R 8/1) saprolite wet, very dense, very fine to coarse grained, trace red staining, weathered rock fragments, residual quartz, feldspar, hornblende, biotite, chlorite, muscovite			SPT N=95bpf(@63.5ft.)
70		Silt (ML) - brown (7.5YR 4/4) saprolite wet, hard, with partially weathered rock fragments			SPT N=37bpf(@68.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING PZ-08I / SGWA-2

PAGE 3 OF 3

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
75		PARTIALLY WEATHERED ROCK - hard to very hard, highly weathered, partially weathered rock fragments			
80		GNEISS - white (N9) and light gray (N7) fine to coarse grain, very soft to soft, highly to completely weathered, inclined, intensely fractured, moderate-angle fractures (30 - 45d) along schistosity, abundant pyrite throughout, orangish-red oxidation along fractures			
85		- black (N1) and dark gray (N3) fine to coarse grain, very soft to soft, highly to completely weathered, inclined, 17 moderate-angle fractures (30 - 45d) along foliation, interbedded with thin layers of Biotite Gneiss, with quartz, feldspar, pyrite, biotite, hornblende, periodic zones of oxidation, no apparent zones of healing			
90		- white (N9) and light gray (N7) fine to coarse grain, very soft to soft, highly to completely weathered, inclined, 23 moderate-angle fractures (30 - 45d) along foliation, very intensely fractured 93.5' - 95.0' bgs, interbedded Amphibolite, heavy oxidation, with quartz, biotite, muscovite, hornblende, pyrite, no apparent healing, feldspar and quartz crystallization in fractures			
95					
		Bottom of borehole at 95.8 feet.			
100					
105					
110					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWA-2/PZ-081
PAGE 1 OF 3
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

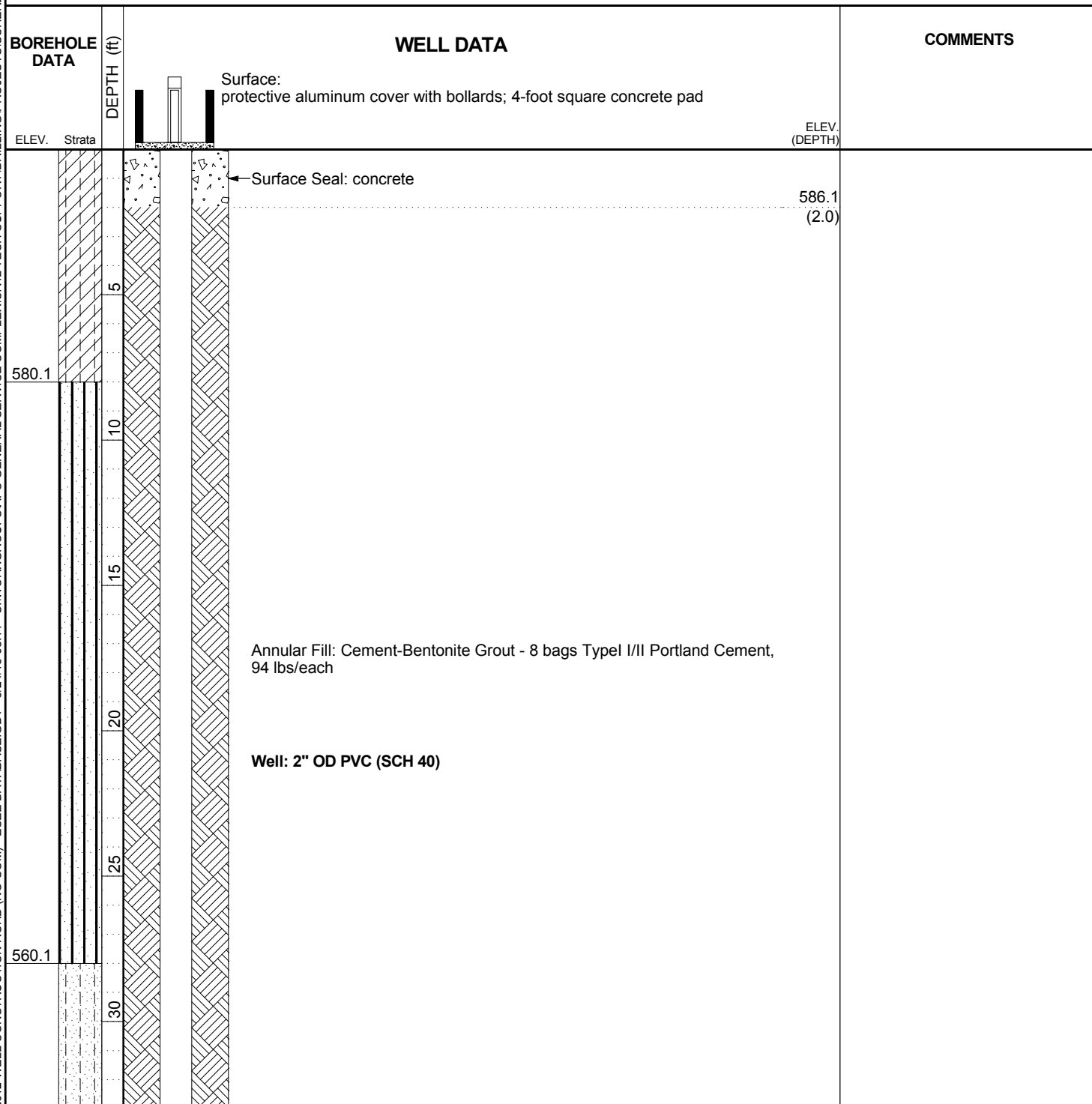
DATE STARTED 2/12/2015 COMPLETED 2/17/2015 SURF. ELEV. 588.1 COORDINATES: N:33.076579 E:-83.829348

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 95.8 ft. GROUND WATER DEPTH: DURING 38.5 ft. COMP. 37.5 ft. DELAYED 37.3 ft. after 24 hrs.

NOTES _____



(Continued Next Page)

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWA-2/PZ-081
PAGE 3 OF 3
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
515.1		75	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		(CONTINUED)		
			Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	
509.1		80		510.0 (78.1)
			Annular Seal: bentonite pellets - 0.75 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
		85		504.9 (83.2)
			Filter: Unimin FilterSil - 1 Bag #1A, 50 lbs/each	
				502.7 (85.4)
		90	Screen: 10 ft. pre-pack	
		95		
492.3			Sump: 0.40 ft.	492.7

RECORD OF BOREHOLE SGWA-3/APA-2

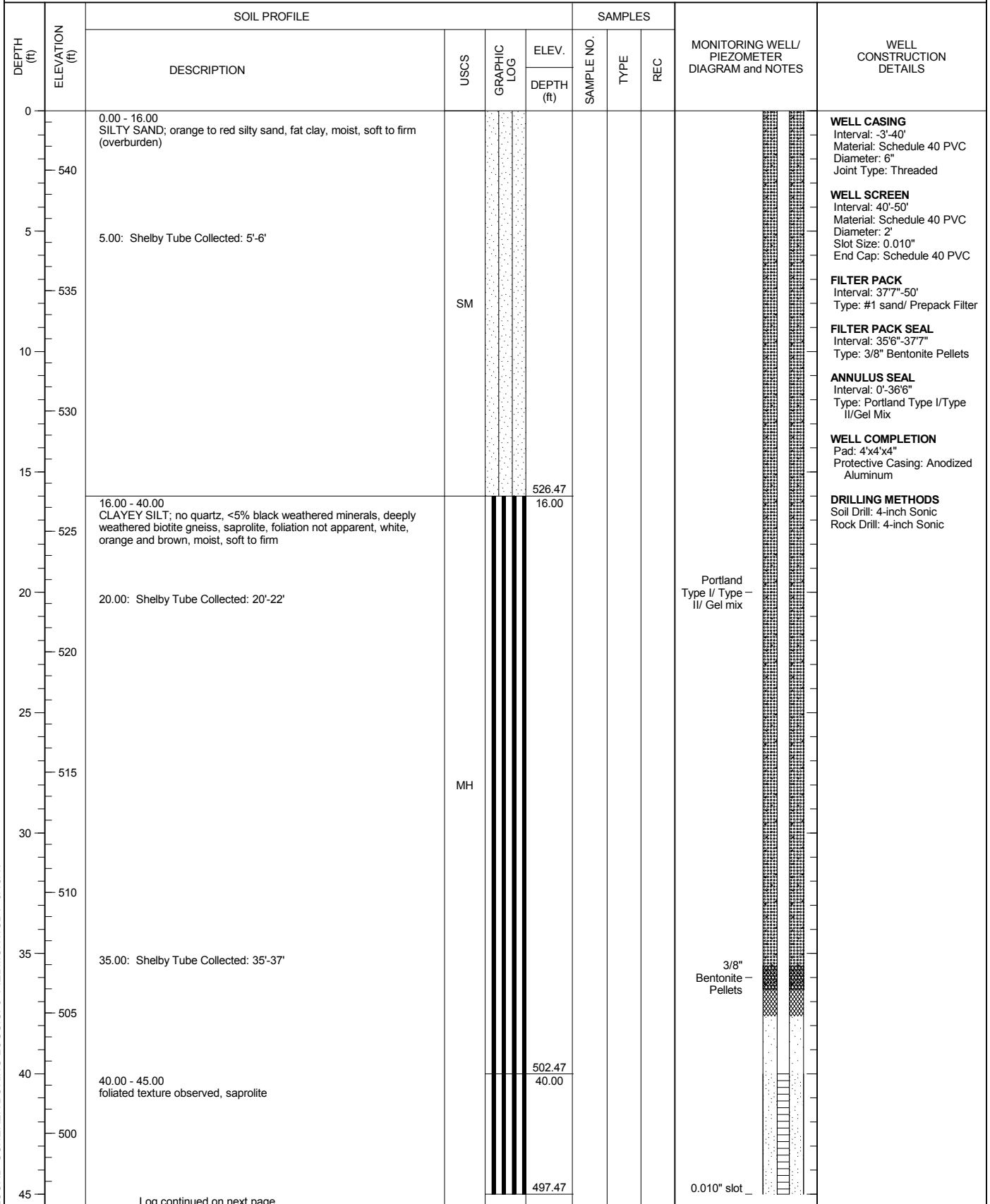
SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 50.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/17/15
DATE COMPLETED: 11/18/15

NORTHING: 1,120,224.56
EASTING: 1,399,295.72
GS ELEVATION: 542.47
TOC ELEVATION: 545.65 ft

DEPTH W.L.: 32'
ELEVATION W.L.:
DATE W.L.: 11/18/15
TIME W.L.: 08:50



Log continued on next page

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: Shannon George, P.G.
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

RECORD OF BOREHOLE SGWA-3/APA-2


SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 50.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/17/15
DATE COMPLETED: 11/18/15

NORTHING: 1,120,224.56
EASTING: 1,399,295.72
GS ELEVATION: 542.47
TOC ELEVATION: 545.65 ft

DEPTH W.L.: 32'
ELEVATION W.L.:
DATE W.L.: 11/18/15
TIME W.L.: 08:50

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
45		45.00 - 50.30 light brown clayey silt interbedded with white to black foliations, deeply weathered biotite gneiss, saprolite, orange-brown to light brown clay, moist to wet			45.00				screen	WELL CASING Interval: -3'-40' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 40'-50' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 37'7"-50' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 35'6"-37'7" Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-36'6" Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
495									#1 sand	
50		Boring completed at 50.00 ft			492.17 50.30					
55										
60										
65										
70										
75										
80										
85										
90										

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: Shannon George, P.G.
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

RECORD OF BOREHOLE SGWA-4/APA-3




SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 67.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/17/15
DATE COMPLETED: 11/17/15

NORTHING: 1,121,478.04
EASTING: 2,401,124.35
GS ELEVATION: 544.25
TOC ELEVATION: 547.27 ft

DEPTH W.L.: 25.71'
ELEVATION W.L.:
DATE W.L.: 11/13/15
TIME W.L.: 13:10

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 CLAY (CH); clay, reddish brown, some organic material, trace quartz, trace mica, dry to moist, firm, overburden	CH							WELL CASING Interval: -3'-50.5' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 50.5'-60.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 49'-61.5' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 46.7'-49' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-46.7' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
5	540	5.00 - 10.00 CLAYEY SILT; silt with some clay, reddish brown to yellow saprolite, micaceous, trace quartz, trace biotite, trace weathered rock, dry, firm	MH		539.25 5.00					
10	535	10.00 - 15.00 silt, mottled brown/yellow/red/orange saprolite, trace clay, trace quartz, trace mica, some large biotite deposits, moist to wet Shelby Tube Collected: 10'-12'			534.25 10.00					
15	530	15.00 - 20.00 silt, mottled brown/yellow/orange saprolite, trace quartz, trace mica, trace biotite, trace clay, soft, moist to wet Shelby Tube Collected: 17'-19'			529.25 15.00					
20	525	20.00 - 25.00 mottled orange/brown/yellow silty saprolite, larger biotite deposits, trace quartz and weathered rock, soft, moist to wet			524.25 20.00					
25	520	25.00 - 30.00 silt and fine sand, trace quartz (angular ~5-10mm diameter), trace weathered rock, micaceous, mottled orange/reddish/yellow/black saprolite, dry, firm			519.25 25.00					
30	515	30.00 - 35.00 mottled orange/yellow/reddish/black silty saprolite, black streaking, trace quartz, trace clays, micaceous, moist, firm			514.25 30.00					
35	510	35.00 - 40.00 mottled orange/yellow/white silty saprolite, bitoite, mica, trace quartz, trace clay, moist, firm			509.25 35.00					
40	505	40.00 - 67.00 SILTY SAND; brown/grey/white/orange silty saprolite, trace quartz, micaceous, fine grains, moist, firm Shelby Tube Collected: 40'-42'	SM		504.25 40.00					
45	500	Log continued on next page								

Portland
Type I/ Type --
II/ Gel mix

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWA-4/APA-3

SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 67.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/17/15
DATE COMPLETED: 11/17/15

NORTHING: 1,121,478.04
EASTING: 2,401,124.35
GS ELEVATION: 544.25
TOC ELEVATION: 547.27 ft

DEPTH W.L.: 25.71'
ELEVATION W.L.:
DATE W.L.: 11/13/15
TIME W.L.: 13:10

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
45		40.00 - 67.00 SILTY SAND; brown/grey/white/orange silty saprolite, trace quartz, micaceous, fine grains, moist, firm Shelby Tube Collected: 40'-42' (Continued) 45.00 - 50.00 grey/white/orange/brown silty saprolite, medium grain, trace quartz, micaceous, trace iron pyrite	SM							WELL CASING Interval: -3'-50.5' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 50.5'-60.5' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 49'-61.5' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 46.7'-49' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-46.7' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
49.5		50.00 - 55.00 grey/white/brown/orange silty saprolite, medium grain, mica, iron pyrite, trace quartz, trace biotite, moist, firm			494.25 50.00					
55		55.00 - 60.00 grey/white/brown/orange silty saprolite, medium grain sand, mica, iron pyrite, trace quartz, trace biotite, some clay lenses, moist, very firm			489.25 55.00					
60		60.00 - 63.00 SANDY SILT; fine to medium sand, grey, saturated, saprolite	SM		484.25 60.00					
65		63.00 - 67.00 grey, saprolite biotite gneiss, trace thin clay lenses, grey, very firm			481.25 63.00					
67		Boring completed at 67.00 ft			477.25					

LOG SCALE: 1 in = 5.5 ft

DRILLING COMPANY: Cascade Drilling

DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly

CHECKED BY: Rachel P. Kirkman, P.G.

DATE: 9/29/17



BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEMONT.GDT 9/15/17

RECORD OF BOREHOLE SGWA-5/APA-4

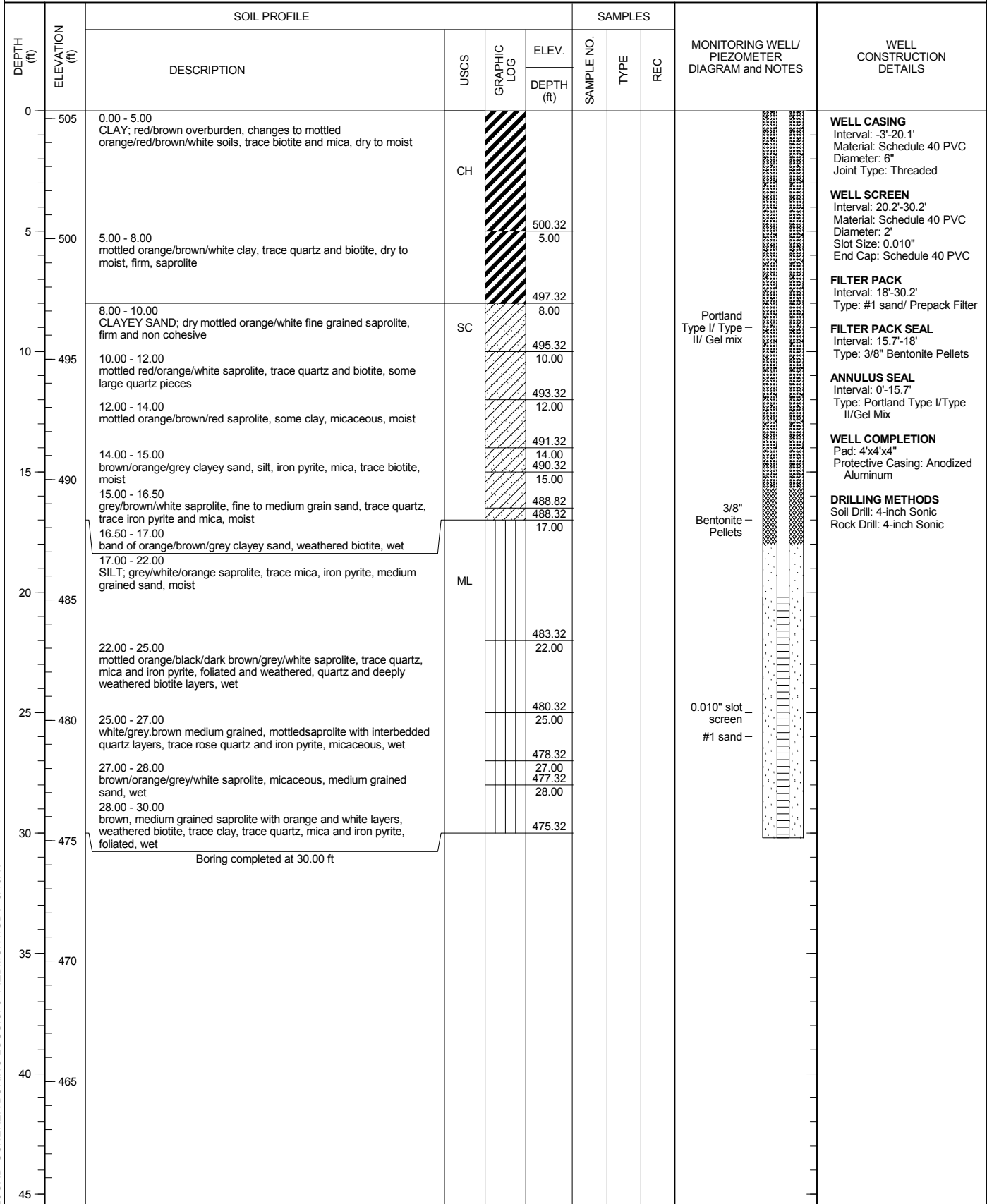
SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 30.00 ft
LOCATION: Carrollton, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/18/15
DATE COMPLETED: 11/18/15

NORTHING: 1,118,087.17
EASTING: 2,397,426.72
GS ELEVATION: 505.32
TOC ELEVATION: 508.11 ft

DEPTH W.L.: 15.23'
ELEVATION W.L.:
DATE W.L.: 11/18/15
TIME W.L.: 16:05



BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-6/APC-1

SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 25.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/12/15
DATE COMPLETED: 11/12/15

NORTHING: 1,122,168.29
EASTING: 2,401,979.45
GS ELEVATION: 507.94
TOC ELEVATION: 510.57 ft

DEPTH W.L.: 11.4'
ELEVATION W.L.:
DATE W.L.: 11/12/15
TIME W.L.: 15:30

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 SILTY CLAY (CLY/OVERBURDEN; clay with silt and very fine sand, trace quartz, mica and angular rock peices, reddish-brown fill, black streaking, dry to moist, firm	MH		502.94					WELL CASING Interval: -3'-15' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 15'-25' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 12.9'-25' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 10.1'-12.9' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-10.1' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
5		5.00 - 10.00 CLAYEY SILT (MH)/SAPROLITE; mottled red/brown/orange saprolite with lenses of silty clay, trace mica and quartz, black streaking, moist, firm Shelby Tube Collected: 7'-9'	MH		5.00					
10		10.00 - 15.00 mottled orange/brown/reddish/yellow saprolite, trace quartz and weathered rock, micaceous, black streaking, wet, firm			497.94					
15		15.00 - 20.00 SILTY SAND/SAPROLITE; mottled orange/brown/white/yellow saprolite, trace quartz and wetahered rock, micaceous, trace clay, medium grain, moist to wet, firm Shelby Tube Collected: 15'-17'	SM		15.00					
20		20.00 - 25.00 mottled brown/grey/orange saprolite with trace clay, silty gravel with medium grained sands, trace quartz and weathered rock, micaceous, wet			487.94					
25		Boring completed at 25.00 ft			482.94					

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-7/APC-2

SHEET 1 of 1

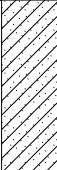




PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 35.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/10/15
DATE COMPLETED: 11/11/15

NORTHING: 1,122,669.57
EASTING: 2,402,259.67
GS ELEVATION: 503.32
TOC ELEVATION: 506.05 ft

DEPTH W.L.: 22'
ELEVATION W.L.:
DATE W.L.: 11/11/15
TIME W.L.: 11:40

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 CLAYEY SAND (SC)/OVERBURDEN; top soil followed by partially weathered rock pieces and silty gravel, transitions to brown/reddish fill with organic material, some clay, firm	SC						 <p>Portland Type I/ Type II/ Gel mix</p> <p>3/8" Bentonite — Pellets</p> <p>#1 sand — 0.010" slot screen</p>	<p>WELL CASING Interval: -3'-25' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 25'-35' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 23'-35' Type: #1 sand/ Prepack Filter</p> <p>FILTER PACK SEAL Interval: 21'-23' Type: 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0'-21' Type: Portland Type I/Type II/Gel Mix</p> <p>WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>
5		5.00 - 10.00 OVERBURDEN/SAND (SW); densely compacted coarse grained sand, some silt, trace clay, micaceous, loose, W<PL	SW		498.32 5.00					
10		10.00 - 15.00 COARSE SAND and PARTIALLY WEATHERED ROCK/SAPROLITE (GP); brown/grey/orange deeply weathered rock with some larger pieces, coarse sand, trace mica and iron pyrite, dry to moist	GP		493.32 10.00					
15		15.00 - 20.00 SILTY GRAVEL (GM); mottled brown/grey/orange/white weathered rock and saprolite, trace clays and mica, some larger quartz and rock pieces, coarse sand, dry	GM		488.32 15.00					
20		20.00 - 25.00 NO RECOVERY; apparent washout			483.32 20.00					
25		25.00 - 30.00 ROCK (BR); biotite gneiss, ~45° angle on banding, 1 near vertical healed fracture, 3 near horizontal fractures with possible weathering from water movement	BR		478.32 25.00					
30		30.00 - 35.00 biotite gneiss, mica, iron pyrite, some layer quartz pieces, at least 6 apparent fractures with lesser partial fractures along core, some weathering from water apparent			473.32 30.00					
35		Boring completed at 35.00 ft			468.32					

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-8/APC-3

SHEET 1 of 1

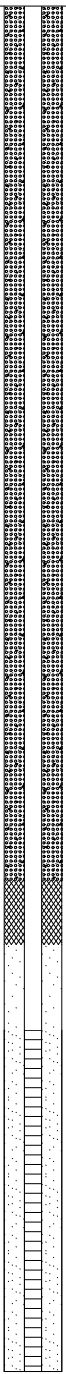
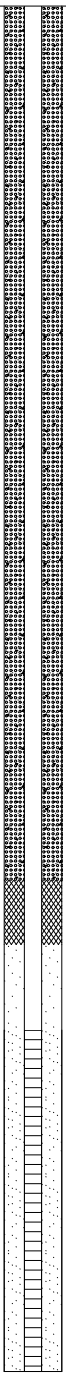
PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 40.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/9/15
DATE COMPLETED: 11/10/15

NORTHING: 1,122,866.66
EASTING: 2,402,979.66
GS ELEVATION: 511.05
TOC ELEVATION: 513.93 ft

DEPTH W.L.: 25'
ELEVATION W.L.:
DATE W.L.: 11/10/15
TIME W.L.: 13:45

BOREHOLE RECORD - SCHERER BORING LOGS.GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0	510	0.00 - 5.00 SANDY SILT; brown silt with clay changing to sandy silt, fine-grained, trace clay, dry, overburden	ML						 <p>Portland Type I/ Type – II/ Gel mix</p> <p>3/8" Bentonite – Pellets</p> <p>0.010" slot screen #1 sand –</p>	<p>WELL CASING Interval: -3'-30' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 30'-40' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 27.5'-40' Type: #1 sand/ Prepack Filter</p> <p>FILTER PACK SEAL Interval: 25.6'-27.5' Type: 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0'-25.6' Type: Portland Type I/Type II/Gel Mix</p> <p>WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>
5	505	5.00 - 10.00 SILTY GRAVEL; silty sand, trace quartz and rock pieces, mottled orange/brown/yellow/grey, non-cohesive, trace clay and weathered rock fragments, densely compacted, fin grained, dry, saprolite	GM		506.05 5.00					
10	500	10.00 - 15.00 grey gravelly sand and silt with large pieces of gneiss, biotite gneiss at 12' with several near horizontal fractures and chemical weathering, changing back to micaceous, fine-medium silty sand, saprolite			501.05 10.00					
15	495	15.00 - 20.00 GRAVELLY SAND/SILT (GP); grey, gravelly fine sand/silt, weathered rock with pieces of quartz, trace pyrite and mica, weathered soil, trace clay, fine-medium grain, brown/grey/orange, dry, saprolite	GP		496.05 15.00					
20	490	20.00 - 25.00 CLAYEY SILT; mottled brown/grey/orange saprolite, densely compacted, medium-coarse grain silt, trace clay, mica and black streaking, trace quartz and weathered rock, dry-moist, saprolite	MH		491.05 20.00					
25	485	25.00 - 30.00 PARTIALLY WEATHERED ROCK/SILTY SAND; with gravel, mica, biotite quartz, iron pyrite, feldspar, some coarse grain sands, trace clay, wet	PWR		486.05 25.00					
30	480	30.00 - 35.00 gravel and coarse grained sand, large quartz pieces, mica, iron pyrite, densely compacted brown/grey/orange, moist-wet			481.05 30.00					
35	475	35.00 - 40.00 BEDROCK (BR); biotite gneiss, gravelly coarse sand, large quartz pieces, brown/orange/grey, moist-wet	BR		476.05 35.00				 <p>Portland Type I/ Type – II/ Gel mix</p> <p>3/8" Bentonite – Pellets</p> <p>0.010" slot screen #1 sand –</p>	<p>WELL CASING Interval: -3'-30' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 30'-40' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 27.5'-40' Type: #1 sand/ Prepack Filter</p> <p>FILTER PACK SEAL Interval: 25.6'-27.5' Type: 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0'-25.6' Type: Portland Type I/Type II/Gel Mix</p> <p>WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>
40	470	Boring completed at 40.00 ft			471.05					

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-9/APC-4

SHEET 1 of 1


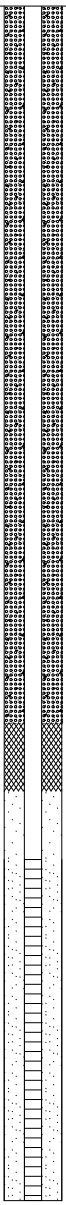






PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 35.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/5/15
DATE COMPLETED: 11/6/15

NORTHING: 1,122,635.28
EASTING: 2,403,455.82
GS ELEVATION: 507.61
TOC ELEVATION: 510.37 ft

DEPTH W.L.: 18'
ELEVATION W.L.:
DATE W.L.: 11/6/15
TIME W.L.: 10:00

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 OVERBURDEN; reddish brown fill, micaceous, some organic material, dry-moist, firm (fill)	FILL						 <p>Portland Type I/ Type II/ Gel mix</p> <p>3/8" Bentonite Pellets</p> <p>0.010" slot screen #1 sand</p>	WELL CASING Interval: -3'-25' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 25'-35' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 23'-35' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 21'-23' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-21' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
5		5.00 - 10.00 CLAY/SAPROLITE; mottled reddish/brown/orange clay, black streaking, micaceous, dry-moist, firm	CH		502.61 5.00					
10		10.00 - 15.00 CLAYEY SILT (MH)/SAPROLITE; mottled orange/red/brown/yellow silt, black streaking, micaceous, fine grainined, trace clay, dry-moist, soft	MH		497.61 10.00					
15		15.00 - 20.00 mottled brown/orange/grey/white silt, trace clay, m icaceous, fine-medium grained, black streaking, moist, soft Shelby Tube Collected: 15'-17'			492.61 15.00					
20		20.00 - 25.00 SILT (ML)/SAPROLITE; mottled grey/brown/orange soft saprolite changing to firm grey/white/orange/yellow silt, medium grained, trace clay, trace quartz and weathered rock pieces, black banding, mica and biotite layers, iron pyrite, moist	ML		487.61 20.00					
25		25.00 - 30.00 mottled grey/white/brown saprolite, trace quartz and weathered rock, black banding, iron pyrite, moist, firm			482.61 25.00					
30		30.00 - 35.00 mottled grey/white/brown/orange saprolite, densely compacted, trace quartz and weatehred rock, medium to coarse grained, difficult to determine water content but steam generated during drilling			477.61 30.00					
35		Boring completed at 35.00 ft			472.61					

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-10/APC-5


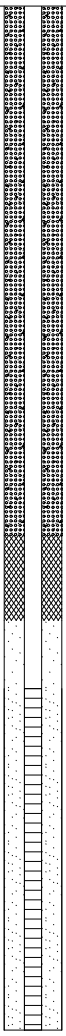


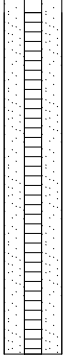
SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 30.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/4/15
DATE COMPLETED: 11/5/15

NORTHING: 1,121,896.65
EASTING: 2,404,047.18
GS ELEVATION: 506.30
TOC ELEVATION: 509.22 ft

DEPTH W.L.: 17'
ELEVATION W.L.:
DATE W.L.: 11/5/15
TIME W.L.: 13:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 CLAY/OVERBURDEN; reddish/brown silty fine grained fill, some rock fragments and organic material, trace clay, micaceous, dry-moist, firm, W<PL	CH		501.3				 <p>Portland Type I/ Type II/ Gel mix</p> <p>3/8" Bentonite Pellets</p> <p>0.010" slot screen #1 sand</p>	<p>WELL CASING Interval: -3'-20' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded</p> <p>WELL SCREEN Interval: 20'-30' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC</p> <p>FILTER PACK Interval: 18'-30' Type: #1 sand/ Prepack Filter</p> <p>FILTER PACK SEAL Interval: 15.5'-18' Type: 3/8" Bentonite Pellets</p> <p>ANNULUS SEAL Interval: 0'-15.5' Type: Portland Type I/Type II/Gel Mix</p> <p>WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum</p> <p>DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic</p>
5		5.00 - 10.00 mottled brown/reddish/orange micaceous fill, changing to saprolite soils with black streaking, trace quartz, moist, firm			5.00					
10		10.00 - 15.00 SILTY CLAY (CL)/SAPROLITE; mottled orange/brown/yellow/reddish saprolite, micaceous, trace quartz and angular rock fragments, firm to soft, moist	CL		496.3					
15		15.00 - 20.00 mottled orange/brown/yellow/reddish saprolite, some clay, micaceous, black streaking, trace quartz and weathered rock fragments, soft, wet, ~17"			491.3					
20		20.00 - 25.00 SILTY SAND (SM)/SAPROLITE; mottled orange/brown/reddish/yellow saprolite, trace clay, trace quartz and weathered rock fragments, micaceous, soft, wet	SM		486.3				 <p>0.010" slot screen #1 sand</p>	
25		25.00 - 30.00 mottled brown/grey/orange/white saprolite, fin grained, trace clay, trace quartz and weathered rock fragments, soft, wet			481.3					
30		Boring completed at 30.00 ft			476.3					
35										
40										
45										

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-11/APC-6

SHEET 1 of 1


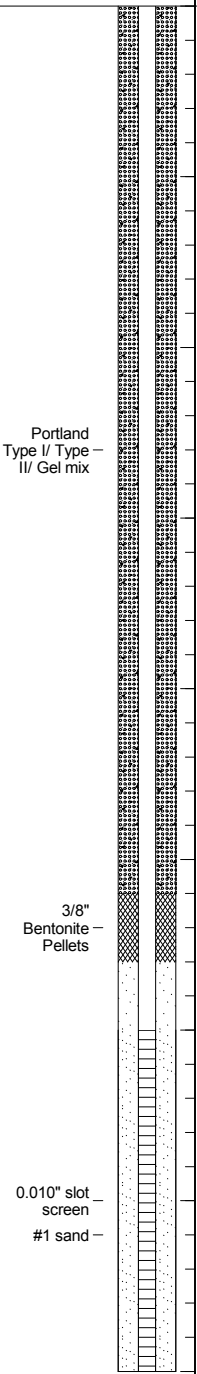








PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 40.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 10/28/15
DATE COMPLETED: 10/29/15

NORTHING: 1,121,542.39
EASTING: 2,404,332.79
GS ELEVATION: 508.30
TOC ELEVATION: 511.28 ft

DEPTH W.L.: 29'
ELEVATION W.L.:
DATE W.L.: 10/29/15
TIME W.L.: 17:50

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 CLAY (CH)/OVERBURDEN; reddish brown silty overburden, micaceous, dry, firm (fill/topsoil)	CH		503.3					WELL CASING Interval: -3'-30' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded
5		5.00 - 10.00 SILTY CLAY; reddish brown silty clay, micaceous; changes to mottled reddish/light brown/brown, black streaking, trace quartz, dry, firm to soft	CL		498.3					WELL SCREEN Interval: 30'-40' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC
10		10.00 - 15.00 CLAYEY SILT; clay with some silt, saprolitic at 10'-11', black streaks, micaceous, mottled light brown/brown/reddish/orange, soft, dry to moist	MH		493.3					FILTER PACK Interval: 28'-40' Type: #1 sand
15		15.00 - 20.00 CLAY (CL); mottled reddish/brown/orange/light brown saprolite, black streaking, trace clay and quartz, micaceous, possible weathered rock, soft, dry-moist	CL		488.3					FILTER PACK SEAL Interval: 26'-28' Type: 3/8" Bentonite Pellets
20		20.00 - 22.00 SILTY CLAY/CLAYEY SILT/SAPROLITE (CL-ML); clayey silt lense, trace clay, very soft, wet	CL-ML		486.3					ANNULUS SEAL Interval: 0'-26' Type: Portland Type I/Type II/Gel Mix
25		22.00 - 25.00 mottled orange/reddish/light brown/yellow saprolite, black streaks, residual quartz, moist			483.3					WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum
30		25.00 - 30.00 CLAYEY SILT (ML)/SAPROLITE; mottled orange/red/brown/white/grey saprolite, weathered rock fragments, trace clay, black streaking, soft-medium, moist	ML		478.3					DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
35		30.00 - 35.00 mottled brown/orange/yellow/red with some grey and white saprolite, quartz fragments, some weathered rock pieces, trace clay, soft-medium, moist			473.3					
40		35.00 - 40.50 mottled brown/orange/grey/light brown saprolite, quartz fragments and weathered rock pieces, trace clay, black streaks, wet			467.8					
45		Boring completed at 40.00 ft			40.50					

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-12/APC-7

SHEET 1 of 2

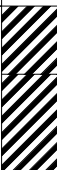
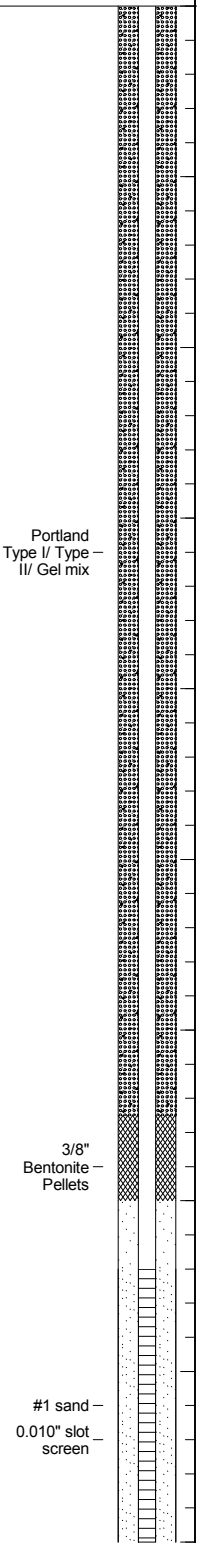




PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 47.60 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 10/29/15
DATE COMPLETED: 10/30/15

NORTHING: 1,121,576.07
EASTING: 2,405,009.68
GS ELEVATION: 497.35
TOC ELEVATION: 500.29 ft

DEPTH W.L.: 29'
ELEVATION W.L.:
DATE W.L.: 10/30/15
TIME W.L.: 10:10

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 2.00 OVERBURDEN/FILL (CH); reddish brown silt and fine grained sand	CH		495.35					WELL CASING Interval: -3'-37' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 37'-47' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 35'-47' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 32.5'-35' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-32.5' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
495		2.00 - 5.00 reddish brown silt with trace clay, micaceous, dry, firm			2.00					
5		5.00 - 10.00 SILTY SAND/SAPROLITE (SM); mottled reddish brown and grey saprolite, micaceous, trace quartz fragments, some clay, dry	SM		492.35					
490					5.00					
10		10.00 - 15.00 CLAYEY SILT; mottled brown/orange/yellow clayey silt, trace quartz and weathered rock fragments, micaceous, firm trending to stiff, dry-moist	MH		487.35					
485					10.00					
15		15.00 - 18.00 mottled brown/orange/yellow clayey silt, trace quartz and weathered rock fragments, micaceous, firm-stiff, moist			482.35					
480					15.00					
20		18.00 - 25.00 SANDY SILT; trace biotite, trace quartz, micaceous, mottled brown/orange/reddish/yellow, firm-stiff, fine grained, loose, black streaks, firm-stiff	ML		479.35					
475					18.00					
25		25.00 - 30.00 mottled brown/orange/yellow sandy clay, fine grained, micaceous, some quartz pieces, greyish white with black streaking, trace weathered rock fragments, coarse sand, moist to wet, soft			472.35				3/8" Bentonite Pellets	
470					25.00					
30		30.00 - 35.00 SILTY SAND; mottled grey/white/reddish sandy silt, fine to medium grained, micaceous, trace clay, some quartz, trace weathered rock fragments, moist, W<PL	SM		467.35					
465					30.00					
35		35.00 - 40.00 mottled brown/grey/black saprolite, fine grained, micaceous, trace clay, trace quartz and weathered rock fragments, W<PL, soft but densely compacted, wet			462.35				#1 sand - 0.010" slot screen	
460					35.00					
40		40.00 - 45.00 mottled grey/white/black/brown saprolite, fine grained, trace quartz and weathered rock fragments, micaceous, black streaks, densely compacted, wet			457.35					
455					40.00					
45		Log continued on next page			452.35					

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-12/APC-7



SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 47.60 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 10/29/15
DATE COMPLETED: 10/30/15

NORTHING: 1,121,576.07
EASTING: 2,405,009.68
GS ELEVATION: 497.35
TOC ELEVATION: 500.29 ft

DEPTH W.L.: 29'
ELEVATION W.L.:
DATE W.L.: 10/30/15
TIME W.L.: 10:10

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE			REC
					DEPTH (ft)					
45		45.00 - 47.00 black/gy/white/brown fine grained saprolite, tightly compacted, trace biotite and mica, soft, moist-wet			45.00					WELL CASING Interval: -3'-37' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 37'-47' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 35'-47' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 32.5'-35' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-32.5' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
450		Boring completed at 47.60 ft			450.35 47.00					
50										
55										
60										
65										
70										
75										
80										
85										
90										

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



RECORD OF BOREHOLE SGWC-13/APC-8

SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 35.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/3/15
DATE COMPLETED: 11/4/15

NORTHING: 1,121,274.08
EASTING: 2,405,760.64
GS ELEVATION: 479.75
TOC ELEVATION: 482.58 ft

DEPTH W.L.: 22'
ELEVATION W.L.:
DATE W.L.: 11/4/15
TIME W.L.: 13:00

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 9/15/17

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0		0.00 - 5.00 CLAYEY SILT (MH)/FILL; mottled reddish brown fill, some clay, micaceous, some black streaks and organic material, moist, stiff, W~PL	MH							WELL CASING Interval: -3'-25' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 25'-35' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 23'-35' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 21'-23' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-21' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
5	475	5.00 - 10.00 overburden, reddish brown fill, some clay, trace mica, firm, moist, W<PL			474.75 5.00					
10	470	10.00 - 15.00 SILT (ML)/SAPROLITE; mottled reddish/brown/orange saprolite, micaceous, trace quartz fragments, fine grained, soft to firm, W<PL	ML		469.75 10.00					
15	465	15.00 - 20.00 mottled brown/orange/reddish saprolite, micaceous, trace quartz, black streaking, fine grained, moist, firm			464.75 15.00					
20	460	20.00 - 25.00 mottled red/orange/brown/yellow saprolite, micaceous, trace quartz and biotite, fine grained, some clays, soft, wet, W~PL			459.75 20.00					
25	455	25.00 - 30.00 SAPROLITE; mottled brown/orange/yellow saprolite, fine gained, trace clay, trace quarts and biotite, micaceous, black streaking/banding, soft, wet, water noted	MH		454.75 25.00					
30	450	30.00 - 35.00 mottled brown/grey/white saprolite, trace quartz znc weathered rock fragments, micaceous, black streaking, firm-stiff			449.75 30.00					
35	445	Boring completed at 35.00 ft			444.75					
40	440									
45	435									

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Jeremy Triepke

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17





LOG OF TEST BORING

BORING APC-9 / PZ-16S / SGWC-14

PAGE 1 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/24/2015 COMPLETED 2/24/2015 SURF. ELEV. 473.3 COORDINATES: N:33.081272 E:-83.808363

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 35.3 ft. GROUND WATER DEPTH: DURING 18.5 ft. COMP. 9.91 ft. DELAYED 9.91 ft. after 24 hrs.

NOTES _____

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silty Clay (CL) - mottled red (2.5YR 5/8) and light red / moderate reddish orange (10R 6/6) residuum moist, stiff			SPT N=11bpf(@3.5ft.)
10		- mottled red (2.5YR 5/8) and light red / moderate reddish orange (10R 6/6) residuum moist, medium stiff			SPT N=5bpf(@8.5ft.)
15		Silty Sand (SM) - mottled reddish yellow (5YR 7/8) and red (10R 4/8) saprolite moist, medium stiff, with weathered rock fragments, black streaking, trace clay			(MC = 44.4%; UW(d) = 72.8pcf; PERM. = 1.18E-6cm/sec) SPT N=6bpf(@13.5ft.)(LL=63; PI=16; FC = 40.2%; Gravel = 16.3%)
20		- mottled reddish yellow (5YR 6/8) and yellow (10YR 7/6) saprolite wet, medium stiff, with white and black streaking, trace weathered rock fragments			SPT N=6bpf(@18.5ft.)
25		- mottled reddish yellow (5YR 6/8) and yellow (10YR 7/6) saprolite wet, medium stiff, with black streaking, trace weathered rock fragments			SPT N=7bpf(@23.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING APC-9 / PZ-16S / SGWC-14

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		Silty Sand (SM) (Cont) - mottled reddish yellow (5YR 6/8), pale green (10G 6/2) and white (10YR 8/1) saprolite wet, stiff, gravelly, trace weathered rock fragments			SPT N=13bpf(@28.5ft.)(LL=45; PI=7; FC = 26.1%; Gravel = 0%) (MC = 47.4%; UW(d) = 77.9pcf; PERM. = 2.49E-5cm/sec)
35		- mottled grayish olive (10Y 4/2) and pale green (10G 6/2) saprolite wet, hard, trace weathered rock fragments, residual quartz, biotite			SPT N=38bpf(@33.5ft.)
		Bottom of borehole at 35.3 feet.			
40					
45					
50					
55					

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC-14/PZ-16S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/24/2015 COMPLETED 2/24/2015 SURF. ELEV. 473.3 COORDINATES: N:33.081272 E:-83.808363

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 35.3 ft. GROUND WATER DEPTH: DURING 18.5 ft. COMP. 9.91 ft. DELAYED 9.91 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	471.3 (2.0)
		5	Well: 2" OD PVC (SCH 40)	
		10		
		15	Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
460.3		20	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	454.0 (19.3)
		25	Filter: Unimin FilterSil - 7 Bags #1A, 50 lbs/each	451.3 (22.0)
				448.5

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RECORD OF WELL CONSTRUCTION

WELL: SGWC-14/PZ-16S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Screen: 10 ft. pre-pack	ELEV. (DEPTH) (24.8)
			Screen: 10 ft. pre-pack	
438.0			Sump: 0.50 ft.	438.5 (34.8)



LOG OF TEST BORING

BORING APC-10 / PZ-17S / SGWC-15

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/25/2015 COMPLETED 2/26/2015 SURF. ELEV. 480.3 COORDINATES: N:33.079136 E:-83.805879

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE BEARING

BORING DEPTH 45.2 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 33.81 ft. DELAYED 31.66 ft. after 24 hrs.

NOTES

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silt (ML) - mottled red (2.5YR 4/8) and dark reddish brown (2.5YR 2.5/4) residuum moist, very stiff, trace clay			SPT N=18bpf(@3.5ft.)
10		- mottled red (2.5YR 4/8) and yellow (10YR 7/8) saprolite moist, stiff, trace coarse sand			SPT N=10bpf(@8.5ft.)
15		- mottled red (2.5YR 4/8) and yellow (10YR 7/8) saprolite moist, medium stiff, with black streaking, trace residual quartz and mica			SPT N=5bpf(@13.5ft.)
20		- mottled reddish brown (2.5YR 4/3) and dusky red / dark reddish brown (10R 3/4) saprolite moist, medium stiff, with black streaking, trace weathered rock fragments, biotite, muscovite, residual quartz			SPT N=6bpf(@18.5ft.)
25		▽ - mottled reddish brown (2.5YR 4/3) and dusky red / dark reddish brown (10R 3/4) saprolite wet, soft, with black spots, trace weathered rock fragments			SPT N=3bpf(@23.5ft.)

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LOG OF TEST BORING

BORING APC-10 / PZ-17S / SGWC-15

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION	COMMENTS
				Weak Moderate Strong	
30		Silt (ML) (Con't) - mottled light red (2.5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, stiff, with black streaking, trace weathered rock fragments			SPT N=9bpf(@28.5ft.)
35		Sandy Elastic Silt (MH) - mottled reddish brown (2.5YR 4/3) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium stiff, with black streaking, trace weathered rock fragments			SPT N=5bpf(@33.5ft.)(LL=55; PI=23; FC = 54.7%; Gravel = 0%) (MC = 51.6%; UW(d) = 70.3pcf; PERM. = 4.10E-4cm/sec)
40		Silt (ML) - mottled reddish brown (2.5YR 4/3) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium stiff, trace weathered rock fragments, residual quartz, biotite, muscovite			SPT N=8bpf(@38.5ft.)
45		- mottled reddish brown (2.5YR 4/3) and light red / moderate reddish orange (10R 6/6) saprolite wet, stiff, with black streaking, trace weathered rock fragments, biotite, muscovite, residual quartz			SPT N=12bpf(@43.5ft.)
Bottom of borehole at 45.2 feet.					
50					
55					

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RECORD OF WELL CONSTRUCTION

WELL: SGWC-15/PZ-17S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/25/2015 COMPLETED 2/26/2015 SURF. ELEV. 480.3 COORDINATES: N:33.079136 E:-83.805879
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 45.2 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 33.81 ft. DELAYED 31.66 ft. after 24 hrs.
NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				478.3 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 6 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE: GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



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WELL: SGWC-15/PZ-17S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		(CONTINUED)		
			Annular Fill: Cement-Bentonite Grout - 6 bags Type I/II Portland Cement, 94 lbs/each	
		30		451.5 (28.8)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
447.3			Filter: Unimin FilterSil - 5.5 Bags #1A, 50 lbs/each	447.7 (32.6)
		35		445.5 (34.8)
442.3			Screen: 10 ft. pre-pack	
		40		
435.1		45	Sump: 0.40 ft.	435.5



LOG OF TEST BORING

BORING APC-11 / PZ-18S / SGWC-16

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/3/2015 COMPLETED 3/3/2015 SURF. ELEV. 456.9 COORDINATES: N:33.076470 E:-83.805688
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 40.2 ft. GROUND WATER DEPTH: DURING 18.5 ft. COMP. 29.95 ft. DELAYED 29.33 ft. after 24 hrs.
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silty Clay (CL) - Hand auger 5' for utilities clearance			
10		- mottled red (2.5YR 4/8) and light red / moderate reddish orange (10R 6/6) residuum dry, very stiff, trace roots			SPT N=16bpf(@8.5ft.)
15		Sandy Silt (ML) - mottled red (2.5YR 4/8) and white (10R 8/1) saprolite dry, stiff, with black streaking, trace residual quartz			SPT N=11bpf(@13.5ft.)
20		▽ - mottled reddish yellow (5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, soft, trace weathered rock fragments			SPT N=4bpf(@18.5ft.)
25		- mottled reddish yellow (5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium stiff, with black streaking, trace residual quartz and biotite			SPT N=5bpf(@23.5ft.)

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LOG OF TEST BORING

BORING APC-11 / PZ-18S / SGWC-16

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
30		<div>- mottled reddish yellow (5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, soft, trace weathered rock fragments</div>			SPT N=3bpf(@28.5ft.)
35		<div>- mottled reddish yellow (5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, soft, with white streaking, trace biotite and residual quartz</div>			SPT N=4bpf(@33.5ft.)
40		<div>- mottled reddish yellow (5YR 6/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, soft, with black and white streaking, trace biotite and residual quartz</div>			SPT N=4bpf(@38.5ft.)
		Bottom of borehole at 40.2 feet.			
45					
50					
55					



RECORD OF WELL CONSTRUCTION

WELL: SGWC-16/PZ-18S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/3/2015 **COMPLETED** 3/3/2015 **SURF. ELEV.** 456.9 **COORDINATES:** N:33.076470 E:-83.805688

CONTRACTOR Civil Field Services **EQUIPMENT** CME550 **METHOD** Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE BEARING

BORING DEPTH 40.2 ft. **GROUND WATER DEPTH: DURING** 18.5 ft. **COMP.** 29.95 ft. **DELAYED** 29.33 ft. after 24 hrs.

NOTES

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		ELEV. (DEPTH)
		<p>Surface: protective aluminum cover with bollards; 4-foot square concrete pad</p> <p>Surface Seal: concrete</p> <p>Well: 2" OD PVC (SCH 40)</p> <p>Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each</p> <p>Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each</p>		
				454.9 (2.0)
443.9				
				432.9 (24.0)

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WELL CONSTRUCTION

WELL: SGWC-16/PZ-18S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	430.1 (26.8)
			Filter: Unimin FilterSil - 6.5 Bags #1A, 50 lbs/each	428.1 (28.8)
			Screen: 10 ft. pre-pack	
			Sump: 0.40 ft.	418.1 (38.8)
416.7				

LOG OF TEST BORING

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RECORD OF WELL CONSTRUCTION

WELL: SGWC-17/PZ-20S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/11/2015 COMPLETED 3/11/2015 SURF. ELEV. 414.8 COORDINATES: N:33.073961 E:-83.805332

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 24.5 ft. GROUND WATER DEPTH: DURING 0.5 ft. COMP. 6.1 ft. DELAYED 5.9 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		ELEV. (DEPTH)
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	412.8 (2.0)
			Well: 2" OD PVC (SCH 40)	
			Annular Fill: Cement-Bentonite Grout - 3 bags Type I/II Portland Cement, 94 lbs/each	
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	405.2 (9.6)
			Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	402.7 (12.1)
			Screen: 10 ft. pre-pack	400.7 (14.1)
			Sump: 0.40 ft.	390.7
401.8				
390.3				



LOG OF TEST BORING

BORING APC-13 / PZ-22S / SGWC-18

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/16/2015 COMPLETED 3/17/2015 SURF. ELEV. 510.3 COORDINATES: N:33.070220 E:-83.806444

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 44.5 ft. GROUND WATER DEPTH: DURING 28.5 ft. COMP. 31.4 ft. DELAYED 31.1 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:59 - S:\WORKGROUP\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
5		Lean Clay (CL) - Hand auger 5' for utilities clearance			
10		- mottled brown (7.5YR 5/2) and yellow (10YR 7/6) fill moist, stiff, micaceous			SPT N=9bpf(@8.5ft.)
15		- mottled brown (7.5YR 5/2) and yellow (10YR 7/6) fill moist, medium stiff, micaceous			SPT N=5bpf(@13.5ft.)
20		Silt (ML) - mottled reddish yellow (7.5YR 7/8) and white (10R 8/1) saprolite moist, medium stiff, with black spots, trace weathered rock fragments			SPT N=7bpf(@18.5ft.)
25		- mottled reddish yellow (7.5YR 7/8) and white (10R 8/1) saprolite moist, medium stiff, with black spots, trace weathered rock fragments, residual quartz, biotite, muscovite			SPT N=5bpf(@23.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING APC-13 / PZ-22S / SGWC-18

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Silt (ML) (Con't)			
30		- mottled reddish yellow (7.5YR 7/8) saprolite wet, medium stiff, black/yellow streaking and spots, trace residual quartz, feldspar, biotite, muscovite			SPT N=5bpf(@28.5ft.)
35		- mottled reddish yellow (7.5YR 7/8) saprolite wet, medium stiff, black/yellow streaking and spots, trace residual quartz, feldspar, biotite, muscovite			SPT N=7bpf(@33.5ft.)
40		- mottled reddish yellow (7.5YR 7/8) and pink (10R 8/3) saprolite wet, stiff, with black streaking, trace residual quartz, feldspar, biotite, muscovite			SPT N=9bpf(@38.5ft.)
45		- mottled reddish yellow (7.5YR 7/8) and white (10R 8/1) saprolite wet, stiff, with black streaking, trace residual quartz, feldspar, hornblende, biotite, muscovite			SPT N=10bpf(@43.5ft.)
		Bottom of borehole at 44.5 feet.			
50					
55					

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SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:59 -

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RECORD OF WELL CONSTRUCTION

WELL: SGWC-18/PZ-22S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/16/2015 COMPLETED 3/17/2015 SURF. ELEV. 510.3 COORDINATES: N:33.070220 E:-83.806444
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 44.5 ft. GROUND WATER DEPTH: DURING 28.5 ft. COMP. 31.4 ft. DELAYED 31.1 ft. after 24 hrs.
NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH) 508.3 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
		20		
492.3		25		

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE: GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PROJECT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC-18/PZ-22S

PAGE 2 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
		30		481.3 (29.0)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
				478.1 (32.2)
		35	Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	
				476.2 (34.1)
		40	Screen: 10 ft. pre-pack	
465.8			Sump: 0.40 ft.	466.2



LOG OF TEST BORING

BORING APC-14 / PZ-23S / SGWC-19

PAGE 1 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/18/2015 COMPLETED 3/18/2015 SURF. ELEV. 475.8 COORDINATES: N:33.067693 E:-83.809179

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 34.6 ft. GROUND WATER DEPTH: DURING 13.5 ft. COMP. 15.1 ft. DELAYED 12.1 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:59 - S:\WORKGROUP\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Lean Clay (CL) - Hand auger 5' for utilities clearance			
10		- mottled red (2.5YR 5/8) fill moist, medium stiff, trace mica			SPT N=8bpf(@8.5ft.)
15		Silt (ML) - mottled reddish gray (2.5YR 5/1) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium stiff, black spots, with trace residual quartz			SPT N=5bpf(@13.5ft.)
20		- mottled reddish yellow (7.5YR 7/8) saprolite wet, medium stiff, trace mica			SPT N=6bpf(@18.5ft.)
25		Silty Sand (SM) - mottled white (7.5YR 8/1) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, muscovite, biotite			SPT N=10bpf(@23.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING APC-14 / PZ-23S / SGWC-19

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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		Silty Sand (SM) (Cont) - mottled white (7.5YR 8/1) saprolite wet, medium dense, very fine to fine grained, black streaking, trace weathered rock fragments and mica - mottled white (7.5YR 8/1) saprolite wet, dense, very fine to fine grained, black streaking, trace muscovite, biotite, residual quartz			SPT N=20bpf(@28.5ft.) SPT N=39bpf(@33.5ft.)
35		Bottom of borehole at 34.6 feet.			
40					
45					
50					
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC-19/PZ-23S
PAGE 1 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

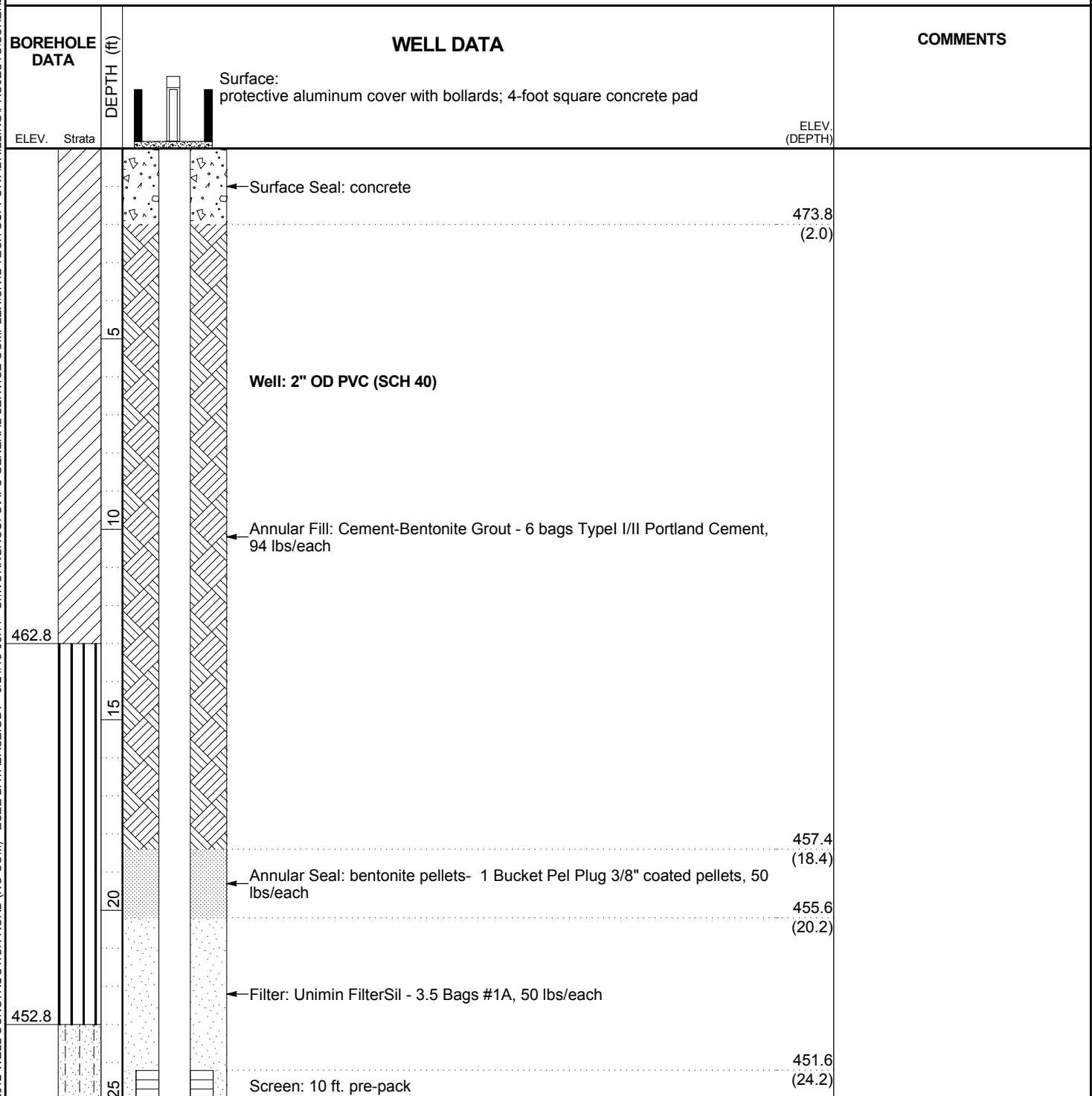
DATE STARTED 3/18/2015 COMPLETED 3/18/2015 SURF. ELEV. 475.8 COORDINATES: N:33.067693 E:-83.809179

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 34.6 ft. GROUND WATER DEPTH: DURING 13.5 ft. COMP. 15.1 ft. DELAYED 12.1 ft. after 24 hrs.

NOTES _____



(Continued Next Page)



RECORD OF WELL CONSTRUCTION

WELL: SGWC-19/PZ-23S

PAGE 2 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		(CONTINUED)		
		30	Screen: 10 ft. pre-pack	
441.2			Sump: 0.40 ft.	441.6

RECORD OF BOREHOLE SGWC-20/APC-15

SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 25.00 ft
LOCATION: Juliette, GA

DRILL RIG: C 100 Track Mounted Rig
DATE STARTED: 11/19/15
DATE COMPLETED: 11/19/15

NORTHING: 1,116,020.77
EASTING: 2,405,307.58
GS ELEVATION: 501.12
TOC ELEVATION: 504.44 ft

DEPTH W.L.: 8.20'
ELEVATION W.L.:
DATE W.L.: 11/20/15
TIME W.L.: 11:35

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES			MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	REC		
0	500	0.00 - 5.00 CLAY (CH)/FILL; clayey silty overburden, red/brown, moist (vacuum cleared by Southern Company Services to 10 feet prior to drilling activities)	CH						<p>Portland Type I/ Type II/ Gel mix</p> <p>3/8" Bentonite Pellets</p> <p>#1 sand - 0.010" slot screen</p>	WELL CASING Interval: -3'-15' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded WELL SCREEN Interval: 15'-25' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 12.7'-25' Type: #1 sand/ Prepack Filter FILTER PACK SEAL Interval: 10.6'-12.7' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-10.6' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Anodized Aluminum DRILLING METHODS Soil Drill: 4-inch Sonic Rock Drill: 4-inch Sonic
5	495	5.00 - 10.00 clayey silt, red/brown, moist			496.12 5.00					
10	490	10.00 - 13.00 CLAYEY SILT (ML)/SAPROLITE; clayey silts, fat clay, trace biotite streaking and mica, red/orange/brown, moist	ML		491.12 10.00					
15		13.00 - 15.00 FAT CLAY (CH)/SAPROLITE; silt and fine sand with trace quartz, micaceous, trace biotite, red/brown, wet	CH		488.12 13.00					
15	485	15.00 - 20.00 SILT/SAPROLITE; clayey silty, mottled saprolite, trace biotite, red/orange/brown, very soft, wet Shelby Tube Collected: 15'-17'	MH		486.12 15.00					
20	480	20.00 - 25.00 mottled saprolite, weathered biotite, micaceous, trace quartz, foliation (clayey silt with interbedded fine sand), orange/red/brown, very wet			481.12 20.00					
25	475	Boring completed at 25.00 ft			476.12					
30	470									
35	465									
40	460									
45										

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 9/15/17

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Cascade Drilling
DRILLER: Vernon Scott

GA INSPECTOR: James Mullooly
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 9/29/17



LOG OF TEST BORING

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC-21/PZ-01S
PAGE 1 OF 1
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

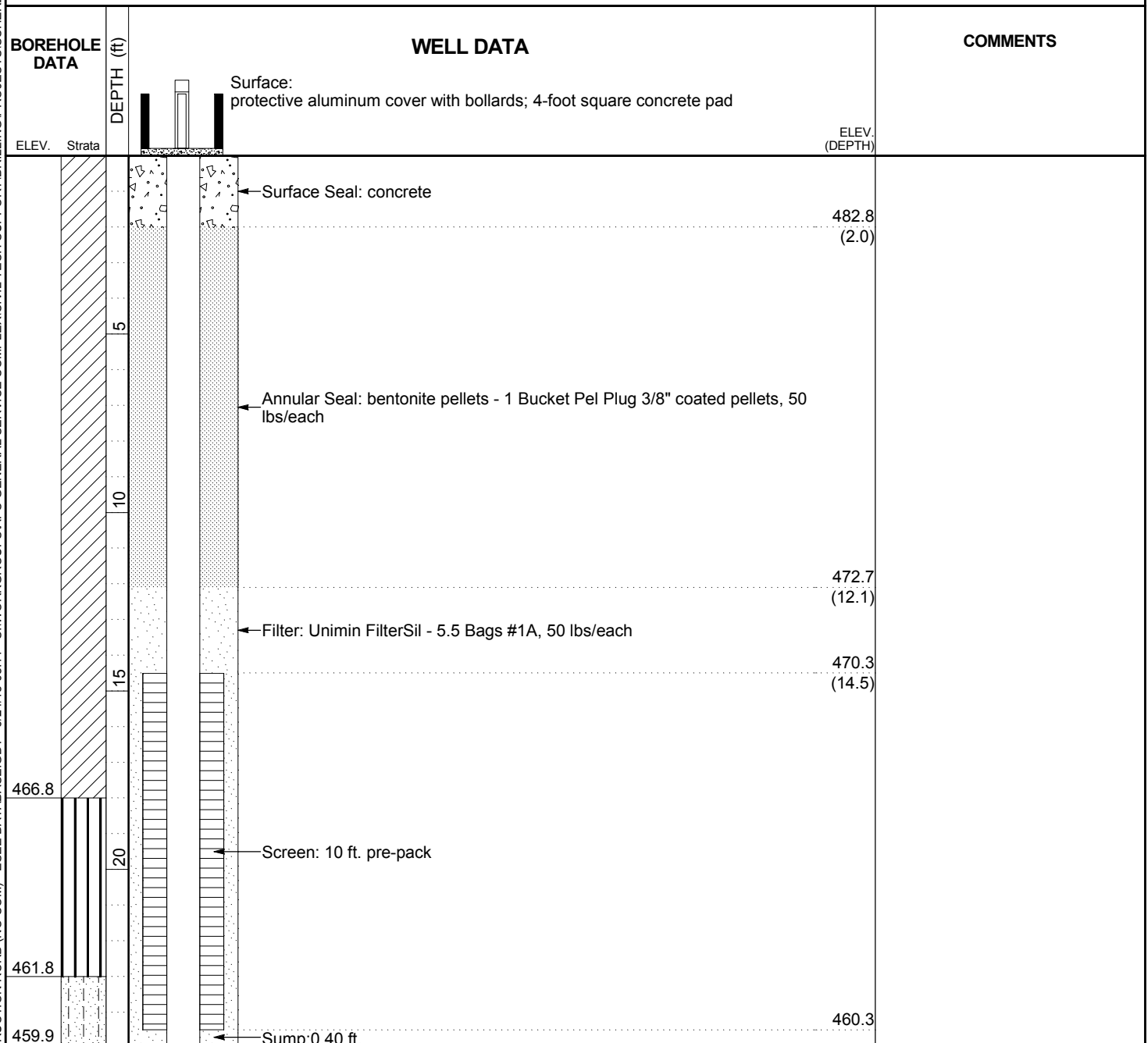
DATE STARTED 5/6/2015 COMPLETED 5/6/2015 SURF. ELEV. 484.8 COORDINATES: N:33.066024 E:-83.815384

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 24.9 ft. GROUND WATER DEPTH: DURING 14.4 ft. COMP. 0 ft. DELAYED 2.7 ft. after 24 hrs.

NOTES _____





LOG OF TEST BORING

BORING APC-17 / PZ-02S / SGWC-22

PAGE 1 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 1/21/2015 COMPLETED 1/22/2015 SURF. ELEV. 515.6 COORDINATES: N:33.066392 E:-83.819283

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE BEARING

BORING DEPTH 50.1 ft. GROUND WATER DEPTH: DURING 25.5 ft. COMP. 25.5 ft. DELAYED 24.51 ft. after 24 hrs.

NOTES

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Lean Clay (CL) - mottled dusky red (5R 3/4), light red / moderate reddish orange (10R 6/6) and pinkish white / grayish orange pink (10R 8/2) fill moist, very stiff			SPT N=21bpf(@3.5ft.)
10		Silt (ML) - mottled dusky red (5R 3/4), pinkish white (7.5YR 8/2) and pale red / moderate orange pink (10R 7/4) residuum moist, very stiff, white banding, micaceous			SPT N=20bpf(@8.5ft.)
15		- mottled dusky red (5R 3/4), very pale brown / very pale orange (10YR 8/2) and very pale brown / very pale orange (10YR 8/2) saprolite moist, stiff, with black spots			SPT N=9bpf(@13.5ft.)
20		- mottled brown (10YR 4/3), light brown (7.5YR 6/4) and white (2.5YR 8/1) saprolite moist, medium stiff			SPT N=8bpf(@18.5ft.)
25		Silty Sand (SM) - mottled brown (10YR 4/3), very pale brown / very pale orange (10YR 8/2) and pale red / moderate orange pink (10R 7/4) saprolite wet, loose, very fine to fine grained, with black spots			SPT N=6bpf(@23.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING APC-17 / PZ-02S / SGWC-22

PAGE 2 OF 2

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		▼ Silty Sand (SM) (Cont)			
30		- mottled brown (10YR 4/3), very pale brown / very pale orange (10YR 8/2) and pale red / moderate orange pink (10R 7/4) saprolite wet, medium dense, very fine to fine grained, with black spots			SPT N=12bpf(@28.5ft.)
35		- mottled very pale brown / very pale orange (10YR 8/2), very pale brown / very pale orange (10YR 8/2) and light brownish gray / pale yellowish brown (10YR 6/2) saprolite wet, medium dense, very fine to fine grained, with black spots			SPT N=20bpf(@33.5ft.)
40		- mottled light greenish gray (10BG 7/1), white (7.5YR 8/1) and white (10R 8/1) saprolite wet, dense, very fine to fine grained, micaceous, trace weathered rock fragments			SPT N=42bpf(@38.5ft.)
45		- mottled brown (10YR 4/3), very pale brown / very pale orange (10YR 8/2) and white (10R 8/1) saprolite wet, medium dense, very fine to fine grained, micaceous, with black spots			SPT N=27bpf(@43.5ft.)
50		- mottled brown (10YR 4/3), very pale brown / very pale orange (10YR 8/2) and white (10R 8/1) saprolite wet, dense, very fine to fine grained, micaceous, with black spots			SPT N=43bpf(@48.5ft.)
		Bottom of borehole at 50.1 feet.			
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC 22/PZ-02S
PAGE 1 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

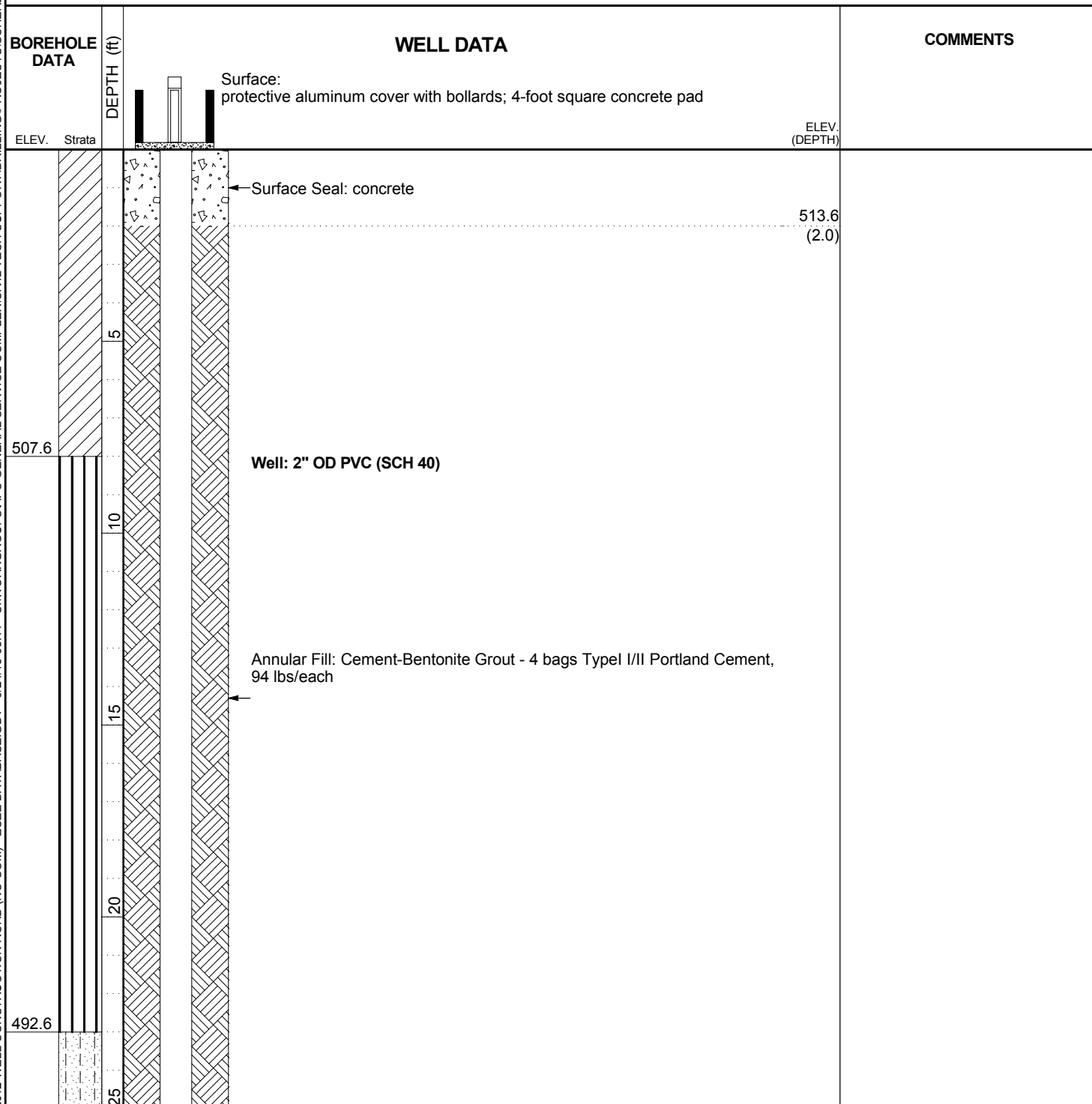
DATE STARTED 1/21/2015 COMPLETED 1/22/2015 SURF. ELEV. 515.6 COORDINATES: N:33.066392 E:-83.819283

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 50.1 ft. GROUND WATER DEPTH: DURING 25.5 ft. COMP. 25.5 ft. DELAYED 24.51 ft. after 24 hrs.

NOTES _____



(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRIFT LOGS\ISCHERER LOGS.GPJ



RECORD OF
WELL CONSTRUCTION

WELL: SGWC22/PZ-02S
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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
				ELEV. (DEPTH)
			Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	489.0 (26.6)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	486.4 (29.2)
			Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	
				479.1 (36.5)
			Screen: 10 ft. pre-pack	
			Sump: 0.40 ft.	469.1 (46.5)
			Backfill:	468.7 (46.9)
465.5		50		



LOG OF TEST BORING

BORING APC-18 / PZ-04I / SGWC-23

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
30		Silty Sand (SM) - mottled greenish gray (10BG 5/1) and light red / moderate reddish orange (10R 6/6) saprolite moist, medium dense, very fine to fine grained, with white streaking and black spots, trace weathered rock fragments and mica			SPT N=17bpf(@28.5ft.)(PL=NP; FC = 32.5%; Gravel = 0%) (MC = 23%; UW(d) = 96pcf; PERM. = 1.65E-4cm/sec)
35		 - mottled greenish gray (10BG 5/1) and light red / moderate reddish orange (10R 6/6) saprolite moist, dense, very fine to fine grained, black streaking, with weathered rock fragments, trace mica			SPT N=36bpf(@33.5ft.)
		PARTIALLY WEATHERED ROCK - variegated with greenish gray (10BG 5/1) fine to coarse grain, very soft, highly weathered			
40		GRANITIC GNEISS - variegated with very pale brown / grayish orange (10YR 7/4) coarse grain, hard to very hard, slightly to moderately weathered, massive, banded, 2 low angle-fractures (10 - 25d), 3 moderate-angle fractures (30 - 45d), 2 high-angle fractures (65 - 90d), with iron oxide staining, quartz, feldspar, mica			
45		- variegated with dark gray (N3) coarse to medium grain, very soft to soft, moderately to highly weathered, inclined, banded, moderately fractured, 10 low-angle fractures (10 - 30d), 11 moderate-angle fractures (30 - 45d), with iron oxide staining, quartz, amphibole			
50		- variegated with dark gray (N3) coarse to medium grain, very soft to soft, moderately to highly weathered, inclined, banded, moderately fractured, 16 moderate-angle fractures (30 - 45d), 2 high-angle fractures (60 - 90d), with iron oxide staining, quartz, amphibole			
55		Bottom of borehole at 49.7 feet.			

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWC-23/PZ-04I
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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 1/29/2015 COMPLETED 2/3/2015 SURF. ELEV. 520.1 COORDINATES: N:33.069571 E:-83.822112

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 49.7 ft. GROUND WATER DEPTH: DURING 34.9 ft. COMP. 33.1 ft. DELAYED 33.9 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
512.1		5		518.1 (2.0)
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
502.1		20		
		25		

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRIFT LOGS\ISCHERER LOGS.GPJ



RECORD OF
WELL CONSTRUCTION

WELL: SGWC-23/PZ-04I
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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
492.1			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
				ELEV. (DEPTH)
		30	Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
485.1		35	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	486.0 (34.1)
483.6			Filter: Unimin FilterSil - 1 Bag #1A, 50 lbs/each	483.6 (36.5)
		40		480.8 (39.3)
		45	Screen: 10 ft. pre-pack	
470.4			Sump: 0.40 ft.	470.8

(Continued Next Page)



LOG OF TEST BORING

BORING APA-5 / PZ-07S / SGWA-24

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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		Silty Sand (SM) (Con't) - mottled yellowish brown (10YR 5/8) and very dark brown / dusky yellowish brown (10YR 2/2) saprolite moist, medium dense, very fine to fine grained, trace biotite layering and zones of platy greenish chlorite			(MC = 13.1%; UW(d) = 119.8pcf; PERM. = 2.49E-5cm/sec) SPT N=18bpf(@28.5ft.)
35		▽ - mottled reddish brown (2.5YR 5/3) and olive brown (2.5Y 4/4) saprolite wet, dense, very fine to fine grained, trace quartz, coarse silt, sand, biotite			SPT N=36bpf(@33.5ft.)
40		- mottled brown (10YR 5/3) and very pale brown (10YR 8/4) saprolite wet, very dense, very fine to fine grained, trace biotite, residual quartz, feldspar			SPT N=50bpf(@38.5ft.)
45		Bottom of borehole at 40.0 feet.			
50					
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWA-24/PZ-07S

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ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/10/2015 COMPLETED 2/10/2015 SURF. ELEV. 500.9 COORDINATES: N:33.073517 E:-83.826631

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 40 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 12.1 ft. DELAYED 12.25 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	498.9 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
		20		
477.9		25	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	477.8 (23.1)

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\PROJECT LOGS\ISCHERER LOGS.GPJ



RECORD OF
WELL CONSTRUCTION

WELL: SGWA-24/PZ-07S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA			COMMENTS
ELEV.	Strata	DEPTH (ft)	(CONTINUED)		ELEV. (DEPTH)
460.9		40	Surface: protective aluminum cover with bollards; 4-foot square concrete pad		475.8 (25.1)
		30	← Filter: Unimin FilterSil - 7 Bags #1A, 50 lbs/each		473.2 (27.7)
		35	← Screen: 10 ft. pre-pack		
			← Sump: 0.40 ft.		463.2 (37.7)
			← Backfill:		462.8 (38.1)



LOG OF TEST BORING

BORING APA-6 / PZ-09S / SGWA-25

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/17/2015 COMPLETED 2/18/2015 SURF. ELEV. 523.4 COORDINATES: N:33.080196 E:-83.826235

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 45 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 25.9 ft. DELAYED 25.5 ft. after 24 hrs.

NOTES _____

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML)			
5		- mottled red (2.5YR 4/6) and bluish gray (10B 6/1) residuum moist, stiff, micaceous, trace clay and muscovite			SPT N=10bpf(@3.5ft.)
10		- red (2.5YR 5/8) residuum dry, medium stiff, micaceous, trace clay			SPT N=6bpf(@8.5ft.)
15		- mottled yellowish red / light brown (5YR 5/6) and light reddish brown / light brown (5YR 6/4) residuum dry, medium stiff, trace mica			SPT N=6bpf(@13.5ft.)
20		- mottled yellow (10YR 7/8) and yellow (10YR 7/8) saprolite moist, stiff, micaceous, with muscovite, biotite, hornblende			SPT N=9bpf(@18.5ft.)
25		- mottled strong brown (7.5YR 4/6) and yellow (10YR 7/8) saprolite moist, stiff, micaceous, with muscovite, residual quartz, felspar			SPT N=9bpf(@23.5ft.)

(Continued Next Page)



LOG OF TEST BORING

BORING APA-6 / PZ-09S / SGWA-25

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		<p>▼ Sandy Silt (ML) (Con't)</p> <p>- mottled brown (7.5YR 5/4) and very pale brown / very pale orange (10YR 8/2) saprolite moist, very stiff, micaceous</p>			SPT N=18bpf(@28.5ft.)
35		<p>▽ - mottled dark yellowish brown (10YR 3/6) and yellow (10YR 7/8) saprolite wet, stiff, micaceous, trace muscovite, biotite, chlorite, hornblende, feldspar, residual quartz</p>			SPT N=15bpf(@33.5ft.) (MC = 53.6%; UW(d) = 66.1pcf; PERM. = 8.55E-5cm/sec)
40		<p>- mottled light gray (2.5Y 7/1), reddish brown / moderate brown (5YR 4/4) and dark olive brown (2.5Y 3/3) saprolite wet, very stiff, micaceous, trace clay, chlorite, muscovite, biotite, residual quartz, hornblende, feldspar</p>			SPT N=22bpf(@38.5ft.)
45		<p>- mottled grayish olive (10Y 4/2), strong brown (7.5YR 5/8) and weak red / pale reddish brown (10R 5/4) saprolite wet, very stiff, micaceous, trace clay, muscovite, biotite, chlorite, residual quartz, feldspar</p>			SPT N=29bpf(@43.5ft.)
50		Bottom of borehole at 45.0 feet.			
55					

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RECORD OF WELL CONSTRUCTION

WELL: SGWA25/PZ-09S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/17/2015 COMPLETED 2/18/2015 SURF. ELEV. 523.4 COORDINATES: N:33.080196 E:-83.826235

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 45 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 25.9 ft. DELAYED 25.5 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				521.4 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE: GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: SGWA25/PZ-09S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
		30		493.3 (30.1)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs each	
				490.7 (32.7)
		35	Filter: Unimin FilterSil - 6.5 Bags #1A, 50 lbs/each	
				488.8 (34.6)
		40	Screen: 10 ft. pre-pack	
478.4		45	Sump: 0.40 ft.	478.8

APPENDIX A6

Piezometer Construction Logs



LOG OF TEST BORING

BORING PZ-021

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EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING**PROJECT** Piezometer Installation**LOCATION** Plant Scherer**DATE STARTED** 1/22/2015 **COMPLETED** 1/27/2015 **SURF. ELEV.** 515.1 **COORDINATES:** N:33.066405 E:-83.819320**CONTRACTOR** Civil Field Services **EQUIPMENT** CME550 **METHOD** Hollow Stem Auger; HQ Rock Core**DRILLED BY** T. Milam **LOGGED BY** S. Baxter **CHECKED BY** L. Millet **ANGLE** **BEARING****BORING DEPTH** 84.3 ft. **GROUND WATER DEPTH: DURING** 23.51 ft. **COMP.** 25.61 ft. **DELAYED** 25.41 ft. after 24 hrs.**NOTES**

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPAPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silty Clay (CL) - mottled dusky red / dark reddish brown (10R 3/4), very pale brown (10YR 7/3) and yellowish brown / moderate yellowish brown (10YR 5/4) fill moist, very stiff			SPT N=20bpf(@3.5ft.)
10		- mottled dusky red / dark reddish brown (10R 3/4), very pale brown (10YR 7/3) and yellow / pale yellowish orange (10YR 8/6) fill moist, very stiff, trace sand			SPT N=29bpf(@8.5ft.)
15		- mottled dusky red / dark reddish brown (10R 3/4) and very pale brown (10YR 7/3) fill moist, stiff			SPT N=10bpf(@13.5ft.)
20		Sandy Silt (ML) - mottled yellow / pale yellowish orange (10YR 8/6), yellow / pale yellowish orange (10YR 8/6) and yellow / pale yellowish orange (10YR 8/6) saprolite moist, stiff, micaceous, with black spots			SPT N=9bpf(@18.5ft.)
25		Silty Sand (SM) - mottled yellow / pale yellowish orange (10YR 8/6), yellow / pale yellowish orange (10YR 8/6) and yellow (10YR 7/8) saprolite wet, medium dense, very fine to fine grained, with black spots, trace rock fragments			SPT N=15bpf(@23.5ft.)(PL=NP; FC = 36.9%; Gravel = 2.2%) (MC = 20.7%; UW(d) = 106.7pcf; PERM. = 8.60E-9cm/sec)
30		- mottled yellow / pale yellowish orange (10YR 8/6), yellow / pale yellowish orange (10YR 8/6) and yellow (10YR 7/8) saprolite wet, medium dense, very fine to fine grained, with black and gray streaks, trace mica and weathered rock fragments			SPT N=12bpf(@28.5ft.)

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BORING PZ-021
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Silty Sand (SM) (Cont)			
35		- mottled brown (10YR 4/3), reddish gray (10R 6/1) and white (2.5Y 8/1) saprolite wet, medium dense, very fine to fine grained, with black spots, trace mica and weathered rock fragments			SPT N=13bpf(@33.5ft.)
40		- mottled light gray (10R 7/1), white (10R 8/1) and white (10YR 8/1) saprolite wet, medium dense, very fine to fine grained, with black spots, trace mica and weathered rock fragments			SPT N=20bpf(@38.5ft.)(PL=NP; FC = 40.2%; Gravel = 0%) (MC = 23.2%; UW(d) = 100.2pcf; PERM. = 6.71E-5cm/sec)
45		- mottled white (10YR 8/1), pinkish white / grayish orange pink (10R 8/2) and yellow / pale yellowish orange (10YR 8/6) saprolite wet, very dense, very fine to fine grained, with black spots, trace weathered rock fragments			SPT N=70bpf(@43.5ft.)
50		- variegated gray (2.5Y 5/1) and white (10R 8/1) saprolite wet, very dense, very fine to fine grained, with rounded white medium grained quartz fragments, trace weathered rock fragments			SPT N=86bpf(@48.5ft.)
55		- mottled gray (10YR 5/1) and white (10R 8/1) saprolite wet, very dense, very fine to fine grained, white streaking with black spots, partially weathered rock fragments			SPT N=77bpf(@53.5ft.)
60		- mottled gray (10YR 5/1) and white (10R 8/1) saprolite wet, very dense, very fine to fine grained, white banding with black spots, partially weathered rock fragments			SPT N=50bpf(@58.5ft.)
65		- Attempted to start coring, no recovery			

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LOG OF TEST BORING

BORING PZ-021
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
70		Partially Weathered Rock (PWR) (Con't) - mottled gray (10YR 5/1) and white (10R 8/1) saprolite wet, very dense, very fine to coarse grained, banded white with black spots			SPT N=50bpf(@68.5ft.)
75		BIOTITE GNEISS - dark gray (N3) and grayish black (N2) fine to medium grain, soft to medium hard, moderately to highly weathered, inclined, banded, 3 moderate-angle fractures (30 - 45d), oxidized fractures at 69.3' and 70.6'			
80		- dark gray (N3) and grayish black (N2) medium to coarse grain, medium hard, slightly to moderately weathered, inclined, banded, 1 low-angle fracture (10 - 25d), 14 moderate-angle fractures (30 - 45d), 1 high-angle fracture (70 - 90d)			
85		Bottom of borehole at 84.3 feet.			
90					
95					
100					
105					

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RECORD OF WELL CONSTRUCTION

WELL: PZ-021
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 1/22/2015 COMPLETED 1/27/2015 SURF. ELEV. 515.1 COORDINATES: N:33.066405 E:-83.819320

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 84.3 ft. GROUND WATER DEPTH: DURING 23.51 ft. COMP. 25.61 ft. DELAYED 25.41 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
		5		513.1 (2.0)
		10		
		15		
497.1		20	Annular Fill: Cement-Bentonite Grout - 9 bags Type I/II Portland Cement, 94 lbs/each Well: 2" OD PVC (SCH 40)	
492.1		25		
		30		

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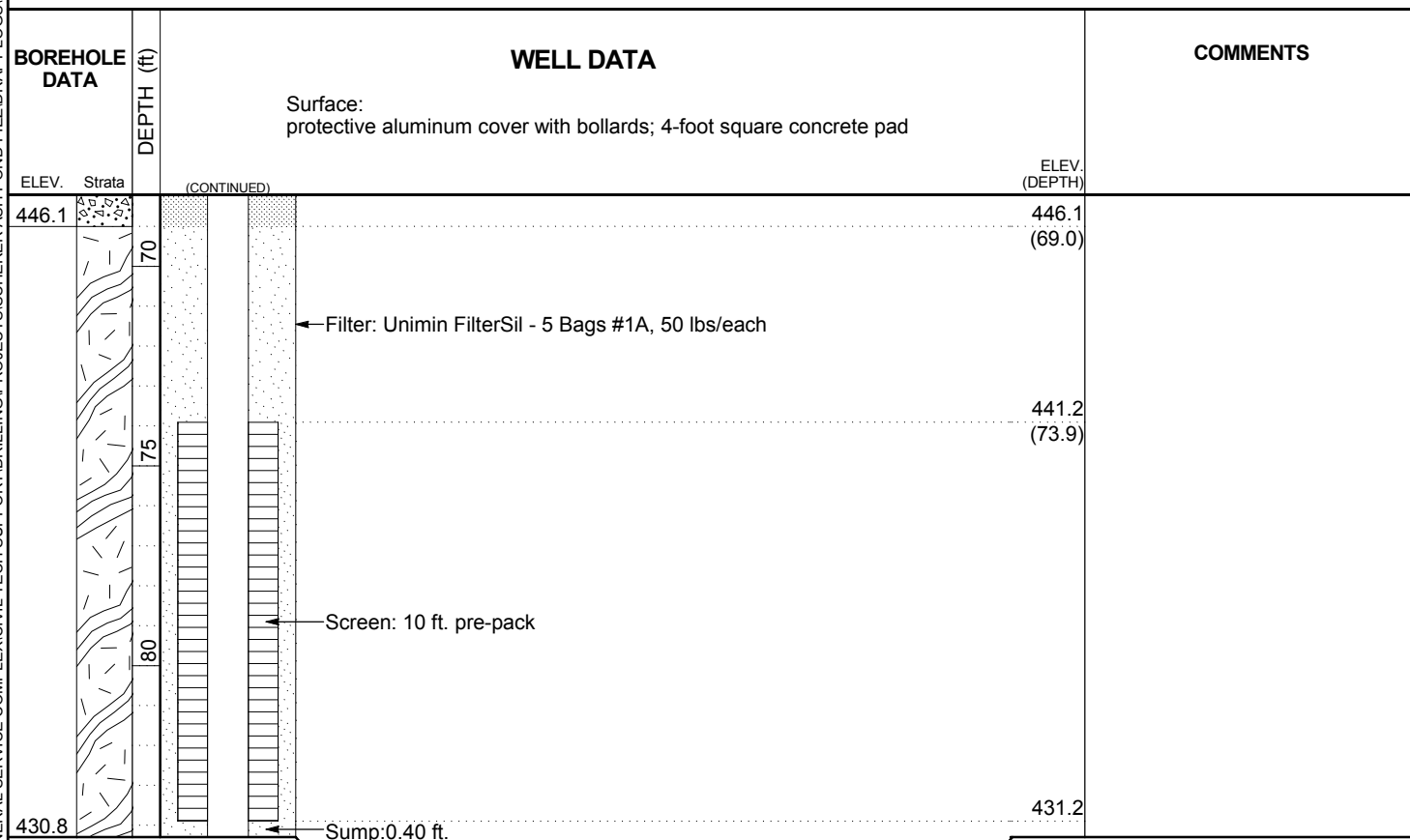
SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
	(CONTINUED)		Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
				ELEV. (DEPTH)
		35		
		40		
		45		
		50		
		55		
		60		
		65		
447.1			Annular Fill: Cement-Bentonite Grout - 9 bags Type I/II Portland Cement, 94 lbs/each	450.6 (64.5)
			Annular Seal: bentonite pellets - 0.5 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	

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BORING PZ-03S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 1/28/2015 **COMPLETED** 1/29/2015 **SURF. ELEV.** 514.6 **COORDINATES:** N:33.067894 E:-83.820805

CONTRACTOR Civil Field Services **EQUIPMENT** CME550 **METHOD** Hollow Stem Auger

DRILLED BY T. Milam **LOGGED BY** S. Baxter **CHECKED BY** L. Millet **ANGLE** **BEARING**

BORING DEPTH 50 ft. **GROUND WATER DEPTH: DURING** 48.5 ft. **COMP.** 28.31 ft. **DELAYED** 30.11 ft. after 24 hrs.

NOTES

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML)			
5		- mottled red / moderate reddish brown (10R 4/6) and light yellowish brown (2.5Y 6/4) fill moist, stiff, clayey, trace mica			SPT N=15bpf(@3.5ft.)
10		- mottled red / moderate reddish brown (10R 4/6) saprolite moist, very stiff, with black spots, trace mica			SPT N=18bpf(@8.5ft.)
15		- mottled white (10YR 8/1) and light yellowish brown (2.5Y 6/4) saprolite moist, stiff, trace mica, weathered rock, residual quartz			SPT N=9bpf(@13.5ft.)
20		- mottled dusky red / dark reddish brown (10R 3/4) and yellow (10YR 7/8) saprolite moist, medium stiff, with black streaks, trace weathered rock fragments			SPT N=8bpf(@18.5ft.)
25		- mottled brown (10YR 5/3), black (10YR 2/1) and white (10YR 8/1) saprolite moist, medium stiff, trace quartz and partially weathered rock fragments			SPT N=5bpf(@23.5ft.)

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BORING PZ-03S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION	COMMENTS
				Weak Moderate Strong	
		Sandy Silt (ML) (Con't)			
30		- mottled very pale brown / very pale orange (10YR 8/2) saprolite moist, stiff, white streaking, trace residual quartz and partially weathered rock fragments			SPT N=11bpf(@28.5ft.)
35		- mottled very pale brown / very pale orange (10YR 8/2) and yellow (10YR 7/8) saprolite moist, stiff, white streaking, with partially weathered rock fragments			SPT N=9bpf(@33.5ft.)
40		- mottled very pale brown / very pale orange (10YR 8/2) saprolite moist, very stiff, white and orange streaking with black spots, with partially weathered rock fragments			SPT N=19bpf(@38.5ft.)
45		- mottled light brownish gray / pale yellowish brown (10YR 6/2) and yellowish brown (10YR 5/8) saprolite moist, hard, white and orange streaking, with partially weathered rock fragments			SPT N=34bpf(@43.5ft.)
50		- mottled gray (10YR 5/1) saprolite wet, very hard, white streaking, with partially weathered rock fragments			SPT N=50bpf(@48.5ft.)
		Bottom of borehole at 50.0 feet.			
55					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
		30	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		35	Annular Fill: Cement-Bentonite Grout - 7 bags Type I/II Portland Cement, 94 lbs/each	
		35		480.4 (34.2)
		35	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
		35		477.8 (36.8)
		40	Filter: Unimin FilterSil - 5 Bags #1A, 50 lbs/each	
		40		475.0 (39.6)
		45	Screen: 10 ft. pre-pack	
		50	Sump: 0.40 ft.	465.0
464.6				

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZOMETER LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 1/28/2015 COMPLETED 1/29/2015 SURF. ELEV. 514.6 COORDINATES: N:33.067894 E:-83.820805
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 50 ft. GROUND WATER DEPTH: DURING 48.5 ft. COMP. 28.31 ft. DELAYED 30.11 ft. after 24 hrs.
NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				512.6 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 7 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

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LOG OF TEST BORING

BORING PZ-05I

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		Silt (ML) (Con't) - mottled very pale brown / very pale orange (10YR 8/2) and dark gray (10YR 4/1) saprolite moist, stiff, with black streaking, micaceous, trace rock fragments			SPT N=12bpf(@28.5ft.)
35		- mottled white (10YR 8/1) saprolite moist, very hard, with black streaking, micaceous, trace sand, weathered rock fragments, and residual quartz			SPT N=86bpf(@33.5ft.)
40		PARTIALLY WEATHERED ROCK - light gray (N7) fine to coarse grain, soft, highly weathered GNEISS - variegated with medium gray (N5) medium to coarse grain, hard to very hard, not weathered, inclined, blastoporphyratic, banded, 1 low angle fracture (10 - 20d), with amphibole, quartz, biotite			
45		- variegated with medium gray (N5) medium to coarse grain, hard to very hard, not weathered, inclined, blastoporphyratic, banded, 1 low-angle fracture (10 - 30d), 6 moderate-angle fractures (30 - 45d), with amphibole, quartz, biotite			Lost circulation
50		- variegated with medium gray (N5) medium to coarse grain, medium hard to hard, slightly to moderately weathered, inclined, pitted, slightly fractured, 1 low-angle fracture (10 - 30d), with amphibole, quartz, biotite, iron oxide staining			
55		Bottom of borehole at 47.2 feet.			

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WELL: PZ-05I
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/3/2015 COMPLETED 2/4/2015 SURF. ELEV. 520.7 COORDINATES: N:33.071745 E:-83.823130

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 47.2 ft. GROUND WATER DEPTH: DURING 35.1 ft. COMP. 41.5 ft. DELAYED 36.8 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				518.7 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRIFT LOGS\ISCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
				ELEV. (DEPTH)
			Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
		30		
			Annular Seal: bentonite pellets - 0.75 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	488.5 (32.2)
485.7		35		486.1 (34.6)
484.7			Filter: Unimin FilterSil - 1 Bag #1A, 50 lbs/each	
				484.1 (36.6)
		40		
			Screen: 10 ft. pre-pack	
		45		
473.5			Sump: 0.40 ft.	474.1 (46.6)



LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/4/2015 COMPLETED 2/4/2015 SURF. ELEV. 529.2 COORDINATES: N:33.072916 E:-83.822737

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 54.8 ft. GROUND WATER DEPTH: DURING 43.15 ft. COMP. 43.15 ft. DELAYED 42.11 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
		Sandy Silt (ML)			
5		- strong brown (7.5YR 5/8) residuum moist, stiff			SPT N=11bpf(@3.5ft.)
10		- yellow (10YR 7/8) residuum moist, stiff			SPT N=14bpf(@8.5ft.)
15		- yellow (10YR 7/8) saprolite moist, very stiff, trace weathered rock fragments			SPT N=16bpf(@13.5ft.)
20		- dark yellowish brown (10YR 4/4) saprolite moist, stiff, trace weathered rock fragments			SPT N=15bpf(@18.5ft.)
25		Silty Sand (SM) - mottled dark grayish brown / dark yellowish brown (10YR 4/2) saprolite moist, medium dense, very fine to fine grained, trace residual quartz, biotite, weathered schist			SPT N=24bpf(@23.5ft.)(LL=41; PI=10; FC = 31.6%; Gravel = 0%) (MC = 28%; UW(d) = 94.1pcf; PERM. = 1.29E-4cm/sec)
30		- mottled dark grayish brown / dark yellowish brown (10YR 4/2) saprolite moist, very dense, very fine to fine grained, trace residual quartz, biotite, weathered schist			SPT N=55bpf(@28.5ft.)

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EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
35		Silty Sand (SM) (Con't) - light greenish gray (10BG 7/1) saprolite moist, very dense, very fine to fine grained, trace biotite, residual quartz, weathered schist			SPT N=50bpf(@33.5ft.)
40		- mottled light greenish gray (10BG 7/1) saprolite moist, very dense, very fine to fine grained, trace moderately weathered schist, biotite, residual quartz			SPT N=50bpf(@38.5ft.)
45		▼ ▼ - dark gray (N3) saprolite moist, very dense, fine to coarse grained, trace biotite, residual quartz, iron oxide staining			SPT N=50bpf(@43.5ft.)
50		Well-graded Sand with Silt (SW-SM) - dark gray (N3) saprolite wet, very dense, very fine to very coarse grained, trace residual quartz, iron oxide staining throughout sample			SPT N=50bpf(@48.5ft.)
55		- dark gray (N3) saprolite wet, very dense, very fine to very coarse grained, trace biotite, residual quartz, iron oxide staining throughout sample			SPT N=50bpf(@53.5ft.)
60		Bottom of borehole at 54.8 feet.			
65					
70					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZOMETER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/4/2015 COMPLETED 2/4/2015 SURF. ELEV. 529.2 COORDINATES: N:33.072916 E:-83.822737

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 54.8 ft. GROUND WATER DEPTH: DURING 43.15 ft. COMP. 43.15 ft. DELAYED 42.11 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover; 4-foot square concrete pad	
			Surface Seal: concrete	ELEV. (DEPTH) 527.2 (2.0)
		5		
		10		
		15	Well: 2" OD PVC (SCH 40)	
		20	Annular Fill: Cement-Bentonite Grout - 7 bags Type I/II Portland Cement, 94 lbs/each	
506.2		25		
		30		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SSCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
		35	Surface: protective aluminum cover; 4-foot square concrete pad	
		40	Annular Fill: Cement-Bentonite Grout - 7 bags Typel I/II Portland Cement, 94 lbs/each	
				ELEV. (DEPTH)
				489.0 (40.2)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
				486.8 (42.4)
		45	Filter: Unimin FilterSil - 8 Bags #1A, 50 lbs/each	
				484.8 (44.4)
481.2		50	Screen: 10 ft. pre-pack	
474.4			Sump: 0.40 ft.	474.8

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
30		Sandy Silt (ML) (Con't) ▽ - mottled yellowish red (5YR 5/8) and red (2.5YR 5/8) saprolite wet, stiff, micaceous, trace residual quartz, feldspar, muscovite			SPT N=14bpf(@28.5ft.)
35		Silty Sand (SM) - mottled yellowish red (5YR 4/6) and brownish yellow (10YR 6/8) saprolite wet, medium dense, very fine to fine grained, micaceous, trace residual quartz, feldspar, weathered rock fragments			SPT N=16bpf(@33.5ft.)(LL=53; PI=6; FC = 32.8%; Gravel = 1.6%)
40		- mottled brown (7.5YR 4/4) and greenish gray (10BG 5/1) saprolite wet, medium dense, very fine to fine grained, micaceous, trace residual quartz, feldspar, muscovite, chlorite, zone of coarse white rock fragments			SPT N=18bpf(@38.5ft.)
45		- mottled greenish gray (10BG 5/1) and strong brown (7.5YR 5/8) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, feldspar, chlorite, biotite, muscovite			SPT N=19bpf(@43.5ft.)
50		- mottled white (10R 8/1) and greenish gray (10BG 5/1) saprolite wet, very dense, very fine to fine grained, with red staining, trace residual quartz, feldspar, chlorite, muscovite, biotite, hornblende			SPT N=74bpf(@48.5ft.)
55		- mottled white (10R 8/1) and greenish gray (10BG 5/1) saprolite wet, very dense, very fine to fine grained, with red staining, trace residual quartz, feldspar, chlorite, muscovite, biotite, hornblende			SPT N=60bpf(@53.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
60		Silty Sand (SM) (Cont) - very dark greenish gray (10BG 3/1) saprolite wet, very dense, very fine to fine grained. trace partially weathered rock fragments, residual quartz, feldspar, biotite, muscovite, hornblende, chlorite			SPT N=50bpf(@58.5ft.)
		Partially Weathered Rock (PWR)			
65		AMPHIBOLITE - black (N1) fine to coarse grain, very soft to soft, highly weathered, horizontal, completely fractured at all angles, low-angle fractures (weathering cracks), no visible healing, with quartz, feldspar, muscovite, biotite, hornblende, pyrite, interbedded Biotite Gneiss - black (N1) fine to coarse grain, soft to medium hard, moderately to highly weathered, inclined, banded, 14 low-angle fractures (10 - 20d), 5 moderate-angle fractures (30 - 45d), not to total healing with some fractures filled with gray mud and/or red oxidation, trace completely healed high-angle fractures, rusty red oxidation, trace yellowish-red oxidation, with pyrite, feldspar, biotite			
70		- black (N1) and white (N9) fine to coarse grain, medium hard, moderately weathered, inclined, banded, moderate-angle fractures along foliation, open verticle fracture at 71.6'-72.6' bgs, healed with quartz and feldspar, 4 low-angle fractures (10 - 20d), 8 moderate-angle fractures (30 - 45d), 1 high-angle fracture (65 - 90d), interbedded with Biotite Gneiss, trace mud filled fractures, oxidation, with quartz, feldspar, pyrite, biotite			
75		- black (N1) and white (N9) fine to coarse grain, medium hard, moderately weathered, inclined, banded, moderate-angle fractures along foliation, healed with quartz and feldspar, 4 low-angle fractures (10 - 30d), 3 moderate-angle fractures (30 - 45d), 2 high-angle fractures (65 - 90d), interbedded with Biotite Gneiss, trace mud filled fractures, oxidation, with quartz, feldspar, pyrite, biotite			
80					
		Bottom of borehole at 80.2 feet.			
85					

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SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 -

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/18/2015 COMPLETED 2/19/2015 SURF. ELEV. 523.5 COORDINATES: N:33.080216 E:-83.826216

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY B. Smelser CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 80.2 ft. GROUND WATER DEPTH: DURING 28.5 ft. COMP. 24.6 ft. DELAYED 24.41 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				521.5 (2.0)
		5		
		10		
		15	Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	
		20	Well: 2" OD PVC (SCH 40)	
		25		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZO\DRIFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
490.5		(CONTINUED)		
		30		
		35		
		40		
		45		
		50		
		55		
			Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
463.0		60	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
459.6		65	Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	
		65.8	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	457.7 (65.8)
		67.8	Filter: Unimin FilterSil - 6.0 Bags #1A, 50 lbs/each	455.7 (67.8)
		70		453.7 (69.8)
		75	Screen: 10 ft. pre-pack	
443.3		80	Sump: 0.40 ft.	443.7



LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 5/5/2015 COMPLETED 5/5/2015 SURF. ELEV. 514.2 COORDINATES: N:33.085087 E:-83.823239


CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 34.9 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 19.3 ft. DELAYED 17.1 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
5		Sandy Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled light reddish brown / light brown (5YR 6/4) residuum moist, stiff, with white speckling, trace medium sand and weathered rock fragments			SPT N=15bpf(@8.5ft.)
15		- mottled light reddish brown / light brown (5YR 6/4) saprolite very moist, stiff, micaceous, trace weathered rock fragments			SPT N=10bpf(@13.5ft.)
20		 - pinkish gray / grayish orange pink (5YR 7/2) saprolite wet, stiff, micaceous, trace weathered rock fragments			SPT N=13bpf(@18.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
25		<div>▽</div> <div>- mottled pinkish gray / grayish orange pink (5YR 7/2) and gray (10YR 5/1) saprolite wet, stiff, micaceous, trace weathered rock fragments</div>			SPT N=10bpf(@23.5ft.)
30		<div>- mottled white / pinkish gray (5YR 8/1) and white (10R 8/1) saprolite wet, hard, micaceous, trace weathered rock fragments</div>			SPT N=33bpf(@28.5ft.)
35		<div>- mottled white / pinkish gray (5YR 8/1) and pinkish gray / grayish orange pink (5YR 7/2) saprolite wet, very hard, trace mica</div>			SPT N=63bpf(@33.5ft.)
		Bottom of borehole at 34.9 feet.			
40					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 5/5/2015 COMPLETED 5/5/2015 SURF. ELEV. 514.2 COORDINATES: N:33.085087 E:-83.823239

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

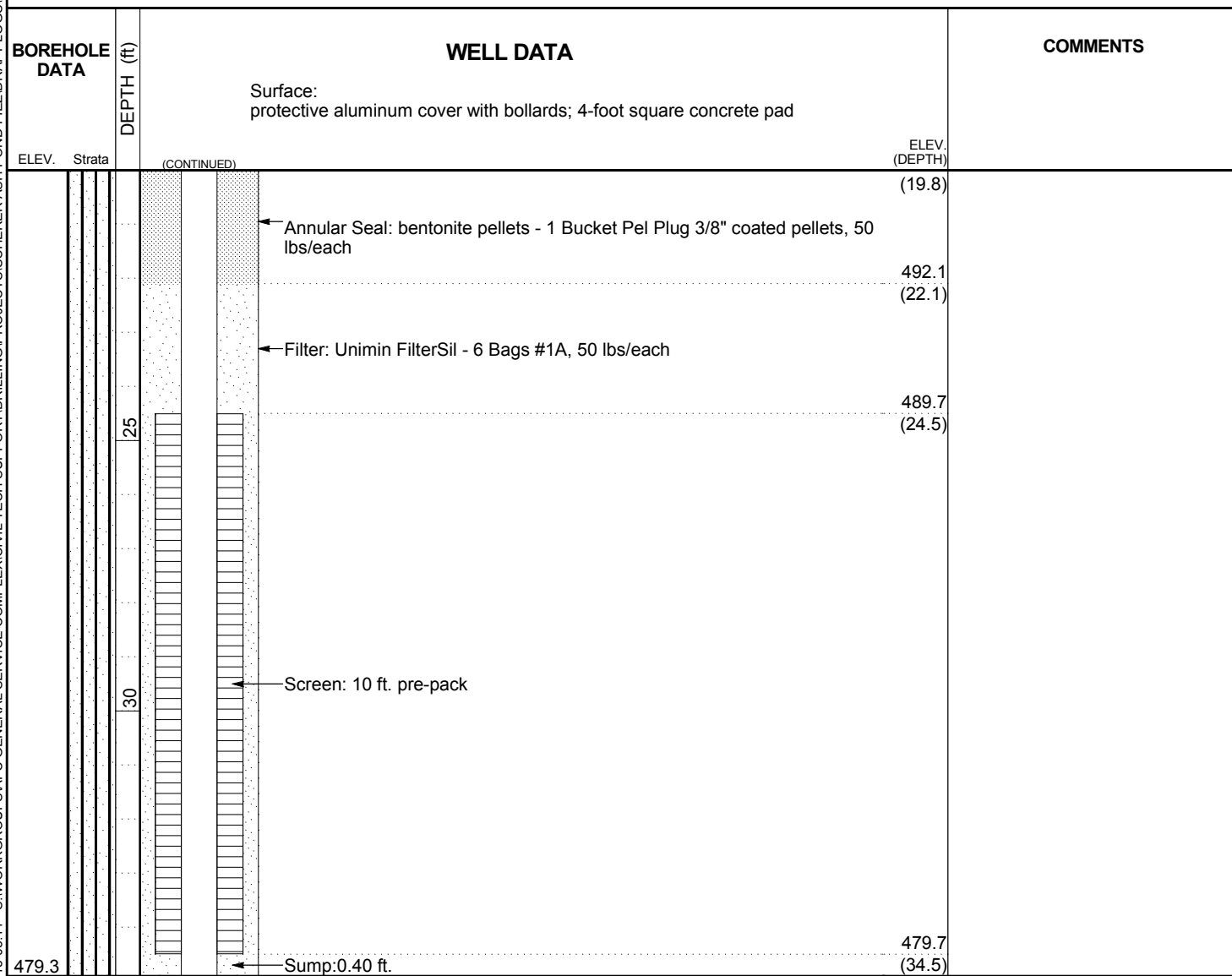
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 34.9 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 19.3 ft. DELAYED 17.1 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				512.2 (2.0)
		5		
			Well: 2" OD PVC (SCH 40)	
		10		
			Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
		15		
		20		494.4

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BORING PZ-11S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 4/1/2015 COMPLETED 4/6/2015 SURF. ELEV. 526.1 COORDINATES: N:33.087361 E:-83.819968

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 45.9 ft. GROUND WATER DEPTH: DURING 37.3 ft. COMP. 34.3 ft. DELAYED 33.2 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
5		Sandy Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled red (10R 5/6) and light yellowish brown (10YR 6/4) saprolite moist, stiff, trace black spots			SPT N=9bpf(@8.5ft.)
15		- mottled red (10R 5/6) saprolite moist, stiff, micaceous, trace orange streaks with black spots			SPT N=9bpf(@13.5ft.)
20		- pinkish white / grayish orange pink (10R 8/2) and very pale brown / very pale orange (10YR 8/2) saprolite moist, stiff, trace mica			SPT N=13bpf(@18.5ft.)
25		- mottled red (10R 5/6) and brown (10YR 5/3) saprolite moist, stiff, micaceous, trace weathered rock fragments			SPT N=13bpf(@23.5ft.)

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BORING PZ-11S

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EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
30		- mottled reddish brown (5YR 5/4) and dark yellowish brown (10YR 4/6) saprolite moist, very stiff, micaceous, trace weathered rock fragments			SPT N=26bpf(@28.5ft.)
35		▽ - mottled dark gray / brownish gray (5YR 4/1) and brown (7.5YR 4/2) ▽ saprolite moist, very hard, micaceous			SPT N=58bpf(@33.5ft.)
40		▽ - mottled dark gray / brownish gray (5YR 4/1) and brown (7.5YR 4/2) saprolite moist, very hard, micaceous			SPT N=56bpf(@38.5ft.)
45		- mottled dark gray / brownish gray (5YR 4/1) and brown (7.5YR 4/2) saprolite wet, very hard, micaceous			SPT N=50bpf(@43.5ft.)
		Bottom of borehole at 45.9 feet.			
50					
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZOMETER LOGS\SCHERER LOGS.GPJ



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EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 4/1/2015 COMPLETED 4/6/2015 SURF. ELEV. 526.1 COORDINATES: N:33.087361 E:-83.819968

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 45.9 ft. GROUND WATER DEPTH: DURING 37.3 ft. COMP. 34.3 ft. DELAYED 33.2 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				524.1 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

(Continued Next Page)

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE: GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRAFT LOGS\ISCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: PZ-11S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		(CONTINUED)		
		30	Annular Fill: Cement-Bentonite Grout - 8 bags Type I/II Portland Cement, 94 lbs/each	
				495.2 (30.9)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
				493.1 (33.0)
		35	Filter: Unimin FilterSil - 6.5 Bags #1A, 50 lbs/each	
				490.6 (35.5)
		40	Screen: 10 ft. pre-pack	
		45		
480.2			Sump: 0.40 ft.	480.6



LOG OF TEST BORING

BORING PZ-12S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/31/2015 COMPLETED 4/1/2015 SURF. ELEV. 514.7 COORDINATES: N:33.086024 E:-83.817193

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 44.4 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 26.2 ft. DELAYED 25.1 ft. after 24 hrs.

NOTES _____

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled red (10R 4/8) and brown (7.5YR 5/2) saprolite moist, stiff, micaceous			SPT N=12bpf(@8.5ft.)
15		- mottled red (10R 4/8) and brown (7.5YR 5/2) saprolite moist, stiff, micaceous, with black streaking, trace weathered rock fragments			SPT N=9bpf(@13.5ft.)
20		- mottled light gray (10R 7/1) and pale brown (10YR 6/3) saprolite moist, stiff, micaceous			SPT N=15bpf(@18.5ft.)
25		- mottled light gray (10R 7/1) and pale brown (10YR 6/3) saprolite moist, medium stiff, micaceous, trace weathered rock fragments			SPT N=8bpf(@23.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		▼ Silt (ML) (Con't) ▼			
30		Silty Sand (SM) - mottled white (10R 8/1) and white (10R 8/1) saprolite moist, medium dense, very fine to coarse grained, trace muscovite and residual quartz			SPT N=18bpf(@28.5ft.)
35		▼ - mottled red (10R 4/8) and red / moderate reddish brown (10R 4/6) saprolite wet, medium dense, very fine to coarse grained, trace iron oxides, feldspar, residual quartz, muscovite			SPT N=22bpf(@33.5ft.)
40		- mottled red (10R 4/8) and red / moderate reddish brown (10R 4/6) saprolite wet, very dense, very fine to medium grained, trace iron oxides, feldspar, muscovite			SPT N=81bpf(@38.5ft.)
45		- mottled white (10R 8/1) and red / moderate reddish brown (10R 4/6) saprolite wet, very dense, very fine to medium, trace iron oxides, feldspar, residual quartz, muscovite Bottom of borehole at 44.4 feet.			SPT N=50bpf(@43.5ft.)
50					
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/31/2015 COMPLETED 4/1/2015 SURF. ELEV. 514.7 COORDINATES: N:33.086024 E:-83.817193

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 44.4 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 26.2 ft. DELAYED 25.1 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				512.7 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			(CONTINUED)	
486.7			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
				ELEV. (DEPTH)
		30	Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	485.2 (29.5)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs each	
		35	Filter: Unimin FilterSil - 5.5 Bags #1A, 50 lbs/each	482.8 (31.9)
		40	Screen: 10 ft. pre-pack	480.7 (34.0)
470.3			Sump: 0.40 ft.	470.7



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BORING PZ-13S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/31/2015 COMPLETED 4/1/2015 SURF. ELEV. 517.4 COORDINATES: N:33.084015 E:-83.815212

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 45.3 ft. GROUND WATER DEPTH: DURING 33.5 ft. COMP. 28.6 ft. DELAYED 26.5 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Sandy Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled red (10R 4/8) and light red / moderate reddish orange (10R 6/6) fill moist, stiff, trace clay			SPT N=9bpf(@8.5ft.)
15		- mottled red (10R 5/6) and yellow (10YR 7/6) saprolite moist, stiff, with black streaking, trace muscovite			SPT N=10bpf(@13.5ft.)
20		- mottled red (10R 5/6) and yellow (10YR 7/6) saprolite moist, medium stiff, with black streaking, trace residual quartz and muscovite			SPT N=6bpf(@18.5ft.)
25		- mottled reddish yellow (5YR 7/8) and light red / moderate reddish orange (10R 6/6) saprolite moist, stiff, trace black streaking and residual quartz			SPT N=10bpf(@23.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
		▽			
		▽			SPT N=11bpf(@28.5ft.)
30		- mottled reddish yellow (5YR 7/8) and light red / moderate reddish orange (10R 6/6) saprolite moist, stiff, trace black streaking, residual quartz, weathered rock fragments			
		▽			SPT N=7bpf(@33.5ft.)
35		- mottled reddish yellow (7.5YR 7/8) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium stiff, with black streaking, trace weathered rock fragments			
		- mottled reddish yellow (7.5YR 7/8) and yellow (10YR 7/6) saprolite wet, stiff, with trace black spots and residual quartz			SPT N=11bpf(@38.5ft.)
40					
		- mottled reddish yellow (7.5YR 7/8) and yellow (10YR 7/6) saprolite wet, stiff, trace sand and weathered rock fragments			SPT N=11bpf(@43.5ft.)
45					
		Bottom of borehole at 45.3 feet.			
50					
55					

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE: GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		(CONTINUED)		
		30	Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	487.8 (29.6)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	485.4 (32.0)
		35	Filter: Unimin FilterSil - 6.5 Bags #1A, 50 lbs/each	482.5 (34.9)
		40	Screen: 10 ft. pre-pack	
472.1		45	Sump: 0.40 ft.	472.5



LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/25/2015 **COMPLETED** 3/26/2015 **SURF. ELEV.** 508.8 **COORDINATES:** N:33.083724 E:-83.813279

CONTRACTOR Civil Field Services **EQUIPMENT** CME550 **METHOD** Hollow Stem Auger

DRILLED BY T. Milam **LOGGED BY** S. Baxter **CHECKED BY** L. Millet **ANGLE** **BEARING**

BORING DEPTH 44.9 ft. **GROUND WATER DEPTH: DURING** 28.5 ft. **COMP.** 28.8 ft. **DELAYED** 18.8 ft. after 24 hrs.

NOTES

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
5		Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled reddish yellow (5YR 6/8) and yellow (10YR 7/6) saprolite moist, very stiff, trace weathered rock fragments			SPT N=21bpf(@8.5ft.)
15		- mottled reddish yellow (5YR 7/8) and yellow (10YR 7/8) saprolite moist, medium stiff, slight pink hue, trace weathered rock fragments			SPT N=8bpf(@13.5ft.)
20		▼ - mottled reddish yellow (5YR 7/8) and yellow (10YR 7/8) saprolite moist, medium stiff, micaceous, trace biotite and residual quartz			SPT N=7bpf(@18.5ft.)
25		Silty Sand (SM) - mottled pink / moderate orange pink (5YR 8/4) and brownish yellow / dark yellowish orange (10YR 6/6) saprolite moist, loose, very fine to fine grained, black and white streaking, micaceous			SPT N=7bpf(@23.5ft.)

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LOG OF TEST BORING

BORING PZ-14S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Silty Sand (SM) (Con't)			
30		 - mottled pink / moderate orange pink (5YR 8/4) and brownish yellow / dark yellowish orange (10YR 6/6) saprolite wet, medium dense, very fine to fine grained, black and white streaking, trace weathered rock fragments			SPT N=11bpf(@28.5ft.)
35		- mottled reddish yellow (5YR 6/8) and brownish yellow / dark yellowish orange (10YR 6/6) saprolite wet, dense, very fine to fine grained, trace angular weathered rock fragments			SPT N=37bpf(@33.5ft.)
40		- mottled reddish yellow (5YR 6/8), brownish yellow / dark yellowish orange (10YR 6/6) and gray (10YR 5/1) saprolite wet, dense, very fine to fine grained, has yellow concretions at 40', trace weathered rock fragments			SPT N=38bpf(@38.5ft.)
45		- mottled reddish yellow (5YR 6/8), brownish yellow / dark yellowish orange (10YR 6/6) and brown (10YR 4/3) saprolite wet, dense, very fine to fine grained, with black streaking, trace weathered rock fragments, biotite, muscovite, residual quartz			SPT N=33bpf(@43.5ft.)
		Bottom of borehole at 44.9 feet.			
50					
55					

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Annular Fill: Cement-Bentonite Grout - 5 bags Type I/II Portland Cement, 94 lbs/each	
		30		478.8 (30.0)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs each	
				476.5 (32.3)
		35	Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	
				474.3 (34.5)
		40	Screen: 10 ft. pre-pack	
463.9			Sump: 0.40 ft.	464.3



LOG OF TEST BORING

BORING PZ-15S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 4/28/2015 COMPLETED 4/28/2015 SURF. ELEV. 496.1 COORDINATES: N:33.082710 E:-83.810871

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 40.1 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 19.6 ft. DELAYED 19.6 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
5		Sandy Silt (ML) - Hand auger 5' for utilities clearance			
10		- mottled red (10R 5/8) fill moist, stiff, trace clay			SPT N=12bpf(@8.5ft.)
15		- mottled dark reddish gray (10R 4/1) saprolite moist, soft, trace weathered rock fragments, mica			SPT N=4bpf(@13.5ft.)
20		- mottled reddish yellow (7.5YR 7/6) saprolite wet, medium stiff, trace mica ▽			SPT N=6bpf(@18.5ft.)
25		▽ - mottled reddish yellow (7.5YR 7/8) saprolite wet, medium stiff, trace mica			SPT N=6bpf(@23.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML) (Con't)			
30		- mottled reddish yellow (7.5YR 6/8) saprolite wet, medium stiff, micaceous, with black streaking			SPT N=7bpf(@28.5ft.)
35		- mottled reddish yellow (7.5YR 6/8) saprolite wet, stiff, micaceous, with black streaking			SPT N=10bpf(@33.5ft.)
40		- mottled gray (7.5YR 6/1) saprolite wet, stiff, trace mica			SPT N=14bpf(@38.5ft.)
		Bottom of borehole at 40.1 feet.			
45					
50					
55					

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 4/28/2015 COMPLETED 4/28/2015 SURF. ELEV. 496.1 COORDINATES: N:33.082710 E:-83.810871

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 40.1 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 19.6 ft. DELAYED 19.6 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	
				ELEV. (DEPTH)
				494.1 (2.0)
		5		
		10	Well: 2" OD PVC (SCH 40)	
		15	Annular Fill: Cement-Bentonite Grout - 6 bags Type I/II Portland Cement, 94 lbs/each	
		20		
		25		471.2

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZO\DRIFT LOGS\SSCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA			COMMENTS
ELEV.	Strata	DEPTH (ft)	(CONTINUED)		
				Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
					ELEV. (DEPTH)
					(24.9)
				← Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	468.8 (27.3)
				← Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	466.4 (29.7)
				← Screen: 10 ft. pre-pack	
				← Sump: 0.40 ft.	456.4



LOG OF TEST BORING

BORING PZ-171
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/26/2015 COMPLETED 2/27/2015 SURF. ELEV. 480.4 COORDINATES: N:33.079134 E:-83.805835

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 97.3 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 28.51 ft. DELAYED 24.75 ft. after 24 hrs.

NOTES _____

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		Sandy Silt (ML)			
5		- mottled yellowish red (5YR 5/8) and yellow (10YR 7/8) residuum moist, very stiff, trace clay			SPT N=18bpf(@3.5ft.)
10		- mottled yellowish red (5YR 5/8) and yellow (10YR 8/8) residuum moist, stiff, trace clay			SPT N=9bpf(@8.5ft.)
15		- mottled red (2.5YR 4/8) and red (10R 4/8) saprolite moist, medium stiff, trace residual quartz			SPT N=7bpf(@13.5ft.)
20		- mottled red (2.5YR 4/8) and yellow (10YR 7/6) saprolite moist, medium stiff, with black streaking, trace weathered rock fragments			SPT N=8bpf(@18.5ft.)
25		▽ - mottled yellowish red (5YR 5/8) and red (10R 4/8) saprolite wet, soft, with black banding, trace residual quartz			SPT N=4bpf(@23.5ft.)
30		▼ - mottled strong brown (7.5YR 5/8) and very pale brown / very pale orange (10YR 8/2) saprolite wet, very soft, with black spots			SPT N=2bpf(@28.5ft.)

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LOG OF TEST BORING

BORING PZ-171
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION	COMMENTS
				Weak Moderate Strong	
		Sandy Silt (ML) (Con't)			
35		Elastic Silt (MH) - mottled strong brown (7.5YR 5/8) and brownish yellow / dark yellowish orange (10YR 6/6) saprolite wet, medium stiff, with black and white banding, trace residual quartz, muscovite, biotite			SPT N=5bpf(@33.5ft.)
40		Silt (ML) - mottled reddish yellow (7.5YR 6/8) and yellow (10YR 7/8) saprolite wet, stiff, with black spots, trace weathered rock fragments			SPT N=9bpf(@38.5ft.)
45		- mottled reddish yellow (7.5YR 6/8) and yellow (10YR 7/8) saprolite wet, stiff, trace weathered rock fragments, residual quartz, biotite, muscovite, amphibole			SPT N=12bpf(@43.5ft.)
50		- mottled reddish yellow (7.5YR 6/8) and yellow (10YR 7/8) saprolite wet, very stiff, trace weathered rock fragments, amphibole, residual quartz, muscovite			SPT N=27bpf(@48.5ft.)
55		- mottled reddish yellow (7.5YR 6/8) and yellow (10YR 7/8) saprolite wet, very stiff, trace weathered rock fragments, residual quartz, muscovite, amphibole			SPT N=20bpf(@53.5ft.)
60		- mottled gray (10YR 6/1) and white (10YR 8/1) saprolite wet, very stiff, trace residual quartz, feldspar, biotite, muscovite			SPT N=27bpf(@58.5ft.)
65		- mottled light gray (10YR 7/1) and white (10YR 8/1) saprolite wet, very hard, trace weathered rock fragments, residual quartz, feldspar, biotite			SPT N=84bpf(@63.5ft.) Switched to casing, advancing into upper weathered rock (Biotite Gneiss/Amphibolite)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION	COMMENTS
				Weak Moderate Strong	
		Silt (ML) (Con't)			
70		Silty Sand (SM) - mottled dark greenish gray (10GY 4/1) saprolite wet, very hard, fine to coarse grained, with residual quartz, biotite, feldspar, amphibole			SPT N=63bpf(@68.5ft.)
75		- mottled dark greenish gray (10GY 4/1) saprolite wet, very hard, fine to coarse grained, with residual quartz, biotite, feldspar, amphibole			SPT N=50bpf(@73.5ft.) Top of rock at 74.1 ft bgs, advanced casing to 81.1 ft bgs and began coring.
80		Partially Weathered Rock (PWR) - mottled dark greenish gray (10GY 4/1) saprolite wet, very hard, fine to coarse grained, with residual quartz, biotite, feldspar, amphibole			
85		AMPHIBOLITE - dark gray (N3) fine to medium grain, soft, slightly to moderately weathered, 12 moderate-angle fractures (30 - 45d), becomes interbedded with Biotite Gneiss			
90		BIOTITE GNEISS - mottled with dark gray (N3) medium grain, soft to medium hard, slightly weathered, inclined, banded, 10 moderate-angle fractures (30 - 45d), oxidized throughout, thin to medium foliation, mechanically fractured along schistosity (35 - 65d), 0.1 to 10 mm thick quartz/feldspar-filled healed fractures			
95		- 4 low-angle fractures (10 - 30d), 2 moderate-angle fractures (30 - 45d), becomes more competent with depth			
		Bottom of borehole at 97.3 feet.			
100					

SAMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

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RECORD OF WELL CONSTRUCTION

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 2/26/2015 COMPLETED 2/27/2015 SURF. ELEV. 480.4 COORDINATES: N:33.079134 E:-83.805835

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 97.3 ft. GROUND WATER DEPTH: DURING 23.5 ft. COMP. 28.51 ft. DELAYED 24.75 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	ELEV. (DEPTH) 478.4 (2.0)
		5		
		10		
		15		
		20	Annular Fill: Cement-Bentonite Grout - 10 bags Typel I/II Portland Cement, 94 lbs/each	
		25	Well: 2" OD PVC (SCH 40)	
		30		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZO\DRIFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
447.4		35		
442.4		40		
		45		
		50		
		55		
		60		
		65		
			Annular Fill: Cement-Bentonite Grout - 10 bags Type I/II Portland Cement, 94 lbs/each	

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
412.4		70	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
405.4		75	Annular Fill: Cement-Bentonite Grout - 10 bags Typel I/II Portland Cement, 94 lbs/each	
399.0		80		
		82.7	Annular Seal: bentonite pellets - 0.5 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	397.7 (82.7)
		84.7	Filter: Unimin FilterSil - 2.5 Bags #1A, 50 lbs/each	395.7 (84.7)
391.7		86.7		393.7 (86.7)
		90	Screen: 10 ft. pre-pack	
383.1		96.7	Sump: 0.60 ft.	383.7 (96.7)

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LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
35		Silty Sand (SM) (Con't) - mottled gray (7.5YR 5/1) saprolite wet, very dense, very fine to fine grained, with white and black and orange streaking, trace oxides, residual quartz, amphibole, biotite			SPT N=59bpf(@33.5ft.)
40		- mottled dusky yellow green (5GY 5/2) saprolite wet, very dense, very fine to fine grained, with white and black and orange streaking, trace iron oxide staining, residual quartz, feldspar, biotite, muscovite, amphibole			SPT N=56bpf(@38.5ft.)
45		- mottled dark gray (N3) saprolite wet, dense, very fine to fine grained, with white streaking, trace iron oxide staining, residual quartz, feldspar, biotite			SPT N=40bpf(@43.5ft.)
50		- mottled dark gray (N3) saprolite wet, very dense, very fine to fine grained, with white speckling, trace biotite, residual quartz, iron oxide staining			SPT N=87bpf(@48.5ft.)
55		Partially Weathered Rock (PWR) - mottled dark gray (N3) saprolite wet, very dense, very fine to coarse grained, weathered Amphibolite			SPT N=50bpf(@53.5ft.)
60		BIOTITE GNEISS - mottled with dark gray (N3) medium to fine grain, soft to medium hard, slightly to moderately weathered, inclined, banded, 4 moderate-angle fractures (30 - 45d), medium to thin foliation, slight to moderate mechanical fracturing along schistosity (36 - 65d), oxidation, quartz, feldspar, biotite, amphibole - 10 moderate-angle fractures (30 - 45d), becomes thin to laminated banding, interbedded with dark gray to black Amphibolite Gneiss			Lack of recovery likely due to weakness of formation. Core water returns contain medium grained amphibolite and quartz which has been observed at other locations where Amphibolite Gneiss has been collected.
65		- No recovery 60.9' - 71.9' bgs			
70					
Bottom of borehole at 71.9 feet.					

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:58 - S:\WORKGROUP\SPAC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZODRAFT LOGS\SCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/3/2015 COMPLETED 3/4/2015 SURF. ELEV. 414.5 COORDINATES: N:33.074732 E:-83.805379
CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core
DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____
BORING DEPTH 71.9 ft. GROUND WATER DEPTH: DURING 1.5 ft. COMP. 0 ft. DELAYED 0.5 ft. after 24 hrs.
NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			← Surface Seal: concrete	ELEV. (DEPTH) 412.5 (2.0)
401.5		5		
		10		
		15	Well: 2" OD PVC (SCH 40)	
		20	Annular Fill: Cement-Bentonite Grout - 7.5 bags Type I/II Portland Cement, 94 lbs/each	
		25		
		30		

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)	(CONTINUED)	ELEV. (DEPTH)
		35		
		40		
		45		
		50		
361.5		55		
359.0				
			Annular Fill: Cement-Bentonite Grout - 7.5 bags Typel I/II Portland Cement, 94 lbs/each	
				357.9 (56.6)
			Annular Seal: bentonite pellets - 0.5 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	355.7 (58.8)
		60		
			Filter: Unimin FilterSil - 1.25 Bags #1A, 50 lbs/each	353.0 (61.5)
		65		
		70		
			Screen: 10 ft. pre-pack	
342.6			Sump: 0.40 ft.	343.0



LOG OF TEST BORING

BORING PZ-19S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/4/2015 COMPLETED 3/4/2015 SURF. ELEV. 414.7 COORDINATES: N:33.074728 E:-83.805412

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 25 ft. GROUND WATER DEPTH: DURING 0.5 ft. COMP. 1.5 ft. DELAYED 0.5 ft. after 24 hrs.

NOTES _____

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
		▽ Silty Sand (ML) - Hand auger 5' for utilities clearance ▽			
5					
10		- mottled reddish yellow (7.5YR 6/8), light red / moderate reddish orange (10R 6/6) and light red / moderate reddish orange (10R 6/6) saprolite wet, very loose, very fine to fine grained, trace biotite, residual quartz, feldspar			SPT N=3bpf(@8.5ft.)
15		- mottled strong brown (7.5YR 5/6), light red / moderate reddish orange (10R 6/6) and light red / moderate reddish orange (10R 6/6) saprolite wet, loose, very fine to fine grained, trace residual quartz, biotite			SPT N=9bpf(@13.5ft.)
20		- mottled reddish yellow (7.5YR 6/8), light red / moderate reddish orange (10R 6/6) and light red / moderate reddish orange (10R 6/6) saprolite wet, loose, very fine to fine grained, with black streaking, trace weathered rock fragments			SPT N=5bpf(@18.5ft.)
25		- mottled reddish yellow (7.5YR 6/8), very dark greenish gray (10BG 3/1) and light red / moderate reddish orange (10R 6/6) saprolite wet, medium dense, very fine to fine grained, trace residual quartz and weathered rock fragments			SPT N=12bpf(@23.5ft.)
		Bottom of borehole at 25.0 feet.			

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/4/2015 COMPLETED 3/4/2015 SURF. ELEV. 414.7 COORDINATES: N:33.074728 E:-83.805412

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 25 ft. GROUND WATER DEPTH: DURING 0.5 ft. COMP. 1.5 ft. DELAYED 0.5 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	412.7 (2.0)
			Well: 2" OD PVC (SCH 40)	
		5	Annular Fill: Cement-Bentonite Grout - 1.5 bags Type I/II Portland Cement, 94 lbs/each	407.1 (7.6)
		10	Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	401.9 (12.8)
		15	Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	400.1 (14.6)
		20	Screen: 10 ft. pre-pack	
389.7		25	Sump: 0.40 ft.	390.1



LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

DATE STARTED 3/10/2015 COMPLETED 3/10/2015 SURF. ELEV. 414.1 COORDINATES: N:33.073986 E:-83.805314

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 79.6 ft. GROUND WATER DEPTH: DURING 5 ft. COMP. 3.2 ft. DELAYED 3.2 ft. after 24 hrs.

NOTES _____

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DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
5		Sandy Fat Clay (CH) - Hand auger 5' for utilities clearance			(MC = 30%; UW(d) = 96.9pcf; PERM. = 1.07E-6cm/sec)
10		- mottled light gray (7.5YR 7/1) residuum wet, stiff, moderate plasticity, with sand, trace organics			SPT N=11bpf(@8.5ft.)(LL=53; PI=31; FC = 72.3%; Gravel = 0%)
15		Silty Sand (SM) - mottled black (7.5YR 2.5/1) and white (10R 8/1) saprolite wet, medium dense, very fine to fine grained, trace residual quartz, feldspar, biotite			SPT N=20bpf(@13.5ft.)
20		- mottled pinkish white (7.5YR 8/2) and pinkish white / grayish orange pink (10R 8/2) saprolite wet, medium dense, very fine to fine grained, with black streaking, trace biotite, residual quartz, amphibole			SPT N=14bpf(@18.5ft.) (MC = 27.6%; UW(d) = 99.8pcf; PERM. = 2.97E-9cm/sec)
25		- mottled pinkish gray (7.5YR 7/2) saprolite wet, medium dense, very fine to fine grained, with white banding, trace weathered rock fragments and mica			SPT N=13bpf(@23.5ft.)(PL=NP; FC = 42.7%; Gravel = 0%)
30		- mottled pinkish gray (7.5YR 7/2) saprolite wet, medium dense, very fine to fine grained, with white banding, trace residual quartz, feldspar, biotite, muscovite			SPT N=28bpf(@28.5ft.)
35		- mottled pinkish gray (7.5YR 7/2) saprolite wet, medium dense, very fine to fine grained, with white banding, trace residual quartz, biotite, muscovite, oxides, weathered rock fragments			SPT N=12bpf(@33.5ft.)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation
LOCATION Plant Scherer

SIMPLE GEOLOGY LOG - ESEE DATABASE GDT - 6/24/15 07:59 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\DRIFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	COMMENTS
40		Silty Sand (SM) (Con't) - mottled gray (7.5YR 6/1) saprolite wet, very dense, very fine to fine grained, with black and white banding, trace residual quartz, mica, weathered rock fragments			SPT N=52bpf(@38.5ft.)
45		- mottled gray (7.5YR 6/1) saprolite wet, dense, very fine to fine grained, with black and white banding, with trace mica, residual quartz, hornblende			SPT N=40bpf(@43.5ft.)
50		- mottled very dark gray (7.5YR 3/1) saprolite wet, very dense, very fine to fine grained, with white speckling, trace oxide staining, mica, residual quartz, amphibole			SPT N=50bpf(@48.5ft.)
55		- mottled very dark gray (7.5YR 3/1) saprolite wet, very dense, very fine to fine grained, with white banding, trace oxide staining, mica, residual quartz, amphibole			SPT N=50bpf(@53.5ft.)
60		- mottled very dark gray (7.5YR 3/1) saprolite wet, very dense, very fine to fine grained, with white and black banding, trace oxide staining, mica, residual quartz, feldspar, amphibole Partially Weathered Rock (PWR) - very fine to medium grained, with white and black banding, trace oxide staining, mica, residual quartz, feldspar, amphibole			SPT N=50bpf(@58.5ft.)
65		AMPHIBOLITE GNEISS - mottled with dark gray (N3) medium to fine grain, soft to medium hard, moderately to highly weathered, inclined, banded, 5 low-angle fractures (10 - 30d), 4 moderate-angle fractures (30 - 45d), thin to laminate banding, slight mechanical fracturing along schistosity (30-50d)			
70		- mottled with dark gray (N3) medium to fine grain, soft to medium hard, moderately to highly weathered, inclined, banded, 2 low-angle fractures (10 - 30d), 8 moderate-angle fractures (30 - 45d), 5 high-angle fractures (65 - 90d), becomes more laminated and competent with depth			
75		- mottled with dark gray (N3) medium to fine grain, soft to medium hard, moderately to highly weathered, inclined, banded, 8 low-angle fractures (10 - 30d), 5 moderate-angle fractures (30 - 45d), 3 high-angle fractures (65 - 90d), becomes slightly less competent			
80		Bottom of borehole at 79.6 feet.			

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/10/2015 COMPLETED 3/10/2015 SURF. ELEV. 414.1 COORDINATES: N:33.073986 E:-83.805314

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger; HQ Rock Core

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 79.6 ft. GROUND WATER DEPTH: DURING 5 ft. COMP. 3.2 ft. DELAYED 3.2 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		ELEV. (DEPTH)
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	412.1 (2.0)
401.1		5		
		10		
		15		
		20	Well: 2" OD PVC (SCH 40)	
		25	Annular Fill: Cement-Bentonite Grout - 9 bags Type I/II Portland Cement, 94 lbs/each	
		30		
		35		

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2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\ISCHERER ASH POND PIEZO\DRIFT LOGS\ISCHERER LOGS.GPJ



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
		(CONTINUED)		
		40	Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
		45		
		50		
		55		
354.1		60	Annular Fill: Cement-Bentonite Grout - 9 bags Type I/II Portland Cement, 94 lbs/each	
350.1		65		
		66.7	Annular Seal: bentonite pellets - 0.5 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	349.5 (64.6)
		66.7	Filter: Unimin FilterSil - 1 Bag #1A, 50 lbs/each	347.4 (66.7)
		70		344.9 (69.2)
		75	Screen: 10 ft. pre-pack	
334.5			Sump: 0.40 ft.	334.9



LOG OF TEST BORING

BORING PZ-21S

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/11/2015 COMPLETED 3/12/2015 SURF. ELEV. 470.5 COORDINATES: N:33.072121 E:-83.806186

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 25 ft. GROUND WATER DEPTH: DURING 1.5 ft. COMP. 3.2 ft. DELAYED 3.2 ft. after 24 hrs.

NOTES _____

S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZIDRAFT LOGS\SCHERER LOGS.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	COMMENTS
		Sandy Silt (ML) - Hand auger 5' for utilities clearance			
5					
10		- mottled reddish yellow (7.5YR 6/8) and light red / moderate reddish orange (10R 6/6) residuum wet, soft, trace mica			SPT N=4bpf(@8.5ft.)
15		- mottled reddish yellow (7.5YR 6/8) and yellow (10YR 7/6) saprolite wet, medium stiff, with black streaking			SPT N=5bpf(@13.5ft.)
20		- mottled light gray (7.5YR 7/1) saprolite wet, very stiff, with white and black spots, trace residual quartz, feldspar, biotite, muscovite, weathered rock fragments			SPT N=17bpf(@18.5ft.)
25		- mottled white (7.5YR 8/1) and light red / moderate reddish orange (10R 6/6) saprolite wet, very stiff, micaceous, with black banding, trace weathered rock fragments			SPT N=22bpf(@23.5ft.)
		Bottom of borehole at 25.0 feet.			

2012 WELL CONSTRUCTION RCRD (NO COM) - ESEE DATABASE.GDT - 6/24/15 08:11 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\SCHERER ASH POND PIEZ\PIEZ.DRAFT LOGS\SCHERER LOGS.GPJ



RECORD OF WELL CONSTRUCTION

WELL: PZ-21S
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Piezometer Installation

LOCATION Plant Scherer

DATE STARTED 3/11/2015 COMPLETED 3/12/2015 SURF. ELEV. 470.5 COORDINATES: N:33.072121 E:-83.806186

CONTRACTOR Civil Field Services EQUIPMENT CME550 METHOD Hollow Stem Auger

DRILLED BY T. Milam LOGGED BY S. Baxter CHECKED BY L. Millet ANGLE _____ BEARING _____

BORING DEPTH 25 ft. GROUND WATER DEPTH: DURING 1.5 ft. COMP. 3.2 ft. DELAYED 3.2 ft. after 24 hrs.

NOTES _____

BOREHOLE DATA		WELL DATA		COMMENTS
ELEV.	Strata	DEPTH (ft)		
			Surface: protective aluminum cover with bollards; 4-foot square concrete pad	
			Surface Seal: concrete	468.5 (2.0)
			Well: 2" OD PVC (SCH 40)	
			Annular Fill: Cement-Bentonite Grout - 4 bags Type I/II Portland Cement, 94 lbs/each	
				461.5 (9.0)
			Annular Seal: bentonite pellets - 1 Bucket Pel Plug 3/8" coated pellets, 50 lbs/each	
			Filter: Unimin FilterSil - 6 Bags #1A, 50 lbs/each	458.5 (12.0) 457.5 (13.0)
			Screen: 10 ft. pre-pack	
			Sump: 0.40 ft.	447.5 (23.0)
445.5		25		

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SAPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-25 I

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 5/22/2016 COMPLETED 5/24/2016 SURF. ELEV. 525.7 COORDINATES: N:33.083680 E:-83.814000

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY M. Pope LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 126 ft. GROUND WATER DEPTH DURING _____ COMP. 32.5 ft. DELAYED 30.6 ft. after 24 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Well-graded Sand with Clay (SW-SC) - mottled red (2.5YR 4/6) dry, fine to medium-grained, with magnetite and illmenite				Surface Seal: concrete
10		- yellowish red (5YR 4/6) dry, with silt				
15		- reddish yellow (7.5YR 6/8) with black and white mottling, weathered feldspar				
20		- mottled strong brown (7.5YR 5/8), light gray (2.5Y 7/2) and pale red (10R 6/3) dry, fine to coarse-grained, trace fine quartz gravel - with magnetite and illmenite				
25		- strong brown (7.5YR 5/8), black (7.5YR 2.5/1) and very pale brown / grayish orange (10YR 7/4) with mica				
30		Sandy Silt (ML) - mottled dark reddish brown (2.5YR 3/4) and dark reddish gray (2.5YR 3/1) moist, with sandy clay (CL) bedding				Annular Fill: Cement-Bentonite Grout (8 - 94# bags PC, 1 - 55# bag gel, 210 gal. water)
35		- mottled strong brown (7.5YR 5/8) and black (7.5YR 2.5/1)				
40		- dark red (2.5YR 3/6), red (2.5YR 4/6) and reddish gray (2.5YR 5/1) wet, flow-banded fabric				
45		Elastic Silt (MH) - mottled weak red (10R 5/3) and reddish black (10R 2.5/1) wet, medium, with sandy clay (CH) bedding				
50		- mottled strong brown (7.5YR 5/8), light brownish gray (2.5Y 6/2) and black (2.5Y 2.5/1)				
		- reddish brown (2.5YR 4/4), reddish yellow (7.5YR 6/6) and black (7.5YR 2.5/1) wet, with sandy clay (CH) bedding				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
		Elastic Silt (MH) (<i>Con't</i>)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
55		- yellowish red / light brown (5YR 5/6)				
60		Well-graded Sand with Clay (SW-SC) - yellowish red / light brown (5YR 5/6) saprolite wet, medium dense, fine to coarse-grained, cohesive				
65		- dark grayish brown / dark yellowish brown (10YR 4/2) with gravel (residual diabase)				
70		- dark gray / olive gray (5Y 4/1) and strong brown (7.5YR 5/6) moist				
75		- mottled very dark gray (5Y 3/1) and white (N9)				
80		- dark brown (10YR 3/3) with interlayered clay bedding				
85		- gray (10YR 5/1) moist				
90		- very dark gray (2.5Y 3/1) regolith moist, dense				
95		- very dark gray (5Y 3/1)				
100		- with interlayered clay bedding				
105		- dark yellowish brown (10YR 4/6) and olive (5Y 5/4)				
110		- mottled black (2.5Y 2.5/1), dark gray (2.5Y 4/1) and white (N9)				
						Annular Fill: Cement-Bentonite Grout (8 - 94# bags PC, 1 - 55# bag gel, 210 gal. water)
						Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)

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SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\BORING LOGS\BORING LOGS



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
						(CONTINUED)
115		Well-graded Sand with Clay (SW-SC) (Con't) - grayish brown (2.5Y 5/2) - dark yellowish brown (10YR 3/6)				Filter: ← 20/40 silica filter sand (6 - 0.5 cubic ft. bags)
120						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
125		- very dark gray (2.5Y 3/1)				← Sump: 0.2000000000000003 ft.
		Bottom of borehole at 126.0 feet.				← Cave-in to 126 ft.
130						
135						
140						
145						
150						
155						
160						
165						
170						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
55		Elastic Silt (MH) <i>(Con't)</i> - yellowish red / light brown (5YR 5/6)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad (CONTINUED) Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack Sump: 0.2000000000000003 ft. Cave-in to 56 ft.
60		Bottom of borehole at 56.0 feet.				
65						
70						
75						
80						
85						
90						
95						
100						
105						
110						

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Lean Clay (CL) - dark red (2.5YR 3/6) dry, with silt				<p>Surface Seal: concrete</p> <p>Annular Fill: Cement-Bentonite Grout (3 - 94# bags PC, 1/4 - 55# bag gel, 50 gal. water)</p> <p>Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets) Filter: 20/40 silica filter sand (5 - 0.5 cubic ft. bags)</p> <p>Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack</p> <p>Sump: 0.200000000000003 ft. Cave-in to 46 ft.</p>
		- red (2.5YR 4/6)				
10		- red (2.5YR 4/8)				
15		Sandy Silt (ML) - red (2.5YR 4/6) and reddish black (2.5YR 2.5/1) dry, with mica				
		- yellowish red (5YR 4/6) damp, with mica - red (2.5YR 4/6) wet				
20		Poorly-graded Sand with Silt (SP-SM) - mottled yellowish red (5YR 5/8) and black (5YR 2.5/1) fine-grained, with mica				
25		- mottled strong brown (7.5YR 4/6) and black (7.5YR 2.5/1)				
30						
35		Elastic Silt (MH) - olive brown (2.5Y 4/4) wet, with fine sand, micaceous				
		Silty Sand (SM) - light olive brown (2.5Y 5/6) fine-grained, micaceous				
40						
		Poorly-graded Sand (SP) - gray / light olive gray (5Y 6/1) and white / yellowish gray (5Y 8/1) fine to coarse-grained				
45		Silty Sand (SM) - light olive brown (2.5Y 5/6) fine-grained, micaceous				
50		Bottom of borehole at 46.0 feet.				

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SA\PC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/14/2016 COMPLETED 6/17/2016 SURF. ELEV. 472.4 COORDINATES: N:33.082900 E:-83.809300

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY M. Pope LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 126 ft. GROUND WATER DEPTH DURING COMP. DELAYED 10 ft. after 24 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Sand (SC) - dark brown (7.5YR 3/3) damp, fine to medium-grained				
		Lean Clay (CL) - mottled yellowish red (5YR 4/6) and yellowish brown (10YR 5/6) damp, medium, with mica				
10		- dark brown (10YR 3/3) with fine quartz gravel				Surface Seal: concrete
15		Well-graded Sand with Silt (SW-SM) - yellowish red / light brown (5YR 5/6) and yellowish brown (10YR 5/6) moist, fine to coarse-grained, with mica				
20		- very dark gray (10YR 3/1) black (10YR 3/1) oxidation mottling				
25		- dark brown (7.5YR 3/4) wet				
30		- brown (7.5YR 4/3) and strong brown (7.5YR 4/6) fine to coarse-grained - dark yellowish brown (10YR 4/4) wet				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 75 gal. water)
35		Clayey Sand (SC) - grayish brown (2.5Y 5/2) wet, with mica				
40		Well-graded Sand with Silt (SW-SM) - grayish brown (2.5Y 5/2) and white / yellowish gray (5Y 8/1) partially weathered rock biotite gneiss, fine to coarse-grained, - olive gray (5Y 4/2) wet, fine to coarse-grained				
45		- mottled olive gray (5Y 4/2) and white / yellowish gray (5Y 8/1)				
50		- UD tube attempted, crushed due to dense soils - dark grayish brown (2.5Y 4/2) and yellow (2.5Y 7/6) saprolite wet, fine to coarse-grained, with mica				
		Well-graded Sand (SW)				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
55		Well-graded Sand (SW) (Con't) - very dark gray (2.5Y 3/1) and dark grayish brown (2.5Y 4/2) wet, fine to coarse-grained, with mica - very dark greenish gray (10Y 3/1) and greenish black (10Y 2.5/1) with gravel and clay (pulverized rock), biotite gneiss, fresh to highly weathered				(CONTINUED)
60		Biotite Gneiss - dark gray / olive gray (5Y 4/1) and light gray (5Y 7/1) coarse grain, medium hard to hard, not to slightly weathered, banded, moderately fractured, sub-horizontal fractures - medium hard to hard, inclined, white feldspar and quartz banding, thin to medium bedded - increased granitic composition 61 to 63 ft., light gray with black banding				
65						
70		- very dark gray (5Y 3/1) and black (5Y 2.5/2) coarse grain, medium hard to very hard, not weathered, inclined, intensely to moderately fractured, white banding, thin bedded				
75		- increased granitic composition 71 to 73 ft., light gray with black banding				
80		- gray (2.5Y 5/1) coarse grain, medium hard to very hard, folded, moderately fractured, black and white banding				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets (98-102.5 ft.), 6 - 50# bags 3/8" chips (54-98 ft.)
85						
90		- gray (2.5Y 5/1) coarse grain, soft to hard, not weathered, moderately fractured, black and white banding, thin to medium bedded				
95		- very dark gray (2.5Y 3/1) completely weathered, 93 to 95 ft.				
100		- light gray (2.5Y 7/1) hard, inclined and folded bedding, moderately fractured, white and dark gray banding, thin to medium bedded, sub-vertical fractures				
105		- intensely fractured, 100 to 101 ft.				Filter: 20/40 silica filter sand (10 - 0.5 cubic ft. bags)
110		- gray (2.5Y 5/1) and very dark gray (2.5Y 3/1) coarse grain, hard, not weathered, inclined and folded bedding, moderately fractured, white banding - near vertical bedding 109 to 111 ft.				Standpipe: 2" OD PVC (SCH 40) Screen: 20 ft; 0.010" Slots

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LOG OF TEST BORING

BORING PZ-27 D



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Biotite Gneiss (<i>Con't</i>)				(CONTINUED)
115		- gray (2.5Y 6/1) coarse grain, hard, not weathered, inclined, intensely fractured, white and dark gray banding, near horizontal fractures				 <p>Standpipe: 2" OD PVC (SCH 40) Screen: 20 ft; 0.010" Slots</p> <p>Sump: 0.2000000000000003 ft. Cave-in to 126 ft.</p>
120						
125		- soft				
Bottom of borehole at 126.0 feet.						
130						
135						
140						
145						
150						
155						
160						
165						
170						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SA\PC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 5/25/2016 COMPLETED 5/26/2016 SURF. ELEV. 473.0 COORDINATES: N:33.082910 E:-83.809300

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY M. Pope LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 46 ft. GROUND WATER DEPTH DURING _____ COMP. 3.5 ft. DELAYED 5.8 ft. after 200 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Clayey Sand (SC) - dark brown (7.5YR 3/3) damp, fine to medium-grained Lean Clay (CL) - mottled yellowish red (5YR 4/6) and yellowish brown (10YR 5/6) damp, medium, with mica				Surface Seal: concrete
10		- dark brown (10YR 3/3) with fine quartz gravel Well-graded Sand with Silt (SW-SM) - yellowish red / light brown (5YR 5/6) and yellowish brown (10YR 5/6) moist, fine to coarse-grained, with mica				
15		- very dark gray (10YR 3/1) black (10YR 3/1) oxidation mottling				Annular Fill: Cement-Bentonite Grout (2 - 94# bags PC, 1/4 - 55# bag gel, 55 gal. water)
20		- dark brown (7.5YR 3/4) wet				
25		- brown (7.5YR 4/3) and strong brown (7.5YR 4/6) fine to coarse-grained - dark yellowish brown (10YR 4/4) wet				
30		Clayey Sand (SC) - grayish brown (2.5Y 5/2) wet, with mica				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
35		Well-graded Sand with Silt (SW-SM) - grayish brown (2.5Y 5/2) and white / yellowish gray (5Y 8/1) partially weathered rock biotite gneiss, fine to coarse-grained, - olive gray (5Y 4/2) wet, fine to coarse-grained				Filter: 20/40 silica filter sand (4 1/2 - 0.5 cubic ft. bags)
40						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
45		- mottled olive gray (5Y 4/2) and white / yellowish gray (5Y 8/1)				Sump: 0.200000000000003 ft.
		Bottom of borehole at 46.0 feet.				Cave-in to 46 ft.
50						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SAPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-28 I

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/3/2016 COMPLETED 6/3/2016 SURF. ELEV. 481.3 COORDINATES: N:33.082440 E:-83.808200

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY T. Ardito LOGGED BY P. Alexander CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 70 ft. GROUND WATER DEPTH DURING _____ COMP. _____ DELAYED 15.5 ft. after 24 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Silt (ML) - red (2.5YR 5/8) residuum dry, medium stiff, no, micaceous				Surface Seal: concrete
10						
15		Poorly-graded Sand with Silt (SP-SM) - yellowish red (5YR 5/8) saprolite moist, loose, fine-grained, with mica, oxidation				Annular Fill: Cement-Bentonite Grout (5 - 94# bags PC, 1/4 - 55# bag gel, 55 gal. water)
20						
25		Silt (ML) - mottled red (2.5YR 5/6), reddish gray (10R 6/1) and reddish yellow (5YR 6/6) saprolite moist, medium stiff, no, fine-grained, some mica, oxidation				
30		Poorly-graded Sand with Silt (SP-SM) - mottled light gray (2.5Y 7/2), olive brown (2.5Y 4/3) and dusky yellow green (5GY 5/2) saprolite moist, loose				
35						
40						
45		- greenish gray (10Y 5/1) moist				
50		Well-graded Sand (SW) - greenish gray (10Y 5/1), black (N1) and white (N9) moist, loose, biotite and feldspar, some mica				

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SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
						(CONTINUED)
55		- yellowish brown / moderate yellowish brown (10YR 5/4) and white (2.5Y 8/1) very soft, highly weathered, banded Biotite Gneiss (Con't) - yellowish brown / moderate yellowish brown (10YR 5/4), white (2.5Y 8/1) and dark greenish gray (10Y 4/1) very soft to soft, banded, horizontal to sub-vertical fractures				Annular Seal: bentonite pellets (3/4 - 5 gal. bucket 3/8" pellets)
60		- dark bluish gray (5PB 4/1) and very light gray (N8) hard to very hard, slightly weathered, banded, horizontal to sub-vertical fractures, intensely fractured				Filter: 20/40 silica filter sand (4 1/2 - 0.5 cubic ft. bags)
65						Standpipe: 2" OD PVC (SCH 40) Screen: 9.999999999999999 ft; 0.010" Slot Prepack
70		- greenish black (5GY 2.5/1) and medium light gray (N6) slightly to moderately weathered, banded, horizontal to sub-vertical fractures, intensely fractured				Sump: 0.2000000000000003 ft.
		Bottom of borehole at 70.0 feet.				Cave-in to 70 ft.
75						
80						
85						
90						
95						
100						
105						
110						

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LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 5/26/2016 COMPLETED 5/26/2016 SURF. ELEV. 488.4 COORDINATES: N:33.082090 E:-83.807400

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY M. Pope LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 46 ft. GROUND WATER DEPTH DURING COMP. 22 ft. DELAYED 26.9 ft. after 100 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Sandy Lean Clay (CL) - red (2.5YR 4/8) dry, with mica				
5		Sandy Silt (ML) - red (2.5YR 4/8) with mica				Surface Seal: concrete
10		- mottled strong brown (7.5YR 5/6) and black (7.5YR 2.5/1) dry				
15						Annular Fill: Cement-Bentonite Grout (2 - 94# bags PC, 1/4 - 55# bag gel, 55 gal. water)
20						
25		Well-graded Sand with Silt (SW-SM) - dark yellowish brown (10YR 4/4) damp, fine to medium-grained				
		▼ - olive brown (2.5Y 4/4)				
30		- light olive brown (2.5Y 5/6)				
		- mottled olive (5Y 4/3) and pale yellow (5Y 7/4)				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets) Filter: 20/40 silica filter sand (5 - 0.5 cubic ft. bags)
35		- olive brown (2.5Y 4/3)				
40						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
45		- mottled olive gray / light olive gray (5Y 5/2) and dark greenish gray (10Y 4/1) weathered biotite gneiss				Sump: 0.200000000000003 ft.
		Bottom of borehole at 46.0 feet.				Cave-in to 46 ft.
50						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/2/2016 COMPLETED 6/2/2016 SURF. ELEV. 475.4 COORDINATES: N:33.081550 E:-83.805900

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY T. Ardito LOGGED BY P. Alexander CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 87 ft. GROUND WATER DEPTH DURING _____ COMP. _____ DELAYED 18.9 ft. after 24 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Sandy Silt (ML) - red (2.5YR 5/6) residuum dry, stiff, no, fine-grained, trace mica				Surface Seal: concrete
10		- damp				
15		Silt (ML) - mottled yellowish red / light brown (5YR 5/6) and strong brown (7.5YR 5/6) residuum dry, soft, low, fine-grained, trace mica, oxidation				
20		Poorly-graded Sand with Silt (SP-SM) - brown (7.5YR 5/4) residuum moist, loose, fine-grained, with mica				Annular Fill: Cement-Bentonite Grout (6 - 94# bags PC, 1/2 - 55# bag gel, 70 gal. water)
25						
30						
35		Sandy Silt (ML) - mottled brown (7.5YR 5/4) and reddish yellow (7.5YR 8/6) saprolite moist, no, with mica, oxidation				
40		Poorly-graded Sand with Silt (SP-SM) - light brownish gray (2.5Y 6/2) moist, loose, fine-grained				
45		- sub-vertical fractures - mottled light red / moderate reddish orange (10R 6/6) and very pale brown / very pale orange (10YR 8/2) saprolite folded fabric				
50		- white (N9), very pale brown (10YR 7/3) and reddish brown (2.5YR 4/4) - very dark grayish brown (2.5Y 3/2) moist, fine-grained, some mica				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Poorly-graded Sand with Silt (SP-SM) <i>Con't</i>				(CONTINUED)
55						
60		Biotite Gneiss - olive gray / light olive gray (5Y 5/2) and pale yellow (2.5Y 8/4) very soft, highly weathered, banded				Annular Fill: Cement-Bentonite Grout (6 - 94# bags PC, 1/2 - 55# bag gel, 70 gal. water)
65						
70		- dark gray (N3) and very light gray (N8) soft, highly weathered, banded - black (5Y 2.5/1) and light olive brown (2.5Y 5/4) moderately to highly weathered				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
75						Filter: 20/40 silica filter sand (6 - 0.5 cubic ft. bags)
80		- very dark greenish gray (10Y 3/1) and very light gray (N8) soft, moderately weathered, foliated				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
85						Sump: 0.2000000000000003 ft.
		Bottom of borehole at 87.0 feet.				Cave-in to 87 ft.
90						
95						
100						
105						
110						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/1/2016 COMPLETED 6/2/2016 SURF. ELEV. 463.8 COORDINATES: N:33.081910 E:-83.804700

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY T. Ardito LOGGED BY P. Alexander CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 77 ft. GROUND WATER DEPTH DURING _____ COMP. 24 ft. DELAYED 28.1 ft. after 200 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Silt (ML) - red (10R 5/6) residuum dry, stiff, no, trace mica				Surface Seal: concrete
10						
15		- red (2.5YR 5/8) residuum dry, some mica - oxidation				
20		Poorly-graded Sand with Silt (SP-SM) - mottled reddish yellow (7.5YR 6/6) and pink / moderate orange pink (5YR 8/4) residuum damp, loose, fine-grained				
25		Silt (ML) - strong brown (7.5YR 4/6) and white (N9) residuum moist, soft, fine-grained, feldspar and biotite				Annular Fill: Cement-Bentonite Grout (6 - 94# bags PC, 1/2 - 55# bag gel, 70 gal. water)
30		Poorly-graded Sand with Silt (SP-SM) - greenish gray (5G 5/1) and very light gray (N8) saprolite moist, fine-grained, some mica				
35						
40		Biotite Gneiss - yellowish brown / moderate yellowish brown (10YR 5/4), light greenish gray (10Y 7/1) and white (N9) highly weathered, feldspar banding				
45		- greenish gray (5GY 5/1) and greenish black (5GY 2.5/1) soft, highly weathered, feldspar banding				
50						

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SAMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
						(CONTINUED)
55		Biotite Gneiss (Con't)				Annular Fill: Cement-Bentonite Grout (6 - 94# bags PC, 1/2 - 55# bag gel, 70 gal. water)
60		- dark gray (N3) and very light gray (N8) soft to medium hard, moderately weathered, felspar banding				Annular Seal: bentonite pellets (3/4 - 5 gal. buckect 3/8" pellets)
65						Filter: 20/40 silica filter sand (7 1/2 - 0.5 cubic ft. bags)
70		- bluish black (10B 2.5/1) and white (N9) very hard, slightly weathered, horizontal and sub-vertical fractures, felspar banding				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
75						Sump: 0.199999999999989 ft.
		Bottom of borehole at 77.0 feet.				Cave-in to 77 ft.
80						
85						
90						
95						
100						
105						
110						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 5/31/2016 COMPLETED 6/1/2016 SURF. ELEV. 462.3 COORDINATES: N:33.081590 E:-83.803800

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 126.5 ft. GROUND WATER DEPTH DURING COMP. 23.5 ft. DELAYED 24.5 ft. after 24 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Silt (ML) - red (2.5YR 4/6) residuum dry, stiff, no				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Clayey Sand (SC) - red (10R 5/6) dry, loose, fine-grained, some oxidation				
15		Sandy Silt (ML) - reddish yellow (5YR 6/6) dry				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 80 gal. water)
20		Silty Sand (SM) - mottled reddish brown (5YR 5/4) and very dark gray (7.5YR 3/1) dry, loose, fine-grained, trace mica - strong brown (7.5YR 5/8) moist				
25		Light brown (7.5YR 6/4) - mottled light yellowish brown (10YR 6/4) and light olive brown (2.5Y 5/4)				
30		Sandy Silt (ML) - bluish gray (10B 5/1) and white (N9) moist, medium stiff, some clay, varying amounts of sand				
35		Poorly-graded Sand with Clay (SP-SC) - white (7.5YR 8/1), very dark bluish gray (10B 3/1) and very dark gray (10YR 3/1) moist, loose, fine-grained - 2" sand (SW) seam at 41 ft.				
40						
45						
50		Well-graded Sand (SW) - greenish black (10GY 2.5/1) saprolite medium to coarse-grained, weathered biotite gneiss, some silt, pulverized rock (sand with gravel)				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
						(CONTINUED)
55		Well-graded Sand (SW)(Con't)				
60		- SW: - greenish black (10GY 2.5/1) medium to coarse-grained, weathered biotite gneiss, some silt - very dark greenish gray (5GY 3/1)				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 80 gal. water)
65		Well-graded Sand with Silt (SW-SM) - very dark gray (7.5YR 3/1) medium to coarse-grained, some gravel (slightly decomposed biotite gneiss) - mottled very dark greenish gray (10GY 3/1) and white (7.5YR 8/1) weathered biotite gneiss				
70		Biotite Gneiss - dark gray (7.5YR 4/1) medium to coarse grain, medium hard to hard, slightly to highly weathered, thin to medium bedding, vuggy, moderately fractured, white feldspar and quartz banding				
75		- yellowish red (5YR 5/8) water staining - dark gray / brownish gray (5YR 4/1) and black (5YR 2.5/1) medium to coarse grain, not to slightly weathered, inclined, white banding - slightly fractured				
80		- not to moderately weathered				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets (89-93 ft.), 6 - 50# bags 3/8" chips (66-89 ft.)
85		- slightly fractured, feldspar rich 84-86 ft.				
90		Granitic Gneiss - white (10YR 8/1) and gray (10YR 6/1) medium to coarse grain, hard, not to slightly weathered, inclined, banded, slightly fractured				
95						Filter: 20/40 silica filter sand (15 1/2 - 0.5 cubic ft. bags)
100		Biotite Gneiss - dark gray (10YR 4/1) and black (10YR 2/1) medium to coarse grain, not to slightly weathered, medium bedded, white banding				
105		Granitic Gneiss - gray (10YR 6/1) and pink (5YR 7/3) medium to coarse grain, not weathered				Standpipe: 2" OD PVC (SCH 40) Screen: 30 ft; 0.010" Slots
110		Biotite Gneiss - dark gray (10YR 4/1), black (10YR 2/1) and white (10YR 8/1) not weathered, medium bedded, slightly to moderately fractured, sub-				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <div>Weak Moderate Strong</div>	GROUNDWATER OBSERVATIONS	WELL DATA
115		horizontal fractures Biotite Gneiss (Con't) - quartz healed fractures (sub-vertical) - medium to coarse sand in fractures				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
120		- coarse grain, not to highly weathered, medium bedded, moderately fractured, alternating competent rock and sand filled fractures				<div>(CONTINUED)</div> <div></div> <div>Standpipe: 2" OD PVC (SCH 40) Screen: 30 ft; 0.010" Slots</div> <div>Sump: 0.200000000000003 ft. Cave-in to 126.5 ft.</div>
125						
Bottom of borehole at 126.5 feet.						
130						
135						
140						
145						
150						
155						
160						
165						
170						



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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 5/31/2016 COMPLETED 6/1/2016 SURF. ELEV. 462.3 COORDINATES: N:33.081600 E:-83.803800

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotasonic

DRILLED BY J. Asua LOGGED BY P. Alexander CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 57 ft. GROUND WATER DEPTH DURING 26 ft. COMP. 21.3 ft. DELAYED 23.8 ft. after 200 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
5		Silt (ML) - red (2.5YR 4/6) residuum dry, stiff, no				Completion: protective aluminum cover with bollards; 4-foot square concrete pad
10		Clayey Sand (SC) - red (10R 5/6) dry, loose, fine-grained, some oxidation				Surface Seal: concrete
15		Sandy Silt (ML) - reddish yellow (5YR 6/6) dry				
20		Silty Sand (SM) - mottled reddish brown (5YR 5/4) and very dark gray (7.5YR 3/1) dry, loose, fine-grained, trace mica - strong brown (7.5YR 5/8) moist				Annular Fill: Cement-Bentonite Grout (2 - 94# bags PC, 1/4 - 55# bag gel, 55 gal. water)
25		- light brown (7.5YR 6/4)				
30		Sandy Silt (ML) - bluish gray (10B 5/1) and white (N9) moist, medium stiff, some clay, varying amounts of sand				
35						
40		Poorly-graded Sand with Clay (SP-SC) - white (7.5YR 8/1), very dark bluish gray (10B 3/1) and very dark gray (10YR 3/1) moist, loose, fine-grained - 2" sand (SW) seam at 41 ft.				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
45						Filter: 20/40 silica filter sand (5 - 0.5 cubic ft. bags)
50		Well-graded Sand (SW) - greenish black (10GY 2.5/1) saprolite medium to coarse-grained, weathered biotite gneiss, some silt, pulverized rock (sand with gravel)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
55		Well-graded Sand (SW)(Con't)				Completion: protective aluminum cover with bollards; 4-foot square concrete pad (CONTINUED) Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack Sump:0.200000000000003 ft. Cave-in to 57 ft.
60		Bottom of borehole at 57.0 feet.				
65						
70						
75						
80						
85						
90						
95						
100						
105						
110						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/7/2016 COMPLETED 6/8/2016 SURF. ELEV. 466.3 COORDINATES: N:33.082010 E:-83.799400

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 76.5 ft. GROUND WATER DEPTH DURING _____ COMP. _____ DELAYED 39 ft. after 100 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Sandy Lean Clay (CL) - red (2.5YR 4/6) dry, no				Surface Seal: concrete
10		Sandy Silt (ML) - red (2.5YR 4/6) dry, no - yellowish red / light brown (5YR 5/6)				
15		Well-graded Sand with Silt (SW-SM) - mottled yellowish red / light brown (5YR 5/6) and black (5YR 2.5/1) dry, fine to coarse-grained				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 90 gal. water)
20						
25						
30		Clayey Sand (SC) - mottled strong brown (7.5YR 5/8), yellowish brown (10YR 5/8) and white (10YR 8/1) dry, fine to medium-grained				
35						
40		Well-graded Sand with Silt (SW-SM) - mottled light olive brown (2.5Y 5/3), white (2.5Y 8/1) and black (2.5Y 2.5/1) damp, fine to coarse-grained, with mica				
45						
50		Well-graded Sand (SW) - olive gray / light olive gray (5Y 5/2), greenish gray (5GY 5/1) and white (2.5Y 8/1) saprolite wet, fine to coarse-grained, weathered gneiss				

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
55		Well-graded Sand (SW)(Con't) - mottled dark gray (7.5YR 4/1) and white (N9)				(CONTINUED)
60		Well-graded Sand with Silt (SW-SM) - very dark greenish gray (10Y 3/1) wet, fine to coarse-grained, with gravel (pulverized rock/biotite gneiss)				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 90 gal. water)
65						Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
70						Filter: 20/40 silica filter sand (4 1/2 - 0.5 cubic ft. bags)
75		Biotite Gneiss - dark greenish gray (10G 4/1) coarse grain, medium hard to soft, moderately to highly weathered, vuggy, black and white banding, quartz and feldspar - Driller indicated competent rock at 76.5 ft.				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
		Bottom of borehole at 76.5 feet.				Sump:0.200000000000003 ft. Cave-in to 76.5 ft.
80						
85						
90						
95						
100						
105						
110						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SPAPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-34 S

PAGE 1 OF 1

ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/3/2016 COMPLETED 6/4/2016 SURF. ELEV. 440.8 COORDINATES: N:33.082240 E:-83.798600

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 46 ft. GROUND WATER DEPTH DURING COMP. 13 ft. DELAYED

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Lean Clay (CL) - red (2.5YR 4/6) dry, no				Surface Seal: concrete
10		Sandy Silt (ML) - reddish brown (2.5YR 4/4)				
		Elastic Silt (MH) - mottled strong brown (7.5YR 5/6) and black (7.5YR 2.5/1) damp, medium				
15		Well-graded Sand with Silt (SW-SM) - mottled yellowish brown (10YR 5/6), black (10YR 2/1) and white (10YR 8/1) damp, fine to medium-grained - mottled light olive brown (2.5Y 5/4), black (10YR 2/1) and white (10YR 8/1) saprolite				Annular Fill: Cement-Bentonite Grout (3 - 94# bags PC, 1/2 - 55# bag gel, 60 gal. water)
20		- light olive brown (2.5Y 5/3) moist				
25		- mottled olive (5Y 5/3) and strong brown (7.5YR 5/6) wet				
30		- olive gray / light olive gray (5Y 5/2)				
35		- mottled olive gray / light olive gray (5Y 5/2), strong brown (7.5YR 5/6) and white (7.5YR 8/1) weathered feldspar				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets) Filter: 20/40 silica filter sand (5 - 0.5 cubic ft. bags)
40		- mottled dark gray (2.5Y 4/1) and white (7.5YR 8/1) weathered biotite gneiss				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
45						Sump: 0.2000000000000003 ft. Cave-in to 46 ft.
50		Bottom of borehole at 46.0 feet.				

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LOG OF TEST BORING

BORING PZ-35 I
PAGE 1 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/22/2016 COMPLETED 6/22/2016 SURF. ELEV. 474.5 COORDINATES: N:33.083012 E:-83.809238

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotasonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 56 ft. GROUND WATER DEPTH DURING COMP. DELAYED 5.3 ft. after 100 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION Weak Moderate Strong	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: flush-mount 8" diameter steel cover; 4-foot square concrete pad
5		Sandy Silt (ML) - dark red (2.5YR 3/6) dry				
		Poorly-graded Sand with Silt (SP-SM) - dark red (10R 3/6) dry				
		Clayey Sand (SC) - dark reddish brown (2.5YR 3/4) dry, cohesive - yellowish red / light brown (5YR 5/6)				Surface Seal: concrete
10		Poorly-graded Sand with Silt (SP-SM) - mottled red (2.5YR 4/6) and brown (7.5YR 4/4) moist, fine-grained, micaceous				
15		- mottled light yellowish brown (10YR 6/4), red (2.5YR 4/6) and black (N1) micaceous (biotite and muscovite), oxidation - mottled brown (7.5YR 4/4), yellowish red / light brown (5YR 5/6) and black (N1) saprolite wet, micaceous				
20		- mottled light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/8)				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 60 gal. water)
25		Well-graded Sand with Silt (SW-SM) - mottled strong brown (7.5YR 4/6) and black (N1) wet, fine to coarse-grained, micaceous				
30		- mottled brown (10YR 5/3) and white (N9) weathered feldspar				
35		Poorly-graded Sand (SP) - mottled dark gray (2.5Y 4/1) and light olive brown (2.5Y 5/6) fine-grained				
40		Well-graded Sand with Silt (SW-SM) - damp - olive brown (2.5Y 4/3) fine to coarse-grained - SW: - olive brown (2.5Y 4/3), white (N9) and light gray (10YR 7/1) with gravel (residual/pulverized rock)				Annular Seal: bentonite pellets (1 - 5 gal. buckect 3/8" pellets)
45						Filter: 20/40 silica filter sand (4 1/2 - 0.5 cubic ft. bags)
50		Well-graded Sand with Clay (SW-SC) - dark greenish gray (10Y 4/1) with gravel (residual/pulverized rock)				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack

(Continued Next Page)

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUPS\APC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-35 I
PAGE 2 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
55		Biotite Gneiss - dark gray (10YR 4/1) and light gray (10YR 7/1) medium to coarse grain, medium hard to hard, slightly to highly weathered, inclined, moderate to intensely fractured, white banding				Completion: flush-mount 8" diameter steel cover; 4-foot square concrete pad (CONTINUED) Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack Sump: 0.2000000000000003 ft. Cave-in to 56 ft.
		Bottom of borehole at 56.0 feet.				
60						
65						
70						
75						
80						
85						
90						
95						
100						
105						
110						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SPAC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-36 I
PAGE 2 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
55		reddish brown (2.5YR 7/4) saprolite moist, loose, some mica, some oxidation 47 to 56 ft., foliation 55 to 57 ft. Poorly-graded Sand with Clay (SP-SC)(Con't)				(CONTINUED)
60		- mottled gray (2.5Y 6/1), olive gray / light olive gray (5Y 5/2) and very dark gray (5Y 3/1) saprolite moist, loose, some mica				
65						Annular Fill: Cement-Bentonite Grout (6 - 94# bags PC, 1/2 - 55# bag gel, 70 gal. water)
70		Biotite Gneiss - greenish gray (10Y 6/1), white (7.5YR 8/1) and dark greenish gray (10GY 4/1) very soft to soft, highly weathered, banded - bluish gray (10B 5/1) and light bluish gray (5PB 8/1) soft, highly weathered, banded, water staining, moderately disintegrated				
75		- white (10YR 8/1) and greenish gray (5BG 5/1) very soft to soft, moderately weathered, banded, water staining, moderately disintegrated				
80		- medium light gray (N6), white (N9) and dark bluish gray (10B 4/1) hard, slightly weathered, banded, horizontal and sub-vertical fractures, water staining, slightly disintegrated				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
85		- dark bluish gray (10B 4/1) hard, slightly weathered, banded, slightly disintegrated				Filter: 20/40 silica filter sand (6 - 0.5 cubic ft. bags)
90		- white (N9) and bluish gray (10B 5/1) hard, slightly weathered, banded, sub-vertical fractures, water staining, slightly disintegrated				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
95		- intensely fractured - hard, not to slightly weathered, massive, horizontal and sub-vertical fractures, slightly disintegrated				Sump: 0.2000000000000003 ft.
		Bottom of borehole at 97.0 feet.				Cave-in to 97 ft.
100						
105						
110						

RECORD OF BOREHOLE PZ-36S

SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 56.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/22/18
DATE COMPLETED: 8/22/18

NORTHING: 1,120,400.37
EASTING: 2,407,247.17
GS ELEVATION: 479.21 ft
TOC ELEVATION: 482.19 ft

DEPTH W.L.: 35.5 ft
ELEVATION W.L.: 446.69 ft
DATE W.L.: 8/24/18
TIME W.L.: 09:05

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER		WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE	REC / ATT			
					DEPTH (ft)							
0		0.00 - 4.00 Clayey SILT with trace sand and organic matter; sand: fine; red to dark reddish brown; non-cohesive; moist to wet; compact; RESIDUUM	ML							2.98 ft AGS stick up	PZ 36	PZ 36 Borehole Diameter: 6"
475		4.00 - 10.00 Silty CLAY with trace organics; red to reddish brown; cohesive; w~PL to w>PL; firm to very stiff; RESIDUUM	CL		475.21 4.00	No	S-1	ROTO SONIC	7.50 10.00			WELL CASING Interval: 0-45' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread
470		10.00 - 20.00 Silty CLAY with some sand; sand: fine to coarse; red; cohesive; w<PL to w~PL; firm to stiff; RESIDUUM	CL		469.21 10.00							WELL SCREEN Interval: 45-55' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010 End Cap: 0.4
465			CL			No	S-2	ROTO SONIC	2.00 10.00			FILTER PACK Interval: 43-55' Type: Double Wall U-Pack Screen Quantity: 200 lbs
460		20.00 - 25.00 Clayey SAND; sand: fine to coarse; reddish-pink to red; non-cohesive; moist to wet; compact to dense; RESIDUUM	SC		459.21 20.00					Portland Cement and Quick Gel Bentonite Mix		FILTER PACK SEAL Interval: 38.8-43' Type: 3/8" Pel-Plug Quantity: 5 gallons
455		25.00 - 30.00 Clayey SAND; sand: fine to coarse; reddish brown; micaceous; non-cohesive; moist to wet; compact to dense; RESIDUUM	SC		454.21 25.00	No	S-3	ROTO SONIC	8.50 10.00			ANNULUS SEAL Interval: 0-38.8' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 470 lbs Quick Gel: 12 lbs Water: 60 gallons
450												
445		30.00 - 40.00 Clayey SAND with some gravel; sand: fine to coarse; gravel: fine to coarse; red to light grey; micaceous; non-cohesive; moist; compact to dense; SAPROLITE	SC		449.21 30.00	No	S-4	ROTO SONIC	10.00 10.00			
440												
40					439.21							

Log continued on next page.

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-36S

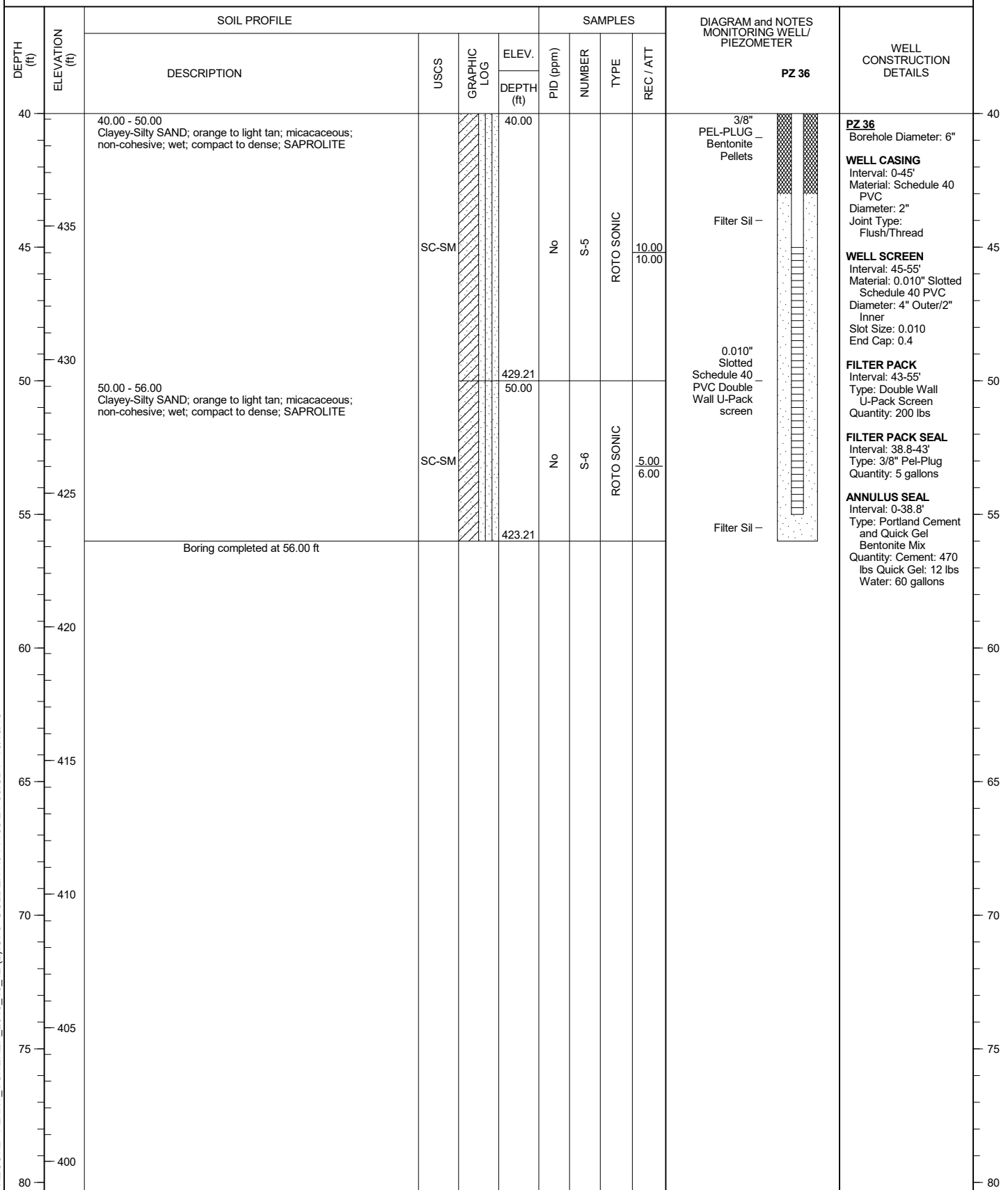
SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 56.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/22/18
DATE COMPLETED: 8/22/18

NORTHING: 1,120,400.37
EASTING: 2,407,247.17
GS ELEVATION: 479.21 ft
TOC ELEVATION: 482.19 ft

DEPTH W.L.: 35.5 ft
ELEVATION W.L.: 446.69 ft
DATE W.L.: 8/24/18
TIME W.L.: 09:05



AA BOREHOLE RECORD PLANT SCHERER_2018_10_12 (2).GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SPAC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

BORING PZ-37 I

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/2/2016 COMPLETED 6/2/2016 SURF. ELEV. 479.5 COORDINATES: N:33.081830 E:-83.801500

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE _____ BEARING _____

BORING DEPTH 72.5 ft. GROUND WATER DEPTH DURING _____ COMP. _____ DELAYED 43 ft. after 48 hrs.

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA Completion: protective aluminum cover with bollards; 4-foot square concrete pad
5		Sandy Silt (ML) - dark red (2.5YR 3/6) dry				Surface Seal: concrete
		- red (2.5YR 4/6)				
10		- yellowish red (5YR 4/6)				
15		Silty Sand (SM) - red (10R 5/6) dry, fine-grained, with mica				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 90 gal. water)
		- weak red (10R 5/3)				
20		- mottled reddish brown (2.5YR 4/4) and reddish black (2.5YR 2.5/1) dry, weathered schist				
		- weak red (2.5YR 5/2)				
25		- mottled reddish brown (2.5YR 4/4) and strong brown (7.5YR 5/6)				
30		Elastic Silt (MH) - reddish brown (2.5YR 4/4) wet				
		Silty Sand (SM) - reddish brown (2.5YR 5/4) fine to coarse-grained. with mica				
35		- yellowish red (5YR 4/6) and reddish brown (2.5YR 4/4) with coarse gravel (residual quartz+feldspar viens)				
		- mottled grayish brown (10YR 5/2) and white (10YR 8/1)				
40		Silt (ML) - mottled strong brown (7.5YR 5/8) and black (7.5YR 2.5/1)				
		Silty Sand (SM) - light brown (7.5YR 6/4) fine to coarse-grained. with mica				
45		Silt (ML) - strong brown (7.5YR 4/6) and black (7.5YR 2.5/1) - dark yellowish brown (10YR 4/4)				
50						

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LOG OF TEST BORING

BORING PZ-37 I
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: protective aluminum cover with bollards; 4-foot square concrete pad
		Silt (ML) (Con't)				(CONTINUED)
55		Silty Sand (SM) - olive brown (2.5Y 4/4) and olive gray / light olive gray (5Y 5/2) saprolite fine to coarse-grained, with mica				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 90 gal. water)
60						Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
65		Well-graded Sandy Gravel (GW) - dark gray (10YR 4/1) and white (10YR 8/1) transition zone pulverized rock, biotite gneiss, feldspar and quartz				Filter: 20/40 silica filter sand (5 - 0.5 cubic ft. bags)
70		Biotite Gneiss - black (5Y 2.5/1) and white / yellowish gray (5Y 8/1) coarse grain, hard, not to slightly weathered, banded, moderately fractured, sub- horizontal fractures - yellowish red (5YR 5/8) water staining				Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; 0.010" Slot Prepack
		Bottom of borehole at 72.5 feet.				Sump: 0.2000000000000003 ft. Cave-in to 72.5 ft.
75						
80						
85						
90						
95						
100						
105						
110						

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LOG OF TEST BORING

BORING PZ-38 I
PAGE 1 OF 2
ECS38467

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DATE STARTED 6/22/2016 COMPLETED 6/23/2016 SURF. ELEV. 482.1 COORDINATES: N:33.082673 E:-83.808276

CONTRACTOR Cascade EQUIPMENT Tracked METHOD Rotosonic

DRILLED BY J. Asua LOGGED BY W. Shaughnessy CHECKED BY B. Smelser ANGLE BEARING

BORING DEPTH 76 ft. GROUND WATER DEPTH DURING COMP. DELAYED 16.3 ft. after 100 hrs.

NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
5		Sandy Silt (ML) - dark red (2.5YR 3/6) dry - with mica				Completion: flush-mount 8" diameter steel cover; 4-foot square concrete pad
10		Poorly-graded Sand with Silt (SP-SM) - yellowish red / light brown (5YR 5/6) dry, fine-grained				
15		Elastic Silt (MH) - yellowish red / light brown (5YR 5/6) and brown (7.5YR 5/4) micaceous - brown (7.5YR 5/3) damp				
20		Poorly-graded Sand with Silt (SP-SM) - grayish brown (10YR 5/2) fine-grained, micaceous				
25		Well-graded Sand (SW) - black (N1) and very light gray (N8) coarse-grained, weathered feldspar seam Poorly-graded Sand with Silt (SP-SM) - grayish brown (10YR 5/2) and strong brown (7.5YR 4/6) saprolite wet, fine-grained, white banding, interbedded by weathered feldspar and quartz seams				
30						
35						
40		Well-graded Sand with Silt (SW-SM) - mottled olive gray / light olive gray (5Y 5/2) and pale yellow (5Y 8/2) saprolite wet, fine to coarse-grained - mottled grayish olive (10Y 4/2) and pale yellow (2.5Y 7/4) - mottled grayish brown (2.5Y 5/2) and pale yellow (2.5Y 7/4) with mica				
45						
50						

Surface Seal:
concrete

Annular Fill:
Cement-Bentonite Grout (4 - 94#
bags PC, 1/2 - 55# bag gel, 90
gal. water)

(Continued Next Page)

SAMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 9/7/16 11:23 - S:\WORKGROUP\SPC GENERAL SERVICE COMPLEX\CIVIL TECH SUPPORT\DRILLING\PROJECTS\GA-SCHERER\SCHERER ADDITIONAL HYDROGEOLOGIC INVESTIGATION (2016)\BORING LOG



LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Additional Hydrogeological Investigation (2016)

LOCATION Plant Scherer

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION	HCL REACTION <small>Weak Moderate Strong</small>	GROUNDWATER OBSERVATIONS	WELL DATA
						Completion: flush-mount 8" diameter steel cover; 4-foot square concrete pad
						(CONTINUED)
55		Well-graded Sand with Silt (SW-SM)(Con't) - mottled olive gray / light olive gray (5Y 5/2), brown (7.5YR 4/4) and white (N9) weathered biotite gneiss - mottled dark grayish brown (2.5Y 4/2) and white (N9) - mottled black (N1) and white (N9)				Annular Fill: Cement-Bentonite Grout (4 - 94# bags PC, 1/2 - 55# bag gel, 90 gal. water)
60		Poorly-graded Sand (SP) - yellowish brown (10YR 5/6) and dark grayish brown (2.5Y 4/2) fine-grained				Annular Seal: bentonite pellets (1 - 5 gal. bucket 3/8" pellets)
65		Biotite Gneiss - grayish brown (2.5Y 5/2) fine to coarse grain, gravelly sand (pulverized weathered rock)				Filter: 20/40 silica filter sand (4 1/2 - 0.5 cubic ft. bags)
70						Standpipe: 2" OD PVC (SCH 40)
75						Screen: 10 ft; 0.010" Slot Prepack
						Sump:0.200000000000003 ft.
						Cave-in to 76 ft.
80						
85						
90						
95						
100						
105						
110						

Bottom of borehole at 76.0 feet.

RECORD OF BOREHOLE PZ-39S

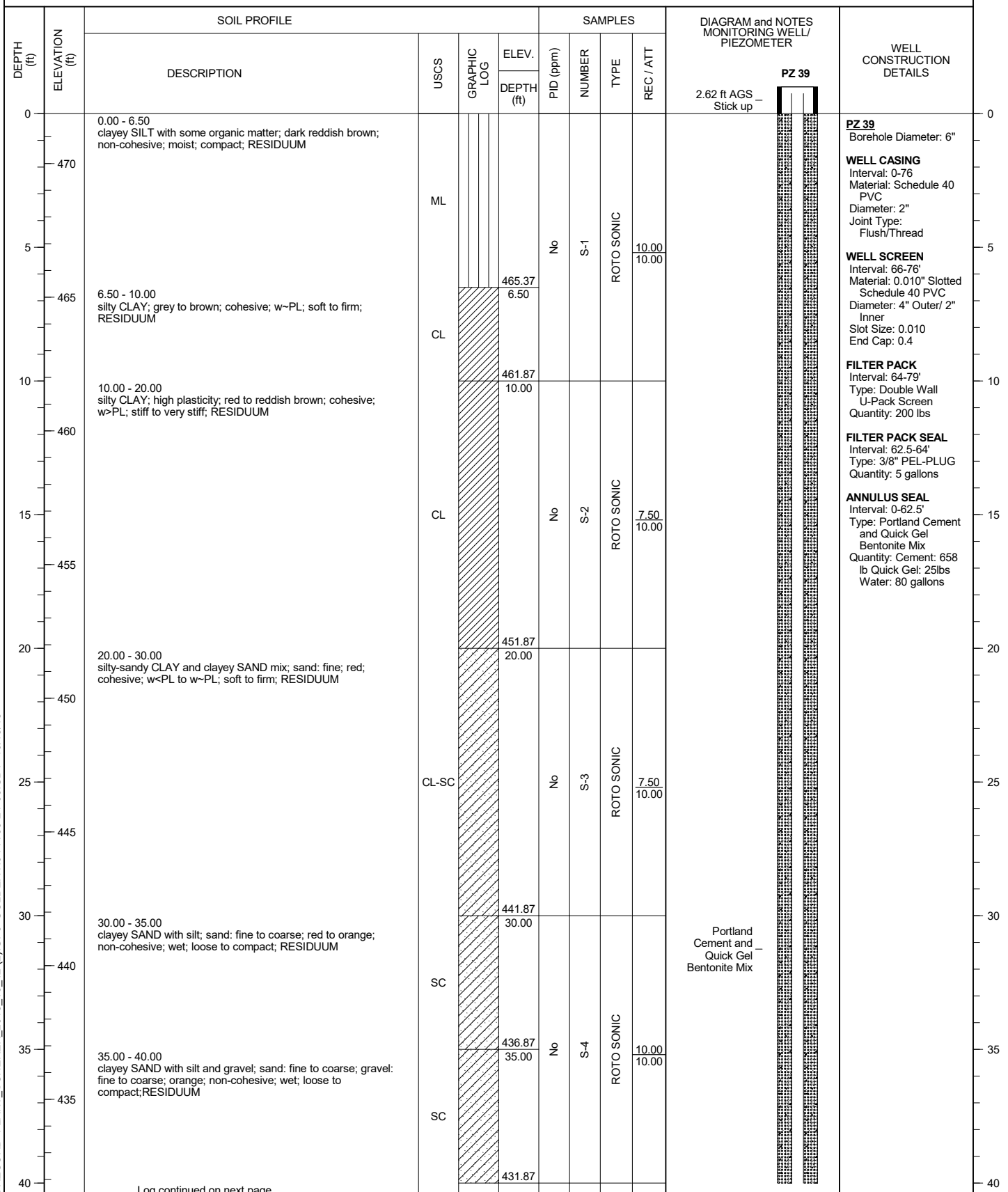
SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 80.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/21/18
DATE COMPLETED: 8/21/18

NORTHING: 1,120,177.25
EASTING: 2,407,470.86
GS ELEVATION: 471.87 ft
TOC ELEVATION: 474.49 ft

DEPTH W.L.: 35.9 ft
ELEVATION W.L.: 438.59 ft
DATE W.L.: 8/24/18
TIME W.L.: 09:10



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-39S

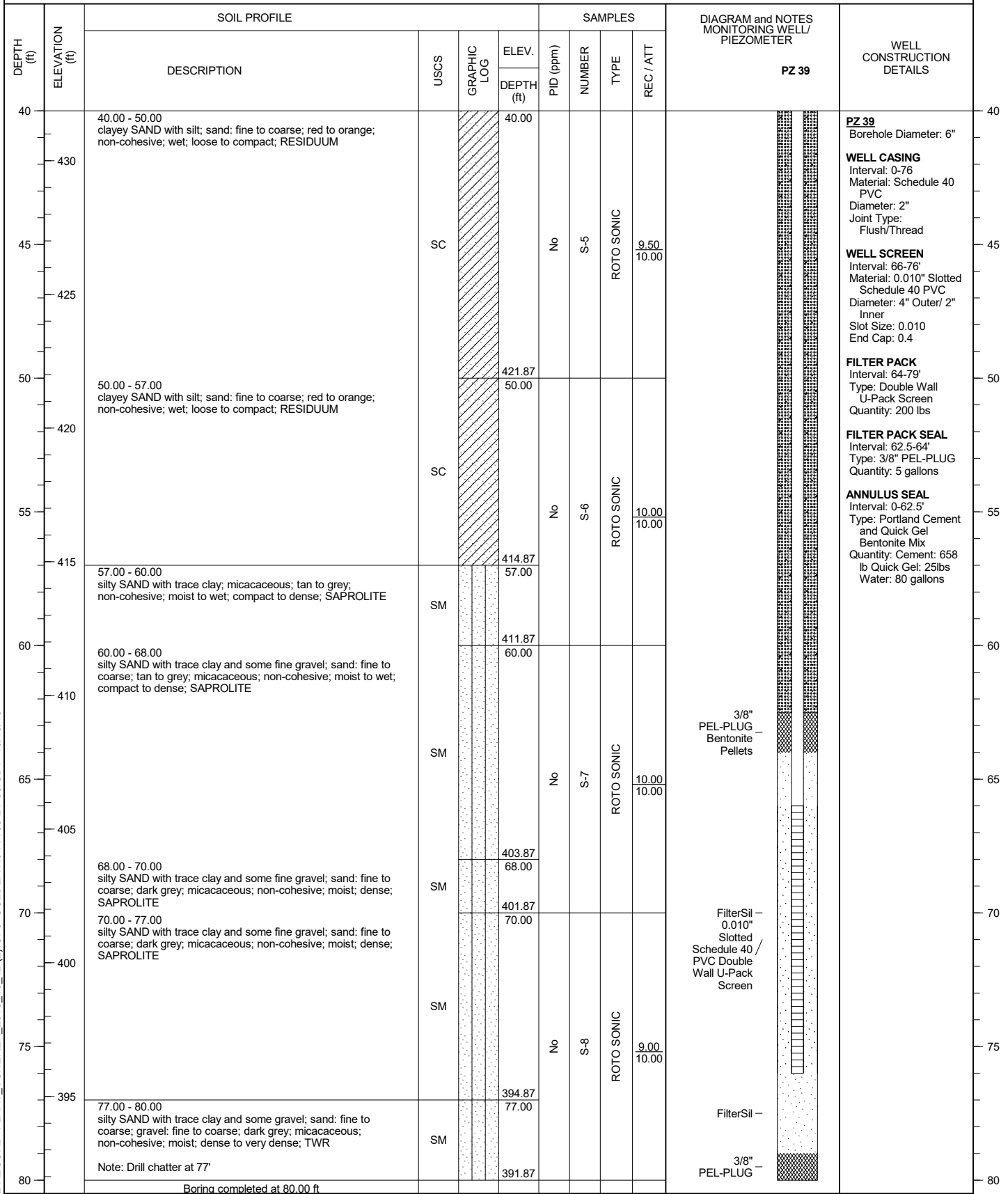
SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 80.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/21/18
DATE COMPLETED: 8/21/18

NORTHING: 1,120,177.25
EASTING: 2,407,470.86
GS ELEVATION: 471.87 ft
TOC ELEVATION: 474.49 ft

DEPTH W.L.: 35.9 ft
ELEVATION W.L.: 438.59 ft
DATE W.L.: 8/24/18
TIME W.L.: 09:10



LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDER NJ-PA 05-24-06 GDT 10/15/18

RECORD OF BOREHOLE PZ-40I







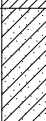
SHEET 1 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 84.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/15/18
DATE COMPLETED: 8/15/18

NORTHING: 1,116,959.59
EASTING: 2,406,964.09
GS ELEVATION: 509.76 ft
TOC ELEVATION: 512.22 ft

DEPTH W.L.: 31.8 ft
ELEVATION W.L.: 480.42 ft
DATE W.L.: 8/17/18
TIME W.L.: 13:25

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE			REC / ATT
					DEPTH (ft)						
0		0.00 - 10.00 Hydrovac from 0-10'									
5	505										
10	500	10.00 - 20.00 Sandy, Clayey SILT; low to medium plasticity; sand: fine to coarse; red to reddish brown; non-cohesive; moist to wet; compact; trending towards clay downhole; RESIDUUM	MH		499.76 10.00	No	S-1	ROTO SONIC	7.00 10.00		PZ 40 Borehole Diameter: 6"
15	495										WELL CASING Interval: 0-73' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread
20	490	20.00 - 22.80 silty CLAY with some sand; sand: fine to coarse; reddish brown; cohesive; w<PL; compact; soft to firm; RESIDUUM	CL		489.76 20.00						WELL SCREEN Interval: 73-83' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010" End Cap: 0.4
25	485	22.80 - 27.60 sandy SILT with some clay; sand: fine to coarse; reddish brown with black; micaceous; non-cohesive; moist; loose; RESIDUUM	SM		486.96 22.80	No	S-2	ROTO SONIC	8.00 10.00		FILTER PACK Interval: 70-84' Type: Double Wall U-Pack Screen Quantity: 250 lbs
30	480	27.60 - 30.00 silty CLAY with some sand and nodules of organic matter; sand: fine to coarse; reddish brown; cohesive; w<PL; soft to firm; RESIDUUM	CL		482.16 27.60						FILTER PACK SEAL Interval: 70-65.5' Type: 3/8" PEL-PLUG Quantity: 5 gallons
35	475	30.00 - 36.80 silty CLAY; red; cohesive; w>PL; very soft; RESIDUUM	CL		479.76 30.00						ANNULUS SEAL Interval: 0-65.5' Type: Portland Cement and Quick Gel Bentonite Gel Mix Quantity: Cement: 752 lbs Quick Gel: 37.5 lbs Water: 70 gallons
40	470	36.80 - 40.00 clayey SAND; sand: fine; reddish-pink; micaceous; non-cohesive; wet; compact; SAPROLITE	SC		472.96 36.80	No	S-3	ROTO SONIC	9.50 10.00		
		Log continued on next page			469.76						

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDER NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-40I

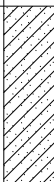
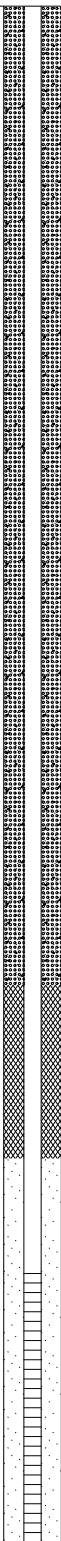


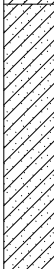
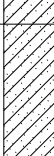


SHEET 2 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 84.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/15/18
DATE COMPLETED: 8/15/18

NORTHING: 1,116,959.59
EASTING: 2,406,964.09
GS ELEVATION: 509.76 ft
TOC ELEVATION: 512.22 ft

DEPTH W.L.: 31.8 ft
ELEVATION W.L.: 480.42 ft
DATE W.L.: 8/17/18
TIME W.L.: 13:25

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER PZ 40	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE	REC / ATT		
					DEPTH (ft)						
40		40.00 - 50.00 clayey SAND; sand: fine; reddish pink; micaceous; cohesive; w<PL; very soft to soft; SAPROLITE	SC		40.00	No	S-4	ROTO SONIC	5.00 10.00		PZ 40 Borehole Diameter: 6" WELL CASING Interval: 0-73' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread WELL SCREEN Interval: 73-83' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010" End Cap: 0.4 FILTER PACK Interval: 70-84' Type: Double Wall U-Pack Screen Quantity: 250 lbs FILTER PACK SEAL Interval: 70-65.5' Type: 3/8" PEL-PLUG Quantity: 5 gallons ANNULUS SEAL Interval: 0-65.5' Type: Portland Cement and Quick Gel Bentonite Gel Mix Quantity: Cement: 752 lbs Quick Gel: 37.5 lbs Water: 70 gallons
45	465										
50	460	50.00 - 55.00 sandy CLAY; sand: fine to coarse; light tan; micaceous; cohesive; w>PL; soft to firm; SAPROLITE	CH		459.76 50.00	No	S-5	ROTO SONIC	10.00 10.00		
55	455	55.00 - 57.50 clayey SAND; sand: fine to coarse; brown; micaceous; non-cohesive to cohesive; moist to wet; compact; SAPROLITE	SC		454.76 55.00						
60	450	57.50 - 65.00 clayey SAND; sand: fine to coarse; dark grey; micaceous; highly weathered rock; non-cohesive; moist; compact to dense; SAPROLITE	SC		452.26 57.50	No	S-6	ROTO SONIC	8.00 10.00	3/8" PEL-PLUG Bentonite Pellets	
65	445	65.00 - 68.50 clayey SAND with some gravel; sand: fine to coarse; gravel; fine to coarse; light grey to grey; micaceous; some weathered quartz; orange mottling; non-cohesive; moist to wet; dense; TWR	SC		444.76 65.00						
70	440	68.50 - 70.00 silty GRAVEL; gravel: fine to coarse; dark grey; micaceous; highly weathered rock; non-cohesive; wet; dense to very dense; BEDROCK 70.00 - 80.00 BIOTITE GNEISS; fresh; banded coarse and fine; gneissic banding; crystals fine to coarse; strong		 	441.26 68.50 439.76 70.00	No	S-7	ROTO SONIC	8.50 10.00	Filter Sil - 0.010" Slotted Schedule 40 PVC Double Wall U-Pack Screen	
75	435										
80	430				429.76						

Log continued on next page

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-40I


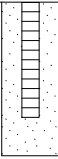
SHEET 3 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 84.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/15/18
DATE COMPLETED: 8/15/18

NORTHING: 1,116,959.59
EASTING: 2,406,964.09
GS ELEVATION: 509.76 ft
TOC ELEVATION: 512.22 ft

DEPTH W.L.: 31.8 ft
ELEVATION W.L.: 480.42 ft
DATE W.L.: 8/17/18
TIME W.L.: 13:25

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER PZ 40	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	PID (ppm)	NUMBER	TYPE	REC / ATT		
80		80.00 - 84.00 BIOTITE GNEISS; fresh; banded coarse and fine; gneissic banding; crystals fine to coarse; strong			80.00	No	S-8	ROTO SONIC	4.00 4.00		PZ 40 Borehole Diameter: 6" WELL CASING Interval: 0-73' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread WELL SCREEN Interval: 73-83' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010" End Cap: 0.4 FILTER PACK Interval: 70-84' Type: Double Wall U-Pack Screen Quantity: 250 lbs FILTER PACK SEAL Interval: 70-65.5' Type: 3/8" PEL-PLUG Quantity: 5 gallons ANNULUS SEAL Interval: 0-65.5' Type: Portland Cement and Quick Gel Bentonite Gel Mix Quantity: Cement: 752 lbs Quick Gel: 37.5 lbs Water: 70 gallons
	425	Boring completed at 84.00 ft			425.76						
85											
90											
95											
100											
105											
110											
115											
120											

AA BOREHOLE RECORD PLANT SCHERER 2018_10_12 (2).GPJ GOLDER NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-41S

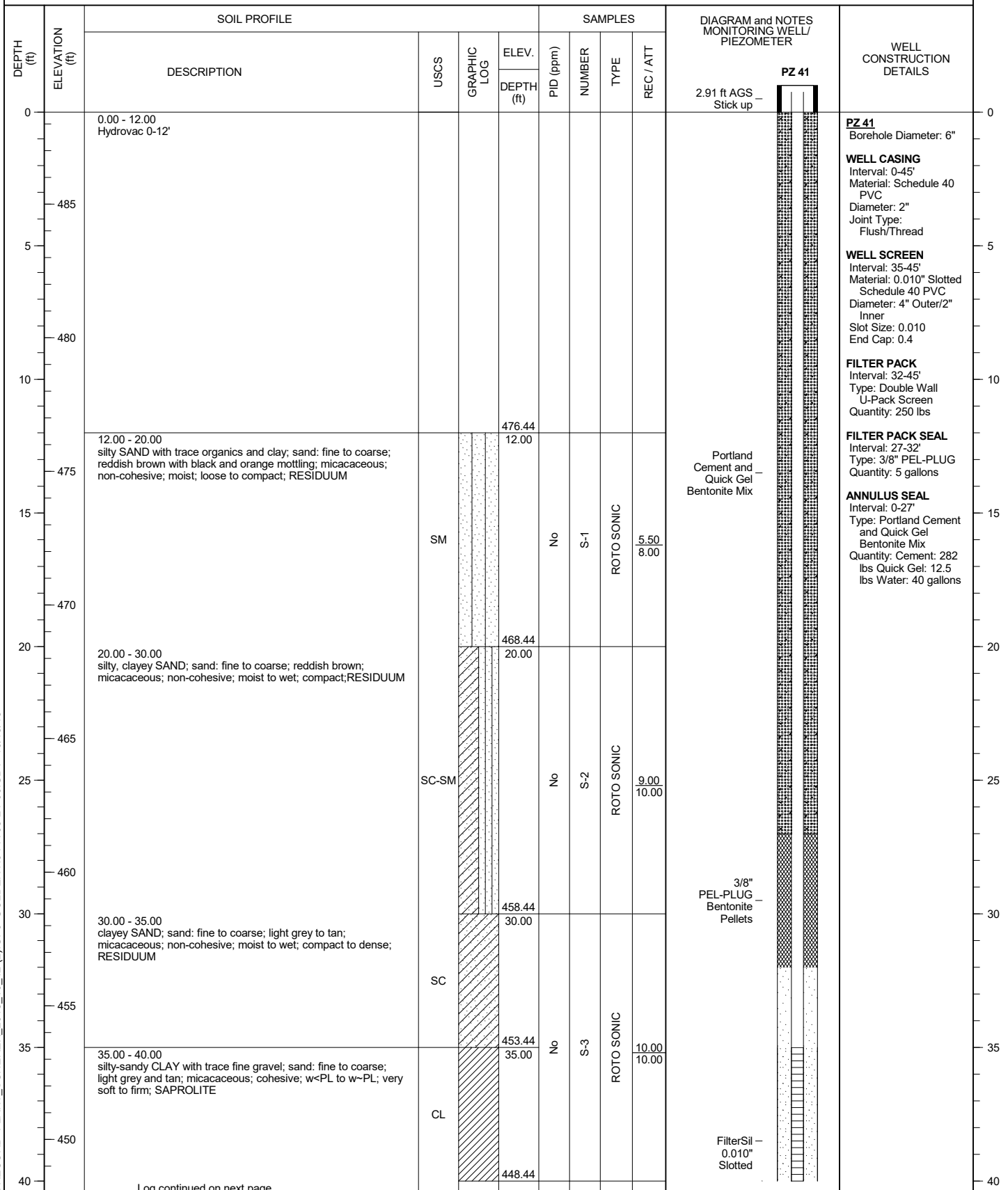
SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 45.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/16/18
DATE COMPLETED: 8/16/18

NORTHING: 1,116,799.23
EASTING: 2,407,126.21
GS ELEVATION: 488.44 ft
TOC ELEVATION: 491.35 ft

DEPTH W.L.: 25.8 ft
ELEVATION W.L.: 465.55 ft
DATE W.L.: 8/17/18
TIME W.L.: 14:45



LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-41S


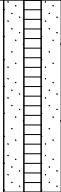


SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 45.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/16/18
DATE COMPLETED: 8/16/18

NORTHING: 1,116,799.23
EASTING: 2,407,126.21
GS ELEVATION: 488.44 ft
TOC ELEVATION: 491.35 ft

DEPTH W.L.: 25.8 ft
ELEVATION W.L.: 465.55 ft
DATE W.L.: 8/17/18
TIME W.L.: 14:45

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER PZ 41	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE	REC / ATT		
					DEPTH (ft)						
40		40.00 - 41.00 silty-sandy CLAY with trace gravel; sand: fine to coarse; gravel: fine to coarse; grey; micaceous; cohesive; w~PL; firm; SAPROLITE	CL		40.00 447.44 41.00	No	S-4	ROTO SONIC	3.00 5.00		<p>PZ 41 Borehole Diameter: 6"</p> <p>WELL CASING Interval: 0-45' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread</p> <p>WELL SCREEN Interval: 35-45' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010 End Cap: 0.4</p> <p>FILTER PACK Interval: 32-45' Type: Double Wall U-Pack Screen Quantity: 250 lbs</p> <p>FILTER PACK SEAL Interval: 27-32' Type: 3/8" PEL-PLUG Quantity: 5 gallons</p> <p>ANNULUS SEAL Interval: 0-27' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 282 lbs Quick Gel: 12.5 lbs Water: 40 gallons</p>
445		41.00 - 43.00 silty SAND with trace gravel; sand: fine to coarse; gravel: fine; light grey to grey; micaceous; non-cohesive; dry; dense to very dense; TWR	SM		445.44 43.00						
45		43.00 - 45.00 clayey- silty SAND with some silt and gravel; sand: fine to coarse; gravel: fine to coarse; grey; micaceous; non-cohesive; moist to wet; dense; TWR	SM		443.44						
		Boring completed at 45.00 ft									
440											
50											
435											
55											
430											
60											
425											
65											
420											
70											
415											
75											
410											
80											

AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDER NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-42I

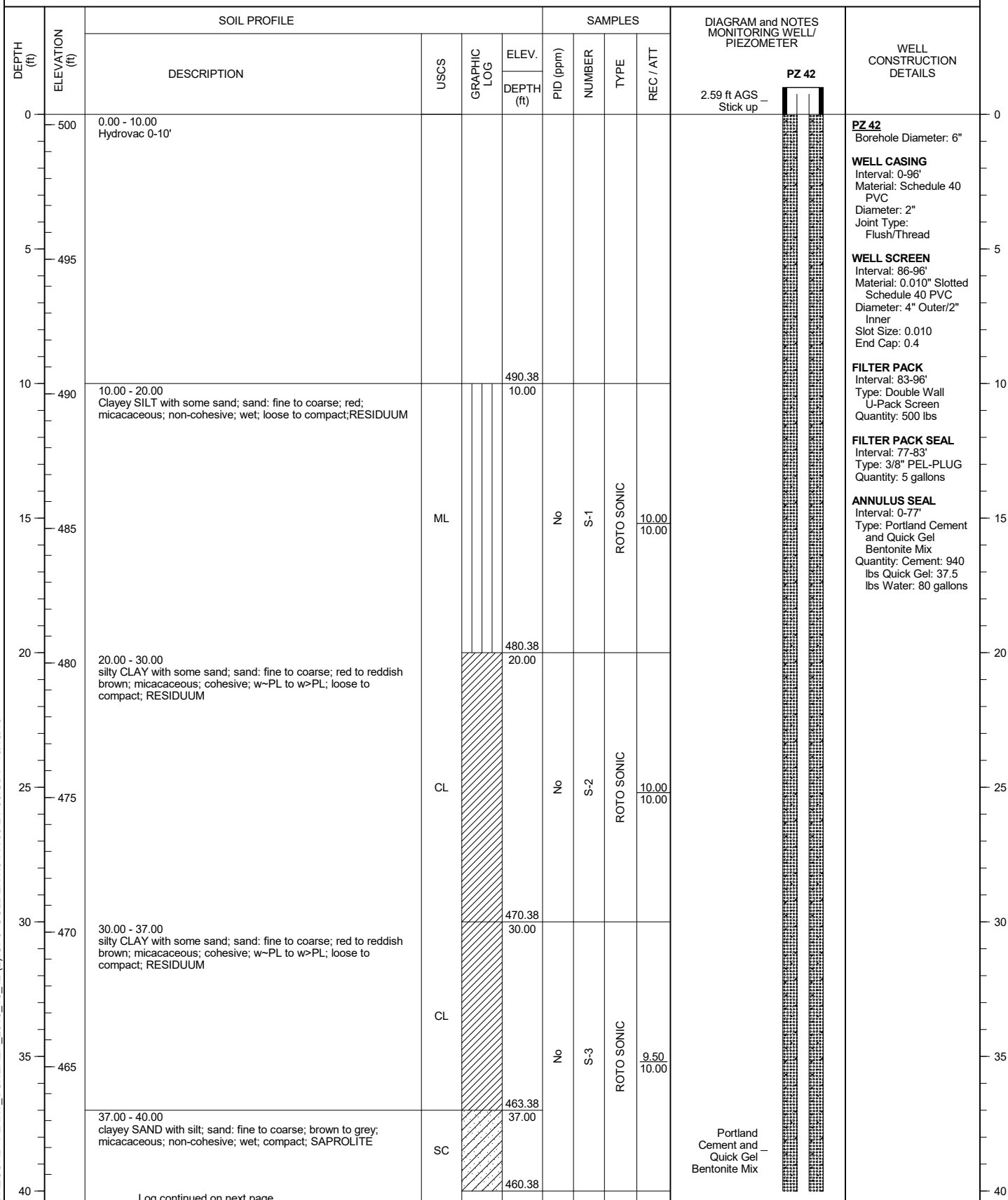
SHEET 1 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 105.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/20/18
DATE COMPLETED: 8/21/18

NORTHING: 1,116,014.66
EASTING: 2,405,294.40
GS ELEVATION: 500.38 ft
TOC ELEVATION: 502.97 ft

DEPTH W.L.: 9.5 ft
ELEVATION W.L.: 493.47 ft
DATE W.L.: 8/22/18
TIME W.L.: 15:15



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-42I


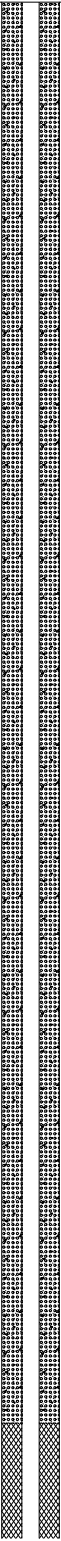




SHEET 2 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 105.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/20/18
DATE COMPLETED: 8/21/18

NORTHING: 1,116,014.66
EASTING: 2,405,294.40
GS ELEVATION: 500.38 ft
TOC ELEVATION: 502.97 ft

DEPTH W.L.: 9.5 ft
ELEVATION W.L.: 493.47 ft
DATE W.L.: 8/22/18
TIME W.L.: 15:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER PZ 42	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	PID (ppm)	NUMBER	TYPE	REC / ATT		
40	460	40.00 - 45.00 clayey SAND with silt; sand: fine to coarse; brown to grey; micaceous; non-cohesive; wet; compact; SAPROLITE	SC		40.00	No					PZ 42 Borehole Diameter: 6" WELL CASING Interval: 0-96' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread WELL SCREEN Interval: 86-96' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010 End Cap: 0.4 FILTER PACK Interval: 83-96' Type: Double Wall U-Pack Screen Quantity: 500 lbs FILTER PACK SEAL Interval: 77-83' Type: 3/8" PEL-PLUG Quantity: 5 gallons ANNULUS SEAL Interval: 0-77' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 940 lbs Quick Gel: 37.5 lbs Water: 80 gallons
45	455	45.00 - 50.00 silty SAND with some clay and gravel; sand: fine to coarse; gravel: fine; grey; micaceous; non-cohesive; moist; compact to dense; SAPROLITE	SM		455.38 45.00	No	S-4	ROTO SONIC	10.00 10.00		
50	450	50.00 - 60.00 silty SAND with some clay and gravel; sand: fine to coarse; gravel: fine; grey; micaceous; non-cohesive; moist to wet; dense to very dense; SAPROLITE	SM		450.38 50.00	No	S-5	ROTO SONIC	8.50 10.00		
55	445		SM			No	S-6	ROTO SONIC	0.00 10.00		
60	440	60.00 - 70.00 No Recovery Note: Assumed SAPROLITE based on surrounding samples	SM		440.38 60.00	No	S-6	ROTO SONIC	0.00 10.00		
65	435		SM			No	S-7	ROTO SONIC	6.00 10.00		
70	430	70.00 - 77.00 silty SAND to silty GRAVEL; sand: fine to coarse; gravel: fine to coarse; black to dark grey; micaceous; non-cohesive; wet; dense to very dense; SAPROLITE	SM-GM		430.38 70.00	No				3/8" PEL-PLUG	
75	425		SM-GM		423.38 77.00	No					
80		77.00 - 80.00 silty SAND/GRAVEL; sand: fine to coarse; gravel: fine to coarse; grey to dark grey; micaceous; non-cohesive; dry to moist; dense to very dense; TWR	SM-GM		420.38						

Log continued on next page

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



GOLDER

AA BOREHOLE RECORD PLANT SCHERER_2018_10_12 (2).GPJ GOLDER NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-42I



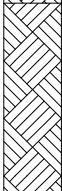
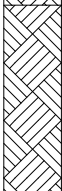

SHEET 3 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 105.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/20/18
DATE COMPLETED: 8/21/18

NORTHING: 1,116,014.66
EASTING: 2,405,294.40
GS ELEVATION: 500.38 ft
TOC ELEVATION: 502.97 ft

DEPTH W.L.: 9.5 ft
ELEVATION W.L.: 493.47 ft
DATE W.L.: 8/22/18
TIME W.L.: 15:15

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE			REC / ATT
					DEPTH (ft)						
80	420	80.00 - 84.50 silty SAND to silty GRAVEL; sand: fine to coarse; gravel: fine to coarse; dark grey; micaceous; non-cohesive; wet; dense to very dense; TWR	SM-GM		80.00					Bentonite Pellets	PZ 42 Borehole Diameter: 6" WELL CASING Interval: 0-96' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread WELL SCREEN Interval: 86-96' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010 End Cap: 0.4 FILTER PACK Interval: 86-96' Type: Double Wall U-Pack Screen Quantity: 500 lbs FILTER PACK SEAL Interval: 77-83' Type: 3/8" PEL-PLUG Quantity: 5 gallons ANNULUS SEAL Interval: 83-96' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 940 lbs Quick Gel: 37.5 lbs Water: 80 gallons
85	415	84.50 - 85.00 BIOTITE GNEISS; moderately weathered; crystals: medium to coarse; gneissic banding; black/white; strongBEDROCK 85.00 - 90.00 No Recovery Note: Assumed BEDROCK due to biotite gneiss rock fragments (i.e., sonic-drilling induced wafers or disks) found in preceding and following intervals and drill chatter/hard drilling indicative of drilling in competent bedrock			415.88 415.38 85.00	No	S-8	ROTO SONIC	5.00 10.00	FilterSil - 0.010" Slotted Schedule 40 PVC Double Wall U-Pack Screen	
90	410	90.00 - 95.00 BIOTITE GNEISS; moderately weathered; crystals: medium to coarse; gneissic banding; black/white; strong		410.38 90.00							
95	405	95.00 - 100.00 No Recovery; possible high fracture zone Note: Assumed BEDROCK due to biotite gneiss rock fragments (i.e., sonic-drilling induced wafers or disks) and competent bedrock found in preceding interval and drill chatter/hard drilling indicative of drilling in competent bedrock		405.38 95.00	No	S-9	ROTO SONIC	5.00 10.00			
100	400	100.00 - 105.00 No recovery; rock dropped out of sample Note: Assumed BEDROCK due to biotite gneiss rock fragments (i.e., sonic-drilling induced wafers or disks) and competent bedrock found in preceding interval and drill chatter/hard drilling indicative of drilling in competent bedrock		400.38 100.00	No	S-10	ROTO SONIC	0.00 5.00	Cave-in at bottom of - hole		
105	395	Boring completed at 105.00 ft			395.38						
110	390										
115	385										
120											

AA BOREHOLE RECORD PLANT SCHERER 2018 10 12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-43S

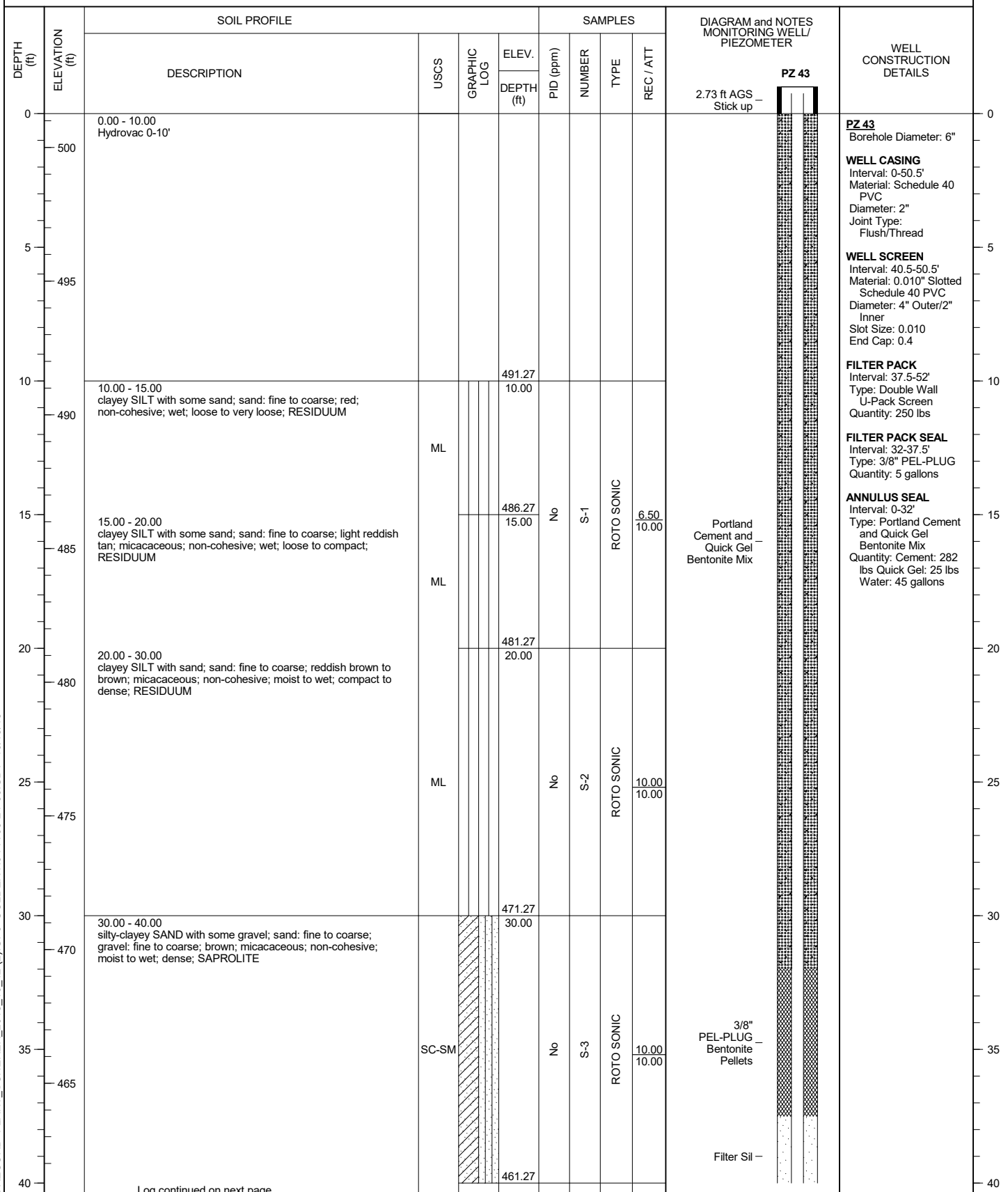
SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 55.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/17/18
DATE COMPLETED: 8/17/18

NORTHING: 1,115,598.55
EASTING: 2,405,507.91
GS ELEVATION: 501.27 ft
TOC ELEVATION: 504.00 ft

DEPTH W.L.: 19.0 ft
ELEVATION W.L.: 485.00 ft
DATE W.L.: 8/17/18
TIME W.L.: 15:00:00



AA BOREHOLE RECORD PLANT SCHERER 2018 10 12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-43S

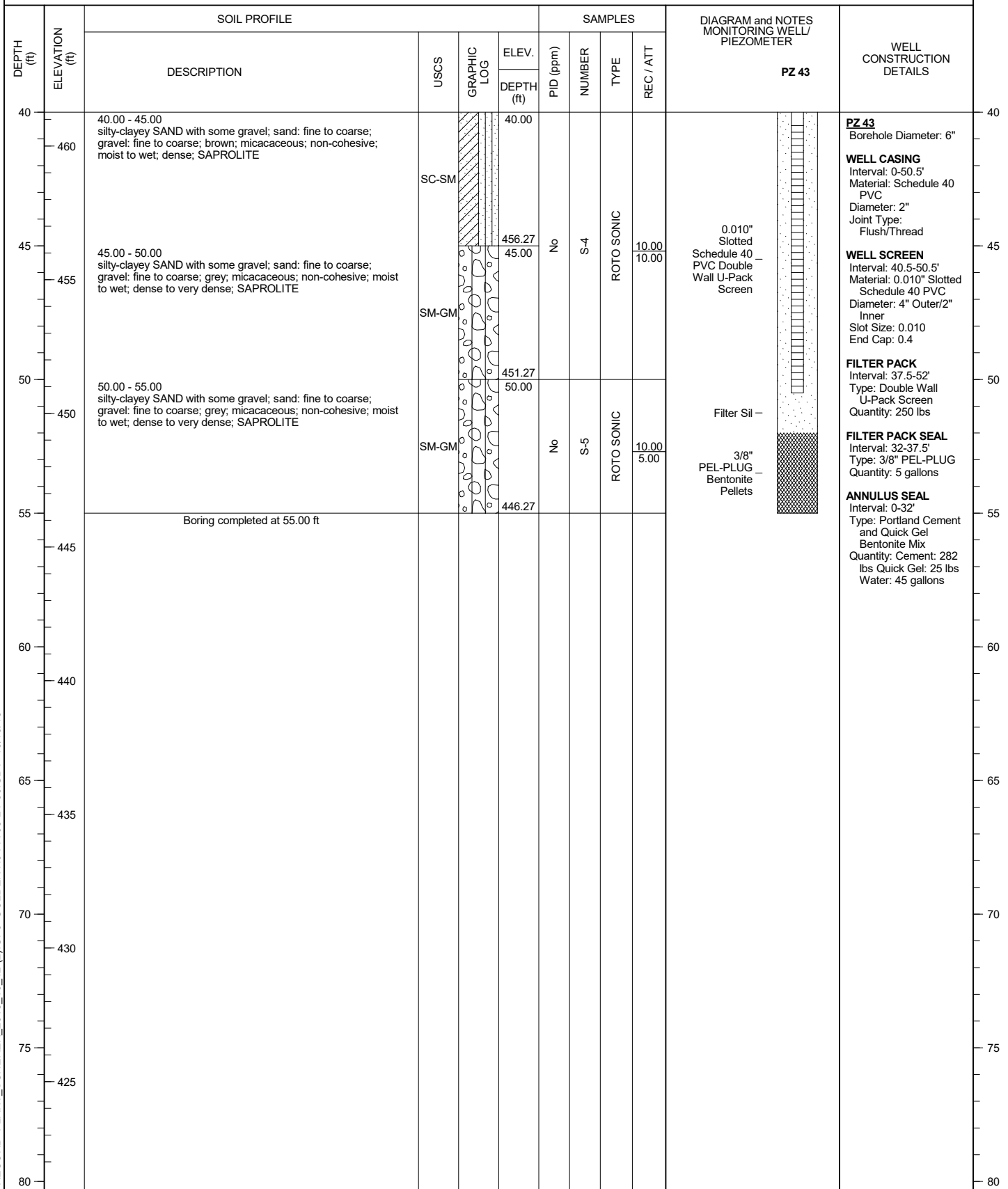
SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 55.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/17/18
DATE COMPLETED: 8/17/18

NORTHING: 1,115,598.55
EASTING: 2,405,507.91
GS ELEVATION: 501.27 ft
TOC ELEVATION: 504.00 ft

DEPTH W.L.: 19.0 ft
ELEVATION W.L.: 485.00 ft
DATE W.L.: 8/17/18
TIME W.L.: 15:00:00



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE PZ-44I


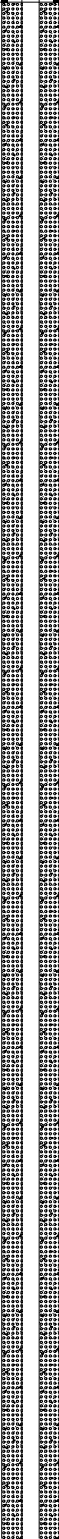






SHEET 1 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 114.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/23/18
DATE COMPLETED: 9/5/18

NORTHING: 1,121,515.27
EASTING: 2,404,331.42
GS ELEVATION: 507.69 ft
TOC ELEVATION: 510.19 ft

DEPTH W.L.: 19.8 ft
ELEVATION W.L.: 490.39 ft
DATE W.L.: 9/7/18
TIME W.L.: 07:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	PID (ppm)	NUMBER	TYPE		
0		0.00 - 5.00 silty CLAY with some sand; sand: fine; red; cohesive; w<PL; firm to stiff; FILL	CL		502.69	No	S-1	ROTO SONIC	<div>2.5 ft AGS - Stick up</div> 	PZ 44 Borehole Diameter: 6" WELL CASING Interval: 0-114' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread WELL SCREEN Interval: 104-114' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010" End Cap: 0.4 FILTER PACK Interval: 103-114' Type: Double Wall U-Pack Screen Quantity: 200 lbs FILTER PACK SEAL Interval: 98-103' Type: 3/8" PEL-PLUG Quantity: 5 gallons ANNULUS SEAL Interval: 0-98' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 1128 lbs Quick Gel: 150 lbs Water: 120 gallons
5		5.00 - 10.00 silty CLAY-clayey SILT with trace sand; sand: fine; red; non-cohesive; wet; loose to compact; RESIDUUM	CL-ML		5.00	No				
10		10.00 - 15.00 clayey SILT with sand; sand: fine to coarse; orange brown; non-cohesive; moist to wet; compact; RESIDUUM	ML		10.00					
15		15.00 - 20.00 sandy SILT-silty SAND; sand: fine to coarse; orange brown; non-cohesive; wet; loose; RESIDUUM	ML-SM		15.00	No	S-2	ROTO SONIC		
20		20.00 - 30.00 clayey-silty SAND with some gravel; sand: fine to coarse; gravel: fine; orange brown; micaceous; non-cohesive; moist to wet; compact to dense; RESIDUUM	SC-SM		20.00	No	S-3	ROTO SONIC		
30		30.00 - 35.00 clayey SAND with silt and some gravel; sand: fine to coarse; gravel: fine to coarse; highly weathered rock fragments; orange-brown; micaceous; non-cohesive; moist to wet; dense; RESIDUUM	SC		30.00					
35		35.00 - 40.00 silty GRAVEL and SAND with some clay; sand: fine to coarse; gravel: fine to coarse; orange brown; micaceous; weathered rock and black carbon deposits; non-cohesive; moist to wet; dense to very dense; RESIDUUM	SM-GM		35.00	No	S-4	ROTO SONIC		
40		Log continued on next page			467.69					

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10 12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-44I

SHEET 2 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 114.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/23/18
DATE COMPLETED: 9/5/18

NORTHING: 1,121,515.27
EASTING: 2,404,331.42
GS ELEVATION: 507.69 ft
TOC ELEVATION: 510.19 ft

DEPTH W.L.: 19.8 ft
ELEVATION W.L.: 490.39 ft
DATE W.L.: 9/7/18
TIME W.L.: 07:55

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE			SAMPLES				DIAGRAM and NOTES MONITORING WELL/ PIEZOMETER PZ 44	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	PID (ppm)	NUMBER	TYPE			REC / ATT
					DEPTH (ft)						
40		40.00 - 43.00 silty GRAVEL and SAND with some clay; sand: fine to coarse; gravel: fine to coarse; orange brown;micaceous; weathered rock and black carbon deposits; non-cohesive; moist to wet; dense to very dense; RESIDUUM	SM-GM		40.00						PZ 44 Borehole Diameter: 6"
465		42.00 - 45.00 silty GRAVEL and SAND with some clay; sand: fine to coarse; gravel: fine to coarse; tan to dark grey; micaceous; weathered rock fragments; non-cohesive; moist to wet; dense; SAPROLITE	SM-GM		464.69						WELL CASING Interval: 0-114' Material: Schedule 40 PVC Diameter: 2" Joint Type: Flush/Thread
45		45.00 - 50.00 silty SAND with clay and gravel; sand: fine to coarse; gravel: fine to coarse; grey to dark grey; micaceous; weathered rock; non-cohesive; moist to wet; dense; SAPROLITE	SM		462.69 45.00	No	S-5	ROTO SONIC	8.00 10.00		WELL SCREEN Interval: 104-114' Material: 0.010" Slotted Schedule 40 PVC Diameter: 4" Outer/2" Inner Slot Size: 0.010" End Cap: 0.4
460										Portland Cement and Quick Gel Bentonite Mix	FILTER PACK Interval: 103-114' Type: Double Wall U-Pack Screen Quantity: 200 lbs
50		50.00 - 60.00 silty SAND with clay and gravel; sand: fine to coarse; gravel: fine to coarse; grey to dark grey; micaceous; weathered rock; non-cohesive; moist to wet; dense; SAPROLITE			457.69 50.00						FILTER PACK SEAL Interval: 98-103' Type: 3/8" PEL-PLUG Quantity: 5 gallons
455											ANNULUS SEAL Interval: 0-98' Type: Portland Cement and Quick Gel Bentonite Mix Quantity: Cement: 1128 lbs Quick Gel: 150 lbs Water: 120 gallons
55			SM			No	S-6	ROTO SONIC	8.00 10.00		
450											
60		60.00 - 69.50 silty SAND with clay and gravel; sand: fine to coarse; gravel: fine to coarse; grey to dark grey; micaceous; weathered rock; non-cohesive; moist to wet; dense; SAPROLITE			447.69 60.00						
445											
65			SM			No	S-7	ROTO SONIC	8.70 10.00		
440											
70		69.50 - 70.00 silty GRAVEL with sand; sand: fine to coarse; gravel: fine; dark grey; micaceous; non-cohesive; moist; dense to very dense; SAPROLITE	GM		438.19 437.69 70.00						
435		70.00 - 80.00 silty SAND and silty GRAVEL; sand: fine to coarse; gravel: fine; dark grey; micaceous; non-cohesive; moist; dense to very dense; SAPROLITE									
75			SM-GM			No	S-8	ROTO SONIC	10.00 10.00		
430											
80					427.69						

Log continued on next page

Log continued on next page

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

RECORD OF BOREHOLE PZ-44I

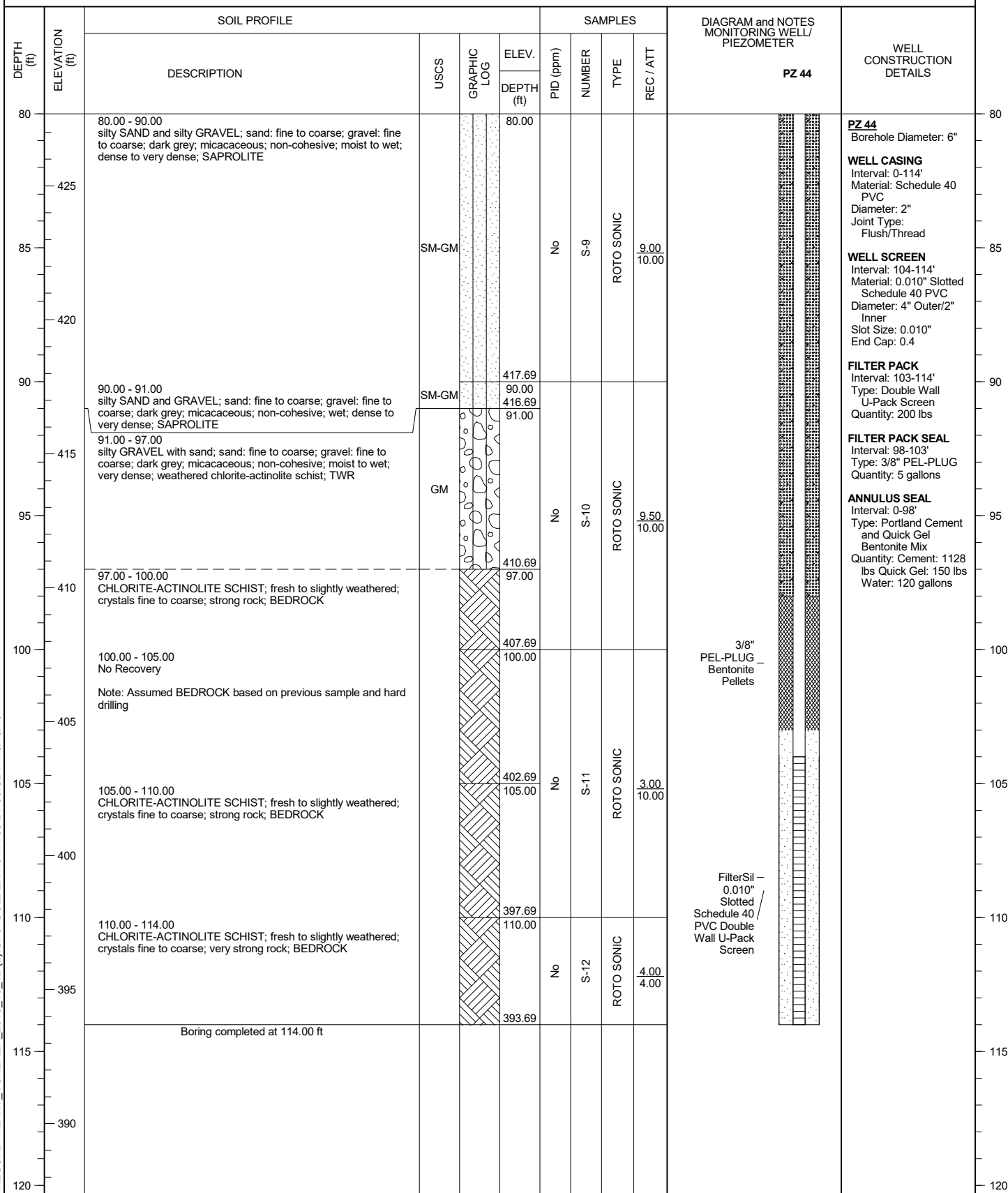
SHEET 3 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 166235004
DRILLED DEPTH: 114.00 ft

DRILL RIG: Geoprobe 8140LC
DATE STARTED: 8/23/18
DATE COMPLETED: 9/5/18

NORTHING: 1,121,515.27
EASTING: 2,404,331.42
GS ELEVATION: 507.69 ft
TOC ELEVATION: 510.19 ft

DEPTH W.L.: 19.8 ft
ELEVATION W.L.: 490.39 ft
DATE W.L.: 9/7/18
TIME W.L.: 07:55



AA BOREHOLE RECORD PLANT SCHERER 2018 10_12 (2) GPJ GOLDR NJ-PA 05-24-06.GDT 10/15/18

LOG SCALE: 1 in = 5 ft
DRILLING COMPANY: Cascade
DRILLER: M. Rodrigues

GA INSPECTOR: C. Tidwell
CHECKED BY: Timothy Richards, PG
DATE: 10/15/18



RECORD OF BOREHOLE LPZ-01

SHEET 1 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 65.80 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 11/6/15
DATE COMPLETED: 11/10/15

NORTHING: 1,117,001.06
EASTING: 2,398,512.88
GS ELEVATION: 549.84
TOC ELEVATION: 553.16 ft

DEPTH W.L.: 53.78'
DATE W.L.: 11/11/15
TIME W.L.: 11:30

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC	
					DEPTH (ft)								
0		0.00 - 2.50 CLAYEY SILT; red/brown clay, trace to little sand, firm to stiff, dry, W<PL	MH		547.34 2.50							WELL CASING Interval: -3'-54' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded SURFACE CASING Interval: N/A Material: N/A Diameter: N/A WELL SCREEN Interval: 54'-64' Material: Schedule 40 PVC Diameter: 2' Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 47.7'-65.8' Type: #1 sand FILTER PACK SEAL Interval: 45.1'-47.7' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-45.1' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary	
		2.50 - 5.00 reddish brown/beige mottled clay with trace fine sand, some mica, stiff to very stiff, dry to moist, W<PL			544.84 5.00	1	DO	4-5-7	12	1.20 1.50			
5	545	5.00 - 8.50 more clay noted, reddish brown clay with trace fine sand and mica			541.34 8.50	2	DO	6-12-17	29	1.50 1.50			
		8.50 - 13.50 not mottled			536.34 13.50 535.34 14.50	3	DO	4-10-13	23	1.50 1.50			
10	540		SM		532.84 17.00	4	DO	5-10-13	23	1.50 1.50			
		13.50 - 14.50 reddish brown clay with trace fine sand and mica											
15	535	14.50 - 17.00 SILTY SAND; deeply weathered granitic gneiss, some quartz, partially weathered rock, white sand and silt, compact, dry, W<PL	ML		529.84 20.00	5	DO	2-7-5	12	1.00 1.50			Portland Type I/ Type – II/ Gel mix
		17.00 - 20.00 SILT; light brown silt with trace fine sand, some mica, non-plastic, soft, dry to moist, W<PL			524.84 25.00								
20	530	20.00 - 25.00 light beige/white silver silt, lots of mica, non-plastic, trace fine sand, soft, dry, W<PL			519.84 30.00	6	DO	3-3-4	7	1.20 1.50			
		25.00 - 30.00 light beige/white silt with mica and trace fine sand to deeply weathered granitic gneiss with quartz, partially weathered rock, white sand and silt, compact, dry, W<PL			516.84 33.00								
25	525		SM		509.84 40.00	7	DO	3-4-4	8	1.10 1.50			
		30.00 - 33.00 light to medium brown silt, trace to little sand, non-plastic, silt appears to be made of biotite gneiss interlayered with quartz veins, soft, dry to moist, W<PL											
30	520					8	DO	4-8-7	15	1.30 1.50			
		33.00 - 40.00 SILTY SAND; light to medium brown silt with trace fine sand, greenish weathering, non-plastic, soft, moist, W<PL											
35	515		SM			9	DO	3-6-8	14	1.40 1.50			
		40.00 - 53.00 brown/white/green fine to coarse sand, non to low plasticity, dry to moist, soft, W<PL											
40	510					10	DO	6-27-42	69	1.50 1.50			
45	505												

Log continued on next page

Log continued on next page

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT.GDT 2/3/16

RECORD OF BOREHOLE LPZ-01

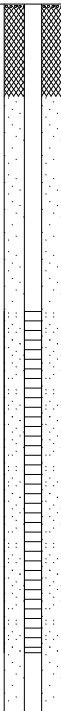
SHEET 2 of 2

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 65.80 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 11/6/15
DATE COMPLETED: 11/10/15

NORTHING: 1,117,001.06
EASTING: 2,398,512.88
GS ELEVATION: 549.84
TOC ELEVATION: 553.16 ft

DEPTH W.L.: 53.78'
DATE W.L.: 11/11/15
TIME W.L.: 11:30

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC
					DEPTH (ft)							
45		40.00 - 53.00 brown/white/green fine to coarse sand, non to low plasticity, dry to moist, soft, W<PL (Continued)				11	DO	12-20-17	37	1.30 1.50		WELL CASING Interval: -3'-54' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded SURFACE CASING Interval: N/A Material: N/A Diameter: N/A WELL SCREEN Interval: 54'-64' Material: Schedule 40 PVC Diameter: 2' Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 47.7'-65.8' Type: #1 sand FILTER PACK SEAL Interval: 45.1'-47.7' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-45.1' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary
50	500					12	DO	14-21-29	50	1.40 1.50		
55	495	53.00 - 58.00 PARTIALLY WEATHERED ROCK; biotite gneiss with quartz and hornblende	PWR		496.84 53.00	13	DO	50/3	50	0.20 0.30		
60	490	58.00 - 65.80 ROCK; biotite gneiss, no recovery in spoon *No auger refusal noted due to drilling conditions Core Run (58.3'-59.8'): RQD=0%; REC=67% Core Run (59.8'-64.8'): RQD=44%; REC=98% Core Run (64.8'-65.8'): RQD=82%; REC=90%	BR		491.84 58.00	14	CORE			1.00 1.50		
65	485					15	CORE			4.90 5.00		
		Boring completed at 65.80 ft			484.04	16	CORE			0.90 1.00		
70	480											
75	475											
80	470											
85	465											
90	460											

BOREHOLE RECORD - SCHERER BORING LOGS.GPJ - PIEDMONT.GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-02





SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 20.00 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 11/20/15
DATE COMPLETED: 11/20/15

NORTHING: 1,119,972.99
EASTING: 2,398,005.52
GS ELEVATION: 510.46
TOC ELEVATION: 513.96 ft

DEPTH W.L.: 2.05'
DATE W.L.: 11/21/15
TIME W.L.: 08:00

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS			
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE			REC		
					DEPTH (ft)									
0	510	0.00 - 2.50 CLAYEY SAND; red/brown clayey sand, fine to medium grain, non-plastic, some organic material, soft, moist to wet, W<PL	SC		507.96						Portland Type I/ Type II/ Gel mix		WELL CASING Interval: -3'-10' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded	
		2.50 - 6.00 red/brown clayey sand to orange/yellow clay with trace fine sand, low plasticity, soft, moist, W<PL			2.50	1	DO	4-4-3	7	0.80 1.50				SURFACE CASING Interval: N/A Material: N/A Diameter: N/A
5	505	6.00 - 7.50 blue grey sandy clay, trace organica material, low plasticity, firm to stiff, moist, W<PL			504.46	2	DO	3-3-3	6	1.30 1.50			WELL SCREEN Interval: 10'-20' Material: Schedule 40 PVC Diameter: 2' Slot Size: 0.010" End Cap: Schedule 40 PVC	
		7.50 - 13.00 sand and clay, soft, loose, low to non-plastic, moist to wet			502.96	3	DO	3-4-8	12	1.50 1.50				FILTER PACK Interval: 8.3'-20' Type: #1 sand
10	500								FILTER PACK SEAL Interval: 5.3'-8.3' Type: 3/8" Bentonite Pellets					
										ANNULUS SEAL Interval: 0'-5.3' Type: Portland Type I/Type II/Gel Mix				
									WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Steel					
15	495	13.00 - 15.00 SILTY SAND; brownish white sand, trace to some silt, some mica, soft, loose, non-plastic, looks like weathered quartz vein or pegmatite, W<PL	SM		497.46								#1 sand - 0.010" slot screen	
		15.00 - 20.00 brown/bronze and white sand with trace to some silt, non-plastic, loose, moist, W<PL			13.00									
					495.46	5	DO	13-12-10	22	1.40 1.50				
					15.00									
20	490	Boring completed at 20.00 ft			490.46	6	DO	10-50/4	50	0.50 0.80				
25	485													
30	480													
35	475													
40	470													
45														

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-03


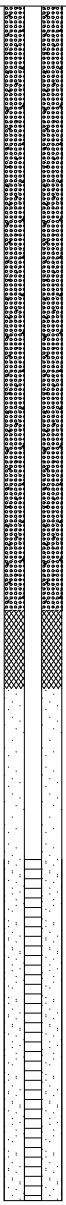

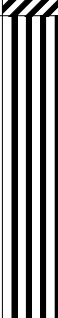
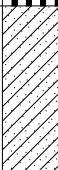

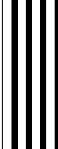
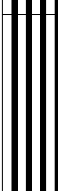
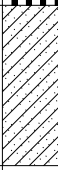
SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 35.00 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 11/17/15
DATE COMPLETED: 11/18/15

NORTHING: 1,117,884.20
EASTING: 2,398,656.59
GS ELEVATION: 511.48
TOC ELEVATION: 515.11 ft

DEPTH W.L.: 6.48
DATE W.L.: 1/14/16
TIME W.L.: 11:13

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
0		0.00 - 2.50 CLAY; with some silt, orange/yellow/beige mottled clay with trace fine sand, low plasticity, very stiff to hard, dry to moist, W<PL	CH		508.98							WELL CASING Interval: -3'-25' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded SURFACE CASING Interval: N/A Material: N/A Diameter: N/A WELL SCREEN Interval: 25'-35' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 20'-35' Type: #1 sand 'Heaving sands during well construction FILTER PACK SEAL Interval: 17.7'-20' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-17.7' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary
510		2.50 - 4.00 red brown mottled clay with trace fine sand, dry to moist, W<PL			507.48	1	DO	4-6-10	16	1.40 1.50		
5		4.00 - 13.00 Shelby Tube Collected: 4'-6" CLAYEY SILT; light green and brown mottled clay, trace fine sand, stiff to very stiff, low plasticity, moist W<PL	MH		4.00	2	DO	5-10-12	22	1.50 1.50		
505						3	DO	5-7-9	16	1.50 1.50		
10						4	DO	3-5-8	13	1.50 1.50		
500					498.48							
15		13.00 - 18.00 CLAYEY SAND; light green to beige sand, fine to coarse, trace clay and gravel, non to low plasticity, compact, soft, very moist, W<PL	SC		13.00	5	DO	2-1-2	3	1.50 1.50		
495					493.48							
20		18.00 - 20.00 CLAYEY SILT; beige to brown spotted clay, moderate to high plasticity, soft to firm, moist, W=PL	MH		18.00	6	DO	1-2-1	3	1.50 1.50		
490		20.00 - 25.00 beige to brown spotted clay, moderate to high plasticity, soft to firm, moist, W=PL			491.48							
25		25.00 - 30.30 yellow brown clay,, trace to some fine to medium sand, low to moderate plasticity, soft to very soft, wet, W>PL			486.48	7	DO	1-2-2	4	1.50 1.50	#1 sand -	0.010" slot screen
485					481.18	8	DO	1-2-2	4	0.90 1.50		
30		30.30 - 35.00 SAPROLITE; white/black/brown sand and clay, low to non-plastic, deeply weathered granitic biotite gneiss, soft, wet	SC		30.30							
480					476.48							
35		Boring completed at 35.00 ft				9	DO	1-2-3	5	1.50 1.50		
475												
40												
470												
45												

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-04






SHEET 1 of 1

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 40.00 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 11/18/15
DATE COMPLETED: 11/19/15

NORTHING: 1,115,963.34
EASTING: 2,397,083.70
GS ELEVATION: 457.83
TOC ELEVATION: 461.06 ft

DEPTH W.L.: 15.09'
DATE W.L.: 11/19/15
TIME W.L.: 14:20

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS		
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC				
					DEPTH (ft)									
0		0.00 - 2.50 SILTY CLAY; reddish brown clay, firm to stiff, low plasticity, moist, W<PL	CL		455.33							WELL CASING Interval: -3'-18' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded		
455		2.50 - 6.00 reddish brown clay, firm to stiff, low plasticity, moist, W<PL			2.50	1	DO	4-5-8	13	1.50 1.50			SURFACE CASING Interval: N/A Material: N/A Diameter: N/A	
5												WELL SCREEN Interval: 18'-28' Material: Schedule 40 PVC Diameter: 2' Slot Size: 0.010" End Cap: Schedule 40 PVC		
		6.00 - 7.50 CLAY; yellowish orange clay with fine to medium sand, low plasticity, stiff, moist, W<PL	CH		451.83	2	DO	2-5-7	12	1.30 1.50		Portland Type I/ Type – II/ Gel mix	FILTER PACK Interval: 16.5'-31.9' Type: #1 sand	
450		7.50 - 10.00 grayish white clay with trace to some fine to medium sand, low plasticity, very stiff to hard, dry to moist, W<PL			450.33	3	DO	5-7-8	15	1.20 1.50			FILTER PACK SEAL Interval: 12.5'-16.5' Type: 3/8" Bentonite Pellets	
10		10.00 - 13.00 CLAYEY SAND; yellowish orange fine to medium sand, some clay, firm to stiff, non to low plasticity, dry to moist, W<PL Shelby Tube Collected: 10'-12'	SC		447.83	4	DO	7-9-10	19	1.50 1.50			ANNULUS SEAL Interval: 0'-12.5' Type: Portland Type I/Type II/Gel Mix	
445		13.00 - 18.00 red/brown/black/silver silt with some clay and trace coarse sand, non-plastic, mica, extremely moist, saturated but not wet, possible water around 17'			444.83								WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel	
15						5	DO	4-9-9	18	1.50 1.50			DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary	
440		18.00 - 25.00 SILTY SAND; red/brown/black/silver silt with some clay and trace coarse sadn, non to low plasticity, soft, moist to wet, W>PL	SM		439.83								0.010" slot screen #1 sand –	
20								6	DO	2-2-2		4		1.50 1.50
435														
25		25.00 - 30.00 SAPROLITE; top 4 inches fine grain granitic texture, sand, trace silt, non-plastic, loose, soft, W>PL; bottom 10 inches saprolite, fine to medium grain biotite gneiss, sand, silt, fine to coarse, soft, compact, W>PL			432.83	7	DO	2-3-4	7	1.50 1.50				
430														
30		30.00 - 35.00 interlayered fine grain granitic sand with trace silt and fine to medium grain biotite gneiss saprolite with fine to coarse sand and silt			427.83	8	DO	1-4-3	7	1.20 1.50				
425														
35		35.00 - 40.00 intertayered sequence: fine grain granitic sand with trace silt and fine to medium grain biotite gneiss saprolite with fine to coarse sand and silt, moist to wet, W>PL			422.83	9	DO	3-5-11	15	1.20 1.50		3/8" Bentonite – chips		
420														
40		Boring completed at 40.00 ft			417.83									
415						10	DO	11-17-20	37	0.90 1.50				
45														

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-05

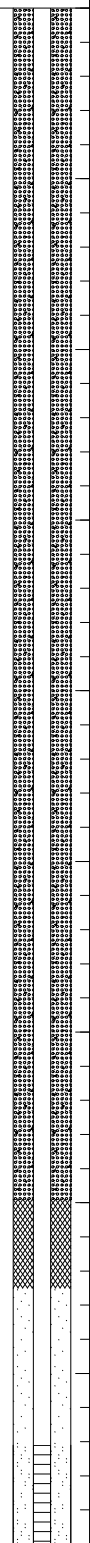
SHEET 1 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 103.40 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 10/28/15
DATE COMPLETED: 11/5/15

NORTHING: 1,115,329.72
EASTING: 2,399,698.73
GS ELEVATION: 520.97
TOC ELEVATION: 524.28 ft

DEPTH W.L.: 45.10'
DATE W.L.: 11/5/15
TIME W.L.: 10:40

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES				MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS	
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC			
					DEPTH (ft)							
0	520	0.00 - 2.50 SILT; soft sandy top soil followed by red silt and clay with mica, low plasticity, dry, compact, W>PL	ML		518.47						WELL CASING Interval: -3.5'-43.1' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded	
		2.50 - 5.00 red silt and clay, contains mica, low plasticity, compact, dry, W>PL			2.50	1	DO	3-5-8	13		<u>1.30</u> 1.50	SURFACE CASING Interval: N/A Material: N/A Diameter: N/A
5		5.00 - 8.00 red/brown silt, contains mica, non-plastic, 1 inch thick pegmatite lense at 6.7 feet, dry to moist			515.97							WELL SCREEN Interval: 42.1'-52.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC
	515			5.00	2	DO	4-8-11	19	<u>1.10</u> 1.50		FILTER PACK Interval: 37.5'-53.1' Type: #1 sand	
				512.97							FILTER PACK SEAL Interval: 34.9'-37.5' Type: 3/8" Bentonite Pelletes	
		8.00 - 10.00 SILTY CLAY; red/brown clay with some silt, contains mica, low plasticity, loose to firm, dry to moist	CL	8.00	3	DO	5-5-5	10	<u>1.20</u> 1.50		ANNULUS SEAL Interval: 0'-34.9' Type: Portland Type I/Type II/Gel Mix	
10		10.00 - 18.20 red/brown clay with some silt, contains mica, coarse biotite and feldspar crystals, low plasticity, loose to firm, dry to moist			510.97	4	DO	2-4-5	9		<u>0.90</u> 1.50	WELL COMPLETION Pad: 4"x4"x4" Protective Casing: Steel
	510											DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary
	505					5	DO	2-3-4	7		<u>0.90</u> 1.50	
				502.77								
		18.20 - 23.00 SILTY SAND; tan to white sand, fine to coarse, trace silt, non-plastic, loose; orange-brown silt with trace sand, fine to medium, weathered amphibolite, firm , dry, moist; then to silty sand with biotite/quartz/feldspar pegmatite, non-plastic, soft, dry to moist	SM	18.20								
20	500					6	DO	3-4-3	7	<u>0.90</u> 1.50		
				497.97								
		23.00 - 33.20 SILT; orange/brown silt with trace fine sand, weathered amphibolite, non-plastic, soft to firm, dry to moist	ML	23.00								
25	495					7	DO	5-6-6	12	<u>1.50</u> 1.50		
	490				8	DO	5-6-10	16	<u>1.30</u> 1.50			
				487.77								
		33.20 - 35.00 SILTY SAND; white sand, fine to coarse, non-plastic, weathered quartz/biotite/feldspar pegmatite, loose, dry, W<PL	SM	33.20								
35	485	35.00 - 40.00 white sand, fine to coarse with trace silt, non-plastic, weathered quartz/biotite/feldspar pegmatite, loose, moist to wet			485.97	9	DO	19-33-20	>50	<u>1.40</u> 1.50		
				35.00								
				480.97								
40	480	40.00 - 45.00 green salt and pepper texture, sand, some silt, fine to coarse, some mica, iron staining evident, compact, non-plastic, moist to wet		40.00	10	DO	32-50/3	>50	<u>0.80</u> 0.80			
				475.97								
45		Log continued on next page										

BOREHOLE RECORD SCHERER BORING LOGS GPJ PIEDMONT GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-05

SHEET 2 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 103.40 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 10/28/15
DATE COMPLETED: 11/5/15

NORTHING: 1,115,329.72
EASTING: 2,399,698.73
GS ELEVATION: 520.97
TOC ELEVATION: 524.28 ft

DEPTH W.L.: 45.10'
DATE W.L.: 11/5/15
TIME W.L.: 10:40

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
45	475	45.00 - 50.00 green salt and pepper texture, sand, some silt, fine to coarse, some mica, iron staining evident, thin vein of quartz, compact, non-plastic, moist to wet			45.00	11	DO	6-7-11	18	1.30 1.50	<p>#1 sand 0.010" slot screen 3/8" Bentonite chips</p>	WELL CASING Interval: -3.5'-43.1' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded SURFACE CASING Interval: N/A Material: N/A Diameter: N/A WELL SCREEN Interval: 42.1'-52.1' Material: Schedule 40 PVC Diameter: 2' Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 37.5'-53.1' Type: #1 sand FILTER PACK SEAL Interval: 34.9'-37.5' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-34.9' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary
50	470	50.00 - 53.90 green salt and pepper texture, fine to coarse sand and silt, some mica, iron staining evident, compact, wet			470.97 50.00	12	DO	5-8-10	18	1.50 1.50		
55	465	53.90 - 63.00 SAPROLITE; biotite/gneiss/quartz/feldspar saprolite, silt with some fine to coarse sand, brown and white, non-plastic, compact to dense, wet,	ML		467.07 53.90	13	DO	3-15-15	30	1.50 1.50		
60	460					14	DO	7-9-15	24	1.50 1.50		
65	455	63.00 - 68.00 SILTY SAND; white/black/green silty sand, fine to coarse, trace silt, non-plastic, compact, moist, W<PL <i>Auger Refusal at 68 feet</i> Core Run (67.3'-73.5'): RQD=56%; REC=78%	SM		457.97 63.00	15	DO	10-17-25	42	1.50 1.50		
70	450	68.00 - 103.00 BEDROCK; deeply weathered gneiss			452.97 68.00	16	CORE			4.80 6.20		
75	445	76.60: Core Run (76.6'-81.2'): no recovery	BR			17	CORE			0.00 4.60		
80	440	81.20: Core Run (81.2'-85.7'): no recovery				18	CORE			0.00 4.50		
85	435	85.70: Core Run (85.7'-93'): no recovery				19	CORE			0.00 7.30		
90		Log continued on next page										

BOREHOLE RECORD: SCHERER BORING LOGS GPJ, PIEDMONT, GDT, 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



RECORD OF BOREHOLE LPZ-05

SHEET 3 of 3

PROJECT: Plant Scherer
PROJECT NUMBER: 1542702
DRILLED DEPTH: 103.40 ft
LOCATION: Juliette, GA

DRILL RIG: CME 550X (98977) Track
Mounted Rig
DATE STARTED: 10/28/15
DATE COMPLETED: 11/5/15

NORTHING: 1,115,329.72
EASTING: 2,399,698.73
GS ELEVATION: 520.97
TOC ELEVATION: 524.28 ft

DEPTH W.L.: 45.10'
DATE W.L.: 11/5/15
TIME W.L.: 10:40

DEPTH (ft)	ELEVATION (ft)	SOIL PROFILE				SAMPLES					MONITORING WELL/ PIEZOMETER DIAGRAM and NOTES	WELL CONSTRUCTION DETAILS
		DESCRIPTION	USCS	GRAPHIC LOG	ELEV. DEPTH (ft)	SAMPLE NO.	TYPE	BLOWS per 6 in 140 lb hammer 30 inch drop	N-VALUE	REC		
90	430	68.00 - 103.00 BEDROCK, deeply weathered gneiss (Continued)	BR		417.97 103.00	19	CORE			0.00 7.30		WELL CASING Interval: -3.5'-43.1' Material: Schedule 40 PVC Diameter: 6" Joint Type: Threaded SURFACE CASING Interval: N/A Material: N/A Diameter: N/A WELL SCREEN Interval: 42.1'-52.1' Material: Schedule 40 PVC Diameter: 2" Slot Size: 0.010" End Cap: Schedule 40 PVC FILTER PACK Interval: 37.5'-53.1' Type: #1 sand FILTER PACK SEAL Interval: 34.9'-37.5' Type: 3/8" Bentonite Pellets ANNULUS SEAL Interval: 0'-34.9' Type: Portland Type I/Type II/Gel Mix WELL COMPLETION Pad: 4'x4'x4" Protective Casing: Steel DRILLING METHODS Soil Drill: 3.25" HSA/HQ Rotary Rock Drill: 3.25" HSA/HQ Rotary
95	425	93.00: Core Run (93'-98'): RQD=0%; REC=20%				20	CORE			1.00 5.00		
100	420	98.00: Core Run (98'-103.4'): RQD=62%; REC=90%				21	CORE			4.90 5.40		
		Boring completed at 103.40 ft										
105	415											
110	410											
115	405											
120	400											
125	395											
130	390											
135												

BOREHOLE RECORD SCHERER BORING LOGS.GPJ PIEDMONT.GDT 2/3/16

LOG SCALE: 1 in = 5.5 ft
DRILLING COMPANY: Southern Company Services
DRILLER: DJ Wideman

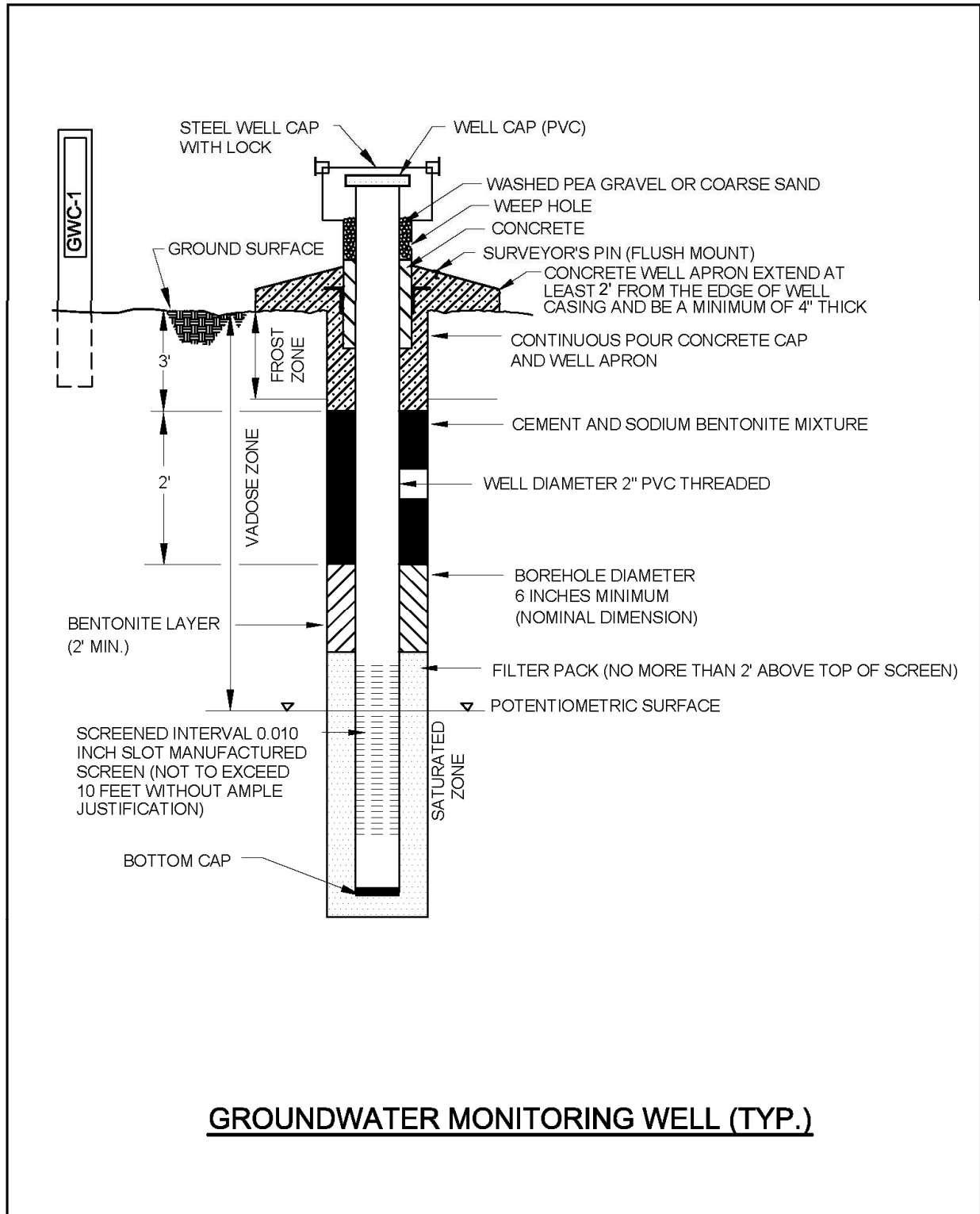
GA INSPECTOR: Michael Boatman
CHECKED BY: Rachel P. Kirkman, P.G.
DATE: 2/1/16



APPENDIX B

GROUNDWATER MONITORING WELL DETAIL

B. GROUNDWATER MONITOIRNG WELL DETAIL



APPENDIX C

GROUNDWATER SAMPLING PROCEDURES

C. GROUNDWATER SAMPLING PROCEDURES

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

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 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 submersible pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. In case of peristaltic pump, the tubing will be likewise lowered slowly to the target depth. The pump intake or tubing for peristaltic pump must be kept at least two (2) feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. Non-dedicated pumps and wiring will be decontaminated before use and between well locations using procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency Science and Ecosystem Support Division (SESD) Operating Procedure for Field Equipment Cleaning and Decontamination as a guide.
- 4) Measure Water Level: Immediately prior to purging, measure the water level again with the pump in the well. Leave the water level measuring device in the well.
- 5) Purge Well: Begin pumping the well at approximately 100 to 500 milliliters per minute (ml/min). Monitor the water level continually. Maintain a steady flow rate that results in a stabilized water level with 0.3 ft. or less of variability. Avoid entraining air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.
- 6) Monitor Indicator Parameters: Monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, ORP, and DO) approximately every three to five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings at a minimum:
 - ± 0.1 S.U. for pH
 - $\pm 5\%$ for specific conductance (conductivity)
 - $\pm 10\%$ for DO where $DO > 0.5$ mg/L. If $DO < 0.5$ mg/L no stabilization criteria apply
 - ≤ 10 NTUs for turbidity
 - Temperature – Record only, not used for stabilization criteria
 - ORP – Record only, not used for stabilization criteria.

- 7) Collect samples at a flow rate between 50 and 250 ml/min and such that drawdown of the water level within the well is stable. Flow rate must be reduced if excessive drawdown is observed during sampling. 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, a second sample may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.
- 9) Sample bottles will be filled, capped, and placed in an ice containing cooler immediately after sampling where temperature control is required. Samples that do not require temperature control will be placed in a clean and secure container.
- 10) Sample containers and preservative will be appropriate for the analytical method being used.
- 11) Information contained on sample container labels will include:
 - a) Name of facility
 - b) Date and time of sampling
 - c) Sample description (well number)
 - d) Sampler's initials
 - e) Preservatives
 - f) Analytical method(s)
- 12) After samples are collected, samplers will remove non-dedicated equipment. Upon completion of field activity the well will be closed and locked.
- 13) 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 nitrile gloves will be worn by the sampling personnel. A clean pair of new, disposable gloves will be worn each time a different location is sampled and new gloves donned prior to filling sample bottles. Gloves will be discarded after sampling each well and before sampling the next well.

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

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

- If turbidity remains above 5 NTUs but is less than 10 NTUs, and other parameters are stabilized, the well can be sampled.
- Where turbidity remains above 10 NTUs, an unfiltered sample will be collected followed by a filtered sample that has passed through an in-line 0.45-micron filter attached to the discharge (sample

collection) tube. Data from filtered samples will only be used to quantify the effects of turbidity on sample results.

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



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