GROUNDWATER MONITORING PLAN

PLANT MITCHELL – ASH PONDS A, 1 & 2
DOUGHERTY AND MITCHELL COUNTIES, GEORGIA
FOR

Georgia Power

May 2021

wood.

Wood Environment & Infrastructure Solutions, Inc.
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I. CERTIFICATION

I hereby certify that this Groundwater Monitoring Plan was prepared by, or under the direct supervision of, a "Qualified Groundwater Scientist," in accordance with the Rules of Solid Waste Management. According to 391-3-4-.01(57), a Qualified Groundwater Scientist is "a professional engineer or geologist registered to practice in Georgia who has received a baccalaureate or post-graduate degree in the natural sciences or engineering and has sufficient training and experience in groundwater hydrology and related fields that enable individuals to make sound professional judgments regarding groundwater monitoring, contaminant fate and transport, and corrective action." The design of the groundwater monitoring system was developed in compliance with the Georgia Environmental Protection Division (EPD) Rules of Solid Waste Management, Chapter 391-3-4.10(6).

Signature: Neven Kresic

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Date: 5/25/2021

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1. INTRODUCTION

Georgia Power Company (GPC) is monitoring groundwater in and around Ash Ponds A, 1 & 2 to detect and quantify potential changes in groundwater chemistry as summarized in a report titled "*Hydrogeologic Assessment Report*" prepared by Wood dated May 2021 (Wood, 2021) and included in Plant Mitchell CCR Permit Application, Part B, Exhibit 1. This Groundwater Monitoring Plan (plan) describes the groundwater monitoring program for the site. This plan meets the requirements of State CCR Rules Chapter 391-3-4-.10(6) and uses the Georgia Environmental Protection Division (EPD's) *Manual for Ground Water Monitoring* dated September 1991 (EPD, 1991) as a guide. Groundwater sampling locations are presented on Figure B-1A for Ash Ponds A, 1 & 2.

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

In accordance with the United States Environmental Protection Agency (USEPA) Coal Combustion Rule (§257.90), a detection monitoring well network for Ash Ponds A, 1 & 2 has been installed. 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 installation or decommissioning of monitoring wells. Well installation must be directed by a professional engineer or geologist licensed to practice in Georgia.

All discharges from Plant Mitchell ash ponds associated with industrial activities occur under the existing Plant Mitchell NPDES Industrial Wastewater Permit GA0001465. This permit is likely to remain in effect to support plant demolition and CCR removal activities. GPC will ensure that any discharge of industrial stormwater or construction stormwater are permitted under the applicable General Permit. An appropriate and comprehensive system of best management practices required by the Georgia Water Quality Control Act and in accordance with the current version of the Manual for Erosion and Sediment Control in Georgia will be included to manage discharges.

2. GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Geologic and hydrogeologic conditions described below are based on observations of drilling logs and data from previous environmental investigations at the site. The geology in the study area generally includes residual soils consisting of an interlayered sequence of predominantly fine-grained unconsolidated material including reddish brown to gray silty and clayey sands overlying sandy clay and clay. Artificial fill is also present in some locations. These surficial materials overlie the Ocala Limestone, which is described as a pink to white, slightly silty friable limestone to partially to well-indurated fossiliferous limestone. The variations in elevation where the pink to white limestone was encountered in site borings indicate that the top of the Ocala Limestone forms an undulating surface beneath the site as a result of differential weathering of the formation.

The hydrogeologic conditions in the study area indicate the presence of three distinct hydrostratigraphic units: (1) a surficial unconfined saturated zone developed in thin sandy residual soils; (2) the clayey sands, sandy clays, and clays of the residual soils which form a discontinuous zone of low permeability separating the shallow water bearing zone from the underlying Ocala Limestone; and (3) the Ocala Limestone (the Upper Floridan aquifer). The elevation of the water table in the surficial saturated zone is consistently approximately a few feet higher than the potentiometric surface of the Upper Floridan aquifer as recorded in the well clusters at the site.

The depth to groundwater typically ranges from approximately 20 to 50 feet below ground surface spatially across the site. The depth to groundwater also varies vertically across the hydrostratigraphic units. As indicated by the differences in the depths to groundwater in the well clusters, a downward hydraulic gradient from the shallow saturated zone to the Ocala Limestone aquifer is present in the study area; however, the sandy clays and clays overlying the Ocala Limestone appear to function as an aquitard limiting the vertical migration of groundwater. Laboratory analysis of undisturbed samples collected from three locations within the surficial sediments overlying the Ocala Limestone resulted in measured hydraulic conductivity values ranging from 10^{-4} to 10^{-8} cm/sec. These preliminary data suggest that fine-grained material in the surficial residual soils overlying the Ocala Limestone may serve as a barrier that restricts vertical movement of groundwater beneath the site, as discussed above. Slug tests conducted on piezometers screened in the Ocala Limestone resulted in measured hydraulic conductivity values ranging from 10^{-3} to 10^{-4} cm/sec.

The uppermost aquifer is considered to be the Ocala Limestone, since the overburden, which consists predominantly of low permeability clay, is not an aquifer and in places the saturated zone in the overburden is quite thin. The aquitard may be breached or may not be present, providing a potential pathway for vertical migration of groundwater. Because of a pronounced vertical downward gradient from the overburden into the underlying limestone, any off-site migration of groundwater would primarily occur in the limestone bedrock.

Based on potentiometric surface maps for the surficial unconfined saturated zone and for the Upper Floridan aquifer, the horizontal groundwater flow direction for both zones is to the southwest (toward the Flint River). Hydraulic gradients in the Upper Floridan aquifer at the site in March 2021 (Figure B-1B) ranged from 0.0021 ft/ft in the area of AP-1 to 0.00473 ft/ft in the area of the former coal fired plant.

3. SELECTION OF WELL LOCATIONS

A groundwater monitoring system was installed to monitor the uppermost aquifer at Ash Ponds A, 1 & 2. The multi-unit monitoring system is designed to monitor groundwater passing the waste boundary of the ash pond units within the uppermost aquifer. Well locations were selected based on site geologic and hydrogeologic considerations and proximity to the ash pond boundaries. Wells were located to serve as upgradient and downgradient monitoring points based on groundwater flow directions as determined by a potentiometric evaluation at the site. A detailed discussion of the conceptual model for groundwater flow and monitoring well placement at the site is included in the *Hydrogeologic Assessment Report* (Wood, 2021).

A map depicting the locations of the wells in the groundwater monitoring (sampling) network is included in Appendix B, Monitoring System Details (Figure B-1A). An existing piezometer, PZ-28, will be incorporated into the monitoring well network in mid-2021 to monitor localized flow between monitoring network well locations PZ-17 and PZ-18 during seasonally high groundwater levels. Figure B-1B depicts the locations of the wells and piezometers used for water level monitoring, and includes the bedrock groundwater elevation contours for the March 2021 monitoring event. Appendix B 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. Table B-1 presents the groundwater monitoring network well details, while Table B-2 presents details for the wells and piezometers used for water level monitoring. Certain monitoring wells and piezometers are in locations that may interfere with planned construction activities. As construction activities become more clearly defined, the installation of additional protective measures, decommissioning, and replacement of these monitoring wells/piezometers will be evaluated and implemented, as appropriate. Any change to the groundwater monitoring network will be made after submitting a minor modification to the permit pursuant to 391-3-4-.10(6)(g) to EPD for review and approval.

4. MONITORING WELL DRILLING, CONSTRUCTION, ABANDONMENT & REPORTING

The existing monitoring well network for AP-A, 1 & 2 is in place. Existing monitoring wells were installed following the Region 4 U.S. Environmental Protection Agency *Science and Ecosystem Support Division Operating Procedure for Design and Installation of Monitoring Wells* (USEPA, 2013) as a general guide for best practices. Monitoring well and piezometer logs for the existing monitoring well network and piezometers are included in Appendix A.

4.1 DRILLING

A variety of well drilling methods are available for the purpose of installing groundwater wells. Drilling methodology may include, but is not limited to: hollow stem augers, direct push, air rotary, mud rotary, or rotosonic techniques. The drilling method shall minimize the disturbance of subsurface materials and shall not cause impact to the groundwater. Borings will be advanced using an appropriate drilling technology capable of drilling and installing a well in the site-specific geology. Monitoring wells will be installed using the most current version of the USEPA SESD SESDGUID-101-R1 as a general guide for best practices. Drilling equipment shall be decontaminated before use and between borehole locations using the procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency *Science and Ecosystem Support Division Operating Procedure for Field Equipment Cleaning and Decontamination* (USEPA, 2015 or latest version) 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 and well installation activities will be directed by a qualified groundwater scientist. All drilling for any subsurface hydrologic investigation, installation or abandonment of groundwater monitoring wells will be performed by a driller that has, at the time of installation, a performance bond on file with the Water Well Standards Advisory Council.

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.

WELL CASINGS AND SCREENS

ASTM, 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.

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* (USEPA, 2013 or latest version) as a general guide. If the dual-wall pre-packed-screened wells do not yield sufficient water or are excessively turbid after development, further steps will be taken to assure that the well screen is appropriately sized for the formation material. This may include performing sieve analysis of the formation material and determining well screen slot size based on the grain size distribution.

FILTER PACK AND ANNULAR SEAL

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

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

PROTECTIVE CASING AND WELL COMPLETION

After allowing the grout to settle, the well will be finished by installing a flush-mount or above-ground protective casing as appropriate, and building a surface cap. The use of flush-mount wells will generally be limited to paved surfaces unless site operations warrant otherwise. The surface cap will extend from the top of the cementitious grout to ground surface, where it will become a concrete apron extending outward with a radius of at least 3 feet from the edge of the well casing and sloped to drain water away from the well.

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

Protective bollards 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 A, Groundwater Monitoring Well Detail, illustrates the general design and construction details for a monitoring well.

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 should be met. A variety of techniques may be used to develop site groundwater monitoring wells. The method used must create reversals or surges in flow to eliminate bridging by particles around the well screen. These reversals or surges can be created by using surge blocks, bailers, or pumps. The wells will be developed using a pump capable of inducing the stress necessary to achieve the development goals. All development equipment will be decontaminated prior to first use and between wells.

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

Many geologic formations contain clay and silt particles that are small enough to work their way through the wells' filter packs over time. Therefore, the turbidity of the groundwater from the monitoring wells may gradually increase over time after initial well development. As a result, the monitoring wells may have to be redeveloped periodically to remove the silt and clay that has worked its way into the filter pack of the monitoring wells. Each monitoring well should be redeveloped when sample turbidity values have significantly increased since initial development or since prior redevelopment. The redevelopment should be performed as described above.

Well development will be conducted under the supervision of a certified groundwater professional. Well development data will be provided as part of the well instillation report.

4.3 ABANDONMENT

Monitoring wells will be abandoned using industry-accepted practices and using the *Manual for Groundwater Monitoring* (EPD, 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. Any piezometers or groundwater wells located within the footprint of current ash ponds will be over-drilled prior to abandonment.

Per Georgia Rule 391-3-4-.10(6)(g): Monitoring wells require abandonment and replacement after two consecutive dry sampling events, unless an alternate schedule is approved by the GA EPD. Well abandonment will be directed by a qualified groundwater scientist.

4.4 DOCUMENTATION

The following information documenting the construction and development of each well will be submitted to EPD by a qualified groundwater scientist within 60 days after completing all planned well installations:

- Well Identification
- Name of drilling contractor and type of drill rig
- Documentation stating that a Georgia-registered professional surveyor shall certify that the horizontal accuracy for the installed monitoring wells is 0.5 feet, and vertical accuracy for top of casing elevations to 0.01 feet using a known datum.
- 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 (i.e., interval in feet below ground surface and elevation)
- Screen length
- Screen slot size
- Filter pack material/size and volume (placement narrative)
- Sealant materials and volume
- Seal emplacement method and type/volume of sealant
- Surface seal and volumes/mix of annular seal material
- Documentation of ground surface elevation (±0.01 ft)
- Documentation of top of casing elevation (±0.01 ft)
- Schematic of the well with dimensions
- Type of protective well cap and sump dimensions for each well
- Well development date

- Well turbidity following development
- Narrative of well development method – specific well development

5. GROUNDWATER MONITORING PARAMETERS AND FREQUENCY

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

Table 1, Groundwater Monitoring Parameters and Frequency, presents the groundwater monitoring parameters and the sampling frequency. According to EPD rules (391-3-4-.10(6)(b)), which incorporates Appendix III and IV constituents of 40 CFR 257.93 by reference) a minimum of eight independent sampling events 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. Assessment monitoring was initiated on November 13, 2019 per Georgia Chapter 391-3-4-.10, Rules for Solid Waste Management.

According to EPD rules (391-3-4-.10(6)(b)), 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 Methods, the groundwater samples will be analyzed using methods specified in USEPA Manual SW-846, EPA 600/4-79-020, Standard Methods for the Examination of Water and Wastewater (SM18-20), USEPA Methods for the Chemical Analysis of Water and Wastes (MCAWW), American Society for Testing and Materials (ASTM), or other suitable analytical methods approved by the Georgia EPD. The method used will be able to reach a suitable practical quantification limit to detect natural background conditions at the facility. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP). Field instruments used to measure pH must be accurate and reproducible to within 0.1 Standard Units (S.U.).

TABLE 1
GROUNDWATER MONITORING PARAMETERS & FREQUENCY

MONITORING PARAMETER		GROUNDWATER MONITORING	
		Background	Semi-Annual Events
Field Parameters	Temperature	X	X
	pH	X	X
	ORP	X	X
	Turbidity	X	X
	Specific Conductance	X	X
	Dissolved Oxygen	X	X
Appendix III (Detection)	Boron	X	X
	Calcium	X	X
	Chloride	X	X
	Fluoride	X	X
	pH (field)	X	X
	Sulfate	X	X
	Total Dissolved Solids	X	X
Appendix IV (Assessment)	Antimony	X	Assessment sampling frequency and parameter list determined in accordance with Georgia Chapter 391-3-4-.10(6)
	Arsenic	X	
	Barium	X	
	Beryllium	X	
	Cadmium	X	
	Chromium	X	
	Cobalt	X	
	Fluoride	X	
	Lead	X	
	Lithium	X	
	Mercury	X	
	Molybdenum	X	
	Selenium	X	
	Thallium	X	
	Radium 226 & 228	X	

TABLE 2
ANALYTICAL METHODS

Parameters	EPA Method Number
Boron	EPA 6010C/6020B
Calcium	EPA 6010C/6020B/7140
Chloride	EPA 300.0/300.1/9250/9251/9253/9056A
Fluoride	EPA 300.0/300.1/9214/9056A
pH	EPA 150.1 field/9040B
Sulfate	EPA 300.0/300.1/9035/9036/9038/9056A
Total Dissolved Solids (TDS)	EPA 160.1/Standard Method 2540C
Antimony	EPA 6010C/6020B/7040/7041
Arsenic	EPA 6010C/6020B/7060A/7061A
Barium	EPA 6010C/6020B/7080A/7081
Beryllium	EPA 6010C/6020B/7090/7091
Cadmium	EPA 6010C/6020B/7130/7131A
Chromium	EPA 6010C/6020B/7190/7191
Cobalt	EPA 6010C/6020B/7200/7201
Fluoride	EPA 300.0/300.1/9214/9056A
Lead	EPA 6010C/6020B/7420/7421
Lithium	EPA 6010C/6020B/7430
Mercury	EPA 7470A
Molybdenum	EPA 6010B/6020C/7480/7481
Selenium	EPA 6010C/6020B/7740/7741A
Thallium	EPA 6010C/6020B/7840/7841
Radium 226 and 228 combined	EPA 903.0/9320/9315

6. SAMPLE COLLECTION

During each sampling event, samples will be collected and handled in accordance with the procedures specified in Appendix C, Groundwater Sampling Procedures. 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. The applied groundwater purging and sampling methodologies will be discussed in the groundwater semi-annual monitoring reports submitted to EPD.

For groundwater sampling, positive gas displacement Teflon or stainless steel bladder pumps with PVC intake screens 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 in general accordance with USEPA LSASDPROC-205-R4.

Groundwater wells that are determined to be dry for two consecutive sampling events will be replaced unless an alternate schedule has been approved by EPD" to "Per Georgia Rule 391-3-4-.10(6)(g) monitoring wells require replacement after two consecutive dry sampling events. Well installation must be directed by a qualified groundwater scientist. A minor modification shall be submitted in accordance with Rule 391-3-4-.02(3)(b)(6) prior to the installation or decommissioning of monitoring wells.

7. CHAIN-OF-CUSTODY

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

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

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

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

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

8. FIELD AND LABORATORY QUALITY ASSURANCE / QUALITY CONTROL

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

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

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

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

A custody seal shall be placed on each shipping cooler or shipping container. Custody seals on sample containers serve two purposes: to prevent accidental opening of the shipping container and to provide visual evidence should the container be opened or tampered with. The use of custody seals controls the loss of samples and provides direct evidence whether sample containers have been opened and possibly compromised. The groundwater samples will be analyzed by licensed and accredited laboratories through the National Environmental Laboratory Accreditation Program (NELAP).

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

9. REPORTING RESULTS

A semi-annual groundwater report that documents the results of sampling and analysis will be submitted to EPD. Semi-annual groundwater monitoring reports will be submitted to the EPD within 90 days of receipt 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 P.G. or P.E.

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

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

8. Groundwater flow rate and direction calculations.

9. Identification of any groundwater wells that were installed or decommissioned during the preceding semi-annual period, along with a narrative description of why these actions were taken.

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

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

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

13. Laboratory reports.

14. COC documentation.

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

16. Documentation of non-functioning wells.

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

18. Statistical analyses.

19. Certification by a qualified groundwater scientist.

10. STATISTICAL ANALYSIS

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

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 identified constituent. The statistical test chosen shall be conducted separately for each constituent in each well. As authorized by the rule, statistical tests that will be used include:

1. A prediction interval procedure in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (§257.93(f)(3)).

2. A control chart approach that gives control limits for each constituent (§257.93(f)(4)).

3. Another statistical test method (such as prediction limits or control charts) that meets the performance standards of §257.93(g). 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, interwell methods will be used for statistical analysis of Appendix III constituents to background concentrations.

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

11. REFERENCES

EPD, 1991. Manual for Groundwater Monitoring, Georgia Department of Natural Resources, Environmental Protection Division, September 1991.

USEPA, 2020. Science and Ecosystem Support Division Operating Procedures: LSASDPROC-205-R4 Field Equipment Cleaning and Decontamination, US Environmental Protection Agency, Region 4, Athens, Georgia, June 22, 2020.

USEPA, 2018. Science and Ecosystem Support Division Operating Procedures: SESDGUID-101-R2 Design and Installation of Monitoring Wells, US Environmental Protection Agency, Region 4, Athens, Georgia, January 16, 2018.

Wood, 2021. Hydrogeologic Assessment Report, Plant Mitchell – Ash Ponds A, 1 & 2, Dougherty and Mitchell Counties, Georgia, May, 2021.

FIGURE 1. STATISTICAL ANALYSIS PLAN OVERVIEW

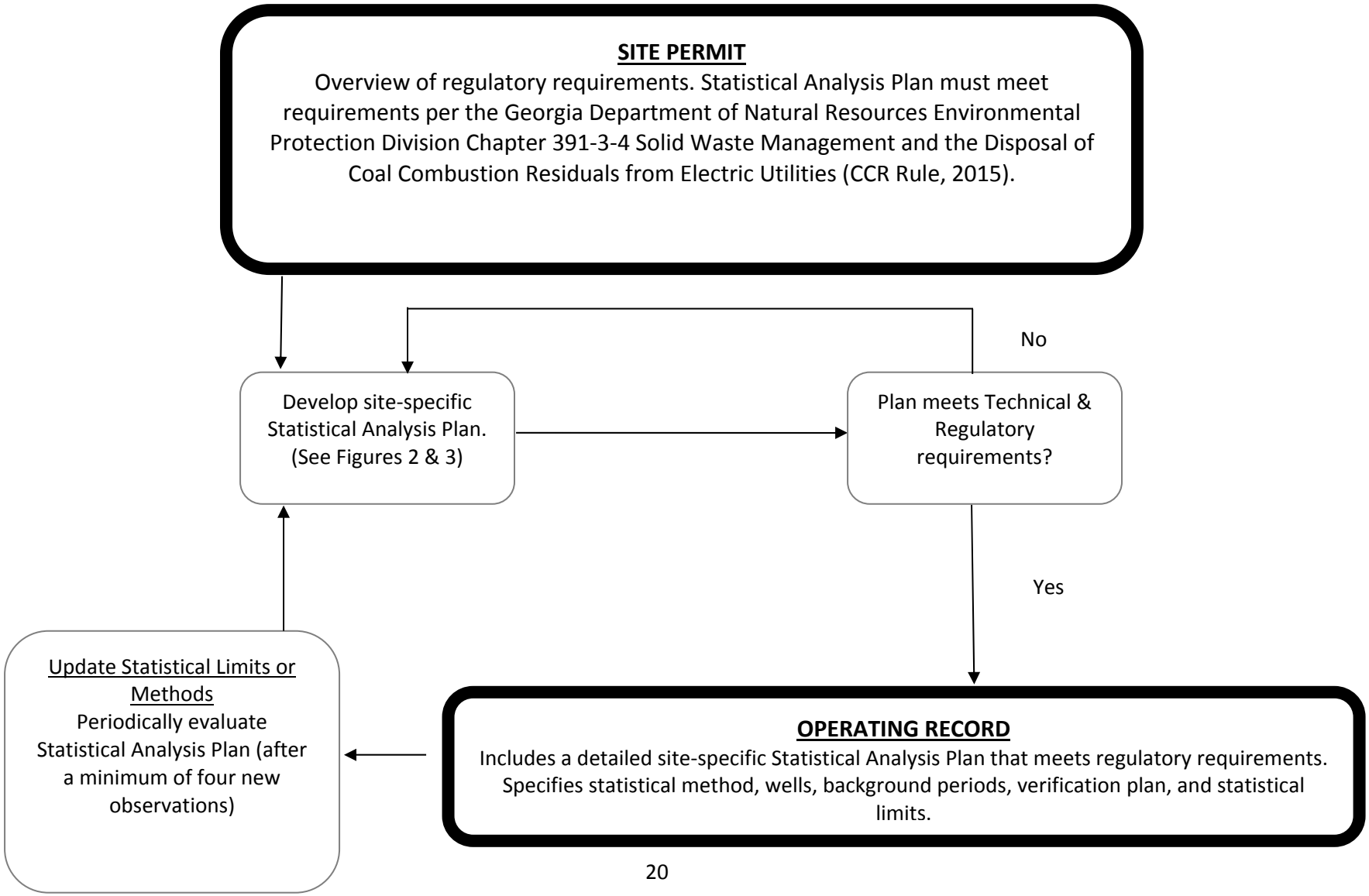
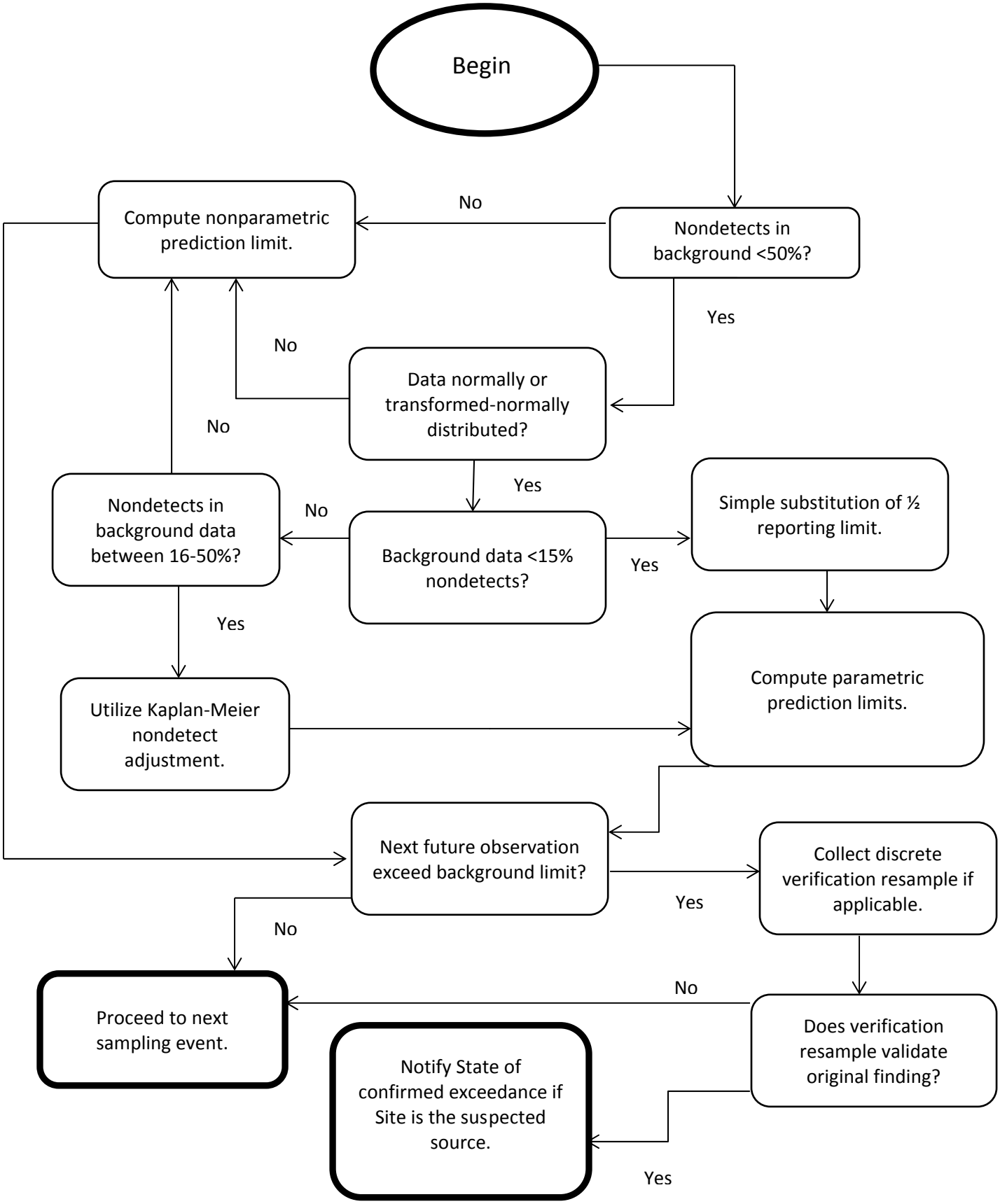


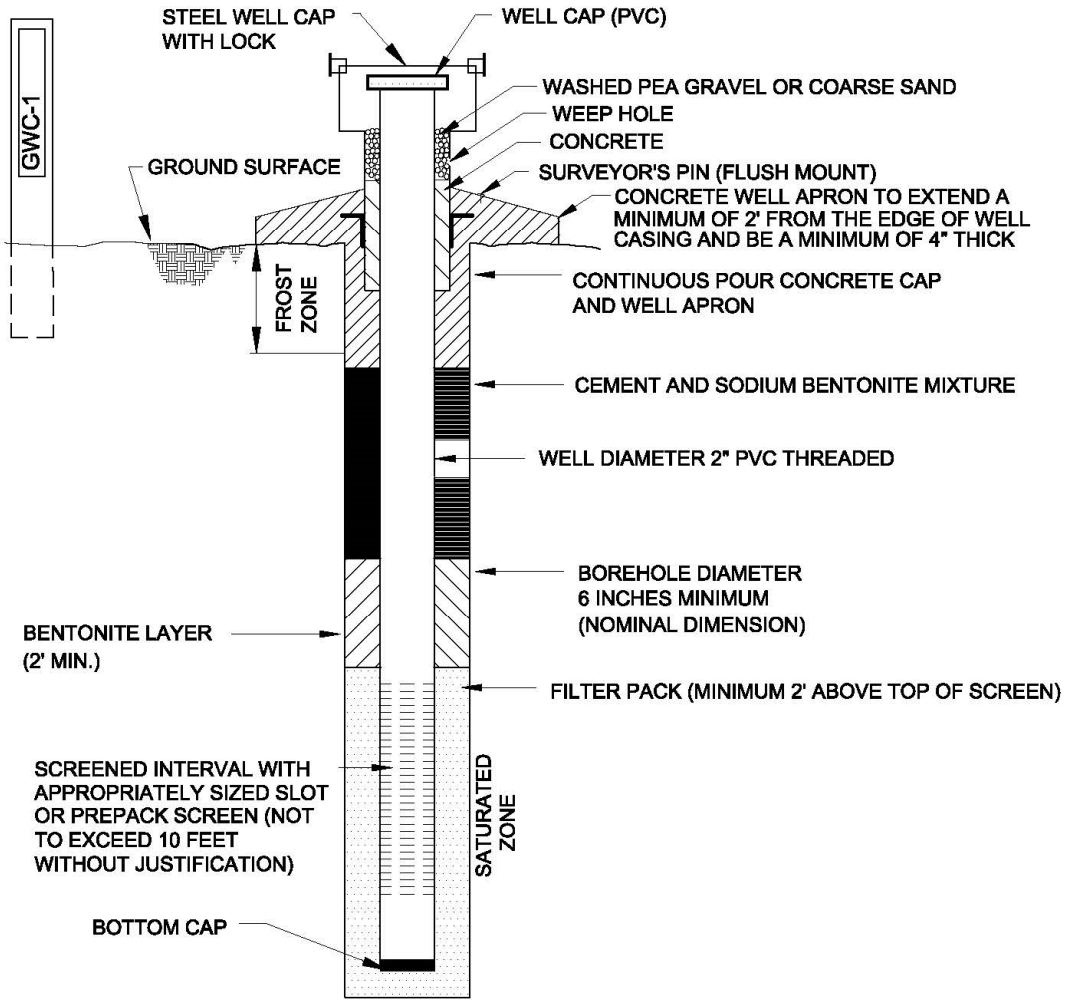
FIGURE 2. DECISION LOGIC FOR COMPUTING PREDICTION LIMITS



APPENDICES

A. GROUNDWATER MONITORING WELL DETAILS
B. MONITORING SYSTEM DETAILS
C. GROUNDWATER SAMPLING PROCEDURES

A. GROUNDWATER MONITORING WELL DETAILS

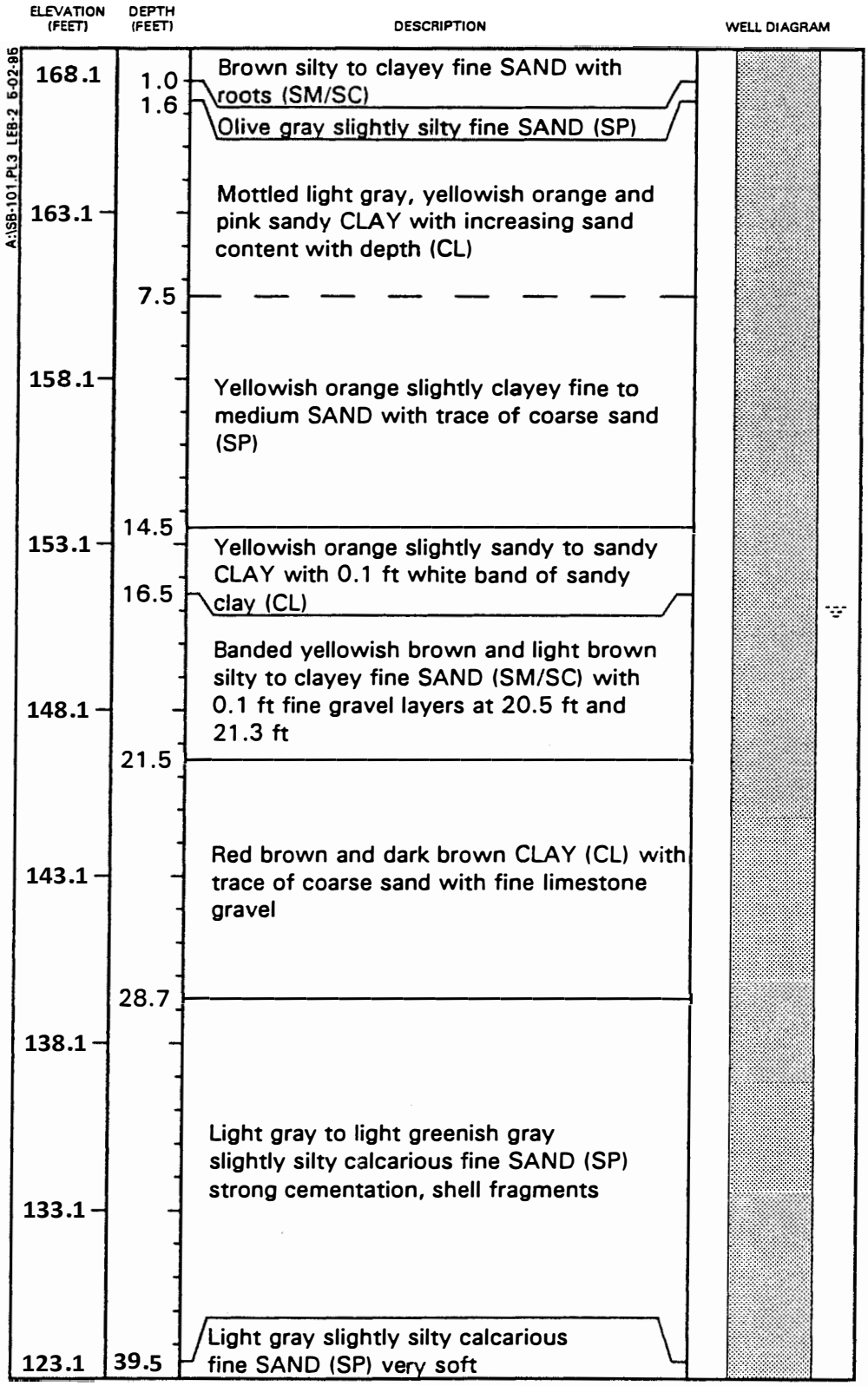


NOTES:
(i) Monitoring network wells included in Table B-1 were constructed in accordance with this typical detail.
(ii) Certain historical water level monitoring wells, identified with "MW" within the well names in Table B-2, were constructed with some variations.

GROUNDWATER MONITORING WELL (TYP.)

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

1) Boring advanced using 8-inch O.D. hollow stem augers with CME continuous samplers.
2) Boring grouted to ground surface upon completion, no soil or ground-water retained for analyses.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	

BORING NUMBER	SB-101
DATE STARTED	2-7-95
DATE COMPLETED	2-7-95
JOB NUMBER	41-4621

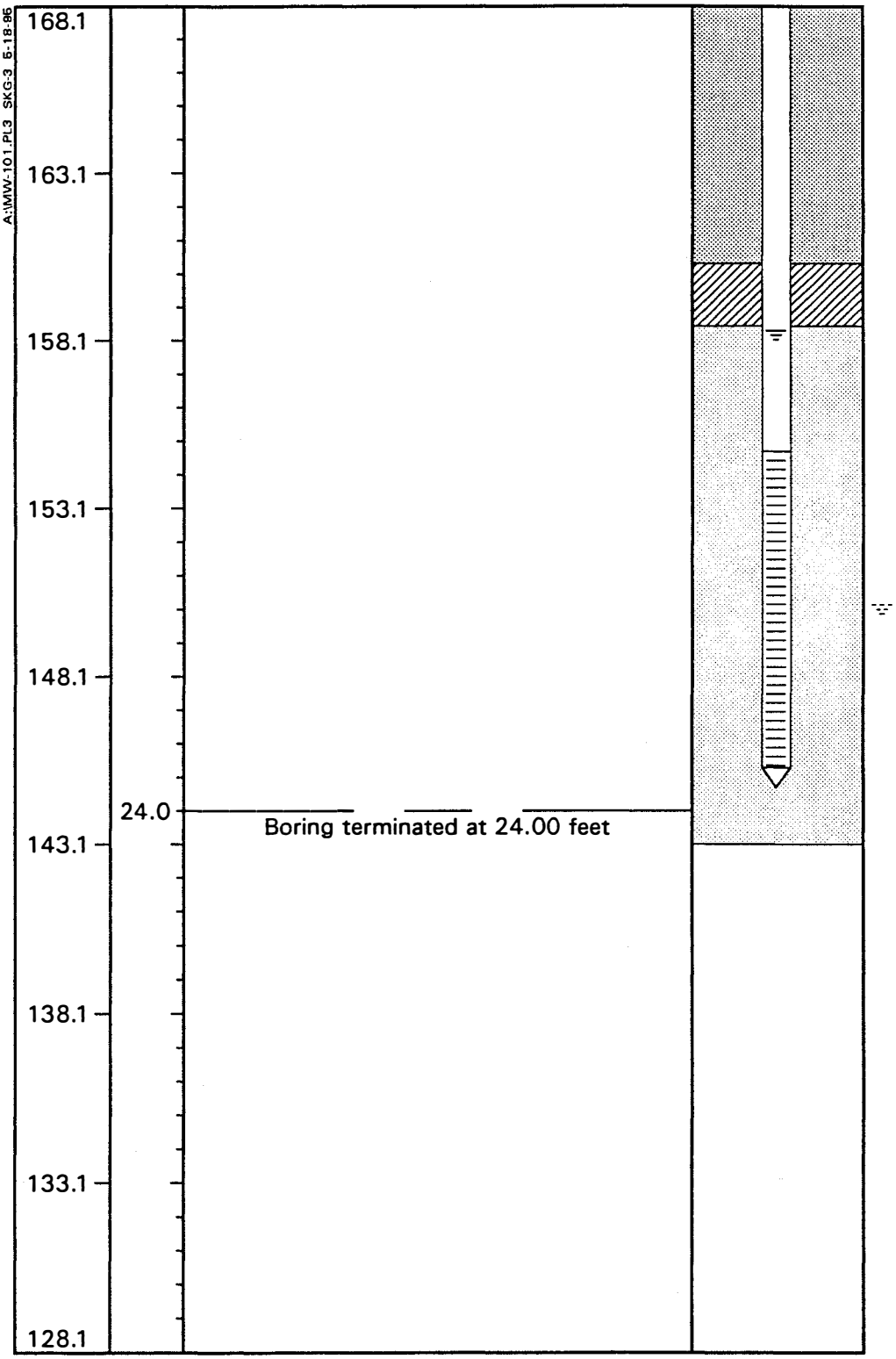
Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 170.93 Ft.
HEIGHT OF RISER: 2.79 Ft.

A:\MW-101.PL3 SKG:3 6-18-86



REMARKS:

1) Boring advanced using 8-inch O.D. hollow stem augers with CME continuous samplers.
2) Type II ground-water monitoring well installed consisting of 2-inch I.D. PVC riser and slotted screen.
3) Samples retained for laboratory analyses include soil samples MW-101 0-5' and a duplicate, MW-101 5-10', and ground-water sample MW-101-U and MW-100-F.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-101
DATE STARTED	2/14/95
DATE COMPLETED	2/14/95
JOB NUMBER	41/4621

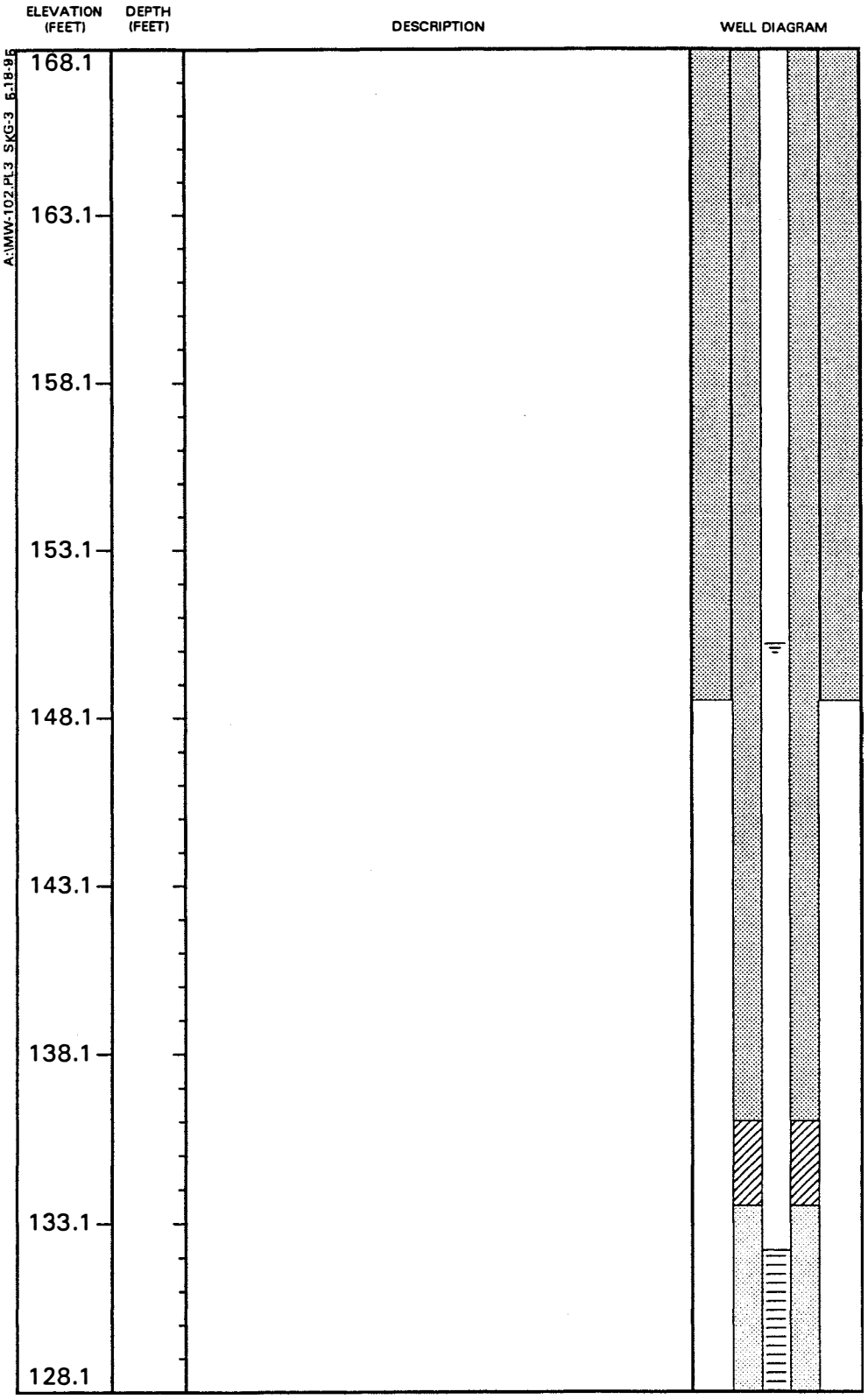
Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 170.93 Ft.
HEIGHT OF RISER: 2.83 Ft.

A:\MW-102.PL3 SKG-3 6.18.96



REMARKS:

1) Borehole advanced to 19.5 with 10-inch O.D. hollow stem augers. A 5-inch ID PVC outer casing was installed to the 19.5 foot depth, then the borehole was advanced to 44.5 foot depth by rotary wash methods using a 4 7/8-inch roller bit.
2) Type III ground-water monitoring well completed with 2-inch PVC riser and slotted screen.
3) Samples retained for laboratory analyses include ground-water samples MW-102-U, MW-102-F and duplicate MW-100-U.

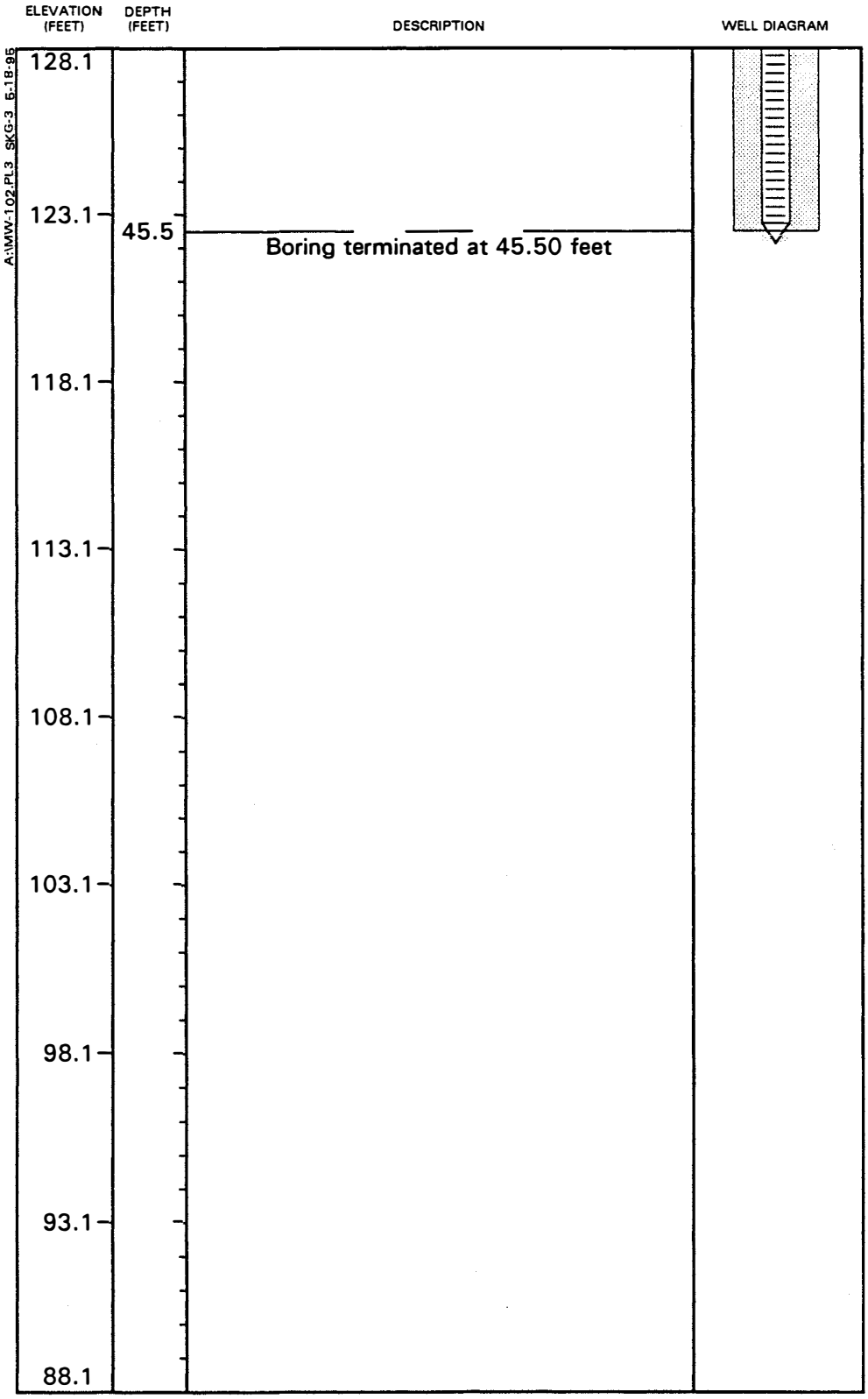
DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-102
DATE STARTED	2/14/95
DATE COMPLETED	2/22/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

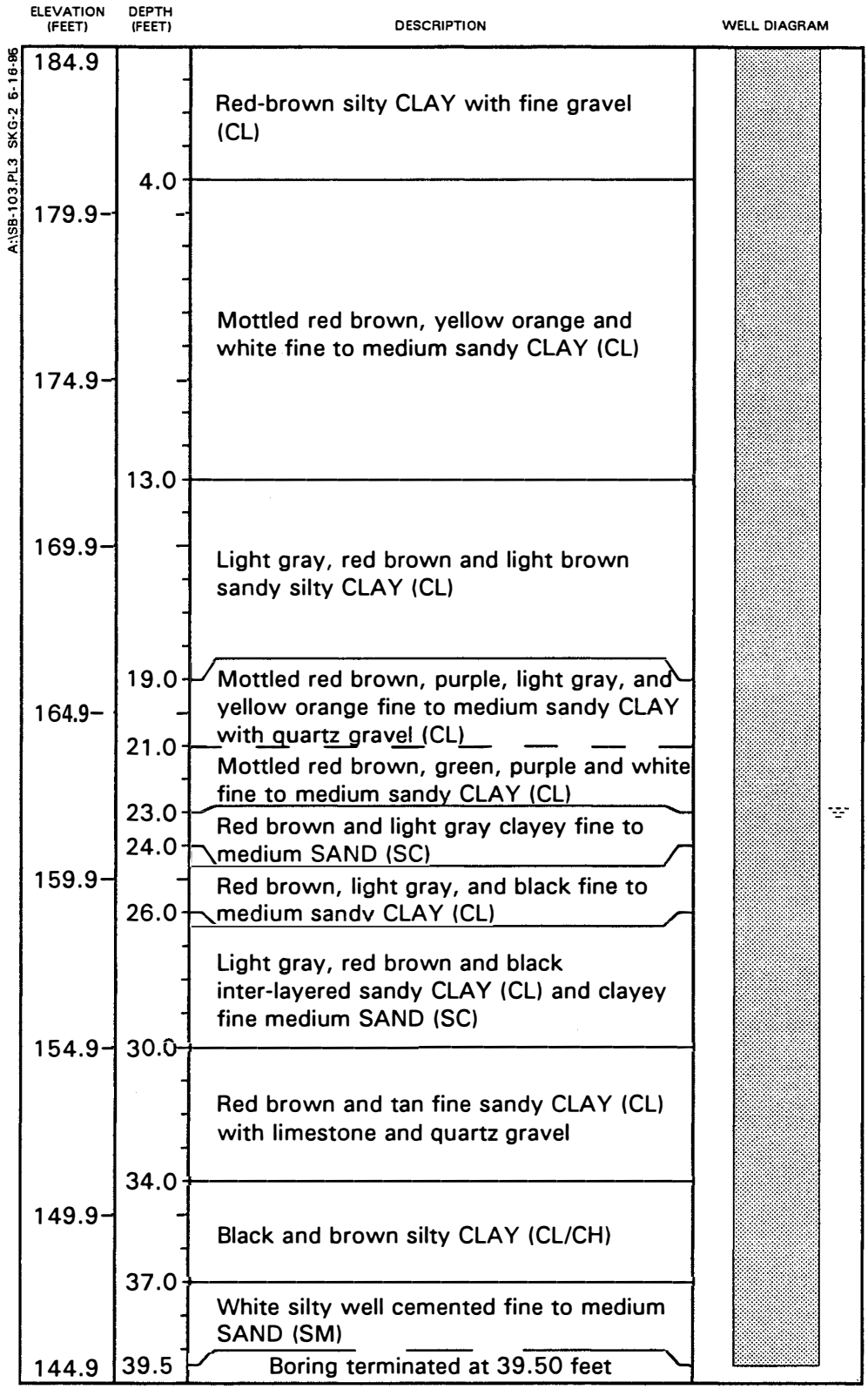
DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-102
DATE STARTED	2/14/95
DATE COMPLETED	2/22/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

1) Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2) No soil or ground-water samples were collected from SB-103.
3) Boring grouted to ground surface upon completion.

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	SB-103
DATE STARTED	2/14/95
DATE COMPLETED	2/14/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

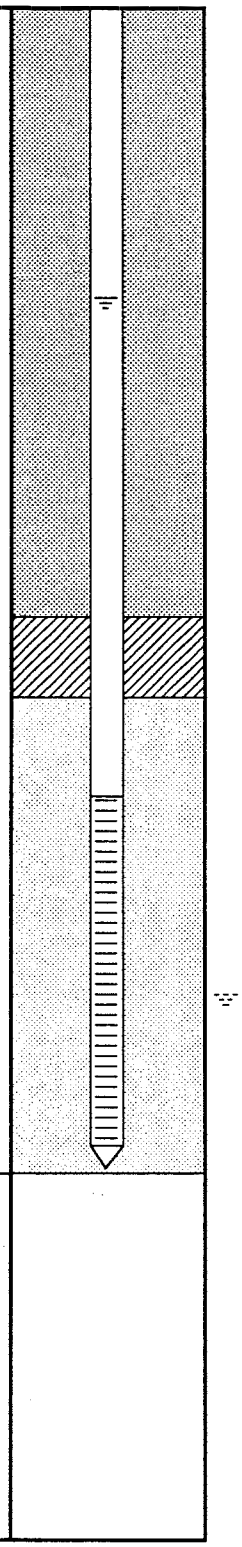
Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 187.78 Ft.
HEIGHT OF RISER: 2.86 Ft.

A:\MW-103.PL3 SKG-4 5-01-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
184.9			
179.9			
174.9			
169.9		See Boring Log for SB-103 for Soil Descriptions	
164.9			
159.9			
154.9	30.5	Boring terminated at 30.50 feet	
149.9			
144.9			



REMARKS:

1) Boring advanced using 8-inch hollow stem augers with CME continuous sampler.
2) Type II ground-water monitoring well installed consisting of 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analysis include soil sample MW-103 (0-5') and ground-water samples MW-103-U, MW-103-F and MW-103B-F.

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

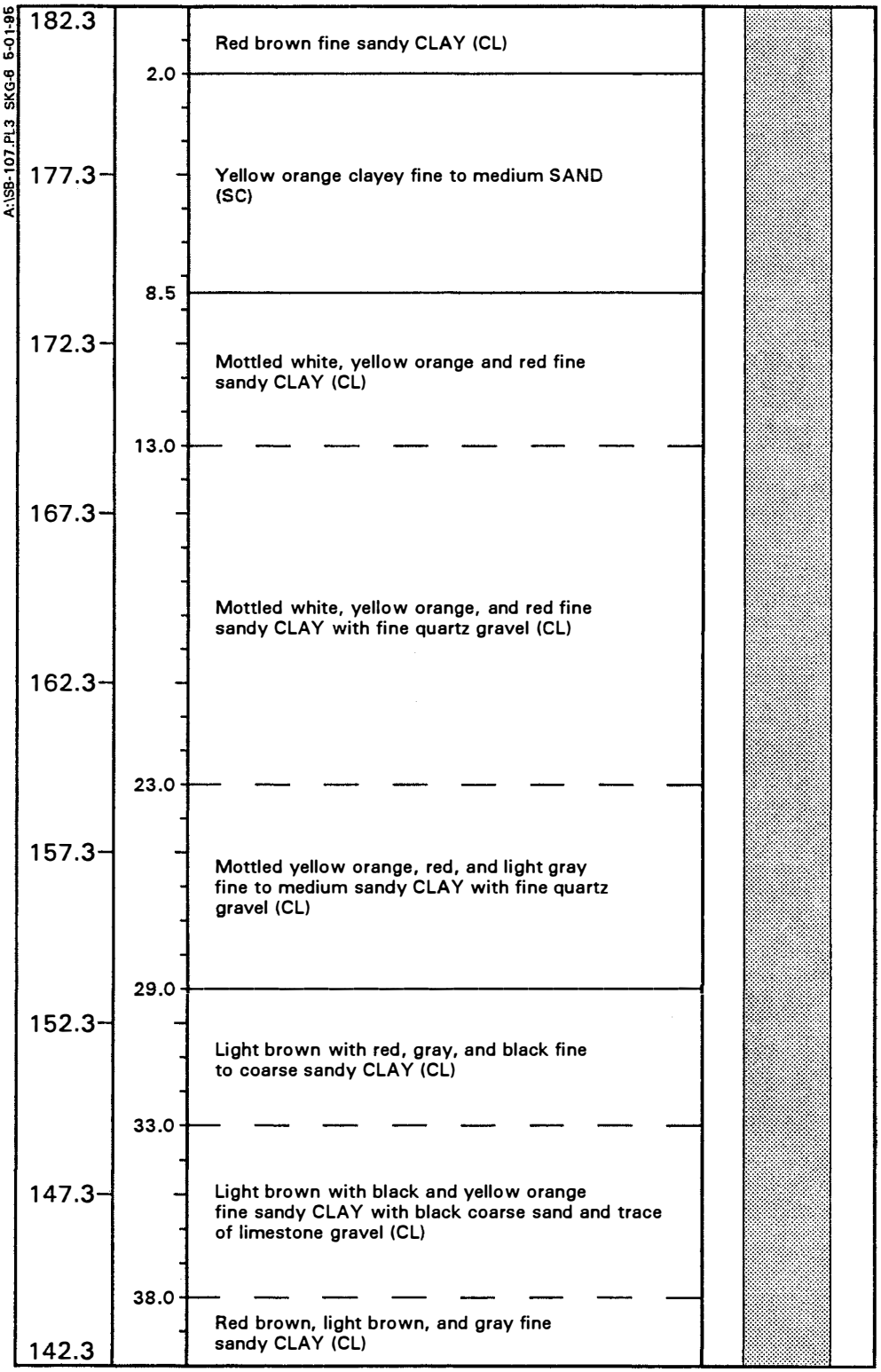
BORING NUMBER	MW-103
DATE STARTED	2/14/95
DATE COMPLETED	2/14/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

A:\SB-107.PL3 SKG-6 6-01-95



REMARKS:

1. Boring advanced using 8-inch OD hollow stem auger with CME continuous sampler.
2. Soil sample MW-107 0-5' retained for laboratory analysis.
3. Borehold grouted to ground surface upon completion.

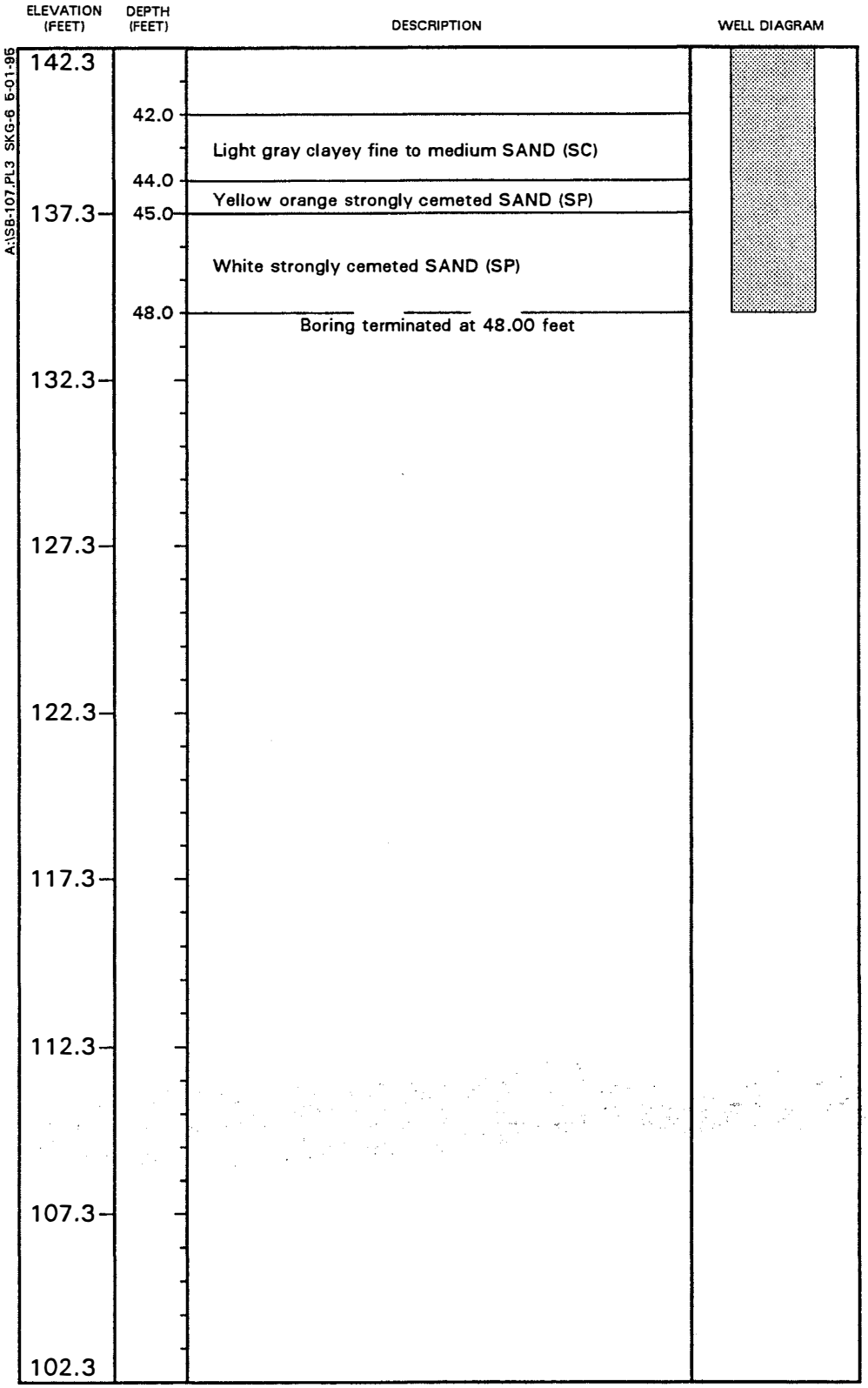
DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	SB-107
DATE STARTED	2/15/95
DATE COMPLETED	2/15/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	SB-107
DATE STARTED	2/15/95
DATE COMPLETED	2/15/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 185.71 Ft.
HEIGHT OF RISER: 2.82 Ft.

A:\MW-107.PL3 SKG-4 6-18-96

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
182.9			
177.9			
172.9			
167.9		See Boring Log SB-107 for Soil Descriptions.	
162.9			
157.9			
152.9			
147.9	35.5	Boring terminated at 35.50 feet	
142.9			

REMARKS:
1) Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2) Type II ground-water monitoring well installed with 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analyses include MW-107U and MW-107F.

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-107
DATE STARTED	2-15-95
DATE COMPLETED	2-15-95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

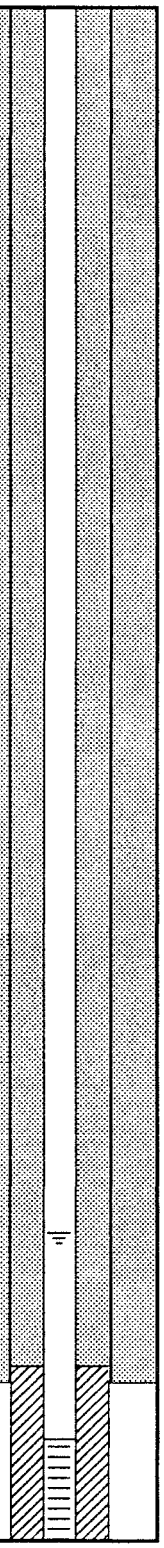
Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 185.47 Ft.
HEIGHT OF RISER: 2.72 Ft.

A:\MW-108.PL3 SKG-4 6-18-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
182.8			
177.8			
172.8			
167.8			
162.8		See Boring Log SB-107 for Soil Descriptions	
157.8			
152.8			
147.8			
142.8			



REMARKS:

1) Borehole advanced to 36 foot depth 8-inch O.D. hollow stem augers. A 5-inch I.D. PVC outer casing was installed to the 36 foot depth then the borehole was advanced to 54 foot depth by rotary wash methods using a 4 7/8-inch roller bit.
2) Ground-water monitoring well was completed with 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analyses include ground-water samples MW-108U and MW-108F.

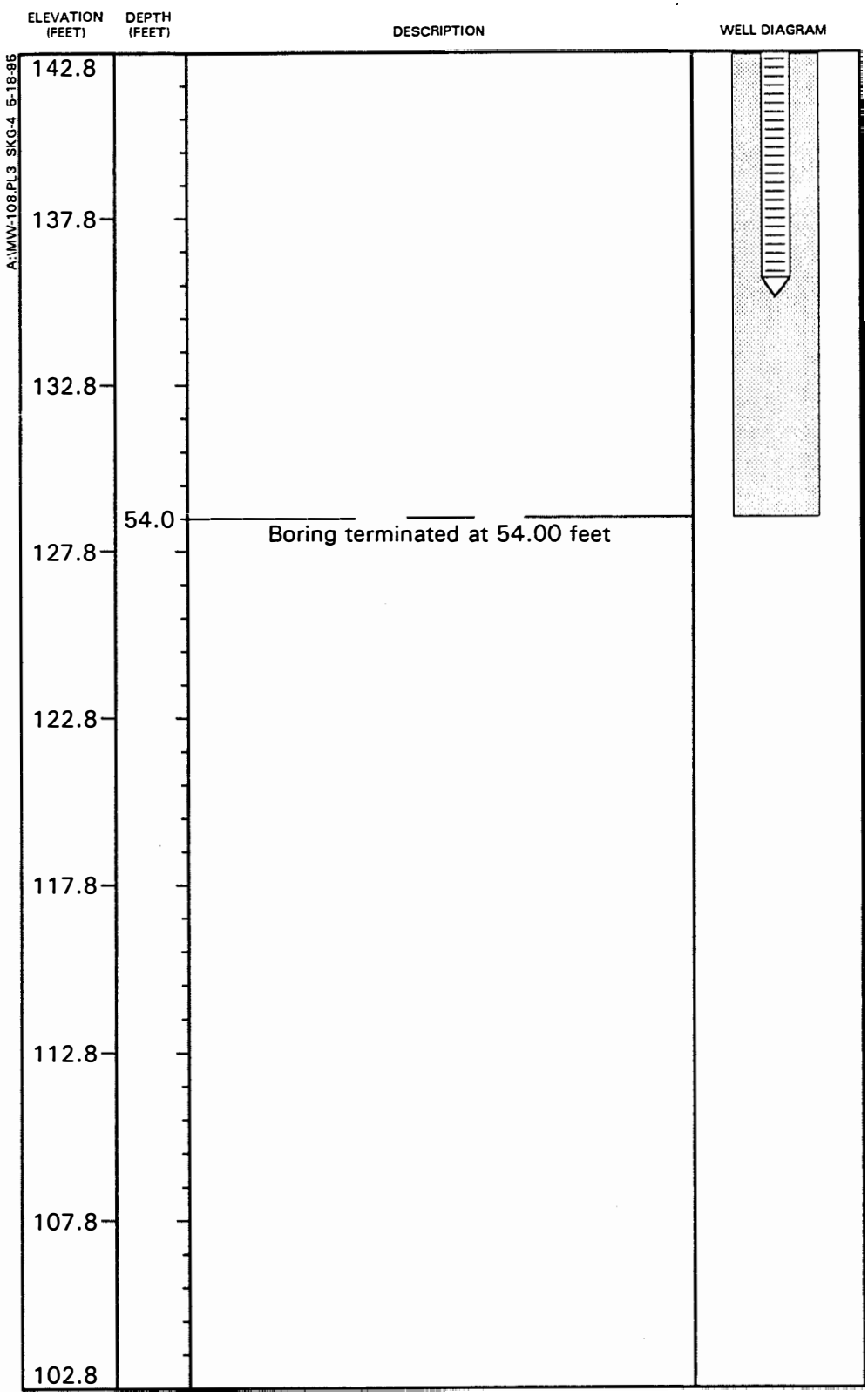
DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-108
DATE STARTED	2-16-95
DATE COMPLETED	2-21-95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-108
DATE STARTED	2-16-95
DATE COMPLETED	2-21-95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 167.86 Ft.
HEIGHT OF RISER: 2.67 Ft.

A:\MW-110.PL3 SKG-10 6-18-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
165.2		Dark brown to brown silty medium SAND with roots (SM)
	2.2	Yellowish orange and red brown mottled CLAY (CL)
	3.2	Dark gray siltly fine SAND (SM) with wood fragments
160.2	5.5	Mottled yellowish orange and red brown sandy CLAY (CL)
	7.5	Mottled yellow orange and red brown clayey medium SAND (SC)
155.2	9.5	Yellowish orange SAND with trace of silt (SP)
	14.0	Mottled red brown, yellowish orange and light gray clayey fine to medium SAND (SC), has open conduits approximately 0.1 ft diameter
150.2	17.0	Boring terminated at 17.00 feet
145.2		
140.2		
135.2		
130.2		
125.2		

WELL DIAGRAM

REMARKS:

1. Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler
2. Type II ground-water monitoring well installed consisting of 2-inch ID PVC riser and slotted screen.
3. Samples retained for laboratory analyses include soil sample MW-110 0-5 and ground-water samples MW-110-U, MW-110-F, and duplicate MW-110B-U.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

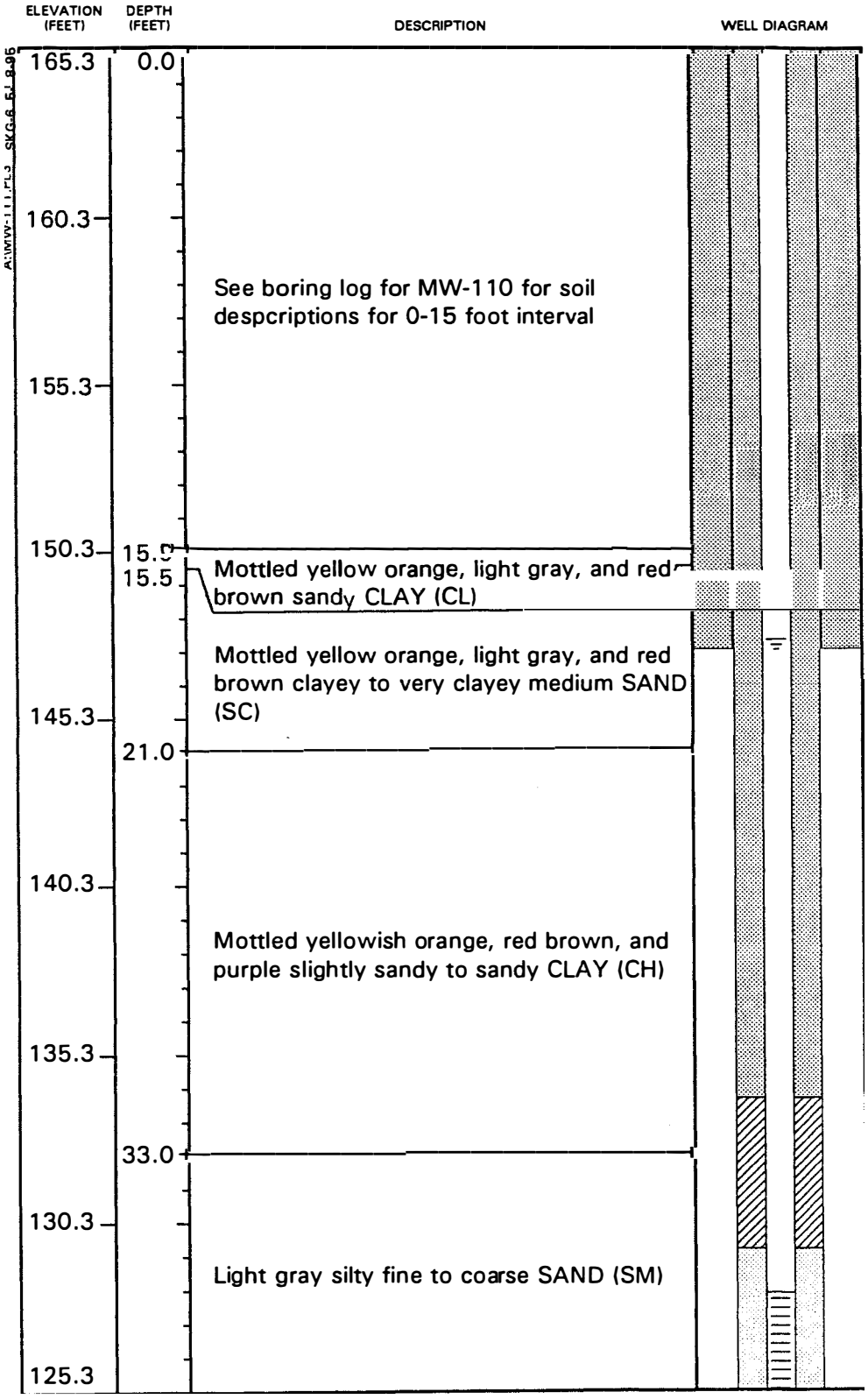
BORING NUMBER	MW-110
DATE STARTED	2/21/95
DATE COMPLETED	2/21/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 168.06 Ft.
HEIGHT OF RISER: 2.78 Ft.



REMARKS:

1. Borehole advanced to 18.0 feet with 10-inch O.D. hollow stem augers. A 5-inch ID PVC outer casing was installed to the 18.0 foot depth. Then the borehole was advanced to 45.0 foot depth by rotary wash methods using a 4 7/8 inch roller bit.
2. Ground-water monitoring well was completed with 2-inch PVC riser and slotted screen.
3. Samples retained for laboratory analysis included ground-water samples MW-111-U and MW-111-F.

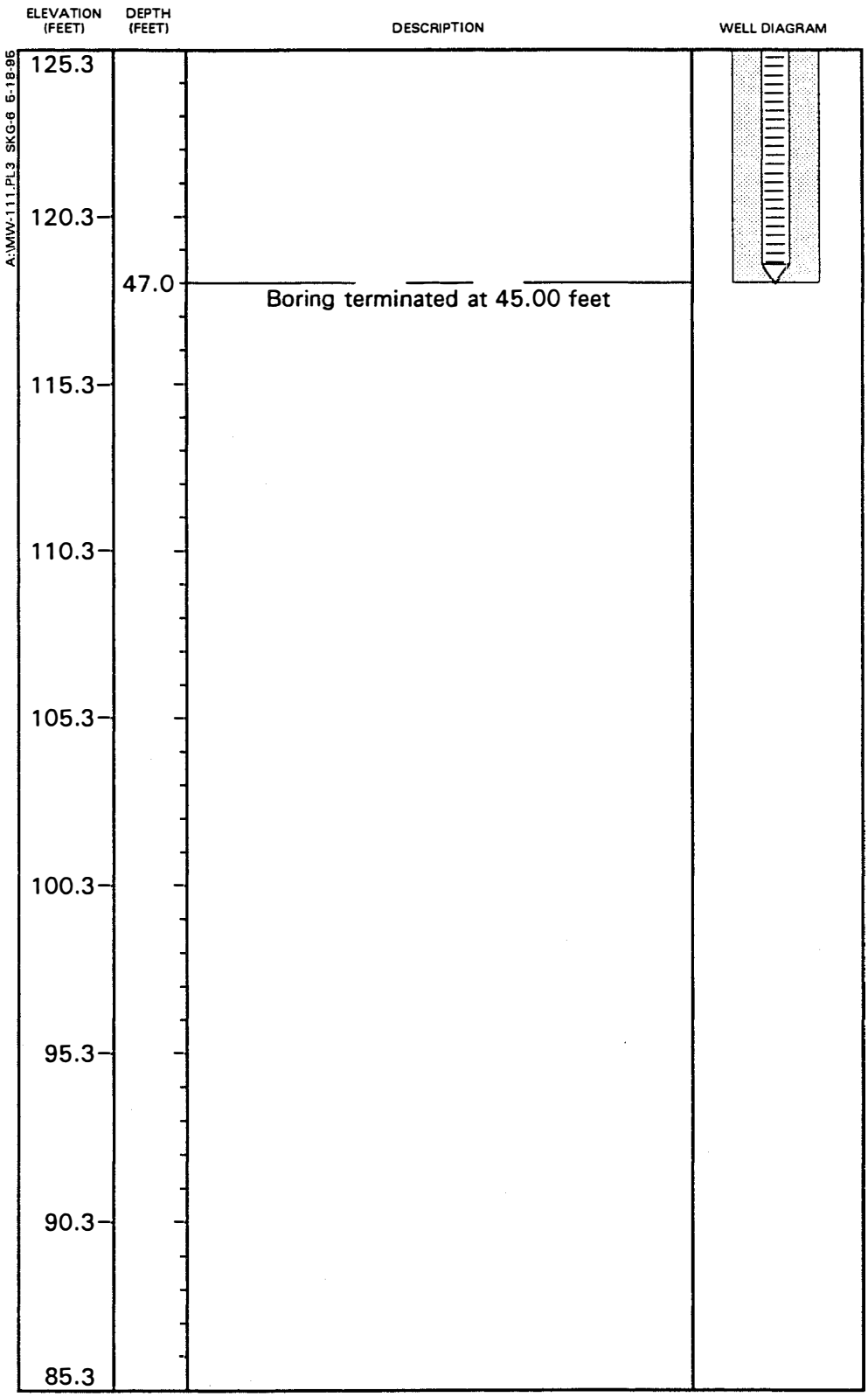
DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-111
DATE STARTED	2/21/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

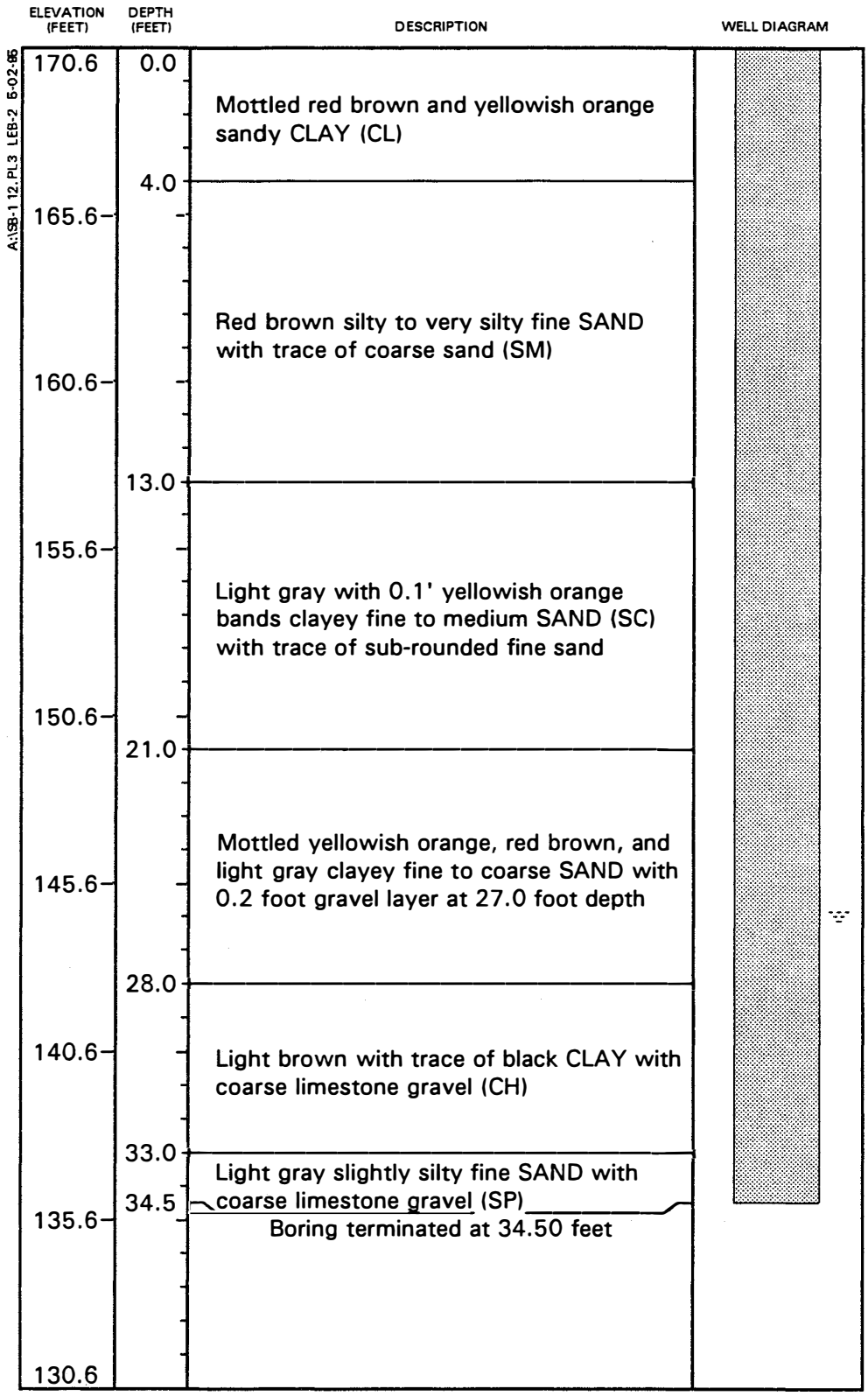
DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-111
DATE STARTED	2/21/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

1) Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2) Boring grouted to ground surface upon completion.
3) Soil sample MW-112 0-5' retained for laboratory analysis.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	SB-112
DATE STARTED	2/16/95
DATE COMPLETED	2/16/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 174.56 Ft.
HEIGHT OF RISER: 2.80 Ft.

A:\MW-112.PL3 SKG-8 5-23-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
171.8	0.0		
166.8			
161.8		See boring log for SB-112 for soil descriptions	
156.8			
151.8			
146.8	24.5	Boring terminated at 24.50 feet	
141.8			
136.8			
131.8			

REMARKS:

1. Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2. Type II ground-water monitoring well was completed with 2-inch PVC riser and slotted screen.
3. Sample retained for laboratory analyses include ground-water samples and MW-112-U

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-112
DATE STARTED	2/16/95
DATE COMPLETED	2/16/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 174.61 Ft.
HEIGHT OF RISER: 2.73 Ft.

A:\MW-113.PL3 SKG-3 6-18-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
171.9		
166.9		
161.9		See Boring Log SB-112 for soil descriptions for 0 - 20 foot depths.
156.9		
151.9	20.0	Mottled yellow orange, red brown and light gray slightly sandy CLAY (CL/CH)
	21.0	
	21.5	Weathered limestone
146.9		Mottled red brown, yellow orange and light gray slightly sandy to sandy CLAY (CL)
141.9		No samples collected from 24.5 foot depth to 35 foot depth
136.9	35.0	
	36.0	Light brown fine sandy CLAY (CL)
	36.5	White cemented medium SAND (SP)
	38.0	Light brown fine sandy CLAY (CL)
131.9		White cemented fine SAND with fossils (SP)

WELL DIAGRAM

REMARKS:

1) Borehole advanced to 24.5 foot depth with 8-inch OD hollow stem augers. A 5-inch ID PVC outer casing was installed to the 24.5 foot depth, then the borehole was advanced to 52.5 foot depth by rotary wash methods using a 4 7/8-inch roller bit.
2) Ground-water monitoring well completed with 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analyses included ground-water samples MW-113U and MW-113F.

DRILLED BY	SCS
LOGGED BY	TDM/DME
CHECKED BY	TMK

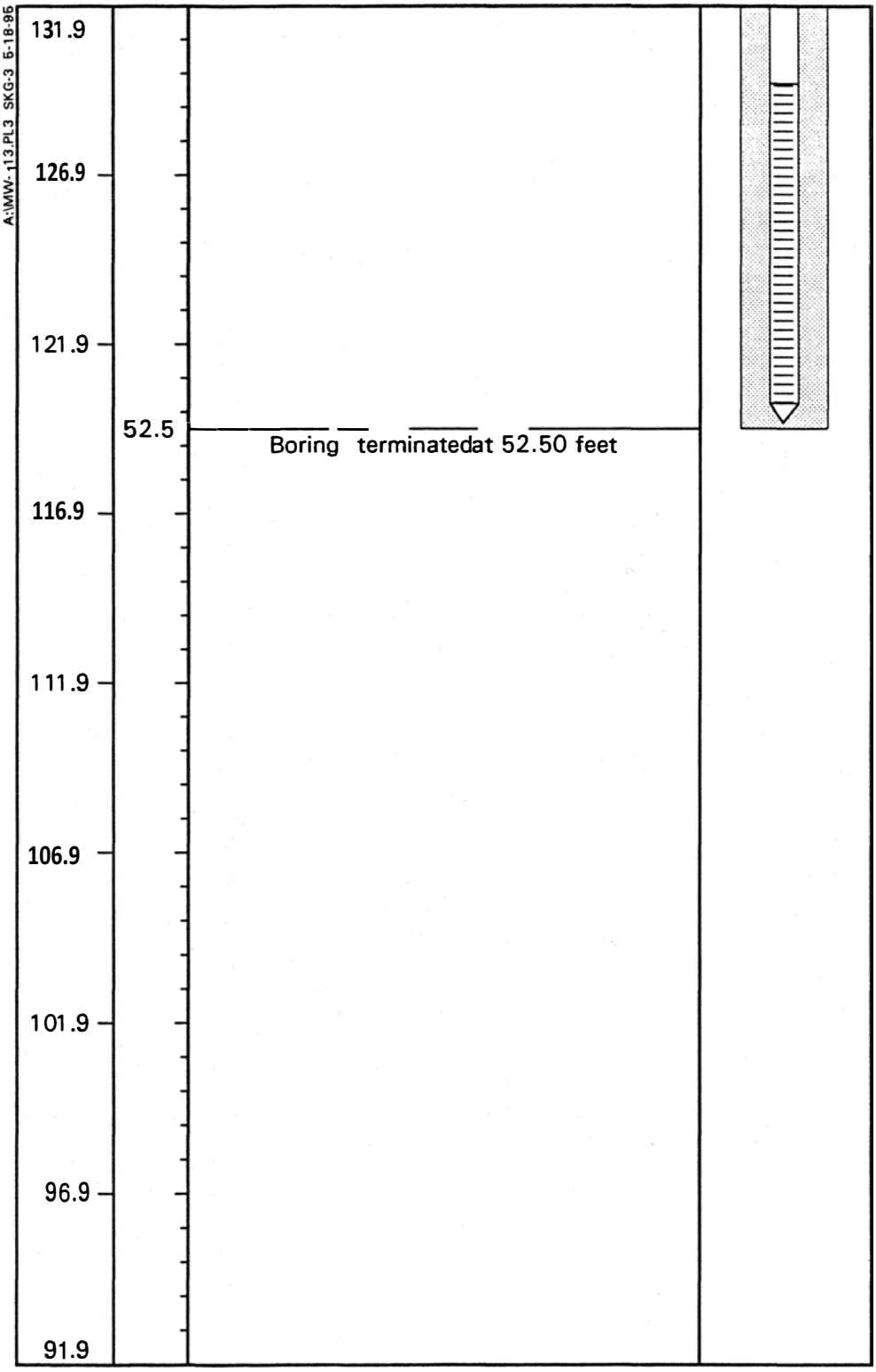
BORING NUMBER	MW-113
DATE STARTED	2/17/95
DATE COMPLETED	2/21/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

A:\MW-113.PL3 SKG-3 6-18-96



REMARKS:

DRILLED BY	SCS	BORING NUMBER	MW-113
LOGGED BY	TDM/DME	DATE STARTED	2/17/95
CHECKED BY	TMK	DATE COMPLETED	2/21/95
		JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

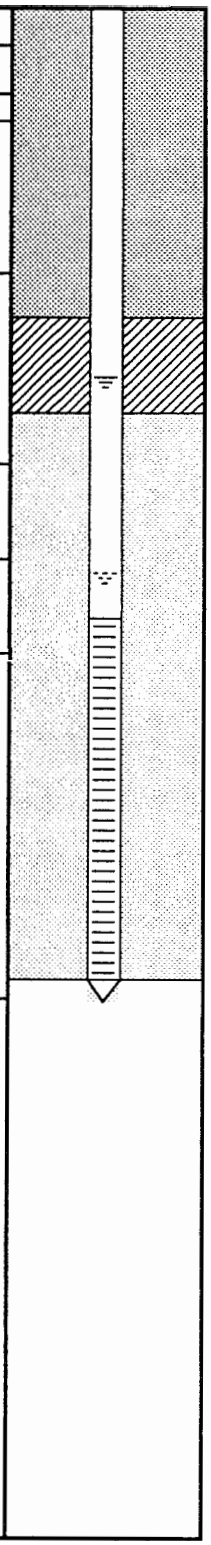
TEST BORING RECORD

DATUM ELEVATION: 169.11 Ft.
HEIGHT OF RISER: 2.81 Ft.

A:\MW-114.PL3 SKG-10 5-01-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
166.3	0.0	
	1.0	Brown and red brown silty to clayey fine SAND with roots (SM/SC)
	2.3	
	3.0	Dark brown to black slightly sandy SILT and CLAY with roots and wood fragments (ML/CL)
161.3		Gray brown silty to clayey fine SAND (SM/SC)
	7.0	Mottled yellowish orange, light gray, and red brown slightly sandy to very sandy CLAY with increasing sand content with depth (CL)
156.3		Mottled yellowish orange and gray very clayey to slightly clayey fine SAND with decreasing clay content with depth (SC/SP)
	12.0	Yellowish orange slightly silty fine SAND (SP)
	14.5	Red brown slightly silty fine to medium SAND with trace of coarse sand (SP)
151.3	17.0	
146.3		Mottled red brown and light gray slightly sandy SILT and CLAY (ML/CL)
141.3	26.0	Boring terminated at 26.0 feet
136.3		
131.3		
126.3		

WELL DIAGRAM



REMARKS:

1. Boring advanced using 8-inch O.D. hollow stem augers with CME continous sampler.
2. Type II ground-water well installed consisting of 2-inch ID PVC riser and slotted screen.
3. Samples retained for laboratory analyses include soil sample MW-114 0-5 and ground-water samples MW-114-U and MW-114-F.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-114
DATE STARTED	2/16/95
DATE COMPLETED	2/16/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 169.05 Ft.
HEIGHT OF RISER: 2.82 Ft.

A:\MW-115.PL3 SKG-3 5-01-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
166.2			
161.2			
156.2		See Boring Log MW-114 for soil description for 0 - 19.5 foot depth	
151.2			
146.2	19.5	Yellowish orange slighty silty fine to medium SAND (SP)	
141.2	24.5		
136.2		Mottled red brown and light gray slightly sandy CLAY (CL)	
131.2			
126.2			

REMARKS:

1) Borehole advanced to 34.5 foot depth with 8-inch O.D. hollow stem augers. A 5-inch ID PVC outer casing was installed to the 34.5 foot depth, then the borehole was advanced to the 88.0 ft depth by rotary wash methods using a 4 7/8-inch roller bit.
2) Type III ground-water monitoring well completed 2-inch PVC riser and slotted screen.
3) Samples retained for laboratory analysis include ground-water samples MW-115U and MW-115F.

DRILLED BY	SCS
LOGGED BY	TDM/DME
CHECKED BY	TMK

BORING NUMBER	MW-115
DATE STARTED	2/16/95
DATE COMPLETED	2/21/95
JOB NUMBER	41-4621

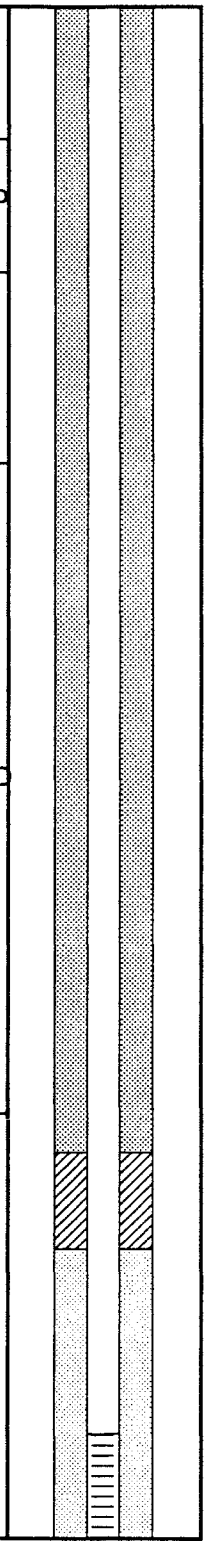
Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

A:\MW-115.PL3 SKG-3 6-01-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
126.2			
	43.5		
121.2		Red brown and yellow orange clayey fine to medium SAND (SC)	
	47.0		
116.2		Red brown fine sandy CLAY (CL)	
	52.0		
111.2			
106.2		Light brown clayey medium to coarse SAND (SC)	
101.2			
	69.0		
96.2			
91.2		White, strongly cemented fine to medium SAND (SP) with fossils.	
86.2			

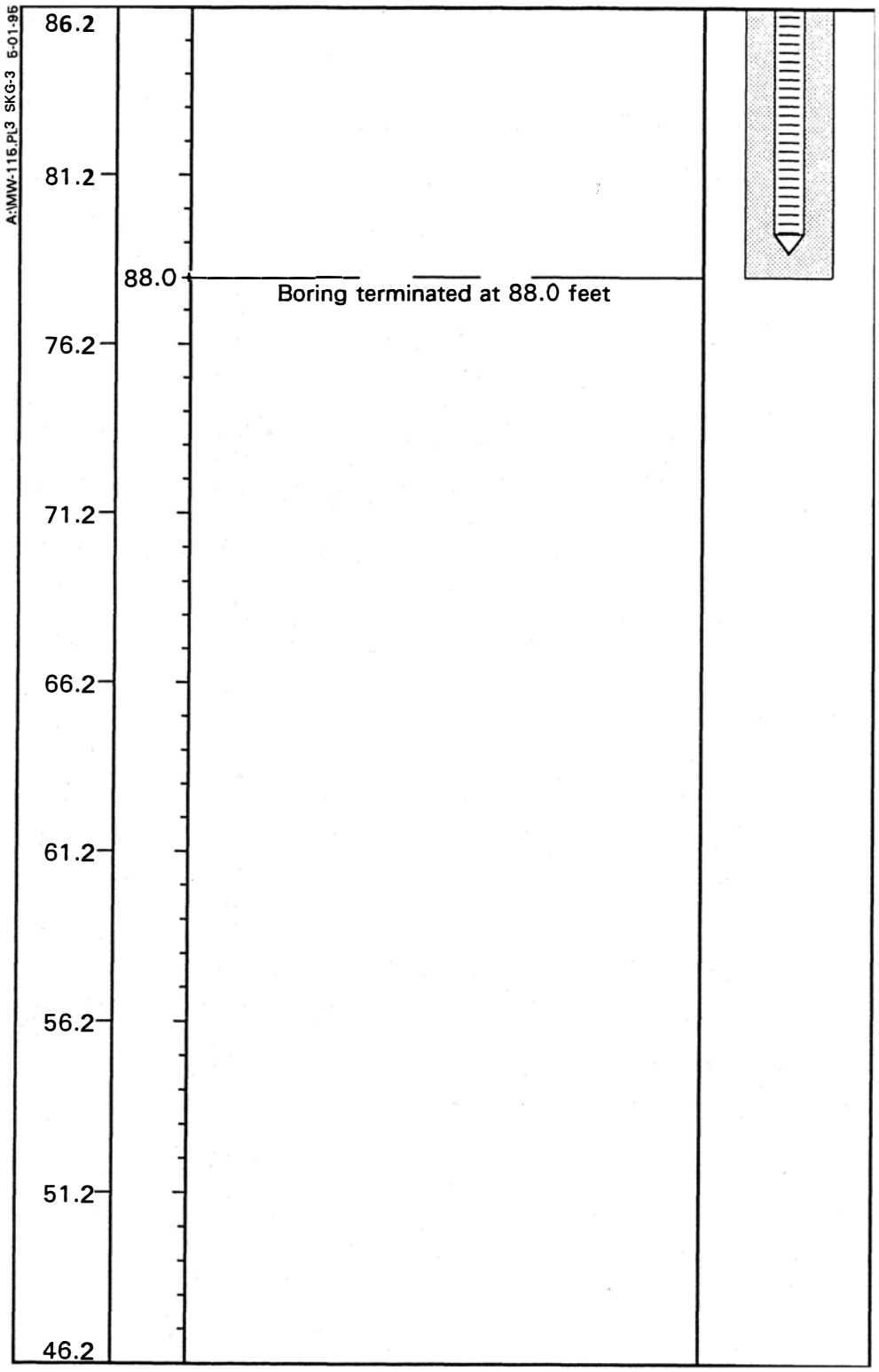


REMARKS:

DRILLED BY	SCS	BORING NUMBER	MW-115
LOGGED BY	TDM/DME	DATE STARTED	2/16/95
CHECKED BY	TMK	DATE COMPLETED	2/21/95
		JOB NUMBER	41-4621

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

DRILLED BY	SCS	BORING NUMBER	MW-115
LOGGED BY	TDM/DME	DATE STARTED	2/16/95
CHECKED BY	TMK	DATE COMPLETED	2/21/95
		JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 171.69 Ft.
HEIGHT OF RISER: 2.76 Ft.

A:\MW-116.PL3 SKG-8 6-18-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
168.9	0.0	Dark brown and olive gray clayey SAND with roots (SC)
163.9	6.4	Mottled yellowish orange, gray, and red brown sandy CLAY (CL)
	9.0	Mottled yellowish orange and gray clayey SAND (SC)
158.9	11.0	Mottled yellowish orange and gray clayey SAND (SC)
	13.0	
153.9		
148.9		Light gray slightly silty fine SAND with trace of coarse sand (SP)
143.9		
138.9		
	31.9	
133.9		Yellowish orange and red brown slightly silty fine to medium SAND with trace of coarse SAND (SP)
128.9		

WELL DIAGRAM

REMARKS:

1. Borehole advanced to 40 foot depth with 8-inch O.D. hollow stem auger. A 5-inch ID PVC outer casing was installed to the 40 foot depth, then the boring was advanced to the 75 foot depth by rotary wash methods using a 4 7/8-inch roller bit.
2. The ground-water monitoring well was completed with 2-inch ID PVC riser and slotted screen.
3. Samples retained for laboratory analysis include soil sample MW-116 0-5' and ground-water samples MW-116-U and MW-116-F.

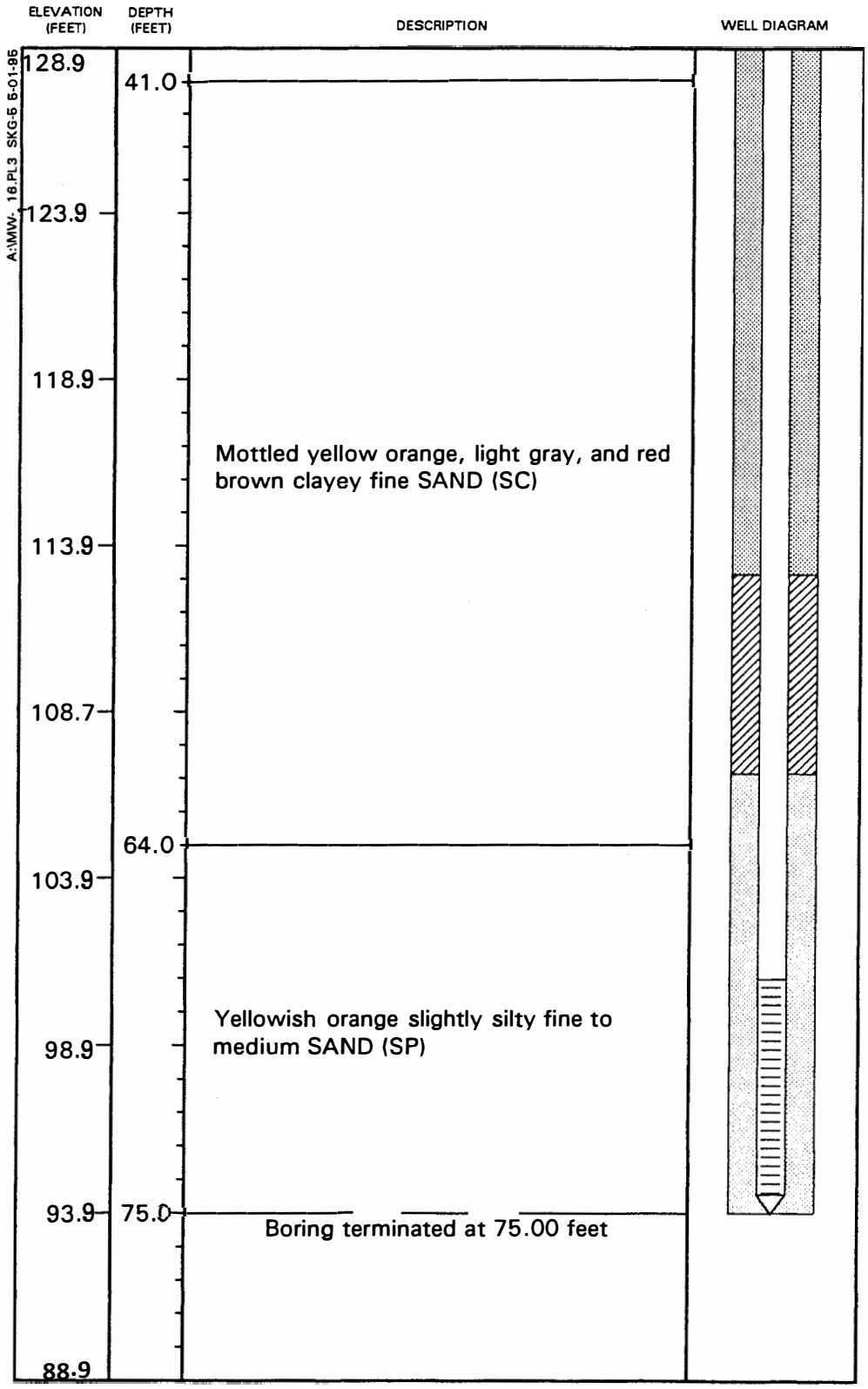
DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-116
DATE STARTED	2/15/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-116
DATE STARTED	2/15/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 171.66 Ft.
HEIGHT OF RISER: 2.82 Ft.

A:\MW-117.PL3 SKG-4 6-18-96

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
168.8	1.0	Dark brown and olive gray clayey SAND with roots (SC)
163.8		Mottled yellow orange, gray, and red brown clayey fine to medium SAND (SC)
	8.5	
	9.5	Light gray slightly silty fine SAND (SP)
158.8		Mottled light gray, yellowish orange and red brown slightly silty fine to medium SAND with trace of coarse sand and rounded gravel (SP)
153.8		
	17.0	
148.8		Mottled yellowish orange, light gray and red brown clayey fine SAND with trace of coarse sand (SC)
143.8		
138.8		
	31.0	
		Mottled yellowish orange, light gray and red brown sandy CLAY (CL)
	34.5	
133.8		Boring terminated at 34.50 feet
128.8		

REMARKS:

1. Boring advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2. Type II monitoring well installed consisting of 2-inch ID PVC user and slotted screen.
3. Samples retained for laboratory analyses include ground-water samples MW-117U and MW-117F.

DRILLED BY	SCS
LOGGED BY	TDM
CHECKED BY	TMK

BORING NUMBER	MW-117
DATE STARTED	2/15/95
DATE COMPLETED	2/15/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 194.82 Ft.
HEIGHT OF RISER: 2.71 Ft.

A:\MW-118.PL3 SKG-2 6-01-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
192.1	1.0	Black top soil
		Red brown fine sandy clay with trace of coarse SAND (CL)
	4.0	
187.1		Red brown and light brown fine sandy CLAY (CL)
	6.5	
		Mottled red brown, gray and light brown fine sandy silty CLAY (CL)
	9.5	
182.1		Red brown, light brown and light gray clayey fine to coarse SAND (SC) with gravel from 13.0 to 13.5 feet
	13.0	
177.1		
		Purple and light brown fine sandy CLAY (CL)
172.1		
167.1		
	26.0	
		Purple, light brown and light gray clayey fine to medium SAND (SC)
	29.0	
162.1		Purple with light gray fine sandy CLAY (CL)
	32.0	
		Red brown, light gray and yellow orange fine sandy CLAY (CL)
	34.5	Purple and light gray clayey fine SAND (SC)
157.1	35.0	
		Dark brown, black and light brown fine sandy CLAY (CL)
	37.5	
		Purple, light gray and light brown fine sandy CLAY (CL)
	39.0	
152.1		Purple fine sandy CLAY (CL)

WELL DIAGRAM

REMARKS:

1) Boring advanced using 8-inch O.D. hollow stem auger with CME continuous sampler.
2) Type II ground-water monitoring well installed consisting of 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analysis include soil sample MW-118 0-5' and ground-water samples MW-118-U, MW-118-F, and MW-118B-F (Duplicate)

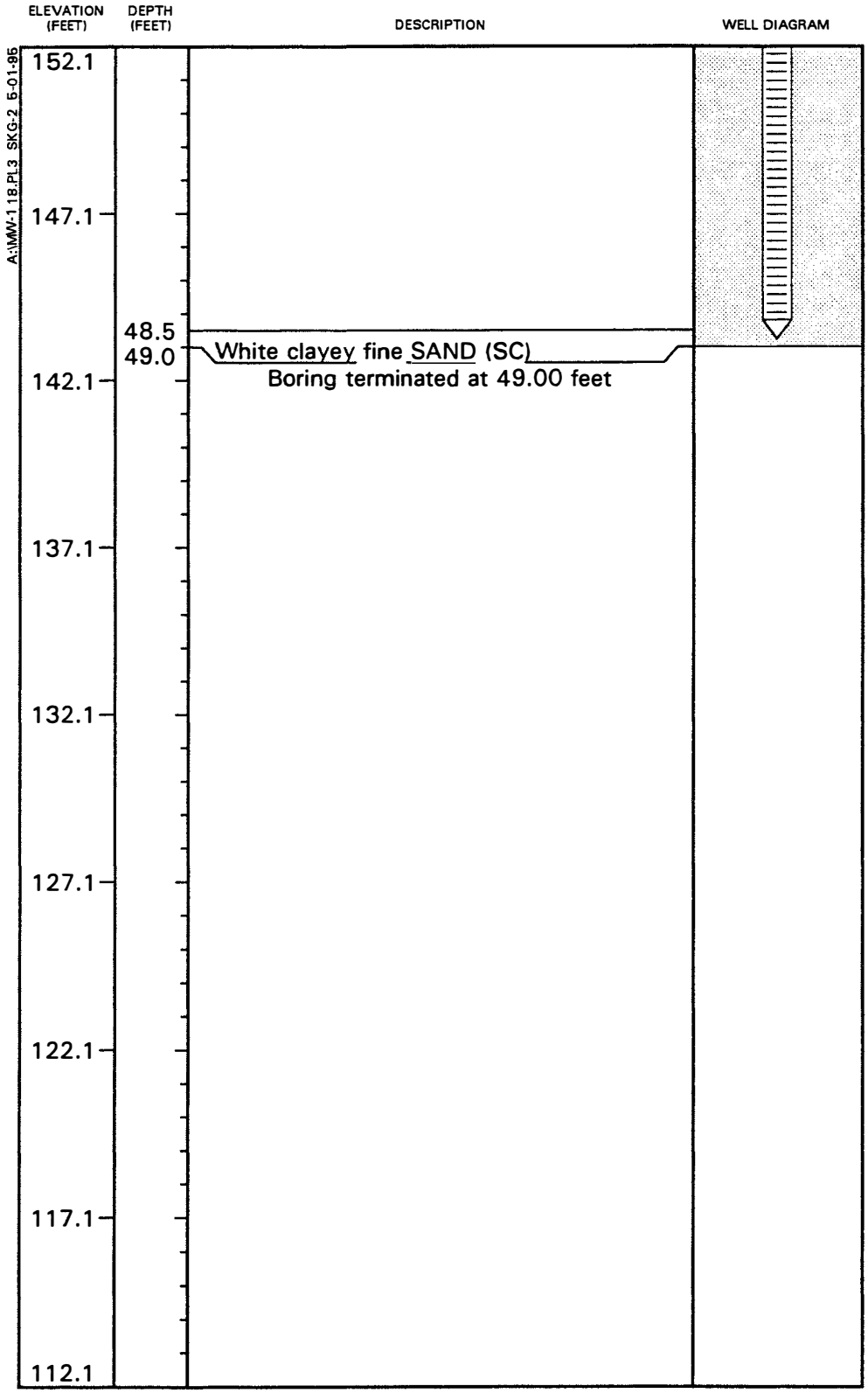
DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-118
DATE STARTED	2/23/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD



REMARKS:

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-118
DATE STARTED	2/23/95
DATE COMPLETED	2/23/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 194.49 Ft.
HEIGHT OF RISER: 2.89 Ft.

A:\MW-119.PL3 SKG-3 6-08-96

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION
191.6		
	1.5	Brown clayey fine to medium SAND (SC)
		Red brown fine sandy CLAY with well rounded gravel (CL)
	4.5	
186.6		Mottled red brown and yellow orange silty fine sandy CLAY (CL)
	9.0	
181.6		Yellow orange, light gray, and red brown fine sandy CLAY with fractures (CL)
	13.0	
	14.0	Red brown and yellow orange clayey fine SAND (SC)
176.6		Yellow orange, light gray and red brown fine sandy CLAY (CL)
	19.5	Purple, light gray and yellow orange clayey fine SAND (SC) with well rounded pebbles
171.6	20.5	
	21.5	Purple and yellow orange fine sandy CLAY (CL)
166.6		Purple and light brown clayey fine SAND (SC)
	28.0	Purple, red-brown and yellow orange fine sandy CLAY (CL)
	29.0	
161.6	30.5	Purple and light brown clayey fine to coarse SAND (SC)
		Light brown, black, yellow orange and light gray fine sandy CLAY (CL)
	33.5	
156.6		No sample recovered
	38.5	
151.6		Purple, light gray, and brown fine sandy CLAY (CL)

WELL DIAGRAM

REMARKS:

1) Boring advanced to 32.5 foot depth using 8-inch O.D. hollow stem augers with CME continuous sampler, advanced to 49.0 foot depth with rotary wash methods.
2) Type II ground-water monitoring well installed consisting of 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analyses include dsoil sample MW-119 0-5' and ground-water samples MW-119-U and MW-119-F.

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-119
DATE STARTED	2/23/95
DATE COMPLETED	2/27/95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

A:\MW-119.PL3 SKG:3 8-08-95

ELEVATION (FEET)	DEPTH (FEET)	DESCRIPTION	WELL DIAGRAM
151.6			
146.6			
	47.5	White clayey fine to medium SAND	
	49.0	Boring terminated at 49.00 feet	
141.6			
136.6			
131.6			
126.6			
121.6			
116.6			
111.6			

REMARKS:

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

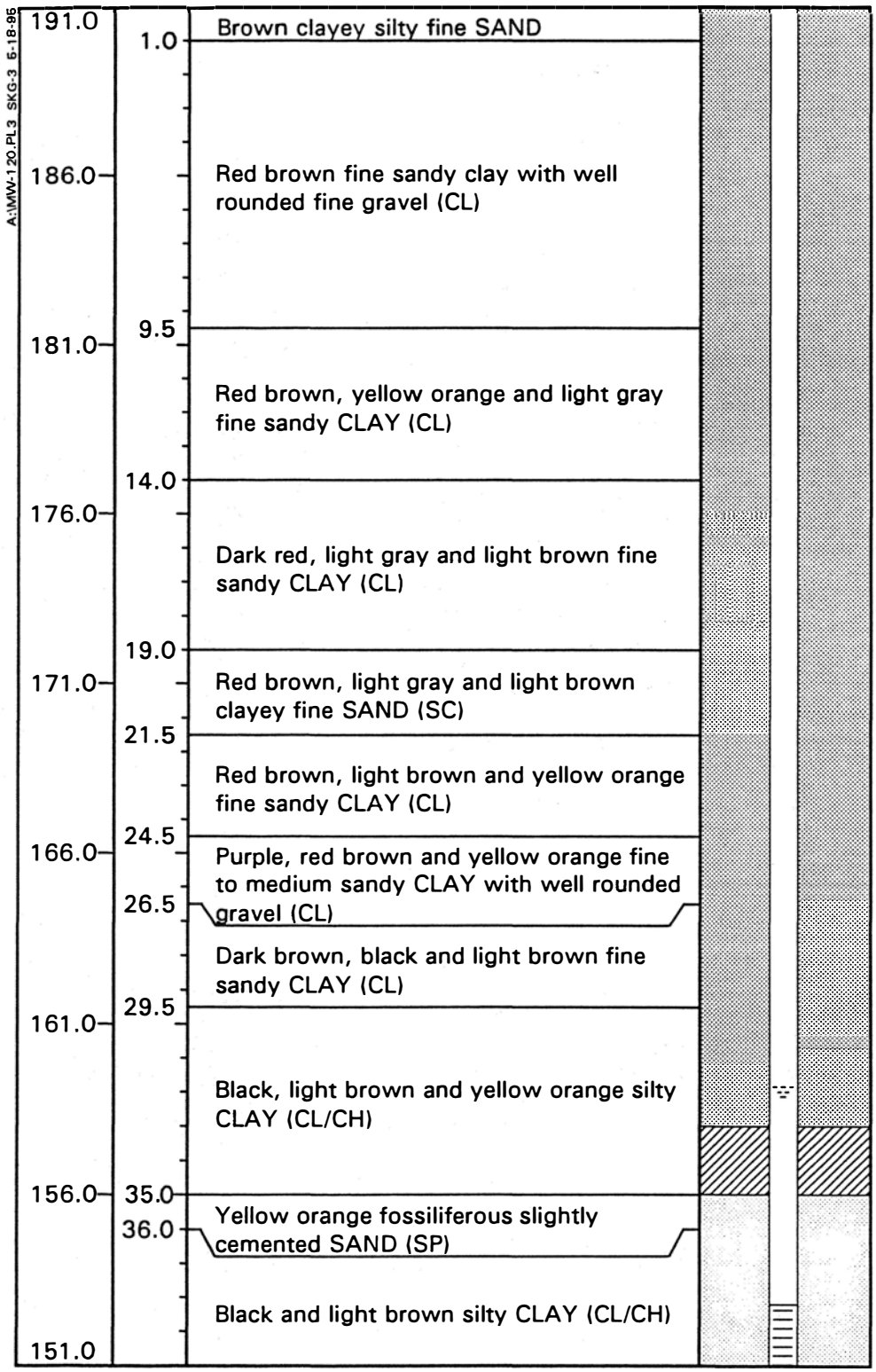
BORING NUMBER	MW-119
DATE STARTED	2/23/95
DATE COMPLETED	2/27/95
JOB NUMBER	41-4621

Law Engineering and
Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

TEST BORING RECORD

DATUM ELEVATION: 193.79 Ft.
HEIGHT OF RISER: 2.76 Ft.



REMARKS:

1) Borehole advanced using 8-inch O.D. hollow stem augers with CME continuous sampler.
2) Type II ground-water monitoring well installed consisting of 2-inch ID PVC riser and slotted screen.
3) Samples retained for laboratory analysis include soil sample MW-120 0-5' and ground-water samples MW-120-U and MW-120-F.

DRILLED BY	SCS
LOGGED BY	DME
CHECKED BY	TDM

BORING NUMBER	MW-120
DATE STARTED	2-23-95
DATE COMPLETED	2-24-95
JOB NUMBER	41-4621

Law Engineering and Environmental Services, Inc.

Log updated with revised survey certified 6/15/2020.

SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/10/2014 **COMPLETED** 6/11/2014 **SURF. ELEV.** 193.44 ft. msl **COORDINATES:** N: 31.447245 E:-84.132098
CONTRACTOR Cascade **EQUIPMENT** _____ **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** _____ **TOP OF CASING** 196.44 ft msl
BORING DEPTH 78 ft. **GROUND WATER DEPTH: DURING** _____ **COMP.** _____ **DELAYED** 46.4 ft. after 144 hrs.
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- CLAY (CL), dry, stiff, red with yellow-brown and light gray mottling			Completion: protective steel cover with bollards; 4-foot square concrete pad Surface Seal: concrete
5					
10		- CLAY (CL), dry, yellow-brown, with light gray and light red mottling			
15		- silty CLAY (CL), dry to damp, pink-gray with light red mottling, somewhat plastic			
20		- silty CLAY (CL), dry to damp, pink-gray with light red mottling, somewhat plastic			
25					Annular Fill: cement-bentonite grout
30		- silty CLAY (CL), damp, stiff, red with light gray and yellow-brown mottling - CLAY (CL), damp to dry, red with light gray and yellow-brown mottling, few thin silty seams			
35					
40		- Clayey SAND (SC), wet to damp, yellow-red with red and light gray mottling, interbedd by few fat clay seams			
45					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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Log updated with revised survey certified 6/15/2020.

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Con't)			Completion: protective steel cover with bollards; 4-foot square concrete pad
		- sandy CLAY (CL), dry, very stiff, red with light gray mottling			(CONTINUED)
		- clayey SILT (MH), saturated, pale yellow			
		- sandy CLAY (CH), wet, brown with black and pale brown mottling			
50					
		- sandy CLAY (CH), wet, light gray with light red and dark red mottling, plastic, few 2-inch thick sand seams			Annular Fill: cement-bentonite grout
55					
		- CLAY (CH), wet to damp, dark brown, plastic			
60		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			Annular Seal: bentonite chips
65					Filter: silica filter sand
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			
70					**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
75					
		Bottom of borehole at 78.0 feet.			Sump:0.400000000000006 ft.
80					
85					
90					
95					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

Log updated with revised survey certified 6/15/2020.

SOUTHERN COMPANY

LOG OF TEST BORING

SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/11/2014 **COMPLETED** 6/11/2014 **SURF. ELEV.** 193.43 ft. msl **COORDINATES:** N:31.447254 E:-84.132118
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 196.52 ft msl
BORING DEPTH 58 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 29.9 ft. after 144 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- CLAY (CL), dry, red with yellow-red mottles			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5					
		- CLAY (CL), dry, stiff, pink-gray with yellow-brown mottling			
10					
15					
		- CLAY (CL), dry, red with yellow-brown and light gray mottling			Annular Fill: cement-bentonite grout
20					
25		- sandy CLAY (CL), damp, red-yellow and weak red with red-gray mottling			
		- sandy CLAY (CL), damp, stiff, yellow-brown with light gray mottles, somewhat plastic			
30		▼ - clayey SAND (SC), wet, yellow-brown with red mottling, medium grained			
		- CLAY (CL), dry, hard, light gray with yellow-brown mottling			
35					
		- sandy CLAY (CL), dry, hard, weak red with light gray mottling			Annular Seal: bentonite chips
40		- clayey SAND (SC), wet, light gray with weak red mottling			
		- sandy CLAY (CL), damp, medium stiff, red with pale brown mottling			Filter: silica filter sand
		- sandy CLAY (CL), damp, brown with black and white mottling			
45		- sandy CLAY (CL), damp to wet, light gray with weak red and yellow-			

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Log updated with revised survey certified 6/15/2020.

SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		brown mottling *(Con't)*			(CONTINUED) Completion: protective steel cover; 4-foot square concrete pad
50		- sandy CLAY (CH), wet, black with red-yellow mottling, plastic, some fine gravel			Filter: silica filter sand
		- CLAY (CH), damp, light gray with pale red mottling, plastic			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
55					Sump:0.399999999999999 ft.
		Bottom of borehole at 58.0 feet.			
60					
65					
70					
75					
80					
85					
90					
95					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

Log updated with revised survey certified 6/15/2020.

SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/9/2014 **COMPLETED** 6/10/2014 **SURF. ELEV.** 175.64 ft. msl **COORDINATES:** N:31.446457 E:-84.129557
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 178.51 ft msl
BORING DEPTH 78 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 28.1 ft. after 120 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy SILT (ML), dry, dark brown to brown, top soil			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
		- silty SAND (SM), dry, dark yellow-brown, fine grained			
5		- SAND (SP), dry, red, fine grained			
10		- SAND (SP), dry, red, fine grained			
		- clayey SAND (SC), damp to dry, pale yellow-brown to red			
15					
		- sandy CLAY (CL), damp, light gray with red and yellow-brown mottling, somewhat plastic			
20		- clayey SAND (SC), damp to wet, pale brown and pink, interbedded by 2-3 inch sand seams			Annular Fill: cement-bentonite grout
25		- sandy CLAY (CL), damp, red with pale brown mottling			
		- CLAY (CL), dry, hard, white with red and yellow-brown mottling			
30		- CLAY (CL), damp, stiff, red with yellow-brown and light gray mottling, somewhat plastic, some sand - CLAY (CL), damp, stiff, dark red and weak red with yellow-brown mottling			
35		- ----3 inch thick sand seam			
		- sandy CLAY (CL-CH), wet, brown with few red and white mottling			
40					
45					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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Log updated with revised survey certified 6/15/2020.

SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Con't) - CLAY (CH), wet, dark brown, plastic			Completion: protective steel cover; 4-foot square concrete pad (CONTINUED)
		- clayey SAND (SC), wet, loose,white, fine to medium grained, carbonate - CLAY (CH), brown -- interbedded with loose clayey SAND (SC), carbonate			
50		- clayey SAND (SC), saturated, white, brown and pale brown, fine to medium grained, carbonate			Annular Fill: cement-bentonite grout
55					
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			
60					
65					Annular Seal: bentonite chips
					Filter: silica filter sand
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			
70					
75					**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
					Sump:0.400000000000006 ft.
		Bottom of borehole at 78.0 feet.			
80					
85					
90					
95					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/10/2014 **COMPLETED** 6/10/2014 **SURF. ELEV.** 175.63 ft. msl **COORDINATES:** N:31.446455 E:-84.129531
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 178.61 ft msl
BORING DEPTH 58 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 27.6 ft. after 24 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy SILT (ML), dry, dark brown, top soil			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
		- SAND (SP), dry, red-yellow and pale yellow, fine grained			
5					
		- SAND (SP), dry, red-yellow and pale yellow, fine grained			
10		- sandy CLAY (CL), damp, pale brown with red and light red mottling, somewhat plastic, interbedded with few 2 to 3 inch thick sand seams			
15					
		- sandy CLAY (CH), damp to wet, yellow-brown with red and light gray mottling, plastic, interbedded with several 2 to 3 inch thick sand seams			Annular Fill: cement-bentonite grout
20					
25		- CLAY (CL), dry, very stiff, red with light gray mottling, somewhat plastic			
		- CLAY (CL), damp, very stiff, dark red-gray with yellow-brown mottling			
30					
35		- Clayey SAND (SC), wet, red with yellow-brown mottles, medium grained			
		- sandy CLAY (CL), damp, very stiff, red-yellow with red mottling			
		- CLAY (CH), damp, dark brown with white and pale yellow mottling			
40		- sandy CLAY (CH), damp to wet, dark brown with white and black mottling, plastic, interbedded with sand seam			Annular Seal: bentonite chips; Filter: silica filter sand
45					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
50		*(Con't)* - sandy CLAY (CH), wet to saturated, brown with black mottling			(CONTINUED) Completion: protective steel cover; 4-foot square concrete pad **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
55		- clayey SAND (SC), saturated, pale brown and white, gravel concretions, carbonate			Sump:0.399999999999999 ft. Backfill:
		Bottom of borehole at 58.0 feet.			
60					
65					
70					
75					
80					
85					
90					
95					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 5/27/2014 **COMPLETED** 5/28/2014 **SURF. ELEV.** 188.08 ft. msl **COORDINATES:** N:31.444549 E:-84.130319
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 190.98 ft msl
BORING DEPTH 88 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 41.3 ft. after 96 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), brown, dry			Completion: protective steel cover; 4-foot square concrete pad
		- silty CLAY (CL), damp, yellow-red			Surface Seal: concrete
5		- CLAY (CL), damp, dark red with red-yellow mottling, slight plasticity			
		- CLAY (CL), damp, dark red with red-yellow mottling, slight plasticity			
10		- sandy CLAY (CL), damp, yellow-red with yellow mottling, some well rounded quartz gravel			
15					
		- clayey SAND (SC), damp, red with yellow-red and light gray mottling, coarse grained			
		- sandy CLAY (CL), dry, red with yellow and light gray mottling			
20					
		- CLAY (CL), dry, light gray with red and yellow mottling			Annular Fill: cement-bentonite grout
25					
		- CLAY (CL), dry, very stiff, weak red with light gray and yellow mottling, slight plasticity			
30					
35					
		- clayey SAND (SC), saturated, weak red with pale brown and yellow mottling, fine to medium grained			
		- clayey SAND (SC), wet to saturated, weak red and pale brown with light gray mottling, fine to medium grained			
40					
		▼			
45					

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:36 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Con't)			Completion: protective steel cover; 4-foot square concrete pad
		- SAND (SP), saturated, red with light gray mottling, fine to medium grained, some clay			(CONTINUED)
		- clayey SAND (SC), saturated, red-gray, fine to coarse grained			
50					
		- sandy CLAY (CL), wet, red and red-brown with yellow mottling, somewhat plastic			
55		- SAND (SP), wet, red and pale red-brown, trace clay, fine to medium grained			
		- SAND (SP), wet to saturated, brown with pale red mottles, fiine to medium grained			Annular Fill: cement-bentonite grout
60					
		- sandy CLAY (CL), wet, brown with white mottling, moderately plastic			
65		- SAND (SP), wet to saturated, yellow-brown, some clay			
		- sandy CLAY (CH), wet, brown, plastic, interbedded with 2 to 3 inch thick sand seams			
70					
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			Annular Seal: bentonite chips
75					Filter: silica filter sand
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			
80					**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
85					Sump:0.400000000000006 ft.
		Bottom of borehole at 88.0 feet.			
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 5/28/2014 **COMPLETED** 5/28/2014 **SURF. ELEV.** 188.14 ft. msl **COORDINATES:** N:31.444528 E:-84.130316
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 191.12 ft msl
BORING DEPTH 63 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 36.6 ft. after 96 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey SILT (ML), dark brown, top soil			Completion: protective steel cover; 4-foot square concrete pad
		- CLAY (CL), dry to damp, red with dark yellow-brown mottling, some well rounded quartz gravel			Surface Seal: concrete
5					
		- silty CLAY (CL), dry, red with yellow-brown mottling, trace well rounded quartz gravel			
10					
		- sandy CLAY (CL), dry, red with yellow-brown and light gray mottling, trace well rounded quartz gravel			
15					
		- sandy CLAY (CL), dry, hard, red and dark red with light gray and yellow mottling			
20					
					Annular Fill: cement-bentonite grout
25					
		- CLAY (CH), damp to wet, very stiff, red with yellow mottling, plastic			
30					
35		- sandy CLAY (CL), damp, hard, red, then dark red with light gray mottling			
		- clayey SAND (SC), wet to saturated, weak red with pale brown mottling, fine to medium grained			
40					
		- sandy CLAY (CL), damp, hard, weak red with light gray mottling			
45					

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EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
50		*(Con't)* - clayey SAND (SC), wet, weak red and pale brown with light gray mottling, fine to medium grained - clayey SAND (SC), saturated, weak red and red with light gray mottling, fine to medium grained			(CONTINUED) Completion: protective steel cover; 4-foot square concrete pad Annular Seal: bentonite chips Filter: silica filter sand
55		- SAND (SP), saturated, red and yellow-red, fine to medium grained, interbedded with sandy CLAY			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
60		- clayey SAND (SC), saturated, yellow, fine to medium grained - sandy CLAY (CH), wet, brown with white mottles			Sump:0.399999999999999 ft. Backfill:Silica Sand
65		Bottom of borehole at 63.0 feet.			
70					
75					
80					
85					
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 5/29/2014 **COMPLETED** 5/29/2014 **SURF. ELEV.** 188.25 ft. msl **COORDINATES:** N:31.441318 E:-84.130027
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 191.10 ft msl
BORING DEPTH 58 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 43.2 ft. after 96 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey GRAVEL (GC), road bed fill			Completion: protective steel cover; 4-foot square concrete pad
		- clayey SILT (ML), dry, dark brown, buried top soil			Surface Seal: concrete
		- gravelly CLAY (CL), dry, red, slight plasticity			
5					
		- sandy CLAY (CL), dry, hard, red-brown with yellow-red mottling			
10					
		- CLAY (CL), dry, hard, red with light gray and yellow-red mottling			
15					
		- sandy CLAY (CL), dry, hard, weak red with white mottling			
20					Annular Fill: cement-bentonite grout
25		- clayey SAND (SC), dry, dark red and weak red with yellow mottling, medium to coarse grained			
		- sandy CLAY (CL), dry, hard, dark red and weak red with white mottling, silt			
		- clayey GRAVEL (GC), pale yellow, weathered chert gravel			
30		- sandy CLAY (CL), dry, hard, dark brown and weak red			
		- clayey GRAVEL (GC), pale yellow, weathered chert gravel			
35		- sandy CLAY (CL), dry, hard, dark brown and weak red with yellow mottling			
		- sandy CLAY (CL), dry, hard, dark brown and weak red with yellow mottling			
40					
		- CLAY (CH), damp, very stiff, plastic,			Annular Seal: bentonite chips
		- clayey SAND (SC), wet, white, gravel concretions, carbonate			Filter:
45					

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SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
50		*(Con't)* - clayey SAND (SC), saturated, white, gravel concretions, carbonate			Completion: protective steel cover; 4-foot square concrete pad (CONTINUED) silica filter sand **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack Sump:0.399999999999999 ft. Backfill:Silica Sand
55					
		Bottom of borehole at 58.0 feet.			
60					
65					
70					
75					
80					
85					
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 5/29/2014 **COMPLETED** 5/29/2014 **SURF. ELEV.** 188.42 ft. msl **COORDINATES:** N:31.4413002 E:-84.130041
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 191.20 ft msl
BORING DEPTH 38 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 12.3 ft. after 96 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey GRAVEL (GC), dark brown and white, road bed fill			Completion: protective steel cover; 4-foot square concrete pad
		- clayey SILT (ML), dry, dark brown			Surface Seal: concrete
5		- gravelly CLAY (CL), dry, red with red-yellow mottling			
		- sandy CLAY (CL), dry, hard, red and dark red with red-yellow mottling			
10					Annular Fill: cement-bentonite grout
		- CLAY (CL), dry, red and dark red with yellow and white mottling			
15					
		- CLAY (CL), dry, red and dark red with yellow and white mottling			
20					Annular Seal: bentonite chips
					Filter: silica filter sand
25		- clayey SAND (SC), wet, dark red, medium to coarse grained			
		- sandy CLAY (CL), wet, hard, dark red with white mottling			
		- clayey SAND (SC), wet to saturated, weathered chert gravel, coarse grained			**Standpipe: 2" OD PVC (SCH 40)**
30		- CLAY (CL), hard, dark red			Screen: 10 ft; pre-pack
		- sandy CLAY (CL), dry, hard, brown with yellow-brown mottling			
		- sandy CLAY (CL), dry, hard, dark brown with yellow-brown mottling			
35					Sump:0.399999999999999 ft.
					Backfill:Silica Sand
40		Bottom of borehole at 38.0 feet.			
45					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/12/2014 **COMPLETED** 6/13/2014 **SURF. ELEV.** 186.52 ft. msl **COORDINATES:** N:31.435974 E:-84.132600
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 189.47 ft msl
BORING DEPTH 58 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 9.1 ft. after 96 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey SILT (ML), dark brown, top soil			Completion: protective steel cover; 4-foot square concrete pad
		- silty CLAY (CL), dry, very stiff, yellow-brown with red-yellow mottling			Surface Seal: concrete
5					
10		- clayey SAND (SC), damp, pale yellow-brown, red mottling, fine grained, cohesive			
		- silty CLAY (CL), dry, very stiff, light gray with pale brown and yellow-red mottling, some sand			
15					Annular Fill: cement-bentonite grout
20		- CLAY (CL), dry to damp, very stiff, yellow-brown with light gray mottling, somewhat plastic			
		- clayey SAND (SC), damp, red-yellow, fine grained			
		- CLAY (CL), dry, hard, light gray with red and yellow-brown mottling			
25					
30		- CLAY (CL), dry, hard, light gray with red and yellow-brown mottling, somewhat plastic			
35					Annular Seal: bentonite chips
					Filter: silica filter sand
40		- CLAY (CH), saturated, plastic, pale yellow-brown, chert bed with fossil shell casts (1 ft. thick)			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
		- CLAY (CL), damp, stiff, yellow-brown with red mottles, somewhat plastic			
45					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
50		*(Con't)* - CLAY (CH), saturated, plastic, pale yellow-brown, chert bed with fossil shell casts (1 ft. thick) - CLAY (CH), saturated, red-yellow, plastic, some chert gravel with fossil shell casts, - clayey SAND (SC), saturated, white, gravel concretions, carbonate			Completion: protective steel cover; 4-foot square concrete pad (CONTINUED) Sump:0.400000000000006 ft. Backfill:Bentonite Chips
55					
		Bottom of borehole at 58.0 feet.			
60					
65					
70					
75					
80					
85					
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/2/2014 **COMPLETED** 6/3/2014 **SURF. ELEV.** 170.28 ft. msl **COORDINATES:** N:31.433696 E:-84.136488
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 173.08 ft msl
BORING DEPTH 67 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 28.6 ft. after 168 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY, red-brown, then SAND, fill			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5		- SAND (SP), dry, red-yellow, fine grained, fill			
10		- sandy CLAY (CL), dry, hard, gray with yellow-brown and weak red mottles			
		- SAND (SP), damp, pink-gray and pale brown, fine grained			
15		- silty CLAY (CL), dry, gray with yellow-brown mottles			
		- CLAY (CL), dry, very stiff, light gray with dark red and yellow mottling			
		- sandy CLAY (CL), dry to damp, stiff, light gray with yellow-brown and dark red mottling			
20					Annular Fill: cement-bentonite grout
25					
		- silty CLAY (CL), damp, red with yellow-brown mottling			
30					
35		- clayey SAND (SC), saturated, light gray, gravel concretions, carbonate			
		- gravelly sand (SW), saturated, pale yellow and pale brown, gravel concretions, clay, carbonate			
40					
45					Annular Seal: bentonite chips

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Con't)			Completion: protective steel cover; 4-foot square concrete pad
		- gravelly sand (SW), saturated, pale yellow and pale brown, gravel concretions, clay, carbonate			(CONTINUED)
50					Filter: silica filter sand
					Standpipe: 2" OD PVC (SCH 40)
55					Screen: 10 ft; pre-pack
		- clayey SAND (SC), saturated, loose, very pale brown, gravel concretions, carbonate			Sump:0.399999999999999 ft.
60					
					Backfill:Silica Sand
65					
		Bottom of borehole at 67.0 feet.			
70					
75					
80					
85					
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/3/2014 **COMPLETED** 6/3/2014 **SURF. ELEV.** 170.10 ft. msl **COORDINATES:** N:31.433694 E:-84.136464
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING** 173.10 ft msl
BORING DEPTH 38 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 28.3 ft. after 168 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty CLAY, damp, yellow-red,			Completion: protective steel cover; 4-foot square concrete pad
		- SAND, dry, white, fine grained, fill			Surface Seal: concrete
5		- CLAY, dry, red-brown and gray, fill			
		- Silty CLAY (CL), dry, very stiff, light gray with gray-red mottling			
		- SAND (SP), dry to damp, yellow-brown, fine grained			
10		- sandy CLAY (CH), wet, soft, yellow-red, plastic			
		- sandy CLAY (CL), dry, hard, gray with red mottling			Annular Fill: cement-bentonite grout
		- clayey SAND (SC), damp, gray with yellow-brown mottling, fine to medium grained			
15		- SAND (SP), wet, very pale brown with yellow-brown mottles			
		- sandy CLAY (CL), dry, very stiff, brown-yellow with light gray mottles			
20		- sandy CLAY (CL), dry, hard, red with light gray and yellow-brown mottling			Annular Seal: bentonite chips
					Filter: silica filter sand
25		- CLAY (CH), wet, yellow-red, plastic			
		- CLAY (CH), wet to saturated, yellow-red, plastic			**Standpipe: 2" OD PVC (SCH 40)**
30					Screen: 10 ft; pre-pack
					Sump:0.399999999999999 ft.
35		- gravelly SAND (SW), saturated, pale brown, some clay, carbonate			Backfill:Bentonite Chips
		Bottom of borehole at 38.0 feet.			
40					
45					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/5/2014 **COMPLETED** 6/5/2014 **SURF. ELEV.** 167.24 ft. msl **COORDINATES:** N:31.433743 E:-84.139013
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 170.35 ft msl
BORING DEPTH 77 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 26.4 ft. after 120 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- samdy CLAY (CL), dry, dark yellow-brown to dark brown, fill			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5		- sandy CLAY (CL), dry, yellow-red fill			
		- SAND (SP), dry, yellow-red, fine to medium grained			
10					
15		- silty CLAY (CL), damp, yellow-brown with light gray mottling, somewhat plastic			
		- clayey SAND (SC), damp, yellow-brown with red and light gray mottling, somewhat plastic			
20		- SAND (SP), damp to wet, brown-yellow with pale yellow mottling, fine to medium grained			Annular Fill: cement-bentonite grout
25		- sandy CLAY (CL), damp, dark yellow-brown, interbedded with 6 inch thick sand seam			
		- CLAY (CH), damp, red-yellow with weak red mottling, plastic			
30					
35					
		- CLAY (CH), damp, red-yellow, ocassional chert gravel, plastic, 3 inch thick sand seam			
40					
45		- ----3 inch thick sand seam			

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 7/14/14 09:37 - \\ALTRCFP01\X2WSHAUG$\DESKTOP\MITCHELL\PLANT MITCHELL PIEZOMETERS.GPJ

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SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
					Completion: protective steel cover; 4-foot square concrete pad
					(CONTINUED)
		- clayey SAND (SC), saturated, very pale brown, gravel concretions, carbonate *(Con't)*			
		- clayey SAND (SC), saturated, very pale brown to white, gravel concretions, carbonate			
50					
					Annular Fill: cement-bentonite grout
55					
		- clayey SAND (SC), saturated, very loose, very pale brown to white, gravel concretions, carbonate			
60					
					Annular Seal: bentonite chips
65					Filter: silica filter sand
		- gravelly SAND (SW), saturated, white, some clay, carbonate			
70					**Standpipe: 2" OD PVC (SCH 40)**
					Screen: 10 ft; pre-pack
75					
					Sump:0.400000000000006 ft.
		Bottom of borehole at 77.0 feet.			
80					
85					
90					
95					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/5/2014 **COMPLETED** 6/5/2014 **SURF. ELEV.** 167.67 ft. msl **COORDINATES:** N:31.433738 E:-84.138982
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 170.78 ft msl
BORING DEPTH 47 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 20.5 ft. after 120 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty CLAY (CL), dry, dark red-brown and dark yellow-brown, fill			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5		- clayey SILT (OL), dry, dark gray-brown, buried topsoil			
		- CLAY (CL), dry, very stiff, red with yellow-red mottles - sandy CLAY (CL), dry, stiff, yellow-brown with pale brown and yellow-red mottles			
10		- SAND (SP), dry, red-yellow, fine to medium grained			Annular Fill: cement-bentonite grout
15		- SAND (SP), dry, pale yellow, fine grained - SAND (SP), damp, pale brown and pale yellow, fine grained			
20		▽			Annular Seal: bentonite chips
25		- ----clayey sand seam - SAND (SP), wet, pale yellow-brown, and light gray, fine grained			Filter: silica filter sand **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
30					
35		- ----clayey sand seam			Sump:0.399999999999999 ft.
		- sandy CLAY (CH), wet, dark yellow-brown, plastic, interbedded by 2 inch thick sand seam - CLAY (CH), damp, dark red-brown with weak red mottles, plastic			
40		- gravelly SAND (SW), saturated, very loose, very pale yellow, carbonate			Backfill:Bentonite Chips
45					

Bottom of borehole at 47.0 feet.

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/4/2014 **COMPLETED** 6/4/2014 **SURF. ELEV.** 163.18 ft. msl **COORDINATES:** N:31.434647 E:-84.139270
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 166.16 ft msl
BORING DEPTH 48 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 22.9 ft. after 144 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), dry, yellow-brown to light yellow-brown			Completion: protective steel cover; 4-foot square concrete pad Surface Seal: concrete
5		- clayey SAND (SC), dry, light yellow-brown - SAND (SP), dry, red-yellow, fine grained			
10		- SAND (SP), dry, red-yellow, fine to medium grained			
15					Annular Fill: cement-bentonite grout
20		- SAND (SW), wet, red-yellow, fine to medium grained, some gravel - clayey SAND (SC), saturated, very pale yellow to white, gravel concretions			
25					
30		- clayey SAND (SC), saturated, very pale yellow to white, gravel concretions			
35					Annular Seal: bentonite chips Filter: silica filter sand
40		- clayey SAND (SC), saturated, very pale yellow to white, gravel concretions			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
45					Sump:0.399999999999999 ft.

Bottom of borehole at 48.0 feet.

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/4/2014 **COMPLETED** 6/5/2014 **SURF. ELEV.** 163.06 ft. msl **COORDINATES:** N:31.434628 E:-84.139276
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 166.02 ft
BORING DEPTH 28 ft. **GROUND WATER DEPTH: DURING** **COMP.** msl **DELAYED** 22.5 ft. after 120 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), dry, yellow-brown and light brown			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5		- clayey SAND (SC), dry, light yellow-brown, fine to medium grained			
		- SAND (SP), dry, red-yellow, fine to medium grained			Annular Fill: cement-bentonite grout
10		- SAND (SP), wet to saturated, red-yellow, fine to coarse grained			
15					Annular Seal: bentonite chips; Filter: silica filter sand
		- SAND (SP), wet to saturated, red-yellow, fine to coarse grained			
20		- clayey SAND (SC), saturated, very pale brown to white, gravel concretions, carbonate			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
		▼			
25					Sump:0.399999999999999 ft.
		Bottom of borehole at 28.0 feet.			
30					
35					
40					
45					

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/4/2014 **COMPLETED** 6/4/2014 **SURF. ELEV.** 170.93 ft. msl **COORDINATES:** N:31.440211 E:-84.137507
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 173.92 ft msl
BORING DEPTH 48 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 30.3 ft. after 144 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- SILT (ML), dry, dark brown, some clay			Completion: protective steel cover; 4-foot square concrete pad; Surface Seal: concrete
5		- clayey SILT (ML), dry, red			
		- clayey SAND (SC), dry, red, medium grained			
10		- SAND (SP), dry, yellow with red-yellow mottling, fine grained			
15					Annular Fill: cement-bentonite grout
		- clayey SILT (ML), dry, white with yellow-brown mottles, some chert gravel			
20		- sandy CLAY (CH), wet, yellow-red then brown with yellow and black mottles, plastic			
25					
		- CLAY (CH), wet to saturated, brown, plastic			
30		▼			
35					Annular Seal: bentonite chips; Filter: silica filter sand
		- clayey SAND (SC), saturated, white, gravel concretions, carbonate			
40					**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
45					Sump:0.399999999999999 ft.
		Bottom of borehole at 48.0 feet.			

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Ash Pond Piezometers
LOCATION Plant Mitchell, Georgia

DATE STARTED 6/6/2014 **COMPLETED** 6/6/2014 **SURF. ELEV.** 170.23 ft. msl **COORDINATES:** N:31.442059 E:-84.137080
CONTRACTOR Cascade **EQUIPMENT** **METHOD** Rotosonic
DRILLED BY T. Ardito **LOGGED BY** W. Shaughnessy **CHECKED BY** **TOP OF CASING:** 173.22 ft msl
BORING DEPTH 48 ft. **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 29.1 ft. after 72 hrs.
NOTES

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), damp, dark brown to red-brown, fill			Completion: protective steel cover; 4-foot square concrete pad
		- clayey SILT (ML), wet, dark brown, buried top soil			Surface Seal: concrete
5		- sandy CLAY (CL), damp, red-brown with yellow-brown mottling, somewhat plastic			
10		- CLAY (CL), damp, stiff, yellow-brown with gray and red-yellow mottles			
		- silty CLAY (CL), wet to damp, soft, yellow-brown with gray mottling			
15		- SAND (SP), damp, pale yellow-brown, fine to medium grained			Annular Fill: cement-bentonite grout
		- ---3 inch thick gray clay seam			
20		- SAND (SP), wet to saturated, yellow-brown and pale brown, fine to coarse grained, some chert gravel, interbedded with few 3 inch thick gray clay seams			
25					
30		▼ - SAND (SP), wet to saturated, yellow-brown and pale brown, fine to coarse grained, some chert gravel, interbedded with few 3 inch thick gray clay seams			
		- clayey SAND (SC), wet to saturated, yellow-brown with light gray mottling, fine to coarse grained,			Annular Seal: bentonite chips
35					Filter: silica filter sand
40		- sandy CLAY (CH), damp, brown with black and pale yellow mottling, plastic			**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
45					
		Bottom of borehole at 48.0 feet.			Sump:0.399999999999999 ft.

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/25/2016 **COMPLETED** 7/25/2016 **SURF. ELEV.** 180.85 ft msl **COORDINATES:** N:31.433827 E:-84.133892
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 183.46 ft msl
BORING DEPTH 50 ft bgs **GROUND WATER DEPTH: DURING** 35 ft bgs **COMP.** 43.07 ft bgs **DELAYED** 15 days
NOTES Southeast corner of Pond B, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), reddish brown, fill				Completion: Protective casing set in concrete pad
5			175.9			Annular Fill: Cement-Bentonite Grout
		- CLAY (CL), fine sand, hard, mottled white and reddish brown, dry				
10						
15						
20			160.9			
		- as above; moist				
25						
			153.4			
		- sandy CLAY (CL), coarse sand, wet	152.4			
		- CLAY (CL), reddish brown, still, moist, low plasticity				
30						
						147.9 (33.0)
35					▽	Annular Seal: 3/8" bentonite pellets (non-coated)
			145.4			
		- SAND (SP), white, calcareous, loose, fossiliferous, saturated fossilites				142.9 (38.0)
40						Filter: silica filter sand 140.9

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA	ELEV. (DEPTH)
45		*(Cont.)*			▼	(CONTINUED) Completion: Protective casing set in concrete pad **Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack	(40.0)
50			130.9				
		Bottom of borehole at 50.0 feet.					
55							
60							
65							
70							
75							
80							
85							

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/23/2016 **COMPLETED** 7/23/2016 **SURF. ELEV.** 167.38 ft msl **COORDINATES:** N:31.434178 E:-84.138534
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 170.37 ft msl
BORING DEPTH 80 ft bgs **GROUND WATER DEPTH: DURING** 32.45 ft bgs **COMP.** 34.19 ft bgs **DELAYED** 17 days
NOTES *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), reddish brown, fill, dry				Completion: Protective casing set in concrete pad
5			161.4			Annular Fill: Cement-Bentonite Grout
		- sandy CLAY (CL), mottled maroon and white, MnO staining				
10						
			153.4			
15		- chalky SANDSTONE, white, with brown chert nodules	152.4			
		- fat CLAY (CL), pebble sized rounded chert fragments				
20						
			144.9			
		- NO RECOVERY				
25			142.4			
		- SAND (SP), tan, rounded and subrounded pebbles, calcareous, medium-coarse grained, moist				
			139.9			
		- SAND (SP), tan, calcareous, fine grained, moist				
30						
			134.9		▽	135.4 (32.0)
		- fat CLAY (CL), with pebbles, wet			▼	Annular Seal: 3/8" bentonite chips
35						
40			127.4			

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- as above				(CONTINUED) Annular Seal: 3/8" bentonite chips
50						
55						
60						
65			102.4			**102.9** (64.5)
		- clayey SAND (SC), calcareous, fossiliferous, large calcarenite fragments				Annular Seal: 3/8" bentonite pellets (non-coated) **100.4** (67.0) Filter: silica filter sand
70			97.4			**97.4** (70.0)
		- as above; with increasing cementation				**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
75						
80			87.4			
		Bottom of borehole at 80.0 feet.				
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/24/2016 **COMPLETED** 7/25/2016 **SURF. ELEV.** 171.21 ft msl **COORDINATES:** N:31.435621 E:-84.138525
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 173.92 ft msl
BORING DEPTH 50 ft bgs **GROUND WATER DEPTH: DURING** 35 ft bgs **COMP.** 34.04 ft bgs **DELAYED** 15 days
NOTES *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), fill, reddish brown				Completion: Protective casing set in concrete pad
5			166.2			Annular Fill: Cement-Bentonite Grout
		- clayey SAND (SC), white and reddish brown, firm, mottled, fine to medium,				
10						
15						
20			151.2			
		- as above, moist, more plasticity				
25						
30			141.2			
		- CLAY (CL), reddish brown, stiff, moist, low plasticity				138.2 (33.0)
35			136.2		▼ ▽	Annular Seal: 3/8" bentonite pellets (non-coated)
		- SAND (SP), white, calcareous, fine to coarse sand, saturated				133.2 (38.0)
40						Filter: silica filter sand 131.2

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA	ELEV. (DEPTH)
45		*(Cont.)*				(CONTINUED) Completion: Protective casing set in concrete pad	(40.0)
50			121.2			**Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack	
		Bottom of borehole at 50.0 feet.					
55							
60							
65							
70							
75							
80							
85							

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/22/2016 **COMPLETED** 7/22/2016 **SURF. ELEV.** 170.12 ft msl **COORDINATES:** N:31.436893 E:-84.136835
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 172.91 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 32.5 ft bgs **COMP.** 32.67 ft bgs **DELAYED** 18 days
NOTES Approximately 260' South of MW-115, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), reddish brown, fill, dry				Completion: Protective casing set in concrete pad
5						Annular Fill: Cement-Bentonite Grout
10			159.1			
		- well graded SAND (SP), tan, moist				
15			154.1			
		- clayey SAND (SC), tan, moist				
			151.1			
20		- clayey SAND (SC), red and tan interbedded layers, moist				
25						**144.6 (25.5)** Annular Seal: 3/8" bentonite chips
			141.1			
30		- fat CLAY (CL), gray, wet				
			139.1			
		- clayey SAND (SC), calcareous, calcite and silica cemented				
35						
40			130.1			**130.1**

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- as above				(CONTINUED) Completion: Protective casing set in concrete pad Annular Seal: 3/8" bentonite pellets (non-coated) (40.0) 125.6 Filter: silica filter sand (44.5)
50			120.1			120.1
55		- as above; with increasing cementation				**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack (50.0)
60			110.1			
		Bottom of borehole at 60.0 feet.				
65						
70						
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/22/2016 **COMPLETED** 7/23/2016 **SURF. ELEV.** 167.34 ft msl **COORDINATES:** N:31.438426 E:-84.136015
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 170.11 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 31.8 ft bgs **COMP.** 29.53 ft bgs **DELAYED** 17 days
NOTES Approximately 300' Northwest of MW-115, Southest of berm, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy CLAY (CL), reddish brown, fill				Completion: Protective casing set in concrete pad
5						Annular Fill: Cement-Bentonite Grout
			158.3			
10		- well graded SAND (SW), loose, fine to medium grained, moist				
15						
20			147.3			
		- clayey SAND (SC), moist,				
25			142.3			
		- sandy CLAY, HP fines, moist				
30			137.3		▼	
		- NO RECOVERY			▽	136.3 (31.0)
						Annular Seal: 3/8" bentonite chips
35						
			128.3			
40		- sandy CLAY, white, calcareous	127.3			

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SOUTHERN COMPANY

LOG OF TEST BORING

BORING PZ-18
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- as above; fossiliferous, cobbles of calcarenite	122.3			(CONTINUED) Completion: Protective casing set in concrete pad Annular Seal: 3/8" bentonite chips **122.3** (45.0) Annular Seal: 3/8" bentonite pellets (non-coated) **119.3** (48.0) Filter: silica filter sand **117.3** (50.0) **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
50		- as above; saturated				
55						
60			107.3			
		Bottom of borehole at 60.0 feet.				
65						
70						
75						
80						
85						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 12/12/16 12:47 - C:\USERS\MACKENZIE.FIOCA\DESKTOP\PLANT MITCHELL\PLANT MITCHELL_SOUTHERN COMPANY.GPJ

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SOUTHERN COMPANY

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BORING PZ-19
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/13/2016 **COMPLETED** 7/13/2016 **SURF. ELEV.** 169.40 ft msl **COORDINATES:** N:31.439626 E:-84.135979
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** Terrasonic 150 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Alan Blackwell **LOGGED BY** Andrew Smits* **CHECKED BY** _____ **TOP OF CASING:** 172.05 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 27.5 ft bgs **COMP.** 32.12 ft bgs **DELAYED** 27 days
NOTES West side of Pond A, approximately 6' west of the toe of slope of berm, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- well graded SAND with silt (SW-SM), yellow red (5 Y 5/6), damp to moist, fine to medium grained, NP-LP fines, trace clay	167.4			Completion: Protective casing set in concrete pad
		- well graded SAND with clay (SW-SC), yellow red (5 Y 5/6), moist to damp, medium grained, trace gravel, LP fines	167.9			Annular Fill: Cement-Bentonite Grout
5		- NO RECOVERY				
10			159.4			
		- well graded SAND (SW), variegated red (5 Y 5/6 - 2.5 YR 3/6), damp, medium grained, NP fines, trace silt, trace gravel	155.4			
15		- clayey SAND (SC), varigated red and orange (2.5 YR), loose, damp to dry, trace gravel, LP to MP fines	153.4			
		- fat CLAY (CH), pink, white, and yellow mottled (NR 8/2), MnO staining, hard, moist, HP fines	151.9			
		- NO RECOVERY				
20			149.4			
		- fat CLAY (CH), pink and white, mottled, MnO staining, hard to soft, moist				
25			143.9			
		- clayey SAND (SC), white (2.5 YR 8/1), calcareous, weak to moderate cementation, carbonate, mud-sized calcareous matrix with calcite and silica cement, detrital material with fossil fragments			▽	**142.4** (27.0) Annular Seal: 3/8" bentonite chips
30						
					▼	
35						
40						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		*(Cont.)*				(CONTINUED)
		- strong cementation	123.4			
50						Completion: Protective casing set in concrete pad **127.4** (42.0) Annular Seal: 3/8" bentonite pellets (non-coated) **122.4** (47.0) Filter: silica filter sand **120.4** (49.0) **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
55						
60			109.4			**110.4** (59.0)
		Bottom of borehole at 60.0 feet.				
65						
70						
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/13/2016 **COMPLETED** 7/14/2016 **SURF. ELEV.** 170.62 ft msl **COORDINATES:** N:31.440844 E:-84.135981
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** Terrasonic 150 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Alan Blackwell **LOGGED BY** Andrew Smits* **CHECKED BY** **TOP OF CASING:** 173.44 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 34.5 ft bgs **COMP.** 33.29 ft bgs **DELAYED** 26 days
NOTES West side of Pond A, approximately 6' west from toe of slope of berm, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey SAND (SC), dark red brown (2.5 YR 3/4), damp, with roots and organics, trace gravel, fine to medium sand				Completion: Protective casing set in concrete pad
5			162.1			Annular Fill: Cement-Bentonite Grout
10		- NO RECOVERY	160.6			
		- well graded SAND (SW), varigated red and yellow (7.5 YR), interbedded with gravel,	157.6			
15		- sandy CLAY (CL), banded gray, red and orange (7.5 YR), increasing sand with depth, fine to medium grained, dense, moist	155.6			
		- NO RECOVERY				
20			150.6			
		- clayey SAND (SC), calcareous, white to red-yellow (7.5 YR), trace gravel, weakly cemented, moist	147.6			
		- layered CLAY (CL) and clayey SAND (SC), white and gray (7.5 YR), moist to wet calcareous	146.6			
25		- NO RECOVERY				
30			140.6			**140.6 (30.0)**
		- clayey SAND (SC), pale red to pink (10 R), fine to medium grained, wet	138.6			Annular Seal: 3/8" bentonite pellets (non-coated)
		- clayey SAND (SC), white to pink (10 R), frable to indurated, wet, fossil fragments, shell fragments,			▼ ▽	
35						
40						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA	ELEV. (DEPTH)
		(Cont.)				(CONTINUED)	
		- same as above					**128.6**
							(42.0)
						Annular Seal: 3/8" bentonite chips	
45							**123.6**
							(47.0)
						Filter: silica filter sand	**121.1**
50							(49.5)
						Standpipe: 2" OD PVC (SCH 40) Screen: 10 ft; pre-pack	
55							
60			110.6				**111.1**
		Bottom of borehole at 60.0 feet.					
65							
70							
75							
80							
85							

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/29/2016 **COMPLETED** 7/29/2016 **SURF. ELEV.** 177.08 ft msl **COORDINATES:** N:31.442533 E:-84.133481
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Bill Lindsey **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 179.84 ft msl
BORING DEPTH 70 ft bgs **GROUND WATER DEPTH: DURING** 45 ft bgs **COMP.** 38.6 ft bgs **DELAYED** 11 days
NOTES North side of Pond A, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy SILT (ML), reddish brown, loose, fill, dry				Completion: Protective casing set in concrete pad
5						Annular Fill: Cement-Bentonite Grout
			168.1			
10		- sandy SILT (ML), interbedded red and greenish gray layers, medium stiff, MnO staining, dry				
15						
			160.8			
		- CLAY (CL), mottled gray and red, stiff, MnO staining, dry				
20						
25			152.1			
		- as above, moist, HP fines				
30						
35					▼	
40						

ELEV. (DEPTH)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Cont.)				(CONTINUED) Completion: Protective casing set in concrete pad
45		- as above; calcareous, strong reaction to HCL, wet	132.1		▽	Annular Fill: Cement-Bentonite Grout **133.1** (44.0) Annular Seal: 3/8" bentonite chips
50		- SAND, calcareous, white, rock fragments, cemented, wet	128.1			**124.1** (53.0) Annular Seal: 3/8" bentonite pellets (non-coated) **119.1** (58.0)
55						
60		- as above; with increasing cementation and fossiliferous	117.1			Filter: silica filter sand **117.1** (60.0) **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
65						
70			107.1			
		Bottom of borehole at 70.0 feet.				
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/28/2016 **COMPLETED** 7/28/2016 **SURF. ELEV.** 184.76 ft msl **COORDINATES:** N:31.442485 E:-84.130862
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Bill Lindsey **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 187.69 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 50 ft bgs **COMP.** 45.83 ft bgs **DELAYED** 12 days
NOTES *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), fill, loose, dry				Completion: Protective casing set in concrete pad
5						Annular Fill: Cement-Bentonite Grout
10		- CLAY (CL), reddish brown (5 YR 4/0) with gray mottling, slightly moist, low plasticity MnO staining	174.8			
15						
20		- sandy CLAY (CL), loose, MnO staining	164.8			
25						
30						154.8 (30.0) Annular Seal: 3/8" bentonite chips
35		- CLAY (CL), reddish brown, fine, MnO staining, HP fines	149.8			
40						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		*(Cont.)*				(CONTINUED)
		- SAND (SP), white, calcareous	139.8		▼	
50					▽	
55						
60			124.8			

Completion:
Protective casing set in concrete pad

Annular Seal:
3/8" bentonite chips
141.8
(43.0)

Annular Seal:
3/8" bentonite pellets
(non-coated)
136.8
(48.0)

Filter:
silica filter sand
134.8
(50.0)

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

Bottom of borehole at 60.0 feet.

65
70
75
80
85

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BORING PZ-23A
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LOG OF TEST BORING

PROJECT Plant Mitchell - Geotech
LOCATION Albany, GA

DATE STARTED 3/9/2020 **COMPLETED** 3/10/2020 **SURF. ELEV.** 189.06 ft msl **COORDINATES:** N:31.44031 W:84.13088
CONTRACTOR SCS Field Services **EQUIPMENT** **METHOD** Hollow Stem Auger
DRILLED BY SM **LOGGED BY** FM **CHECKED BY** NJM
BORING DEPTH 70 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 40.11 ft after 14 days
NOTES Top of casing elevation: 191.85 ft msl.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA	ELEV. (DEPTH)
0		-SAND (SC), red, clayey, moist				Annular Fill: Cement Grout	
5							
10							
			175.6				
15		-CLAY (CL), mottled gray and red, stiff, moist					
20							
25							
30							
35							
40							

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/15/20 13:03 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\PLANT MITCHELL PZ-23-PZ-24.GPJ

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wood.

LOG OF TEST BORING

BORING PZ-23A
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PROJECT Plant Mitchell - Geotech

LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		*(Cont.)* -CLAY (CL), mottled gray and red, stiff, moist	141.1		▼	(CONTINUED) Completion: Protective casing set in concrete pad; 2-foot square concrete pad
50		-LIMESTONE, white, fine-medium grained, very weathered, moist				Annular Fill: Cement Grout — 143.6 (45.5) — Annular Seal: Bentonite Pellets — 138.4 (50.7) — Filter: Silica Filter Sand — 134.6 (54.5) — Filter: Silica Filter Sand — Stand Pipe: 2" OD PVC (SCH 40) — Screen: 10 feet of 0.01-inch slotted 2" OD PVC (SCH 40)
55						
60						
65						
70			119.1			

Bottom of borehole at 70.0 feet.

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/15/20 12:36 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\PLANT MITCHELL PZ-23-PZ-24.GPJ

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BORING PZ-24A

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LOG OF TEST BORING

PROJECT Plant Mitchell - Geotech

LOCATION Albany, GA

DATE STARTED 3/3/2020 **COMPLETED** 3/6/2020 **SURF. ELEV.** 192.25 ft msl **COORDINATES:** N:31.438442 W:84.131835

CONTRACTOR SCS Field Services **EQUIPMENT** **METHOD** Hollow Stem Auger

DRILLED BY SM **LOGGED BY** ML **CHECKED BY** NJM

BORING DEPTH 61 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** **DELAYED** 45.26 after 18 days

NOTES Top of casing elevation: 194.97 ft msl.

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA (ELEV. (DEPTH))
0		-HYDROVAC, no description obtained				Annular Fill: Cement Grout
10			182.3			
10		-CLAY (CL), reddish brown, stiff, with silty sand, moist				
40						

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/14/20 18:02 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\PLANT MITCHELL PZ-23-PZ-24.GPJ

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wood.

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PROJECT Plant Mitchell - Geotech

LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA (CONTINUED)	ELEV. (DEPTH)
		(Cont.) -CLAY (CL), reddish brown, stiff, with silty sand, moist	148.3			Annular Fill: Cement Grout	150.3 (42.0)
45		-LIMESTONE, white, fine-medium grained, very weathered			▼	Annular Seal: Bentonite Pellets	145.3 (47.0)
50						Filter: Silica Filter Sand	142.3 (50.0)
55						Filter : Silica Filter Sand Stand Pipe: 2" OD PVC (SCH 40) Screen: 10 feet of 0.01-inch slotted 2" OD PVC (SCH 40)	
60			131.3				
		Bottom of borehole at 61.0 feet.					
65							
70							
75							
80							
85							

SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/15/20 12:36 - C:\PROGRAM FILES (X86)\GINT\PROJECTS\PLANT MITCHELL PZ-23-PZ-24.GPJ

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SOUTHERN COMPANY

LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DATE STARTED 7/19/2016 **COMPLETED** 7/20/2016 **SURF. ELEV.** 168.24 ft msl **COORDINATES:** N:31.442129 E:-84.135983
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY Jeremy John **LOGGED BY** Daniel Morris* **CHECKED BY** **TOP OF CASING:** 171.14 ft msl
BORING DEPTH 60 ft bgs **GROUND WATER DEPTH: DURING** 31.7 ft bgs **COMP.** 30.36 ft bgs **DELAYED** 20 days
NOTES Northwest side of Pond A, *Samples logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
0		- clayey SAND (SC), reddish brown, fill, moist				Completion: Protective casing set in concrete pad
5						Annular Fill: Cement-Bentonite Grout
10			158.2			
		- well graded SAND (SW), reddish brown				
15			153.2			
		- sandy CLAY (CL), banded gray and red, moist				
20			148.2			
		- clayey SAND (SC), calcareous, with gravel				
25			143.2			
		- NO RECOVERY				
30			138.2		▼	
		- clayey SAND (SC), pink, very moist			▽	
35			133.2			133.2 (35.0)
		- clayey SAND (SC), white, fossiliferous, calcareous, wet				Annular Seal: 3/8" bentonite pellets (non-coated)
40			128.2			128.2

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, Georgia

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- as above	123.2			(CONTINUED) Completion: Protective casing set in concrete pad
		- as above; with increasing cementation				Annular Seal: 3/8" bentonite chips (40.0)
50						120.2 (48.0) Filter: silica filter sand 118.2 (50.0)
55						**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack
60			108.2			
		Bottom of borehole at 60.0 feet.				
65						
70						
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/4/2016 **COMPLETED** 10/4/2016 **SURF. ELEV.** 161.88 ft msl **COORDINATES:** N:31.436488 E:-84.138925
CONTRACTOR Southern Company Services **EQUIPMENT** CME-558 HSA **METHOD** Hollow Stem Auger
DRILLED BY Donald Wildman **LOGGED BY** F. Mayila* **CHECKED BY** **TOP CASING ELEV.** 164.58 ft msl
BORING DEPTH 47 ft bgs **GROUNDWATER DEPTH: DURING** 26 ft bgs **COMP.** 26.5 ft bgs **DELAYED** 28.86 ft.;2 days
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	MATERIAL DESCRIPTION	ELEV.	SAMPLE TYPE NUMBER	BLOW COUNTS (N-VALUE)/ RECOVERY % (RQD %)	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
						Completion: Protective casing set in concrete pad; 2-foot square concrete pad — ELEV. (DEPTH) 160.97 (0.5)
	- silty SAND (SM), dark brown (7.5 YR 3/3), medium dense, dry		SS-1	8-12-14 (**26**)		Annular Fill: Cement-Bentonite Grout
		158.38				
5	- silty CLAY (CL), light brown (7.5 YR 6.3), mottled, moist, very stiff		SS-2	8-9-10 (**19**)		
		155.88				
	- SAND (SP), reddish yellow (7.5 YR 7.6), medium to coarse, moist, sub-angular fine gravel, medium dense		SS-3	6-11-13 (**24**)		
10	- same as above		SS-4	10-11-9 (**20**)		
		148.38				
15	- clayey SAND (SC), yellowish red (5 YR 5/6), fine, medium dense, moist		SS-5	18-8-7 (**15**)		
		143.38				
	- SAND (SP), brown (7.5 YR 4/3), medium dense	142.88	SS-6	6-8-5 (**13**)		
20	- LIMESTONE, white (5 YR 8/1), stiff to medium stiff, moist to wet					
25	- same as above, with rock fragments		SS-7	2-4-8 (**12**)		
						136.28 (25.6) Annular Seal: 3/8" bentonite chips
30	- same as above		SS-8	2-8-8 (**16**)		
						131.28 (30.6) Annular Seal: 3/8" bentonite chips
35	- same as above		SS-9	3-2-5 (**7**)		
						126.28 (35.6) Filter: silica filter sand
						123.58 (38.3)
40	- same as above		SS-10	4-5-7 (**12**)		121.47

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SOUTHERN COMPANY

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	GROUNDWATER	SAMPLE TYPE NUMBER	BLOW COUNTS **(N-VALUE)**/ RECOVERY % **(RQD %)**	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
		(Cont.) (CONTINUED)						Completion: Protective casing set in concrete pad; 2-foot square concrete pad — ELEV. (DEPTH)
								Standpipe: **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
45		- same as above			SS -11	9-9-2 (**11**)		
			114.88					
		- Casing fell under own weight to 48.3 ft bgs when place in borehole. Total well depth = 48.3 ft						
50		Bottom of borehole at 47.0 feet.						
55								
60								
65								
70								
75								
80								
85								

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/13/2016 **COMPLETED** 10/13/2016 **SURF. ELEV.** 163.49 ft msl **COORDINATES:** N:31.437900 E:-84.138565
CONTRACTOR Cascade Drilling, LP **EQUIPMENT** 100C DB320 **METHOD** Sonic Drilling with 4 in. barrel
DRILLED BY T. Ardito **LOGGED BY** F. Mayila* **CHECKED BY** _____ **TOP CASING ELEV.** 165.96 ft msl
BORING DEPTH 47 ft bgs **GROUNDWATER DEPTH: DURING** 23 ft bgs **COMP.** 24.9 ft bgs **DELAYED** 27.2 ft.;0.5 days
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty CLAY (CL), pale brown (10 YR 6/3) to light yellowish brown (10 YR 6/4), decreasing silty content w/ depth, moist				Completion: Protective casing set in concrete pad; 2-foot square concrete pad
5			158.49			ELEV. (DEPTH)
		- silty SAND (SM), very pale brown (10 YR 7/3) to dark brown (7.5 YR 4/6)	156.49			Annular Fill: Cement-Bentonite Grout
		- silty CLAY (CL), pale brown (10 YR 6/3) to light yellowish brown (10 YR 6/4), decreasing silty content w/ depth, moist				
10						
15						
		- same as above, stringers of sand				
		- some gravel/rock fragments	146.49			
		- LIMESTONE, yellow (10 YR 8/8), weathered, hard, large fragments intermixed with gravely fragments, wet	145.49			
20		- LIMESTONE, white (10 YR 8/1), weathered, with rock fragments throughout sample, pieces up to 3", wet				
25					▽ ▼	138.49 (25.0)
						Annular Seal: 3/8" bentonite chips
		- LIMESTONE, white (10 YR 8/1), weathered, with rock fragments throughout sample core	136.49		▼	
30						133.99 (29.5)
						Annular Seal: 3/8" bentonite chips
35						128.99 (34.5)
						Filter: silica filter sand
						126.49 (37.0)
40						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA (CONTINUED)	WELL DATA: Completion: Protective casing set in concrete pad; 2-foot square concrete pad — ELEV. (DEPTH)
45		*(Cont.)* - same as above	116.49				**Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
		Bottom of borehole at 47.0 feet.					
50							
55							
60							
65							
70							
75							
80							
85							

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/3/2016 **COMPLETED** 10/4/2016 **SURF. ELEV.** 170.42 ft msl **COORDINATES:** N:31.440384 E:-84.137776
CONTRACTOR Southern Company Services **EQUIPMENT** CME-558 HSA **METHOD** Hollow Stem Auger
DRILLED BY Donald Wildman **LOGGED BY** F. Mayila* **CHECKED BY** **TOP CASING ELEV.** 173.18 ft msl
BORING DEPTH 55 ft bgs **GROUNDWATER DEPTH: DURING** 33 ft bgs **COMP.** 34 ft bgs **DELAYED** 37.38 ft.;2 days
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	GROUNDWATER	SAMPLE TYPE NUMBER	BLOW COUNTS (N-VALUE)/ RECOVERY % (RQD %)	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
		- silty CLAY (CL), strong brown (7.5 YR 4/6), very stiff to hard						Completion: Protective casing set in concrete pad; 2-foot square concrete pad ELEV. (DEPTH) 169.54 (0.5)
					SS -1	13-8-10 (**18**)		Annular Fill: Cement-Bentonite Grout
5		- same as above, very dense			SS -2	20-25-32 (**57**)		
					SS -3	19-19-23 (**42**)		
		- same as above, reddish yellow (7,5 YR 6/8), dense	161.92					
10		- clayey SAND (SC), pinkish gray (7.5 YR 6/2) to light brown (7.5 YR 6/3), medium grained, medium dense, moist			SS -4	6-11-14 (**25**)		
			156.92					
15		- SAND (SP), very pale brown (10 YR 7/4), fine to medium increasing fine gravel at 14.5', medium dense			SS -5	8-11-10 (**21**)		
			151.92					
20		- clayey SAND (SC), very pale brown (10 YR 7/4), fine, medium dense			SS -6	4-6-6 (**12**)		
			146.92					
25		- clayey SILT (ML), very pale brown (10 YR 7/4) to yellow (10 YR 8/6), fine quartz gravel, 1" round claystone? in toe of spoon, very dense			SS -7	50/4" (**50+**)		
			141.42					
30		- fat CLAY (CH), yellowish brown (10 YR 8/4) to reddish brown, soft			SS -8	2-1-2 (**3**)		
				▽				
35		- same as above, reddish yellow (7.5 YR 7/8)		▼	SS -9	0-2-1 (**3**)		136.42 (34.0) Annular Seal: 3/8" bentonite chips
				▼				
40		- same as above, 6" SAND layer at 38.5', light brown (7.5 YR			SS -10	1-2-1 (**3**)		130.92

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	GROUNDWATER	SAMPLE TYPE NUMBER	BLOW COUNTS (N-VALUE)/ RECOVERY % (RQD %)	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
		6/3), with some rock fragments *(Cont.)*					(CONTINUED)	Completion: Protective casing set in concrete pad; 2-foot square concrete pad ELEV. (DEPTH) 130.92 (39.5)
								Annular Seal: 3/8" bentonite chips
45		- same as above, strong brown (7.5 YR 4/6), MnO nodules, very soft	125.92		SS -11	0-0-0 (**0**)		125.92 (44.5)
		- LIMESTONE, white (7.5 YR 8/1), weathered, very soft						Filter: silica filter sand 123.92 (46.5)
50		- weathered LIMESTONE with rock fragments, strong brown (7.5 YR 4/6) to white (7.5 YR 8/1), very soft			SS -12	1-0-0 (**0**)		**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
		- LIMESTONE, white (7.5 YR 8/1), weathered, very soft						
55					SS -13	0 (**0**)		
		- Casing fell under own weight to 56.5 ft bgs when placed in borehole. Total well depth = 56.5 ft.	115.42					
		Bottom of borehole at 55.0 feet.						
60								
65								
70								
75								
80								
85								

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/12/2016 **COMPLETED** 10/13/2016 **SURF. ELEV.** 180.32 ft msl **COORDINATES:** N:31.449012 E:-84.137718
CONTRACTOR Sonic Drilling with 4 in. barrel **EQUIPMENT** **METHOD** Hollow Stem Auger
DRILLED BY **LOGGED BY** Cascade Drilling, LP **CHECKED BY** 100C DB320 **TOP CASING ELEV.** 182.96 ft msl
BORING DEPTH 57 ft bgs **GROUNDWATER DEPTH: DURING** 35 ft bgs **COMP.** 32 ft bgs **DELAYED** 43.46 ft.;5 days
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty CLAY (CL), red (2.5 YR 6/8), beige mottling, very stiff, damp				Completion: Protective casing set in concrete pad; 2-foot square concrete pad
5						Annular Fill: Cement-Bentonite Grout
		- same as above, gray (7.5 YR 6/1) mottling				
10						
15						
		- same as above, layer of chert (2") at 15', white (2.5 YR 7/1)	163.32			
		- CLAY (CL), dark brown (2.5 YR 3/4) to reddish brown (2.5 YR 5/4), mottled, stiff				
20						
25			154.82			
		- same as above, soft				
30						
			148.32		▼	148.32 (32.0)
		- weathered LIMESTONE, white (2.5 YR 7/1), weathered with rock fragments/gravel carbonate, very moist				Annular Seal: 3/8" bentonite chips
35					▽	
		- same as above, wet				
40						140.32

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		*(Cont.)* - same as above			▽	(CONTINUED) Completion: Protective casing set in concrete pad; 2-foot square concrete pad (40.0) Annular Seal: 3/8" bentonite chips 135.32 (45.0) Filter: silica filter sand 133.32 (47.0) **Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
50						
55			123.32			
		Bottom of borehole at 57.0 feet.				
60						
65						
70						
75						
80						
85						

ELEV. (DEPTH)

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/12/2016 **COMPLETED** 10/13/2016 **SURF. ELEV.** 178.19 ft msl **COORDINATES:** N:31.446489 E:-84.130941
CONTRACTOR Sonic Drilling with 4 in. barrel **EQUIPMENT** **METHOD** Hollow Stem Auger
DRILLED BY **LOGGED BY** Cascade Drilling, LP **CHECKED BY** 100C DB320 **TOP CASING ELEV.** 180.75 ft msl
BORING DEPTH 62 ft bgs **GROUNDWATER DEPTH: DURING** 25 ft bgs **COMP.** 23 ft bgs **DELAYED** 42 ft.;4 days
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), red (10 R 5/8) to reddish yellow (5 YR 7.8), loose, damp				Completion: Protective casing set in concrete pad; 2-foot square concrete pad Annular Fill: Cement-Bentonite Grout
5						
		- same as above, consolidated, very hard				
10			166.69			
		- clayey SILT (ML), transitioning to stiff silty CLAY (CL), consolidated very hard				
15			161.19			
		- CLAY (CL), red (10 R 4/8) with white mottling, stiff, moist				
20					▼	
			154.19		▽	
25		- clayey, weathered LIMESTONE, yellowish brown (10 YR 5/6)				
			151.19			
		- CLAY (CL), yellow (10 YR 7/6), stiff, moist				
30			146.19			
		- weathered LIMESTONE, very pale brown (10 YR 7/4), with rock fragments/gravel concretions, wet				
35			141.19			
		- LIMESTONE, gray, very hard rock, highly pourous with fossils				
40						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		(Cont.)	137.19			(CONTINUED)
		- weathered LIMESTONE, pale brown	135.19		▼	Completion: Protective casing set in concrete pad; 2-foot square concrete pad
45		- fat CLAY (CH), reddish brown (5 YR 4/4), some gravel, stiff	130.19			ELEV. (DEPTH) 133.69 (44.5) Annular Seal: 3/8" bentonite pellets (coated)
50		- weathered LIMESTONE, white, with gravel/rock fragments, wet				128.19 (50.0) Filter: silica filter sand 126.19 (52.0)
55						**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
60		- NOT SAMPLED	121.19			
			116.19			
65		Bottom of borehole at 62.0 feet.				
70						
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DATE STARTED 10/1/2016 **COMPLETED** 10/2/2016 **SURF. ELEV.** 187.08 ft msl **COORDINATES:** N:31.435860 E:-84.132516
CONTRACTOR Southern Company Services **EQUIPMENT** CME-558 HSA **METHOD** Hollow Stem Auger
DRILLED BY Donald Wildman **LOGGED BY** F. Mayila* **CHECKED BY** **TOP CASING ELEV.** 189.61 ft msl
BORING DEPTH 71 ft bgs **GROUNDWATER DEPTH: DURING** 52.2 ft bgs **COMP.** 52.2 ft bgs **DELAYED** NM
NOTES *Sample logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	GROUNDWATER	SAMPLE TYPE NUMBER	BLOW COUNTS (N-VALUE)/ RECOVERY % (RQD %)	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
		- clayey and silty SAND (SC/SM), brownish yellow (10 YR 6/8), loose at surface, with COAL, medium dense to dense			SS -1	8-8-10 (**18**)		Completion: Protective casing set in concrete pad; 2-foot square concrete pad Annular Fill: Cement-Bentonite Grout
5		- same as above, dark yellowish brown (10 YR 4/6)			SS -2	13-16-17 (**33**)		
		- same as above, yellowish brown (10 YR 4/6), no coal, medium dense			SS -3	7-8-9 (**17**)		
10					SS -4	13-12-13 (**25**)		
			173.58					
15		- CLAY (CL), pale brown (10 YR 6/3) to reddish brown (2.5 YR 4/4), very stiff to stiff			SS -5	45-8-9 (**17**)		
20		- same as above, 2" layer SAND with clay, some gravel			SS -6	6-6-7 (**13**)		
25		- same as above, strong brown (2.5 YR 5/8), isolated rock fragments, (no HCl reaction) stiff			SS -7	2-4-5 (**9**)		
30					SS -8	4-6-14 (**20**)		
35		- same as above, 2" layer gravel pieces/rock fragments (no HCL reaction), stiff			SS -9	5-6-8 (**14**)		
40		- same as above, 39-40' - MnO nodules, with some rock			SS -10	2-2-3 (**5**)		

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	GROUNDWATER	SAMPLE TYPE NUMBER	BLOW COUNTS (N-VALUE)/ RECOVERY % (RQD %)	HCL REACTION (Weak / Moderate / Strong)	WELL DATA
		fragrments (no HCL reaction, medium stuff *(Cont.)*						(CONTINUED) Completion: Protective casing set in concrete pad; 2-foot square concrete pad ELEV. (DEPTH)
45		- CLAY (CL), dark brown (7.5 YR 3/3), few gravel, MnO stains, stiff			SS -11	2-3-3 (**6**)		Annular Fill: Cement-Bentonite Grout
			138.58					
50		- LIMESTONE, white (10 YR 8/1), weathered, wet at 50', rock fragments, very stiff to stiff		▼	SS -12	7-12-13 (**25**)		129.38 (52.7)
55		- same as above			SS -13	5-6-7 (**13**)		Annular Seal: 3/8" bentonite pellets (coated) 129.38 (57.7)
60		- same as above			SS -14	6-7-9 (**16**)		Filter: silica filter sand 126.68 (60.4) **Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
65		- same as above			SS -15	6-11-10 (**21**)		
70			116.08					116.68
		Bottom of borehole at 71.0 feet.						Formation Collapse to 70.4 ft.
75								
80								
85								

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DATE STARTED 3/21/2017 **COMPLETED** 3/21/2017 **SURF. ELEV.** 166.50 ft msl **COORDINATES:** N:31.440650 E:-84.138792
CONTRACTOR Cascade **EQUIPMENT** C100 Track **METHOD** Rotosonic
DRILLED BY Jeremy T. **LOGGED BY** M. Andrews* **CHECKED BY** **TOP OF CASING:** 166.79 ft msl
BORING DEPTH 50 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** 27.7 ft bgs **DELAYED** 27.33 ft.;6 days
NOTES *Sample Logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), dark grayish brown (2.5 Y 4/2), fine grained	165.0			Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		- fat CLAY (CH), reddish brown (5 YR 4/4), stiff, moist				Annular Fill: Cement-Bentonite Grout
5			161.5			
		- fat CLAY (CH), brown (7.5 YR 4/4), stiff, mottled with gray	158.5			
		- silty SAND (SM), reddish yellow (7.5 YR 6/6), medium grained				
10			156.5			
		- poorly graded SAND (SP), reddish yellow (7.5 YR 6/6), medium to coarse grained, loose, moist				
15			151.5			
		- same as above	149.0			
		- silty CLAY (CL), brown (7.5 YR 5/4), fine grained, black rock fragments, moist				
20			146.0			
		- same as above	142.0			143.5 (23.0)
25		- weathered LIMESTONE, white (10 YR 8/1), rock fragments/concretions	141.0			Annular Seal: 3/8" bentonite chips
		- same as above			▽	
30			136.0			
		- same as above, large weathered limestone fragments/concretions				
35			131.0			
		- same as above				128.8 (37.7)
						Filter: silica filter sand 126.9
40			126.0			

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SIMPLE GEOLOGY WITH WELL - ESEE DATABASE.GDT - 5/30/17 12:49 - C:\USERS\MACKENZIE.FIOCA\DESKTOP\PLANT MITCHELL\PLANT BOWEN_SOUTHERN COMPANY.GPJ

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA	ELEV. (DEPTH)
45		- no recovery, assume same as above,				Completion: Protective casing set in concrete pad; 2-foot square concrete pad (CONTINUED)	
50			116.0			**Standpipe:** **2" OD PVC (SCH 40)** Screen: 10.3 ft; pre-pack with end cap	(39.7)
		Bottom of borehole at 50.0 feet.					
55							
60							
65							
70							
75							
80							
85							

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SOUTHERN COMPANY

LOG OF TEST BORING

BORING PZ-47
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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DATE STARTED 3/22/2017 **COMPLETED** 3/22/2017 **SURF. ELEV.** 164.46 ft msl **COORDINATES:** N:31.439303 E:-84.138860
CONTRACTOR Cascade **EQUIPMENT** C100 Track **METHOD** Rotosonic
DRILLED BY Jeremy T. **LOGGED BY** M. Andrews* **CHECKED BY** **TOP OF CASING:** 164.08 ft msl
BORING DEPTH 50.3 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** 25.17 ft bgs **DELAYED** 24.94 ft.;5 days
NOTES *Sample Logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy SILT (SM), dark brown (7.5 YR 3/3), organic material (leaves and roots)	162.96			Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		- silty CLAY (CL), strong brown (7.5 YR 5/6), very fine grained silt, stiff clay				Annular Fill: Cement-Bentonite Grout
5			159.46			
		- same as above, mottled with gray, very stiff				
			155.46			
10		- silty SAND (SM), brownish yellow (10 YR 6/6), medium to coarse grained, loose	154.46			
		- same as above, color change to reddish yellow (7.5 YR 6/6)	152.46			
		- silty CLAY (CL), dark yellowish brown (10 YR 4/4), fine grained, black rock fragments				
15			149.46			
		- fat CLAY (CH), yellowish brown (10 YR 5/4), small black rock fragments, hard, stiff				
20			144.46			
		- silty CLAY (CL), yellowish brown (10 YR 5/6), fine grained silt, moist, soft				141.5 (23.0)
25			139.46		▼	Annular Seal: 3/8" bentonite chips
		- weathered LIMESTONE, white (10 YR 8/1), wet, rock fragments/concretions				
30			134.46			
		- same as above, very weathered,wet				
35			129.46			
		- same as above, large concretions/rock fragments				127.5 (37.0)
						Filter: silica filter sand
40			124.46			124.5

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- same as above, very weathered, less large concretions				Completion: Protective casing set in concrete pad; 2-foot square concrete pad (CONTINUED) ELEV. (DEPTH) (40.0) **Standpipe: 2" OD PVC (SCH 40)** Screen: 10.3 ft; pre-pack with end cap
45			119.46			
		- weathered LIMESTONE, white (10 YR 8/1), abundant large rock fragments/concretions, less weathered, wet				
50			114.20			
		Bottom of borehole at 50.3 feet.				
55						
60						
65						
70						
75						
80						
85						

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DATE STARTED 3/25/2017 **COMPLETED** 3/25/2017 **SURF. ELEV.** 162.96 ft msl **COORDINATES:** N:31.436550 E:-84.139485
CONTRACTOR Cascade **EQUIPMENT** C100 Track **METHOD** Rotosonic
DRILLED BY Jeremy T. **LOGGED BY** M. Andrews* **CHECKED BY** **TOP OF CASING:** 162.68 ft. msl
BORING DEPTH 40 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** 23.3 ft bgs **DELAYED** 23.4 ft.;3 days
NOTES *Sample Logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- clayey SILT (ML), strong brown (7.5 YR 5/6), fine grained	161.0			Completion: Protective casing set in concrete pad; 2-foot square concrete pad Annular Fill: Cement-Bentonite Grout
		- silty CLAY (CL), light brown (7.5 YR 6/4), mottled with gray (7.5 YR 6/1), very fine grained, stiff				
5			158.0			
		- clayey SILT (ML), brown (7.5 YR 6/4), fine grained, mottled	156.5			
		- clayey SILT (ML), pinkish gray (7.5 YR 6/2), fine to medium grained	156.0			
		- poorly graded SAND (SP), strong brown (7.5 YR 5/6), medium to coarse grained, loose				
10			153.0			
		- same as above				
15			148.0			
		- clayey SILT (ML), strong brown (7.5 YR 5/6), fine to medium grained, trace rounded gravel				
			145.0			145.0 (18.0)
		- same as above				Annular Seal: 3/8" bentonite chips
20			143.0			
		- weathered LIMESTONE, white (7.5 YR 8/1), large rock fragments/concretions, wet			▼	
25			138.0			
		- same as above				135.5 (27.5)
						Filter: silica filter sand
30			133.0			133.0 (30.0)
		- same as above, abundant rock fragments/concretions				**Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
35			128.0			
		- same as above, during the well installation, the well settled to 40.3 ft.				
40			123.0			

Bottom of borehole at 40.0 feet.

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DATE STARTED 3/28/2017 **COMPLETED** 3/28/2017 **SURF. ELEV.** 155.85 ft msl **COORDINATES:** N:31.434670 E:-84.140203
CONTRACTOR Cascade **EQUIPMENT** C100 Track **METHOD** Rotosonic
DRILLED BY Jeremy T. **LOGGED BY** M. Andrews* **CHECKED BY** **TOP OF CASING:** 155.52 ft msl
BORING DEPTH 45 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** 17.7 ft bgs **DELAYED** 16.97 ft.;2 days
NOTES *Sample Logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- sandy SILT (ML), dark brown (10 YR 3/3), fine grained, organics (tree bark and roots)	154.9			Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		- clayey SILT (ML), pinkish gray (7.5 YR 6/2) and strong brown (7.5 YR 5/6), fine grained, some black layers				Annular Fill: Cement-Bentonite Grout
5			150.9			
		- same as above				
			146.9			
10		- poorly graded SAND (SP), reddish yellow (7.5 YR 6/6), medium to coarse grained, loose	145.9			
		- silty CLAY (CL), dark grayish brown (7.5 Y 4/2), fine grained, wood fragments	144.9			
		- poorly graded SAND (SP), reddish yellow (7.5 YR 6/6), medium to coarse grained, loos	142.0			
15		- clayey SILT (ML), light gray (7.5 YR 7/1), fine grained	140.9			
		- poorly graded SAND (SP), light brown (7.5 YR 6/4), coarse grained, loose			▼	138.9 (17.0)
			137.9		▼	Annular Seal: 3/8" bentonite chips
		- weathered LIMESTONE, white (7.5 YR 8/1), large rock fragments/concretions, wet				
20			135.9			
		- same as above				
25			130.9			
		- same as above				
30			125.9			
		- no recovery, very soft drilling, assume same as above				123.6 (32.3) Filter: silica filter sand
35			120.9			121.2 (34.7)
		- weathered LIMESTONE, white (7.5 YR 8/1), large rock fragments/concretions, wet				**Standpipe: 2" OD PVC (SCH 40)** Screen: 10.3 ft; pre-pack with end cap
40			115.9			

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- same as above	110.9			(CONTINUED) Completion: Protective casing set in concrete pad; 2-foot square concrete pad. **Standpipe: 2" OD PVC (SCH 40)** Screen: 10.3 ft; pre-pack with end cap
		Bottom of borehole at 45.0 feet.				

ELEV. (DEPTH)

50
55
60
65
70
75
80
85

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DATE STARTED 3/26/2017 **COMPLETED** 3/26/2017 **SURF. ELEV.** 156.27 ft msl **COORDINATES:** N:31.434341 E:-84.140541
CONTRACTOR Cascade **EQUIPMENT** C100 Track **METHOD** Rotosonic
DRILLED BY Jeremy T. **LOGGED BY** M. Andrews* **CHECKED BY** **ANGLE** **BEARING**
BORING DEPTH 45 ft bgs **GROUND WATER DEPTH: DURING** **COMP.** 17.8 ft bgs **DELAYED** 17.9 ft.;3 days
NOTES *Sample Logged by geologist employed by Amec Foster Wheeler

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
		- silty SAND (SM), brown (7.5 YR 4/3), fine grained, organics (roots and leaves)	155.0			Completion: Protective casing set in concrete pad; 2-foot square concrete pad
		- silty CLAY (CL), strong brown (7.5 YR 5/6), very fine grained	154.0			
		- fat CLAY (CH), strong brown (7.5 YR 5/6), stiff, hard				Annular Fill: Cement-Bentonite Grout
5			151.3			
		- silty CLAY (CL), mottled strong brown (7.5 YR 5/6) and gray (7.5 YR 6/1), very fine grained, soft				
			148.0			
		- sandy SILT (ML), light gray (7.5 YR 7/1), fine grained				
10			146.3			
		- poorly graded SAND (SP), light brown (7.5 YR 6/4) to reddish yellow (7.5 YR 6/6), medium to coarse grained, loose, some rounded gravel				
15			141.3			
		- same as above			▼	
						137.3 (19.0)
20			136.3			
		- same as above, brown (7.5 YR 5/4), trace weathered LIMESTONE fragments, coarse grained	135.5			Annular Seal: 3/8" bentonite chips
		- weathered LIMESTONE, white (7.5 YR 8/1), large rock fragments/concretions throughout				
25			131.3			
		- same as above				
30			126.3			
		- same as above				
						123.8 (32.5)
						Filter: silica filter sand
35			121.3			121.6 (34.7)
		- same as above				**Standpipe: 2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
40			116.3			

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LOG OF TEST BORING

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SOUTHERN COMPANY SERVICES, INC.
EARTH SCIENCE AND ENVIRONMENTAL ENGINEERING

PROJECT Plant Mitchell Offsite Well Installation
LOCATION Albany, GA

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEV.	HCL REACTION (Weak / Moderate / Strong)	GROUNDWATER OBSERVATIONS	WELL DATA
45		- same as above	111.3			(CONTINUED) **Standpipe:** **2" OD PVC (SCH 40)** Screen: 10 ft; pre-pack with end cap
		Bottom of borehole at 45.0 feet.				Formation Collapse to 45 ft.

Completion:
Protective casing set in concrete pad;
2-foot square concrete pad

ELEV. (DEPTH)

50
55
60
65
70
75
80
85

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B. MONITORING SYSTEM DETAILS

TABLE B-1 Monitoring Network Well Details – Plant Mitchell AP-A, 1 & 2

TABLE B-2 Groundwater Piezometer Details – Plant Mitchell AP-A, 1 & 2

FIGURE B-1A Plant Mitchell Monitoring Network Well Location Map

FIGURE B-1B Plant Mitchell Monitoring Well and Groundwater Piezometer Location and March 2, 2021 Potentiometric Surface Map of the Bedrock

Table B-1
Monitoring Network Well Details
Plant Mitchell AP-A, 1 and 2

Well Name	Installation Date	Latitude[1]	Longitude[1]	Ground Surface Elevation (ft msl)[2]	Top of Casing Elevation (ft msl)	Top of Screen Elevation (ft msl)	Bottom of Screen Elevation (ft msl)	Depth to Groundwater March 2021 (ft below TOC)[3]	Groundwater Elevation March 2021 (ft msl)[2]	Total Well Depth measured December 2016 (ft below TOC)[3]	Total Well Depth on Construction Log (ft below land surface)	Groundwater Zone Screened	Location
PZ-1D	6/11/2014	31.4472450	-84.1320980	193.44	196.44	125.8	115.8	41.17	155.27	81.7	78.0	Bedrock	Upgradient
PZ-2D	6/10/2014	31.4464570	-84.1295570	175.64	178.51	108.0	98.0	23.50	155.01	80.5	78.0	Bedrock	Upgradient
PZ-7D	6/3/2014	31.4336960	-84.1364880	170.28	173.08	123.9	113.9	27.39	145.69	60.4	57.0	Bedrock	Downgradient
PZ-14	7/25/2016	31.4338270	-84.1338940	180.85	183.46	140.4	130.4	36.89	146.57	53.2	50.0	Bedrock	Downgradient
PZ-15	7/23/2016	31.4341780	-84.1385315	167.38	170.37	96.9	86.94	26.16	144.21	83.2	80.0	Bedrock	Downgradient
PZ-16	7/25/2016	31.4356210	-84.1385225	171.21	173.92	130.7	120.7	28.55	145.37	53.2	50.0	Bedrock	Downgradient
PZ-17	7/22/2016	31.4368930	-84.1368364	170.12	172.91	119.5	109.5	27.02	145.89	62.7	60.0	Bedrock	Downgradient
PZ-18	7/23/2016	31.4384260	-84.1360169	167.34	170.11	116.6	106.6	24.41	145.70	63.2	60.0	Bedrock	Downgradient
PZ-19	7/13/2016	31.4396260	-84.1359816	169.40	172.05	120.1	110.1	26.14	145.91	62.6	59.0	Bedrock	Downgradient
PZ-23A	3/10/2020	31.4403100	-84.1309165	189.06	191.85	138.5	128.5	42.69	149.16	63.6	60.0	Bedrock	Downgradient
PZ-25	7/20/2016	31.4421290	-84.1359850	168.24	171.14	117.9	107.9	24.70	146.44	63.2	60.0	Bedrock	Downgradient
PZ-28	10/13/2016	31.4379000	-84.1385650	163.5	165.96	126.5	116.5	20.68	145.28	50.8	47.0	Bedrock	Downgradient
PZ-31	10/13/2016	31.4490120	-84.1337190	180.32	182.96	133.1	123.1	28.89	154.07	61.6	57.0	Bedrock	Upgradient
PZ-32	10/12/2016	31.4464890	-84.1309419	178.19	180.75	128.7	118.7	24.99	155.76	65.3	62.0	Bedrock	Upgradient
PZ-33	10/1/2016	31.4358600	-84.1325124	187.08	189.61	129.1	119.1	42.52	147.09	73.6	70.4	Bedrock	Downgradient

Notes:

1. Horizontal locations referenced to the North American Datum of 1983.
2. ft msl indicates feet mean sea level.
3. TOC indicates top of casing.

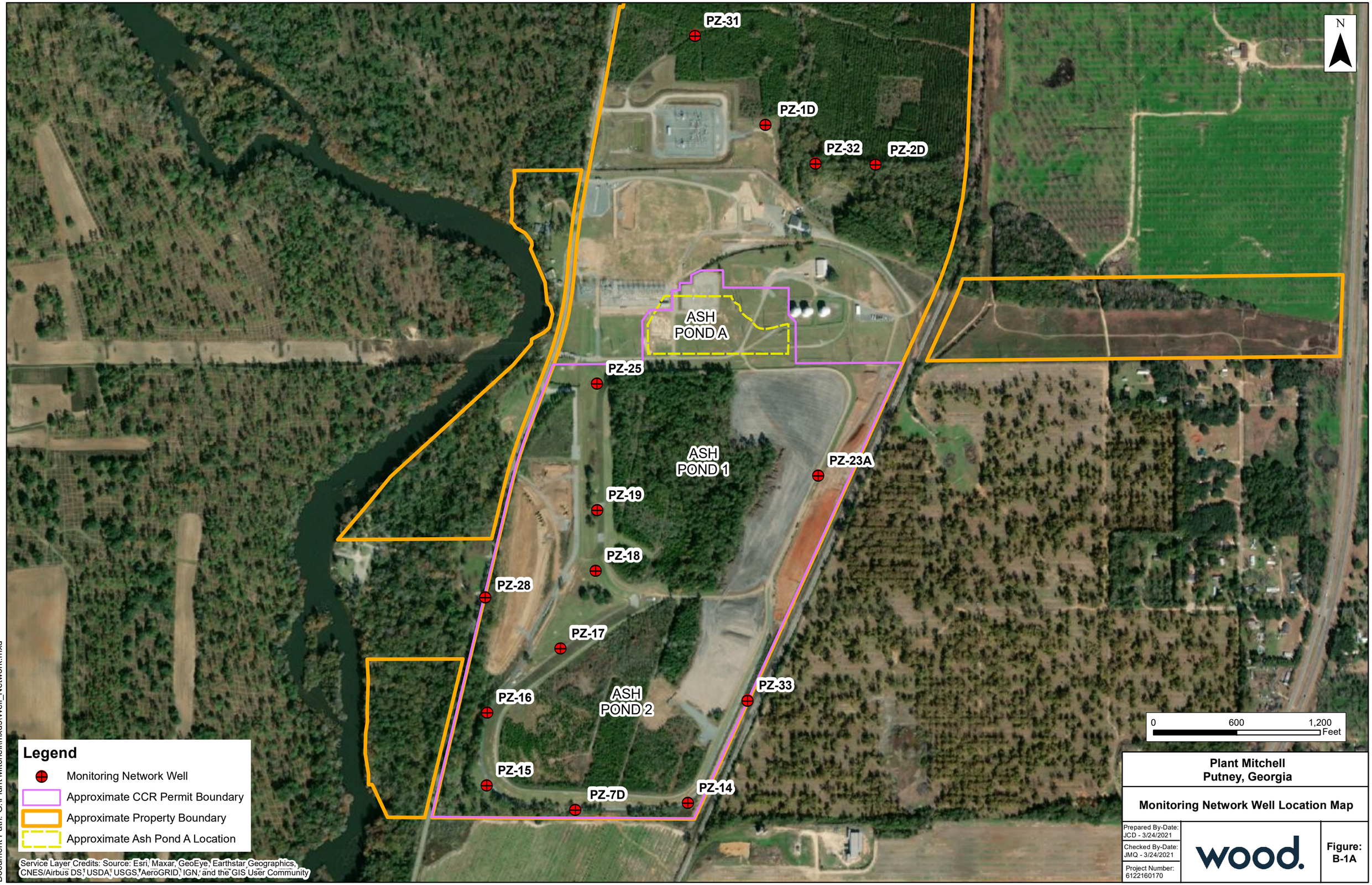
Prepared By: JMQ 2/1/2018
Checked By: NJM 2/8/2018

Table B-2
Groundwater Piezometer Details
Plant Mitchell AP-A, 1 and 2

Piezometer Name	Installation Date	Latitude[1]	Longitude[1]	Ground Surface Elevation (ft msl)[2]	Top of Casing Elevation (ft msl)	Top of Screen Elevation (ft msl)	Depth to Groundwater March 2021 (ft below TOC)[3]	Groundwater Elevation March 2021 (ft msl)	Bottom of Screen Elevation (ft msl)	Total Piezometer Depth measured in the field December 2016 (ft below TOC)[3]	Total Piezometer Depth on Construction Log (ft below land surface)	Groundwater Zone Screened
PZ-1S	6/11/2014	31.4472540	-84.1321180	193.43	196.52	145.8	26.52	170.00	135.83	61.2	58.0	Overburden (Clay)
PZ-2S	6/10/2014	31.4464550	-84.1295310	175.63	178.61	131.6	23.56	155.05	121.63	57.8	54.4	Overburden (Clay)
PZ-3S	5/28/2014	31.4445280	-84.1303160	188.14	191.12	138.5	33.97	157.15	128.54	63.5	60.0	Overburden (Sand)
PZ-3D	5/28/2014	31.4445490	-84.1303190	188.08	190.98	110.5	38.26	152.72	100.48	91.2	88.0	Bedrock
PZ-4S	5/29/2014	31.4413020	-84.1300410	188.42	191.20	163.8	18.89	172.31	153.82	38.4	35.0	Overburden (Sand/Clay)
PZ-4D	5/29/2014	31.4413180	-84.1300270	188.25	191.10	142.65	41.34	149.76	132.65	58.4	56.0	Bedrock
PZ-6S	6/13/2014	31.4359740	-84.1326000	186.52	189.47	148.88	10.72	178.75	138.88	51.4	48.0	Overburden (Clay)
PZ-7S	6/3/2014	31.4336940	-84.1364640	170.10	173.10	146.50	27.22	145.88	136.50	35.1	34.0	Overburden (Clay)
PZ-8S	6/5/2014	31.4337380	-84.1389820	167.67	170.78	142.87	17.72	153.06	132.87	38.3	35.2	Overburden (Sand)
PZ-8D	6/5/2014	31.4337430	-84.1390130	167.24	170.35	100.64	25.82	144.53	90.64	80.9	77.0	Bedrock
PZ-9S	6/5/2014	31.4346280	-84.1392760	163.06	166.02	145.46	21.61	144.41	135.46	30.7	28.0	Overburden (Sand)/Bedrock
PZ-9D	6/4/2014	31.4346470	-84.1392700	163.18	166.16	126.58	21.70	144.46	116.58	50.0	47.0	Bedrock
PZ-12S	6/4/2014	31.4402110	-84.1375070	170.93	173.92	133.33	28.97	144.95	123.33	51.6	48.0	Bedrock
PZ-13S	6/6/2014	31.4420590	-84.1370800	170.23	173.22	132.63	28.11	145.11	122.63	51.8	48.0	Overburden (Clay)
PZ-20	7/14/2016	31.4408440	-84.1359810	170.62	173.44	121.12	27.46	145.98	111.12	63.1	60.0	Bedrock
PZ-21	7/29/2016	31.4425330	-84.1334810	177.08	179.84	117.08	31.83	148.01	107.08	72.6	70.0	Bedrock
PZ-22	7/28/2016	31.4424850	-84.1308620	184.76	187.69	134.76	37.81	149.88	124.76	62.8	60.0	Bedrock
PZ-24A	3/6/2020	31.4384420	-84.1318350	192.25	194.97	132.25	47.17	147.80	122.25	73.3	70.0	Bedrock
PZ-27	10/4/2016	31.4364880	-84.1389250	161.88	164.58	123.58	18.90	145.68	113.58	52.3	48.3	Bedrock
PZ-29	10/4/2016	31.4403840	-84.1377760	170.42	173.18	123.92	28.23	144.95	113.92	60.5	56.5	Bedrock
PZ-46	3/21/2017	31.4406500	-84.1387920	166.50	166.79	126.84	Not Measured	Not Measured	116.50	49.9[4]	50.0	Bedrock
PZ-47	3/22/2017	31.4393030	-84.1388600	164.46	164.08	124.46	Not Measured	Not Measured	114.16	49.9[4]	50.3	Bedrock
PZ-50	3/25/2017	31.4365500	-84.1394850	162.96	162.68	132.96	Not Measured	Not Measured	122.96	40.0[4]	40.0	Bedrock
PZ-51	3/28/2017	31.4346700	-84.1402030	155.85	155.52	121.15	Not Measured	Not Measured	110.85	44.9[4]	45.0	Bedrock
PZ-52	3/26/2017	31.4343411	-84.1405414	156.27	156.22	121.57	Not Measured	Not Measured	111.27	45.0[4]	45.0	Bedrock
MW-101	2/14/1995	31.4421700	-84.1359570	168.14	170.93	154.84	12.46	158.47	145.34	26.3	23.4	Overburden (Sand and Clay)
MW-102	2/22/1995	31.4421720	-84.1359780	168.10	170.93	132.00	24.54	146.39	122.80	49.4	45.9	Bedrock
MW-103	2/14/1995	31.4424580	-84.1322080	184.92	187.78	164.12	7.39	180.39	154.92	33.4	30.6	Overburden (Sand and Clay)
MW-107	2/15/1995	31.4340950	-84.1336470	182.89	185.71	158.09	Dry	Dry	148.39	18.2	35.1	Overburden (Clay)
MW-108	2/16/1995	31.4340710	-84.1336690	182.75	185.47	145.05	38.71	146.76	135.95	54.5	47.4	Overburden (Clay, Sand)/Bedrock
MW-110	2/21/1995	31.4342130	-84.1386770	165.19	167.86	158.29	13.92	153.94	148.69	19.5	17.1	Overburden (Sand and Clay)
MW-111	2/21/1995	31.4342270	-84.1386890	165.28	168.06	127.78	23.64	144.42	118.78	48.9	47.1	Bedrock
MW-112	2/16/1995	31.4362480	-84.1378480	171.76	174.56	157.76	25.97	148.59	148.26	26.6	24.1	Overburden (Sand)
MW-113	2/21/1995	31.4362590	-84.1378240	171.88	174.61	129.58	27.43	147.18	120.13	52.0	52.4	Bedrock
MW-114	2/16/1995	31.4375750	-84.1362390	166.30	169.11	150.20	14.02	155.09	140.70	29.1	26.2	Overburden (Sand, Silt, Clay)
MW-115	2/21/1995	31.4375790	-84.1362150	166.23	169.05	88.63	24.05	145.00	79.53	90.2	87.3	Bedrock
MW-116	2/23/1995	31.4398130	-84.1362060	168.93	171.69	100.73	26.10	145.59	94.33	Not Measured	75.2	Bedrock
MW-117	2/15/1995	31.4397950	-84.1362060	168.84	171.66	144.24	21.06	150.60	134.74	Not Measured	34.7	Overburden (Sand and Clay)
MW-118	2/23/1995	31.4442490	-84.1321520	192.11	194.82	153.01	43.04	151.78	143.91	51.8	48.8	Overburden (Clay)
MW-119	2/27/1995	31.4444050	-84.1329780	191.60	194.49	152.50	29.22	165.27	143.40	52.6	48.8	Overburden (Clay and Sand)
MW-120	2/24/1995	31.4441170	-84.1329390	191.03	193.79	152.43	43.27	150.52	143.33	49.5	48.3	Overburden (Clay)/Bedrock

Notes:
1. Horizontal locations referenced to the North American Datum of 1983.
2. ft msl indicates feet mean sea level.
3. TOC indicates top of casing.

Prepared By: JMQ 9/26/2019
Checked By: GJW 9/26/2019



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Plant Mitchell
Putney, Georgia

Monitoring Network Well Location Map

Prepared By-Date: JCD - 3/24/2021	wood.
Checked By-Date: JMQ - 3/24/2021	Figure: B-1A
Project Number: 6122160170	

Notes:

1. Well PZ-2S is screened in the Overburden and its groundwater elevation was not used for contouring.

2. March 2021 groundwater elevations calculated using top of well casing elevations from the June 2020 resurveying.

N

PZ-31 154.07
PZ-1D 155.27
PZ-1S
PZ-32 155.76
PZ-2D 155.01
PZ-3D 152.72
MW-119
MW-118
PZ-3S
MW-120
ASH POND A
PZ-22 149.88
MW-103
PZ-21 148.01
PZ-13S
MW-101
MW-102 146.39
PZ-25 146.44
PZ-20 145.98
PZ-46
PZ-29 144.95
PZ-12S 144.95
MW-116 145.59
MW-117
PZ-19 145.91
PZ-47
PZ-18 145.70
PZ-28 145.28
MW-114
PZ-17 145.89
MW-115 145.00
PZ-27 145.68
PZ-50
MW-112 147
PZ-16 145.37
MW-113 147.18
ASH POND 2
PZ-51
PZ-9D 144.46
PZ-9S
PZ-52
MW-110
PZ-15 144.21
PZ-8S
PZ-8D 144.53
PZ-7D 145.69
PZ-7S
MW-108 146.76
MW-107
PZ-14 146.57
PZ-4S
PZ-4D 149.76
PZ-23A 149.16
PZ-24
PZ-6S
PZ-33 147.09

152 153 154 155 151 150 149 148 147 146 145

0 600 1,200 Feet

Legend

- Monitoring Network Well
- Groundwater Piezometer
- Interpreted Groundwater Flow Direction
- Bedrock Aquifer Groundwater Contour (ft amsl); Groundwater Elevations Measured March 2, 2021
- Approximate CCR Permit Boundary
- Approximate Property Boundary
- Ash Pond A Approximate

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Document Path: G:\Plant Mitchell\mxds\Well_Location_Map and March 2021 Pot.mxd

Plant Mitchell
Putney, Georgia

Monitoring Well and Groundwater Piezometer Location and Mach 2, 2021 Potentiometric Surface Map of the Bedrock

Prepared By-Date: JCD - 4/26/2021	wood.	Figure: B-1B
Checked By-Date: JMQ - 4/26/2021		
Project Number: 6122160170		

C. GROUNDWATER SAMPLING PROCEDURE

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

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

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

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

3. Install Pump: If a dedicated pump is not present, slowly lower the pump into the well to the midpoint of the well screen or a depth otherwise approved by the hydrogeologist or project scientist. The pump intake must be kept at least two feet above the bottom of the well to prevent disturbance and suspension of any sediment present in the bottom of the well. Record the depth to which the pump is lowered. All non-dedicated pumps and wiring will be decontaminated before use and between well locations using procedures described in the latest version of the Region 4 U.S. Environmental Protection Agency *Laboratory Services and Applied Science Division (LSASD) Operating Procedure for Field Equipment Cleaning and Decontamination* (USEPA, 2020 or latest version) as a guide.

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

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

6. Monitor Indicator Parameters: Monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, oxidation reduction potential, 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

   Oxidation Reduction Potential (ORP) – Record only, not used for stabilization criteria

   ±5% for specific conductance (conductivity)

±10% for DO where DO>0.5mg/L. If DO<0.5mg/L, no stabilization criteria apply

≤5 NTUs for turbidity

Temperature – 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. All sample containers should be filled with minimal turbulence by allowing the groundwater to flow from the tubing gently down the inside of the container.

8. Compliance samples will be unfiltered; however, to determine if turbidity is affecting sample results, duplicate samples may be filtered in the field prior to being placed in a sample container, clearly marked as filtered and preserved. Filtering will be accomplished by the use of 0.45-micron filters on the sampling line. At least two filter volumes of sample will pass through before filling sample containers. Filtered samples are not considered compliance samples and are only used to evaluate the effects of turbidity.

9. All sample bottles will be filled, capped, and placed in 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 preservatives will be appropriate for the analytical method being used.

11. Information contained on sample container labels will include:

    a. Name of facility

    b. Date and time of sampling

    c. Sample description (well number)

    d. Sampler's initials

    e. Preservatives

    f. Analytical method(s)

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

13. Samples will be delivered to the laboratory following appropriate chain-of-custody (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 NTU; however, samples may be collected where turbidity is less than 10 NTU and the stabilization criteria described above are met.

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

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