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Coal Combustion Waste Impoundment

Round 5 - Dam Assessment Report

E. C. Gaston Steam Plant (Site 012)

Fly Ash Dam
Alabama Power
Wilsonville, Alabama

Prepared for:

United States Environmental Protection Agency
Office of Resource Conservation and Recovery

Prepared by:

Dewberry & Davis, LLC
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INTRODUCTION, SUMMARY, CONCLUSION AND RECOMMENDATIONS

The release of over five million cubic yards of coal ash from the Tennessee Valley Authority's Kingston, Tennessee facility in December 2008, which flooded more than 300 acres of land, damaging homes and property, is a wake-up call for diligence on coal combustion waste disposal units. . A first step to prevent such catastrophic failure and damage is to assess the stability and functionality of ash impoundments and other units, then quickly take any needed corrective measures.

This assessment of the stability and functionality of the E. C. Gaston Steam Plant fly ash management unit is based on a review of available documents and on the site assessment conducted by Dewberry personnel on Wednesday, June 23, 2010. We found the supporting technical information adequate (Section 1.1.3). As detailed in Section 1.2.6 there are three recommendations that may help to maintain a safe and trouble-free operation,

In summary, the E. C. Gaston Fly Ash Impoundment Dikes are SATISFACTORY for continued safe and reliable operation, with no recognized existing or potential management unit safety deficiencies.

PURPOSE AND SCOPE

The U. S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of Coal Combustion Surface Impoundments (i.e. management unit) from occurring at electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impoundment slurry. The EPA initiative is intended to identify conditions that may adversely affect the structural stability and functionality of a management unit and its appurtenant structures (if present); to note the extent of deterioration (if present); status of maintenance and/or a need for immediate repair; to evaluate conformity with current design and construction practices, and to determine the hazard potential classification for units not currently classified by the management unit owner or by a state or federal agency. The initiative will address management units that are classified a Less-than-Low, Low, Significant or High Hazard Potential ranking. (For Classification, see pp. 3-8 of the 2004 Federal Guidelines for Dam Safety)

In December 2009, the EPA sent letters to coal-fired electric utilities seeking information on the safety of surface impoundments and similar facilities that receive liquid-borne material that store or dispose if coal combustion waste. This letter was issued under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 104(e), to assist the Agency in assessing the structural stability and functionality of such management units, including which facilities should be visited to perform a safety assessment of the berms, dikes, and dams used in the construction of these impoundments.

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EPA asked utility companies to identify all management units: surface impoundments or similar diked or bermed structures; and; landfills receiving liquid-borne materials that store or dispose of coal-combustion residuals or by-products, including, but not limited to, fly ash, bottom ash, boiler slag, and flue gas emission control residuals. Utility companies responded with information on the size, design, age, and the amount of material placed in the units so that EPA could gauge which management units had or potential could rank as having High Hazard Potential. The USEPA and its contractors used the following definitions for this study:

> "Surface Impoundment or impoundment means a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of liquid wastes or wastes containing free liquids, and which is not an injection well. Examples of surface impoundments are holding, storage, settling and aeration pits, ponds, and lagoons."
>
> For this study, the earthen materials could include coal combustion residuals. EPA did not provide an exclusion for small units based on whether the placement was temporary or permanent. Furthermore, the study covers not only waste units designated as surface impoundments, but also other units designated as landfills which receive free liquids.
>
> EPA is addressing any land-based units that receive fly ash, bottom ash, boiler slag, or flue gas emission control waster along with free liquids. If the landfill is receiving coal combustion wastes with liquids limited to that for proper compaction, then there should not be free liquids present and the EPA did not seek information on such units which are appropriately designated a landfill.
>
> In some cases coal combustion wastes are separated from the water, and the water containing de minimum levels of fly ash, bottom ash, boiler slag, or flue gas emission control wastes are sent to an impoundment. EPA is including such impoundments in this study, because chemicals of concern may have leached from the solid coal combustion wastes into the waster waters, and the suspended solids from the coal combustion wastes remain.

The purpose of this report is to evaluate the condition and potential of waste release from **management units that have not been rated for hazard potential classification**. A two-person team reviewed the information submitted to EPA, reviewed any relevant publicly available information from state or federal agencies regarding the unit potential hazard classification (if any) and accepted information provided via telephone communication with a management unit representative.

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This evaluation included a site visit. EPA sent two engineers, one licensed in the State of Alabama, for a one-day visit. The two-person team met with the owner of the management unit as well as technical and several technical representative and management unit supervisors to discuss the engineering characteristics of the unit as part of the site visit. During the site visit the team collected additional information about the management unit to be used in determining the hazard potential classifications of the management unit(s). Subsequent to the site visit the management unit owner provided additional engineering data pertaining to the management unit.

Factors considered in determining the hazard potential classification of the management unit(s) included the age and size of the impoundment, that quantity of coal combustion residuals or by-products that were stored or disposed in the these impoundments, its past operating history, and its geographic location relative to down gradient population centers and/or sensitive environmental systems.

This report presents the opinion of the assessment team as to the potential of catastrophic failure and reports on the condition of the management units(s). The team considered criteria in evaluating the dams under the National Inventory of Dams in making these determinations.

LIMITATIONS

The assessment of dam safety reported herein is based on field observations and review of readily available information provided by the owner/operator of the subject coal combustion waste management unit(s). Qualified Dewberry engineering personnel performed the field observations and review and made the assessment in conformance with the required scope of work and in accordance with reasonable and acceptable engineering practices. No other warranty, either written or implied, is made with regard to our assessment of dam safety.

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1.0 CONCLUSIONS AND RECOMMENDATIONS

1.1. CONCLUSIONS

Conclusions are based on visual observations from a one-day site visit and review of technical documentation provided by Alabama Power.

1.1.1. Conclusions Regarding the Structural Soundness of the Management Units(s)

The dike embankments and spillway appear to be structurally sound based on a review of the engineering data provided by the owner's technical staff and Dewberry engineers' observations during the site visit.

1.1.2. Conclusions Regarding the Hydrologic/Hydraulic Safety of the Management Units

Hydrologic and hydraulic data provided to Dewberry indicate adequate impoundment capacity to contain the 1 percent probability design storm without overtopping the dikes.

1.1.3. Conclusion Regarding the Adequacy of Supporting Technical Documentation

The supporting technical documentation is adequate. Engineering documentation reviewed is referenced in Appendix A.

1.1.4. Conclusions Regarding the Description of the Management Unit(s).

The description of the management unit provided by Alabama Power was an accurate representation of what Dewberry observed in the field.

1.1.5. Conclusions Regarding the Field Observations

Dewberry staff was provided access to all areas in the vicinity of the management unit required to conduct a thorough filed observation. The visible parts of the embankment dikes and outlet structure were observed to have no signs of overstress, significant settlement, shear failure, or other signs of instability although visual observations were hampered by the presence of thick vegetation in some areas. Embankments appear structurally sound. There are no apparent indications of unsafe conditions or conditions needing remedial action.

1.1.6. Conclusions Regarding the Adequacy of Management Maintenance and Methods of Operation

The current maintenance and methods of operation appear to be adequate for the fly ash management unit. There was no evidence of significant embankment repairs or prior releases observed during the field inspection.

1.1.7. Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

The surveillance program appears to be adequate. The management unit dikes are not instrumented. Based on the size of the dikes, the portion of the impoundment currently used to store wet fly ash and stormwater, the history of satisfactory performance and the current inspection program, installation of a dike monitoring system is not needed at this time.

1.1.8. Classification Regarding Suitability for Continued Safe and Reliable Operation

Facility is SATISFACTORY for continued safe and reliable operation. No existing or potential management unit safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, seismic) in accordance with the applicable criteria.

1.2. RECOMMENDATIONS

1.2.1. Recommendations Regarding the Structural Stability

None appear warranted at this time.

1.2.2. Recommendations Regarding the Hydrologic/Hydraulic Safety

No recommendations appear warranted at this time.

1.2.3. Recommendations Regarding the Supporting Technical Documentation

No recommendations appear warranted at this time.

1.2.4. Recommendations Regarding the Description of Management Units

No recommendations appear warranted at this time.

1.2.5. Recommendations Regarding Filed Observations

No recommendations appear warranted at this time

1.2.6. Recommendations Regarding the Maintenance and Methods of Operation

The maintenances and operation of the management unit dikes appears to be adequate. However, the following recommendations may help maintain safe and trouble-free operation:

- Repair shallow sloughs and erosion rills along the embankment downstream slopes
- Maintain open interior drainage channels to the south settling pond (i.e., control beaver dams).
- Review the acceptability of the "green wall" plantings at the crest near the south end of the west embankment with Southern Company Hydro Services Dam Safety.

1.2.7. Recommendations Regarding the Surveillance and Monitoring Program

Continue weekly surveillance program with particular attention to the wet area along the toe of the west dike.

1.2.8. Recommendations Regarding Continued Safe and Reliable Operation

No recommendations pertaining to the continued safe and reliable operation of the management unit appear to be warranted at this time.

1.3. PARTICIPANTS AND ACKNOWLEDGEMENT

1.3.1. List of Participants

Jay Burdett – Alabama Power
Tommy Ryals – Alabama Power
Jim Pegues – Southern Company
Rachel Mudd – Southern Company
Steven Burns – Balch & Bingham
Joseph P. Klein, III, P.E. – Dewberry
Julia Moline, EIT, CFM – Dewberry

1.3.2. Acknowledgement and Signature

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We acknowledge that the management unit reference herein had been assessed on June 23, 2010.

Joseph P. Klein, III, P.E. (AL25976)	Julia Moline, EIT, CFM

2.0 DESCRIPTION OF THE COAL COMBUSTION WASTE MANAGEMENT UNIT)

2.1. LOCATION

The E. C. Gaston Steam Plant is located along the west bank of the Coosa River in Shelby County, Alabama, The plant is approximately 1.6 miles northeast of Wilsonville, Alabama. The plant is operated by Alabama Power Company, an operating unit of Southern Company. The fly ash pond is located adjacent to the Coosa River on the southwest side of the main plant. A project location aerial photograph is provided in Appendix A – Doc 01. A project area topographic map is provided in Appendix A – Doc. 02.

The E. C. Gaston fly ash pond is impounded by clay fill dikes on the north, east and west sides.

Table 2.1.a Fly Ash Pond Dike Elevations

Dike	Crest Elevation	Max. Dike Height
East	445 ft. – 449 ft.	45 ft.
West	445 ft.	30 ft.
North	444ft. – 447 ft.	25 ft.

The impoundment area is approximately 263 acres and has a storage capacity of 30,472,917 cubic yards (18,890 acre-ft.). Aerial photographs of the impoundment are provided in Appendix A – Docs. 03 and 04.

Approximately 95 acres of the impoundment are used as fly ash settling ponds. The 95 acres are divided into two cells; one in use while the other is dredged. The remainder of the impoundment includes the central portion encompassing approximately 93 acres in use as a dry ash stacking area; approximately 35 acres in the northeast corner is used for dry storage of fly ash from plant Unit 5, and interior water drainage channels and water storage encompass 40 acres. Normal pool elevation of the active fly ash storage cell is approximately 443 ft. Normal pool of the water storage pond at the southwest corner of the impoundment is approximately 433 ft.

Material for the embankment construction was excavated from within the impoundment area adjacent to the embankments.

The E. C. Gaston Steam Plant facilities include a recently completed impoundment for storage of the gypsum byproduct from the flue gas de-sulphurization process. The impoundment is lined with a geosynthetic membrane. An aerial photograph of the gypsum impoundment is provided in Appendix A – Doc. 05. An assessment of the gypsum impoundment is not included in the scope of this assessment.

2.2. SIZE AND HAZARD CLASSIFICATION

The classification for size, based on the height of the embankments and the impoundment storage capacity, is "Intermediate" with the USACE Recommended Guidelines for Safety Inspection of Dams ER 1110-2-106 criteria summarized in Table 2.2a.

Table 2.2a USACE ER 1110-2-106 Size Classification

Category	Impoundment	
	Storage (Ac-ft)	Height (ft)
Small	< 1,000	25 to < 40
Intermediate	1,000 to < 50,000	40 to < 100
Large	> 50,000	> 100

Alabama did not have a State Dam Safety program at the time Dewberry conducted this assessment. Therefore the impounding dike system does not have an established hazard classification. Dewberry conducted a qualitative hazard classification based on the Federal Guidelines for Dam Safety, dated April, 2004.

Table 2.2b FEMA Federal Guidelines for Dam Safety Hazard Classification

Hazard Potential Classification	Loss of Human Life	Economic, Environmental, Lifeline Losses
Low	None Expected	Low and generally limited to owner
Significant	None Expected	Yes
High	Probable. One or more expected	Yes (but not necessary for this classification)

Based on the relatively close proximity of single family homes to the south end of the west dike, loss of human life is probable in the event of a catastrophic failure of that dike. Therefore, Dewberry evaluated the **west dike as a** "**high hazard potential**". Loss of human life is not probable in the event of a catastrophic failure of the east or north dikes. However, a failure of either of those dikes is expected to have a significant economic and environmental impact. Therefore, Dewberry evaluated the **east and north dikes as "significant high hazard potential**".

2.3. AMOUNT AND TYPE OF RESIDUALS AND MAXIMUM CAPACITY OF UNIT

Table 2.3: Amount of Residuals and Maximum Capacity of Unit	
	E. C. Gaston Fly Ash Pond
Surface Area (acre)	263
Current Storage Capacity (cubic yards)[1]	30,472,917
Current Storage Capacity (acre-feet)	18,888
Current Storage (cubic yards)[1]	18,472,917
Crest Elevation (feet)	445
Normal Fly Ash Cell Level (feet)[2]	442
Normal Water Pond Level (feet)[2]	432

[1] Based on measurements taken in 2007 (See Appendix A – Doc 06)
[2] Based on Site Topographic Survey (See Appendix A – Doc. 07)

2.4. PRINCIPAL PROJECT STRUCTURES

2.4.1. Earth Embankment Dikes

The three dikes are composed of compacted sandy clay and clay fill embankments. The design crest width of each dike is 15 feet; however, the crests have been widened in some areas to provide access to roadways within the impoundment and improved maintenance access to downstream/exterior slopes. The exterior slopes are 2.5:1 on the east dike, and 2:1 on the west and north dikes. Interior slopes are 2.5:1 on the east dike and 1.5:1 on the west and north dikes. The downstream slopes are vegetated with various species of grass and ivy. Interior slopes are mostly covered with marsh grasses, bushes and small trees. 1959 design drawings show the embankments with a crest elevation of 445 ft (See Appendix A – Docs 08 through 12). A recent topographic survey indicates the crest elevation varies from approximately 444ft. to 449 ft (See Appendix A – Doc. Doc 07). Table 2.4.1 presents a summary of the dimensions and size specifications of each dike.

Table 2.4.1: E. C. Gaston Steam Plant Fly Ash Pond Summary of Dam Dimensions and Size Dimension			
	East Dike	**West Dike**	**North Dike**
Dam Height (feet)	45	25	27
Crest Width (feet)	15	15	15
Length (feet)	3650	2865	4170
Side Slopes (interior) (H:V)	2.5:1	1.5:1	1.5:1

Side Slopes (exterior) (H:V)	2.5:1	2:1	2:1
Hazard Classification	High Hazard Potential	Significant Hazard Potential	Significant Hazard Potential

2.4.2. Outlet Structures

The fly ash impoundment has a concrete decant riser approximately 8ft. square with an invert elevation of approximately 409 ft. and a 36-inch diameter spillway pipe located in the original ground beneath the south end of the east dike. The spillway pipe discharges to a ditch that flows to the Coosa River. Access to the decant riser is provided by a fixed, steel frame, steel grate walkway which also serves as a partial debris grill.

The fly ash impoundment does not have an emergency spillway.

2.5. CRITICAL INFRASTRUCUTRE WITHIN FIVE MILES DOWNGRADIENT

Critical infrastructure inventory data were not provided to Dewberry for review.

Based on available are topographic maps, surface drainage in the area of the Fly Ash Pond is to the southwest. A bend in the Coosa River intercepts surface runoff approximately 2-1/2 miles southwest of the Fly Ash Pond (See Appendix A Doc 02). Based on available area aerial photographs and a brief driving tour of the area Dewberry did not identify critical infrastructure assets down gradient of the Fly Ash Pond to the Coosa River.

3.0 SUMMARY OF RELEVANT REPORTS, PERMITS AND INCIDENTS

3.1. SUMMARY OF REPORTS ON THE SAFETY OF THE MANAGEMENT UNIT

Alabama Power provided reports of three dam safety reports of inspections (internal) conducted by Southern Company engineers. The reports provided included:

- "E. C. Gaston Steam Plant Ash Pond Dam, Report of Biennial Dam Safety Inspection, October 10, 2007 (See Appendix A – Doc.13)
- "E. C. Gaston Steam Plant Ash Pond Dam, Dam Safety Inspection", report dated December 21, 2009 (See Appendix A – Doc. 14)
- "E. C. Gaston Steam Plant Ash Pond Dam, 2010 Dam Safety Inspection", dated June 14, 2010 (See Appendix A – Doc. 15)

The 2007 inspection concluded that that the structures were performing adequately and that no conditions were observed that would affect the continued safe operation of the facility.

The 2009 inspection report concluded that the structures were performing adequately and provided recommendations pertaining to maintenance activities related to the dike structures. The maintenance recommendations focused on removal of brush and trees from embankment slopes, and removal of beaver dams blocking internal drainage ditches in the impoundment. The report notes that the plant staff refers to a "green wall" near the crest of the west dike. The green wall is beneficial in mitigating dust migration toward homes in close proximity to the west dike. The inspection report concludes that a "green wall" of shallow rooted bamboo is acceptable if located no more than 5 ft. below the crest of the dike.

The 2010 inspection report concluded that the structures were performing adequately and provided recommendations for specific maintenance issues. The recommendations included continuing the improved dike vegetative control program, repair of small surface slides, monitoring two small wet areas at the toe of the west dike, and repair of erosion rill along the east dike and adjacent to the roadway leading to the spillway discharge outlet structure.

The Earth Science & Environmental Engineering Department of Southern Company Generation Technical Services prepared a Summary of Geotechnical Findings dated October 9, 2009 (See Appendix A – Doc. 16). The report concluded that the dikes have stability safety factors at or above minimum recommended values.

3.2. SUMMARY OF LOCAL, STATE AND FEDERAL ENVIRONMENTAL PERMITS

The State of Alabama has not implemented a dam safety program; therefore there is no local or state dam permit.

Discharge from the impoundment is regulated by the Alabama Department of Environmental Management and the impoundment has been issued a National Pollutant Discharge Elimination System Permit,. Permit No. AL 0003140 was issued July 27, 2007, modified September 10, 2007 and expires June 30, 2012 (See Appendix A – Doc 17).

3.3. SUMMARY OF SPILL/RELEASE INCIDENTS

Data reviewed by Dewberry did not indicate any spills, unpermitted releases, or other performance related problems with the dam over the last 10 years.

4.0 SUMMARY OF HISTORY OF CONSTRUCTION AND OPERATION

4.1. SUMMARY OF CONSTRUCTION HISTORY

4.1.1. Original Construction

The E. C. Gaston fly ash pond was designed in the late 1950s and constructed in the early 1960s. The initial phase constructed the dikes to a crest elevation of 445 feet. Planned Stage 2 construction to reconfigure the impoundment and raise the dikes was cancelled. A partial set of project plan and section drawings were made available and reviewed (See Appendix A – Docs. 08 through 12).

4.1.2. Significant Changes/Modifications in Design since Original Construction

The dikes have not been significantly changed or modified since their original construction.

A small section at the south end of the east dike has been widened to the outside in order to provide room for storage and maintenance facilities. (See Appendix A – Doc. 01).

A small section of the south end of the west dike was being widened at the time of this inspection.

4.1.3. Significant Repairs/Rehabilitation since Original Construction

No information was provided regarding major repairs or rehabilitation. No evidence of prior releases, failures, or patchwork was observed on the earthen dikes during the visual site assessment and no documents or statements were provided to the dam assessor that indicates prior releases or failures have occurred.

The owner's 2010 Inspection Report (See Appendix A – Doc 15) identified small surficial slides in the interior slope of the north dike and surface erosion rills along the east dike and adjacent to the access road to the spillway outlet structure. These items were not mentioned in the owner's 2009 Inspection Report (See Appendix A – Doc 14). This suggests that the surficial slides and erosion rills are of recent origin.

4.2. SUMMARY OF OPERATIONAL HISTORY

4.2.1. Original Operational Procedures

The impoundment was designed and operated for fly ash sedimentation and control. The impoundment originally received plant process water, slurryed coal combustion waste, and storm-water runoff from the pond embankments. The original operating procedure was to pump the coal combustion waste slurry to three cells in an area along the north side of the impoundment, designated Zone 1. The three coal combustion waste cells were used on an alternating basis. Water from Zone 1 was conveyed by an interior drainage ditch to the spillway pond in the southeast corner of the impoundment.

4.2.2. Significant Changes in Operational Procedures since Original Startup

In the mid 1980s the western portion of the impoundment began to be used to store/stack dry fly ash. A storm-water settling pond was constructed along the northwest side of the impoundment along the area designated for dry fly ash storage. Overflow from the settling pond was conveyed by interior ditches to the spillway pond (See Appendix A Doc. 18).

In 2007 the coal combustion waste cell in the northeast corner of Zone 1 was closed and converted to storage of dry fly ash from the new generating unit, designated Unit 5. Wet ash from the remaining units continues to be piped in a slurry form to the two remaining cells on an alternating basis.

4.2.3. Current Operational Procedures

Operational procedures put into effect upon the 2009 conversion of a wet cell to receive dry fly ash remain in effect. See Appendix A – Doc. 19).

4.2.4. Other Notable Events since Original Startup

No additional information was provided to Dewberry of other notable events impacting the operation of the impoundment.

5.0 FIELD OBSERVATIONS

5.1. PROJECT OVERVIEW AND SIGNIFICANT FINDINGS

Dewberry personnel Joseph P. Klein, III, P.E. and Julia Moline, EIT, CFM performed a site visit on Wednesday June 23, 2020 accompanied by utility company representatives.

The site visit began at approximately 9:00 AM. The weather was sunny and hot. Photographs were taken of conditions observed. Please refer to photographs in Appendix B and the Dam Inspection Checklist in Appendix C – Doc. 23. Selected photographs are included here for ease of visual reference. All photographs were taken by Dewberry personnel during the site visit.

The overall assessment of the impoundment and the dikes is that they are in satisfactory condition and no significant findings were noted.

5.2. EARTH EMBANKMENT DIKES

5.2.1. Crest

The crest of each dike had no signs of depressions, tension cracks or other indications of settlement of shear failure. Previous inspection reports reviewed by Dewberry did not indicate issues concerning crest of any of the dikes. Figure 5.2.1-1 shows the condition of the crest of the east dike. Photographs 1 – 3, Appendix B provide additional views of the crest of the east dike.

Figure 5.2.1.1. Photo Showing Crest of East Dike

Figure 5.2.1-2 shows the condition of the crest of the west embankment.

Figure 5.2.1-2 Photo Showing Dam Crest of West Dike (Upstream/Interior on Left)

The crest at the south end of the west embankment is planted with bamboo, and Bradford Pear and Mimosa trees as a "green wall". The owner's 2010 Inspection Report (See Appendix A – Doc. 9) noted the green wall and recommended that it extend no further than 5 ft. below the crest of the dike. The report indicates the green wall is undergoing further review. Results of the review were not available to Dewberry at the time of this inspection. Photographs 4 and 5, Appendix B provide additional views of the crest of the west dike.

5.2.2. Upstream/Interior Slopes

The upstream slope of the east dike is bare earth with spotty areas of tall grass or weeds. There were no observed scarps, sloughs, bulging, cracks, scarps, depressions or other indications of slope instability or signs of erosion. Figure 5.2.2-1 shows a representative section of the upstream slope of the east dike.

Figure 5.2.2-1 Photo Showing Upstream/Interior Slope of East Dike.

The upstream slope of the west dike is bare earth and areas of scrub grass, bushes and small trees. There were no observed scarps, sloughs, bulging, cracks, scarps, depressions or other indications of slope instability or signs of erosion. Figure 5.2.2-2 shows a representative section of the upstream slope of the west dike. Photographs 6 – 8, Appendix B provide additional views of the upstream slopes of the west dike.

Figure 5.2.2-2 Photo Showing Upstream/Interior of West Dike

The upstream slope of the north dike is vegetated with grasses and weeds similar to the east dike, but with more coverage. There were no observed scarps, sloughs, bulging, cracks, scarps, depressions or other indications of slope instability or signs of erosion.

5.2.3. Downstream/Exterior Slope and Toe

The downstream or exterior slope of the east dike is protected with several species of grass and weeds. No major scarps, sloughs, depression or other indication of slope instability or signs of uncontrolled seepage were observed. Figure 5.2.3-1 shows a representative section of the downstream slope of the east dike. Trees shown in the photograph are located on the natural slope beneath the fill embankment. The southwestern end of the east dike downstream slope is more heavily vegetated than the main dike length.

Figure 5.2.3 -1 Photo Showing Downstream Slope of East Dike.

Small areas of sloughing and small erosions rills were observed along the downstream slope of the east dike. The erosion rills were discussed in the owner's 2010 Inspection Report. Figures 5.2.3-2 and 5.2.3-3 show an area of sloughing and a typical erosion rill, respectively.

Figure 5.2.3-2 Photo Showing Small Area Mid-Slope Sloughing on East Dike Downstream Slope

Figure 5.2.3-3 Photo Showing Small Erosion Rill East Dike Downstream Slope

No areas of seepage or soft soils were observed along the toe of the east bank downstream slope. Photographs 9 – 17, Appendix B provide additional views of the downstream slopes of the east dike. Figure 5.2.3-4 shows the central length of the east dike downstream slope toe. Photograph 18, Appendix B provides an additional view of the toe of the east dike.

Figure 5.2.3-4 Photo Showing Toe of East Dike Downstream Slope

The downstream or exterior slope of the west dike is protected with several species of grass and ivy. There were no observed scarps, sloughs, bulging, cracks, scarps, depressions or other indications of slope instability or signs of erosion. Figure 5.2.3-1 shows a representative section of the upstream slope of the east dike. Trees shown in the photograph are located in an adjacent low lying area adjacent to the embankment.

Figure 5.2.3-5 Photo Showing West Bank Downstream Slope

One are of sloughing was observed along the west dike downstream slope. Figure 5.2.3-6 shows the observed sloughing. The sloughing was not cited in the owner's 2010 Inspection Report; therefore it is expected to be relatively new. Photographs 19 – 21, Appendix B provide additional views of the downstream slope of the west dike.

Figure 5.2.3-6 Photo Shows Small Area of Sloughing on West Dike Downstream Slope.

The toe of the west dike downstream slope is generally free of seepage and soft soils. One small area of standing water was observed. The owner's 2010 Inspection Report reported two small wet zones, one of which was observed in this inspection. The Inspection Report recommended monitoring the wet areas as part of weekly inspections. Figure 5.2.3-7 shows the wet area observed by Dewberry. The conditions observed by Dewberry were similar to those shown in photographs included in the 2010 Inspection Report. The difference being that there was less water observed by Dewberry than shown in the 2010 Inspection Report photographs. Photographs 22 – 25, Appendix B present additional views of the toe of the west dike.

Figure 5.2.3-7 Photo Showing Small Wet Area West Dike Downstream Toe

The downstream or exterior slope of the north dike is protected with several species of tall grass. There were no observed scarps, sloughs, bulging, cracks, scarps, depressions or other indications of slope instability or signs of erosion. Dewberry did not observe the shallow slide face on the downstream slope included in the owner's 2010 Inspection Report. No areas of seepage or soft soils were observed along the toe of the north dike downstream slope. Figure 5.2.3-8 shows the west end of the north embankment downstream slope.

Figure 5.2.3-8 Photo Showing West End of North Embankment Downstream Slope

5.2.4. Abutments and Groin Areas

Erosion or uncontrolled seepage was not observed along the groins. Abutments and groin areas appeared to be in good condition. Groin slopes are protected with the same vegetative cover as the adjoining slope. Figure 5.2.4-1 shows the west embankment to north embankment groin area. Photographs 26 and 27, Appendix B provide additional views of the groin area formed by the intersection of the west and north dikes.

Figure 5.2.4-1 Photo Showing North End Groin Area of West Dike,

5.3. OUTLET STRUCTURES

5.3.1. Overflow Structure

The impoundment overflow structure is located in the southeast corner of the impoundment. It consists of an 8 ft. square concrete riser with an invert elevation of 409 ft and a 36-inch diameter concrete pipe installed in natural ground beneath the south end of the east dike. The spillway pipe discharges to a ditch that flows into the Coosa River. Access to the riser structure is provided by a fixed, steel frame, steel grate walkway from the crest of the south end of the east dike. The walkway wraps around the riser structure and serves as a partial debris rack. Figure 5.3.1-1 shows the overflow riser.

Figure 5.3.1-1 Photo Showing Overflow Riser

Photographs 28 - 30, Appendix B provide additional views of the spillway riser.

5.3.2. Outlet Conduit

The outlet conduit appeared to be in good condition and operating normally with no sign of clogging. Water flowing from the outlet was clear. Figure 5.3.2-1 shows the water discharging from the outlet pipe.

Figure 5.3.2-1 Photo Showing Water Discharge from Outlet Pipe.

Photograph 31 and 32, Appendix B provide additional views of the spillway outfall structure and outfall channel.

5.3.3. Emergency Spillway

No emergency spillway is present.

5.3.4. Low Level Outlet

No low level outlet is present.

6.0 HYDROLOGIC/HYDRAULIC SAFETY

6.1. SUPPORTING TECHNICAL DOCUMENTATION

6.1.1. Floods of Record

No documentation has been provided about the flood of record.

6.1.2. Inflow Design Flood

Southern Company Engineering and Constructions Services conducted a hydrologic and hydraulic analysis of the capacity of the Fly Ash Pond to store water from the design storm event (See Appendix A – Doc. 20). The design storm was a 100 year (1 percent probability in a given year), 24-hour event with an estimated intensity of 9-inches. The report estimates that the 1 percent probability storm can be retained in the Fly Ash Pond, raising the spillway pond water elevation to about 439 feet, leaving a freeboard of at least 4.5 feet.

6.1.3. Spillway Rating

No spillway hydraulic data were provided for review.

6.1.4. Downstream Flood Analysis

No downstream flood analysis data were provided for review.

6.2. ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Supporting documentation reviewed by Dewberry is adequate.

6.3. ASSESSMENT OF HYDROLOGIC/HYDRAULIC SAFETY

Based on the calculations provided in the hydrologic and hydraulic study (See Appendix A – Doc 20) the Fly Ash Pond can retain the 1 percent design storm event with a freeboard safety of at least 4.5 feet. Hence dike failure by overtopping seems improbable.

7.0 STRUCTURAL STABILITY

7.1. SUPPORTING TECHNICAL DOCUMENTATION

7.1.1. Stability Analysis and Load Cases Analyzed

The October 9, 2009 Summary of Geotechnical Findings for Plant Gaston Ash Pond Existing Dike Stability Assessment summarizes a recent stability analysis following the general guidelines of the US Army Corps of Engineers slope stability engineering manual (See Appendix A – Doc. 16). The assessment used the results of 12 soil test borings drilled in February 2009. The assessment also used soil classification and shear strength laboratory results dated July 2009.

The stability analyses included the results of three loading conditions:

- Steady state conditions based on ground water levels measured at the time of the borings
- Seismic loading applied to the steady state loading
  - A horizontal acceleration of 0.1 g used for seismic loading
- Static analysis with ground water levels raised to near the dike crest elevation

Based on the results of the analyses it was concluded that the embankments have stability safety factors at or above the minimum recommended values.

7.1.2. Design Parameters and Properties of Materials

Documentation provided to Dewberry for review was the 2009 Geotechnical Findings for Plant Gaston Ash Pond Existing Dike Stability Assessment (See Appendix A – Doc. 16). The documentation indicated the stability analyses assumed three material strata: ash fill, medium to high plasticity clay fill, and in situ medium to high plasticity clay. The material properties used for the primary stability analyses are shown in Table 7.1.2

Table 7.2.1 Summary of Soil Properties Used in Stability Analyses

Soil Strata	Unit Weight (pounds/cubic foot)	Cohesive Strength (pounds/square foot)	Angle of Internal Friction
Ash Fill	95	100	22.0^{O}
Clay Fill	132	170	33.6^{O}
In Situ Clay	125	730	26.3^{O}

The geotechnical assessment includes a second set of analyses for the same loading conditions but reducing each soil strength value by 15 percent to evaluate the effects of potential variability in soil conditions.

7.1.3. Uplift and/or Phreatic Surface Assumptions

No documentation of uplift calculations was provided to Dewberry for review. Based on the Geotechnical Findings (See Appendix A – Doc 16) the initial phreatic surface was assumed to be at the elevation measured in the borings, projected into the ash stacks. A second analysis assumed a high ground water condition in both the embankment and the ash pile.

7.1.4. Factors of Safety and Base Stresses

The safety factors computed in the Geotechnical Findings (See Appendix A Doc. 16) are listed in Table 7.1.4

Table 7.1.4 Factor of Safety E. C. Gaston Fly Ash Pond

Loading Condition	Soil Strength	Required Safety Factor (US Army Corps of Engineers)	West Dike Average Computed Safety Factor	East Dike Average Computed Safety Factor
Steady State	Full Design Strength Parameters (See Table 7.2.1)	1.5	2.02	2.05
Steady State with Seismic Loading		1.2	1.90	1.60
High Ground Water Conditions		1.3	1.82	1.75
Steady State	85 % of Full Design Strength Parameters	1.5	1.97	1.75
Steady State with Seismic Loading		1.2	1.55	1.35
High Ground Water Conditions		1.3	1.53	1.50

Based on the results summarized in Table 7.1.4 the Embankments were found to have stability factors at or above the minimum.

7.1.5. Liquefaction Potential

The documentation reviewed by Dewberry did not include an evaluation of liquefaction potential. Foundation soil conditions do not appear to be susceptible to liquefaction.

7.1.6. Critical Geologic Conditions and Seismicity

The oldest geologic unit that crops out in the site area is the Knox Group of Cambrian and Ordovician age. The Knox that occurs in this portion of Alabama is primarily comprised of the Copper Ridge Dolomite. Un-weathered exposures of the Knox consist of a light- to medium-gray, fine-crystalline, massive, siliceous dolomite. Weathering of the unit produces a red to brown, cherty residual clay. Chert in the unit is typically compact, dense, hard, and the color ranges from white to yellowish-gray. Weathering of the Copper Ridge Dolomite forms typical incipient karst type topography. Residual deposits are usually thick and may reach up to one hundred (100) feet. The maximum thickness of the entire Copper Ridge Dolomite is 1,800 feet. The Copper Ridge Dolomite crops out in the hanging wall of the Wilsonville thrust fault in the extreme southern part of the plant site. No visible karst topography has been noted in this outcrop area.

In the new stability analyses (See Appendix A – Doc. 16) a peak ground acceleration of 0.10g was used for seismic loading. The basis for the selection was not provided.

The current Seismic Risk Map of the United States was reviewed using the U.S. Geologic Survey web site. The 2% probability of exceedance in 50 years ground acceleration for rock at the site is 0.05g to 0.10 g. The seismic design criteria used in the analyses are appropriate for the E. C. Gaston Fly Ash Pond.

7.2. ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

Structural stability documentation is adequate.

7.3. ASSESSMENT OF STRUCUTRAL STABILTY

Overall, the structural stability of the dikes appears to be satisfactory based on the following observations during the June 23, 2010 filed visit and dam inspection by Dewberry, available recent dam inspection reports and the 2009 Geotechnical Finings report:

- The crest appeared free of depressions and no significant vertical or horizontal alignment variations were observed,

- There were no indication of major scarps, sloughs or bulging along the dikes,

- Boils, sinks or uncontrolled seepage was not observed along the slopes, groins or toe of the dikes,

- The computed factors of safety comply with accepted criteria.

8.0 ADEQUACY OF MAINTENANCE AND METHODS OF OPERATIONS

8.1. OPERATIONAL PROCEDURES

The facility is operated for the storage of both wet and dry fly ash deposits. Coal combustion process waste water discharges into one of two alternating cells in the northwest corner of the facility. Dry ash from generating Unit 5 is conveyed to a reclaimed cell in the northeast corner of the facility. The central portion of the facility is used for dry stack fly ash storage. Process water from the wet ash storage cells and precipitation water is channeled to setting ponds at the southwest and southeast corners of the facility. Treated process water and storm water is discharged though an unregulated overflow outlet structure located in the southeast corner of the facility.

8.2. MAINTENANCE OF THE DAM AND METHODS OF OPERATION

The 2009 Safety Procedure for Dams and Dike (See Appendix A –Doc 19) establishes inspection and maintenance requirements for the impoundment dikes. The required procedures include:

- Weekly inspection by plant personnel,
- Annual inspections by Southern Company Generation Hydro Service dam safety engineers,
- Maintaining a uniform cover of suitable species of grass on embankment slopes which shall be mowed at least twice a year
- Dam crests shall be protected by a suitable granular surface, and
- Trees and woody brush should not be allowed on the slopes, crest and along the water line of the dikes unless an exception is approved by Southern Company Generation Hydro Services,

8.3. ADEQUACY OF MAINTNENANCE AND METHODS OF OPERATION

8.3.1. Adequacy of Operational Procedures

Based on the assessments of this report, operation procedures seemed to be adequate.

8.3.2. Adequacy of Maintenance

Various dam inspection reports, including Southern Company Dam Inspection Reports dated December 21, 2009 and June 14, 2010 (See Appendix A – Docs. 14

and 15 respectively) and the Dam Inspection Checklist of June 23, 2010 by Dewberry (See Appendix C – Doc 23 "Dam Inspection Checklist) reported no major maintenance issues. The 2010 Southern Company Dam Inspection Report includes several maintenance recommendations but none that are considered critical or imminent. This indicates that the current maintenance plan is probably followed in practice and that adequate maintenance is provided for the dikes and project facilities.

Although the maintenance program is adequate, several recommendations have been made to improve the maintenance and insure trouble-free operation:

- Repair shallow sloughs and erosion rills along the downstream embankments
- Maintain open drainage channels to the south settling ponds inside the impoundment
- Monitor the small wet area at the toe of the west dike
- Review the acceptability of the "green wall" plantings at the crest near the south end of the west embankment.

9.0 ADEQUACY OF SURVEILLANCE AND MONITORING PROGRAM

9.1. SURVEILLANCE PROCEDURES

Weekly Inspections

Weekly inspections are conducted by plant personnel. Inspection observations are documented on the "E.C. Gaston Steam Plant – Ash Pond Dam Surveillance Visual Inspection Check List and Report (See Appendix A- Doc. 21). Inspection reports are submitted to the plant manager for review and appropriate corrective actions.

Annual Inspections

Annual inspections are conducted by Southern Company Generation Hydro Services dam safety engineers. The frequency of inspections was increased from biannual to annual in the 2009 Safety Procedure for Dams and Dikes (See Appendix A – Doc. 19). The 2010 inspection report was submitted June 14, 2010 (See Appendix A – Doc. 15)

Special Inspections

No special inspections have been conducted at the E.C. Gaston fly ash pond.

9.2. INSTRUMENTATION MONITORING

The E. C. Gaston fly ash impoundment dikes not have an instrumentation monitoring system.

9.3. ASSESSMENT OF SURVEILLANCE AND MONITORING SYSTEM

9.3.1. Adequacy of Inspection Program

Based on the data reviewed by Dewberry, including observations during the site visit, the inspection program is adequate.

9.3.2. Adequacy of Instrumentation Monitoring Program

The E. C. Gaston fly ash dikes are not instrumented. Based on the size of the dikes, the portion of the impoundment currently used to store wet fly ash and storm-water, the history of satisfactory performance and the current inspection program, installation of a dike monitoring system is not needed at this time.


© 2010 Europa Technologies
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©2009 Google
Imagery Date: Jun 15, 2006
33°14'23.46" N 86°27'42.27" W elev 428 ft
Eye alt 11462 ft


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GAS-API-0006

Dzw barry

ALABAMA POWER
A SOUTHERN COMPANY

January 28, 2010

Mr. Richard Kinch
U.S. Environmental Protection Agency
Two Potomac Yard
2733 South Crystal Drive
Fifth Floor; N-5783
Arlington, Virginia 22202-2733

Re: Response to Request to Alabama Power Company for Information Regarding Plant Gaston Under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. 9604(e), dated December 29, 2009

Dear Mr. Kinch:

On behalf of Alabama Power Company ("Alabama Power"), this letter and two enclosures respond to the request by the Environmental Protection Agency ("EPA"), dated December 29, 2009, to provide certain information regarding the management of coal combustion by-products at the Ernest C. Gaston Electric Generating Plant ("Plant Gaston").

EPA has requested some information which Alabama Power does not ordinarily report or maintain for the use of any state or federal agency. Some of EPA's requests have required Alabama Power to gather, compile, and confirm information in a manner which is beyond its usual business practices. To provide complete and accurate responses, Alabama Power has relied on personnel and information located at the plants, at corporate headquarters, and at Southern Company Services, an affiliated company. Alabama Power has made a reasonable effort to ensure the accuracy and completeness of its responses within the short time demanded by EPA. Alabama Power reserves the right to supplement this response should the company determine it is appropriate to do so based on additional information or for other reasons.

Certain information included in Alabama Power's responses would raise homeland security concerns if publicly disclosed, and some of that information is also confidential commercial information. Accordingly, some of Alabama Power's responses are confidential or not otherwise subject to public disclosure for purposes of 5 U.S.C. § 552(b)(2), (4) and (7) and 18 U.S.C. § 1905. Alabama Power has provided the responses which include confidential information in a separate appendix, which is marked as confidential. Pursuant to EPA's regulations, Alabama Power asserts a claim of confidentiality for the portions of this response marked as confidential. Should EPA contemplate any disclosure of Alabama Power's confidential information, whether pursuant to the Freedom of Information Act or otherwise,

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Alabama Power expects EPA to provide notice and an opportunity to substantiate its claims of confidentiality, as is required by EPA's regulations.

Alabama Power has gathered information to respond to EPA's request in consultation with legal counsel. Providing this information does not constitute any waiver of the attorney-client privilege or any other applicable claim of confidentiality with respect to communications, documents, or any other information of Alabama Power. Alabama Power provides this response on a voluntary basis. Alabama Power does not concede the authority of EPA to compel disclosure of the information provided or to require a certification pursuant to CERCLA Section 104(e), nor does Alabama Power waive any other right or privilege it may possess.

Please direct all future correspondence regarding this and related matters to Matthew W. Bowden, Vice President, Environmental Affairs, Alabama Power Company, 600 North Eighteenth Street, Birmingham, Alabama, 35203.

Sincerely,

Matthew W. Bowden
Vice President
Environmental Affairs
Alabama Power Company

Enclosures

ALABAMA POWER COMPANY RESPONSES TO EPA QUESTIONS
REGARDING MANAGEMENT OF COAL COMBUSTION BY-PRODUCTS

E.C. GASTON ELECTRIC GENERATING PLANT
Highway 25 South
Wilsonville, Alabama 35186

January 28, 2010

Note: The text of EPA's questions is included below in *italics*. Alabama Power's responses are provided in plain text.

Please provide the information requested below for each surface impoundment or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. This includes units that no longer receive coal combustion residues or by-products, but still contain free liquids.

1. *Relative to the National Inventory of Dams criteria for High, Significant, Low, or Less-than-Low, please provide the potential rating for each management unit and indicate who established the rating, what the basis of the rating is, and what federal or state agency regulates the unit(s). If the unit(s) does not have a rating, please note that fact.*

The Gaston Ash Pond Dam is not listed in the National Inventory of Dams ("NID") database and is therefore not rated. No federal or state agency regulates the Gaston Ash Pond Dam structure relative to the NID.

2. *What year was each management unit commissioned and expanded?*

Available information indicates the Gaston ash pond dam was put in service in 1960. Information we have indicates the volume of the ash pond was expanded in 2006.

3. *What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (1) fly ash; (2) bottom ash: (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other," please specify the other types of materials that are temporarily or permanently contained in the unit(s).*

Fly ash, bottom ash, boiler slag, flue gas emission control residuals, and other (regulatory permitted low volume wastes, i.e., waste that is not hazardous for purposes of RCRA Subtitle C and is otherwise permitted under applicable regulations such as 40 C.F.R. § 423.11).

4. *Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management unit(s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste management unit(s) under the supervision of a Professional Engineer?*

Based on available information, Alabama Power is unable at this time to represent the qualifications and credentials of the individuals responsible for the original design and construction of the Gaston Ash Pond Dam in the 1960's. However, the structure is supported by an operational history of over 40 years. In addition, the Gaston Ash Pond has been included in our comprehensive Dam Safety Inspection program since 1972. This inspection program includes regular dam safety inspections by engineers employed by Southern Company Services, and who hold current Professional Engineer licenses in Alabama. Plant employees visually inspect the embankment structure on a no less than weekly basis.

5. [Response provided in an appendix.]

6. [Response provided in an appendix.]

7. [Response provided in an appendix.]

8. [Response provided in an appendix.]

9. *Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years, whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to surface water or to the land (do not include releases to groundwater).*

Alabama Power's review provides no basis to indicate a spill or unpermitted release from the Gaston ash pond structure within the last ten years.

10. *Please identify all current legal owner(s) and operator(s) at the facility.*

Southern Electric Generating Company (SEGCO), comprised of 50% Georgia Power Company and 50% Alabama Power Company, owns Units 1-4. Alabama Power owns Unit 5. Alabama Power Company is the operator of all 5 units.

###

DO NOT DISCLOSE

CONFIDENTIAL BUSINESS INFORMATION
NOT SUBJECT TO DISCLOSURE UNDER THE FREEDOM OF INFORMATION ACT

CONFIDENTIAL APPENDIX

ALABAMA POWER COMPANY RESPONSES TO EPA QUESTIONS
REGARDING MANAGEMENT OF COAL COMBUSTION BY-PRODUCTS

E. C. GASTON ELECTRIC GENERATING PLANT
Highway 25 South
Wilsonville, Alabama 35186

January 28, 2010

Note: The text of EPA's questions is included below in *italics*. Alabama Power's responses are provided in plain text. This confidential appendix provides only those questions and responses for which the response includes information subject to a claim of confidentiality.

Please provide the information requested below for each surface impoundment or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. This includes units that no longer receive coal combustion residues or by-products, but still contain free liquids.

5. *When did the company last assess or evaluate the safety (i.e., structural integrity) of the management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective actions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected to occur?*

The most recent dam safety inspection of the Gaston ash pond dam was conducted on July 1, 2009, by engineers from Alabama Power's affiliate, Southern Company Services. The inspectors are licensed Professional Engineers in Alabama, have multiple years of experience, and specialize in dam safety. The dam safety inspection of the Gaston ash pond dam is currently scheduled on an annual frequency. The next dam safety inspection of the ash pond dam will be conducted in calendar year 2010, at a date to be determined.

Most of the recommendations made as a result of the most recent dam safety inspection of the Gaston ash pond dam can be characterized as maintenance activities and required no action with respect to the structural integrity or continued safe operation of the dam. One recommendation involved sloping back a low vertical cut made for an access road across a section of the dike. The actions taken in response to these recommendations require no engineering or dam safety credentials and have been or will be addressed by facility personnel in the course of their normal duties. It was also recommended that Southern Company Service's engineers be consulted with respect to any contemplated future road construction.

Southern Company Services engineers also performed an embankment stability analysis that reflected borings drilled in February 2009 and subsequent laboratory testing of boring samples. The engineers are licensed Professional Engineers in Alabama, have multiple years of experience, and specialize in civil engineering, including specifically dam stability. The analysis did not identify any issues or areas of concern with respect to the stability of the embankment.

6. *When did a State or a Federal regulatory official last inspect or evaluate the safety (structural integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation. Please provide a copy of the most recent official inspection report or evaluation.*

Alabama Power has identified no basis to indicate a federal or state agency has inspected or evaluated the ash pond at Gaston for purposes of the structural integrity of those structures.

7. *Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safety issue(s) with the management unit(s), and, if so, describe the actions that have been or are being taken to deal with the issue or issues. Please provide any documentation that you have for these actions.*

See Question 6. In addition, Alabama Power's dam safety program has not identified any issues or conditions that would affect the continued safe operation of the facility.

8. *What is the surface area (acres) and total storage capacity of each of the management units? What is the volume of material currently stored in each of the management unit(s)? Please provide the date that the volume measurement(s) was taken. Please provide the maximum height of the management unit(s). The basis for determining maximum height is explained later in this Enclosure.*

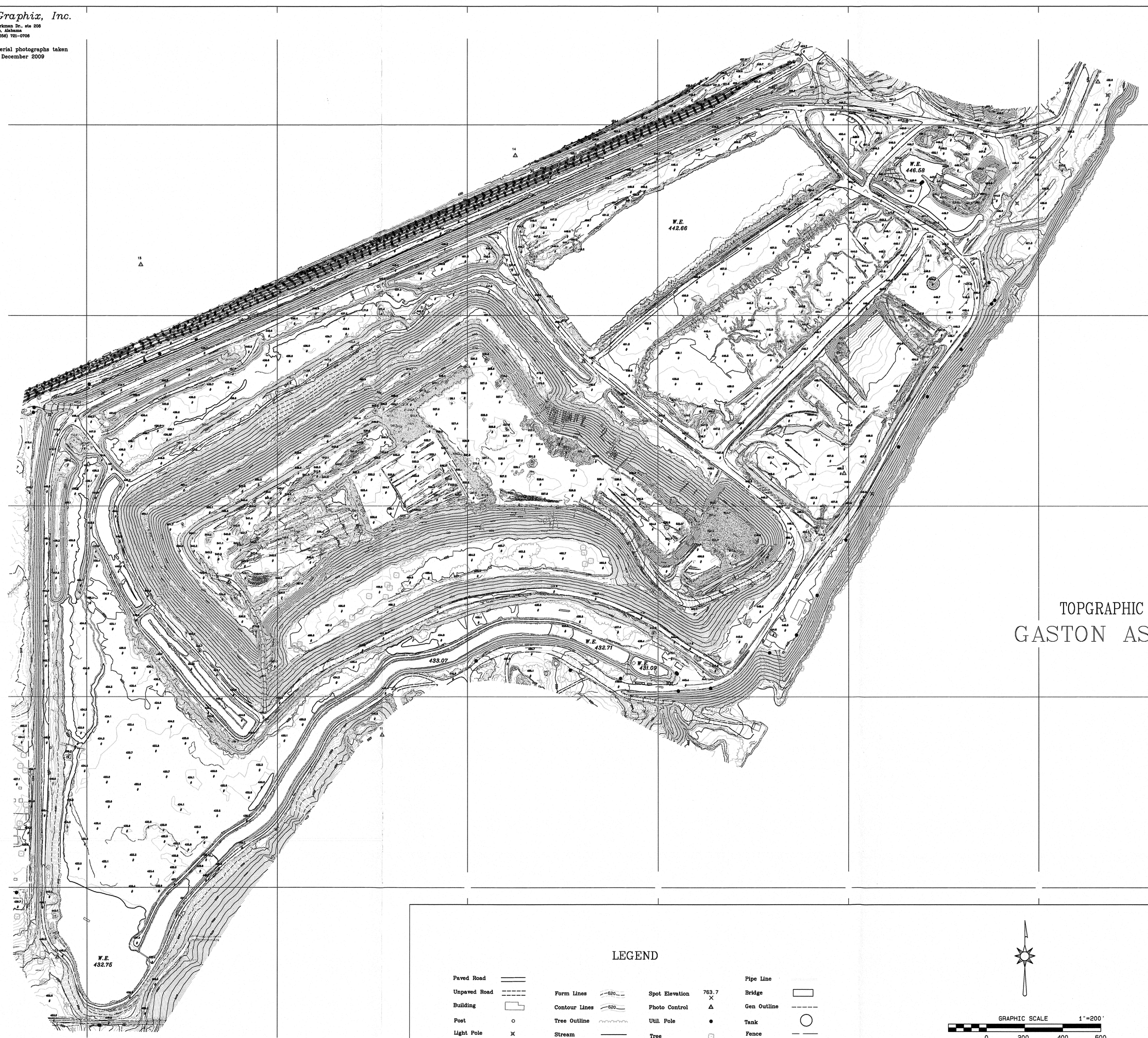
	Gaston Ash Pond
Approximate acres	339
Approximate storage capacity (cubic yards)*	30,472,917
Approximate volume stored (cubic yards)*	18,472,917
Approximate date measurement taken	2007
Approximate maximum height	45 feet

* Cubic yard figures are estimates derived by qualified personnel from available information.

###

GeoGraphix, Inc.
1580 Sparkman Dr., ste 206
Huntsville, Alabama
Phone: (256) 721-0708

from aerial photographs taken
during December 2009



TOPGRAPHIC MAP OF:
GASTON ASH POND

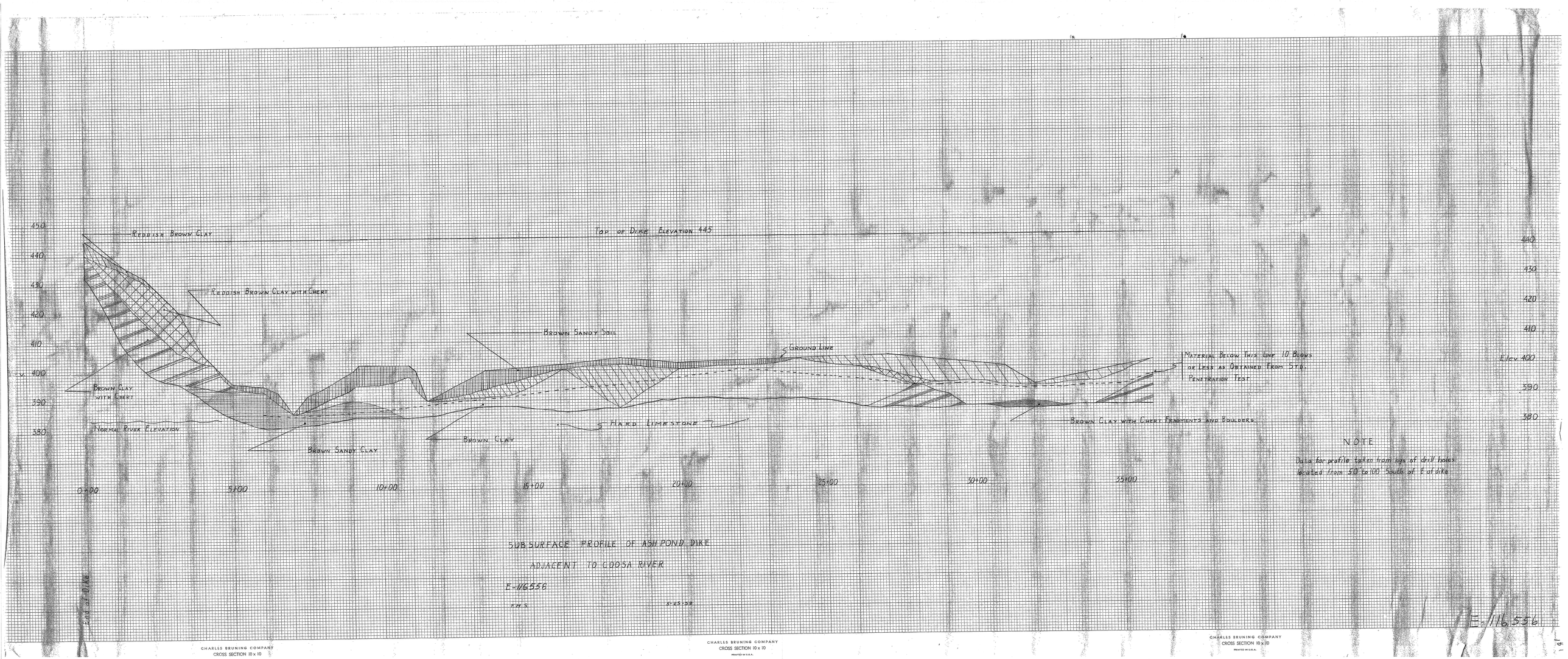
LEGEND

Paved Road		Form Lines	520	Spot Elevation	763.7
Unpaved Road		Contour Lines	520	Photo Control	△
Building		Tree Outline		Util. Pole	●
Post	o	Stream		Tree	
Light Pole	⋇				

Pipe Line		
Bridge		
Gen Outline		
Tank		
Fence	— —	

GRAPHIC SCALE 1"=200'
0 200 400 600
CONTOUR INTERVAL = 1 FT.

SOUTHERN COMPANY SERVICES
I-65 South, Shelby County Airport, EXIT 234 - GSC#7
Calera, AL 35040
TEL: (205) 664-6215 * FAX: (205) 664-6293



SUBSURFACE PROFILE OF ASH POND DIKE

ADJACENT TO COOSA RIVER

E-116556

FWS 2-25-52

CHARLES BRUNING COMPANY
CROSS SECTION 10 x 10
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E-116556

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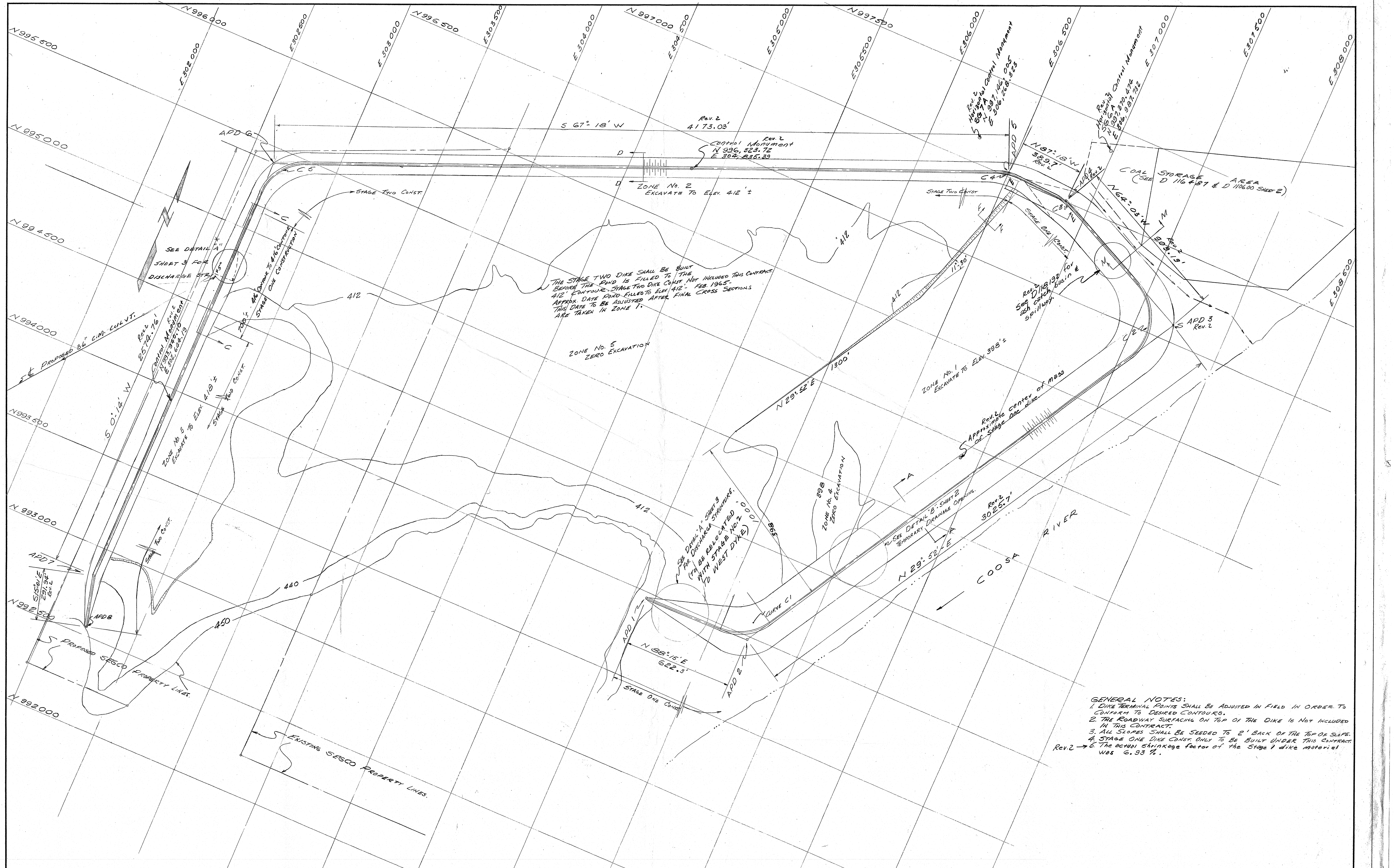
GAS-API-0015



GENERAL NOTES:
1. DIKE TERMINAL POINTS SHALL BE ADJUSTED IN FIELD IN ORDER TO CONFORM TO DESIRED CONTOURS.
2. THE ROADWAY SURFACING ON TOP OF THE DIKE IS NOT INCLUDED IN THIS CONTRACT.
3. ALL SLOPES SHALL BE SEEDED TO 2' BACK OF THE TOP OF SLOPE.
4. STAGE ONE DIKE CONST. ONLY TO BE BUILT UNDER THIS CONTRACT.
Rev. 2 → 5. The actual shrinkage factor of the Stage 1 dike material was 6.93 %.

Rev. 2 C.E.Y. 3-23-60 Revised drawing to show miscellaneous changes made in field.

Rev. 1 C.E.Y. 7-7-59 Revised property line & added B/M No. & material mark numbers.

ALABAMA POWER COMPANY	
JOB	SEGCO No. 1 STEAM PLANT
DETAIL	ASH SETTLING POND - PLAN & SECTIONS
SCALE	1" = 200' B/M B 117017
DRAWN	YEAGER
CHECKED	
TRACED	5-13-1959
APPROVED	DATE 5-13-59
APPROVED	DATE 5-19-59
SHEET 1 OF 4 SHEETS	D-116482
SUPERSEDES	

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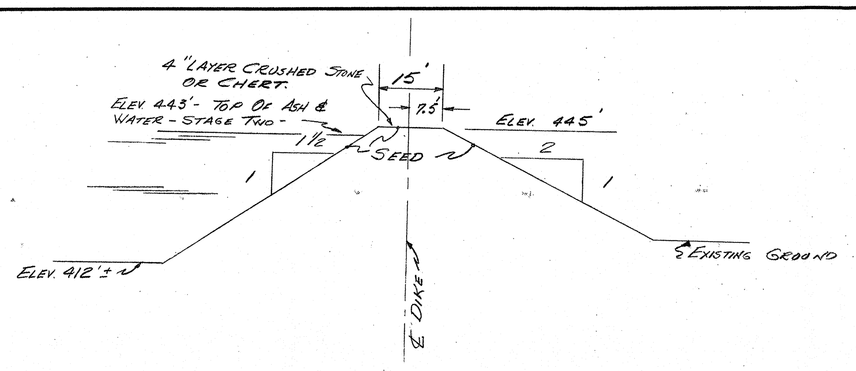
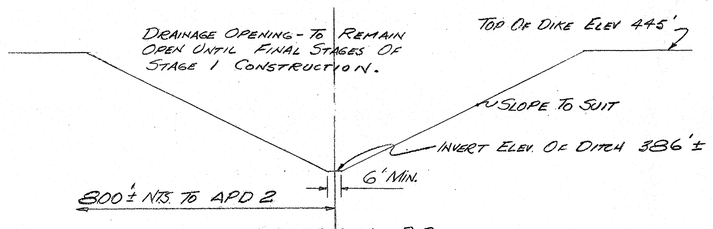
GAS-API-0016

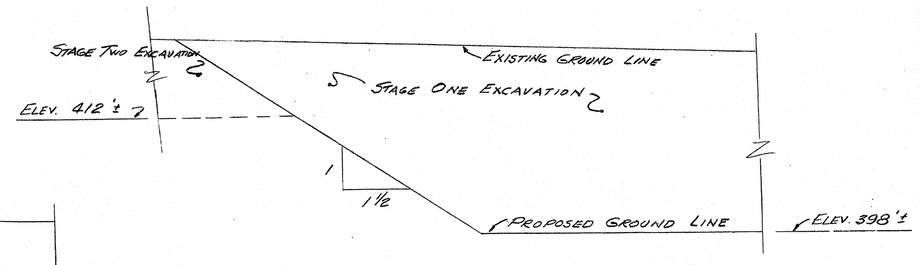
TABLE No. 1 CURVE DATA					
CURVE NO.	Δ	D	R	T	L
C 1	58°-23'-00"	20°	287.94'	160.87'	291.90'
C 2	98°-55'-00"	20°	287.94'	308.32'	469.60'
C 3	23°-15'-00"	20°	287.94'	59.24'	116.25'
C 4	25°-24'-00"	20°	287.94'	64.89'	127.00'
C 5	67°-04'-00"	20°	287.94'	190.24'	335.94'
C 6 REV. 2	15°-15'-00"	20°	287.94'	38.55'	76.25'



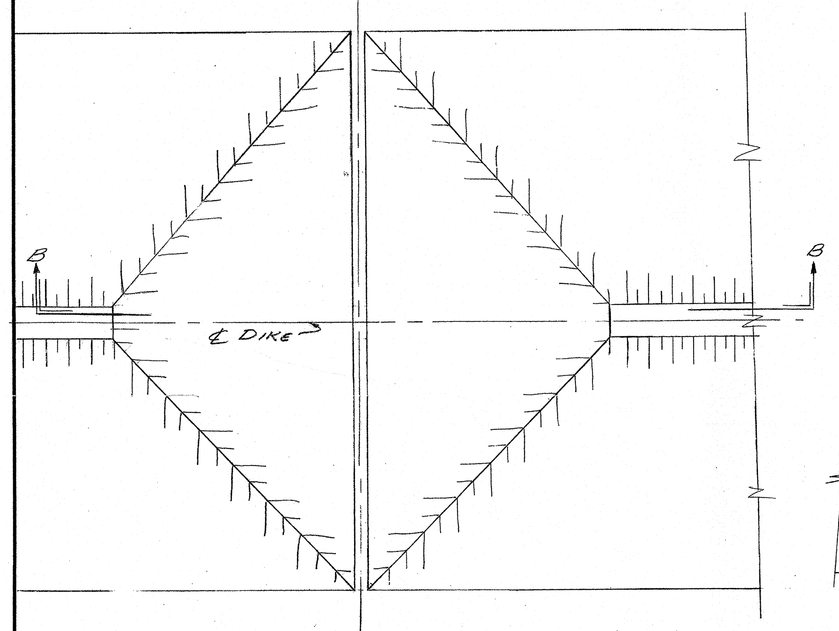
DIKE SECTION D-D-TYPICAL FOR STAGE TWO CONSTRUCTION
SCALE 1"=20'



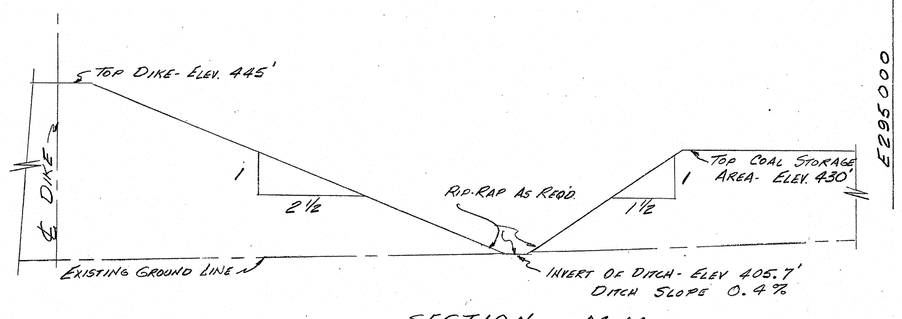
SECTION B-B
NOT TO SCALE



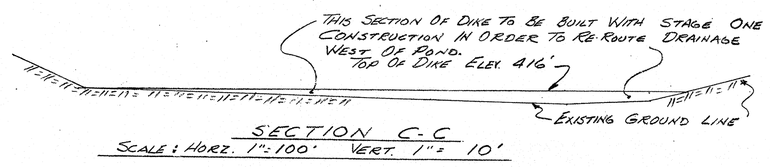
SECTION E-E
SCALE 1"=10'



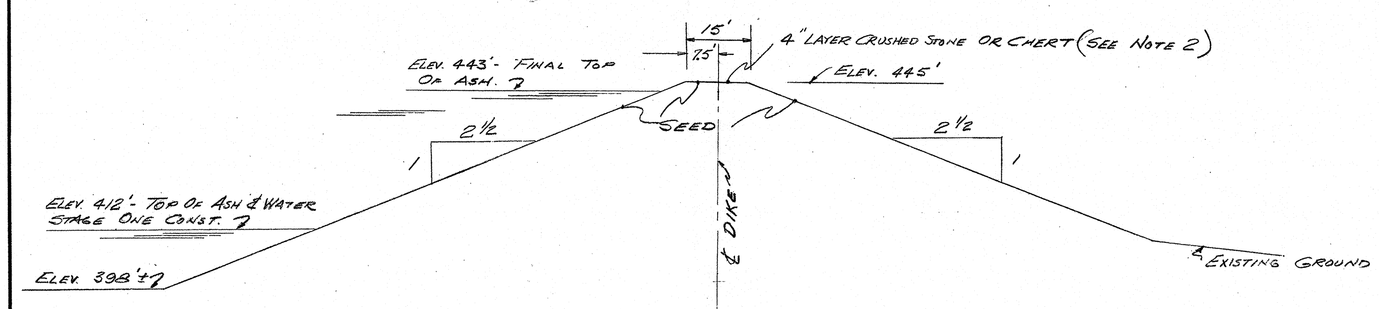
DETAIL "B" - PLAN - TEMPORARY DRAINAGE OPENING
NOT TO SCALE



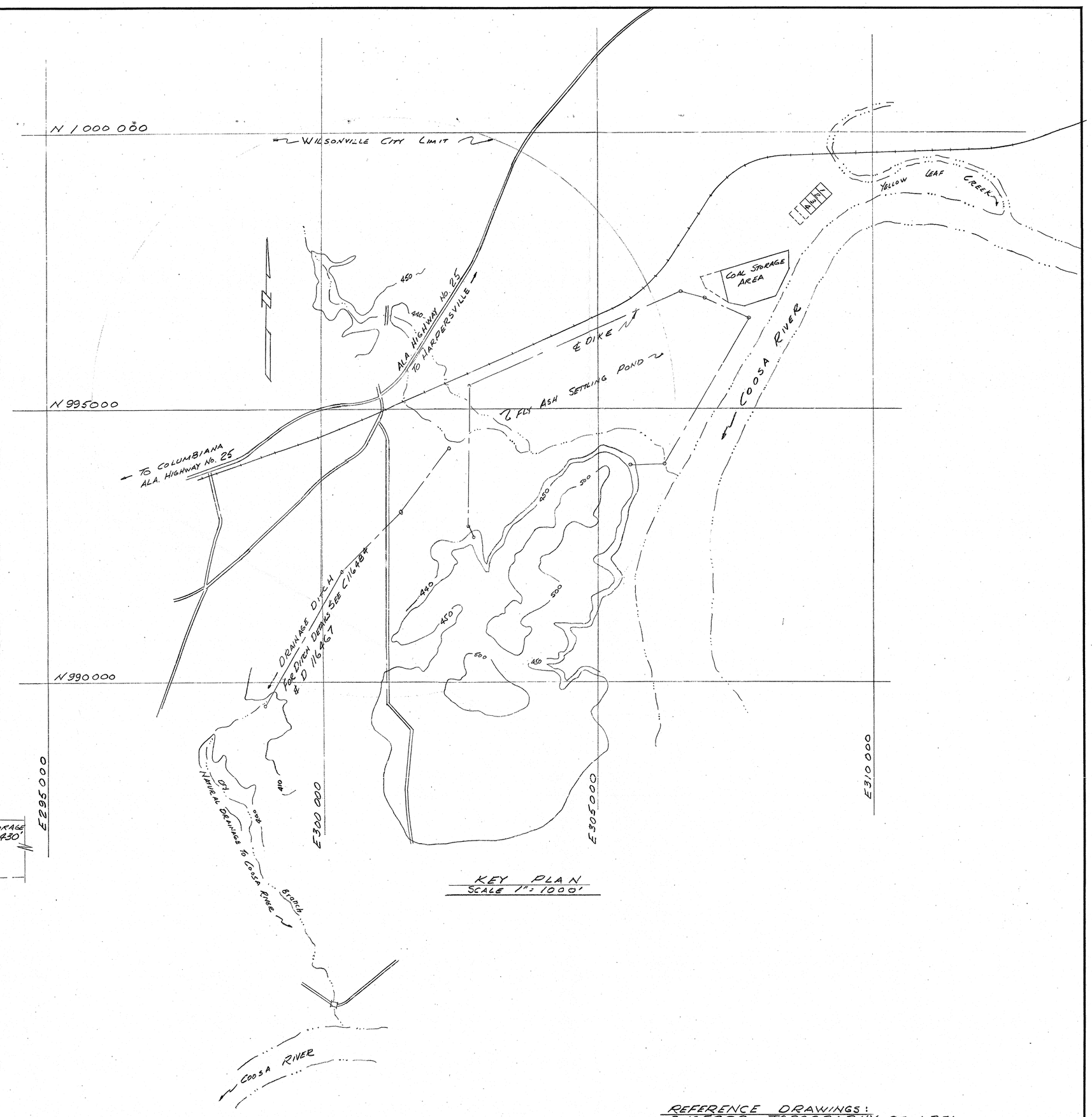
SECTION M-M
SCALE 1"=20'



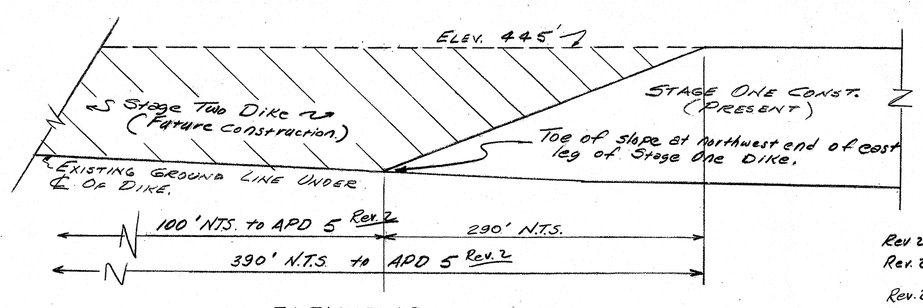
SECTION C-C
SCALE: HORZ. 1"=100' VERT. 1"=10'



DIKE SECTION A-A - TYPICAL FOR STAGE ONE CONSTRUCTION
SCALE 1"=20'



KEY PLAN
SCALE 1"=1000'



ELEVATION E-E
SCALE 1"=20'

REFERENCE DRAWINGS:
D 105382 TOPOGRAPHY OF AREA.
D 113178 TOPOGRAPHY OF AREA.
D 110600 YARD GRADING & PRELIMINARY EXCAVATION DETAILS.
D 116457 CLEARING REQUIRED FOR ASH SETTLING POND AREA.
D 116410 EXCAVATION PLAN & SECTIONS FOR CONST. TRACK RELOCATION IN AREAS 1 & 2.
E 116407 GRADING LAYOUT FOR AREAS 1 & 15.
C 116483 - DETAILS OF PIPE ARCHES UNDER COUNTY ROAD WEST OF ASH POND AREA.
C 116484 PLAN & PROFILE OF DRAINAGE DITCH WEST OF ASH SETTLING POND.
B 116485 - BILL OF REINFORCING - CONCRETE HEADWALL FOR ASH POND DISCHARGE PIPE.
B 116486 BILL OF REINFORCING - CONCRETE CRADLE FOR DISCHARGE PIPE.
D 116487 - EXTENSION TO COAL STORAGE AREA.
D 116457 CLEARING REQUIRED FOR ASH SETTLING POND.
Rev. 2 → D 118192 - ASH DISPOSAL CATCH BASIN AND SPILLWAY.
Rev. 2 → D 118417 - RIGHT OF WAY FOR DRAINAGE DITCH WEST OF ASH STORAGE AREA.
Rev. 2 → C 117525 - FILL BETWEEN COAL STOR. AREA & ASH POND DIKE FOR ASH DISPOSAL LINE.

Rev. 2 C.E.Y. 8-23-60 Revised drawing to show miscellaneous changes made in field.

Rev. 1 C.E.Y. 7-7-59 Revised property line & added B/M No. & material mark numbers.

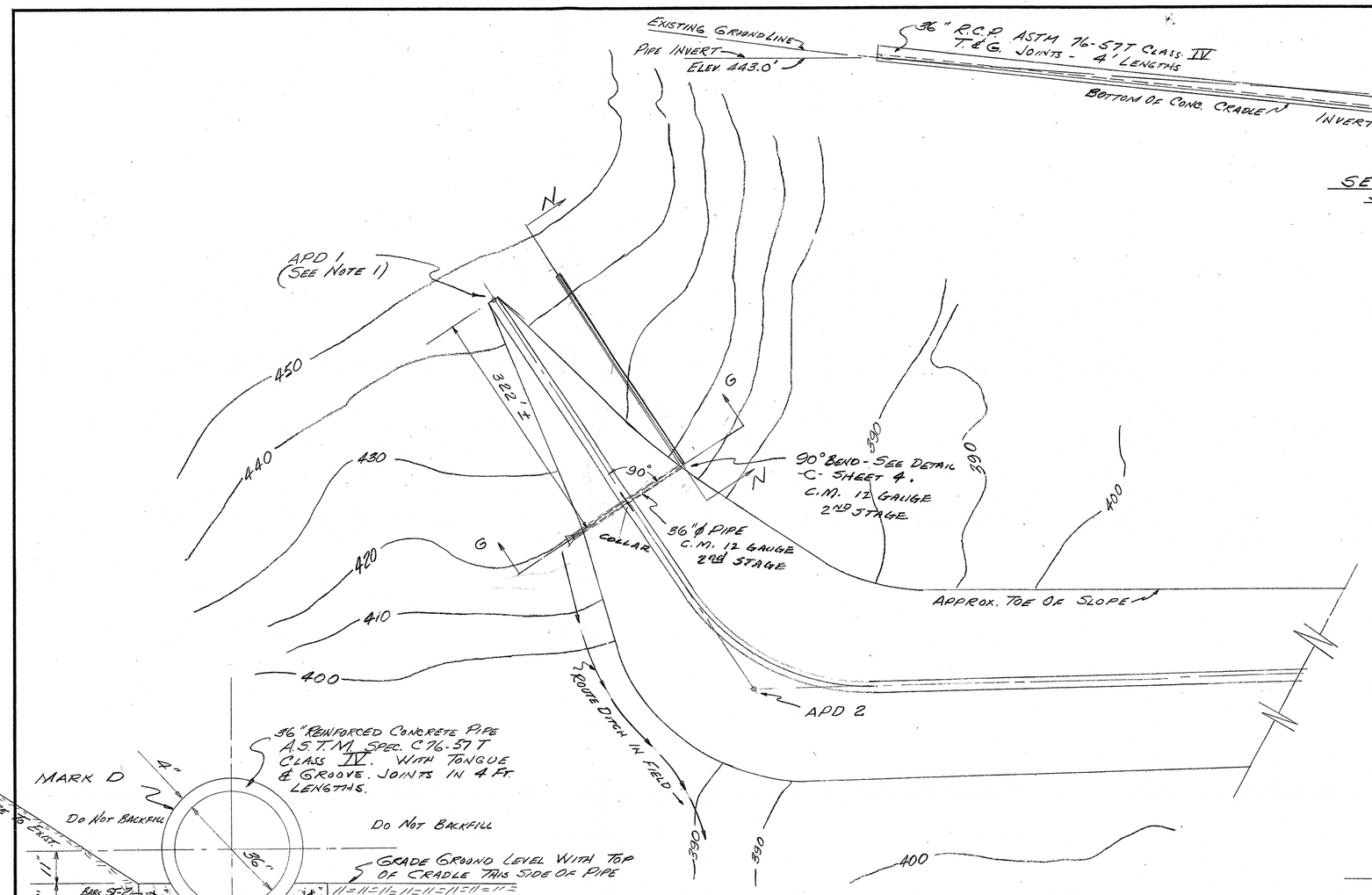
DRAWN YEAGER CHECKED TRACED 5-13-1959
APPROVED DATE 5-19-59
APPROVED DATE 5-19-59

ALABAMA POWER COMPANY

JOB SEGCO No. 1 STEAM PLANT
DETAIL ASH SETTLING POND- PLAN & SECTIONS
SCALE AS SHOWN B/M B 117019
SHEET 2 OF 4 SHEETS
SUPERSEDES

D-116482

CONFIDENTIAL

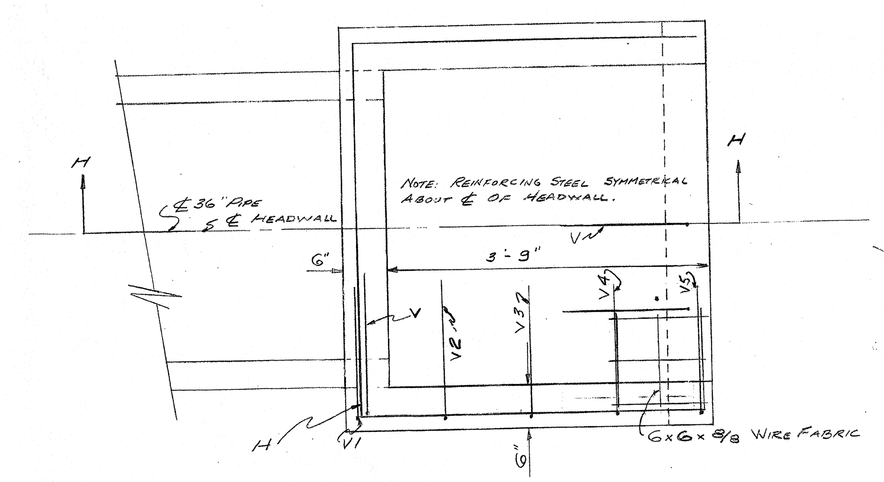


DETAIL - A - PLAN - DISCHARGE STRUCTURE
SCALE 1" = 100'

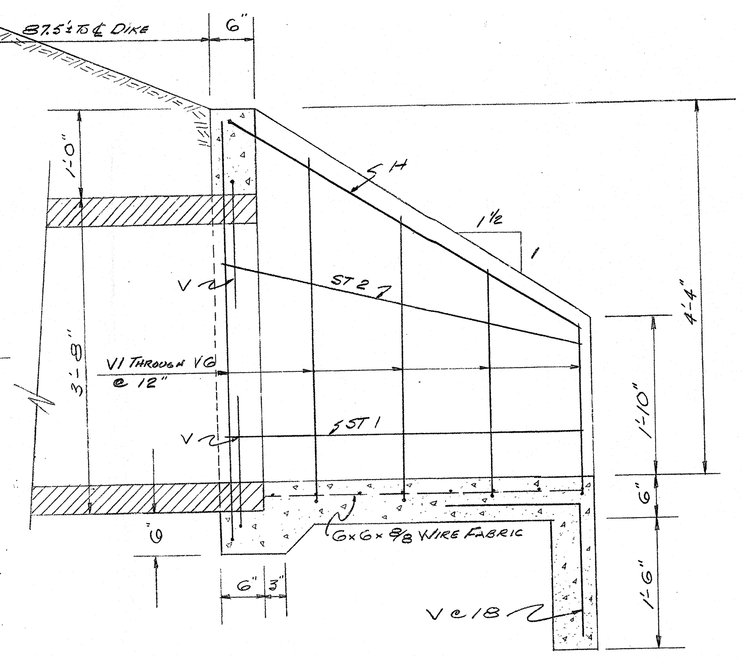
SECTION N-N
SCALE 1" = 20'

SECTION O-O
SCALE 1/2" = 1'-0"

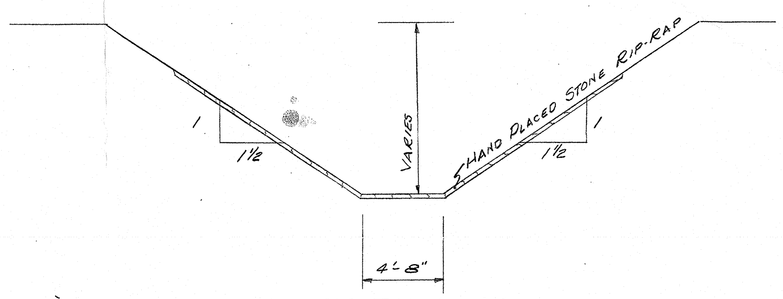
SECTION O-O
SCALE 1/2" = 1'-0"



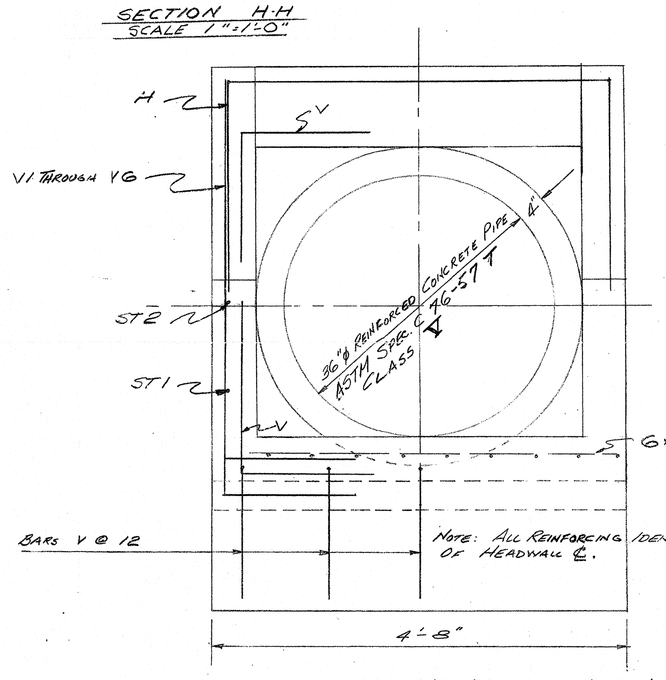
HEADWALL PLAN - N.I. & REIN.
SCALE 1" = 1'-0"



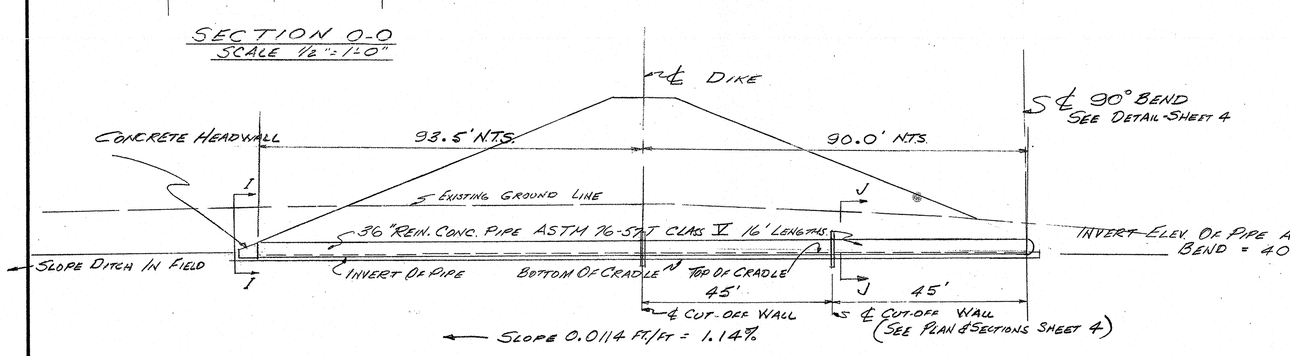
SECTION H-H
SCALE 1" = 1'-0"



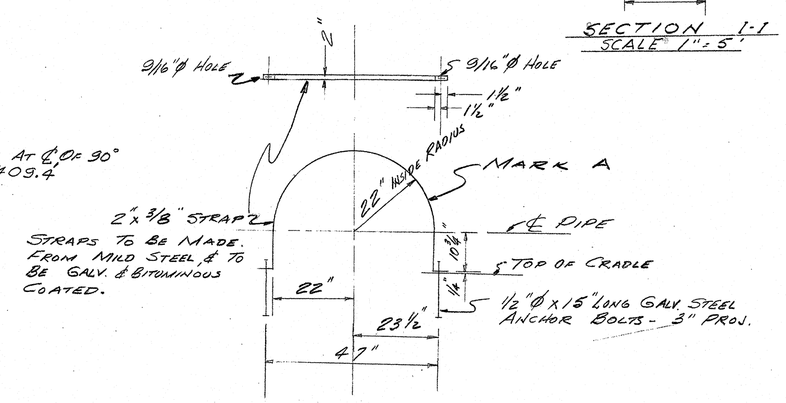
SECTION I-I
SCALE 1" = 5'



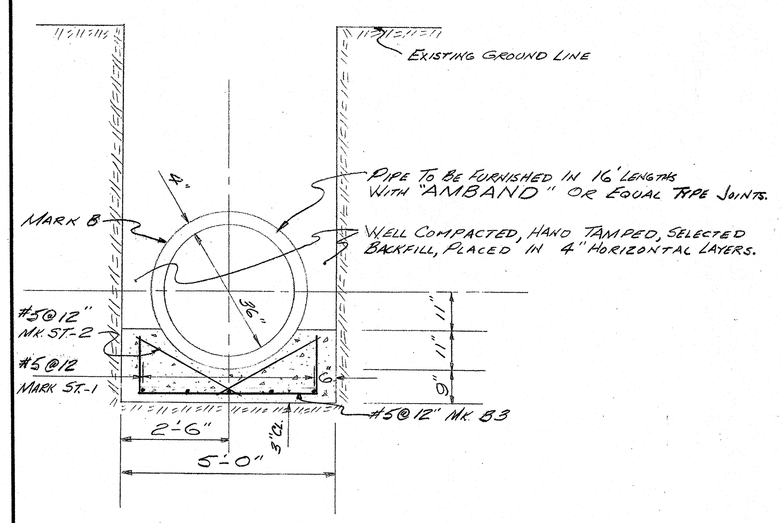
HEADWALL END VIEW - N.I. & REIN.
SCALE 1" = 1'-0"



SECTION G-G
SCALE 1" = 20'



PIPE STRAP DETAIL
½" = 1'-0"
SIX REQUIRED



SECTION J-J
SCALE 1/2" = 1'-0"

GENERAL CONCRETE NOTES:
1. All Concrete To Have 3000 P.S.I. Compressive Strength In 28 Days.
2. Chamfer All Exposed Concrete Corners 3/4".
3. Reinforcing Bars Shall Be Intermediate Grade Deformed Bars In Accordance With Latest A.S.T.M. Specifications, & Deformations Conforming To A.S.T.M. - A305.
4. Welded Steel Wire Fabric For Concrete Reinforcement Shall Conform To A.S.T.M. Designation A185 - 56T.
5. All Reinforcing Shall Be Fabricated From Field Stock.

Note To Bidders: This Structure To Be Voided And A Bituminous Coated C.M. Discharge Structure To Be Used On Stage 2 Const.

Rev. 2 C.E.Y. 3-28-60	Revised drawing to show miscellaneous changes made in field.
Rev. 1 C.E.Y. 7-7-59	Revised property line & added B/M ht. & material mark numbers.

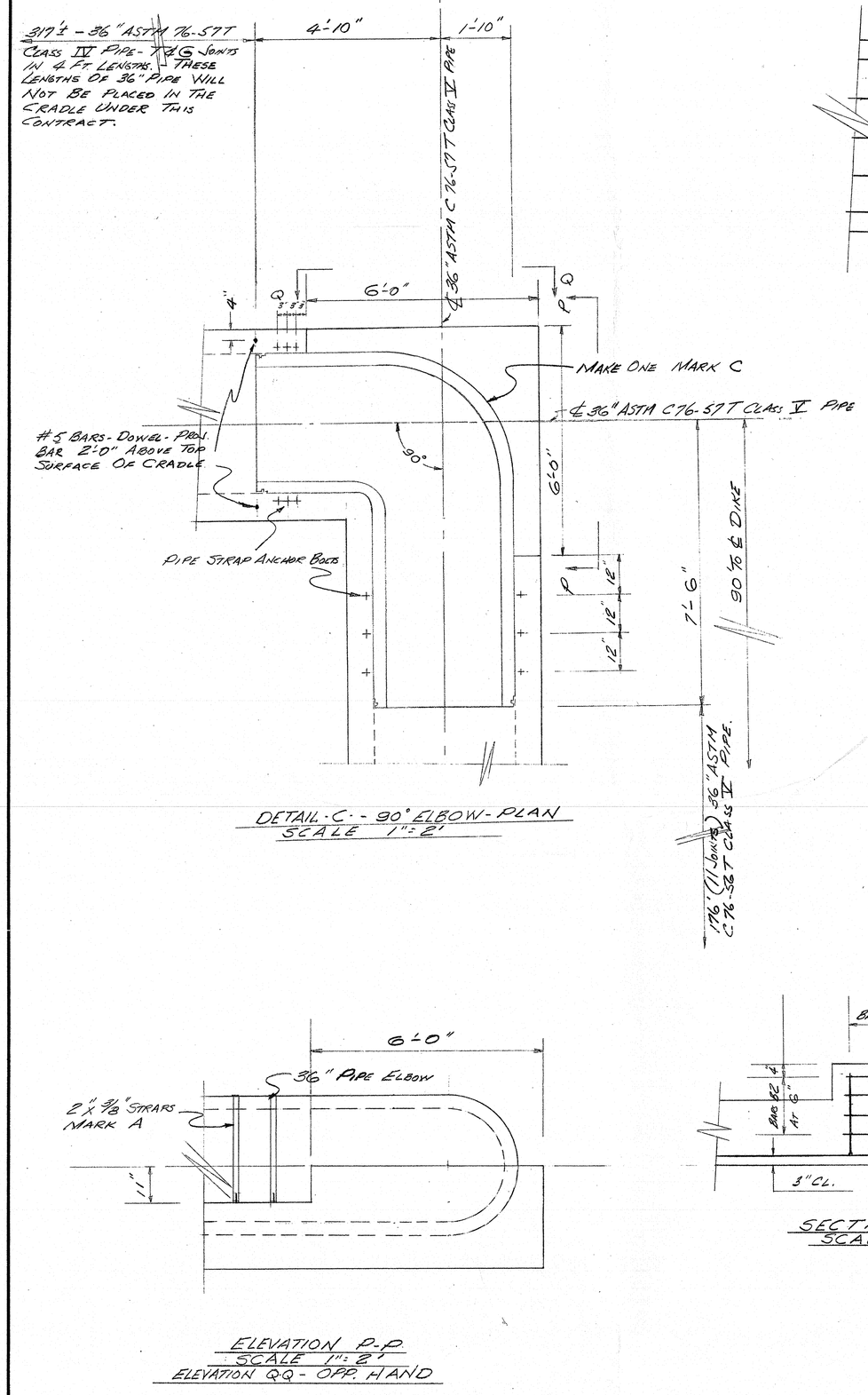
DRAWN YEAGER	CHECKED	TRACED 5-18-1959
APPROVED		DATE 5-19-59
APPROVED		DATE 5-19-59

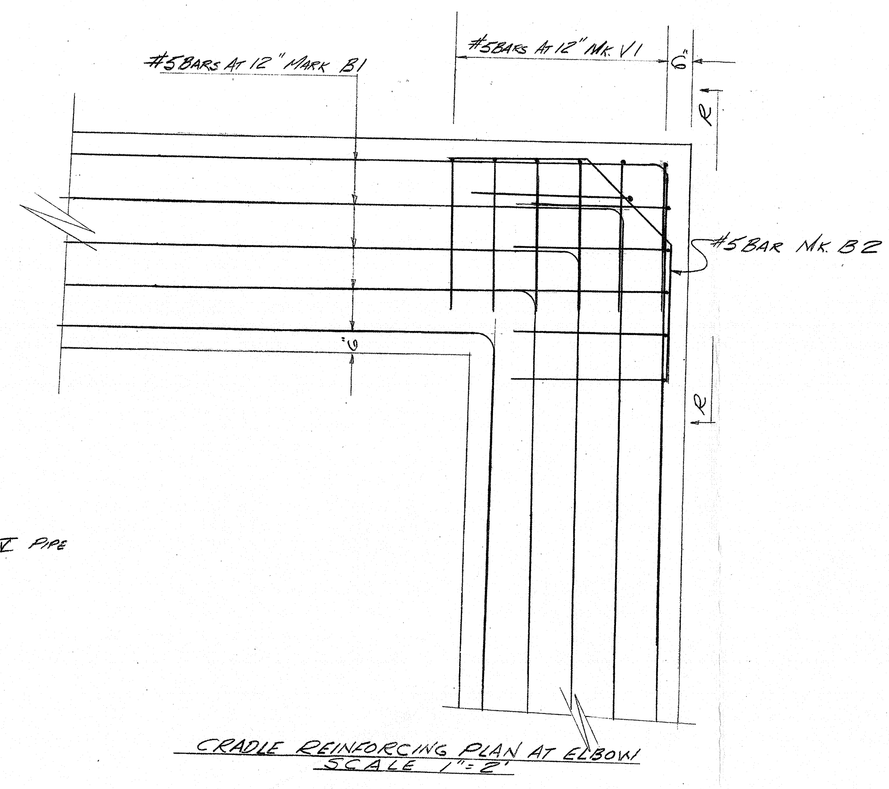
ALABAMA POWER COMPANY

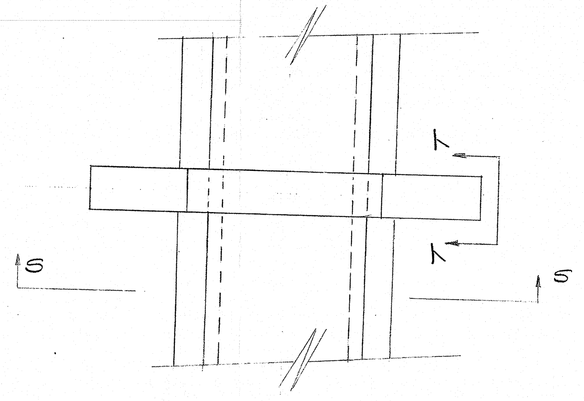
JOB SEGCO No 1 STEAM PLANT
DETAIL ASH SETTLING POND
PLAN & SECTIONS
SCALE AS SHOWN B/M 8.117017
SHEET 3 OF 4 SHEETS
SUPERSEDES

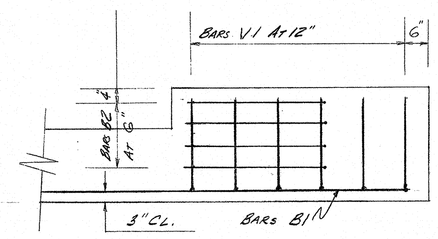
D-116482

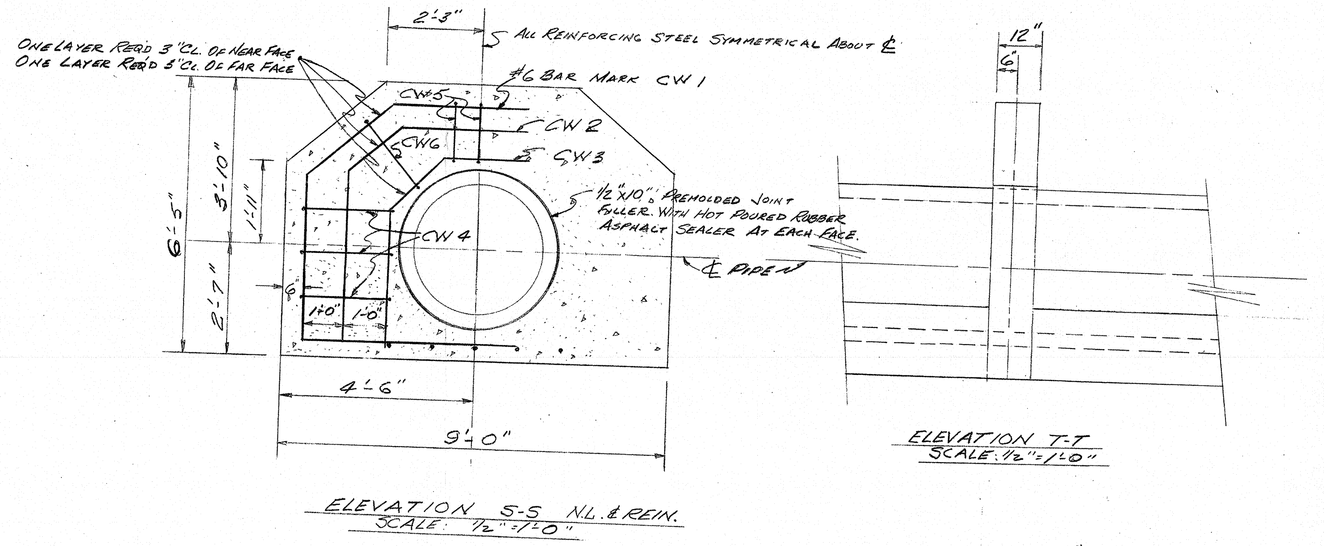
CONFIDENTIAL











Rev. 2

TABLE 2 - COORDINATES OF DIKE & INTERSECTIONS

Point	North	East
APD 1	993,961.00	305,578.00
APD 2	993,388.20	306,880.01
APD 3	996,603.81	307,726.24
APD 4	997,001.66	306,889.22
APD 5	997,020.02	306,499.35
APD 6	995,209.82	302,630.17
APD 7	992,834.58	302,638.43
APD 8	992,352.91	302,715.38

Rev. 2 C.E.Y. 3-23-60 Revised drawing to show miscellaneous changes made in field.	Rev. 1 C.E.Y. 7-7-59 Revised property line & added B.M & & material mark numbers	DRAWN YEAGER CHECKED TRACED 5-13-1959	ALABAMA POWER COMPANY
		APPROVED DATE 5-19-59	JOB SEGCO No. 1 STEAM PLANT
		APPROVED J.E.C. DATE 5-19-59	DETAIL ASH SETTLING POND - PLAN & SECTIONS
			SCALE AS SHOWN B/M B 117017
			SHEET 4 OF 4 SHEETS D-116482
			SUPERSEDES

CONFIDENTIAL

GS 1-1

E.C. Gaston Steam Plant Ash Pond Dam
Report of Biennial Dam Safety Inspection
October 10, 2007

General

The E.C. Gaston ash pond dam inspection was conducted on Wednesday, October 10, 2007. The inspection team consisted of Larry Dunlap and Richard Mickwee. The team met with Byron Corina of the plant staff prior to the inspection. Weather conditions were sunny, clear, and mild. All sections of the main dam, the diversion dike, and the discharge structure were included in the inspection.

Observations.

- North Dike

  The inspection began at the east end of the north dike. Due to the growth of brush and trees, the inspection was performed primarily from the top of the dike, with limited walking along the downstream toe of the slope. No new slides or other signs of erosion were observed during the inspection. Vegetation control on the embankment continues to be a challenge (see Photo 1), but the embankment is very wide in this area and it appears that this section of the pond is retaining ash solids with little to no water.

- West Dike

  The west dike was inspected beginning at the north end and proceeding south along the crest. The extremely dense growth of brush (see Photo 2) limited the inspection of the downstream slope and the toe to a few locations which were somewhat accessible. No new surface slides were observed, but these could have been masked by the heavy growth. The majority of the pond in this area was filled in with ash solids and vegetation (typical, see Photo 3), with the exception of the far southern edge (see Photo 4).

  Similar to other portions of the dike, the southern portion of the embankment was covered with kudzu and thick vegetation (see Photo 5). As this portion of the pond is still retaining water, and the dam section at this location is also not as wide, it is recommended that this area be maintained so that inspection of the downstream slope and toe is possible. Small trees on the upstream slope of water retaining structures should likewise be removed.

Photo 1: Toe of North Dike, Looking East

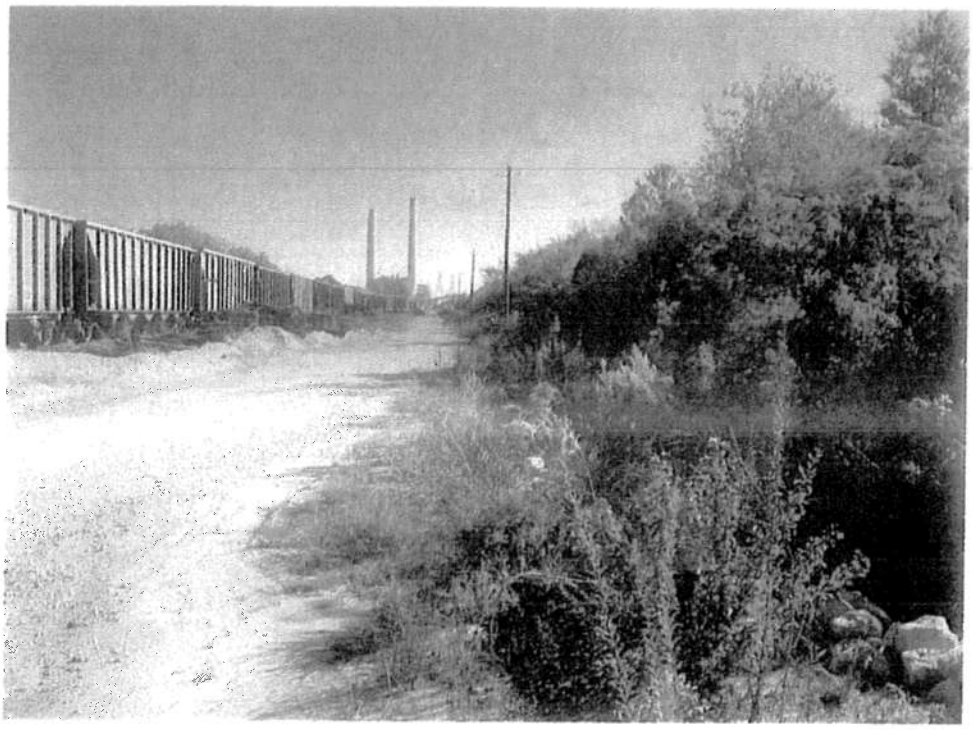


Photo 2: Crest of West Dike, Looking South

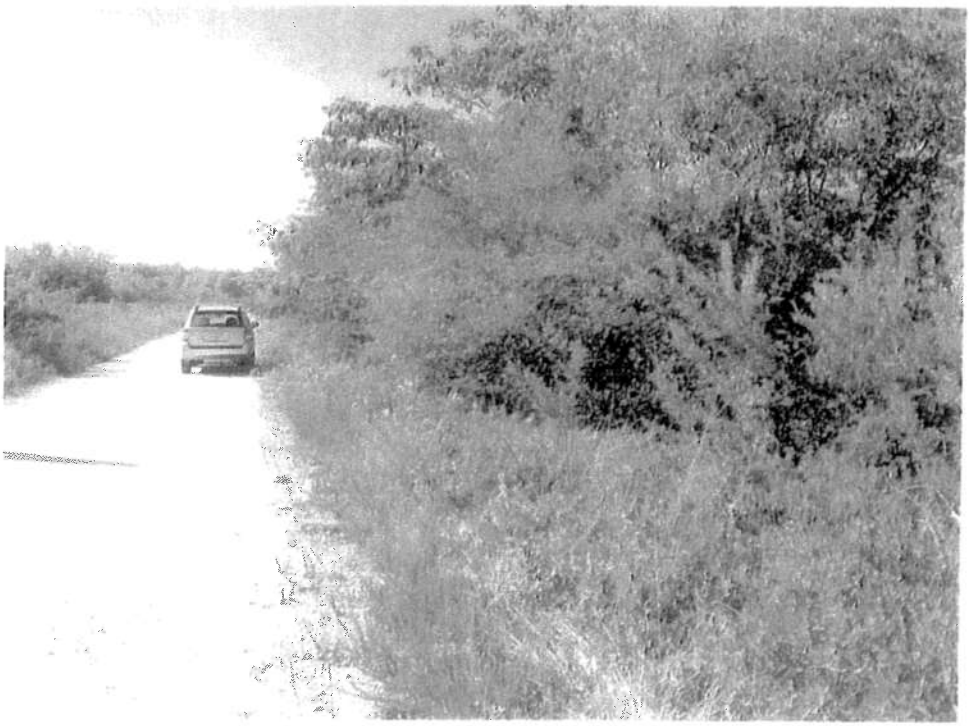


Photo 3: Gaston Ash Pond Near Mid-Point of West Dike, Looking East

Photo 4: Southeast Corner of Ash Pond, Portion Retaining Water, Looking South

Photo 5: Downstream Area Near Southern Portion of West Dike, Looking Southeast

Photo 6: Ash Pond Discharge Inlet Structure

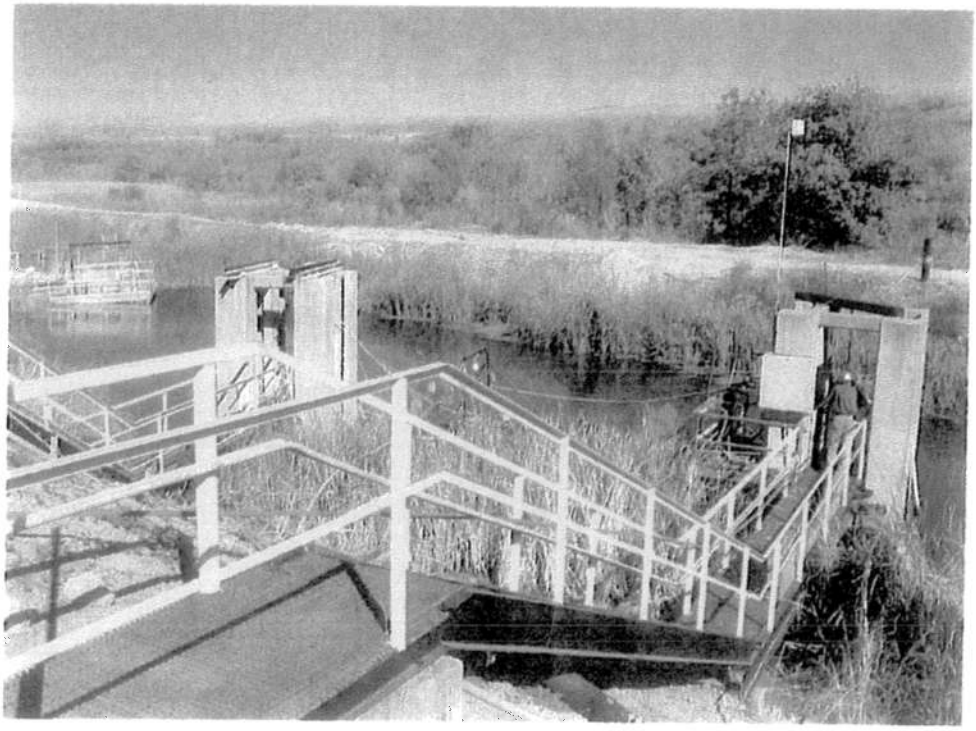
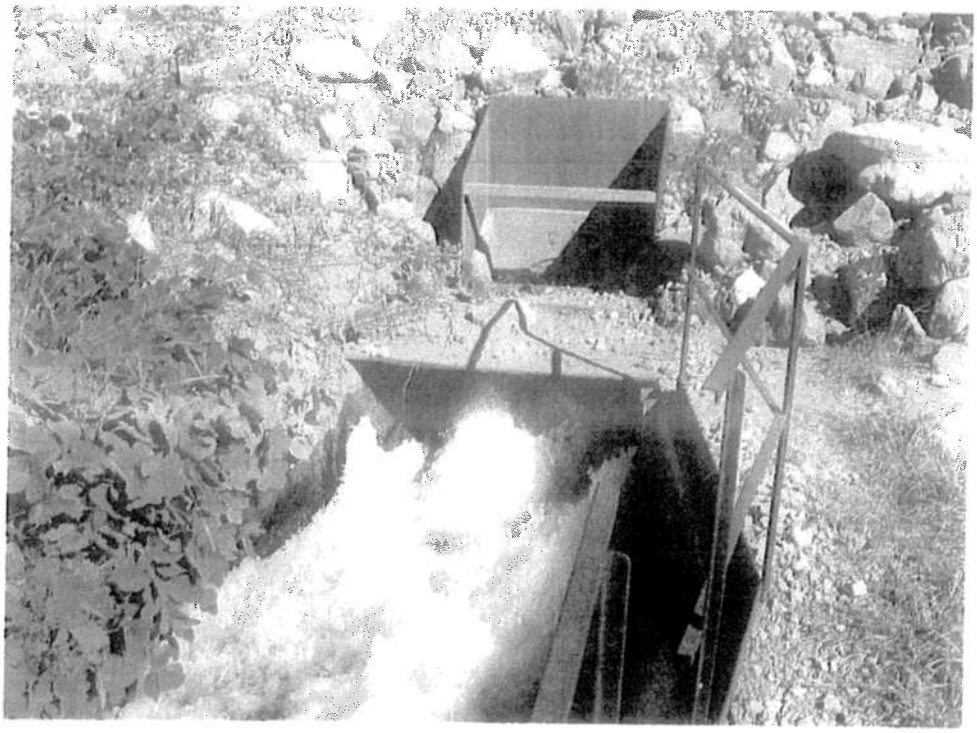


Photo 7: Ash Pond Discharge Structure



- South Dike

  The south dike was inspected and no problems were noted. The pond discharge inlet and outlet structures were inspected and no significant problems were noted (see Photos 6 and 7). Significant erosion damage (i.e. rilling) was observed on the downstream side of the road to the outlet structure. This is not seen as a dam safety concern, but could eventually progress to the point where it affects vehicular traffic in this area.

- Diversion Dike

  The diversion dike forming the discharge canal appeared to be in good condition. The ash stacking operation within the limits of the dike system is continuing.

Conclusion

The project structures appear to be performing adequately. There were no conditions observed that, in the opinion of the inspection team, would affect the continued safe operation of the project.

Larry F. Dunlap

Richard L. Mickwee

600 18th Street North
Birmingham, AL 35203

205/257-1000

SOUTHERN COMPANY
Energy to Serve Your World℠

December 21, 2009

E.C. Gaston Steam Plant Ash Pond Dam
Dam Safety Inspection

Mr. Jay Burdette
Plant Manager
E.C. Gaston Steam Plant
Alabama Power Company

Dear Mr. Burdette,

Enclosed please find the Report of Annual Dam Safety Inspection for the E.C. Gaston Steam Plant Ash Pond Dam based on the inspection performed on January 8, 2009 with a follow-up inspection on July 1, 2009. The inspection team, consisting of myself and Richard Mickwee, appreciate the support provided by Mr. David Edwards in coordinating and conducting this inspection. This report includes a discussion and photographs of site conditions noted during the inspection and a list of our recommendations.

During the inspection, no conditions were noted that posed an immediate threat, or that would affect the continued safe operation of the facilities inspected. There are, however, some recommendations in the report for maintenance related actions to reduce the likelihood of future problems:

- It is recommended that all brush be removed from the dike to facilitate close inspection of the embankment structures, excepting the 'green wall' (see below). The embankment should be seeded to establish grass cover. Work on this recommendation was well underway at the time of our supplemental inspection, but significant work remained to be done.

- Any trees on the embankment face should be cut, and the stumps cut flush with the slope. Any remnant logs and/or branches should be cleared from the embankment. Future embankment maintenance should include the removal of any saplings before they can take root.

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- During clearing of the north dike, an access road was cut into the midslope of the embankment. This access road would facilitate both inspection and maintenance of the dam. It was noted that, in some cases, the excavation into the dike resulted in vertical face sometimes on the order of 5 feet in height. We believe that a vertical face of this height will not be stable on the long term, and as such recommend that this practice not be continued on the other embankments. If an access road on the midslope of the embankment is desired, it should be constructed primarily of new fill, with minimal excavation into the existing dike.

- We agree that the plant could maintain the 'green wall' of bamboo plants on the crest of the west dike adjacent to homeowners downstream of the ash pond. The bamboo plants have a shallow root system that should not result in future problems for the embankment. The green wall vegetation should extend no further than an elevation 5 feet below the crest of the embankment. Below this elevation the embankment should be maintained in accordance with the brush and tree clearing recommendations above.

- Any beaver dams located in the drainage ditch along the toe of the north dike should be removed. The beavers should be trapped to reduce the possibility of future reoccurrence.

Details of the inspection were discussed in an exit meeting with Mr. Edwards at the conclusion of both of our field visits.

Slope stability analyses for the ash pond dam were performed by SCS Earth Science & Environmental Engineering and reported in October, 2009. These analyses were performed based on soil borings and test results obtained earlier in 2009 and indicate that the safety factors against sliding for the perimeter ash pond dam meet or exceed the minimum factors of safety generally considered acceptable by the industry.

If you have any questions, please do not hesitate to contact me at 8-257-1396, or Mr. Mickwee at 8-257-1322.

Respectfully,

Larry F. Dunlap
Principal Engineer
SCG Hydro Services – Dam Safety

/enclosure

CC: **Alabama Power Company**
Ms. Ginger Craig
Mr. Matt Averett
Mr. John A. Woods
Mr. David L. Edwards

Southern Company Generation
Mr. Eugene B. Allison, Jr.
Mr. Richard L. Mickwee, II

E.C. Gaston Steam Plant Ash Pond Dam
Report of Annual Dam Safety Inspection
January 8 and July 1, 2009

General

An inspection of the E.C. Gaston ash pond dam was conducted on Thursday, January 8, 2009. The inspection team consisted of Larry Dunlap and Richard Mickwee with SCG Hydro Services. The team met with David Edwards with the plant staff prior to the inspection to discuss the general procedure of the inspection. Once the inspection was completed, an exit meeting was held with Mr. Edwards to discuss the findings and preliminary recommendations of the inspection team. Due to the fairly dense cover of trees and other vegetation on the ash pond dam, it was recommended that clearing be performed and that a supplemental inspection would be necessary.

The supplemental inspection was performed on July 1, 2009, at which point the clearing was well underway. The inspection team, again consisting of Larry Dunlap and Richard Mickwee, met with Mr. Edwards prior to beginning their inspection. At the time of the supplemental inspection, the major clearing operation had been started and was in process. At the conclusion of the inspection the findings and recommendations from the supplemental inspection were provided to Mr. Edwards.

Weather conditions on the day of the initial inspection were sunny, clear, and cold. During the supplemental inspection, the weather was sunny, clear, and hot. All sections of the main dam, the diversion dam, and the discharge structure were included in both inspections. Photograph locations referenced in this report are provided on the attached Figure 1. Photographs taken during the initial January 8 inspection are labeled with an "IN" prefix, and photographs taken during the supplemental July 1 inspection are labeled with an "SU" prefix.

Observations – Initial Inspection (January 8, 2009)

North Dike – Initial Inspection

The inspection began at the east end of the north dike crest. The inspection team walked the entire length of the structure along both the crest and toe. As has been noted in past inspections, vegetation control continues to be a challenge (see Photo IN-1), but the plant staff was in the process of a major clearing project along the downstream embankment face.

It is worth noting that the crest of the north dike in this area is now very wide (when compared to its overall height), and it appears that this section of the pond is retaining ash solids with little to no water (see Photo IN-2). Localized slumps in the embankment face were noted, and these minor slides have resulted in a steepening of portions of the embankment near the dam crest.

Along the toe of the embankment, a surface water drainage ditch was observed. At the time of the inspection portions of the ditch were retaining water, largely due to several small beaver dams (see Photo IN-3). The water in the ditch did not show any indication that it was carrying embankment material, although there was some minor erosion of the toe noted in very limited areas (see Photo IN-4).

West Dike – Initial Inspection

The inspection team walked the entire west dike, beginning at the north end and proceeding south along the crest. Portions of the downstream slope were also walked, but some areas along the slope could not be accessed due to dense brush and briars (see Photos IN-5 and IN-6). At the time of the initial inspection, the west dike appeared to be performing adequately, but it was not possible to conduct a complete inspection in the areas obscured by vegetation.

The southern portion of the west dike appears to be the only portion of the structure that is retaining water, and the majority of this section appears to have been constructed in a cut of natural soils and does not appear to be a fill embankment.

South Dike – Initial Inspection

The inspection team walked the crest of the south dike and no problems were noted, except for the thick vegetation and trees that had similarly been noted along the north and west dikes. The pond discharge inlet (see Photo IN-7) and outlet (see Photo IN-8) structures were inspected and no problems were noted.

Diversion Dike – Initial Inspection

The diversion dike forming the discharge canal appeared to be in good condition. Some minor erosion gullies, resulting from surface drainage flows, were observed, but these are not a concern. The ash stacking operation within the limits of the dike system is continuing.

OBSERVATIONS – SUPPLEMENTAL INSPECTION (JULY 1, 2009)

On July 1, 2009, a supplemental inspection was performed. Between the initial and supplement inspections significant maintenance and vegetation control work had been conducted (see Photos SU-1 and SU-2). Largely, this was limited to portions of the north dike and the south dike. Clearing had not been started as of July 1 at the west dike. Although a considerable amount of work had been achieved by the supplemental inspection date, the inspection team understands that this is a work in progress. The inspection team appreciates the major effort that has been (and continues to be) applied to the clearing and maintenance of the embankment.

Where cleared, the embankments were thoroughly inspected by the inspection team, and the embankments appeared to be performing adequately. Along the north dike, an access road had been excavated into the embankment at the mid-slope (see Photo SU-3). We understand that this roadway facilitates inspection and maintenance of the embankment slope. In some locations, the cut into the embankment approached 5 feet in height and was vertical in orientation (see Photo SU-4). This high vertical face will likely not be stable in the long-term.

RECOMMENDATIONS

Based on the inspection team's findings, actions recommended to be performed at the E.C. Gaston Steam Plant ash pond dike are provided below. All of these recommendations were discussed with Mr. Edwards during the inspection visits and we understand that most or all have now been addressed or are in the process of being addressed.

- Along the majority of the dike, the downstream embankment face was covered with thick brush and numerous trees. The thick brush obscures the embankment during inspection, and removal would greatly enhance the inspection team's ability to locate any problems. It is recommended that the brush be removed as soon as practical. A cover of grass should be established on the embankment face to protect against future erosion. The vegetation clearing operation was underway during the July 1, 2009 inspection.

- Trees along the dike do present a long-term risk for dam safety as roots can penetrate deep into the dam and accelerate failure by piping. If located near the crest of the dam large trees that topple (and the resulting root ball that is pulled with the tree) can reduce the dam freeboard and lead to a failure by overtopping. **It must be noted that due to the relatively thick dam cross-section and the limited portion of the dikes that are retaining water the inspection team does not believe that these are imminent and/or credible modes of failure for the ash pond dam at E.C. Gaston Steam Plant.** Having said that, it is still the best practice as it relates to both dam performance and ease of maintenance that any and all trees be removed from earthen impoundment structures (except for the bamboo near the crest of the west dike, as noted below). Thus it is the recommendation of the dam inspection team that the tree removal be performed.

Periodic maintenance should be performed to prevent trees from gaining root in the embankment in the future. Once the trees and their stumps have been cut flush with the slope, the remnant logs and branches should be removed from the dam face so as to facilitate future inspections of the dam.

- The clearing and tree removal operations have continued, and substantial progress in this work has already been made. These efforts to facilitate inspection of the ash pond dam are greatly appreciated. During the supplemental inspection, it was noted that along the north dike a mid-slope access road had been cut into the embankment. This road will facilitate inspections and clearing, but at some locations this cut (in a near-vertical orientation) approached 5 feet in height. It is the opinion of the inspection team that this vertical face will not be stable in the long term and that similar cutting into the embankment should not be continued along the remaining embankment structures. The vertical cut section along the north dike should be laid-back as much as possible. If a midslope access road is desired on the other embankments, this should be primarily 'built-out' of the slope by the placement of additional fill, and excavation into the embankment should be minimal. Specific recommendations as to the construction of such access road should be provided by SCG's ES&EE department.

- Based on conversations with David Edwards, it is our understanding that it would be the plant staff's preference to maintain a relatively high "green wall" near the crest of the west dike. This vegetation helps to keep ash dust from being blown from the pond / dry stack to the neighboring homes to the west of this dike. Considering the benefits observed in dust control, the inspection team agrees that the green wall of bamboo plants is acceptable, provided that the plants extend on the downstream slope no more than 5 feet below the crest of the dike. Limiting the vegetation on the dike accordingly will maintain the dust control benefit while also allowing for a thorough inspection by the dam safety inspection team as well as the plant during their regular inspections.

- Small beaver dams were noted to be creating pools of water in the drainage ditch along the toe of the north dike. It is recommended that any beavers be trapped, and the beaver dams be removed. Similar problems have been noted at other APC plants, and in those cases APC Environmental Affairs, who maintains staff capable of dealing with this issue, have been contacted for assistance. As is the nature of animal activity, it can be very difficult to completely eradicate these problems, and plant staff should expect and plan for periodic need for this maintenance work.

For quick reference, the inspection team's recommendations have been summarized on the attached Table 1.

SOIL TEST BORING, LABORATORY TESTING, AND STABILITY ANALYSIS OF EMBANKMENTS

Following the January initial inspection, SCG's Earth Sciences & Environmental Engineering (ES&EE) department performed a subsurface exploration and laboratory testing program for the Gaston ash pond dikes. The testing program included strength testing on Shelby tube samples, and this data was used to perform a stability analysis of the embankments. The results of the testing indicate that the Gaston ash pond embankments have adequate stability.

The results of the exploration, testing, and analysis are provided in ES&EE's report dated October 9, 2009.

CONCLUSION

In summary, the project structures appear to be performing adequately. This report provides the inspection team's recommendations concerning maintenance activities related to the dike structures. Otherwise, there were no conditions noted that, in the opinion of the inspection team, would affect the continued safe operation of the inspected facilities.

Larry F. Dunlap, P.E.

Richard L. Mickwee II, P.E.

TABLE 1: RECOMMENDATIONS FROM 2009 ASH POND INSPECTION – GASTON STEAM PLANT

No.	Description	Location
1	Remove brush from dike to facilitate close inspection of the embankment structures, excepting the 'green wall' (see Recommendation No. 4). Embankment should be seeded to establish grass cover.	All Embankment Structures
2	Cut down any trees from embankment face, cutting stumps flush with the slope. Remove any remnant logs and branches resulting from cutting. As a part of embankment maintenance plan remove any saplings before they can take root.	All Embankment Structures
3	The midslope access roadway excavated into the north dike should be laid-back as much as possible. If the plant staff desire a midslope access roadway along the remaining embankment structures, this should be 'built-out' of the existing embankment by the addition of fill material.	All Embankment Structures
4	Maintain 'green wall' of bamboo plants on crest of west dike adjacent to homeowners downstream of the ash pond. Green wall vegetation should extend no further than an elevation 5 feet below the crest of the embankment. Below this elevation the embankment should be maintained in accordance with Recommendation No. 1.	West Dike
5	Remove any beaver dams located in drainage ditch along toe of north dike. Beavers should be trapped to reduce the likelihood of future reoccurrence, but as with many issues with animal activity this may be an ongoing problem.	North Dike (see Photo 3)

Photo IN-1: Typical Vegetation on North Dike – Initial Inspection

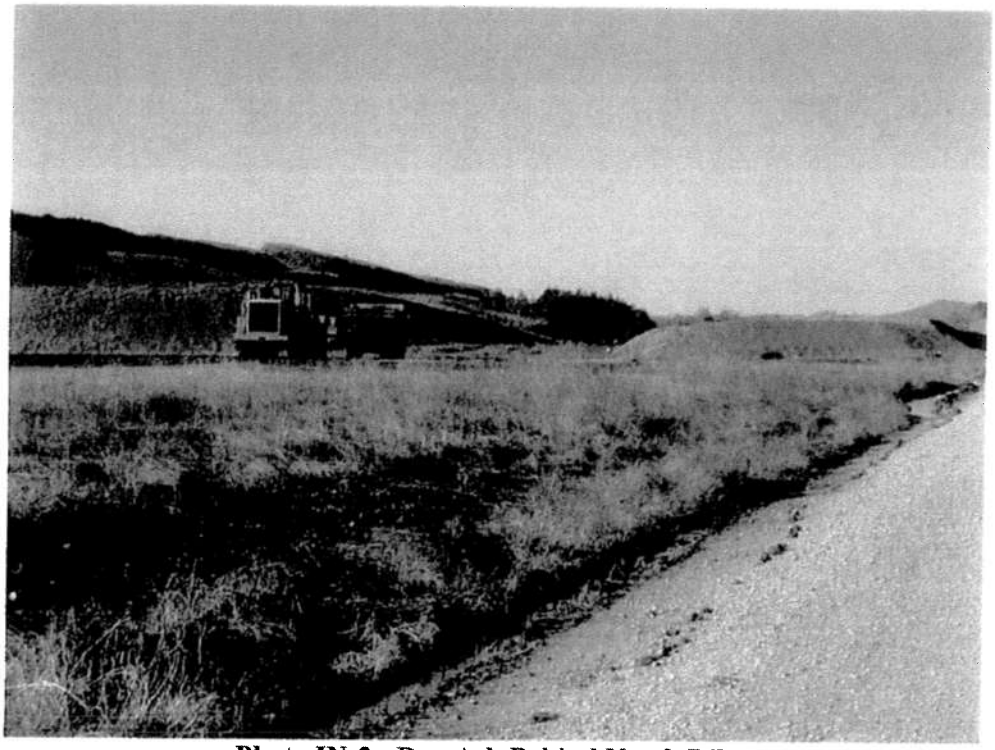

Photo IN-2: Dry Ash Behind North Dike

Photo IN-3: Beaver Dam in Drain Along Toe of North Dike

Photo IN-4: Typical Erosion Noted in Drain Along Toe of North Dike

Photo IN-5: Dense Vegetation Along Toe of West Dike

Photo IN-6: Dense Vegetation Along Toe of West Dike

Figure IN-7: Discharge Inlet Structure

Photo IN-8: Discharge Outlet Structure

Photo SU-1: Condition of Vegetation on North Dike After Clearing

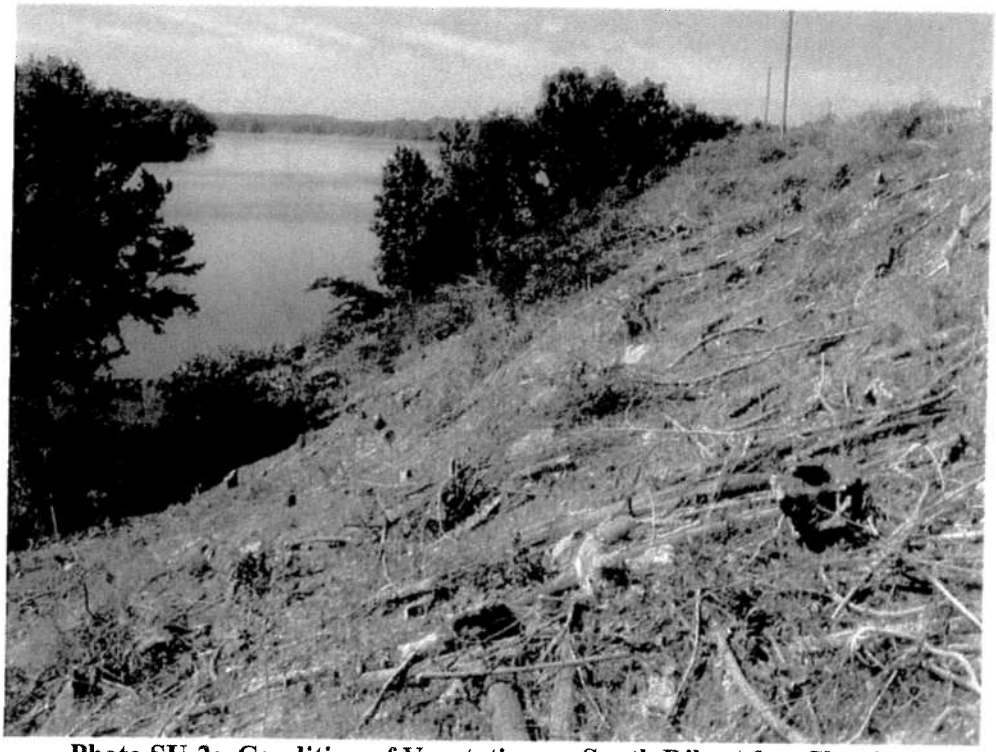

Photo SU-2: Condition of Vegetation on South Dike After Clearing

Photo SU-3: Midslope Access Road on North Dike Embankment

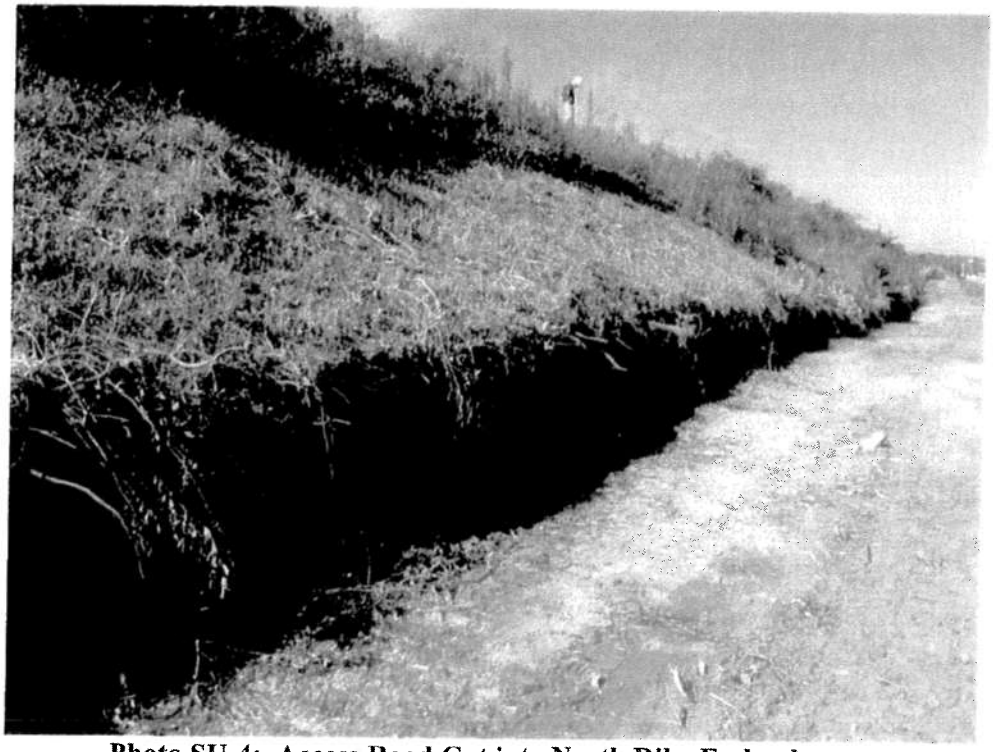

Photo SU-4: Access Road Cut into North Dike Embankment

N

Figure 1

600 18th Street North
Birmingham, AL 35203

205/257-1000

SOUTHERN COMPANY
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June 14, 2010

E.C. Gaston Steam Plant Ash Pond Dam
2010 Dam Safety Inspection

Mr. Jay Burdette
Plant Manager
E.C. Gaston Steam Plant
Alabama Power Company

Dear Mr. Burdette,

Enclosed please find the Report of Annual Dam Safety Inspection for the E.C. Gaston Steam Plant Ash Pond Dam based on the inspection performed on April 15, 2010. The inspection team, consisting of myself and Richard Mickwee, appreciate the support provided by Mr. David Edwards in coordinating and conducting this inspection. This report includes a discussion and photographs of site conditions noted during the inspection and a list of our recommendations.

During the inspection, no conditions were noted that posed an immediate threat, or that would affect the continued safe operation of the facilities inspected. There are, however, some recommendations in the report for maintenance related actions to reduce the likelihood of future problems:

- The significant effort in embankment and vegetation maintenance that has been put forth by the plant staff over the past year is worthy of note. It is recommended that a similar level of embankment maintenance be continued.

- Any beaver dams located in the drainage ditch along the toe of the north dike should be removed. The beavers should be trapped to reduce the possibility of future reoccurrence.

- A few small surficial slides were noted on the north dike, mostly above the midslope access road. The locations were pointed out to plant staff during the inspection, and these areas should be repaired, if they have not been already.

- Two small wet zones were observed along the toe of the west dike. These areas did not generate any concern with the inspection team, but should continue to be monitored by the plant staff during their periodic inspections. If there is a significant change in the area of the wet zones, or if flow carrying embankment material is discernable, Dam Safety staff should be contacted immediately.

- A single large tree was noted along the toe of the west dike. It is suggested that the plant consider its removal.

- It is suggested that the plant consider repairing the erosion rills along the east dike. While this is not seen as critical, these rills may make mowing difficult, and this repair could be conducted as resources allow.

- The erosion along the southern edge of the road leading down to the outlet discharge structure should be repaired.

Details of the inspection were discussed in an exit meeting with Mr. Edwards at the conclusion of both of our field visits.

If you have any questions, please do not hesitate to contact me at 8-257-1396, or Mr. Mickwee at 8-257-1322.

Respectfully,

Larry F. Dunlap
Principal Engineer
SCG Hydro Services – Dam Safety

/enclosure

CC: **Alabama Power Company**
Mr. Shane E. McCray
Mr. John A. Woods
Mr. David L. Edwards

Southern Company Generation
Mr. Eugene B. Allison, Jr.
Mr. James F. Crew
Mr. James C. Pegues
Mr. Richard L. Mickwee, II

E.C. GASTON STEAM PLANT ASH POND DAM
REPORT OF ANNUAL DAM SAFETY INSPECTION
APRIL 15, 2010

GENERAL

An inspection of the E.C. Gaston ash pond dam was conducted on Thursday, April 15, 2010. The inspection team consisted of Larry Dunlap and Richard Mickwee with SCG Hydro Services. The team met with David Edwards with the plant staff prior to the inspection to discuss the general procedure of the inspection. Once the inspection was completed, an exit meeting was held with Mr. Edwards to discuss the findings and preliminary recommendations of the inspection team. At that time, a spot review of the plant's weekly inspection checklists was conducted, and they were found to be complete and satisfactory.

Weather conditions on the day of the inspection were sunny, clear, and warm. All sections of the main dam and the discharge structure were included in the inspection. Photograph locations referenced in this report are provided on the attached Figure 1. Recommendations provided in this report are highlighted in ***italics***, and are also provided with the attached Table 1.

OBSERVATIONS AND RECOMMENDATIONS

North Dike

The inspection began at the east end of the north dike crest. The inspection team walked the entire length of the structure along both the crest and toe. The embankment slope generally appeared to be in good condition and was adequately, while not excessively, vegetated (see Photo 1). The significant effort put forth by the plant staff on the embankment maintenance is greatly appreciated. ***It is recommended that this level of embankment maintenance be continued.***

As was noted in the July 2009 inspection, the plant staff has constructed a midslope access road along the majority of the north dike (see Photo 2). Many of the portions of the embankment that were oversteepened during the construction of this midslope access road appeared to have been flattened out.

During inspection of the north dike, several small beaver dams were observed blocking the flow of the drainage ditch running parallel to the embankment toe (see Photo 3). ***This is not an optimal condition, and it is recommended that these dams be removed and, if possible, the beavers be trapped.*** As has been noted in past inspections, minor erosion of the embankment toe was observed adjacent to the ditch, but this does not generate any concern.

A few small surficial slides, mostly above the midslope access road, were observed along the north dike (for typical, see Photo 4). The locations of these slides were pointed out to Mr. Edwards during the inspection. ***It is recommended that the embankment face be restored by the removal and recompaction of the disturbed soils.***

West Dike

The inspection team walked the entire west dike, beginning at the north end and proceeding south along the toe. As with the north dike, a tremendous amount of vegetation clearing and maintenance has been accomplished along the west dike and the entire toe could be walked (see Photo 5). This is a significant improvement over the slope conditions since the 2009 inspections, and is very appreciated by the inspection team. Generally the embankment was in good condition with a suitable cover of grass/vegetation.

At two locations (known to the project staff), small wet zones were observed along the toe (for typical, see Photo 6). The wet zones did not appear to be flowing and no embankment material or materials from inside the pond were being transported. ***It is recommended that the plant staff, during their regular inspections, pay close attention to these areas.*** They may dry out during the summer months, but if the wet zones appear to expand significantly, or if flow that is carrying material is discernable, Dam Safety staff should be contacted immediately.

Towards the southern end of the west dike, a single large tree (see Photo 7) was noted. While it does not pose an immediate threat to the dike, its presence is not optimal. ***It is suggested that the project staff consider cutting the tree down.***

East Dike

The entire east dike (adjacent to the Coosa River) was inspected by talking along the embankment toe. This has not been possible in the recent past, but due to the maintenance efforts by Mr. Edwards and the plant staff over the past year, access is now available. Generally, the east dike was in good condition and was adequately vegetated (see Photo 8). ***Some surface erosion rills were observed that may make mowing difficult, and it is suggested that the plant consider repair of these as a future action item.*** This is not seen as critical, and could be conducted as resources allow.

Discharge Structures

The pond discharge inlet (see Photo 9) and outlet (Photo 10) were inspected and no problems were noted. ***Erosion of the road down to the outlet (see Photo 11) was noted, and it is recommended that this erosion be repaired.*** Mr. Edwards was aware of this erosion and indicated that he is planning to address the issue. This does not represent a dam safety concern, but if allowed to continue unchecked the erosion will create issues with access to the discharge outlet and the other plant structures adjacent to the river.

STATUS OF PREVIOUS RECOMMENDATIONS

The following summarizes the recommendations from the 2009 inspection report, and their status:

1) Remove brush from dike to facilitate close inspection of the embankment structures, excepting the 'green wall'. Embankment should be seeded to establish grass cover. **Status: Completed. It should be noted that this will require continued effort.**

2) Cut down any trees from embankment face, cutting stumps flush with the slope. Remove any remnant logs and branches resulting from cutting. As a part of embankment maintenance plan remove any saplings before they can take root. **Status: Completed. As mentioned in the report, the plant staff has gone to extreme lengths to meet this recommendation (as well as recommendation 1) and this effort is very appreciated by the inspection team.**

3) The midslope access roadway excavated into the north dike should be laid-back as much as possible. If the plant staff desire a midslope access roadway along the remaining embankment structures, this should be 'built-out' of the existing embankment by the addition of fill material. **Status: Completed, although a few areas with surficial sliding were noted. These areas will require attention, as mentioned above.**

4) Maintain 'green wall' of bamboo plants on crest of west dike adjacent to homeowners downstream of the ash pond. Green wall vegetation should extend no further than an elevation 5 feet below the crest of the embankment. **Status: Completed. It should be noted that the presence of the 'green wall' is being reviewed at this time by the plant and SCG staff. If any changes to the 'green wall' allowance are forthcoming, they will provided to the plant under separate cover.**

5) Remove any beaver dams located in drainage ditch along toe of north dike. Beavers should be trapped to reduce the likelihood of future reoccurrence, but as with many issues with animal activity this may be an ongoing problem. **Status: Continuing. This will likely be a continuing maintenance issue, similar to other issues related to animal activity.**

CLOSING

In summary, the project structures appear to be performing adequately. This report provides the inspection team's recommendations concerning maintenance activities relating to the dike structures. Otherwise, there were no conditions noted that, in the opinion of the inspection team, would affect the continued safe operation of the inspected facilities. Worth special note is our appreciation of the cooperation that the E.C. Gaston plant staff, Mr. Edwards in particular, has extended to us throughout the past year.

Larry F. Dunlap, P.E.

Richard L. Mickwee II, P.E.

TABLE 1: RECOMMENDATIONS FROM 2010 ASH POND INSPECTION – GASTON STEAM PLANT

No.	Description	Location
1	Continue vegetation control and embankment maintenance program.	All Embankments
2	Any beaver dams in the north dike toe ditch should be removed and, if possible, the beavers be trapped.	North Dike (Photo 3)
3	The small surficial slides observed on the downstream face of the north dike should be restored by the removal and recompaction of the disturbed soils.	North Dike (Photo 4)
4	Plant staff should pay close attention to the condition of the two small wet zones observed at the toe of the west dike. If there is any significant increase in flow, or if embankment/pond materials are being transported, Dam Safety should be contacted immediately.	West Dike (Photo 6)
5	It is suggested that the single large tree on the toe of the west dike be removed.	West Dike (Photo 7)
6	It is suggested that surface erosion rills along the east dike (adjacent to the Coosa River) be repaired as plant resources allow.	East Dike (Photo 8)
7	The large surface erosion rill adjacent to the roadway leading to the discharge outlet structure should be repaired.	Discharge Structure (Photo 11)

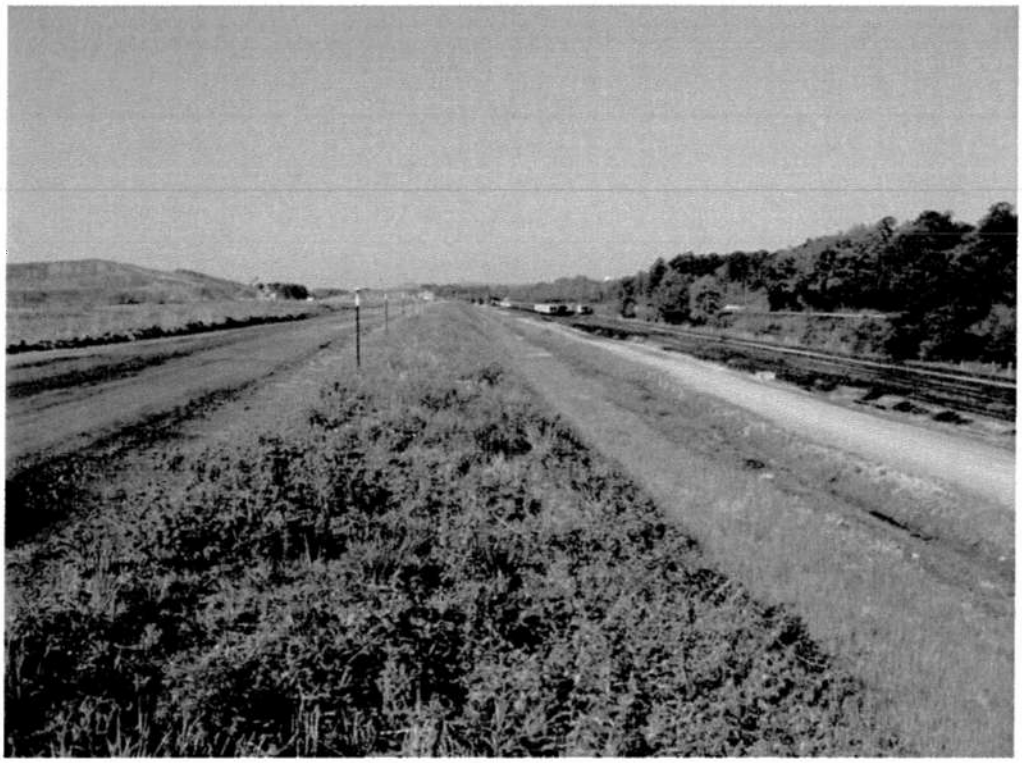

Photo 1 – Typical Condition of North Dike Embankment, From Crest

Photo 2 – Typical Condition of Midslope Access Road on North Dike

Photo 3 – Typical Beaver Dam in North Dike Toe Ditch

Photo 4 – Shallow Slide on Face of North Dike Requiring Repair

Photo 5 – Typical Condition of West Dike, From Toe

Photo 6 – Small Wet Zone on Toe of West Dike

Photo 7 – Tree on Toe of West Dike

Photo 8 – Condition of East Dike, From Crest

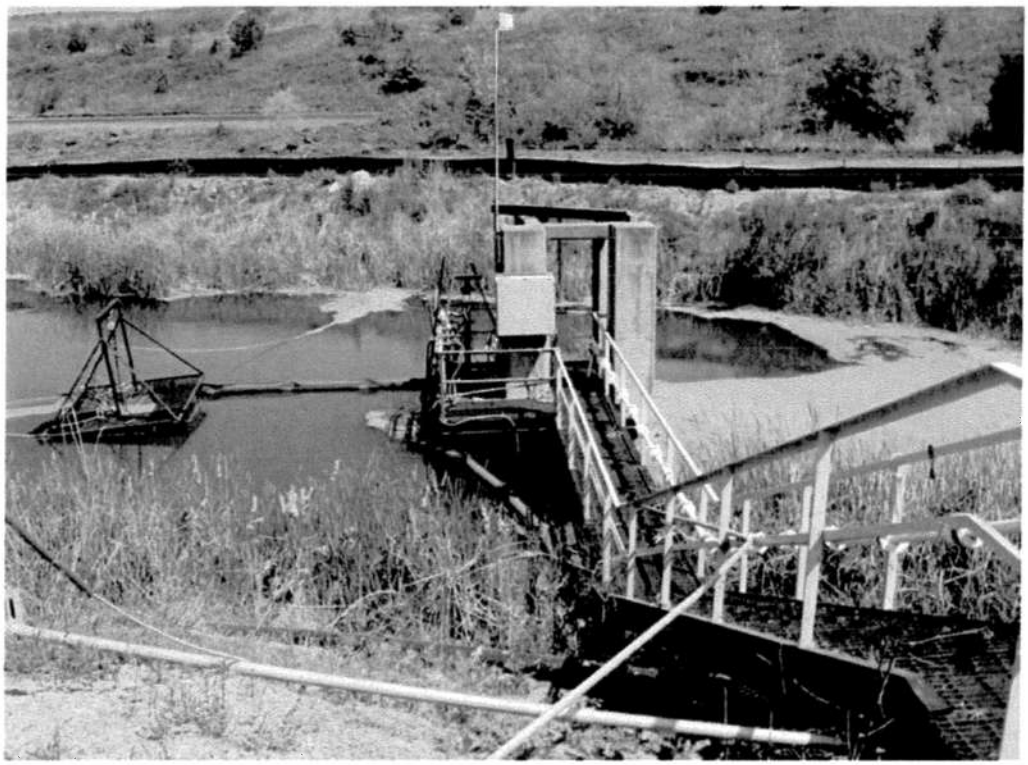

Photo 9 – Discharge Intake Structure

Photo 10 – Discharge Outlet Structure

Photo 11 – Erosion of Road to Discharge Outlet Structure

FIGURE 1

Intracompany Correspondence

SOUTHERN COMPANY
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Date: October 9, 2009

To: Ginger Craig

From: Rachel Mudd and Jim Pegues

Subject: Summary of Geotechnical Findings
Plant Gaston Ash Pond Existing Dike Stability Assessment

The Earth Science & Environmental Engineering Department (ES&EE) of Southern Company Generation Technical Services has prepared this report of geotechnical findings and analyses for the assessment of the existing ash pond dike at Plant E.C. Gaston in Wilsonville, Alabama. This summary details the geotechnical exploration and findings, laboratory test results and stability analysis results.

In summary, our study and analyses did not find indications of stability issues related to the perimeter embankments at the Plant Gaston ash facility.

Field Investigation Results

Borings were performed by the Southern Company Civil Field Services (CFS) Drilling Department in early February, 2009.

A total of twelve borings were drilled as a part of this study. Boring locations were established in the field by Rachel Mudd of ES&EE and Richard Mickwee of Southern Company Generation Hydro Services. Boring locations were surveyed by CFS surveyors, and the coordinates (NAD27 State Plane) and elevations are reflected on the individual boring records. Two borings were drilled along the north portion of the ash pond embankment, seven along the west embankment and two along a stretch of what is referenced as the southeast embankment, parallel to the Coosa River. A Boring Location Plan is attached that reflects approximate boring locations, based on these coordinates.

Standard penetration testing and split-spoon sampling were performed in each boring at depth intervals of approximately 2 feet. In some instances, relatively intact Shelby tube samples were collected immediately below some split-spoon samples. These Shelby tube samples were later utilized for the lab testing portion of this assessment.

The soils were visually classified by a geotechnical engineer. The geotechnical engineer attempted to note the interface between the fill materials used to construct the embankments and the natural, or residual, soils. However, it should be noted that since native soils were used to construct the embankments, it is sometimes difficult to distinguish between fill materials and residual soils, and the noted depth of interface should be considered approximate.

Upon the completion of the borings, each borehole was filled with grout.

Discussion of the findings of the borings is presented in the following paragraphs for the three general embankment portions.

North Embankment

Borings BH-1 and BH-2 were drilled along the north embankment to depths of about 36 feet and 39 feet, respectively. In each boring, the depth of embankment fill was judged to extend to a depth on the order of 23 to 25 feet.

Approximately 3 to 4 feet of ash was present at the ground surface at the location of **boring BH-1**. The fill material beneath the ash to a depth of about 25 feet was visually classified as low to moderate plasticity clay (CL or CL-CH) containing some small pebble-sized gravel. Also, traces of ash were noted in the sample obtained from about 9 to 11 feet. Standard penetration test (SPT) N-values ranged from 6 to 12 blows per foot (bpf) in the fill material at this boring location. A relatively intact Shelby tube sample was collected from a depth of about 22 to 24 feet in this boring.

Below the fill, the boring encountered residual soils similar in visual characteristic to the fill soils, but with higher plasticity, described as medium to high plasticity clay (CL to CH, or CH). SPT N-values in these residual soils generally ranged from 10 to 14 bpf, indicating a stiff apparent consistency. However, it should be noted that a thin layer of soft clay (SPT N-value of 3 bpf) was encountered at a depth of about 28 feet. The boring was terminated in residual soils at a depth of about 36 feet.

Boring BH-2 encountered fill soils similar to those found in boring BH-1, with the absence of any ash at the ground surface or within any of the split-spoon samples. Again, the clays were described as having low to medium plasticity (CL or CL-CH), and contained some pebbled-sized gravel fragments. SPT N-values in the fill, which extended to a depth of about 23 feet, ranged from 10 to 14 bpf.

As with boring BH-1, the residual soils immediately underlying the upper fills consisted of stiff to very stiff moderate to highly plastic clays (CL-CH), with SPT N-values ranging from 11 to 16 bpf. These clays were in turn underlain by medium dense sands (SW). The SPT N-value at about 35 feet was 10 bpf. The next sample, taken at a depth beginning at about 37.5 feet, exhibited an SPT N-value greater than 100 bpf. It appeared the boring encountered a layer of partially weathered rock at this depth, and the boring was terminated.

West Embankment

Borings BH-3 through BH-8 (including BH-4A and BH-6A) were drilled along the west embankment of the ash facility. Boring depths ranged from 9 feet to 39 feet (the shallowest being the offset boring BH-6A).

Boring BH-3 was drilled towards the north end of the west embankment to a depth of about 37 feet. The interpreted depth of fill at this location was on the order of 23 feet. The fill soils at this location were visually described as predominately fat (highly plastic) clay (CH), and exhibited SPT N-values of 8 bpf to 15 bpf.

The underlying residual soils were again a mixture of low to high plasticity clays (CL and CH) having SPT N-values of 9 to 13 bpf, indicating a stiff consistency. The boring was terminated at a depth of about 39 feet.

Boring BH-4 was drilled south of boring BH-3. The termination depth of boring BH-4 was 36 feet, and the interpreted depth of fill at this boring location was approximately 14 to 15 feet. The fill in this boring consisted primarily of ash, with some clay fraction throughout the fill depth. SPT N-values ranged from 5 to greater than 100 bpf, with most N-values greater than 20 bpf.

The split-spoon sample taken from 14.5 to 16 feet contained soil interpreted to be possibly both fill and residual material, indicating the interface between the two was at this location. The SPT N-value at the depth was 4 bpf. A relatively intact Shelby tube sample was obtained immediately below this sample from a depth of 16 to 18 feet.

The residual clays below the fill were predominately of high plasticity, with SPT N-values ranging from 4 to 23 bpf, indicating an apparent consistency of soft to very stiff.

Due to the presence of ash in the upper 14 to 15 feet, an offset boring (**BH-4A**) was drilled along the outside edge of the embankment crest at about the same location. Since this boring was only drilled to assess the presence of ash, it was terminated at a depth of about 14 feet. No ash was present at this boring location. The upper fill soils were low to moderately plastic clays having SPT N-values ranging from 9 to 19 bpf. It appears that the "inside" portion of the embankment crest roadway may have been widened by the placement of ash, with the original embankment section constructed of soil fill.

Boring BH-5 was drilled along the outside edge of the embankment crest to a depth of 39 feet. Depth of fill at this location was estimated to be on the order of 22 feet. Again, the fill was visually classified as low to moderately plastic clay (CL to CH), with SPT N-values ranging from 6 to 13 bpf.

The underlying residual soils were moderately to highly plastic clays (CL-CH), with SPT N-values generally ranging from 6 to 15 bpf. As with other borings, a very soft clay layer was encountered, occurring at a depth of about 30 feet in this boring, having a SPT N-value of 2 bpf. A relatively intact Shelby tube sample was obtained from 32 to 34 feet, just below the very soft clay layer split-spoon sample.

Boring BH-6, drilled to the "inside" of the west dike, encountered ash (with a trace of clay) to a depth of about 12 feet, underlain by clay fill to a depth of about 16 or 17 feet. SPT N-values in the ash and clay fill ranged from 6 to 28 bpf, with the higher N-values in the upper portion of the ash fill.

Again, moderate to highly plastic residual clays were present below the fill, extending to the boring termination depth of about 36 feet. SPT N-values in the residual material ranged from 8 to 25 bpf.

Due to the presence of ash in the upper 12 feet, an offset boring (**BH-6A**) was drilled along the outside edge of the embankment crest at about the same location, as was done with boring BH-4 and BH-4A. Since this boring was only drilled to assess the

presence of ash, it was terminated at a depth of about 9 feet. No ash was present at this boring location. The upper fill soils were low to moderately plastic clays having SPT N-values ranging from 5 to 23 bpf. It appears that the "inside" portion of the embankment crest roadway may have been widened by the placement of ash, with the original embankment section constructed of soil fill at this location as well. Given similar characteristics in both Borings BH-4 and BH-6, it appears that much of the length of roadway along this section of the embankment was widened through the placement of ash.

Boring BH-7 was extended to a depth of about 29 feet. The boring was generally located along the outside edge of the embankment crest. The depth of fill at this location was shallower than the previous boring, with the interpreted depth of fill being only about 9 feet. SPT N-values in the moderately plastic clay (CL-CH) fill ranged from 9 to 21 bpf.

The residual clays underlying the fill extended to the boring termination depth. SPT N-values ranged from 6 to 25 bpf, with most N-values greater than 14 bpf. A relatively intact Shelby tube sample was collected at a depth of about 20 to 22 feet.

Boring BH-8 was the final boring drilled along the west embankment section. Fill depth decreased even further at this location, with an interpreted depth of fill on the order of 7 feet. SPT N-values in the clay fill ranged from 9 to 11 bpf.

The underlying residual clays were stiff to very stiff in consistency to a depth of about 27 feet, where the apparent consistency was firm, or medium stiff. SPT N-values to a depth of about 27 feet ranged from 10 to 18 bpf, decreasing to 8 bpf below about 27 feet.

Southeast Embankment

Boring BH-9 was drilled at the southwest end of the portion of the embankment referenced as the "southeast" embankment, parallel to the Coosa River. The depth of this boring was about 26 feet. The interpreted fill depth at this boring location was approximately 12 feet. SPT N-values in the fill ranged from 7 to 19 bpf. As with most of the other borings, the fill consisted of medium plasticity clays.

The underlying residual soils were medium stiff to very stiff clays of medium to high plasticity. SPT N-values ranged from 8 bpf to 20 bpf.

Boring BH-10 was drilled at the northeast end of this section of embankment, and was extended to a depth of about 31 feet. It was very difficult distinguishing the depth of fill at this location. Based on SPT N-values and soil characteristics, it appears that the fill depth may be on the order of 10 to 12 feet. A review of 1985 site topographic information at Plant Gaston tends to support this interpretation. SPT N-values in the upper 12 feet ranged from 15 to 30 bpf.

The soils below a depth of about 10 to 12 feet, interpreted to be residual soil, again consisted of medium stiff to very stiff moderately plastic clays. SPT N-values ranged from 6 to 25 bpf.

Water Levels

Water levels were measured in the borings approximately 24 hours after the completion of the drilling. As the soils are predominately clays, it may take more than 24 hours for water levels to stabilize, and actual water levels may vary. In addition, water levels in the embankment are expected to be directly impacted by water levels in the ash pond or in the adjoining river.

Measured water levels, and their corresponding elevations, are summarized in Table 1. Please note that water levels were not measured in the two offset borings (BH-4A and BH-6A).

Table 1
Measured Water Levels

Boring No.	Depth to Water (ft)	Elevation of Measured Water Level
BH-1	22.3	423.99
BH-2	20.1	425.54
BH-3	26.1	420.31
BH-4	26.6	418.58
BH-5	20.7	424.85
BH-6	23.3	421.91
BH-7	25.7	419.32
BH-8	24.9	418.18
BH-9	15.2	429.49
BH-10	19.2	431.68

Laboratory Testing Results

Seven Shelby tube samples were obtained during the drilling phase. The tubes were waxed sealed on both ends and securely stored in a controlled temperature environment until June when they were extruded and evaluated for possible strength testing. Table 2 summarizes these samples, their depth, and comments regarding their condition at the time of extrusion. Extrusion was performed under the guidance and observation of an ES&EE geotechnical engineer in a commercial soils testing laboratory.

Shelby tubes from borings BH-4 and BH-7 contained samples that were judged suitable and representative for strength testing. These samples were tested using the consolidated undrained triaxial shear strength testing procedure, ASTM D 4767. The laboratory testing results can be found in the appendix of this report.

The strength properties determined from the laboratory testing were used in the stability analyses discussed in the next section.

Table 2
Shelby Tube Sample Descriptions

Boring	Depth	Comments
BH-1	22-24	Not extruded. Sample was from a part of the dike which was not retaining water. No slope stability concern.
BH-4 (2-9-09)	16-18	Not extruded. Other samples from the same location were usable, so this sample was not necessary (and appeared in worse condition than the other tubes from this boring).
BH-4 (2-10-09)	16-18	Top of sample appeared to contain ash and had collapsed in the tube. Two samples (each approximately 6.5") were cut from the remainder of the sample, and bottom-most section of the sample (17'-18') was scheduled for CU/PP testing at 2 ksf confining pressure.
BH-4	18-20	Top two samples in good condition and retained for testing (18'-18.7' and 18.7'-19.4'). Bottom of sample appeared to be transition from fill to residual material. Sample saved for information purposes, but not scheduled for testing.
BH-5	10-12	Top 6"+ of sample had an SPT sample in the center of the UD sample. Only enough sample for two additional 6" samples, one of which would not hold together. One sample retained from approximately 11.4'-12', but not scheduled for testing.
BH-5	31.5-33.5	Pushed but all of tube appeared to be residual material and not usable for slope analysis of fill material. Material retained in case we decide to test residuum at a later time.
BH-7	19.5-21.5	Sample extruded and looked good. Three samples cut and scheduled for testing. 19.5'-20.3' at 2 ksf, 20.3'-21' at 3 ksf, and 21'-21.5' at 6 ksf.

Cross-Section Surveys

In order to evaluate stability of the ash pond embankments, information was needed regarding topographic cross-sections at various locations along the embankment. ES&EE requested that Southern Company's Civil Field Services (CFS) survey sections of the embankment to obtain the needed topographic information. Cross-sections were requested at the location of borings BH-3 through BH-10, as well as at an intermediate point between borings BH-3 and BH-4. Cross-section information was received from Civil Field Services on July 24, 2009.

Stability Analyses

As stated earlier, borings were drilled on the north, west and south embankments of the ash pond, with most drilled along the west embankment. This is the area of particular interest due to topographic features and downstream development. Therefore, stability analysis calculations focused on the west embankment, however two stability

calculations were also done on the south embankment (BH-9 and BH-10). The cross-section done at BH-8 was not analyzed for stability analysis, since it is the area around this section is cut out of residual soil and is not a stability consideration.

Assumptions were made regarding each cross-section based on the probable soil stratigraphy revealed by the earlier borings, as discussed in the previous sections of this report. Laboratory testing was limited to samples of embankment fill material at boring BH-4, and natural/residual foundation material at boring BH-7. Thus, the laboratory test strength data from these two borings was used for stability analyses at all cross-sections. For comparative purposes, the strengths obtained from laboratory testing were then reduced by about 15 percent in supplemental stability analyses to account for and evaluate potential variability in the soil conditions of both the embankments and the foundation materials.

Stability analyses were performed on each cross-section for three different conditions. The basic analysis utilized water levels in the embankments measured at the time of drilling, projecting these water levels into the ash stacks. This model represents current, steady-state operations of the facility. The second model applies seismic loading conditions (0.1g horizontal acceleration) to the first steady-state model. Finally, a third model was analyzed assuming a high water level condition in both the retained ash and the embankment.

Table 3 summarizes the minimum factors of safety obtained for each model at each cross-section using actual laboratory test data. Table 4 summarizes the minimum factors of safety using reduced strength values. In summary, all minimum factors of safety are at or above the normally accepted industry standards for minimum factors of safety.

Table 3
Summary of Minimum Slope Stability Factors of Safety
(Using original laboratory test strength data)

Cross-Section	Analysis Condition		
	Steady-State[1]	Steady-State with Seismic[2]	High Water Level[3]
BH-3	2.2	1.7	1.6
BH-3 to BH-4	2.2	1.8	1.7
BH-4	2.3	1.8	1.7
BH-5	2.1	1.7	1.5
BH-6	2.5	2.0	1.9
BH-7	3.0	2.4	2.5
BH-9	2.0	1.5	1.8
BH-10	2.1	1.7	1.7

[1]Normally accepted industry standard minimum factor of safety = 1.5
[2]Normally accepted industry standard minimum factor of safety = 1.2
[3]Normally accepted industry standard minimum factor of safety = 1.3

Table 4
Summary of Minimum Slope Stability Factors of Safety
(Using 15 % reduction in laboratory test strength data)

Cross-Section	Analysis Condition		
	Steady-State[1]	Steady-State with Seismic[2]	High Water Level[3]
BH-3	1.8	1.3	1.4
BH-3 to BH-4	1.8	1.5	1.4
BH-4	1.9	1.5	1.4
BH-5	1.8	1.4	1.3
BH-6	2.0	1.6	1.6
BH-7	2.5	2.0	2.1
BH-9	1.7	1.3	1.5
BH-10	1.8	1.4	1.5

[1]Normally accepted industry standard minimum factor of safety = 1.5
[2]Normally accepted industry standard minimum factor of safety = 1.2
[3]Normally accepted industry standard minimum factor of safety = 1.3

Summary

The Earth Science & Environmental Engineering Department of Southern Company Technical Services was asked to provide technical oversight of a series of soil test borings along the perimeter dikes at Alabama Power Company's Plant Gaston. Twelve borings were drilled in February 2009, and a summary report of the findings of these borings was issued March 19, 2009. At the time of the borings, relatively intact Shelby tube samples were collected and stored for possible later laboratory testing.

ES&EE was subsequently authorized to perform needed laboratory testing and stability analyses of the perimeter embankments to assess the potential for slope stability issues in these embankments. Laboratory testing was performed, and topographic information was obtained by Southern Company Civil Field Services in order to develop cross-sections to be used in stability analyses.

Using the geotechnical information obtained from the borings and the laboratory testing on the Shelby tube samples, stability analyses were performed by ES&EE. The analyses indicate the minimum factors of safety against sliding of the perimeter embankments meet or exceed the minimum factors of safety considered acceptable by the industry, even when the embankments were analyzed using a 15 percent reduction in the measured laboratory test strength data. No issues or problems associated with the perimeter dikes were identified during our site visits, by the findings of our field exploration or the results of our stability analyses.

If you have any questions or need additional information, please do not hesitate to contact either Rachel Mudd or Jim Pegues.

NORTH ARROW

GRAPHIC SCALE

400 0 400 800

(IN FEET)

1 inch = 400 ft.

LEGEND:

BH-9 ⊕ BORING LOCATION

Southern Company Generation
Engineering and Construction Services
FOR
Alabama Power Company

PLANT GASTON
ASH POND DIKE STUDY
BORING LOCATIONS

SCALE	PROJ I.D.	DRAWING NUMBER	SHEET	CONT'D	REV
AS SHOWN		ES1734S1	1	FINAL	0

Drawing name: I:\FSFF MAJOR PROJECTS\PROJECTS\Gaston\Gaston 2009\ES1734 Gaston Ash Pond Dike Study\Drawings\ES1734S1.dwg Mar 19, 2009 - 11:01am ANSI B: 17x11 Acad2008

CONFIDENTIAL

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-1
Sheet 1 of 2

SITE	Gaston Steam Plant Ash Pond	HOLE DEPTH	36	SURF.ELEV.	446.29
LOCATION	Ash Pond Dike--North Dike	COORDINATES N	996542.5244	E	305297.3621
ANGLE		BEARING		CONTRACTOR	SCS
DRILL NO.	CME 55	DRILLING METHOD	HSA	NO. SAMPLES	14
NO. U.D. SAMPLES	1	CASING SIZE		LENGTH	
CORE SIZE		TOTAL % REC.		WATER TABLE DEPTH	22.3
ELEV.	423.99	TIME AFTER COMP.	24 hours	DATE TAKEN	
TYPE GROUT		QUANTITY		MIX	
DRILLING START DATE	2/4/2009	DRILLER	P. Smith	RECORDER	R. Mudd
APPROVED		DRILLING COMP. DATE	2/4/2009		

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	446.29								
1									
2									
3									
4		ASH--black, silty, dry, no plasticity, medium dense	1	2.5-4.0	18-5-5	10			
5									
6		CLAY (CL)--fill material; orange, red and yellow mottled; moist; medium to low plasticity; some small pebbles in sample	2	4.5-6.0	4-4-5	9			
7									
8		Same	3	6.5-8.0	3-3-6	9			
9									
10									
11		Same, slightly high plasticity, piece of gravel and some ash in sample	4	9.5-11.0	3-4-5	9			
12									
13									
14		Same, slightly less plasticity, no ash	5	12.5-14.0	3-5-7	12			
15									
16		Same, slightly higher plasticity, maroon color	6	14.5-16.0	3-4-4	8			
17									
18		Same, slightly less plastic, color turning dark maroon to dark brown with depth	7	16.5-18.0	3-5-7	12			
19									
20									
21		CLAY (CH)--medium to high plasticity; dark maroon-brown, moist, small pebbles in sample	8	19.5-21.0	3-2-4	6			
22									
23		Sample caved slightly during sampling. Appears to be CL to CH--light tan		22.0-24.0			UD Sample		
24									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-1
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH 36 SURF.ELEV. 446.29

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CL to CH)--medium to high plasticity, dark gray, moist, medium stiff, residual material	9	24.5-26.0	5-5-5	10			
27									
28									
29		CLAY (CL to CH)--medium plasticity, light tan, very soft, wet, medium to large angular pebbles in sample	10	27.5-29.0	1-1-2	3			
30									
31		CLAY (CH)--medium to high plasticity, gray and tan mottled, moist, stiff	11	29.5-31.0	3-5-9	14			
32									
33									
34		CLAY (CH)--medium to high plasticity, light tan, moist, medium stiff	12	32.5-34.0	1-5-7	12			
35									
36.0 36	410.29	CLAY (CH)--light tan and gray mottled, high plasticity, moist, stiff	13	34.5-36.0	2-5-7	13			
37		Bottom of Hole 36.0' BGS							
38									
39									
40									
41									
42									
43									
44									
45									
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47									
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49									
50									
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55									
56									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-2
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 39 | SURF.ELEV.: 445.64
LOCATION: Ash Pond Dike--North Dike | COORDINATES N: 995741.0393 | E: 303445.3338
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 14 | NO. U.D. SAMPLES: 0
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: 20.1 | ELEV.: 425.54 | TIME AFTER COMP.: 24 hours | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/4/2009
DRILLER: P. Smith | RECORDER: R. Mudd | APPROVED: | DRILLING COMP. DATE: 2/4/2009

	Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0	0	445.64								
	1									
	2									
	3									
	4		CLAY (CL-CH)--medium plasticity; orange and yellow mottled; moist; fill material	1	2.5-4.0	6-5-7	12			
	5									
	6		Same--dark red	2	4.5-6.0	3-5-7	12			
	7									
	8									
	9		Same	3	7.5-9.0	3-5-7	12			
	10									
	11		Same--dark brown, large pebbles in sample	4	9.5-11.0	3-4-6	10			
	12									
	13									
	14		CLAY (CL)--fill; dark brown; some small pebbles; medium to low plasticity; moist	5	12.5-14.0	3-4-6	10			
	15									
	16		Same--black and dark gray	6	14.5-16.0	3-4-6	10			
	17									
	18									
	19		Same--dark red and dark gray	7	17.5-19.0	3-5-7	12			
	20									
	21		Same--some black	8	19.5-21.0	3-5-9	14			
	22									
23.0	23	422.64	CLAY (CL)--dark red; medium to low plasticity; fill							
	24		CLAY (CL-CH)--medium to high plasticity; dark brown; wet; stiff; residual material	9	22.5-24.0	3-6-7	13			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-2
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH 39 SURF.ELEV. 445.64

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25		CLAY (CL-CH)--medium to high plasticity; top part red and yellow mottled, moist, stiff; bottom half soft, wet, light tan	10	24.5-26.0	4-6-7	13			
26									
27									
28									
29		CLAY (CL-CH)--medium plasticity; dark red; some pebbles; stiff; moist	11	27.5-29.0	4-6-10	16			
30									
31									
32									
33									
34		Same--dark gray towards bottom, less plasticity	12	32.5-34.0	3-4-7	11			
35		SAND (SW) with clay--fine to very coarse grained; high plasticity clay portion; wet; medium loose; dark gray	13	34.5-36.0	4-5-5	10			
36									
37		SAND (SW) with clay--fine to very coarse grained; dark gray, changing to maroon (more clay), changing to white (weathered rock) with depth; medium plasticity clay; bottom of sample partially weathered rock							
38									
39	406.64		14	37.5-39.0	50/2"	REF			
39.0		Bottom of Hole 39.0' BGS							
40									
41									
42									
43									
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56									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-3
Sheet 1 of 2

SITE	Gaston Steam Plant Ash Pond	HOLE DEPTH	37	SURF.ELEV.	446.41
LOCATION	Ash Pond Dike--West Dike	COORDINATES N	994943.4032	E	302604.5157
ANGLE		BEARING		CONTRACTOR	SCS
DRILL NO.	CME 55	DRILLING METHOD	HSA	NO. SAMPLES	14
NO. U.D. SAMPLES	0	CASING SIZE		LENGTH	
CORE SIZE		TOTAL % REC.		WATER TABLE DEPTH	26.1
ELEV.	420.31	TIME AFTER COMP.	24 hours	DATE TAKEN	
TYPE GROUT		QUANTITY		MIX	
DRILLING START DATE	2/10/2009	DRILLER	S. Milam	RECORDER	G. Wilson
APPROVED	R. Mudd	DRILLING COMP. DATE	2/10/2009		

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	446.41								
1									
2									
3									
4		CLAY (CH)--fill; orange and gray with some small pebbles; moist	1	2.5-4.0	3-4-4	8			
5									
6		Same	2	4.5-6.0	3-4-4	8			
7									
8									
9		Same	3	7.5-9.0	2-6-5	11			
10									
11		Same	4	9.5-11.0	4-5-7	12			
12									
13									
14		Same--red orange	5	12.5-14.0	3-4-7	11			
15									
16		Same	6	14.5-16.0	3-4-7	11			
17									
18									
19		Same	7	17.5-19.0	4-6-7	13			
20									
21		Same	8	19.5-21.0	4-7-8	15			
22									
23		CLAY (CH)--red-orange; moist to wet							
24		CLAY (CL)--dark brown and gray, silty clay, residual	9	22.5-24.0	1-4-5	9			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-3
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH **37** SURF.ELEV. **446.41**

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CH)--red-orange, stiff, high plasticity, moist	10	24.5-26.0	4-6-7	13			
27									
28									
29		Same	11	27.5-29.0	4-4-6	10			
30									
31		Same--dark brown; very high plasticity	12	29.5-31.0	7-6-7	13			
32									
33									
34		Same--dark red; high plasticity	13	32.5-34.0	3-4-7	11			
35									
36		Silty CLAY (CL)--gray-yellow; stiff; medium plasticity; wet	14	34.5-36.0	4-4-6	10			
37									
38		Bottom of hole 37' BGS--Auger Refusal							
39									
40									
41									
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-4
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 36 | SURF.ELEV.: 445.18
LOCATION: Ash Pond Dike--West Dike | COORDINATES N: 993887.9524 | E: 302617.4043
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 13 | NO. U.D. SAMPLES: 1
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: 26.6 | ELEV.: 418.58 | TIME AFTER COMP.: 24 hours | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/10/2009
DRILLER: S. Milam | RECORDER: G. Wilson | APPROVED: R. Mudd | DRILLING COMP. DATE: 2/10/2009

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	445.18								
1									
2									
3									
4		ASH--moist	1	2.5-4.0	13-16-17	33			
5									
6		Same, small amount of clay in sample	2	4.5-6.0	9-11-12	23			
7									
8									
9		Same, no clay	3	7.5-9.0	23-43-50/4"	REF			
10									
11		Same	4	9.5-11.0	19-27-30	57			
12									
13									
14		Same--pieces of orange clay fill in sample	5	12.5-14.0	5-3-2	5			
15									
16		CLAY (CL-CH)--orange and yellow; possible fill and residual in sample; some pebbles; moist;	6	14.5-16.0	0-2-2	4			
17				16.0-18.0			UD		
18									
19									
20									
21		CLAY (CH)--dark red-orange; high plasticity; medium stiff; moist, residual	7	19.5-21.0	2-3-4	7			
22									
23									
24		Same--dark brown, stiff	8	22.5-24.0	3-4-5	9			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-4
Sheet 2 of 2

SITE Gaston Steam Plant Ash Pond TOTAL DEPTH 36 SURF.ELEV. 445.18

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CH)--dark red-orange; soft; high plasticity; moist	9	24.5-26.0	2-2-2	4			
27									
28									
29		Same	10	27.5-29.0	0-2-2	4			
30									
31		Same--Stiff	11	29.5-31.0	5-6-8	14			
32									
33									
34		Same--some yellow mottled with orange, very stiff	12	32.5-34.0	7-10-13	23			
35									
36		Same	13	34.5-36.0	6-7-8	15			
37		Bottom of Hole 36' BGS							
38									
39									
40									
41									
42									
43									
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56									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-4A
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 14 | SURF.ELEV.: 445.18
LOCATION: Ash Pond Dike--West Dike | COORDINATES N: 993887.9524 | E: 302617.4043
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 5 | NO. U.D. SAMPLES: 1
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: n/a | ELEV.: | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/11/2009
DRILLER: S. Milam | RECORDER: R. Mudd | APPROVED: | DRILLING COMP. DATE: 2/11/2009

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	445.18								
1									
2									
3									
4		FILL (CL to CH)--medium plasticity, dark orange and yellow, some small pebbles	1	2.5-4.0	5-4-5	9			
5									
6		Same- Dark orange-brown	2	4.5-6.0	4-6-6	12			
7									
8									
9		Same- orange-red	3	7.5-9.0	6-8-11	19			
10									
11		Same- several small to medium pebbles, orange-red and yellow	4	9.5-11.0	6-8-10	18			
12									
13									
14.0 14	431.18	Same- orange-brown, less pebbles than above	5	12.5-14.0	3-11-7	18			
15		Bottom of Hole 14.0' BGS							
16									
17									
18									
19		Hole Drilled on West side of embankment near BH-4							
20									
21									
22									
23									
24									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-5
Sheet 1 of 2

SITE	Gaston Steam Plant Ash Pond	HOLE DEPTH	39	SURF.ELEV.	445.55
LOCATION	Ash Pond Dike--West Dike	COORDINATES N	993508.4245	E	302603.1234
ANGLE		BEARING		CONTRACTOR	SCS
DRILL NO.	CME 55	DRILLING METHOD	HSA	NO. SAMPLES	14
NO. U.D. SAMPLES	1	CASING SIZE		LENGTH	
CORE SIZE		TOTAL % REC.		WATER TABLE DEPTH	20.7
ELEV.	424.85	TIME AFTER COMP.	24 hours	DATE TAKEN	
TYPE GROUT		QUANTITY		MIX	
DRILLING START DATE	2/11/2009	DRILLER	S. Milam	RECORDER	R. Mudd
APPROVED		DRILLING COMP. DATE	2/11/2009		

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	445.55								
1									
2									
3									
4		CLAY (CL to CH)--fill material; orange and yellow; moist	1	2.5-4.0	5-5-6	11			
5									
6		Same	2	4.5-6.0	3-3-3	6			
7									
8									
9		Same--some small to medium pebbles	3	7.5-9.0	3-4-5	9			
10									
11		Same	4	9.5-11.0	3-4-4	8			
12									
13									
14		Same	5	12.5-14.0	4-5-8	13			
15									
16		Same	6	14.5-16.0	3-4-4	8			
17									
18									
19		Same	7	17.5-19.0	3-4-6	10			
20									
21		Same--orange and red and yellow with some gray	8	19.5-21.0	4-5-7	12			
22									
23									
24		CLAY (CL to CH)--residual; dark brown to very dark red; medium plasticity; stiff	9	22.5-24.0	4-7-8	15			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-5
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH 39 SURF.ELEV. 445.55

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CH)--dark brown to very dark red; high plasticity; stiff	10	24.5-26.0	3-4-6	10			
27									
28									
29		Same	11	27.5-29.0	4-6-6	12			
30									
31		CLAY (CH)--breaks apart very easily like heavily weathered residual rock; dark red; very wet; soft	12	29.5-31.0	0-1-1	2			
32									
33		Pushed Tube		32.0-34.0			UD		
34									
35									
36		CLAY (CH)--maroon and orange mottled; top of sample soft with pebbles; bottom of sample stiff and wet	13	34.5-36.0	2-3-3	6			
37									
38									
39.0 39	406.55	CLAY (CH)--stiff, maroon and orange mottled; wet very high recovery	14	37.5-39.0	3-3-5	8			
40		Bottom of hole 39.0' BGS							
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-6
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 36 | SURF.ELEV.: 445.21
LOCATION: Ash Pond Dike--West Dike | COORDINATES N: 993251.8015 | E: 302606.2601
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 13 | NO. U.D. SAMPLES: 1
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: 23.3 | ELEV.: 421.91 | TIME AFTER COMP.: 24 hours | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/10/2009
DRILLER: S. Milam | RECORDER: G. Wilson | APPROVED: R. Mudd | DRILLING COMP. DATE: 2/10/2009

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	445.21								
1									
2									
3									
4		ASH with trace clay	1	2.5-4.0	8-15-13	28			
5									
6		Same	2	4.5-6.0	9-14-14	28			
7									
8									
9		Same	3	7.5-9.0	6-4-2	6			
10									
11				10.0-12.0			UD		
12									
13									
14		CLAY (CH)--fill material; orange and gray; moist; trace ash in sample; medium to high plasticity	4	12.5-14.0	2-4-6	10			
15									
16		Silty CLAY (CL to CH)--orange and gray; moist; medium to high plasticity	5	14.5-16.0	2-3-4	7			
17									
18									
19		CLAY (CH)--residual material; orange and gray mottled; medium stiff; moist	6	17.5-19.0	2-3-5	8			
20									
21		Same--dark red and dark gray mottled	7	19.5-21.0	2-4-6	10			
22									
23									
24		Same--orange and gray mottled	8	22.5-24.0	6-5-7	12			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-6
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH 36 SURF.ELEV. 445.21

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CL-CH)--medium plasticity; dark brown with some dark orange, stiff, moist	9	24.5-26.0	3-4-6	10			
27									
28									
29		CLAY (CH)--high plasticity; dark orange-red; medium stiff; moist	10	27.5-29.0	2-3-5	8			
30									
31		Same	11	29.5-31.0	3-6-8	14			
32									
33									
34		Same--very stiff, light orange and yellow	12	32.5-34.0	7-10-12	22			
35									
36.0 36	409.21	Same	13	34.5-36.0	7-12-13	25			
37		Bottom of Hole 36.0' BGS							
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-6A
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 9 | SURF.ELEV.: Approx 445
LOCATION: West Dike; Across from BH-6 across dike road | COORDINATES N: | E:
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 3 | NO. U.D. SAMPLES: 0
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: n/a | ELEV.: n/a | TIME AFTER COMP.: | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/11/2009
DRILLER: S. Milam | RECORDER: R. Mudd | APPROVED: | DRILLING COMP. DATE: 2/11/2009

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0									
1									
2									
3									
4		CLAY (CL to CH)--fill; wet; orange and yellow	1	2.5-4.0	1-2-3	5			
5									
6		Same	2	4.5-6.0	9-11-12	23			
7									
8									
9		Same	3	7.5-9.0	2-3-7	10			
10		Bottom of Hole 9.0' BGS							
11									
12									
13									
14		Hole Drilled on West side of embankment near BH-6							
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-7
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 29 | SURF.ELEV.: 445.02
LOCATION: Ash Pond Dike--West Dike | COORDINATES N: 992868.6456 | E: 302585.1822
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 10 | NO. U.D. SAMPLES: 1
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: 25.7 | ELEV.: 419.32 | TIME AFTER COMP.: 24 hours | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/11/2009
DRILLER: S. Milam | RECORDER: R. Mudd | APPROVED: | DRILLING COMP. DATE: 2/11/2009

	Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0	0	445.02								
	1									
	2									
	3									
	4		CLAY (CL to CH)--fill material; orange and yellow mottled; medium plasticity; moist	1	2.5-4.0	3-5-4	9			
	5									
	6		Same--orange and gray	2	4.5-6.0	3-5-4	9			
	7									
	8									
	9		Same	3	7.5-9.0	8-9-12	21			
10.0	10	435.02								
	11		CLAY (CH)--residual; orange with gray silt; high plasticity; stiff	4	9.5-11	5-6-9	14			
	12									
	13									
	14		Same	5	12.5-14.0	6-6-9	15			
	15									
	16		Same--no gray silt	6	14.5-16.0	4-7-8	15			
	17									
	18									
	19		Same--medium stiff	7	17.5-19.0	2-3-3	6			
	20									
	21		Pushed UD		20.0-22.0			UD		
	22									
	23									
	24		CLAY (CL to CH)---orange and yellow; very stiff; moist; medium plasticity	8	22.5-24.0	8-11-14	25			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-7
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH 29 SURF.ELEV. 445.02

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CL to CH)--orange and yellow; stiff; moist; medium plasticity	9	24.5-26.0	5-8-14	22			
27									
28									
29		Same--some black oxide nodules in sample, markings from residual structure	10	27.5-29.0	5-8-13	21			
30		Bottom of Hole 29.0' BGS							
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-8
Sheet 1 of 2

SITE	Gaston Steam Plant Ash Pond	HOLE DEPTH	31	SURF.ELEV.	443.08
LOCATION	Ash Pond Dike--West Dike	COORDINATES N	992644.3536	E	302615.9989
ANGLE		BEARING		CONTRACTOR	SCS
DRILL NO.	CME 55	DRILLING METHOD	HSA	NO. SAMPLES	12
NO. U.D. SAMPLES	0	CASING SIZE		LENGTH	
CORE SIZE		TOTAL % REC.		WATER TABLE DEPTH	24.9
ELEV.	418.18	TIME AFTER COMP.	24 hours	DATE TAKEN	
TYPE GROUT		QUANTITY		MIX	
DRILLING START DATE	2/11/2009	DRILLER	S. Milam	RECORDER	R. Mudd
APPROVED		DRILLING COMP. DATE	2/11/2009		

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	443.08								
1									
2									
3									
4		CLAY (CL to CH)--fill; several small pebbles in sample; dark brown to orange; moist; stiff	1	2.5-4.0	4-4-7	11			
5									
6		Same	2	4.5-6.0	4-4-5	9			
7									
8									
9		CLAY (CH)--residual; medium to high plasticity; moist; red-orange; stiff	3	7.5-9.0	4-6-9	15			
10									
11		Same--orange and yellow	4	9.5-11	4-6-7	13			
12									
13									
14		Same	5	12.5-14.0	7-9-9	18			
15									
16		Same	6	14.5-16.0	6-7-8	15			
17									
18									
19		Same	7	17.5-19.0	3-4-6	10			
20									
21		Same	8	19.5-21.0	4-6-7	13			
22									
23									
24		Same	9	22.5-24.0	4-5-7	12			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-8
Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH **31** SURF.ELEV. 443.08

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CH)--medium to high plasticity; orange and yellow; moist; stiff	10	24.5-26.0	4-6-6	12			
27									
28									
29		Same	11	27.5-29.0	3-4-4	8			
30									
31		Same	12	29.5-31.0	2-3-5	8			
32		Bottom of Hole 31.0' BGS							
33									
34									
35									
36									
37									
38									
39									
40									
41									
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56									

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-9
Sheet 1 of 2

SITE: Gaston Steam Plant Ash Pond | HOLE DEPTH: 26 | SURF.ELEV.: 444.69
LOCATION: Ash Pond Dike--Southeast Dike | COORDINATES N: 994028.5245 | E: 306214.8589
ANGLE: | BEARING: | CONTRACTOR: SCS | DRILL NO.: CME 55
DRILLING METHOD: HSA | NO. SAMPLES: 10 | NO. U.D. SAMPLES: 0
CASING SIZE: | LENGTH: | CORE SIZE: | TOTAL % REC.:
WATER TABLE DEPTH: 15.2 | ELEV.: 429.49 | TIME AFTER COMP.: 24 hours | DATE TAKEN:
TYPE GROUT: | QUANTITY: | MIX: | DRILLING START DATE: 2/11/2009
DRILLER: S. Milam | RECORDER: R. Mudd | APPROVED: | DRILLING COMP. DATE: 2/11/2009

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	444.69								
1									
2									
3									
4		CLAY (CL-CH)--fill; orange-red; small to medium pebbles; medium plasticity	1	2.5-4.0	3-3-4	7			
5									
6		Same	2	4.5-6.0	4-7-10	17			
7									
8									
9		Same--light orange	3	7.5-9.0	5-10-9	19			
10									
11		Same--dark orange-red and yellow	4	9.5-11	2-3-4	7			
12									
13									
14		CLAY (CH)--residual; orange, yellow and white mottled; medium to high plasticity; stiff	5	12.5-14.0	3-4-6	10			
15									
16		Same--orange, yellow, white and maroon	6	14.5-16.0	2-4-4	8			
17									
18									
19		Same	7	17.5-19.0	4-7-7	14			
20									
21		Same--very stiff, 1/3" seam of maroon weathered rock in sample	8	19.5-21.0	4-10-10	20			
22									
23									
24		CLAY (CH)--dark orange; stiff; medium to high plasticity moist	9	22.5-24.0	6-5-6	11			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-9

Sheet 2 of 2

SITE **Gaston Steam Plant Ash Pond** TOTAL DEPTH **26** SURF.ELEV. 444.69

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CH)--light orange and yellow; medium to high plasticity; moist; stiff	10	24.5-26.0	4-6-6	12			
27		Bottom of Hole 26.0' BGS							
28									
29									
30									
31									
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SOUTHERN COMPANY
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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-10
Sheet 1 of 2

SITE	Gaston Steam Plant Ash Pond	HOLE DEPTH	31	SURF.ELEV.	450.88
LOCATION	Ash Pond Dike--Southeast Dike	COORDINATES N	995576.66	E	307267.9389
ANGLE		BEARING		CONTRACTOR	SCS
DRILL NO.	CME 55	DRILLING METHOD	HSA	NO. SAMPLES	12
NO. U.D. SAMPLES	0	CASING SIZE		LENGTH	
CORE SIZE		TOTAL % REC.		WATER TABLE DEPTH	19.2
ELEV.	431.68	TIME AFTER COMP.	24 hours	DATE TAKEN	
TYPE GROUT		QUANTITY		MIX	
DRILLING START DATE	2/11/2009	DRILLER	S. Milam	RECORDER	R. Mudd
APPROVED		DRILLING COMP. DATE	2/11/2009		

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
0.0 0	450.88								
1									
2									
3									
4		CLAY (CH) with broken limestone and ASH-- orange and yellow clay; white limestone; black ash; moist; fill	1	2.5-4.0	14-16-14	30			
5									
6		CLAY (CH) with some small limestone pieces and one 1" ash seam; moist	2	4.5-6.0	6-10-19	29			
7									
8									
9		CLAY (CL) with limestone--clay has parent rock characteristics and is friable, limestone is broken	3	7.5-9.0	6-10-11	21			
10									
11		Same	4	9.5-11	6-8-7	15			
12									
13									
14		SILT (ML)--dark gray; large percent of sample is rock, probably shale	5	12.5-14.0	6-9-9	18			
15									
16		CLAY (CL)--orange and white; some rock at top of sample; bottom of sample is black clay	6	14.5-16.0	6-6-7	13			
17									
18									
19		CLAY (CL)--black layered with orange clay; some rocks	7	17.5-19.0	3-2-4	6			
20									
21		Same--black with some orange and yellow	8	19.5-21.0	3-5-7	12			
22									
23									
24		CLAY (CL to CH)--black; moist; medium plasticity; stiff	9	22.5-24.0	4-5-6	11			

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DRILLING LOG
GEOLOGICAL SERVICES

Hole No. BH-10
Sheet 2 of 2

SITE: Gaston Steam Plant Ash Pond | TOTAL DEPTH: 31 | SURF.ELEV.: 450.88

Depth	Elev.	Material Description, Classification and Remarks	Sample No.	Standard Penetration Test From To	Blows	N	Comments	% Rec	RQD
25									
26		CLAY (CL to CH)--dark brown to dark gray and orange; medium plasticity; stiff; moist	10	24.5-26.0	3-5-7	12			
27									
28									
29		CLAY (CL)--light orange and dark brown with dark gray; goes from dark to light with depth; very stiff	11	27.5-29.0	7-11-13	24			
30									
31		CLAY (CL to CH)--yellow-orange and gray mottled with black oxide nodules; medium plasticity; moist; stiff	12	29.5-31.0	8-9-11	20			
32		Bottom of hole 31.0' BGS							
33									
34									
35									
36									
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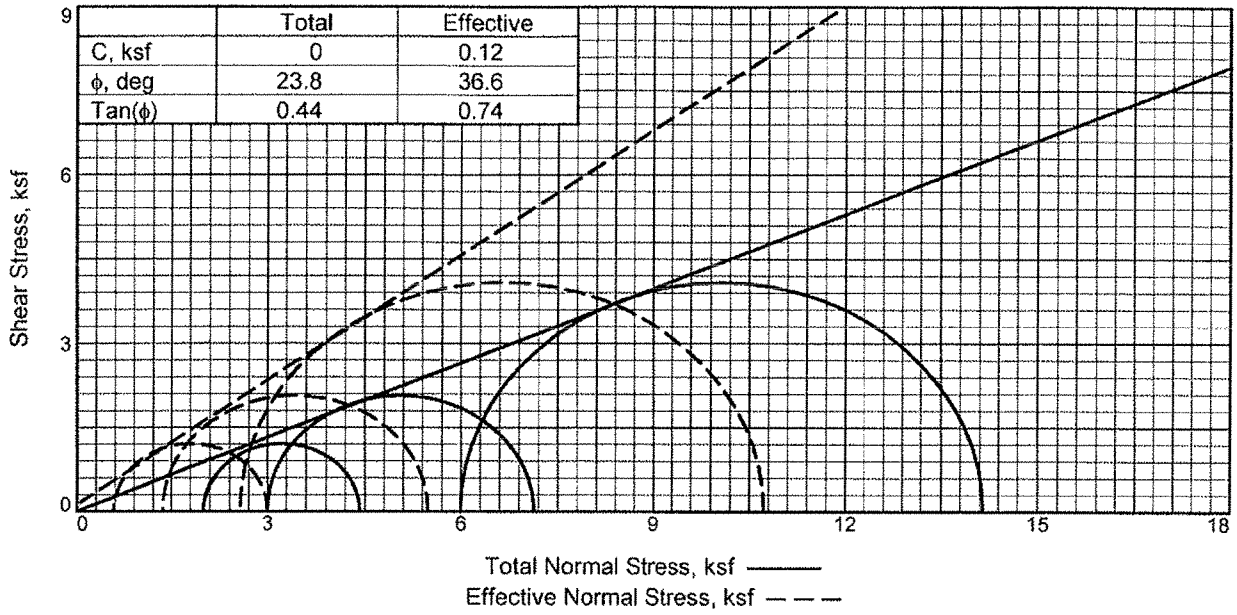
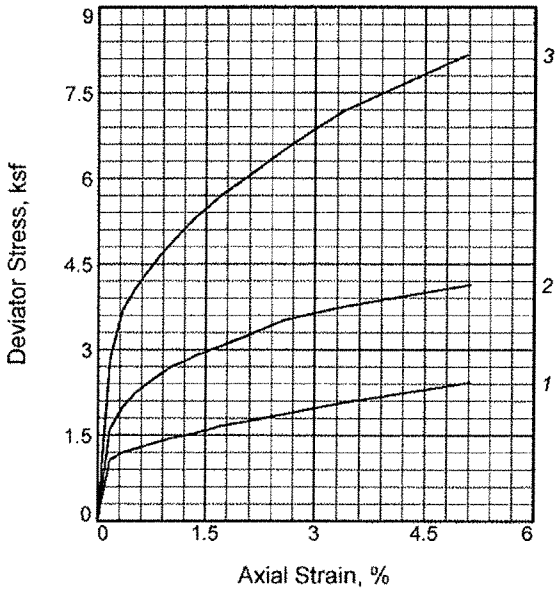
	Total	Effective
C, ksf	0	0.12
ϕ, deg	23.8	36.6
Tan(ϕ)	0.44	0.74





Sample No.		1	2	3
Initial	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	111.3	111.3	115.8
	Saturation, %	94.2	94.2	97.5
	Void Ratio	0.4897	0.4897	0.4322
	Diameter, in.	2.88	2.88	2.89
	Height, in.	5.94	5.94	5.96
At Test	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	113.4	113.6	116.7
	Saturation, %	99.9	100.4	100.1
	Void Ratio	0.4616	0.4593	0.4210
	Diameter, in.	2.87	2.87	2.88
	Height, in.	5.86	5.86	5.92
Strain rate, in./min.		0.05	0.05	0.05
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		2.4	4.1	8.2
Total Pore Pr., ksf		11.5	11.7	13.5
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		3.0	5.5	10.7
$\bar{\sigma}_3$ Failure, ksf		0.6	1.4	2.6

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Brownish Yellow Lean Clay with Sand

LL= 32 **PL=** 14 **PI=** 18
Specific Gravity= 2.656
Remarks:

Figure _____

Client: Southern Company, Inc.

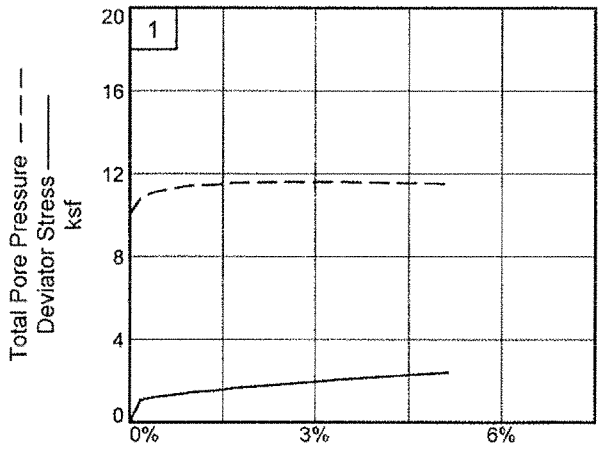
Project: E.C. Gaston Ash Pond

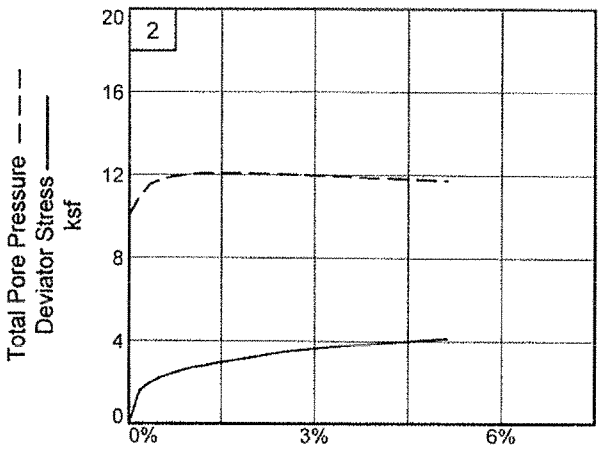
Source of Sample: Site **Depth:** 17.0-19.5'
Sample Number: B-4
Proj. No.: 11746E **Date Sampled:**

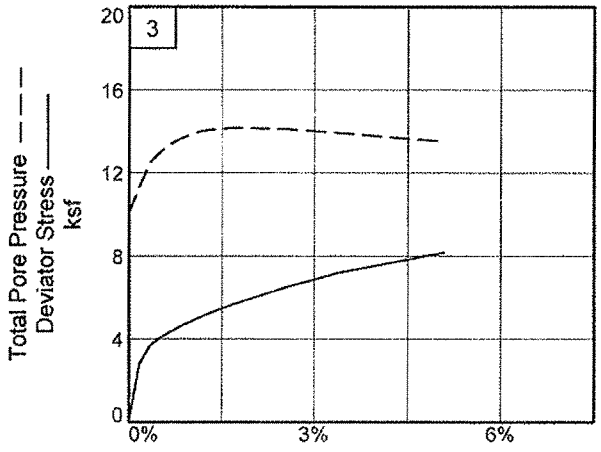
TRIAXIAL SHEAR TEST REPORT

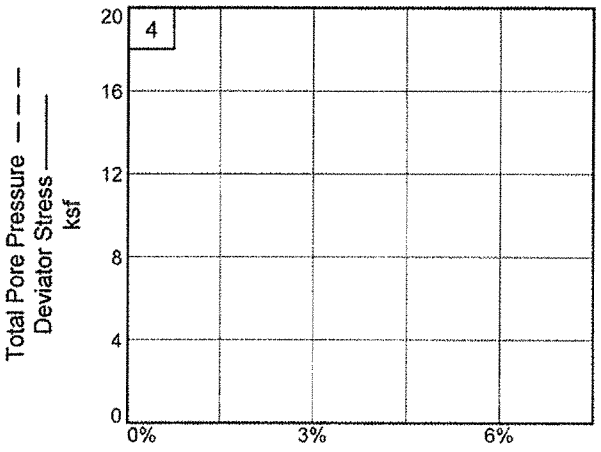
QORE Property Sciences

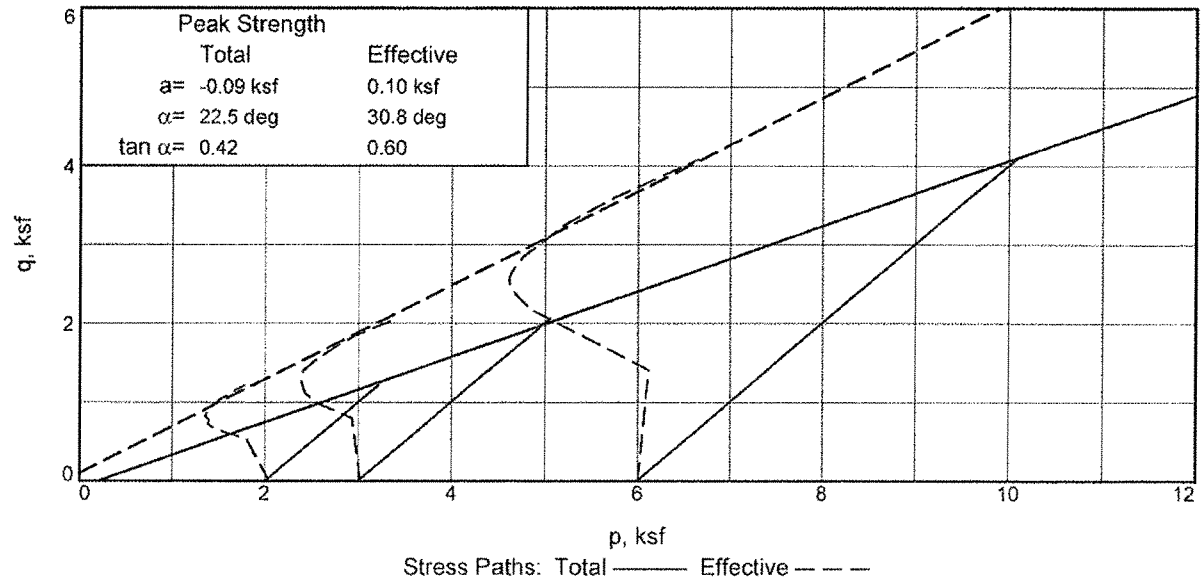
Tested By: Ashok







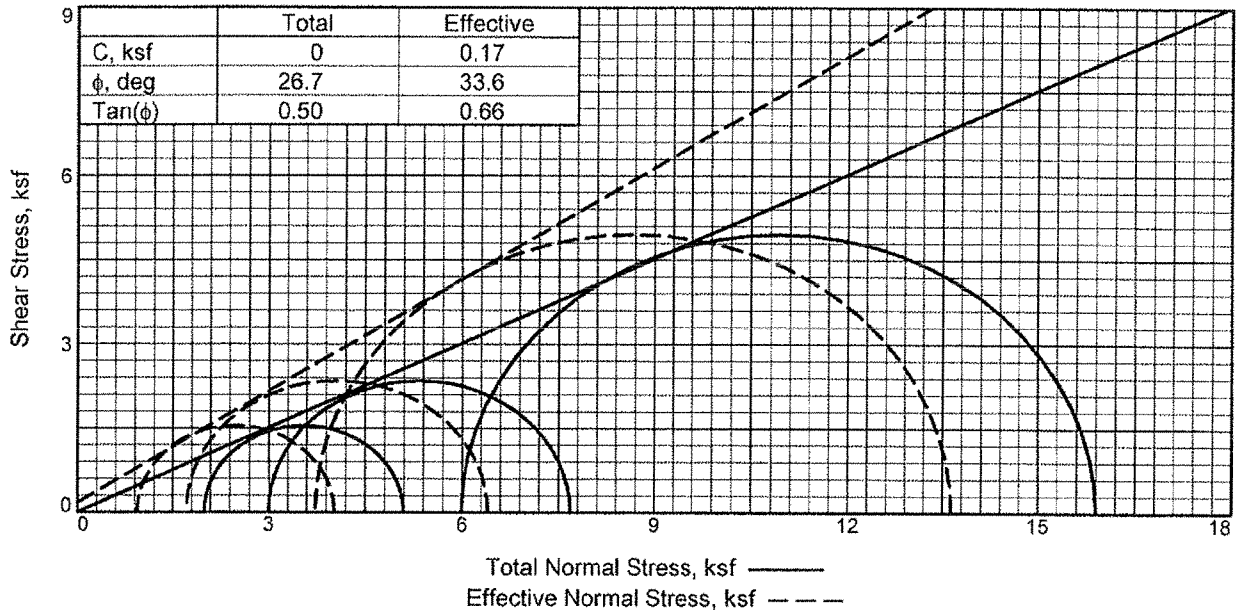


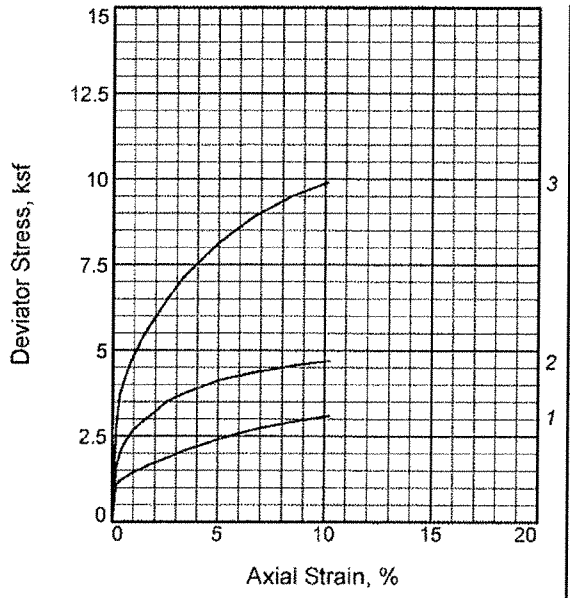


Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 17.0-19.5' **Sample Number:** B-4
Project No.: 11746E **Figure** _____

QORE Property Sciences

Tested By: Ashok





Sample No.		1	2	3
Initial	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	111.3	111.3	115.8
	Saturation, %	94.2	94.2	97.5
	Void Ratio	0.4897	0.4897	0.4322
	Diameter, in.	2.88	2.88	2.89
	Height, in.	5.94	5.94	5.96
At Test	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	113.4	113.6	116.7
	Saturation, %	99.9	100.4	100.1
	Void Ratio	0.4616	0.4593	0.4210
	Diameter, in.	2.87	2.87	2.88
	Height, in.	5.86	5.86	5.92
Strain rate, in./min.		0.05	0.05	0.05
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		3.1	4.7	9.9
Total Pore Pr., ksf		11.1	11.4	12.3
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		4.0	6.4	13.6
$\bar{\sigma}_3$ Failure, ksf		0.9	1.7	3.7

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Brownish Yellow Lean Clay with Sand

LL= 32 **PL=** 14 **PI=** 18
Specific Gravity= 2.656
Remarks:

Client: Southern Company, Inc.

Project: E.C. Gaston Ash Pond

Source of Sample: Site **Depth:** 17.0-19.5'
Sample Number: B-4
Proj. No.: 11746E **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT

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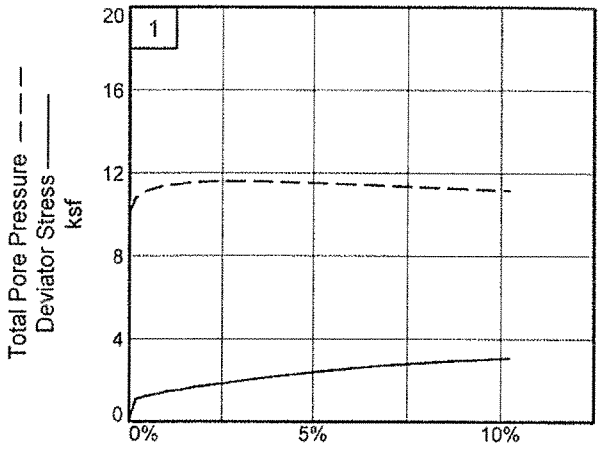
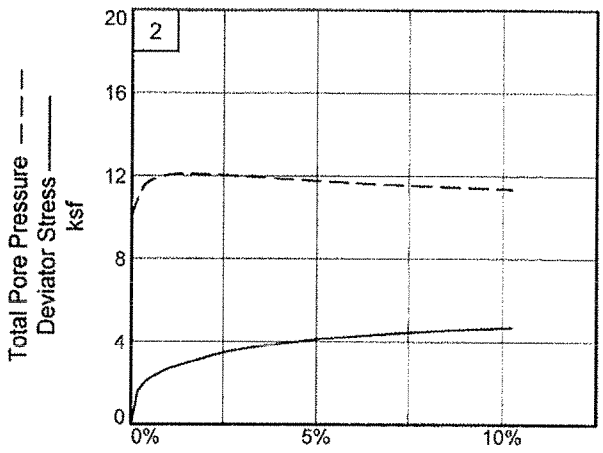
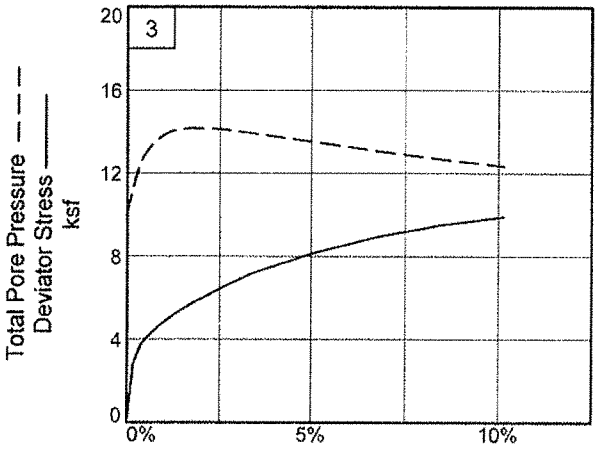
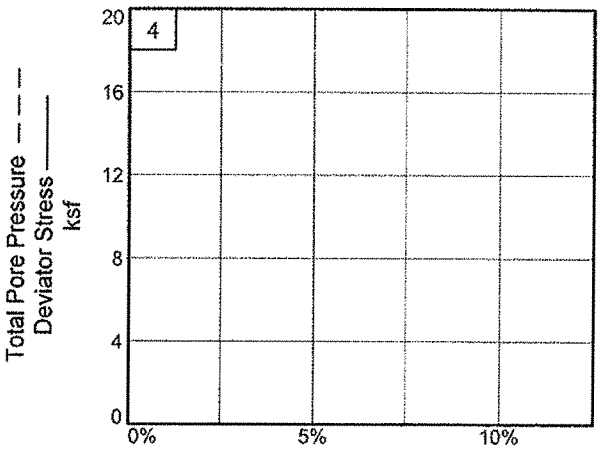
Figure _____

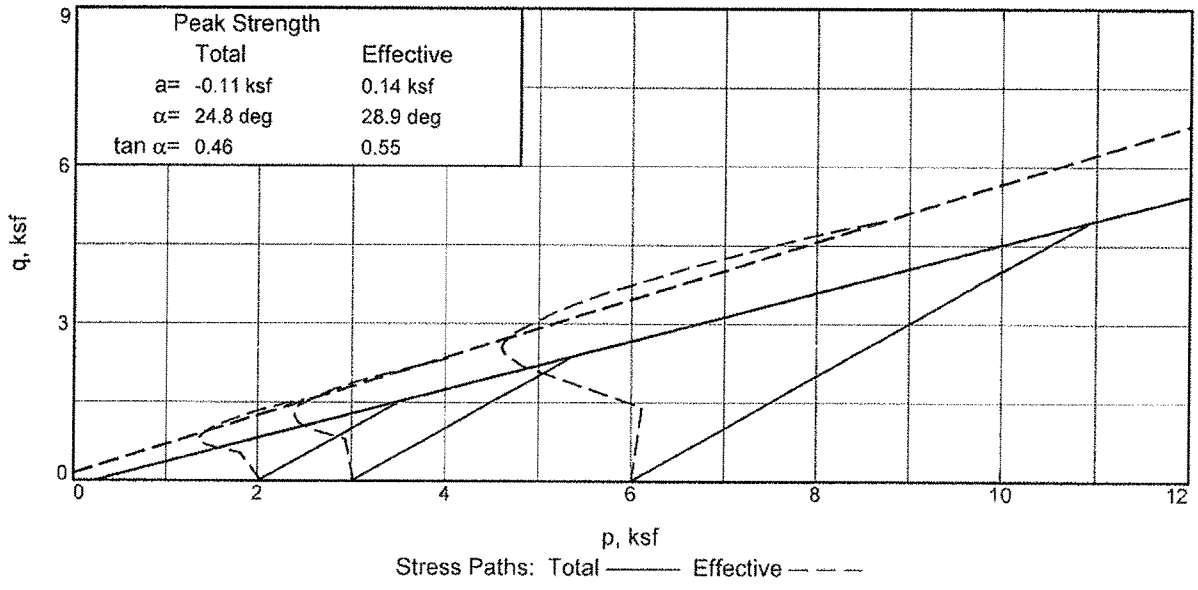
Tested By: Ashok







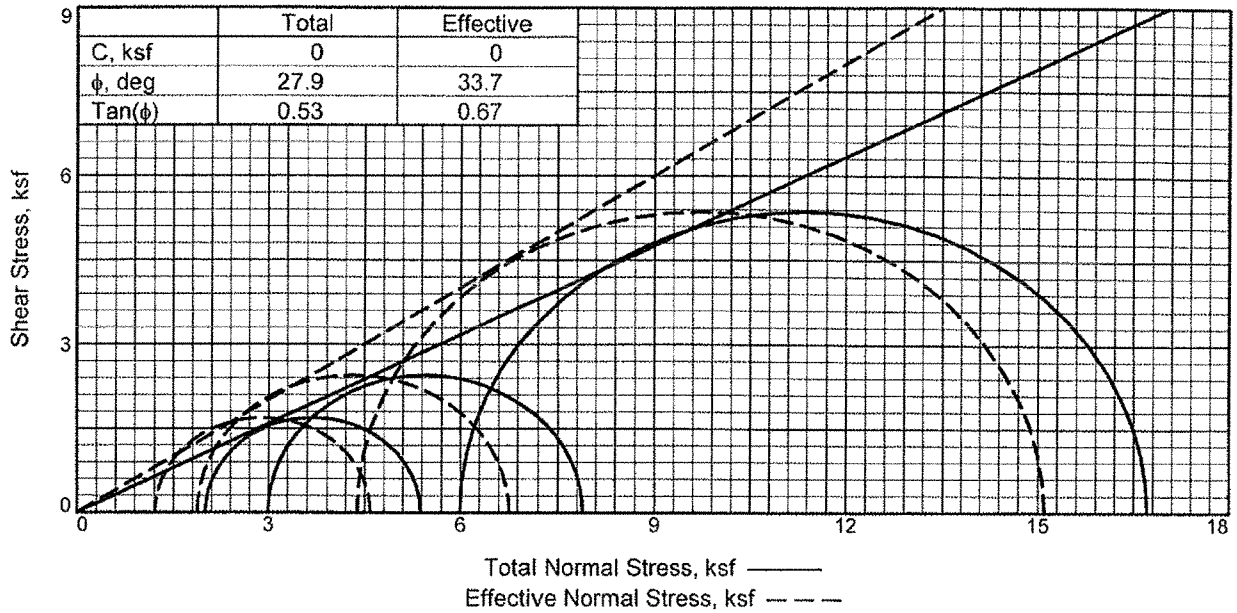


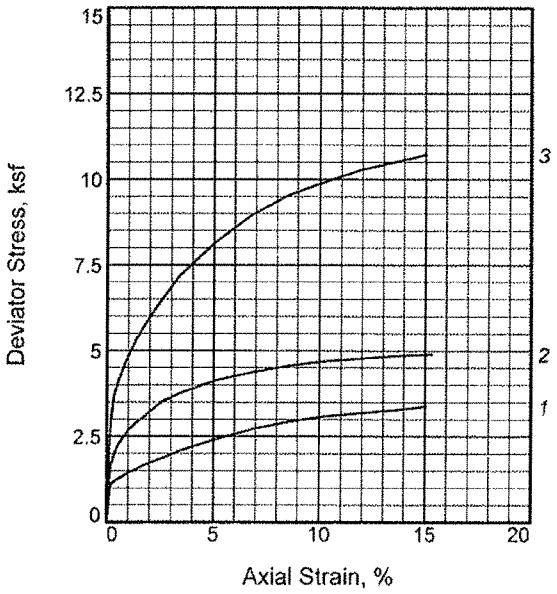


Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 17.0-19.5' **Sample Number:** B-4
Project No.: 11746E **Figure** _____

QORE Property Sciences

Tested By: Ashok





Sample No.		1	2	3
Initial	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	111.3	111.3	115.8
	Saturation, %	94.2	94.2	97.5
	Void Ratio	0.4897	0.4897	0.4322
	Diameter, in.	2.88	2.88	2.89
	Height, in.	5.94	5.94	5.96
At Test	Water Content, %	17.4	17.4	15.9
	Dry Density, pcf	113.4	113.6	116.7
	Saturation, %	99.9	100.4	100.1
	Void Ratio	0.4616	0.4593	0.4210
	Diameter, in.	2.87	2.87	2.88
	Height, in.	5.86	5.86	5.92
Strain rate, in./min.		0.05	0.05	0.05
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		3.4	4.9	10.7
Total Pore Pr., ksf		10.9	11.2	11.7
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		4.6	6.8	15.1
$\bar{\sigma}_3$ Failure, ksf		1.2	1.9	4.4

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Brownish Yellow Lean Clay with Sand

LL= 32 **PL=** 14 **PI=** 18
Specific Gravity= 2.656
Remarks:

Client: Southern Company, Inc.

Project: E.C. Gaston Ash Pond

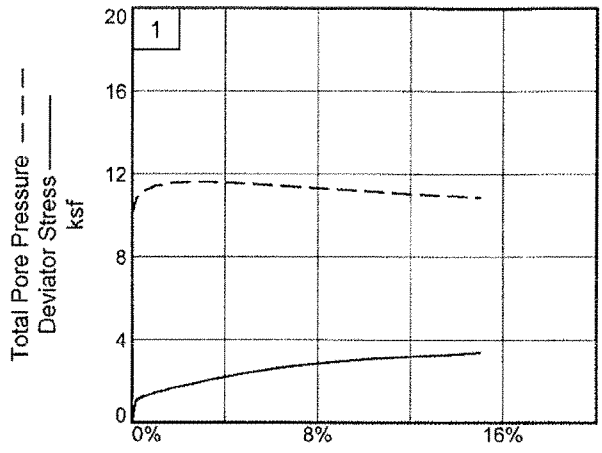
Source of Sample: Site **Depth:** 17.0-19.5'
Sample Number: B-4
Proj. No.: 11746E **Date Sampled:**

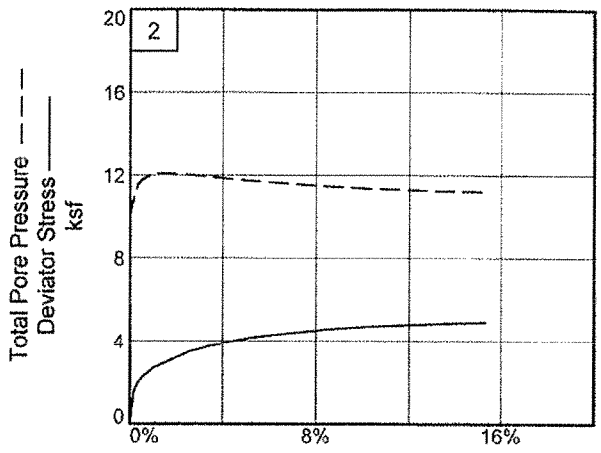
TRIAXIAL SHEAR TEST REPORT

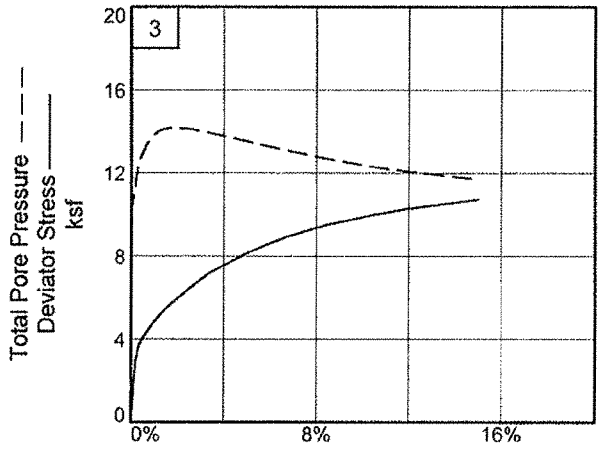
QORE Property Sciences

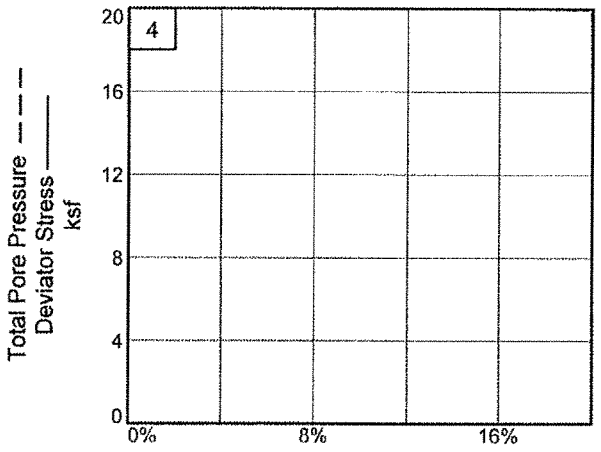
Figure _____

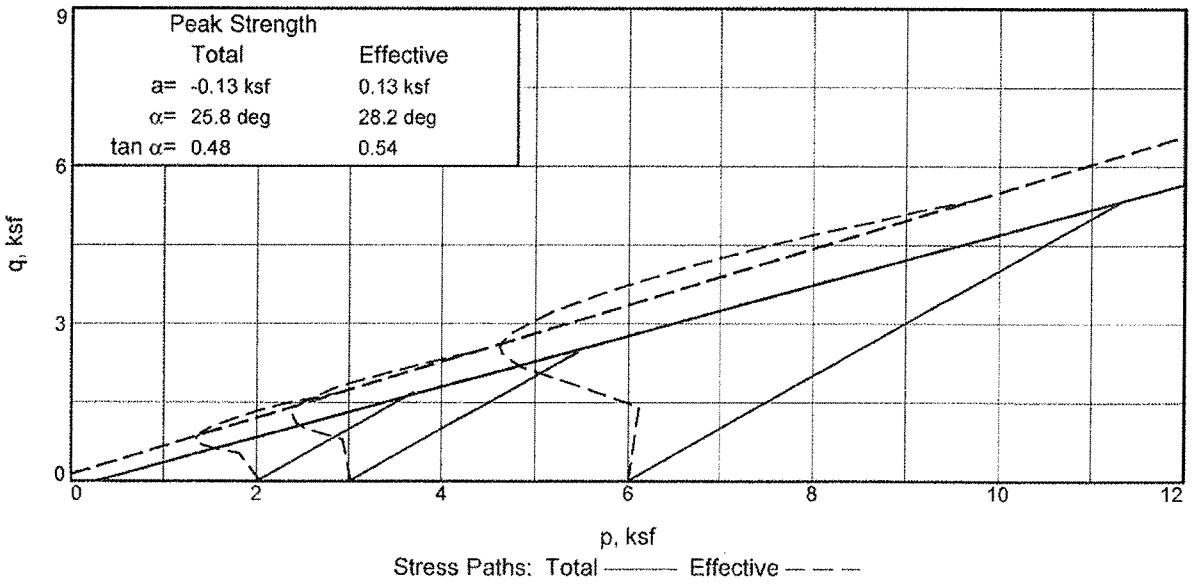
Tested By: Ashok







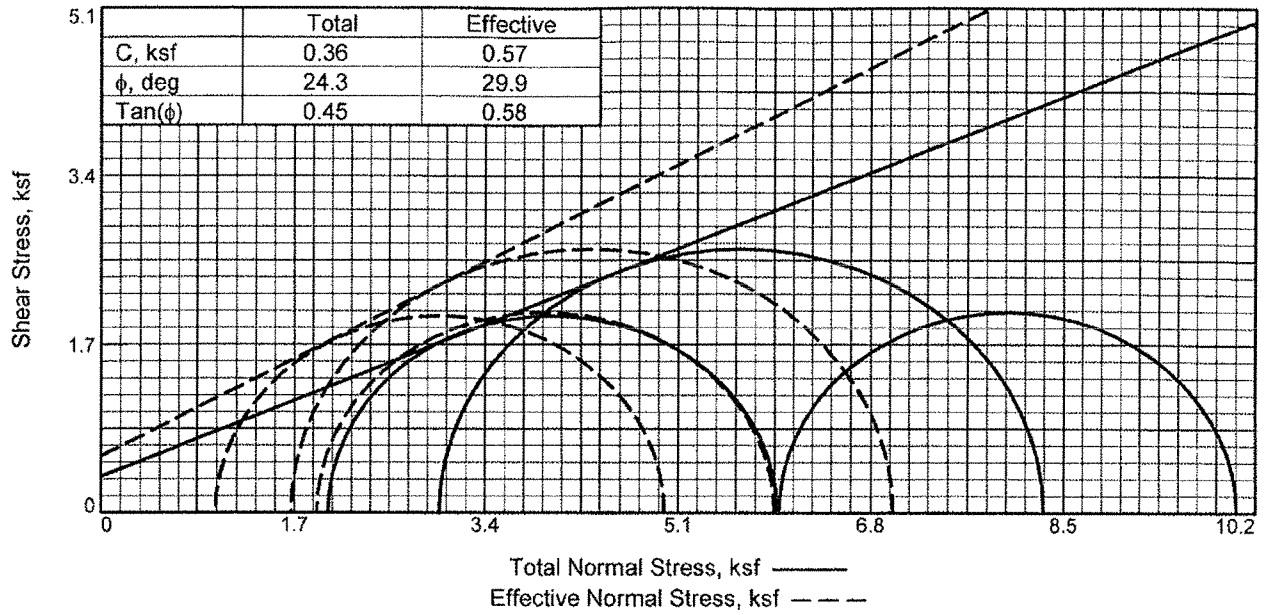


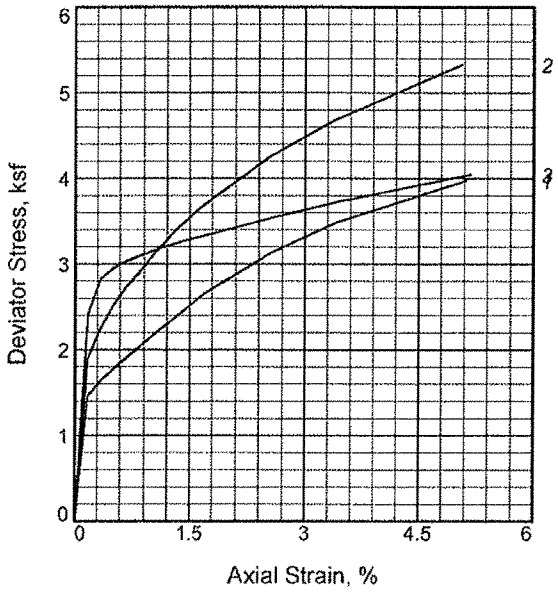


Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 17.0-19.5' **Sample Number:** B-4
Project No.: 11746E Figure _____

QORE Property Sciences

Tested By: Ashok





Sample No.		1	2	3
Initial	Water Content, %	24.4	25.1	22.5
	Dry Density, pcf	99.6	100.2	104.1
	Saturation, %	93.8	98.0	96.9
	Void Ratio	0.7086	0.6989	0.6347
	Diameter, in.	2.84	2.85	2.85
	Height, in.	5.92	5.98	5.92
At Test	Water Content, %	24.4	25.1	22.5
	Dry Density, pcf	102.5	101.5	105.3
	Saturation, %	100.5	101.2	99.8
	Void Ratio	0.6614	0.6771	0.6162
	Diameter, in.	2.82	2.84	2.87
	Height, in.	5.86	5.92	5.79
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		3.97	5.33	4.04
Total Pore Pr., ksf		11.07	11.40	14.17
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		4.98	7.00	5.95
$\bar{\sigma}_3$ Failure, ksf		1.01	1.67	1.90

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Yellowish Red Fat Clay

LL= 57 **PL=** 21 **PI=** 36
Specific Gravity= 2.727
Remarks:

Figure _____

Client: Southern Company, Inc.

Project: E.C. Gaston Ash Pond

Source of Sample: Site **Depth:** 19.5-21.5'
Sample Number: B-7
Proj. No.: 11746E **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT

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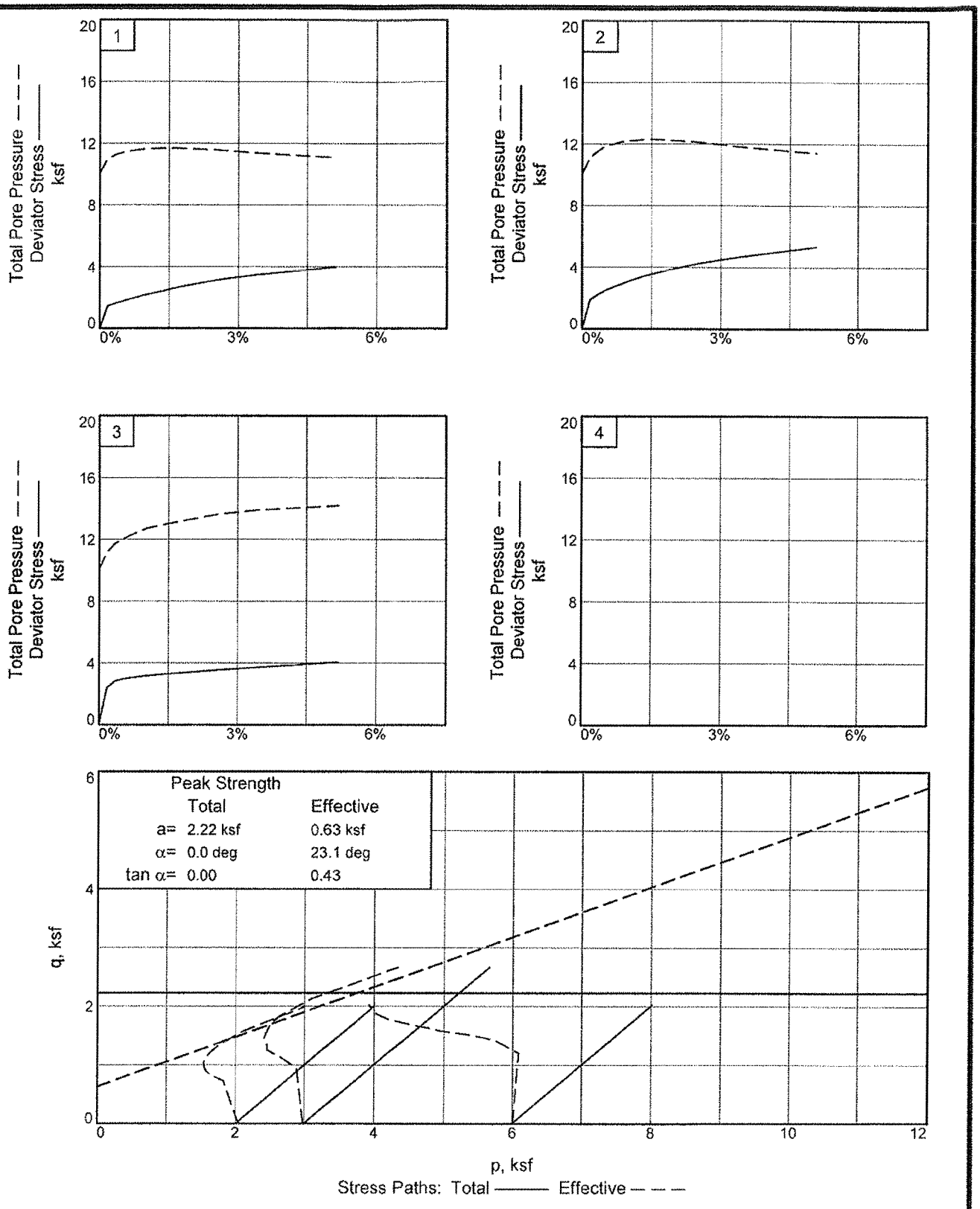
Tested By: Ashok



Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 19.5-21.5' **Sample Number:** B-7
Project No.: 11746E **Figure** _____

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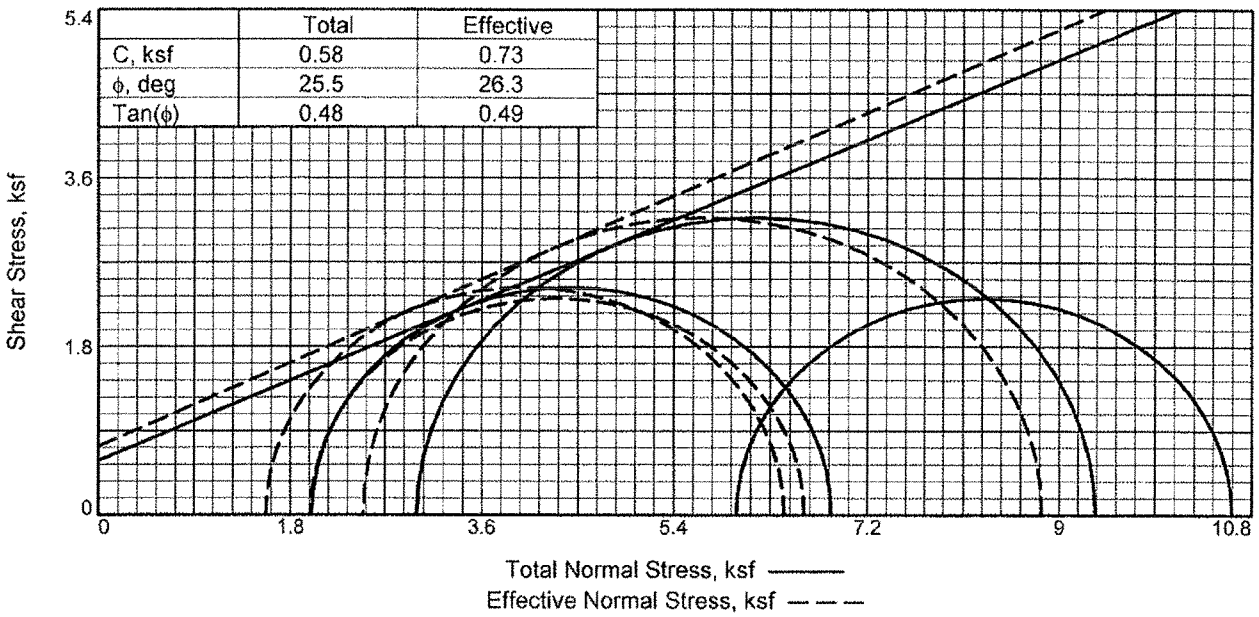
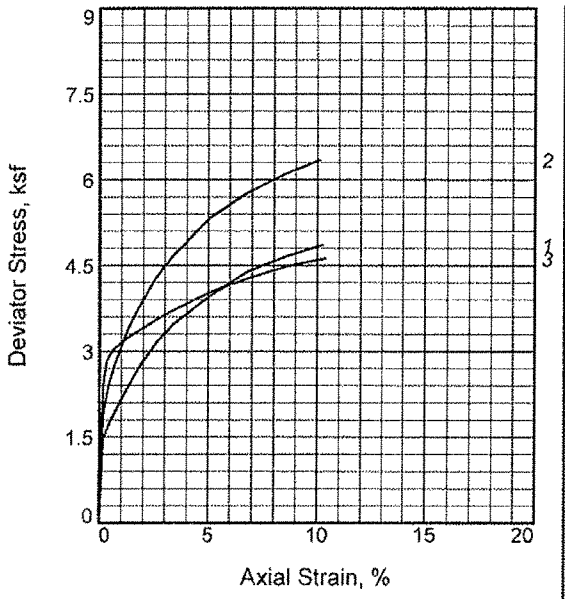
Tested By: Ashok

	Total	Effective
C, ksf	0.58	0.73
ϕ, deg	25.5	26.3
Tan(ϕ)	0.48	0.49





Sample No.		1	2	3
Initial	Water Content, %	24.4	25.1	22.5
	Dry Density, pcf	99.6	100.2	104.1
	Saturation, %	93.8	98.0	96.9
	Void Ratio	0.7086	0.6989	0.6347
	Diameter, in.	2.84	2.85	2.85
	Height, in.	5.92	5.98	5.92
At Test	Water Content, %	24.4	25.1	22.5
	Dry Density, pcf	102.5	101.5	105.3
	Saturation, %	100.5	101.2	99.8
	Void Ratio	0.6614	0.6771	0.6162
	Diameter, in.	2.82	2.84	2.87
	Height, in.	5.86	5.92	5.79
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		4.86	6.35	4.62
Total Pore Pr., ksf		10.51	10.58	14.08
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		6.43	8.84	6.61
$\bar{\sigma}_3$ Failure, ksf		1.57	2.49	1.99

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Yellowish Red Fat Clay

LL= 57 **PL=** 21 **PI=** 36
Specific Gravity= 2.727
Remarks:

Figure _____

Client: Southern Company, Inc.

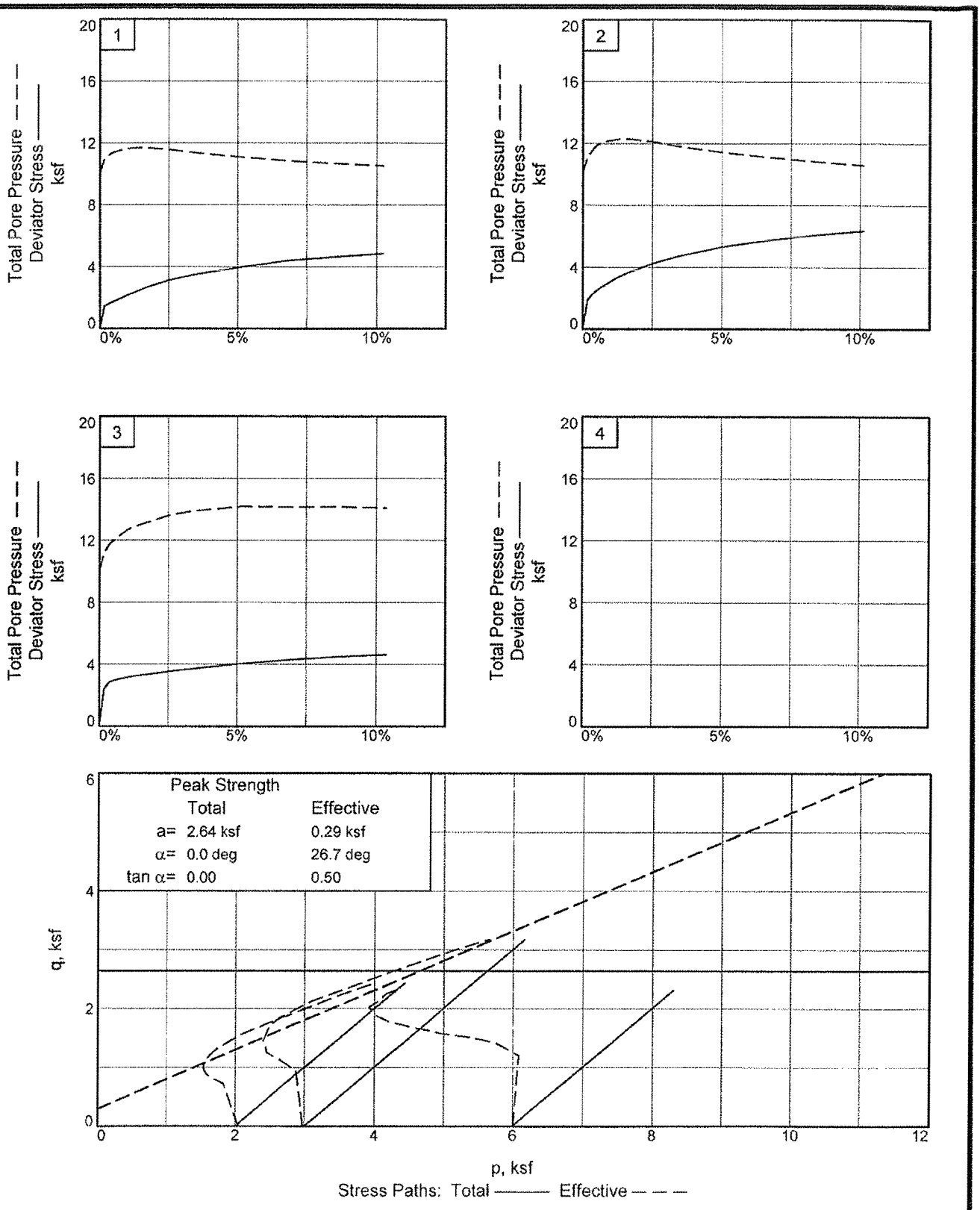
Project: E.C. Gaston Ash Pond

Source of Sample: Site **Depth:** 19.5-21.5'
Sample Number: B-7
Proj. No.: 11746E **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT

QORE Property Sciences

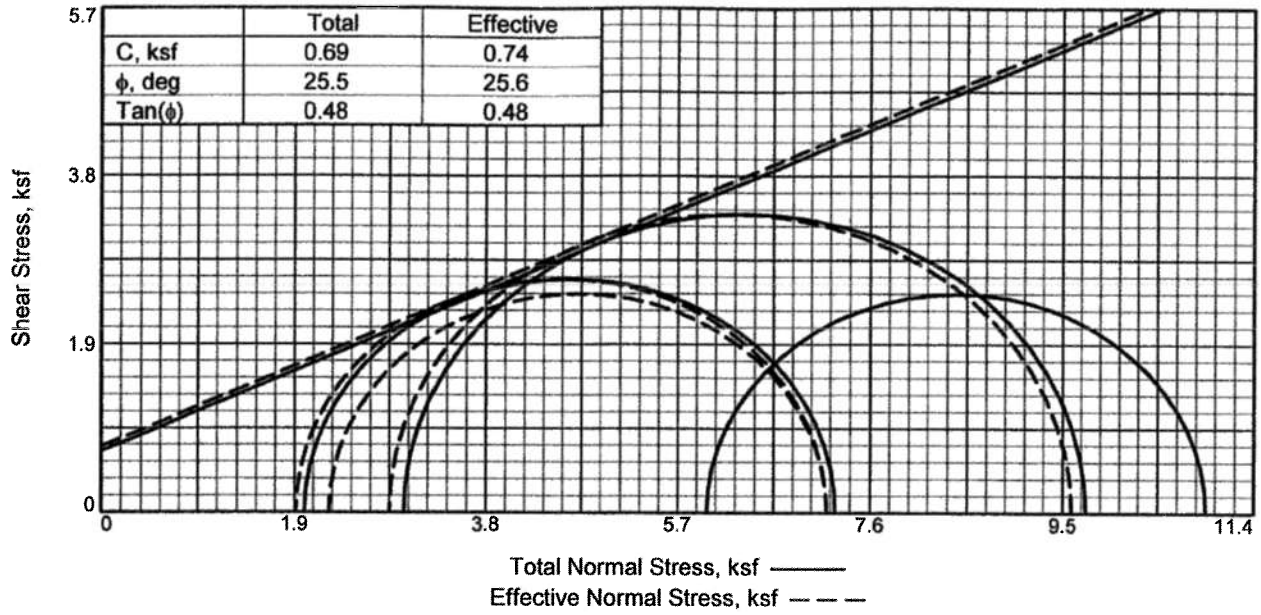
Tested By: Ashok

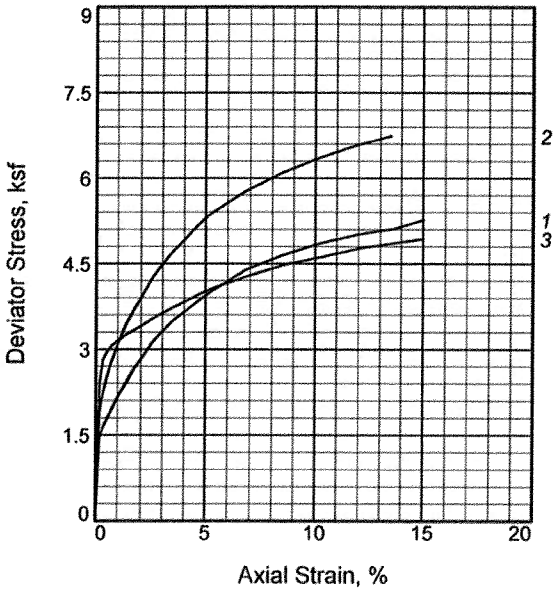


Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 19.5-21.5' **Sample Number:** B-7
Project No.: 11746E **Figure** _____

QORE Property Sciences

Tested By: Ashok





Sample No.		1	2	3
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	Saturation, %	93.8	98.0	96.9
	Void Ratio	0.7086	0.6989	0.6347
	Diameter, in.	2.84	2.85	2.85
	Height, in.	5.92	5.98	5.92
At Test	Water Content, %	24.4	25.1	22.5
	Dry Density, pcf	102.5	101.5	105.3
	Saturation, %	100.5	101.2	99.8
	Void Ratio	0.6614	0.6771	0.6162
	Diameter, in.	2.82	2.84	2.87
	Height, in.	5.86	5.92	5.79
Strain rate, in./min.		0.03	0.03	0.03
Back Pressure, psi		70.00	70.00	70.00
Cell Pressure, psi		83.90	90.80	111.60
Fail. Stress, ksf		5.27	6.74	4.94
Total Pore Pr., ksf		10.17	10.22	13.82
Ult. Stress, ksf				
Total Pore Pr., ksf				
$\bar{\sigma}_1$ Failure, ksf		7.18	9.59	7.18
$\bar{\sigma}_3$ Failure, ksf		1.92	2.85	2.25

Type of Test:
CU with Pore Pressures
Sample Type: UD
Description: Yellowish Red Fat Clay

LL= 57 **PL=** 21 **PI=** 36
Specific Gravity= 2.727
Remarks:

Figure _____

Client: Southern Company, Inc.

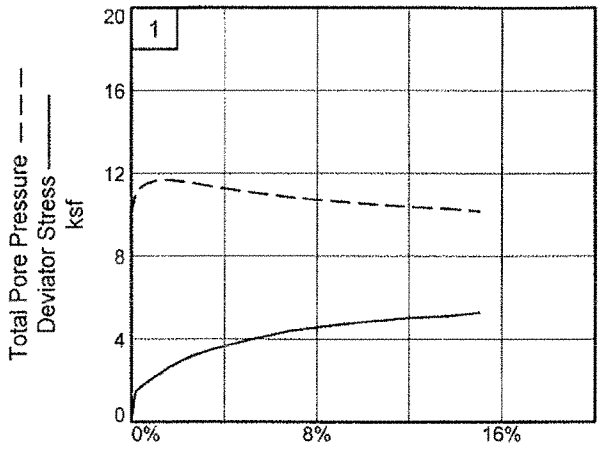
Project: E.C. Gaston Ash Pond

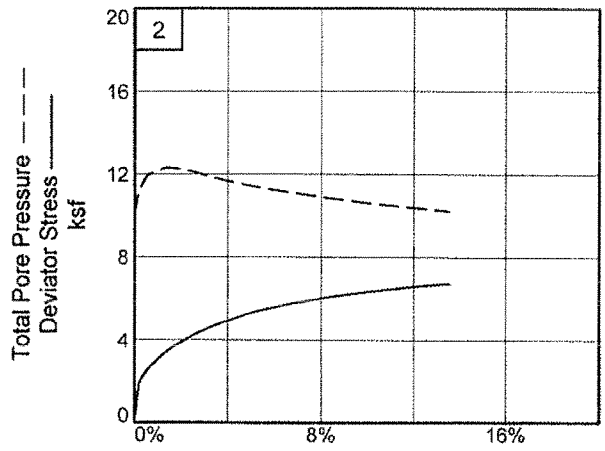
Source of Sample: Site **Depth:** 19.5-21.5'
Sample Number: B-7
Proj. No.: 11746E **Date Sampled:**

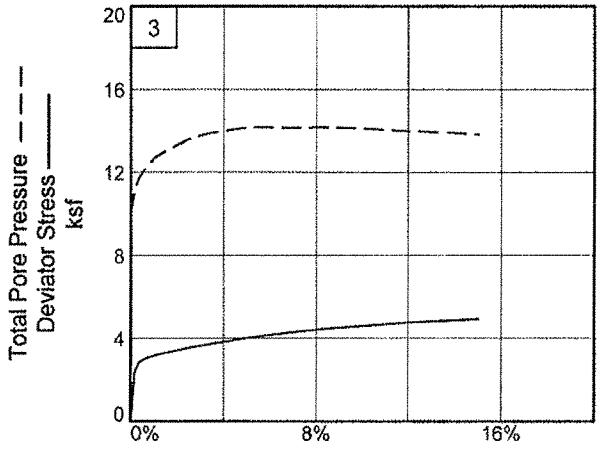
TRIAXIAL SHEAR TEST REPORT

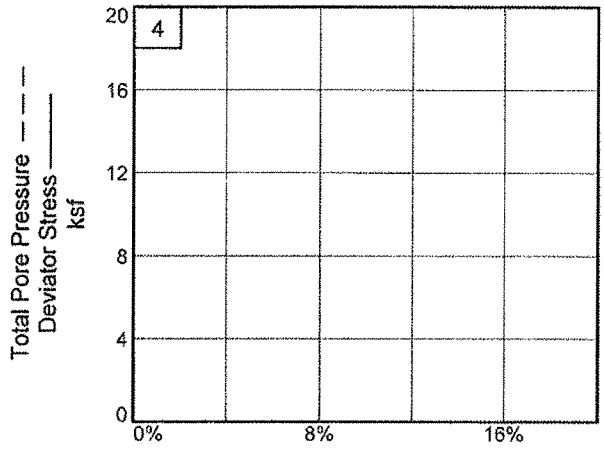
QORE Property Sciences

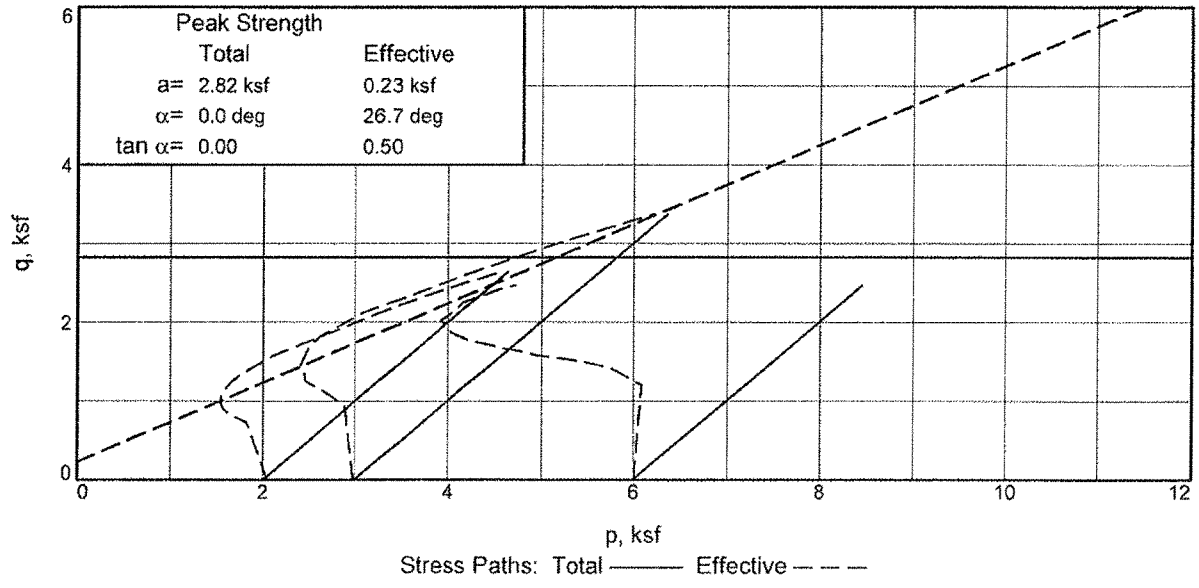
Tested By: Ashok











Client: Southern Company, Inc.
Project: E.C. Gaston Ash Pond
Source of Sample: Site **Depth:** 19.5-21.5' **Sample Number:** B-7
Project No.: 11746E **Figure** _____

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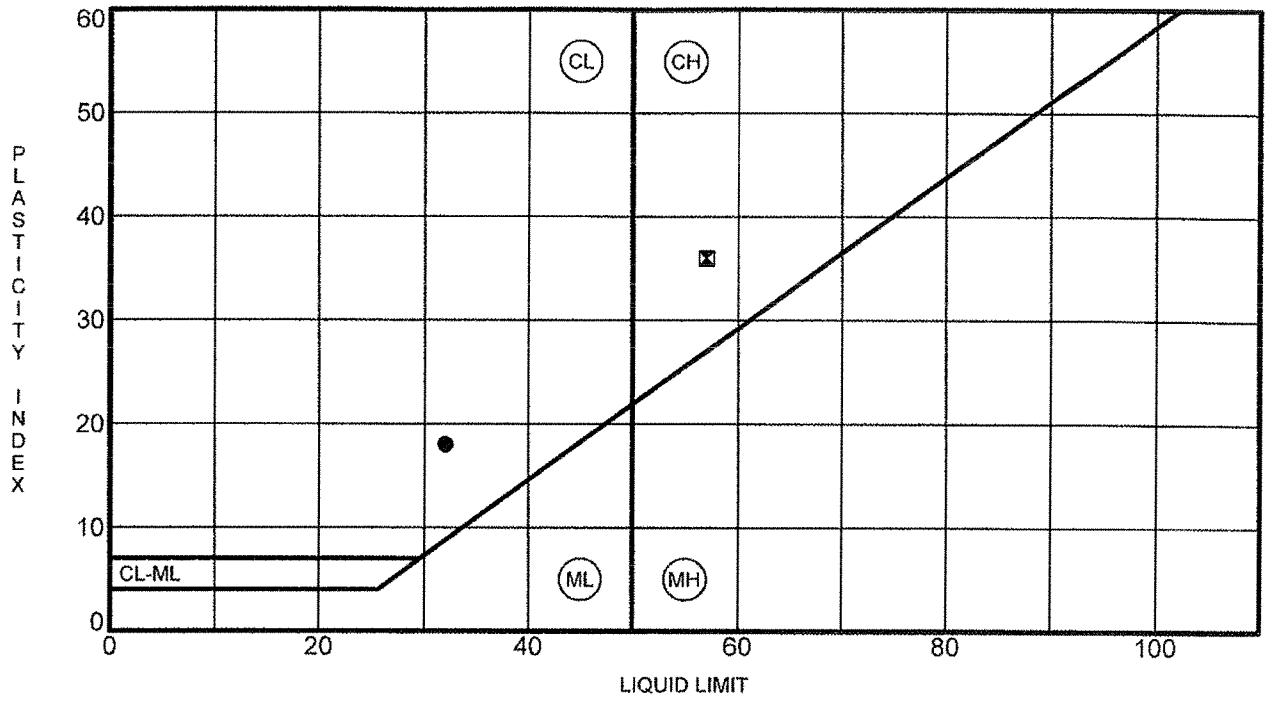
Tested By: Ashok



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**B-4**	**19.4**	**32**	**14**	**18**	**83**	**LEAN CLAY with SAND(CL)**
⊠	**B-7**	**21.5**	**57**	**21**	**36**	**89**	**FAT CLAY(CH)**

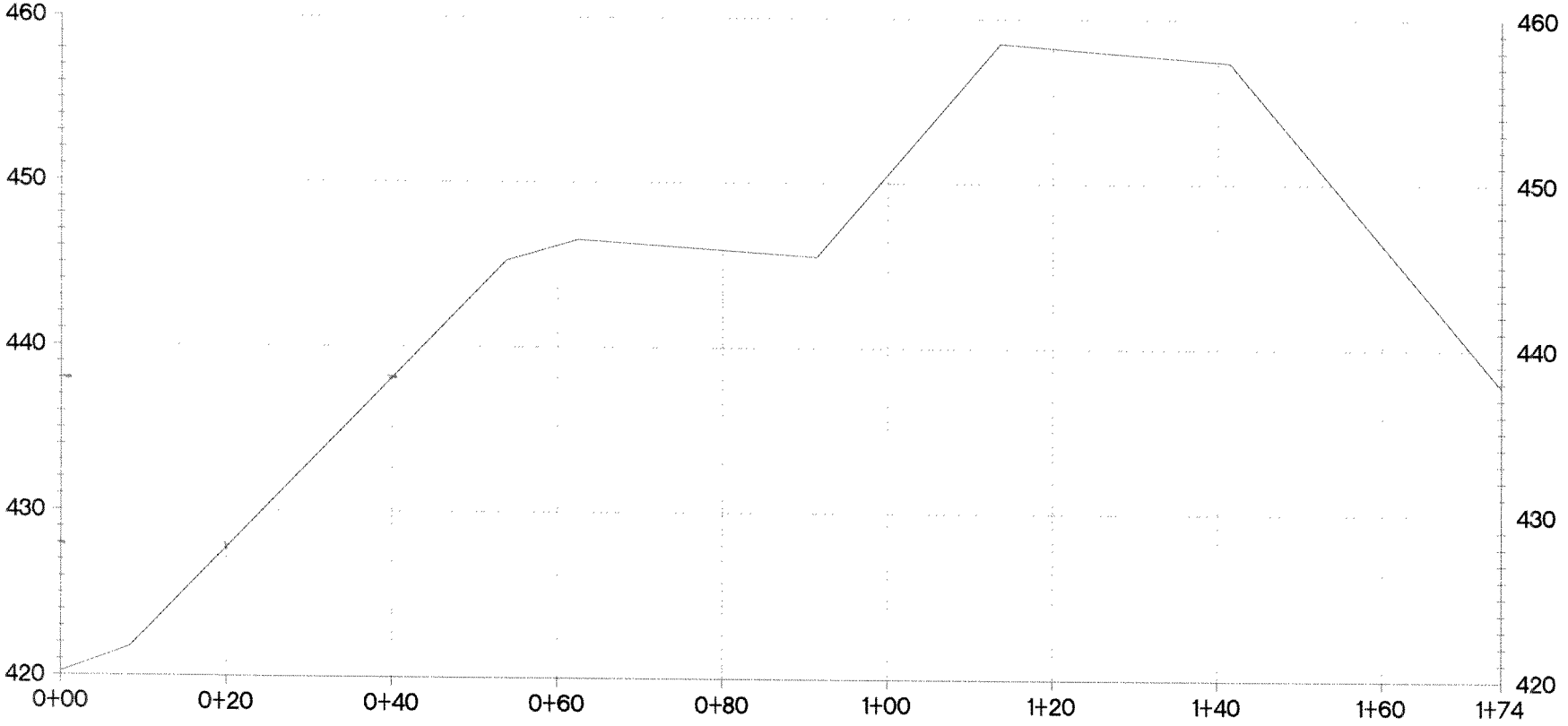
QORE™ PROPERTY SCIENCES

ATTERBERGLIMITS' RESULTS

Project: E.C. Gaston Ash Pond
Location:
Job No: 11746E
Report No:

US ATTERBERG LIMITS 11746E GASTON.GPJ QOR_CORP.GDT 7/8/09

BORE HOLE 3



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 1 OF 9 SHEETS
SUPERSEDES

3486ALA

REV 0

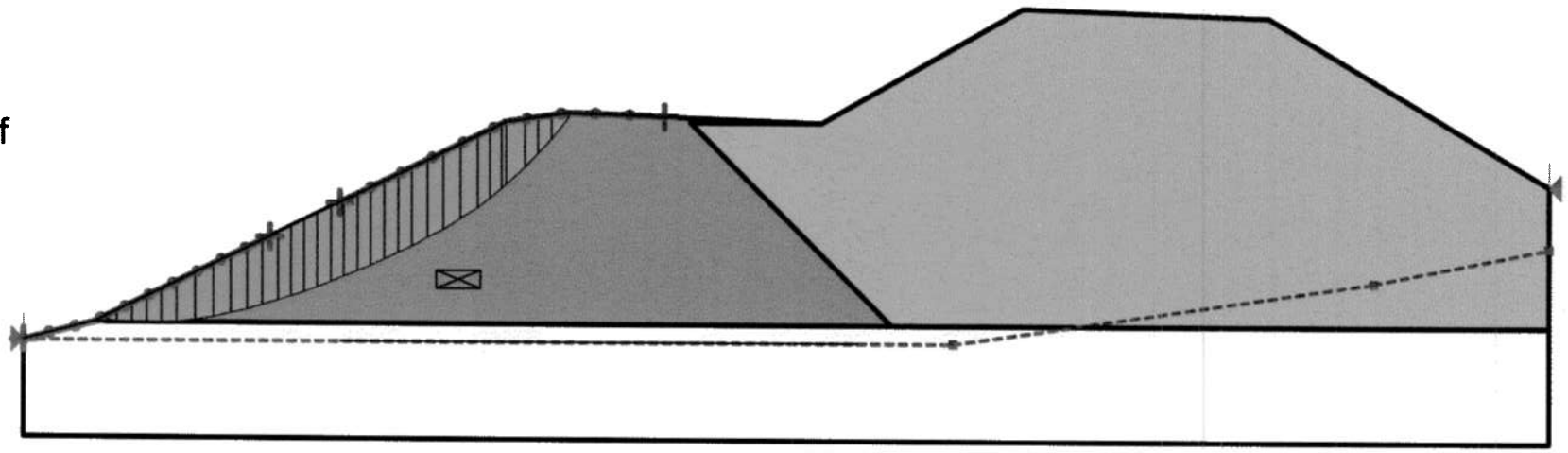
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

1.745

Analysis Type: BH-3 No Reduction (Seismic)



File Name: Bore Hole 3 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

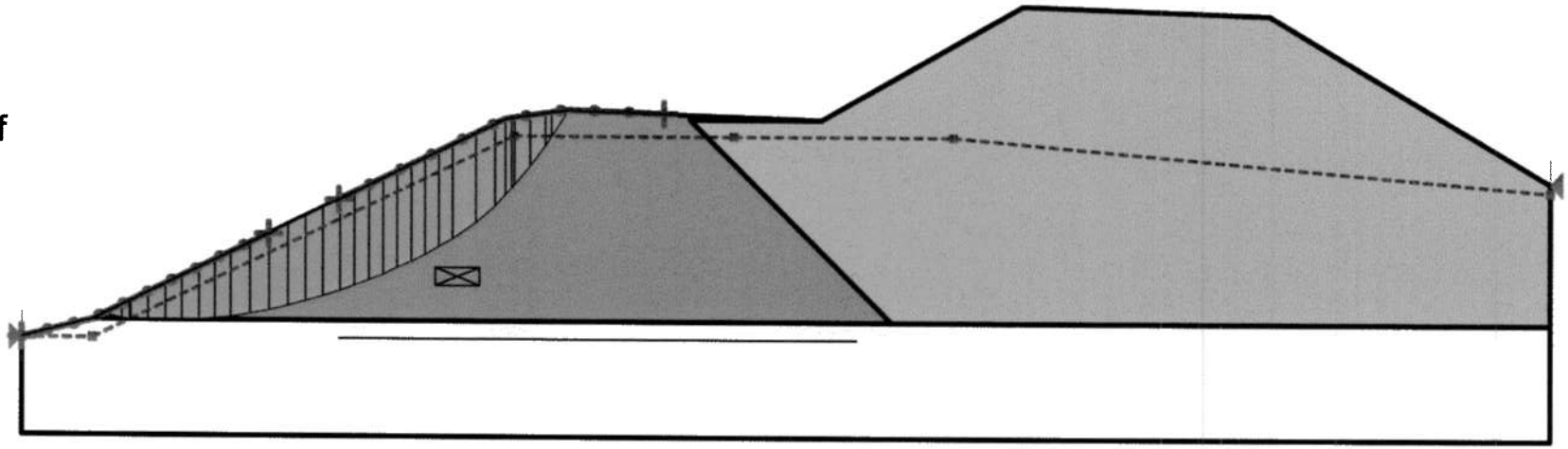
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

1.552

Analysis Type: BH-3 No Reduction (High Water)



File Name: Bore Hole 3 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

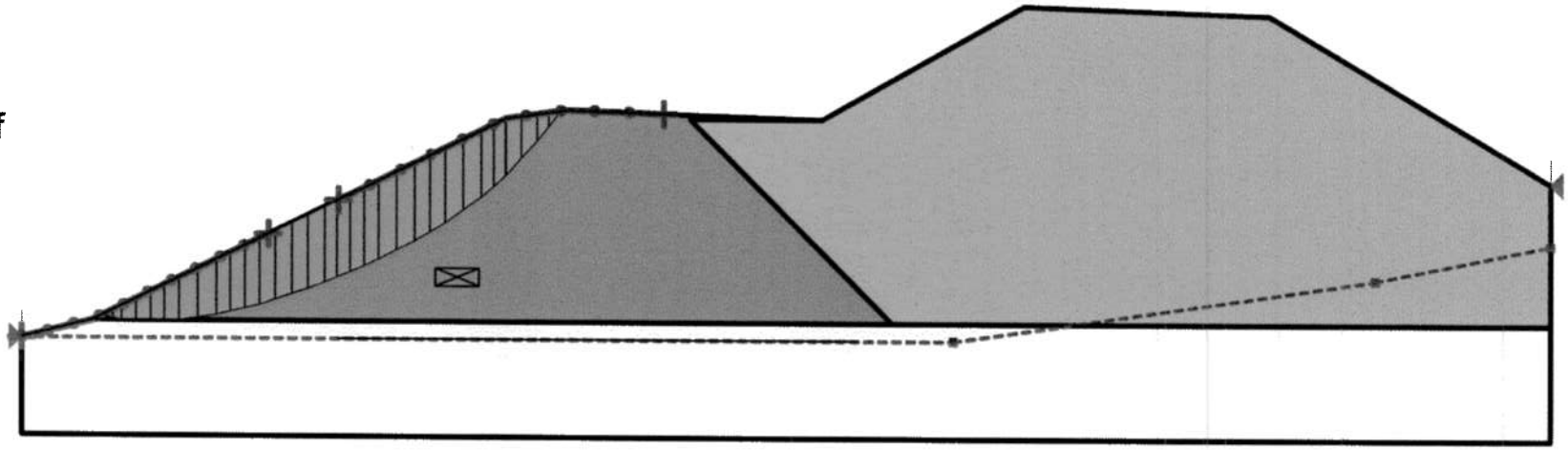
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

1.801

Analysis Type: BH-3 15% Reduction Steady State



File Name: Bore Hole 3 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

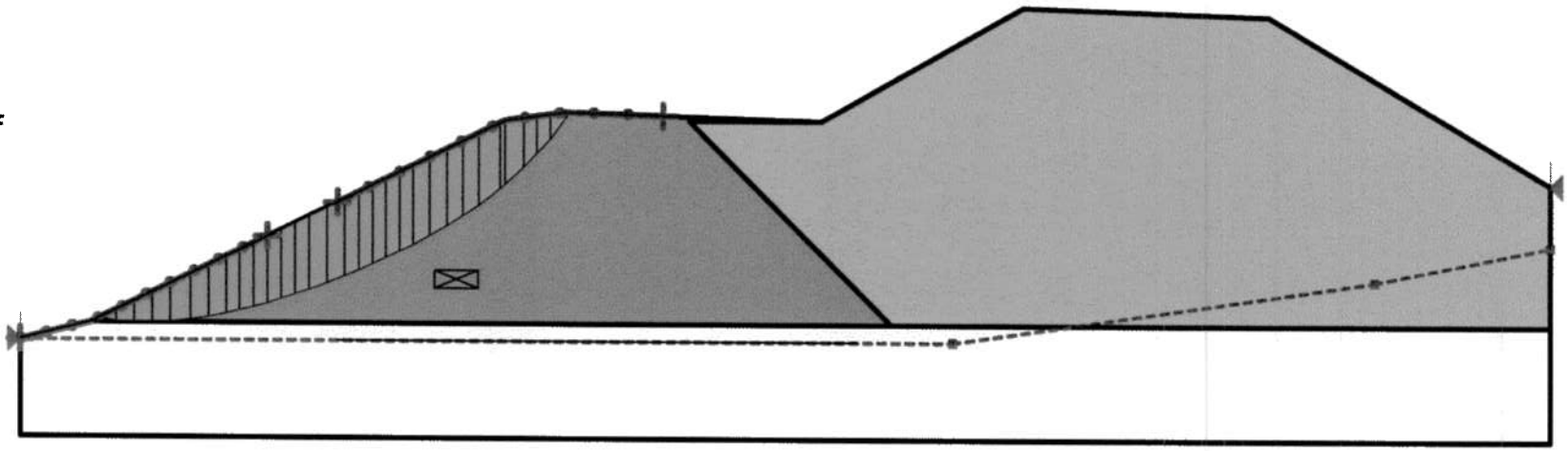
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

1.444

Analysis Type: BH-3 15% Reduction (Seismic)



File Name: Bore Hole 3 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

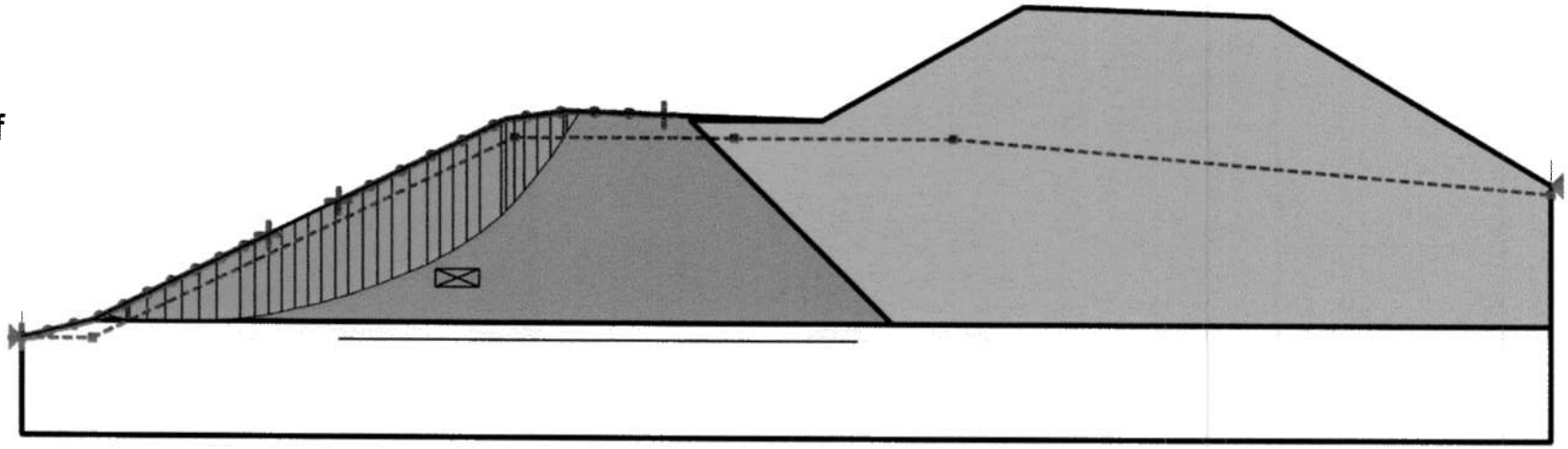
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

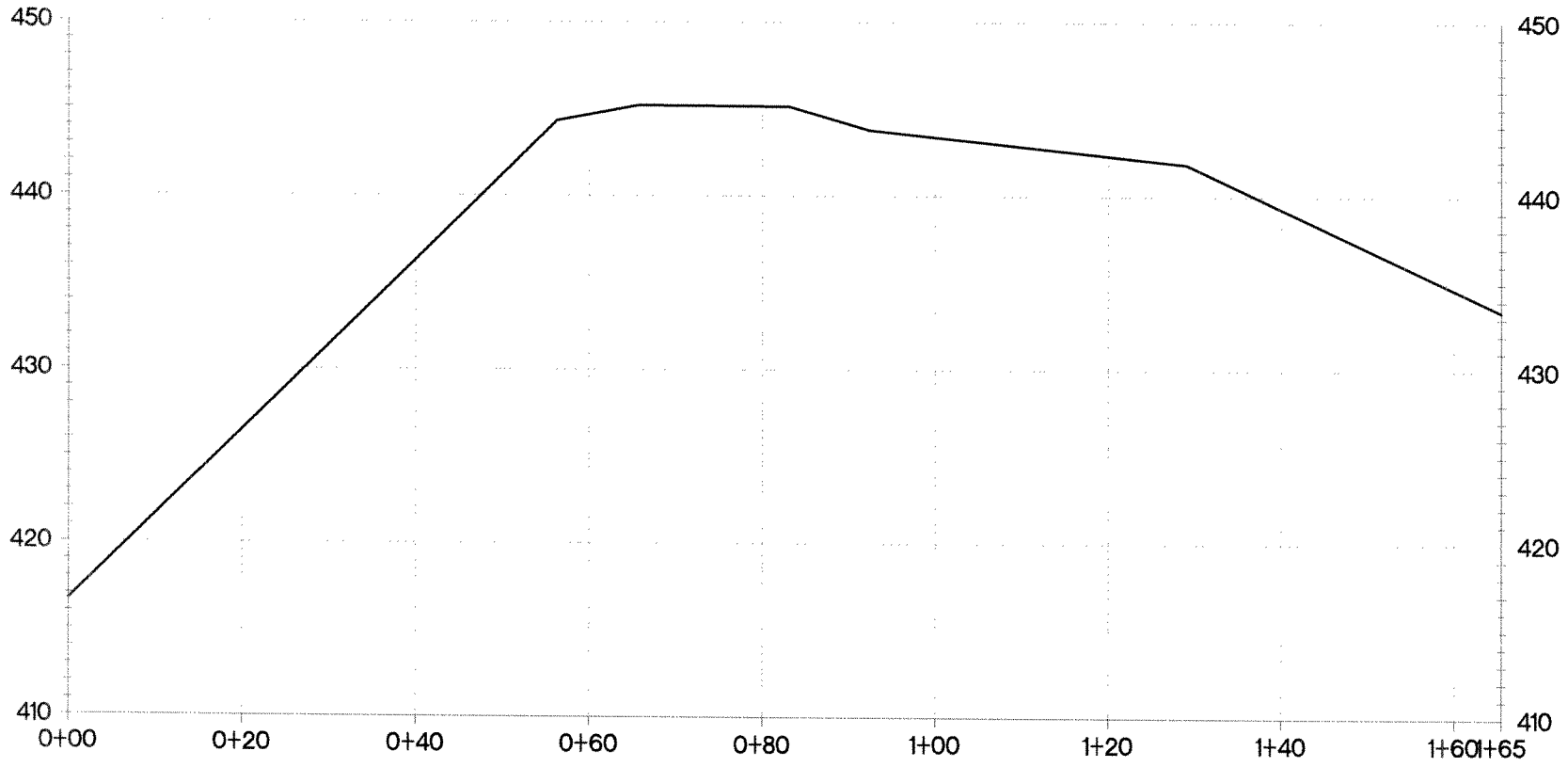
1.285

Analysis Type: BH-3 15% Reduction (High Water)



File Name: Bore Hole 3 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

BETWEEN BORE HOLES 3 AND 4



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 2 OF 9 SHEETS
SUPERSEDES

3679GAS

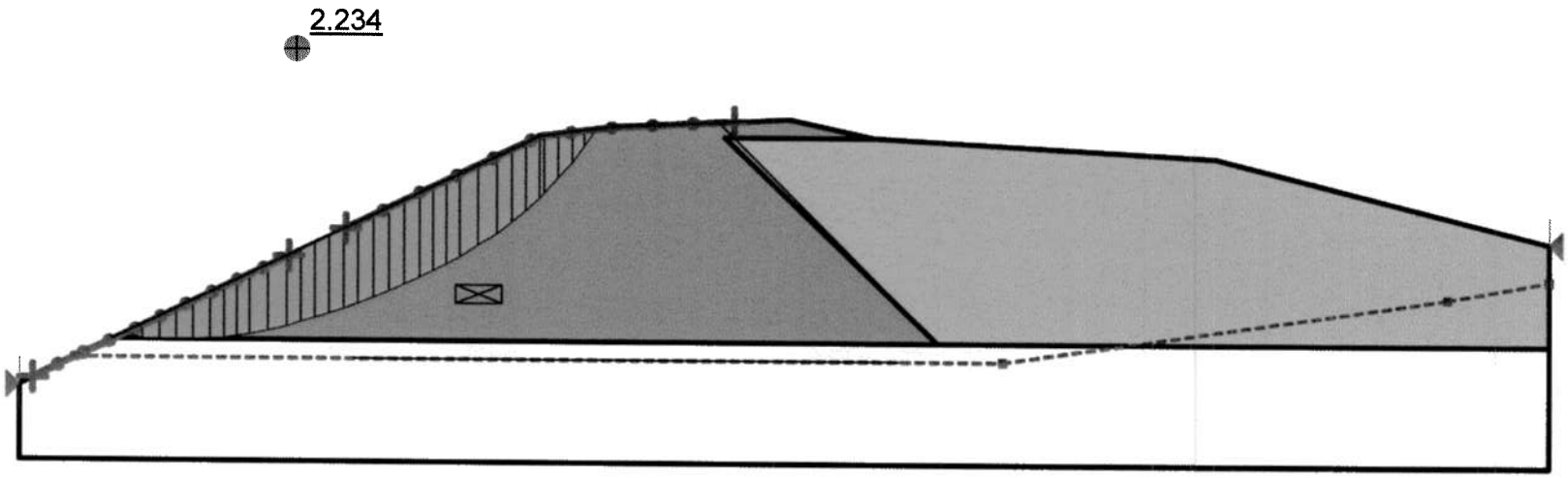
REV 0

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-3 & 4 No Reduction Steady State



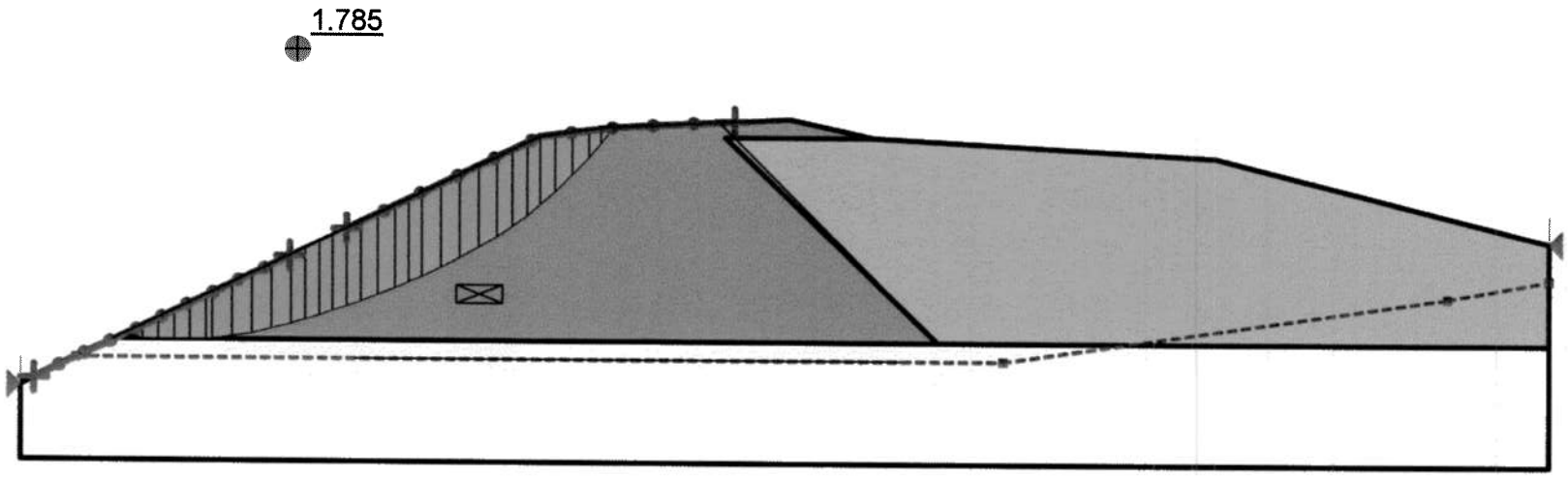
File Name: Bore Hole 3 and 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-3 & 4 No Reduction (Seismic)



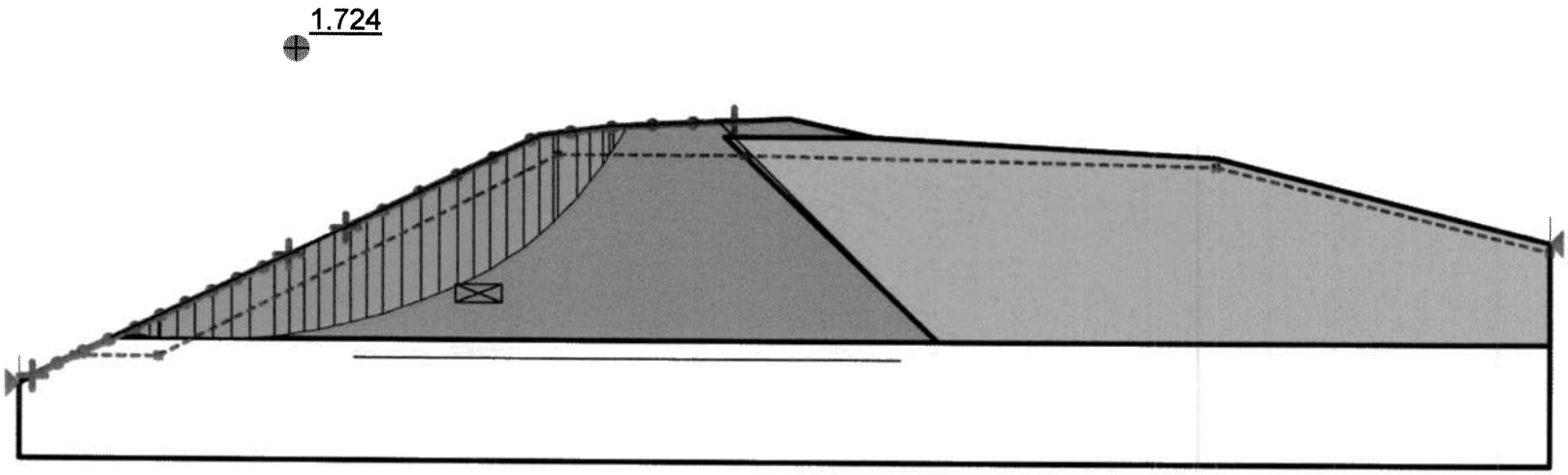
File Name: Bore Hole 3 and 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-3 & 4 No Reduction (High Water)



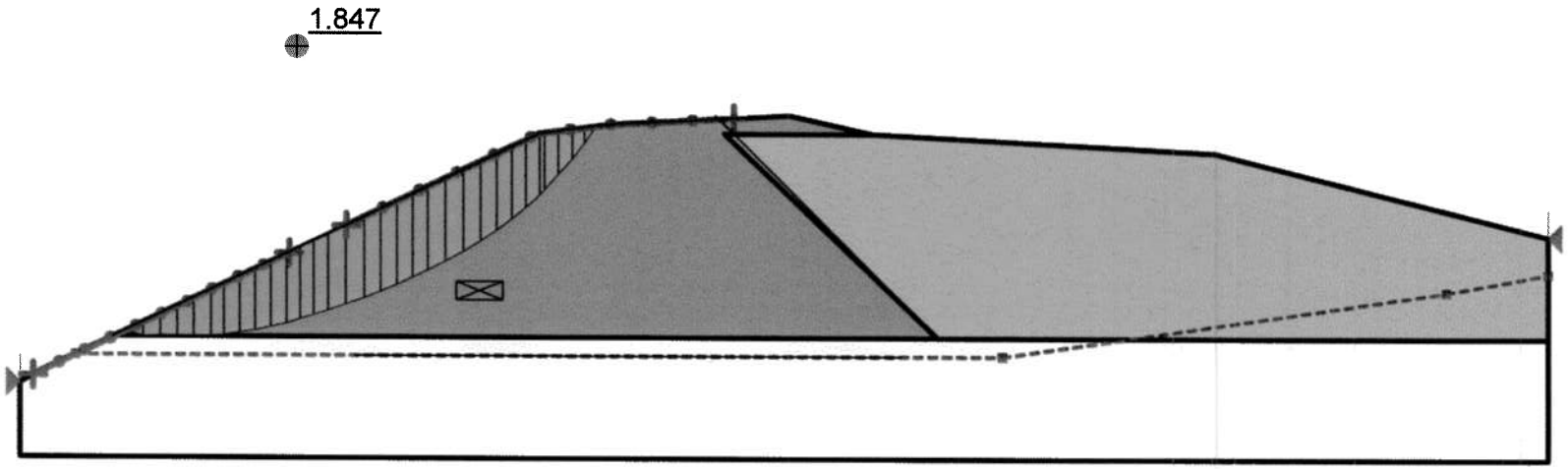
File Name: Bore Hole 3 and 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-3 & 4 15% Reduction Steady State



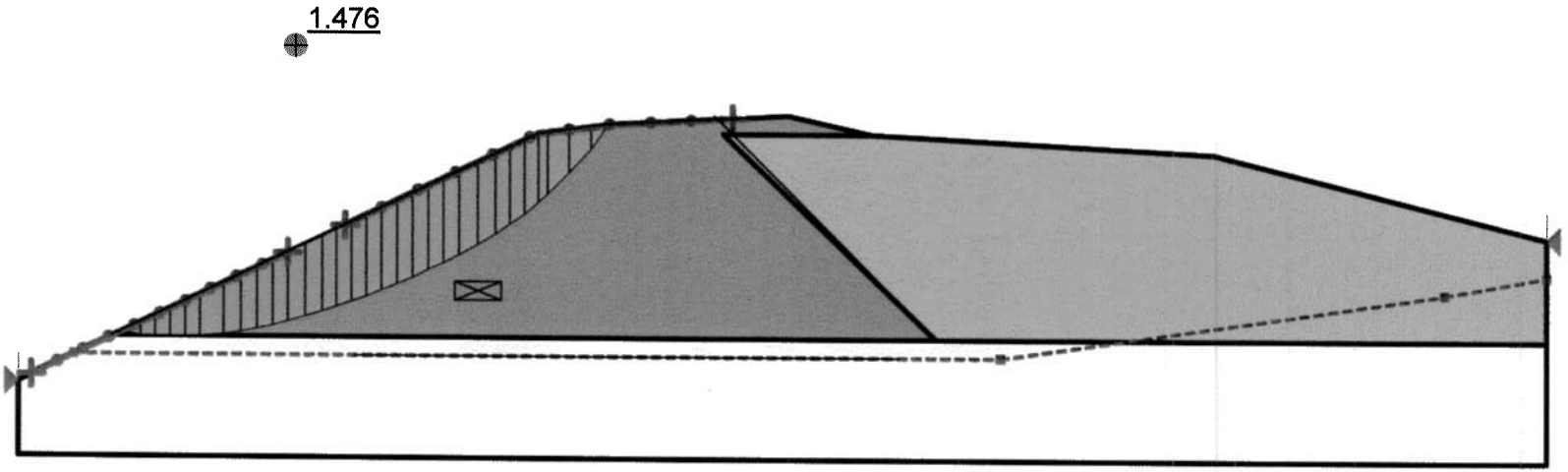
File Name: Bore Hole 3 and 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-3 & 4 15% Reduction (Seismic)



File Name: Bore Hole 3 and 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-

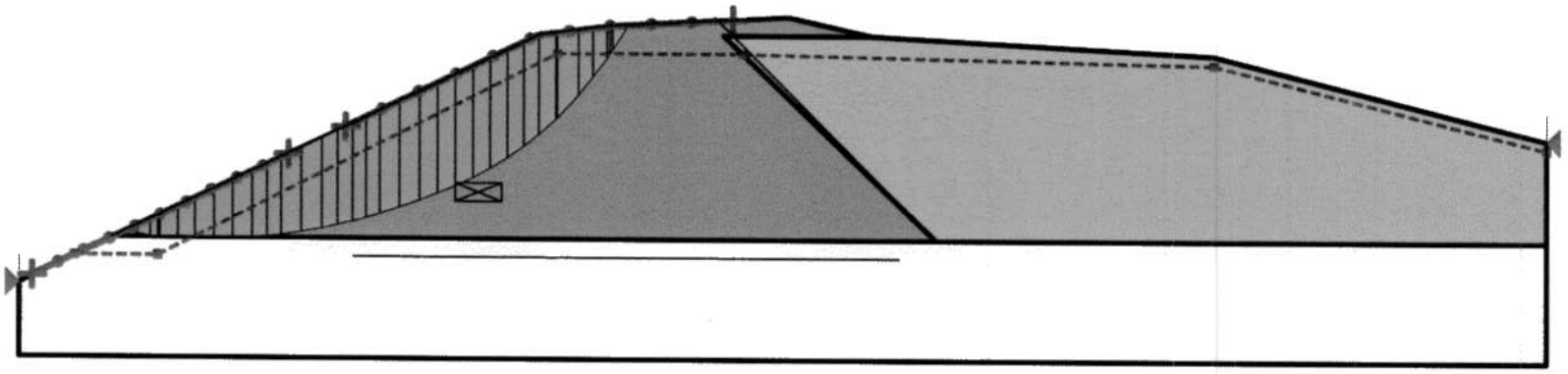
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

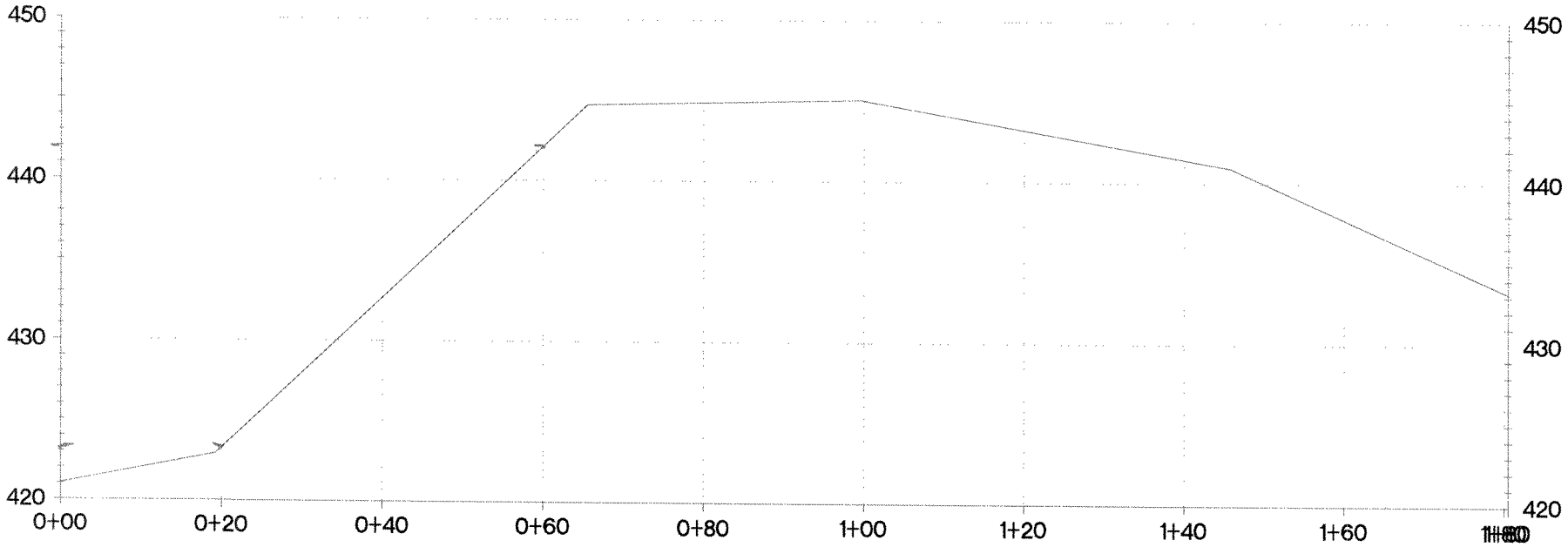
Analysis Type: BH-3 & 4 15% Reduction (High Water)

1.427



File Name: Bore Hole 3 and 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-

BORE HOLE 4



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 3 OF 9 SHEETS
SUPERSEDES

3679GAS

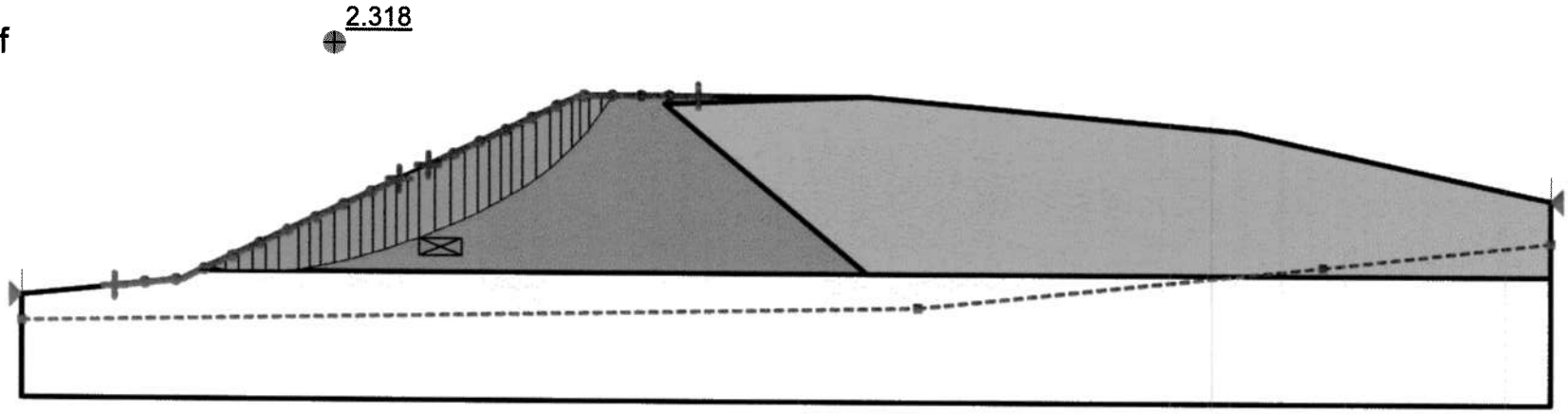
REV 0

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-4 No Reduction Steady State



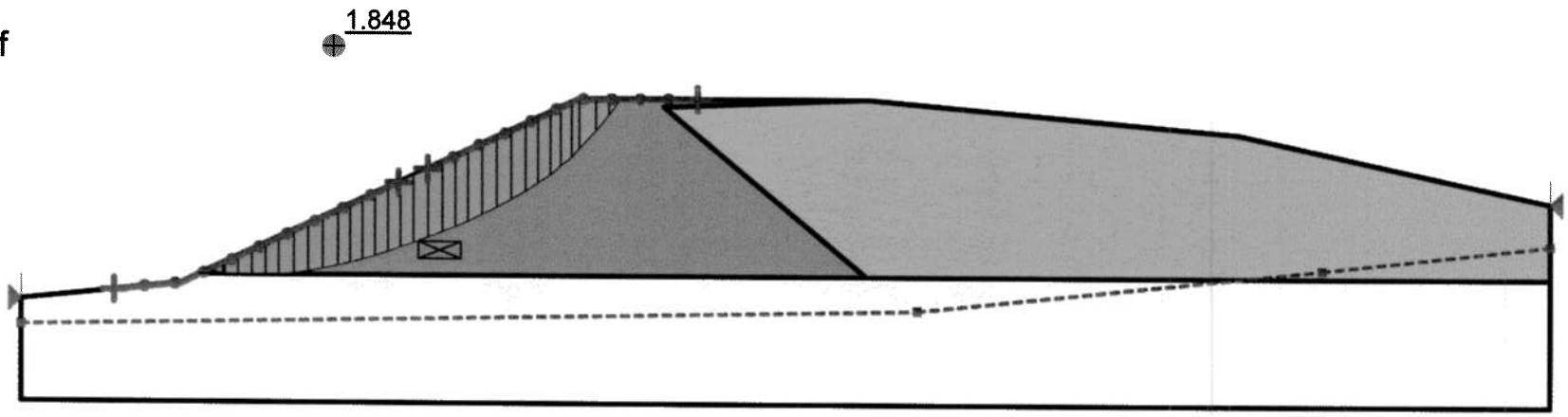
File Name: Bore Hole 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-4 No Reduction (Seismic)



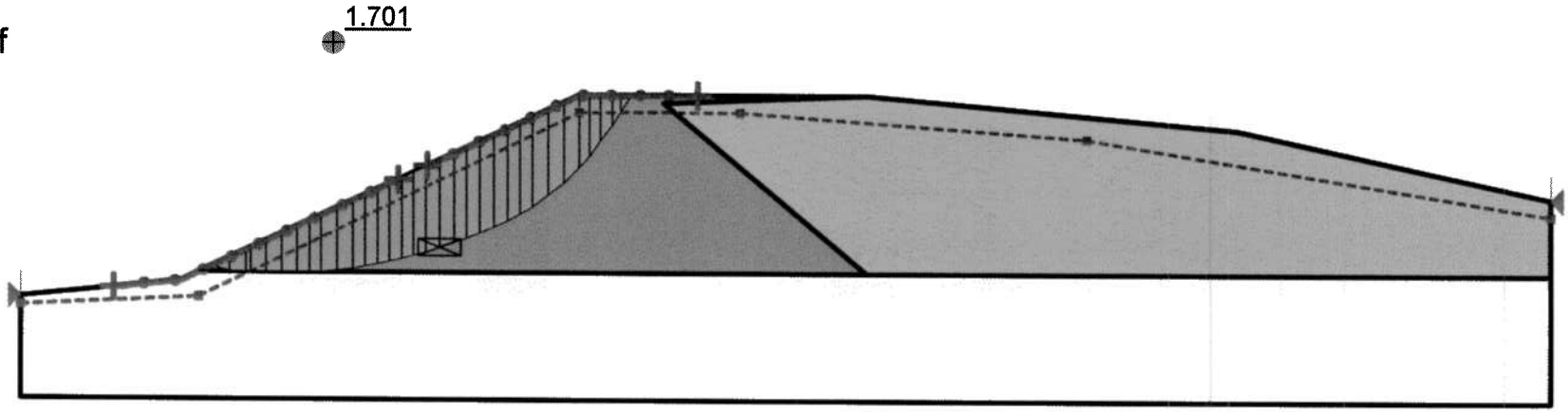
File Name: Bore Hole 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-4 No Reduction (High Water)



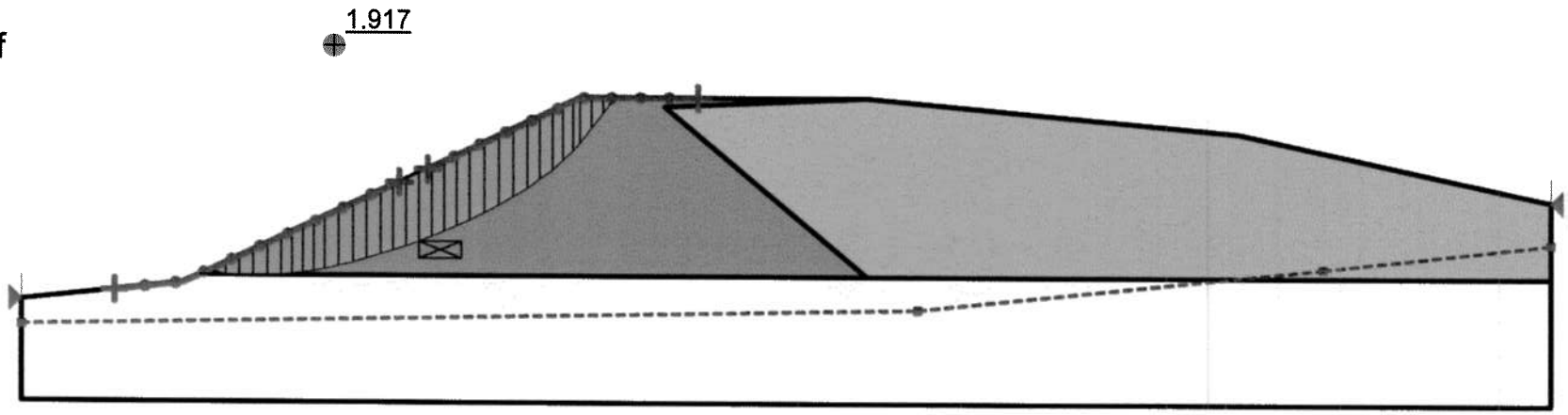
File Name: Bore Hole 4 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-4 15% Reduction Steady State



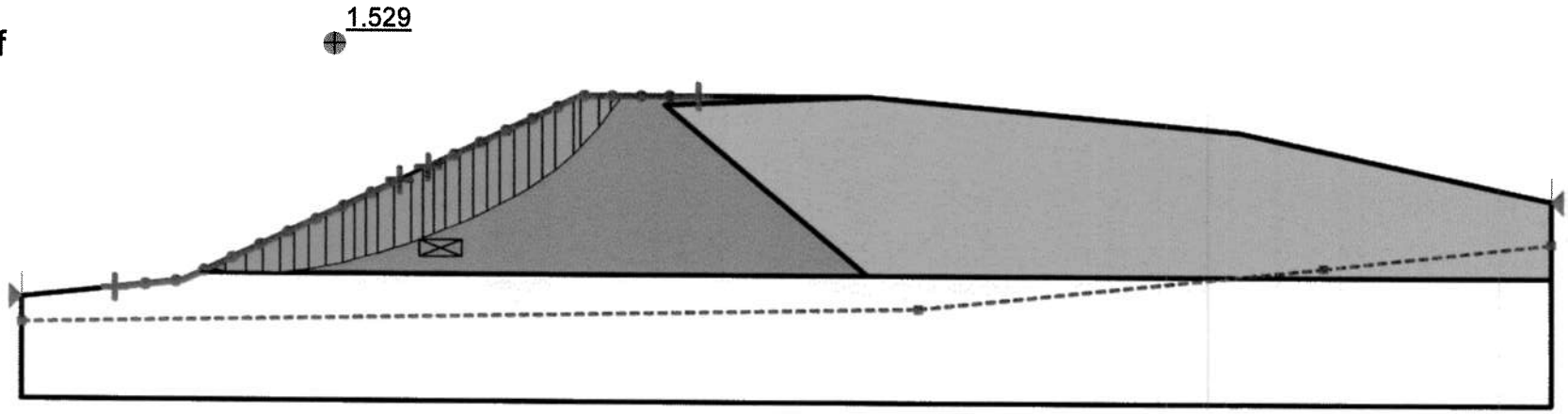
File Name: Bore Hole 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-4 15% Reduction (Seismic)



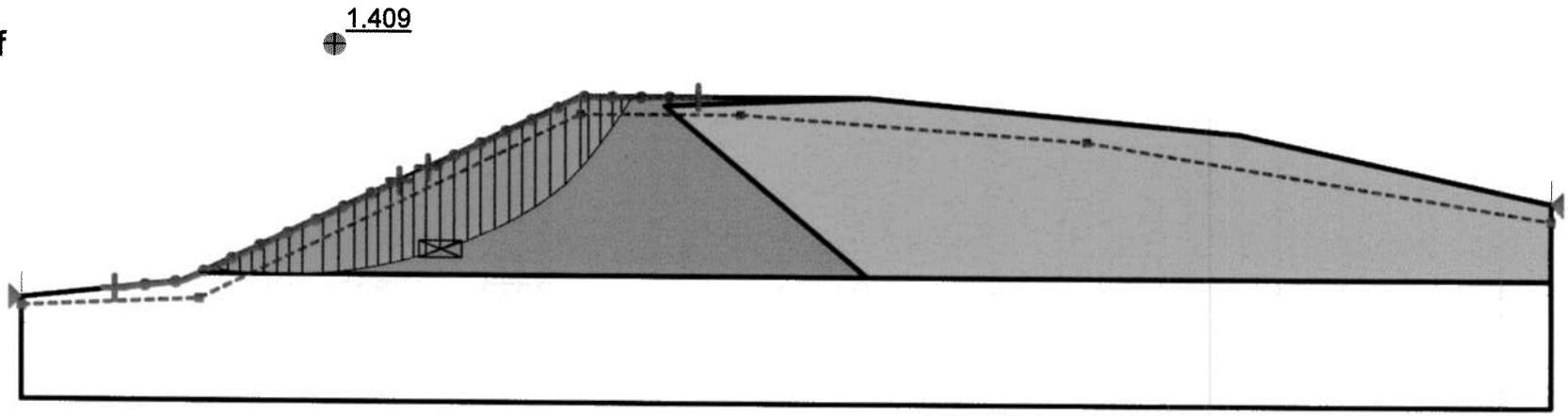
File Name: Bore Hole 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

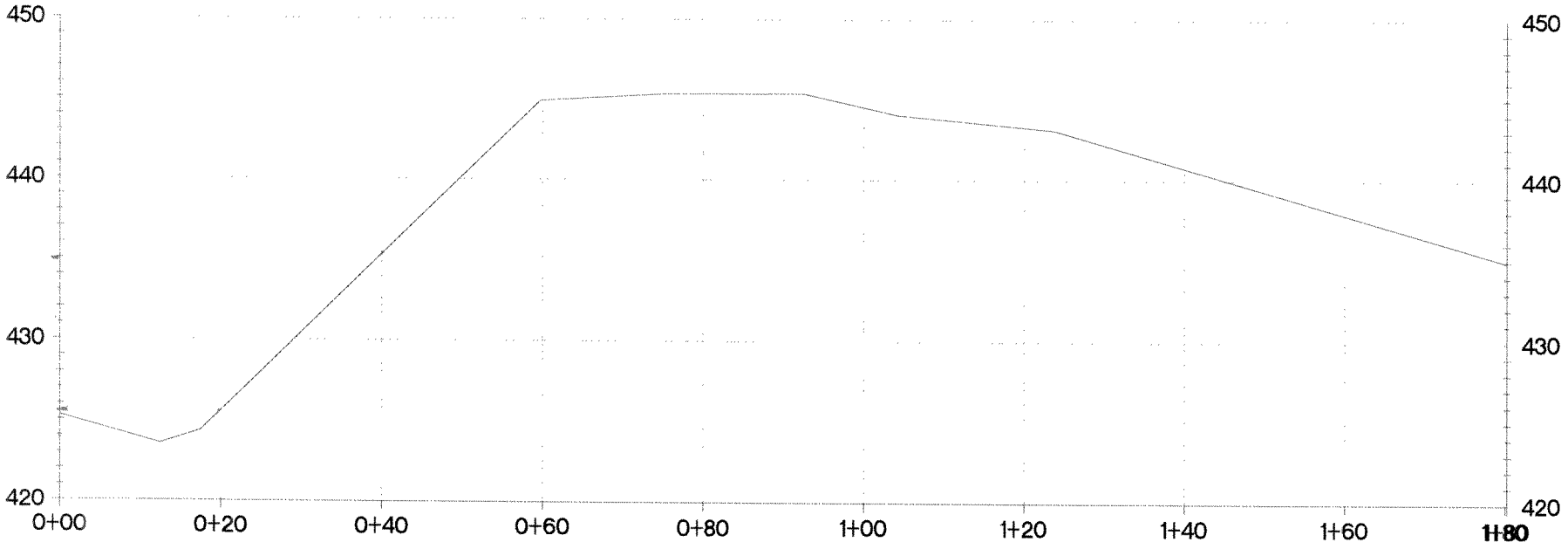
Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-4 15% Reduction (High Water)



File Name: Bore Hole 4 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

BORE HOLE 5



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 4 OF 9 SHEETS
SUPERSEDES

3679GAS

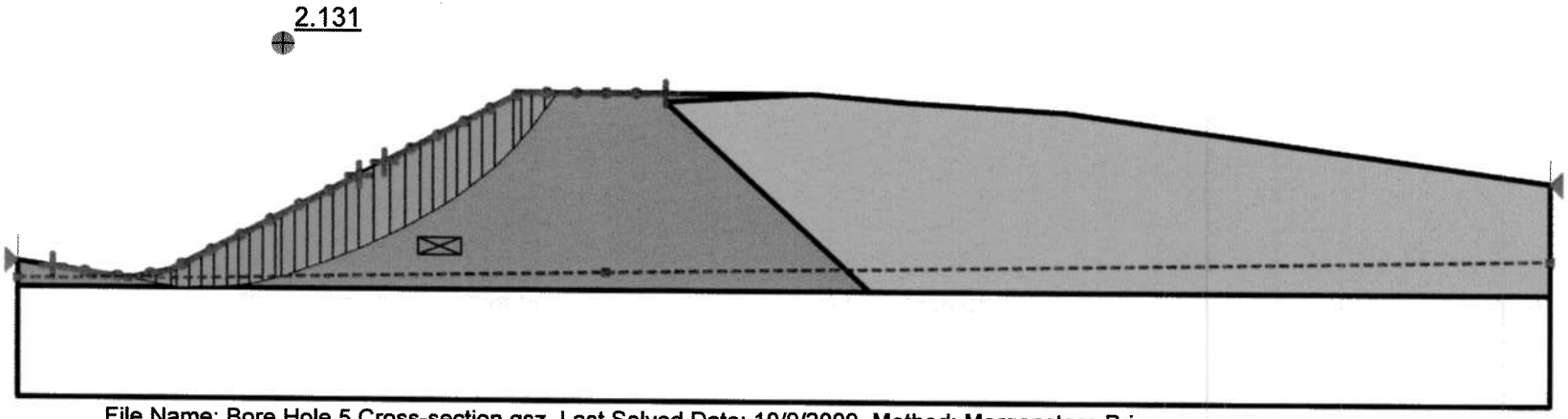
REV 0

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-5 No Reduction Steady State



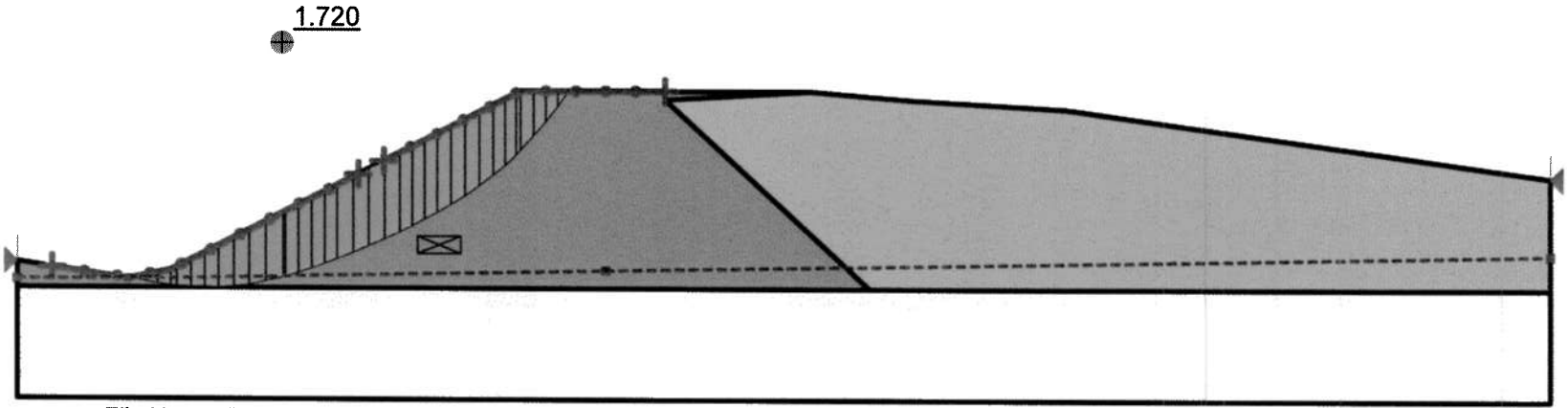
File Name: Bore Hole 5 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-5 No Reduction (Seismic)



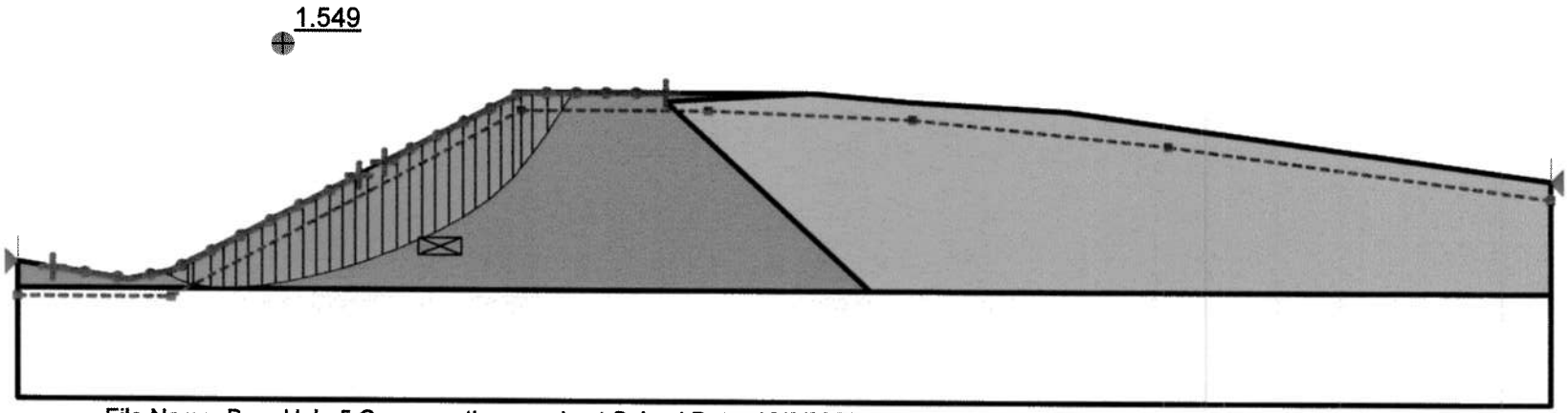
File Name: Bore Hole 5 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-5 No Reduction (High Water)



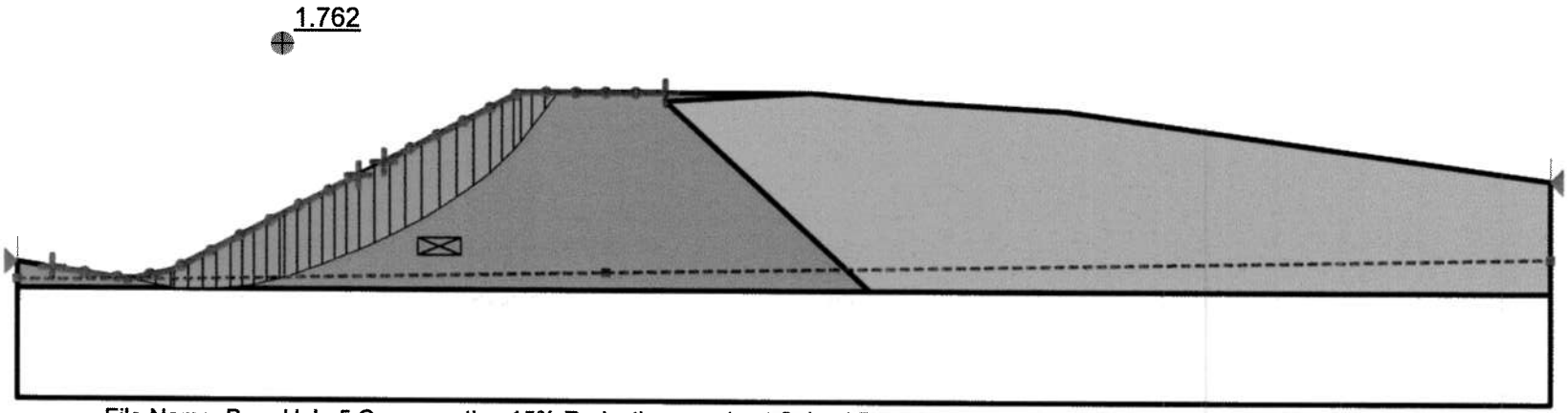
File Name: Bore Hole 5 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-5 15% Reduction Steady State



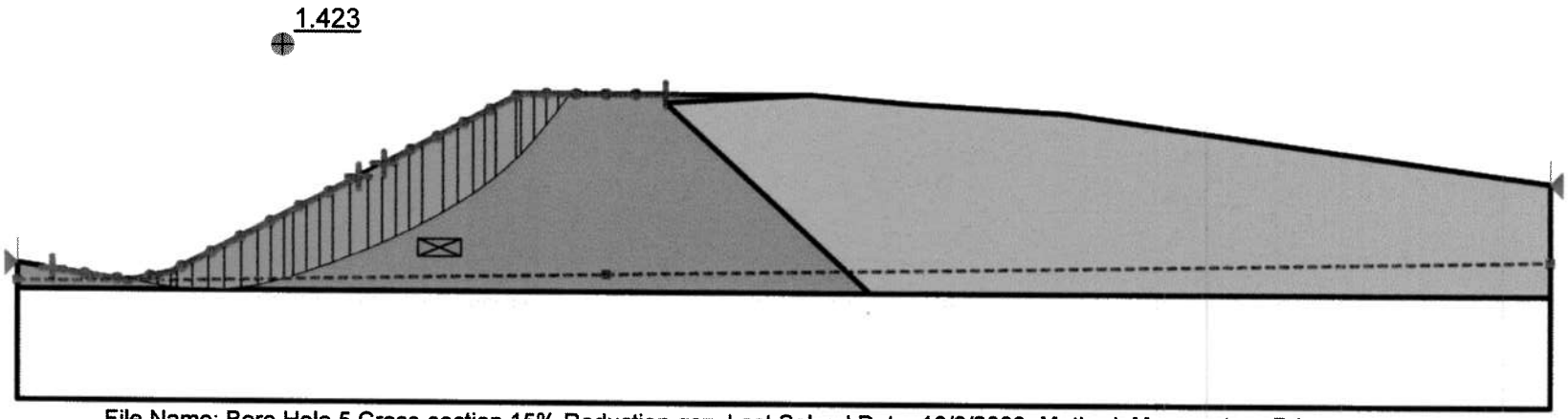
File Name: Bore Hole 5 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-5 15% Reduction (Seismic)



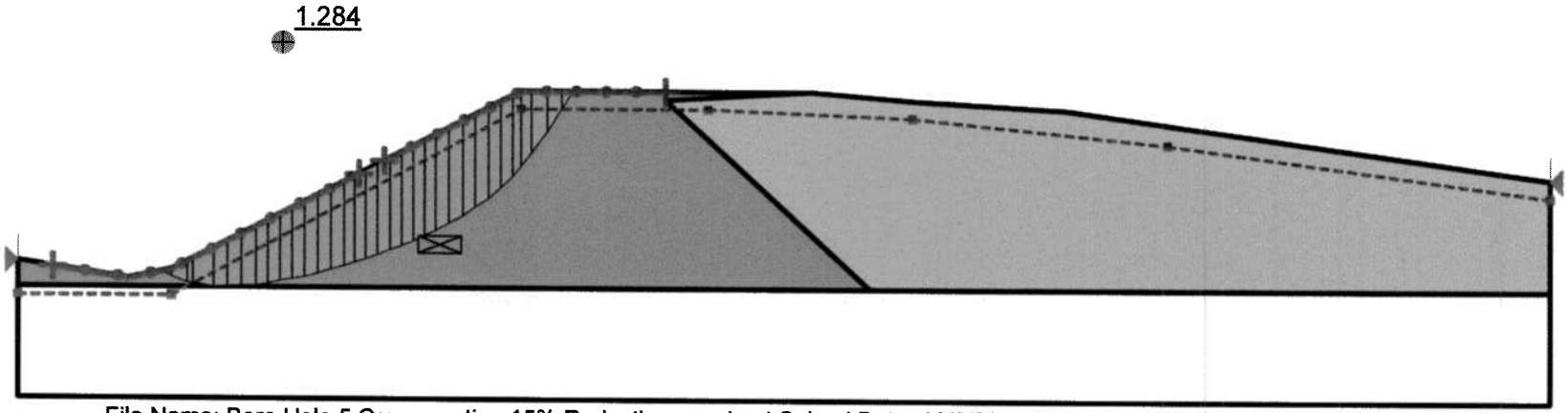
File Name: Bore Hole 5 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

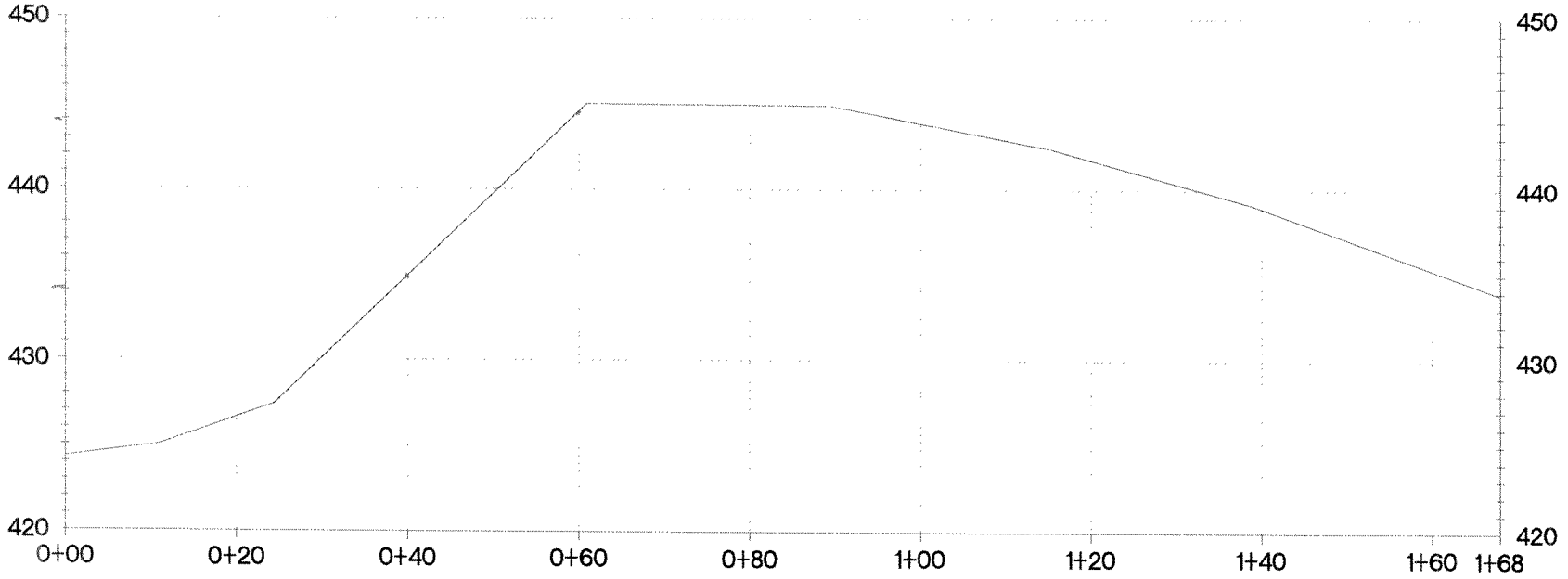
Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-5 15% Reduction (High Water)



File Name: Bore Hole 5 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

BORE HOLE 6



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

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for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 5 OF 9 SHEETS
SUPERSEDES

3679GAS

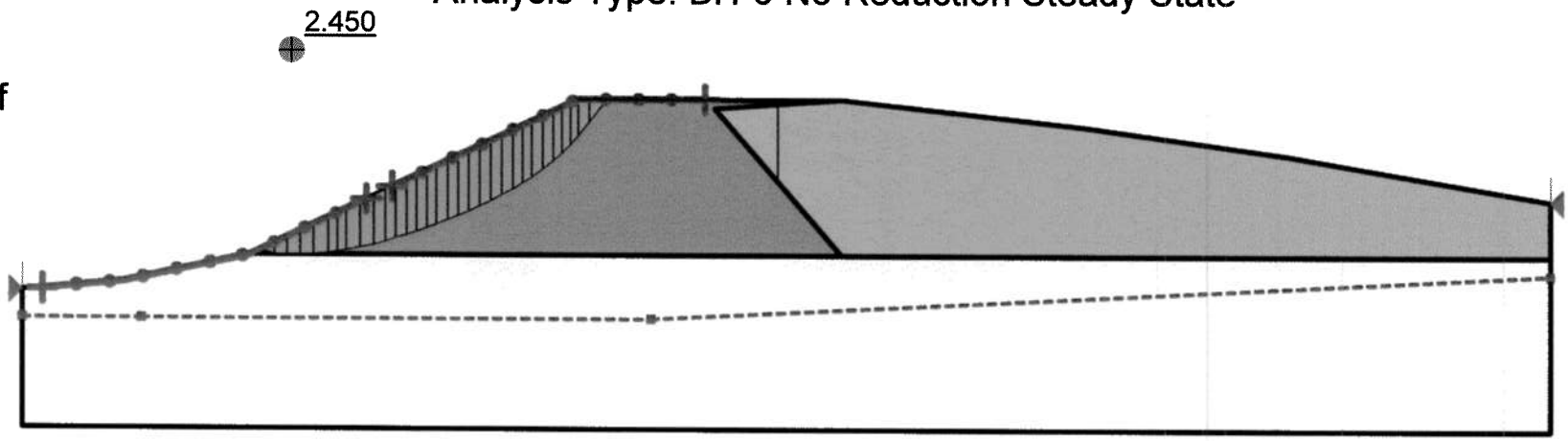
REV 0

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-6 No Reduction Steady State



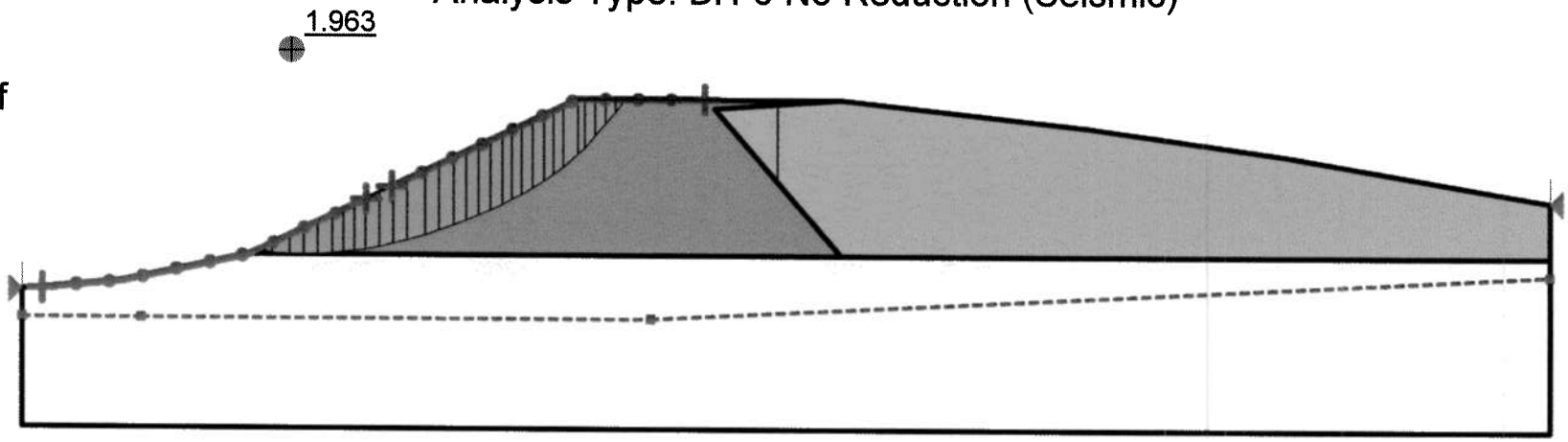
File Name: Bore Hole 6 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-6 No Reduction (Seismic)



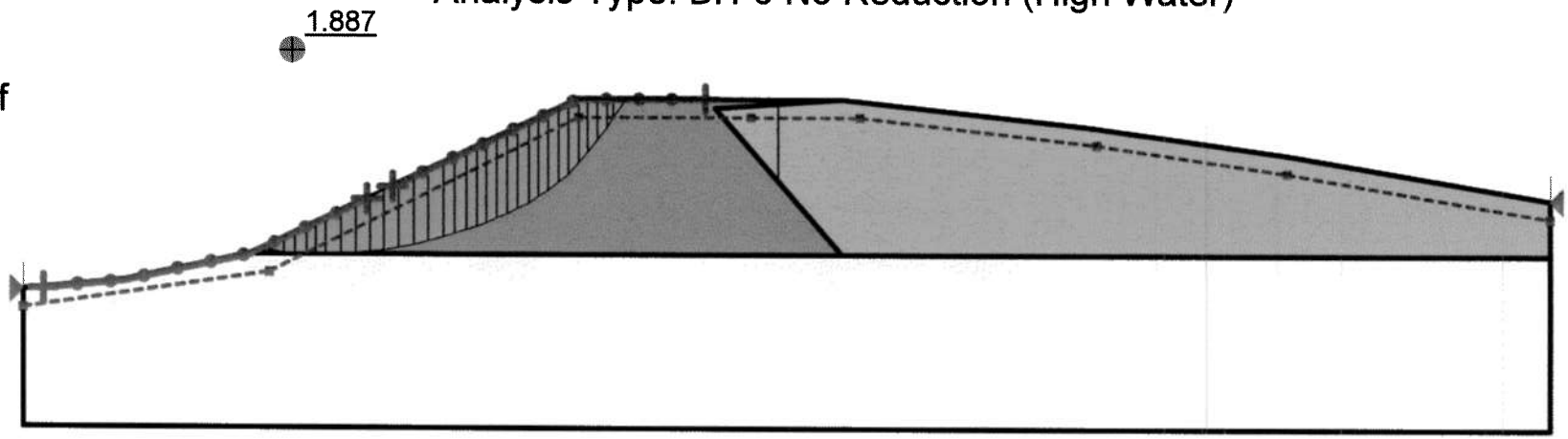
File Name: Bore Hole 6 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-6 No Reduction (High Water)



File Name: Bore Hole 6 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

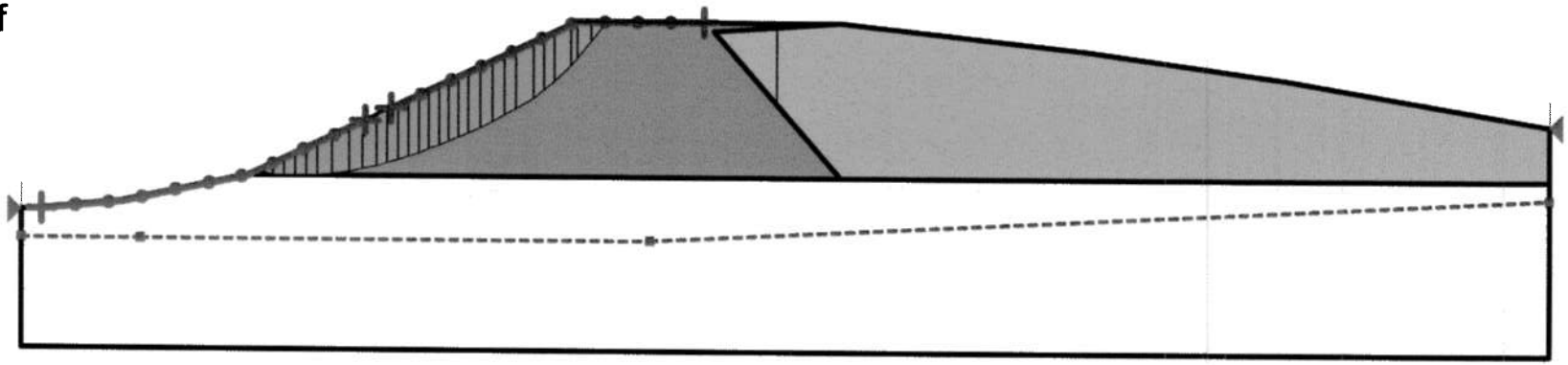
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

2.035

Analysis Type: BH-6 15% Reduction Steady State

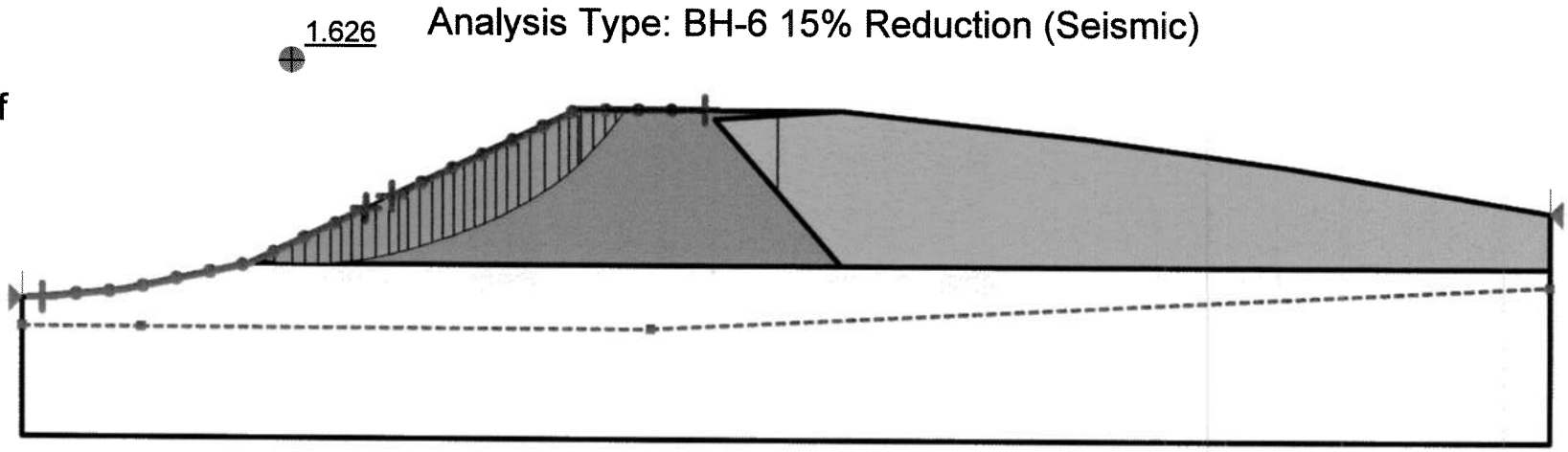


File Name: Bore Hole 6 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °



File Name: Bore Hole 6 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

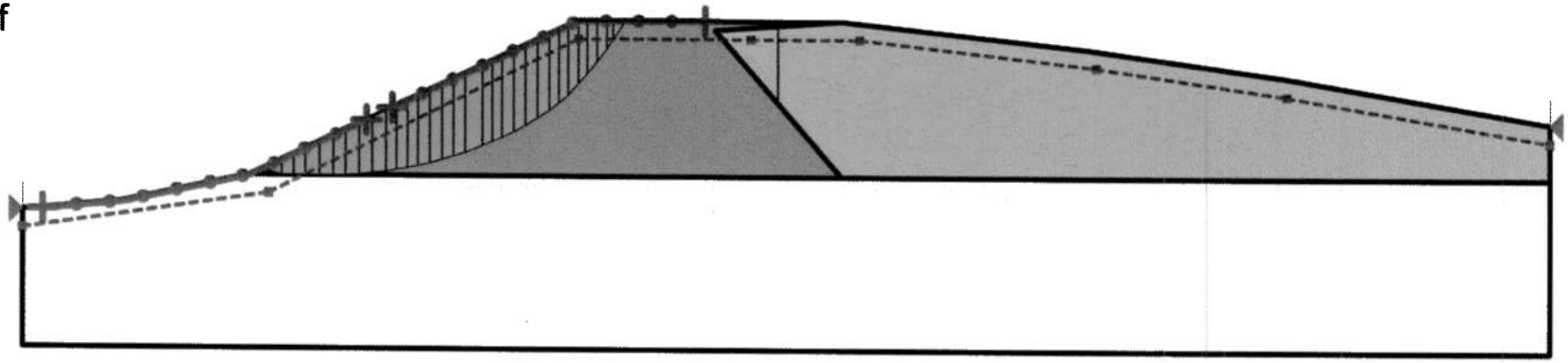
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

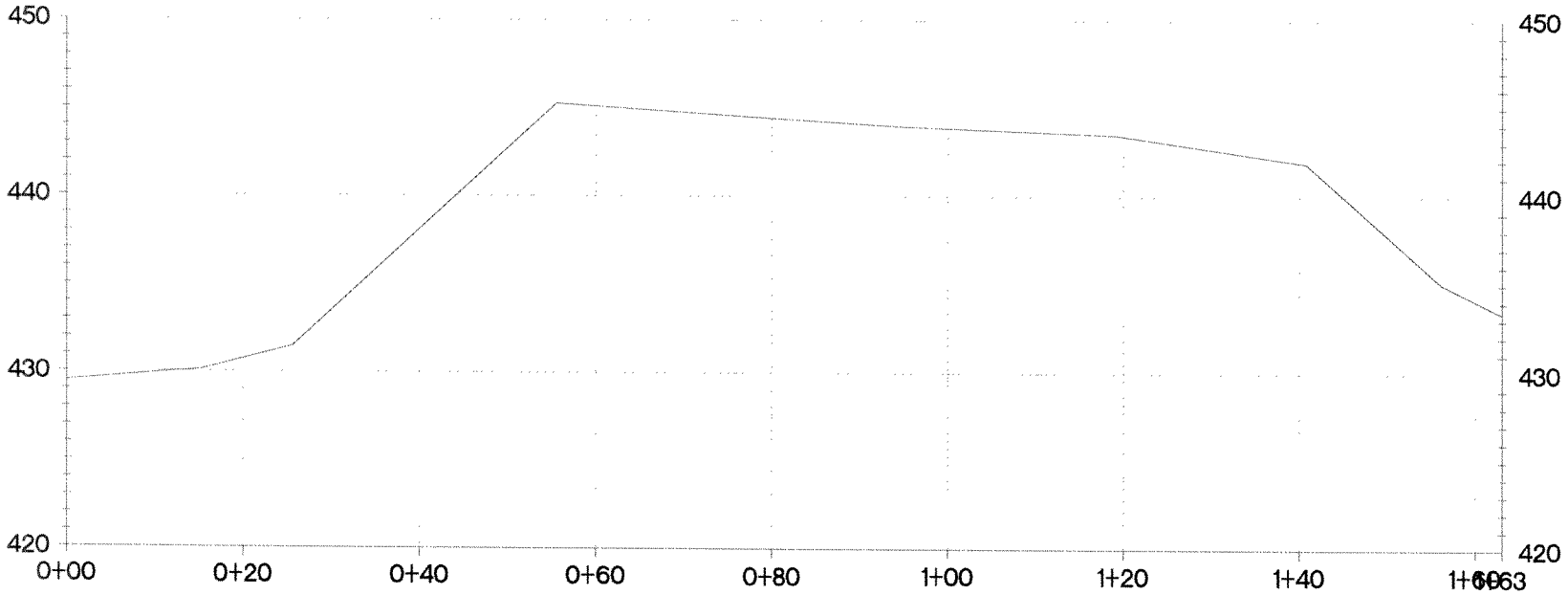
1.564

Analysis Type: BH-6 15% Reduction (High Water)



File Name: Bore Hole 6 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

BORE HOLE 7



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 6 OF 9 SHEETS
SUPERSEDES

3679GAS

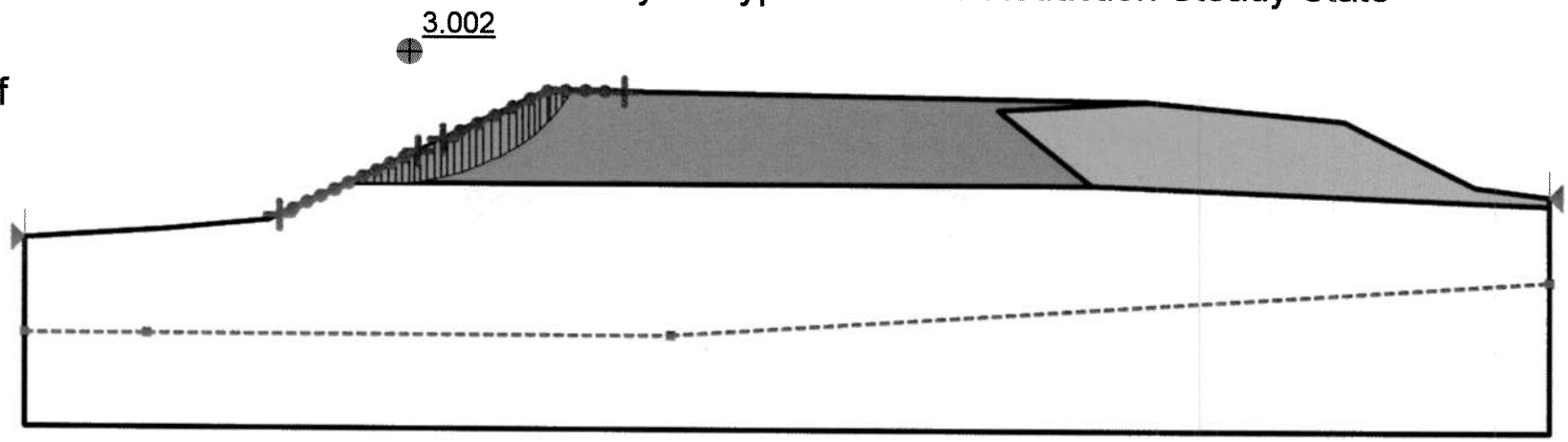
REV 0

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-7 No Reduction Steady State



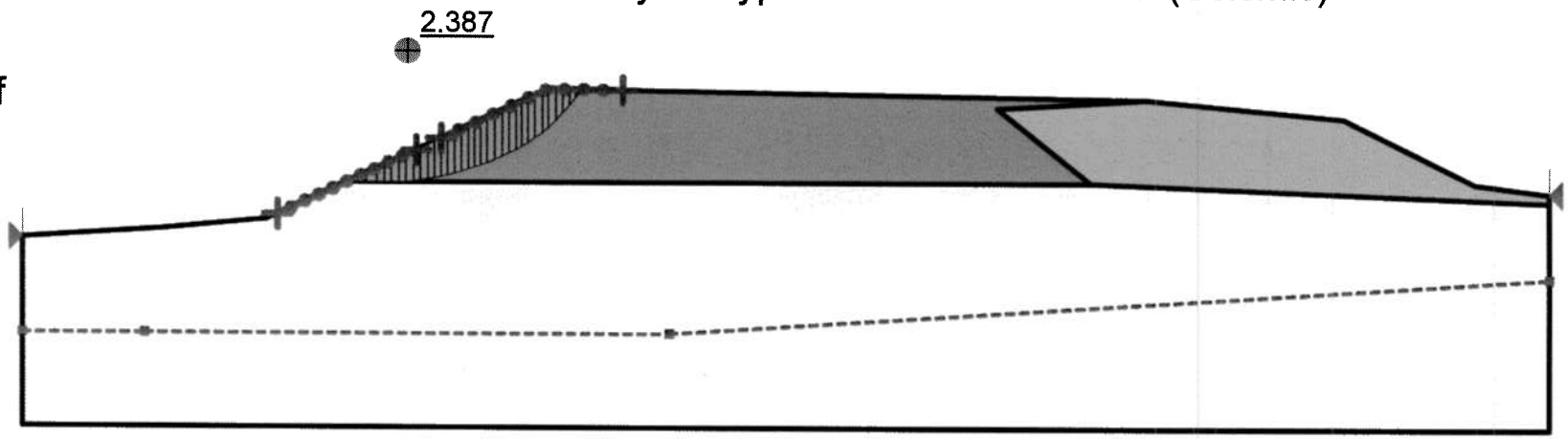
File Name: Bore Hole 7 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-7 No Reduction (Seismic)



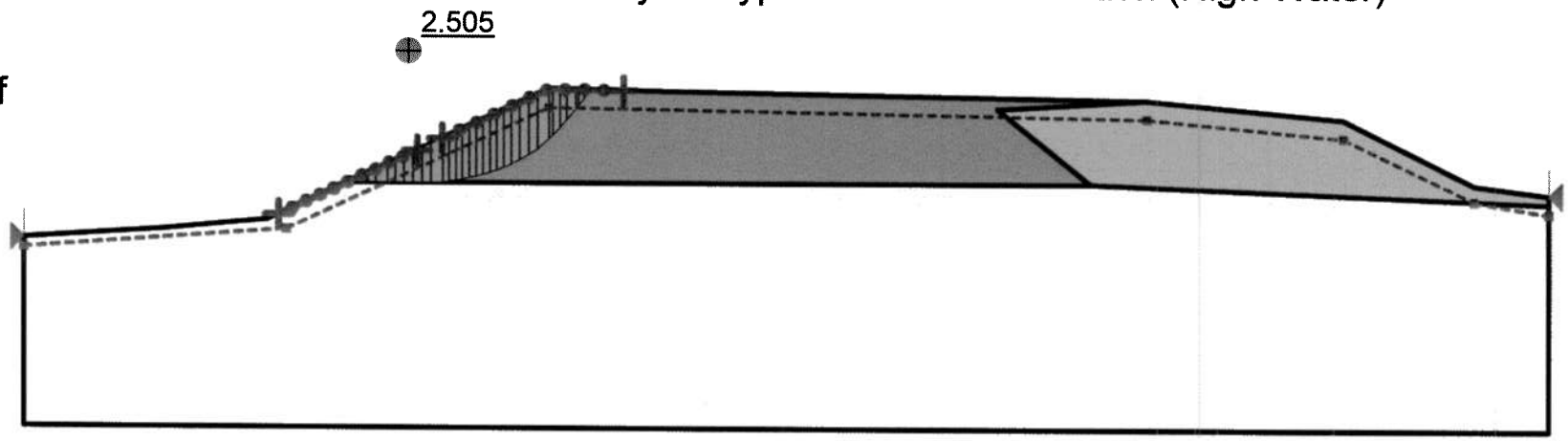
File Name: Bore Hole 7 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

Analysis Type: BH-7 No Reduction (High Water)



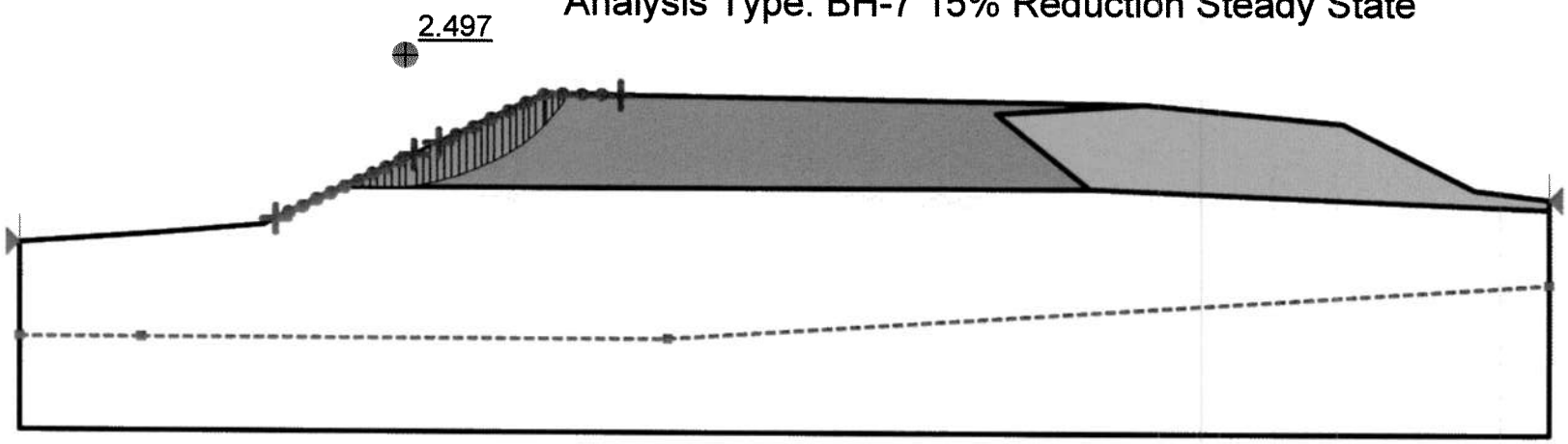
File Name: Bore Hole 7 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-7 15% Reduction Steady State



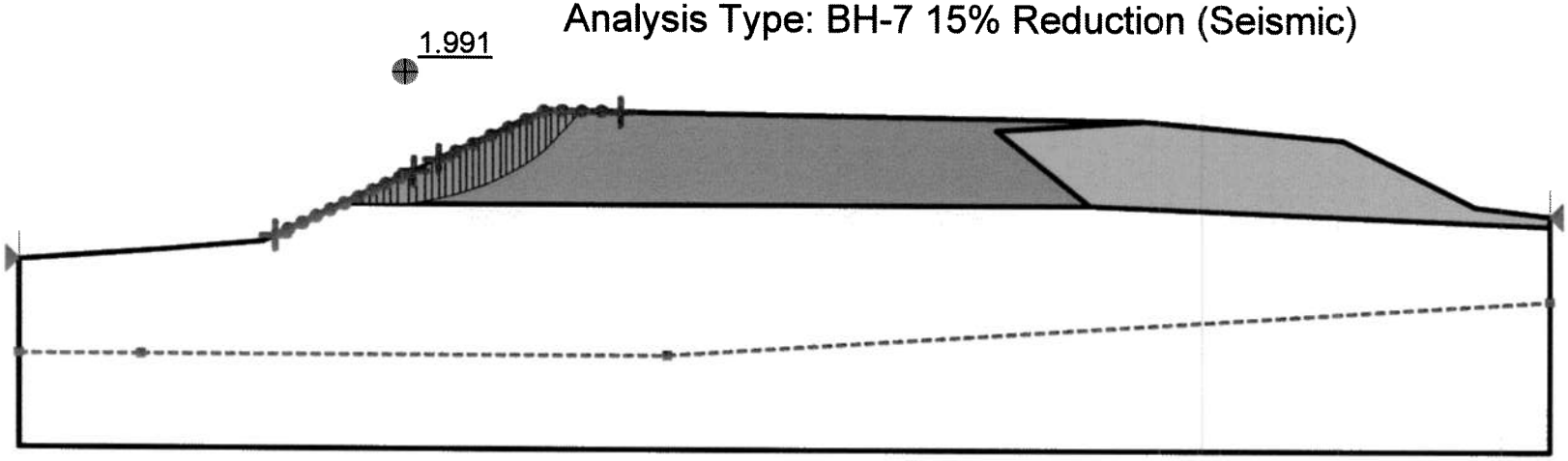
File Name: Bore Hole 7 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-7 15% Reduction (Seismic)



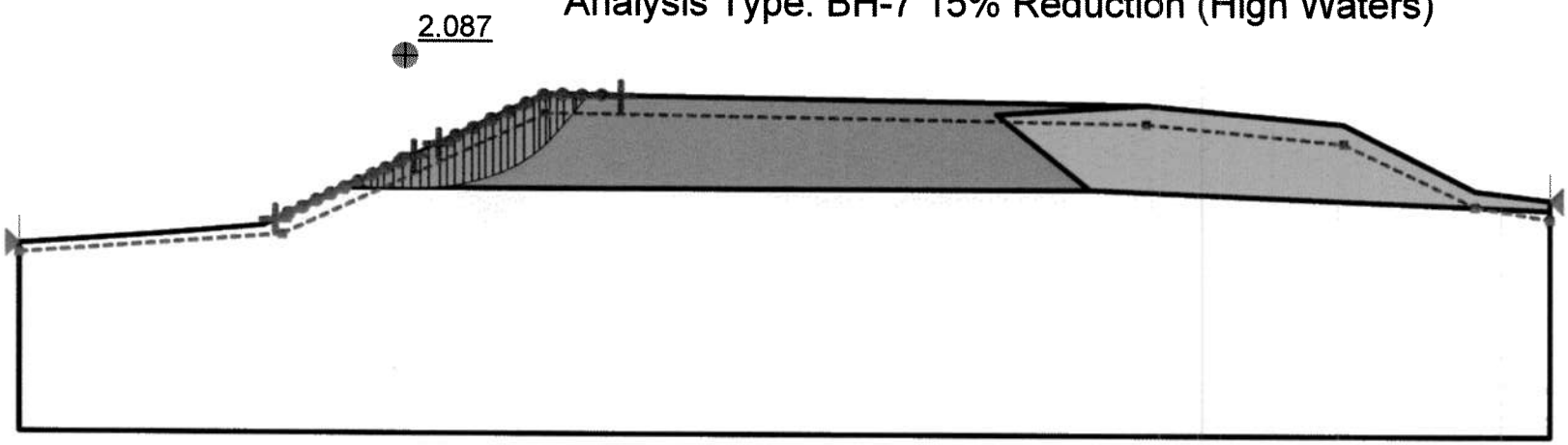
File Name: Bore Hole 7 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °

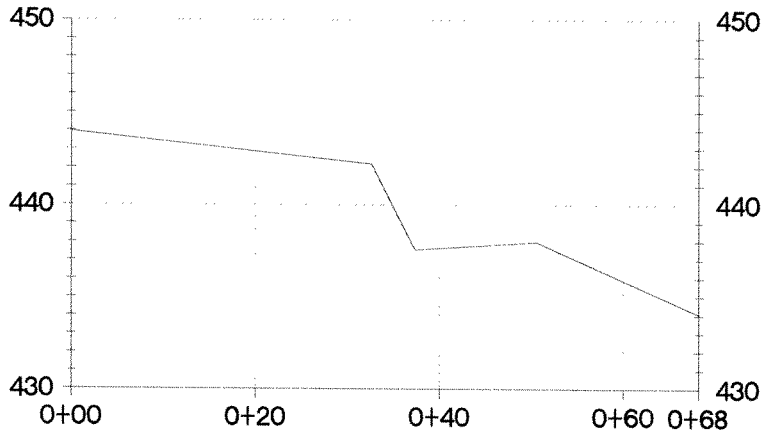
Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

Analysis Type: BH-7 15% Reduction (High Waters)



File Name: Bore Hole 7 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

BORE HOLE 8



SCALE: 1" = 20' HORIZ.
SCALE: 1" = 10' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

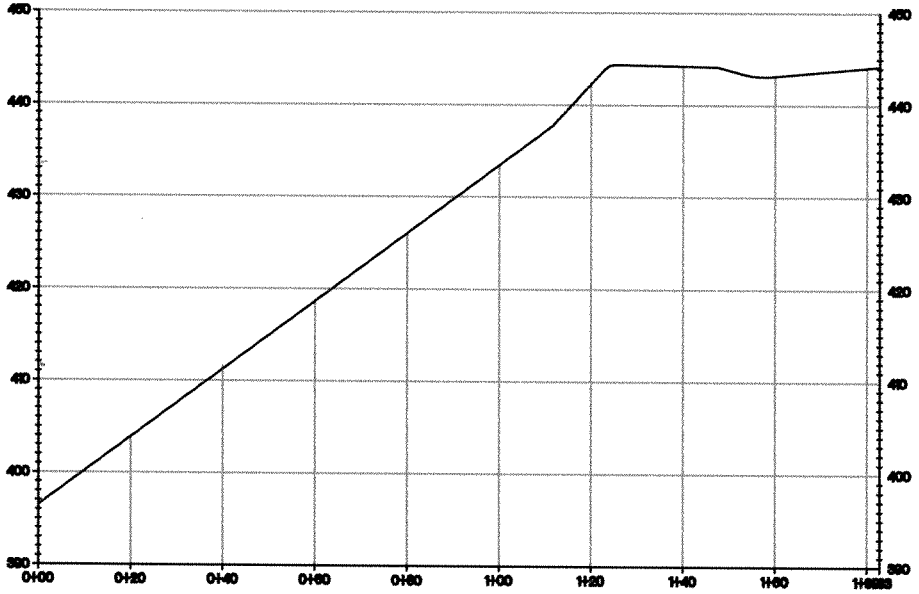
JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 7 OF 9 SHEETS
SUPERSEDES

3679GAS

REV 0

BORE HOLE 9



SCALE: 1" = 40' HORIZ.
SCALE: 1" = 20' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

SHEET 8 OF 9 SHEETS
SUPERSEDES

3679GAS

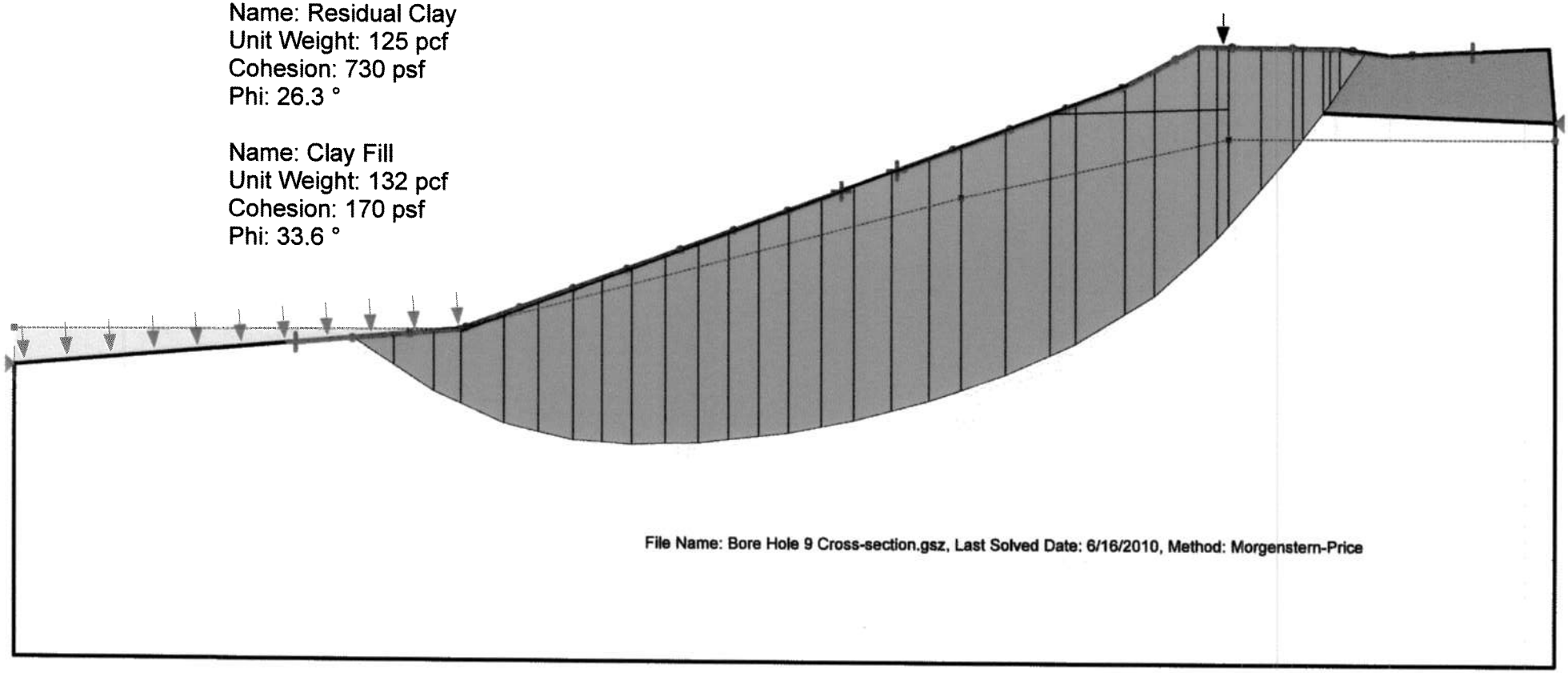
REV 0

2.0

Analysis Type: BH-9 No Reduction Steady State

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °



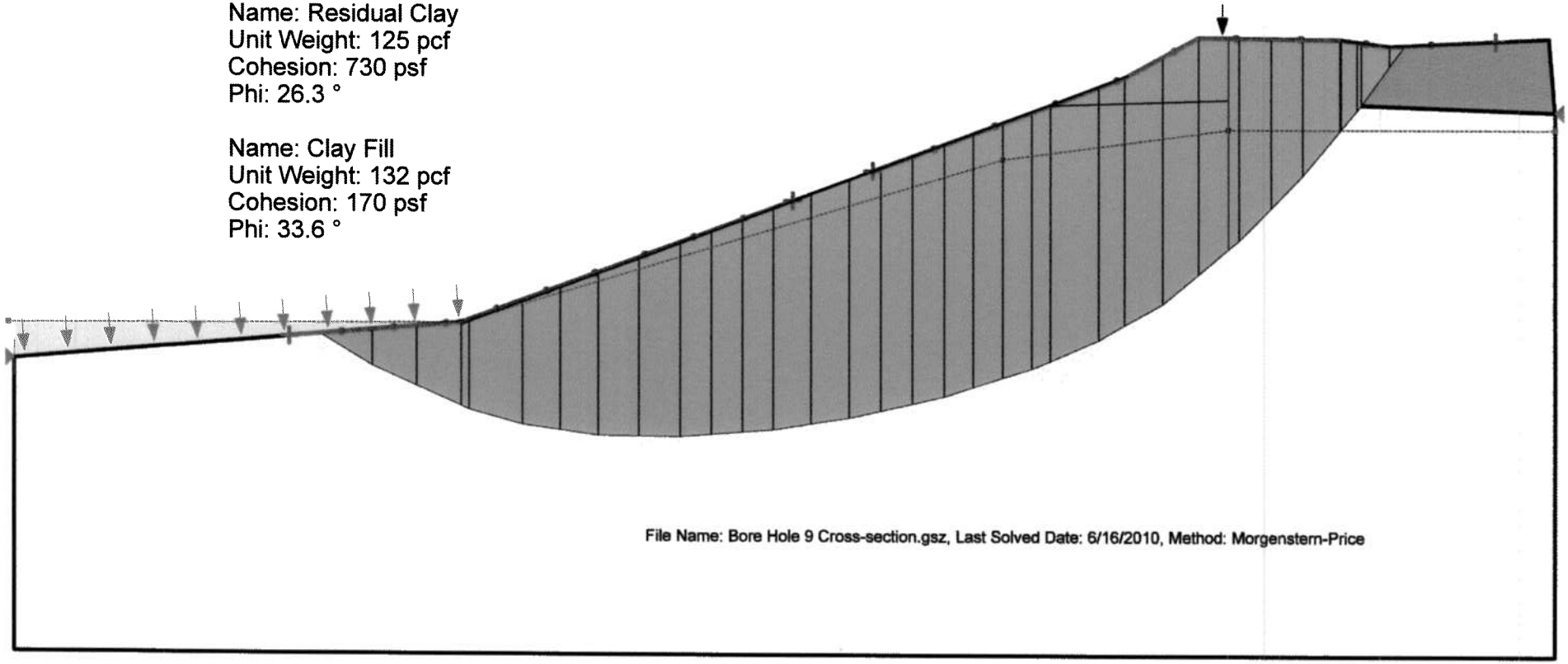
File Name: Bore Hole 9 Cross-section.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

1.5

Analysis Type: BH-9 No Reduction (Seismic)

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °



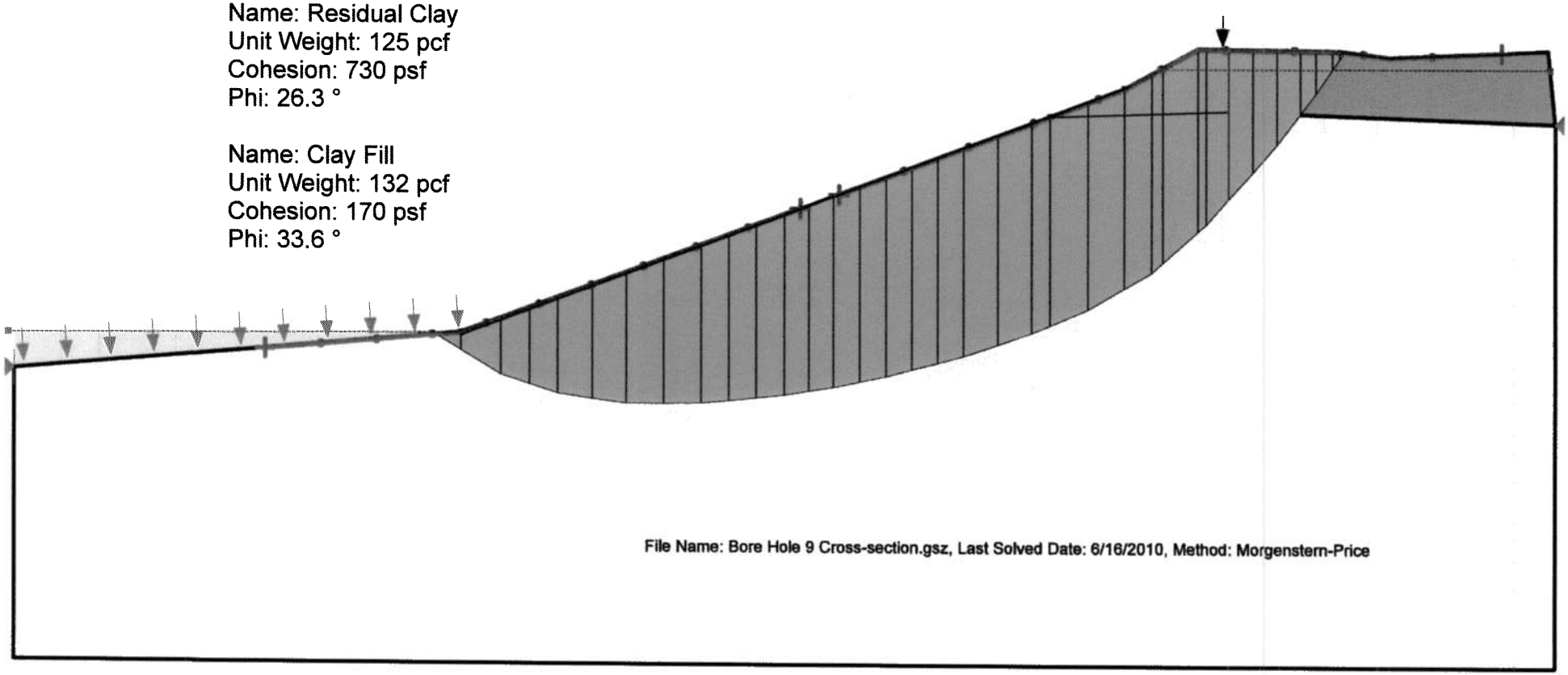
File Name: Bore Hole 9 Cross-section.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

1.8

Analysis Type: BH-9 No Reduction (High Water)

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 170 psf
Phi: 33.6 °



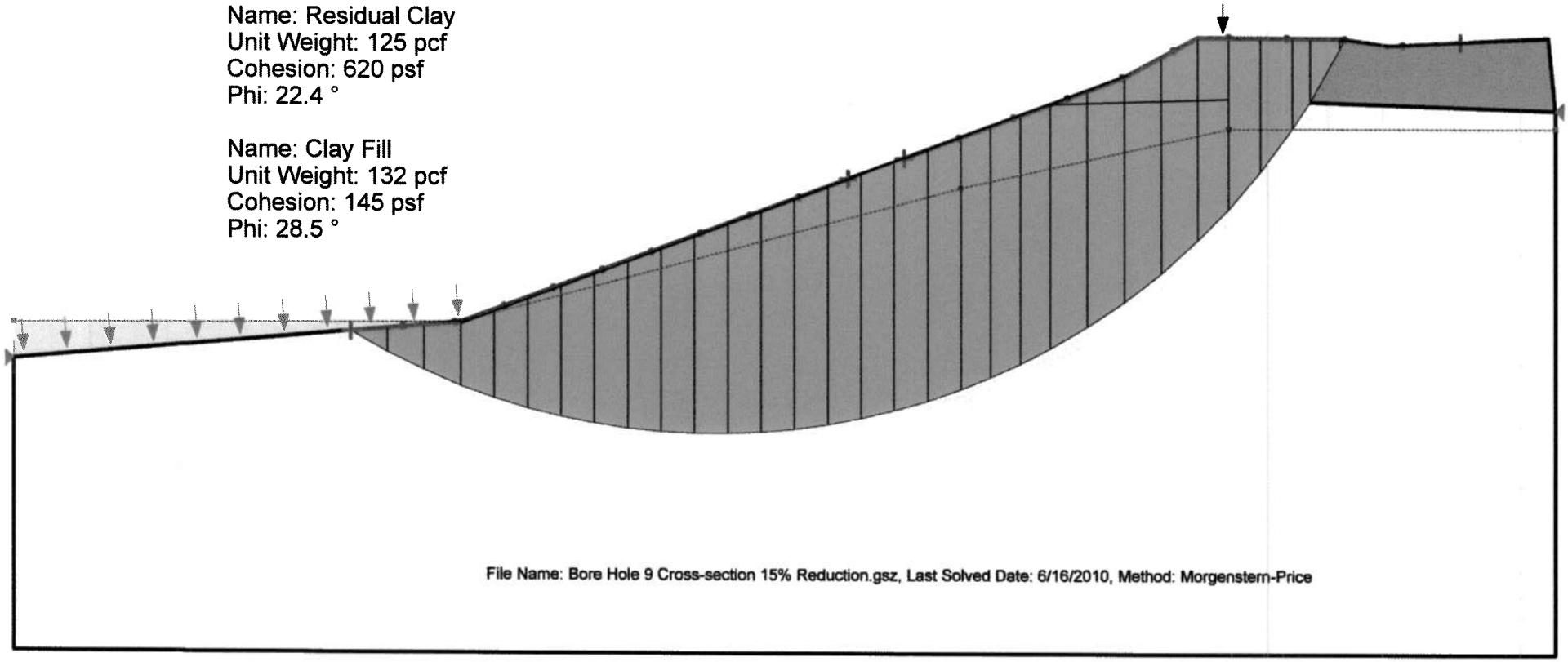
File Name: Bore Hole 9 Cross-section.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

1.7

Analysis Type: BH-9 15% Reduction Steady State

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °



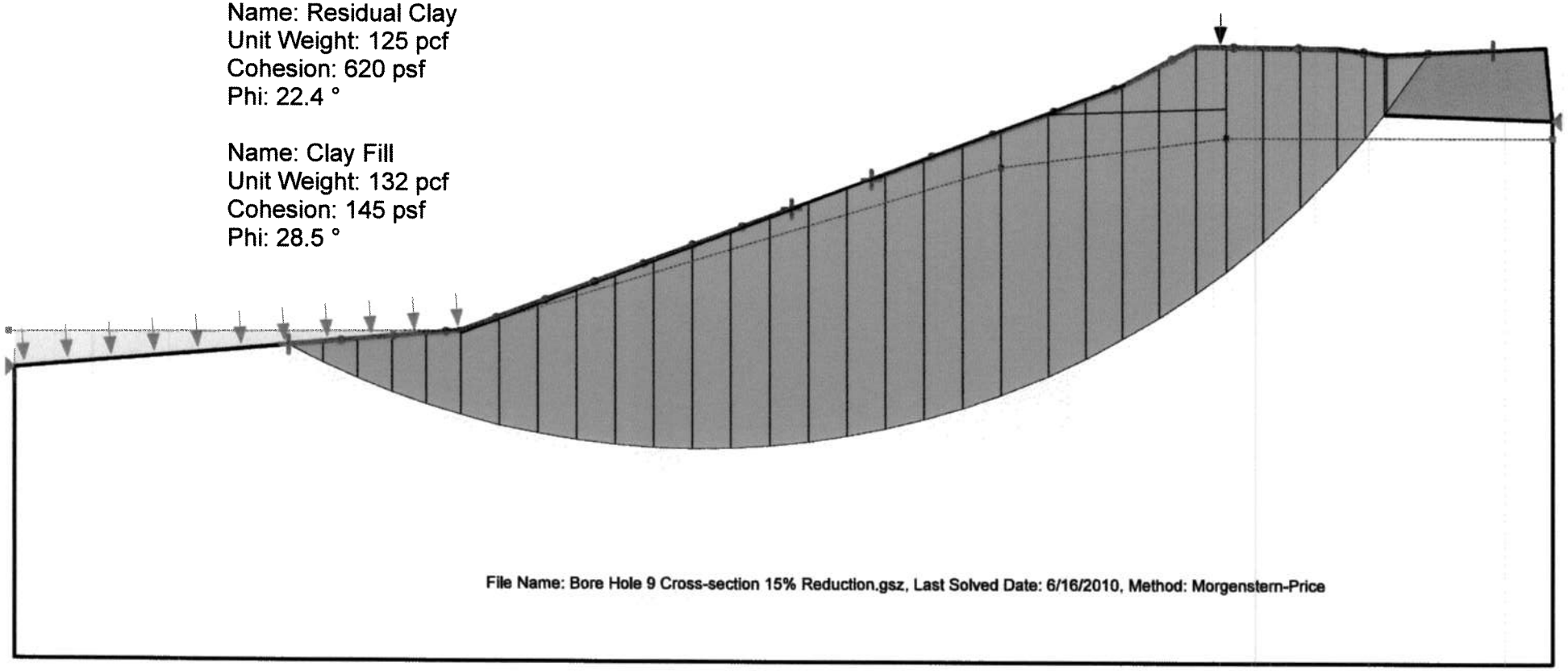
File Name: Bore Hole 9 Cross-section 15% Reduction.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

1.3

Analysis Type: BH-9 15% Reduction (Seismic)

Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °



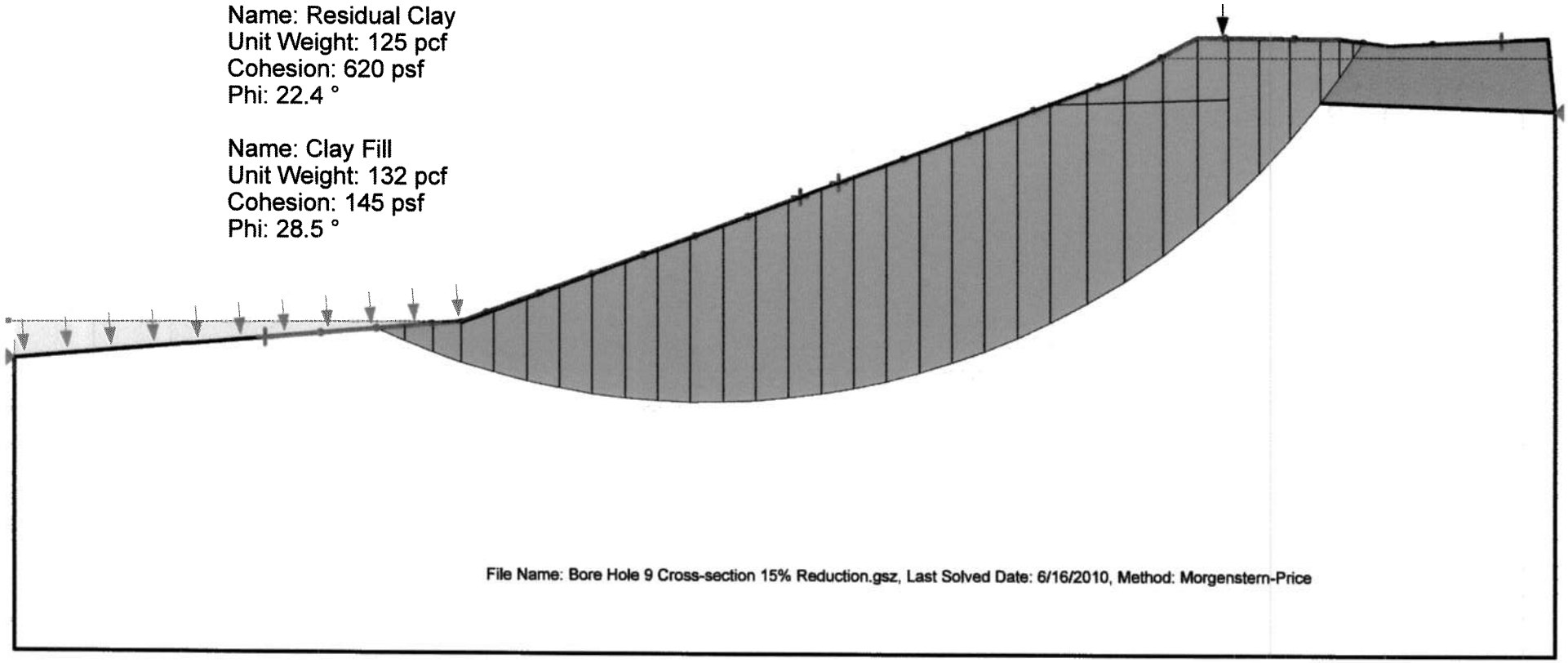
File Name: Bore Hole 9 Cross-section 15% Reduction.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

1.5

Analysis Type: BH-9 15% Reduction (High Water)

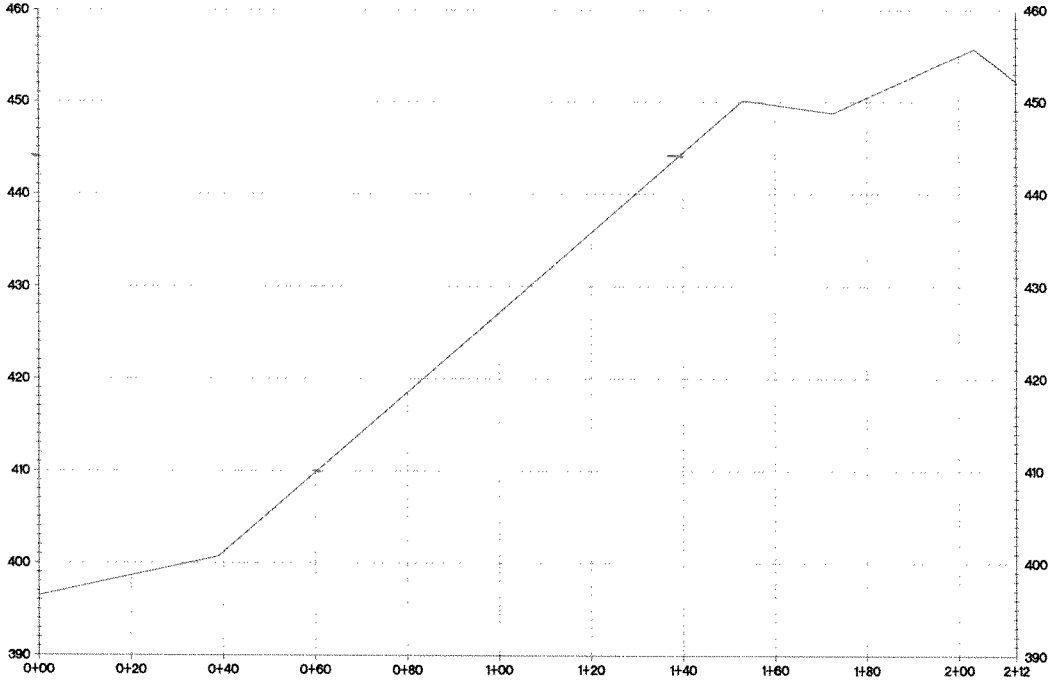
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Clay Fill
Unit Weight: 132 pcf
Cohesion: 145 psf
Phi: 28.5 °



File Name: Bore Hole 9 Cross-section 15% Reduction.gsz, Last Solved Date: 6/16/2010, Method: Morgenstern-Price

BORE HOLE 10



SCALE: 1" = 40' HORIZ.
SCALE: 1" = 20' VERT.

Southern Company Services, Inc.
for
Alabama Power Company

JOB E.C. GASTON
DETAIL ASH POND
BORE HOLE X-SECTIONS
SCALE AS NOTED B/M

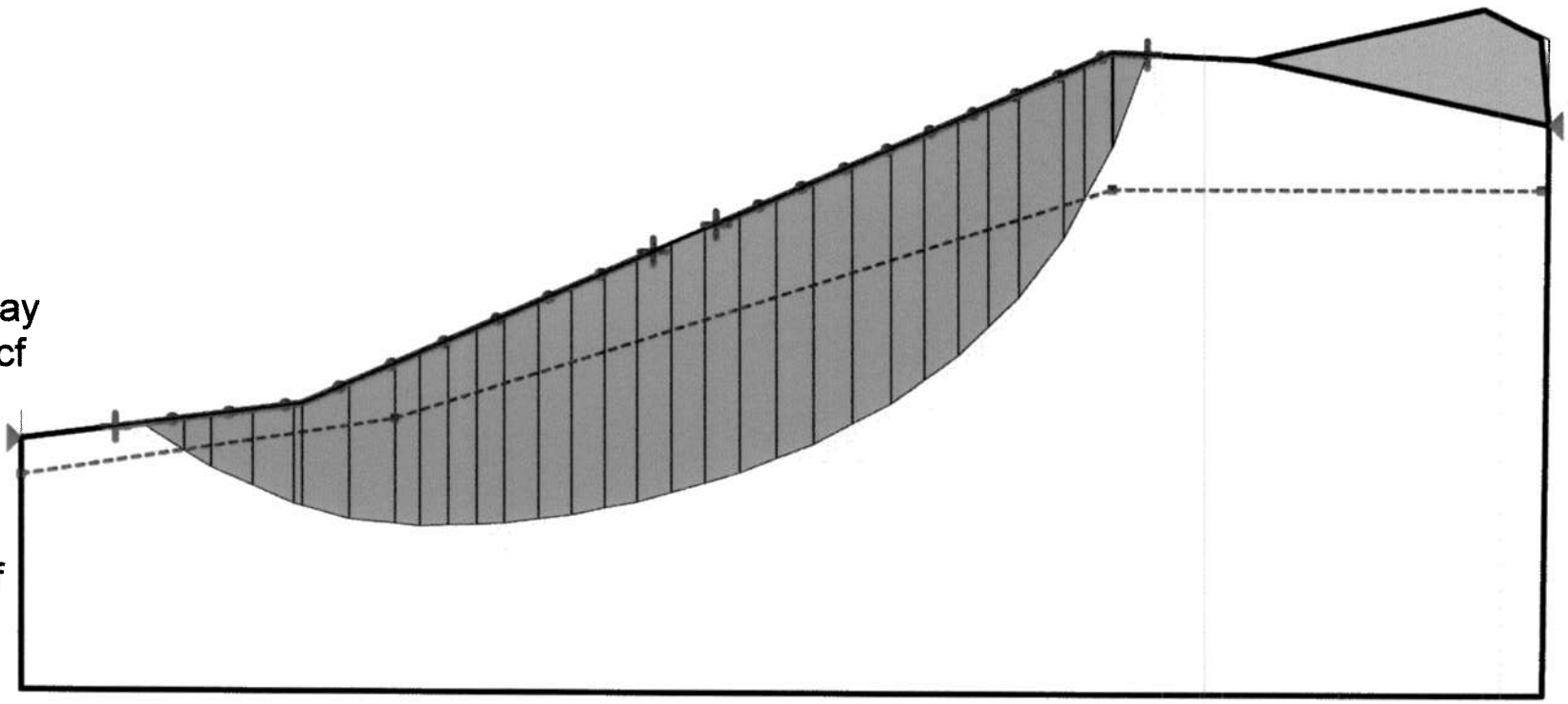
SHEET 9 OF 9 SHEETS
SUPERSEDES

3679GAS

REV 0

2.109

Analysis Type: BH-10 No Reduction Steady State



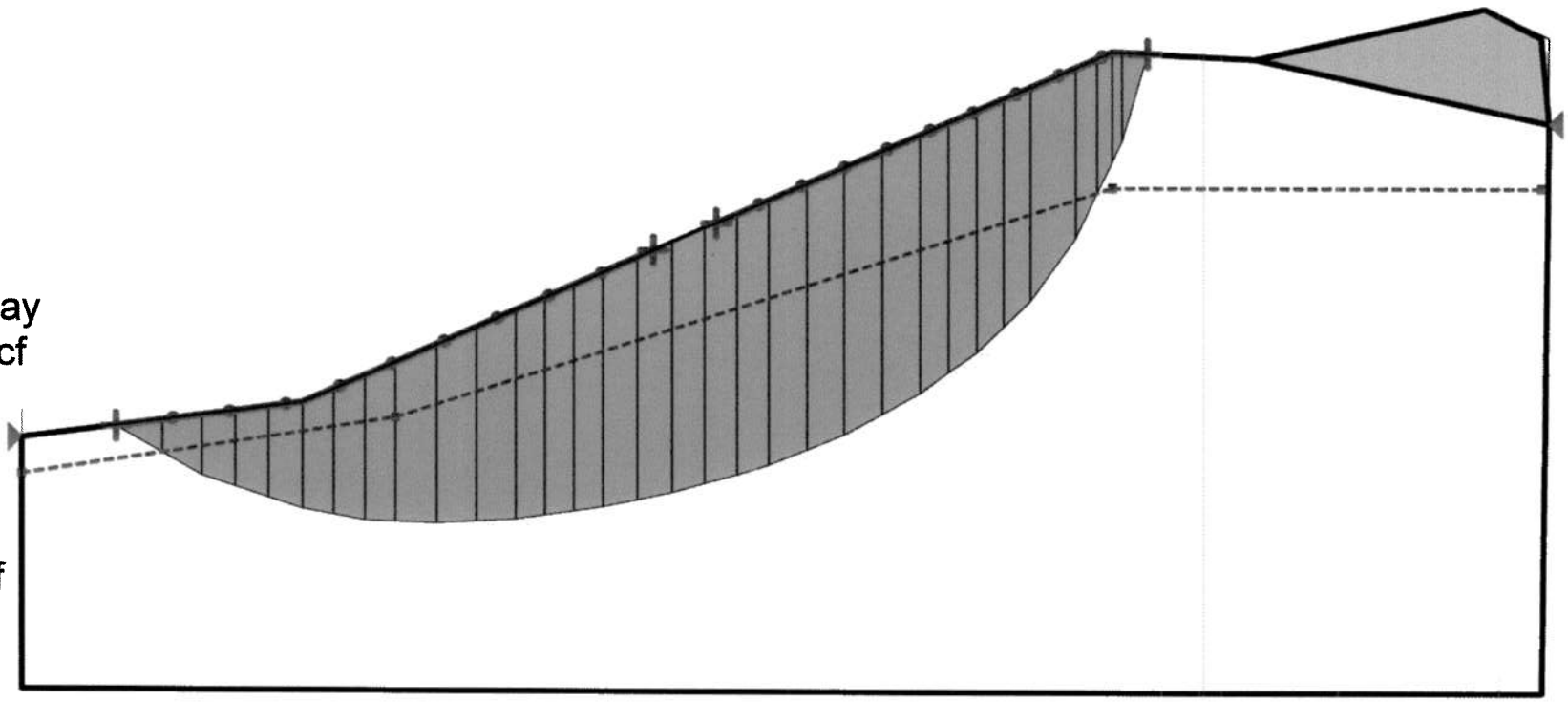
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

File Name: Bore Hole 10 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

1.659

Analysis Type: BH-10 No Reduction (Seismic)



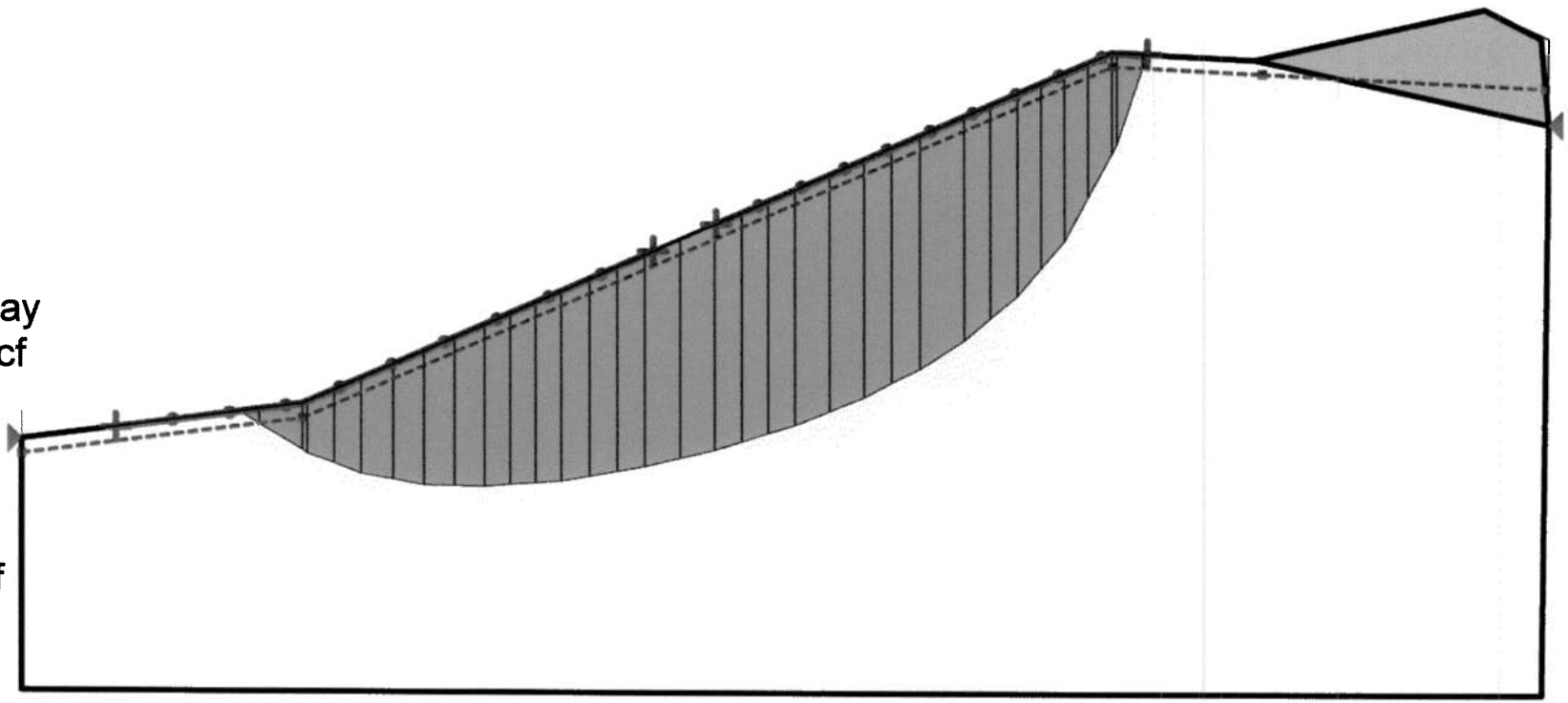
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

File Name: Bore Hole 10 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

1.748

Analysis Type: BH-10 No Reduction (High Water)



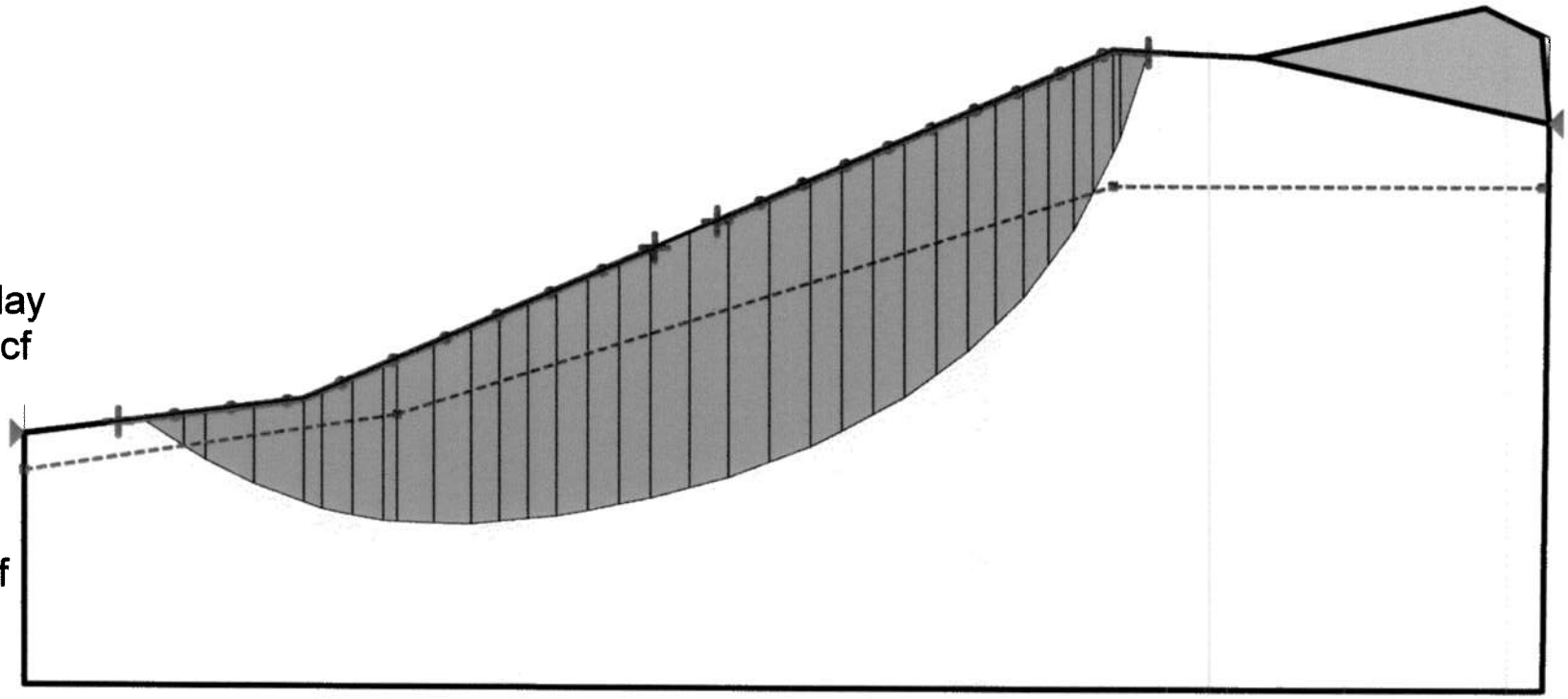
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 730 psf
Phi: 26.3 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 100 psf
Phi: 22 °

File Name: Bore Hole 10 Cross-section.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Price

1.771

Analysis Type: BH-10 15% Reduction Steady State



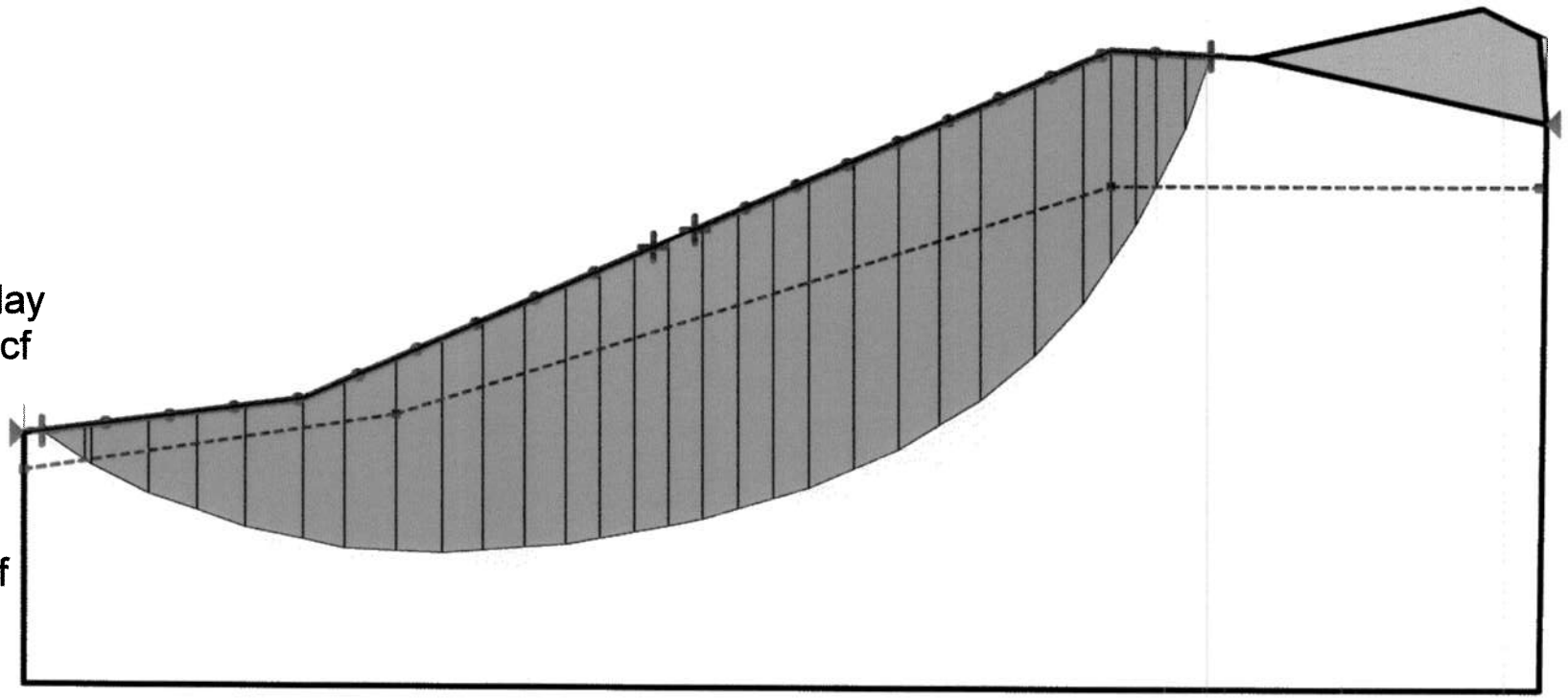
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

File Name: Bore Hole 10 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Pric

1.345

Analysis Type: BH-10 15% Reduction (Seismic)



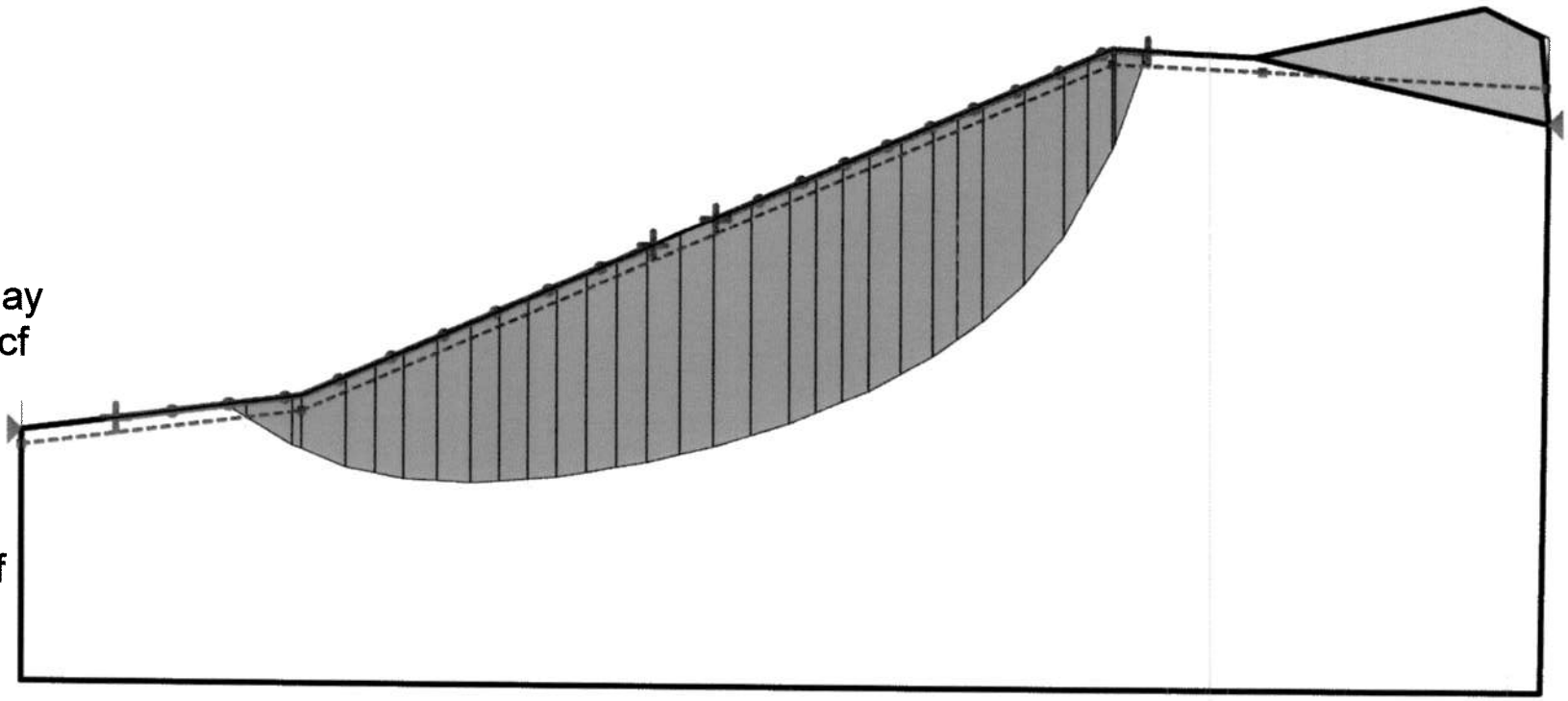
Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

File Name: Bore Hole 10 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Pric

1.473

Analysis Type: BH-10 15% Reduction (High Water)



Name: Residual Clay
Unit Weight: 125 pcf
Cohesion: 620 psf
Phi: 22.4 °

Name: Ash
Unit Weight: 95 pcf
Cohesion: 85 psf
Phi: 18.7 °

File Name: Bore Hole 10 Cross-section 15% Reduction.gsz, Last Solved Date: 10/9/2009, Method: Morgenstern-Pric

ADEM
Alabama Department of Environmental Management

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

PERMITTEE: ALABAMA POWER COMPANY – GASTON STEAM PLANT

FACILITY LOCATION: ALABAMA HIGHWAY 25 SOUTH
WILSONVILLE, AL

PERMIT NUMBER: AL 0003140

RECEIVING WATERS: COOSA RIVER AND YELLOW LEAF CREEK

In accordance with and subject to the provisions of the Federal Water Pollution Control Act, as amended, 33 U.S.C. §§1251-1378 (the "FWPCA"), the Alabama Water Pollution Control Act, as amended, Code of Alabama 1975, §§ 22-22-1 to 22-22-14 (the "AWPCA"), the Alabama Environmental Management Act, as amended, Code of Alabama 1975, §§22-22A-1 to 22-22A-15, and rules and regulations adopted thereunder, and subject further to the terms and conditions set forth in this permit, the Permittee is hereby authorized to discharge into the above-named receiving waters.

ISSUANCE DATE: JUNE 27, 2007

EFFECTIVE DATE: JULY 1, 2007

EXPIRATION DATE: JUNE 30, 2012

MODIFICATION ISSUANCE DATE: SEPTEMBER 10, 2007

MODIFICATION EFFECTIVE DATE: SEPTEMBER 10, 2007

James E. McLeod

Alabama Department of Environmental Management

INDUSTRIAL SECTION
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

TABLE OF CONTENTS

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN001: Once-through condenser cooling water, Units 1 and 2.
DSN002: Once-through condenser cooling water, Units 3 and 4.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	Daily	Pump Log
Effluent Temperature	°F	-	Monitor	Monitor	Daily	Grab or Recorder
Intake Temperature 3/	°F	-	Monitor	Monitor	Daily	Grab or Recorder
In-Stream Temperature (A) 4/	°F	-	Monitor	90 2/	Daily 4/	Recorder
In-Stream Temperature (B) 4/	°F	-	Monitor	93 2/	Daily 4/	Recorder
Total Residual Chlorine 5/	mg/l	-	0.016	0.012 2/	Daily	Grab
Time of Chlorine Addition	min/unit/day	-	120	-	Daily	Clock

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ Samples shall be taken at the intake pump station.

4/ The permittee's thermal discharge shall not cause the increase of the receiving water temperature above the following: (A) 90°F, as measured at the five foot depth at a point 1500 yards downstream of discharge point DSN002 on the east bank; (B) 93°F, as measured at the five foot depth at a point directly across the Coos River from DSN002. Continuous monitoring is required at these points during the months of June through September.

5/ Total Residual Chlorine (TRC) may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to ADEM that discharge for more than two hours is required for macroinvertebrate control. TRC limitations apply at the outlet to the individual unit being chlorinated, prior to combination with any other waste stream or entering the receiving water. When chlorination is occurring, grab samples shall be taken at least every 30 minutes to verify compliance with total residual chlorine limitations. Simultaneous multi-unit chlorination is permitted. Sampling is only required during chlorination.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN004a (formerly DSN003a): Cooling tower blowdown (Unit 5) discharged to ash pond.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	1/week	Estimated
Total Recoverable Chromium 5/	mg/l	-	0.2	0.2 2/	1/year	Composite
Total Recoverable Zinc 5/	mg/l	-	1.0	1.0 2/	1/year	Composite
Time of Chlorine Discharge	min/unit/day	-	120	-	daily	Log book
Priority Pollutants 4/	ug/l	-	BMDL 3/	BMDL 3/	1/year	Grab

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ "BMDL" as defined "Below Minimum Detection Levels." Cooling tower blowdown shall not contain detectable amounts of the 129 Priority Pollutants listed in 40 CFR 423 except for chromium and zinc as limited above. See Attachment I for additional requirements.

4/ Priority Pollutants defined by Appendix A of 40 CFR 423 and in Attachment I.

5/ Annual certification shall be submitted by January 28th on non-use of maintenance chemicals containing chromium or zinc or perform the required monitoring.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN004b (formerly DSN005a): Sanitary wastewater treatment plant. 3/

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/2/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type

DISCHARGE IS TO THE ASH POND. NO MONITORING REQUIREMENTS IMPOSED.

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ The wastewater treatment plant and the effluent shall be observed at least weekly to determine if the system is operating effectively and a log shall be kept as a record of these observations. The logs shall include the date of the inspection, personnel who conducted inspection, any deficiencies notes and corrective action(s) taken, if necessary.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN004c (formerly DSN009a): Pretreated metal cleaning wastes. 3/

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	-	1/discharge	Pump log or Instantaneous
pH	s.u.	6.0	10.5	-	1/discharge	Grab
Dissolved Copper	mg/l	-	1.0	1.0 2/	1/discharge	Composite
Dissolved Iron	mg/l	-	1.0	1.0 2/	1/discharge	Composite

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ Metal cleaning wastes as defined in 40 CFR 423. No monitoring required if wastewater is rainwater only. To quality as rainwater only, all metal cleaning waste must be removed from the boiler cleaning pond, and only rainwater discharged to, or collected in the pond.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN004d (formerly DSN010a): Low volume wastes and storm water.
DSN004e (formerly DSN016a): Miscellaneous low volume wastes.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/2/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type

DISCHARGE IS TO THE ASH POND. NO MONITORING REQUIREMENTS IMPOSED.

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN004: Ash pond discharge including cooling tower blowdown, sanitary wastewater, pretreated metal cleaning wastes, low volume wastewater, coal pile runoff and storm water.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	-	1/month	Instantaneous
pH	s.u.	6.0	9.0	-	1/month	Grab
Free Available Chlorine (FAC) 3/	mg/l	-	0.5	0.2 2/	1/week	MultipleGrabs 4/
Oil and Grease	mg/l	-	15	11 2/ 5/	2/quarter	Grab
Total Suspended Solids	mg/l	-	80	26 2/ 5/	2/quarter	Composite
Total Recoverable Arsenic	ug/l	-	-	107 5/	2/quarter	Composite
Total Recoverable Copper 6/	mg/l	-	Monitor	-	1/quarter	Composite
Total Recoverable Iron 6/	mg/l	-	Monitor	-	1/quarter	Composite
Total Recoverable Manganese 6/	mg/l	-	Monitor	-	1/quarter	Composite
Total Phosphorus	mg/l	-	Monitor	-	1/quarter	Grab
Ammonia as Nitrogen	mg/l	-	Monitor	-	1/quarter	Grab
Nitrate + Nitrite as Nitrogen	mg/l	-	Monitor	-	1/quarter	Grab
Toxicity Ceriodaphnia, 7-day Chronic		-	-	4/	1/year	Grab
Toxicity Pimephales, 7-day Chronic		-	-	4/	1/year	Grab

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ Neither Free Available Chlorine (FAC) nor Total Residual Chlorine (TRC) shall be discharged from any unit for more than two hours in any one day and not more than one unit shall discharge FAC or TRC at any one time unless the utility can demonstrate that the units in a particular location cannot operate at or below this level of chlorination.

4/ See Part IV.A. for Biomonitoring Requirements.

5/ To be monitored twice during the same month. Sampling events shall be at least 10 days apart.

6/ To be monitored only when metal cleaning wastewaters have been discharged to the ash pond. Samples must be collected within 30 days after metal cleaning wastewaters are discharged.

7/ Multiple Grabs are to be collected on 30 minute intervals during periods of TRC/FAC discharges attributable to cooling tower condenser chlorination.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN013 and DSN025: Intake screen backwash, backwash bypass, and storm water runoff.
DSN026: Storm water runoff associated with industrial activity including landfill runoff and gypsum storage runoff. 2/
DSN020: Storm water runoff associated with industrial activity including car rinse water.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	-	1/discharge	Instantaneous
pH	s.u.	Monitor	Monitor	-	1/discharge	Grab
Total Suspended Solids	mg/l	-	Monitor	-	1/discharge	Grab

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ Monitoring only required at DSN026.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN019: Storm water runoff associated with industrial activity and cooling tower A coldwater basin blowdown overflow. 9/

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Flow	MGD	-	Monitor	Monitor	1/discharge	Estimated
Free Available Chlorine (FAC) 5/	mg/l	-	0.5 7/	0.2 2/ 7/	1/discharge	Multiple Grabs 6/
Total Recoverable Chromium 8/	mg/l	-	0.2	0.2 2/	1/discharge	Composite
Total Recoverable Zinc 8/	mg/l	-	1.0	1.0 2/	1/discharge	Composite
Time of Chlorine Discharge 5/	min/unit/day	-	120	-	daily	Log book
Priority Pollutants 4/	ug/l	-	BMDL 3/	BMDL 3/	1/year	Grab

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ If only one sampling event occurs during a month, the sample result shall be reported on the discharge monitoring report as both the monthly average and daily maximum value for all parameters with a monthly average limitation.

3/ "BMDL" as defined "Below Minimum Detection Levels." Cooling tower blowdown shall not contain detectable amounts of the 129 Priority Pollutants listed in 40 CFR 423 except for chromium and zinc as limited above. See Attachment I for additional requirements.

4/ Priority Pollutants defined by Appendix A of 40 CFR 423 and in Attachment I.

5/ Neither Free Available Chlorine (FAC) nor Total Residual Chlorine (TRC) shall be discharged from any unit for more than two hours in any one day and not more than one unit shall discharge FAC or TRC at any one time.

6/ Multiple Grabs are to be collected on 30 minute intervals during periods of TRC/FAC discharges attributable to cooling tower condenser chlorination.

7/ FAC limitations apply at the outlet to the individual unit being chlorinated, prior to combining with any other wastestream. Simultaneous multi-unit chlorination is permitted.

8/ Annual certification shall be submitted by January 28th on non-use of maintenance chemicals containing chromium or zinc or perform the required monitoring.

9/ Monitoring only required during periods of cooling tower blowdown discharge.

PART I

A. DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

DSN022: ID fan cooling water.

Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	UNITS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS 1/	
		Daily Minimum	Daily Maximum	Monthly Average	Measurement Frequency	Sample Type
Total Residual Chlorine 2/	mg/l	-	0.2	-	Daily	Grab
Time of Chlorine Addition	min/unit/day	-	120	-	Daily	Clock
Oil and Grease	mg/l	-	15	-	1/month	Grab

THE DISCHARGE SHALL HAVE NO SHEEN, AND THERE SHALL BE NO DISCHARGE OF VISIBLE OIL, FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

THERE SHALL BE NO DISCHARGE OF POLYCHLORINATED BIPHENYL COMPOUNDS SUCH AS THOSE COMMONLY USED IN TRANSFORMER FLUID.

1/ Samples collected to comply with the monitoring requirements specified above shall be collected at the following location: At the nearest accessible location just prior to discharge and after final treatment. Unless otherwise specified, composite samples shall be time composite samples collected using automatic sampling equipment or a minimum of eight (8) equal volume grab samples collected over equal time intervals. All composite samples shall be collected for the total period of discharge not to exceed 24 hours.

2/ Total Residual Chlorine (TRC) may not be discharged from any single generating unit for more than two hours per day unless the discharger demonstrates to ADEM that discharge for more than two hours is required for macroinvertebrate control. TRC limitations apply at the outlet to the individual unit being chlorinated, prior to combination with any other waste stream or entering the receiving water. When chlorination is occurring, grab samples shall be taken at least every 30 minutes to verify compliance with total residual chlorine limitations. Simultaneous multi-unit chlorination is permitted. Sampling is only required during chlorination.

PART I

During the period beginning on the effective date of this permit and lasting through the expiration date of this permit, the permittee is authorized to discharge from the following point source(s) outfall(s), described more fully in the permittee's application:

Petroleum storage and handling areas.

Such discharge shall be limited and monitored by the permittee as specified below:

1. The facility will have a valid SPCC plan pursuant to 40 CFR 112.

2. Best Management Practices (BMP) are used in draining the diked area. BMP is defined as use of a portable oil skimmer or similar device or the use of absorbent material to remove oil and grease (as indicated by the presence of a sheen) immediately prior to draining.

3. Monitoring records shall be maintained in the form of a log and shall contain the following information, as a minimum:

   a. Date and time of discharge
   b. Estimated volume of discharge
   c. Initials of person making visual inspection and authorizing discharge

   The discharge shall have no sheen, and there shall be no discharge of visible oil, floating solids or visible foam in other than trace amounts. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used in transformer fluid.

4. The permittee shall submit an annual certification by January 28th that all discharges associated with the above were in accordance with the conditions of this permit.

B. DISCHARGE MONITORING AND RECORD KEEPING REQUIREMENTS

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge and shall be in accordance with the provisions of this permit.

2. Test Procedures

For the purpose of reporting and compliance, permittees shall use one of the following procedures:

a. For parameters with an EPA established Minimum Level (ML), report the measured value if the analytical result is at or above the ML and report "0" for values below the ML. Test procedures for the analysis of pollutants shall conform to 40 CFR Part 136 and guidelines published pursuant to Section 304(h) of the FWPCA, 33 U.S.C. Section 1314(h). If more than one method for analysis of a substance is approved for use, a method having a minimum level lower than the permit limit shall be used. If the minimum level of all methods is higher than the permit limit, the method having the lowest minimum level shall be used and a report of less than the minimum level shall be reported as zero and will constitute compliance, however should EPA approve a method with a lower minimum level during the term of this permit the permittee shall use the newly approved method.

b. For pollutants parameters without an established ML, an interim ML may be utilized. The interim ML shall be calculated as 3.18 times the Method Detection Level (MDL) calculated pursuant to 40 CFR Part 136, Appendix B.

Permittees may develop an effluent matrix-specific ML, where an effluent matrix prevents attainment of the established ML. However, a matrix specific ML shall be based upon proper laboratory method and technique. Matrix-specific MLs must be approved by the Department, and may be developed by the permittee during permit issuance, reissuance, modification, or during compliance schedule.

In either case the measured value should be reported if the analytical result is at or above the ML and "0" reported for values below the ML.

c. For parameters without an EPA established ML, interim ML, or matrix-specific ML, a report of less than the detection limit shall constitute compliance if the detection limit of all analytical methods is higher than the permit limit using the most sensitive EPA approved method. For the purpose of calculating a monthly average, "0" shall be used for values reported less than the detection limit.

The Minimum Level utilized for procedures A and B above shall be reported on the permittee's DMR. When an EPA approved test procedure for analysis of a pollutant does not exist, the Director shall approve the procedure to be used.

3. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

a. The facility name and location, point source number, date, time and exact place of sampling;

b. The name(s) of person(s) who obtained the samples or measurements;

c. The dates and times the analyses were performed;

d. The name(s) of the person(s) who performed the analyses;

e. The analytical techniques or methods used, including source of method and method number; and

f. The results of all required analyses.

4. Records Retention and Production

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by the permit, and records of all data used to complete the above reports or the application for this permit, for a period of at least three years from the date of the sample measurement, report or application. This period may be extended by request of the Director at any time. If litigation or other enforcement action, under the AWPCA and/or the FWPCA, is ongoing which involves any of the above records, the records shall be kept until the litigation is resolved. Upon the written request of the Director or his designee, the permittee shall provide the Director with a copy of any record required to be retained by this paragraph. Copies of these records shall not be submitted unless requested.

All records required to be kept for a period of three years shall be kept at the permitted facility or an alternate location approved by the Department in writing and shall be available for inspection.

5. Monitoring Equipment and Instrumentation

All equipment and instrumentation used to determine compliance with the requirements of this permit shall be installed, maintained, and calibrated in accordance with the manufacturer's instructions or, in the absence of manufacturer's instructions, in accordance with accepted practices. The permittee shall develop and maintain quality assurance procedures to ensure proper operation and maintenance of all equipment and instrumentation. The quality assurance procedures shall include the proper use, maintenance, and installation, when appropriate, of monitoring equipment at the plant site.

C. DISCHARGE REPORTING REQUIREMENTS

1. Reporting of Monitoring Requirements

a. The permittee shall conduct the required monitoring in accordance with the following schedule:

MONITORING REQUIRED MORE FREQUENTLY THAN MONTHLY AND MONTHLY shall be conducted during the first full month following the effective date of coverage under this permit and every month thereafter.

QUARTERLY MONITORING shall be conducted at least once during each calendar quarter. Calendar quarters are the periods of January through March, April through June, July through September, and October through December. The permittee shall conduct the quarterly monitoring during the first complete calendar quarter following the effective date of this permit and is then required to monitor once during each quarter thereafter. Quarterly monitoring may be done anytime during the quarter, unless restricted elsewhere in this permit, but it should be submitted with the last DMR due for the quarter, i.e. (March, June, September and December DMRs).

SEMIANNUAL MONITORING shall be conducted at least once during the period of January through June and at least once during the period of July through December. The permittee shall conduct the semiannual monitoring during the first complete calendar semiannual period following the effective date of this permit and is then required to monitor once during each semiannual period thereafter. Semiannual monitoring may be done anytime during the semiannual period, unless restricted elsewhere in this permit, but it should be submitted with the last DMR due for the month of the semiannual period, i.e. (June and December DMRs).

ANNUAL MONITORING shall be conducted at least once during the period of January through December. The permittee shall conduct the annual monitoring during the first complete calendar annual period following the effective date of this permit and is then required to monitor once during each annual period thereafter. Annual monitoring may be done anytime during the year, unless restricted elsewhere in this permit, but it should be submitted with the December DMR.

b. The permittee shall submit discharge monitoring reports (DMRs) on the forms provided by the Department and in accordance with the following schedule:

REPORTS OF MORE FREQUENTLY THAN MONTHLY AND MONTHLY TESTING shall be submitted on a **quarterly** basis. The first report is due on the **28th** day of **October 2007**. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period.

REPORTS OF QUARTERLY TESTING shall be submitted on a **quarterly** basis. The first report is due on the **28th** day of **October 2007**. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period.

REPORTS OF SEMIANNUAL TESTING shall be submitted on a semiannual basis. The reports are due on the 28th day of JANUARY and the 28th day of JULY. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period.

REPORTS OF ANNUAL TESTING shall be submitted on an annual basis. The first report is due on the 28th day of JANUARY. The reports shall be submitted so that they are received by the Department no later than the 28th day of the month following the reporting period.

c. The DMR must be legible and bear an original signature. Photo and electronic copies of the signature are not acceptable and shall not satisfy the reporting requirements of this permit. If the permittee, using approved analytical methods as specified in Provision I. B. 2. monitors any discharge from a point source for a limited substance identified in Provision I. A. of this permit more frequently than required by this permit, the results of such monitoring shall be included in the calculation and reporting of values on the DMR Form and the increased frequency

shall be indicated on the DMR Form. In the event no discharge from a point source identified in Provision I. A of this permit and described more fully in the permittee's application occurs during a monitoring period, the permittee shall report "No Discharge" for such period on the appropriate DMR Form.

d. All reports and forms required to be submitted by this permit, the AWPCA and the Department's Rules and regulations, shall be signed by a "responsible official" of the permittee as defined in ADEM Administrative Code Rule 335-6-6-.09 or a "duly authorized representative" of such official as defined in ADEM Administrative Code Rule 335-6-6-.09 and shall bear the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

e. The permittee may certify in writing that a discharge will not occur for an extended period of time and after such certification shall not be required to submit monitoring reports. Written notification of a planned resumption of discharge shall be submitted at least 30 days prior to resumption of the discharge. If an unplanned resumption of discharge occurs, written notification shall be submitted within 7 days of the resumption. In any case, all discharges shall comply with all provisions of this permit.

f. All Discharge Monitoring Report forms required to be submitted by this permit, the AWPCA and the Department's Rules, shall be addressed to:

Alabama Department of Environmental Management
Permits and Services Division
Info Sys Branch/EDS
Post Office Box 301463
Montgomery, Alabama 36130-1463

Certified and Registered Mail containing Discharge Monitoring Reports shall be addressed to:

Alabama Department of Environmental Management
Permits and Services Division
Info Sys Branch/EDS
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059

g. All other correspondence and reports required to be submitted by this permit, the AWPCA and the Department's Rules, shall be addressed to:

Alabama Department of Environmental Management
Industrial Section, Water Division
Post Office Box 301463
Montgomery, Alabama 36130-1463

Certified and Registered Mail shall be addressed to:

Alabama Department of Environmental Management
Industrial Section, Water Division
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059

h. If this permit is a reissuance, then the permittee shall continue to submit DMRs in accordance with the requirements of their previous permit until such time as DMRs are due as discussed in Part I.C.1.b. above.

2. Noncompliance Notification

a. 24-Hour Noncompliance Reporting

The permittee shall report to the Director, within 24-hours of becoming aware of any noncompliance which may endanger health or the environment. This shall include but is not limited to the following circumstances:

(1) does not comply with any daily minimum or maximum discharge limitation for an effluent characteristic specified in Provision I. A. of this permit which is denoted by an "(X)",

(2) threatens human health or welfare, fish or aquatic life, or water quality standards,

(3) does not comply with an applicable toxic pollutant effluent standard or prohibition established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a),

(4) contains a quantity of a hazardous substance which has been determined may be harmful to public health or welfare under Section 311(b)(4) of the FWPCA, 33 U.S.C. Section 1321(b)(4),

(5) exceeds any discharge limitation for an effluent characteristic as a result of an unanticipated bypass or upset, and

(6) is an unpermitted direct or indirect discharge of a pollutant to a water of the state (unpermitted discharges properly reported to the Department under any other requirement are not required to be reported under this provision).

The permittee shall orally report the occurrence and circumstances of such discharge to the Director within 24-hours after the permittee becomes aware of the occurrence of such discharge. In addition to the oral report, the permittee shall submit to the Director or Designee a written report as provided in Part I.C.2.c. no later than five (5) days after becoming aware of the occurrence of such discharge.

b. If for any reason, the permittee's discharge does not comply with any limitation of this permit, the permittee shall submit to the Director or Designee a written report as provided in Part I.C.2.c. below, such report shall be submitted with the next Discharge Monitoring Report required to be submitted by Part I.C.1. of this permit after becoming aware of the occurrence of such noncompliance.

c. Any written report required to be submitted to the Director or Designee by Part I.C.2 a. or b. shall be submitted using a copy of the Noncompliance Notification Form provided with this permit and shall include the following information:

(1) A description of the discharge and cause of noncompliance;
(2) The period of noncompliance, including exact dates and times or, if not corrected, the anticipated time the noncompliance is expected to continue; and
(3) A description of the steps taken and/or being taken to reduce or eliminate the noncomplying discharge and to prevent its recurrence.

D. OTHER REPORTING AND NOTIFICATION REQUIREMENTS

1. Anticipated Noncompliance

The permittee shall give the Director written advance notice of any planned changes or other circumstances regarding a facility which may result in noncompliance with permit requirements.

2. Termination of Discharge

The permittee shall notify the Director, in writing, when all discharges from any point source(s) identified in Provision I. A. of this permit have permanently ceased. This notification shall serve as sufficient cause for instituting procedures for modification or termination of the permit.

3. Updating Information

a. The permittee shall inform the Director of any change in the permittee's mailing address or telephone number or in the permittee's designation of a facility contact or office having the authority and responsibility to prevent and abate violations of the AWPCA, the Department's Rules and the terms and conditions of this permit, in writing, no later than ten (10) days after such change. Upon request of the Director or his designee, the permittee shall furnish the Director with an update of any information provided in the permit application.

b. If the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information with a written explanation for the mistake and/or omission.

4. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director or his designee may request to determine whether cause exists for modifying, revoking and re-issuing, suspending, or terminating this permit, in whole or in part, or to determine compliance with this permit.

5. Cooling Water and Boiler Water Additives

a. The permittee shall notify the Director in writing not later than thirty (30) days prior to instituting the use of any biocide corrosion inhibitor or chemical additive in a cooling or boiler system, not identified in the application for this permit, from which discharge is allowed by this permit. Notification is not required for additives that do not contain a heavy metal(s) as an active ingredient and that pass through a wastewater treatment system prior to discharge nor is notification required for additives that should not reasonably be expected to cause the cooling water or boiler water to exhibit toxicity as determined by analysis of manufacturer's data or testing by the permittee. Such notification shall include:

(1) name and general composition of biocide or chemical,
(2) 96-hour median tolerance limit data for organisms representative of the biota of the waterway into which the discharge will ultimately reach,
(3) quantities to be used,
(4) frequencies of use,
(5) proposed discharge concentrations, and
(6) EPA registration number, if applicable.

b. The use of a biocide or additive containing tributyl tin, tributyl tin oxide, zinc, chromium or related compounds in cooling or boiler system(s), from which a discharge regulated by this permit occurs, is prohibited except as exempted below. The use of a biocide or additive containing zinc, chromium or related compounds may be used in special circumstances if (1) the permit contains limits for these substances, or (2) the applicant demonstrates during the application process that the use of zinc, chromium or related compounds as a biocide or additive will not pose a reasonable potential to violate the applicable State water quality standards for these substances. The use of any additive, not identified in this permit or in the application for this permit or not exempted from notification under this permit is prohibited, prior to a determination by the Department that permit modification to control discharge of the additive is not required or prior to issuance of a permit modification controlling discharge of the additive.

6. Permit Issued Based On Estimated Characteristics

a. If this permit was issued based on estimates of the characteristics of a process discharge reported on an EPA NPDES Application Form 2D (EPA Form 3510-2D), the permittee shall complete and submit an EPA NPDES Application Form 2C (EPA Form 3510-2C) no later than two years after the date that discharge begins. Sampling required for completion of the Form 2C shall occur when a discharge(s) from the process(s) causing the new or increased discharge is occurring. If this permit was issued based on estimates concerning the composition of a storm water discharge(s), the permittee shall perform the sampling required by EPA NPDES Application Form 2F (EPA Form 3510-2F) no later than one year after the industrial activity generating the storm water discharge has been fully initiated.

b. This permit shall be reopened if required to address any new information resulting from the completion and submittal of the Form 2C and or 2F.

E. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the discharge limitations specified in Provision I. A. in accordance with the following schedule:

COMPLIANCE SHALL BE ATTAINED ON THE EFFECTIVE DATE OF THIS PERMIT

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

PART II

A. OPERATIONAL AND MANAGEMENT REQUIREMENTS

1. Facilities Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities only when necessary to achieve compliance with the conditions of the permit.

2. Best Management Practices

a. Dilution water shall not be added to achieve compliance with discharge limitations except when the Director or his designee has granted prior written authorization for dilution to meet water quality requirements.

b. The permittee shall prepare, implement, and maintain a Spill Prevention, Control and Countermeasures (SPCC) Plan in accordance with 40 C.F.R. Section 112 if required thereby.

c. The permittee shall prepare, submit for approval and implement a Best Management Practices (BMP) Plan for containment of any or all process liquids or solids, in a manner such that these materials do not present a significant potential for discharge, if so required by the Director or his designee. When submitted and approved, the BMP Plan shall become a part of this permit and all requirements of the BMP Plan shall become requirements of this permit.

3. Spill Prevention, Control, and Management

The permittee shall provide spill prevention, control, and/or management sufficient to prevent any spills of pollutants from entering a water of the state or a publicly or privately owned treatment works. Any containment system used to implement this requirement shall be constructed of materials compatible with the substance(s) contained and which shall prevent the contamination of groundwater and such containment system shall be capable of retaining a volume equal to 110 percent of the capacity of the largest tank for which containment is provided.

B. OTHER RESPONSIBILITIES

1. Duty to Mitigate Adverse Impacts

The permittee shall promptly take all reasonable steps to mitigate and minimize or prevent any adverse impact on human health or the environment resulting from noncompliance with any discharge limitation specified in Provision I. A. of this permit, including such accelerated or additional monitoring of the discharge and/or the receiving waterbody as necessary to determine the nature and impact of the noncomplying discharge.

2. Right of Entry and Inspection

The permittee shall allow the Director, or an authorized representative, upon the presentation of proper credentials and other documents as may be required by law to:

a. enter upon the permittee's premises where a regulated facility or activity or point source is located or conducted, or where records must be kept under the conditions of the permit;

b. have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

c. inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under the permit; and

d. sample or monitor, for the purposes of assuring permit compliance or as otherwise authorized by the AWPCA, any substances or parameters at any location.

C. BYPASS AND UPSET

1. Bypass

a. Any bypass is prohibited except as provided in b. and c. below:

b. A bypass is not prohibited if:

(1) It does not cause any discharge limitation specified in Provision I. A. of this permit to be exceeded;

(2) It enters the same receiving stream as the permitted outfall and;

(3) It is necessary for essential maintenance of a treatment or control facility or system to assure efficient operation of such facility or system.

c. A bypass is not prohibited and need not meet the discharge limitations specified in Provision I. A. of this permit if:

(1) It is unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There are no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime (this condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering

judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance); and

(3) The permittee submits a written request for authorization to bypass to the Director at least ten (10) days prior to the anticipated bypass (if possible), the permittee is granted such authorization, and the permittee complies with any conditions imposed by the Director to minimize any adverse impact on human health or the environment resulting from the bypass.

d. The permittee has the burden of establishing that each of the conditions of Provision II.C.1.b. or c. have been met to qualify for an exception to the general prohibition against bypassing contained in a. and an exemption, where applicable, from the discharge limitations specified in Provision I. A. of this permit.

2. Upset

a. A discharge which results from an upset need not meet the discharge limitations specified in Provision I. A. of this permit if:

(1) No later than 24-hours after becoming aware of the occurrence of the upset, the permittee orally reports the occurrence and circumstances of the upset to the Director or his designee; and

(2) No later than five (5) days after becoming aware of the occurrence of the upset, the permittee furnishes the Director with evidence, including properly signed, contemporaneous operating logs, or other relevant evidence, demonstrating that (i) an upset occurred; (ii) the permittee can identify the specific cause(s) of the upset; (iii) the permittee's facility was being properly operated at the time of the upset; and (iv) the permittee promptly took all reasonable steps to minimize any adverse impact on human health or the environment resulting from the upset.

b. The permittee has the burden of establishing that each of the conditions of Provision II. C.2.a. of this permit have been met to qualify for an exemption from the discharge limitations specified in Provision I.A. of this permit.

D. DUTY TO COMPLY WITH PERMIT, RULES, AND STATUTES

1. Duty to Comply

a. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the AWPCA and the FWPCA and is grounds for enforcement action, for permit termination, revocation and reissuance, suspension, modification; or denial of a permit renewal application.

b. The necessity to halt or reduce production or other activities in order to maintain compliance with the conditions of the permit shall not be a defense for a permittee in an enforcement action.

c. The discharge of a pollutant from a source not specifically identified in the permit application for this permit and not specifically included in the description of an outfall in this permit is not authorized and shall constitute noncompliance with this permit.

d. The permittee shall take all reasonable steps, including cessation of production or other activities, to minimize or prevent any violation of this permit or to minimize or prevent any adverse impact of any permit violation.

e. Nothing in this permit shall be construed to preclude and negate the permittee's responsibility or liability to apply for, obtain, or comply with other ADEM, Federal, State, or Local Government permits, certifications, licenses, or other approvals.

2. Removed Substances

Solids, sludges, filter backwash, or any other pollutant or other waste removed in the course of treatment or control of wastewaters shall be disposed of in a manner that complies with all applicable Department Rules.

3. Loss or Failure of Treatment Facilities

Upon the loss or failure of any treatment facilities, including but not limited to the loss or failure of the primary source of power of the treatment facility, the permittee shall, where necessary to maintain compliance with the discharge limitations specified in Provision I. A. of this permit, or any other terms or conditions of this permit, cease, reduce, or otherwise control production and/or all discharges until treatment is restored. If control of discharge during loss or failure of the primary source of power is to be accomplished by means of alternate power sources, standby generators, or retention of inadequately treated effluent, the permittee must furnish to the Director within six months a certification that such control mechanisms have been installed.

4. Compliance with Statutes and Rules

a. This permit has been issued under ADEM Administrative Code, Chapter 335-6-6. All provisions of this chapter, that are applicable to this permit, are hereby made a part of this permit. A copy of this chapter may be obtained for a small charge from the Office of General Counsel, Alabama Department of Environmental Management, 1400 Coliseum Blvd., Montgomery, AL 36130.

b. This permit does not authorize the noncompliance with or violation of any Laws of the State of Alabama or the United States of America or any regulations or rules implementing such laws. FWPCA, 33 U.S.C. Section 1319, and Code of Alabama 1975, Section 22-22-14.

E. PERMIT TRANSFER, MODIFICATION, SUSPENSION, REVOCATION, AND REISSUANCE

1. Duty to Reapply or Notify of Intent to Cease Discharge

a. If the permittee intends to continue to discharge beyond the expiration date of this permit, the permittee shall file a complete permit application for reissuance of this permit at least 180 days prior to its expiration. If the permittee does not intend to continue discharge beyond the expiration of this permit, the permittee shall submit written notification of this intent which shall be signed by an individual meeting the signatory requirements for a permit application as set forth in ADEM Administrative Code Rule 335-6-6-.09.

b. Failure of the permittee to apply for reissuance at least 180 days prior to permit expiration will void the automatic continuation of the expiring permit provided by ADEM Administrative Code Rule 335-6-6-.06 and should the permit not be reissued for any reason any discharge after expiration of this permit will be an unpermitted discharge.

2. Change in Discharge

a. The permittee shall apply for a permit modification at least 180 days in advance of any facility expansion, production increase, process change, or other action that could result in the discharge of additional pollutants or increase the quantity of a discharged pollutant such that existing permit limitations would be exceeded or that could result in an additional discharge point. This requirement applies to pollutants that are or that are not subject to discharge limitations in this permit. No new or increased discharge may begin until the Director has authorized it by issuance of a permit modification or a reissued permit.

b. The permittee shall notify the Director as soon as it is known or there is reason to believe:

(1) That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following notification levels:

(a) one hundred micrograms per liter;

(b) two hundred micrograms per liter for acrolein and acrylonitrile; five hundred micrograms per liter for 2,4-dinitrophenol and for 2-methyl-4,6-dini-trophenol; and one milligram per liter for antimony;

(c) five times the maximum concentration value reported for that pollutant in the permit application; or

(2) That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following notification levels:

(a) five hundred micrograms per liter;

(b) one milligram per liter for antimony;

(c) ten times the maximum concentration value reported for that pollutant in the permit application.

3. Transfer of Permit

This permit may not be transferred or the name of the permittee changed without notice to the Director and subsequent modification or revocation and reissuance of the permit to identify the new permittee and to incorporate any other changes as may be required under the FWPCA or AWPCA. In the case of a change in name, ownership or control of the permittee's premises only, a request for permit modification in a format acceptable to the Director is required at least 30 days prior to the change. In the case of a change in name, ownership or control of the permittee's premises accompanied by a change or proposed change in effluent characteristics, a complete permit application is required to be submitted to the Director at least 180 days prior

to the change. Whenever the Director is notified of a change in name, ownership or control, he may decide not to modify the existing permit and require the submission of a new permit application.

4. Permit Modification and Revocation

a. This permit may be modified or revoked and reissued, in whole or in part, during its term for cause, including but not limited to, the following:

(1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to revoke and reissue this permit instead of terminating the permit;

(2) If a request to transfer this permit has been received, the Director may decide to revoke and reissue or to modify the permit; or

(3) If modification or revocation and reissuance is requested by the permittee and cause exists, the Director may grant the request.

b. This permit may be modified during its term for cause, including but not limited to, the following:

(1) If cause for termination under Provision II. E. 5. of this permit exists, the Director may choose to modify this permit instead of terminating this permit;

(2) There are material and substantial alterations or additions to the facility or activity generating wastewater which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit;

(3) The Director has received new information that was not available at the time of permit issuance and that would have justified the application of different permit conditions at the time of issuance;

(4) A new or revised requirement(s) of any applicable standard or limitation is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA;

(5) Errors in calculation of discharge limitations or typographical or clerical errors were made;

(6) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, when the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued;

(7) To the extent allowed by ADEM Administrative Code, Rule 335-6-6-.17, permits may be modified to change compliance schedules;

(8) To agree with a granted variance under 301(c), 301(g), 301(h), 301(k), or 316(a) of the FWPCA or for fundamentally different factors;

(9) To incorporate an applicable 307(a) FWPCA toxic effluent standard or prohibition;

(10) When required by the reopener conditions in this permit;

(11) When required under 40 CFR 403.8(e) (compliance schedule for development of pretreatment program);

(12) Upon failure of the state to notify, as required by Section 402(b)(3) of the FWPCA, another state whose waters may be affected by a discharge permitted by this permit;

(13) When required to correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions; or

(14) When requested by the permittee and the Director determines that the modification has cause and will not result in a violation of federal or state law, regulations or rules; or

5. This permit may be terminated during its term for cause, including but not limited to, the following:

a. Violation of any term or condition of this permit;

b The permittee's misrepresentation or failure to disclose fully all relevant facts in the permit application or during the permit issuance process or the permittee's misrepresentation of any relevant facts at any time;

c. Materially false or inaccurate statements or information in the permit application or the permit;

d. A change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge;

e. The permittee's discharge threatens human life or welfare or the maintenance of water quality standards;

f. Permanent closure of the facility generating the wastewater permitted to be discharged by this permit or permanent cessation of wastewater discharge;

g. New or revised requirements of any applicable standard or limitation that is promulgated under Sections 301(b)(2)(C), (D), (E), and (F), and 307(a)(2) of the FWPCA that the Director determines cannot be complied with by the permittee.

h. Any other cause allowed by the ADEM Administrative Code, Chapter 335-6-6.

6. This permit may be suspended during its term for noncompliance until the permittee has taken action(s) necessary to achieve compliance.

7. The filing of a request by the permittee for modification, suspension or revocation of this permit, in whole or in part, does not stay any permit term or condition.

F. COMPLIANCE WITH TOXIC POLLUTANT STANDARD OR PROHIBITION

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the FWPCA, 33 U.S.C. Section 1317(a), for a toxic pollutant discharged by the permittee and such standard or prohibition is more stringent than any discharge limitation on the pollutant specified in Provision I. A. of this permit, or controls a pollutant not limited in Provision I. A. of this permit, this permit shall be modified to conform to the toxic pollutant effluent standard or prohibition and the permittee shall be notified of such modification. If this permit has not been modified to conform to the toxic pollutant effluent standard or prohibition before the effective date of such standard or prohibition, the permittee shall attain compliance with the requirements of the standard or prohibition within the time period required by the standard or prohibition and shall continue to comply with the standard or prohibition until this permit is modified or reissued.

G. DISCHARGE OF WASTEWATER GENERATED BY OTHERS

The discharge of wastewater, generated by any process, facility, or by any other means not under the operational control of the permittee or not identified in the application for this permit or not identified specifically in the description of an outfall in this permit is not authorized by this permit.

PART III

A. CIVIL AND CRIMINAL LIABILITY

1. Tampering

Any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained or performed under the permit shall, upon conviction, be subject to penalties as provided by the AWPCA.

2. False Statements

Any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be subject to penalties as provided by the AWPCA.

3. Permit Enforcement

a. Any NPDES permit issued or reissued by the Department is a permit for the purpose of the AWPCA and the FWPCA and as such any terms, conditions, or limitations of the permit are enforceable under state and federal law.

b. Any person required to have a NPDES permit pursuant to ADEM Administrative Code Chapter 335-6-6 and who discharges pollutants without said permit, who violates the conditions of said permit, who discharges pollutants in a manner not authorized by the permit, or who violates applicable orders of the Department or any applicable rule or standard of the Department, is subject to any one or combination of the following enforcement actions under applicable state statutes.

(1) An administrative order requiring abatement, compliance, mitigation, cessation, clean-up, and/or penalties;

(2) An action for damages;

(3) An action for injunctive relief; or

(4) An action for penalties.

c. If the permittee is not in compliance with the conditions of an expiring or expired permit the Director may choose to do any or all of the following provided the permittee has made a timely and complete application for reissuance of the permit:

(1) initiate enforcement action based upon the permit which has been continued;

(2) issue a notice of intent to deny the permit reissuance. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operating without a permit;

(3) reissue the new permit with appropriate conditions; or

(4) take other actions authorized by these rules and AWPCA.

4. Relief from Liability

Except as provided in Provision II. C. 1. (Bypass) and Provision II. C. 2. (Upset), nothing in this permit shall be construed to relieve the permittee of civil or criminal liability under the AWPCA or FWPCA for noncompliance with any term or condition of this permit.

B. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject under Section 311 of the FWPCA, 33 U.S.C. Section 1321.

C. PROPERTY AND OTHER RIGHTS

This permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to persons or property or invasion of other private rights, trespass, or any infringement of federal, state, or local laws or regulations, nor does it authorize or approve the construction of any physical structures or facilities or the undertaking of any work in any waters of the state or of the United States.

D. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Code of Alabama 1975, Section 22-22-9(c), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department. Effluent data shall not be considered confidential.

E. EXPIRATION OF PERMITS FOR NEW OR INCREASED DISCHARGES

1. If this permit was issued for a new discharger or new source, this permit shall expire eighteen months after the issuance date if construction of the facility has not begun during the eighteen-month period.

2. If this permit was issued or modified to allow the discharge of increased quantities of pollutants to accommodate the modification of an existing facility and if construction of this modification has not begun during the eighteen month period after issuance of this permit or permit modification, this permit shall be modified to reduce the quantities of pollutants allowed to be discharged to those levels that would have been allowed if the modification of the facility had not been planned.

3. Construction has begun when the owner or operator has:

a. begun, or caused to begin as part of a continuous on-site construction program:

(1) any placement, assembly, or installation of facilities or equipment; or

(2) significant site preparation work including clearing, excavation, or removal of existing buildings, structures, or facilities which is necessary for the placement, assembly, or installation of new source facilities or equipment; or

b. entered into a binding contractual obligation for the purpose of placement, assembly, or installation of facilities or equipment which are intended to be used in its operation within a reasonable time. Options to purchase or contracts which can be terminated or modified without substantial loss, and contracts for feasibility, engineering, and design studies do not constitute a contractual obligation under the paragraph. The entering into a lease with the State of Alabama for exploration and production of hydrocarbons shall also be considered beginning construction.

F. COMPLIANCE WITH WATER QUALITY STANDARDS

1. On the basis of the permittee's application, plans, or other available information, the Department has determined that compliance with the terms and conditions of this permit should assure compliance with the applicable water quality standards.

2. Compliance with permit terms and conditions notwithstanding, if the permittee's discharge(s) from point sources identified in Provision I. A. of this permit cause or contribute to a condition in contravention of state water quality standards, the Department may require abatement action to be taken by the permittee in emergency situations or modify the permit pursuant to the Department's Rules, or both.

3. If the Department determines, on the basis of a notice provided pursuant to this permit or any investigation, inspection or sampling, that a modification of this permit is necessary to assure maintenance of water quality standards or compliance with other provisions of the AWPCA or FWPCA, the Department may require such modification and, in cases of emergency, the Director may prohibit the discharge until the permit has been modified.

G. GROUNDWATER

Unless specifically authorized by a permit issued by the Department, the discharge of pollutants to groundwater is prohibited. Should a threat of groundwater contamination occur, the Director may require groundwater monitoring to properly assess the degree of the problem and the Director may require that the permittee undertake measures to abate any such discharge and/or contamination.

H. DEFINITIONS

1. Average monthly discharge limitation - means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

2. Average weekly discharge limitation - means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week (zero discharge days shall not be included in the number of "daily discharges" measured and a less than detectable test result shall be treated as a concentration of zero if the most sensitive EPA approved method was used).

3. Arithmetic Mean – means the summation of the individual values of any set of values divided by the number of individual values.

4. AWPCA - means the Alabama Water Pollution Control Act.

5. BOD – means the five-day measure of the pollutant parameter biochemical oxygen demand.

6. Bypass - means the intentional diversion of waste streams from any portion of a treatment facility.

7. CBOD – means the five-day measure of the pollutant parameter carbonaceous biochemical oxygen demand.

8. Daily discharge - means the discharge of a pollutant measured during any consecutive 24-hour period in accordance with the sample type and analytical methodology specified by the discharge permit.

9. Daily maximum - means the highest value of any individual sample result obtained during a day.

10. Daily minimum - means the lowest value of any individual sample result obtained during a day.

11. Day - means any consecutive 24-hour period.

12. Department - means the Alabama Department of Environmental Management.

13. Director - means the Director of the Department.

14. Discharge - means "[t]he addition, introduction, leaking, spilling or emitting of any sewage, industrial waste, pollutant or other waste into waters of the state". Code of Alabama 1975, Section 22-22-1(b)(9).

15. Discharge Monitoring Report (DMR) - means the form approved by the Director to accomplish reporting requirements of an NPDES permit.

16. DO – means dissolved oxygen.

17. 8HC – means 8-hour composite sample, including any of the following:

    a. The mixing of at least 5 equal volume samples collected at constant time intervals of not more than 2 hours over a period of not less than 8 hours between the hours of 6:00 a.m. and 6:00 p.m. If the sampling period exceeds 8 hours, sampling may be conducted beyond the 6:00 a.m. to 6:00 p.m. period.

    b. A sample continuously collected at a constant rate over period of not less than 8 hours between the hours of 6:00 a.m. and 6:00 p.m. If the sampling period exceeds 8 hours, sampling may be conducted beyond the 6:00 a.m. to 6:00 p.m. period.

18. EPA - means the United States Environmental Protection Agency.

19. FC – means the pollutant parameter fecal coliform.

20. Flow – means the total volume of discharge in a 24-hour period.

21. FWPCA - means the Federal Water Pollution Control Act.

22. Geometric Mean – means the Nth root of the product of the individual values of any set of values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered one (1).

23. Grab Sample – means a single influent or effluent portion which is not a composite sample. The sample(s) shall be collected at the period(s) most representative of the discharge.

24. Indirect Discharger – means a nondomestic discharger who discharges pollutants to a publicly owned treatment works or a privately owned treatment facility operated by another person.

25. Industrial User – means those industries identified in the Standard Industrial Classification manual, Bureau of the Budget 1967, as amended and supplemented, under the category "Division D – Manufacturing" and such other classes of significant waste producers as, by regulation, the Director deems appropriate.

26. MGD – means million gallons per day.

27. Monthly Average – means, other than for fecal coliform bacteria, the arithmetic mean of all the composite or grab samples taken for the daily discharges collected in one month period. The monthly average for fecal coliform bacteria is the geometric mean of daily discharge samples collected in a one month period. The monthly average for flow is the arithmetic mean of all flow measurements taken in a one month period.

28. New Discharger – means a person, owning or operating any building, structure, facility or installation:

    a. from which there is or may be a discharge of pollutants;

    b. that did not commence the discharge of pollutants prior to August 13, 1979, and which is not a new source; and

    c. which has never received a final effective NPDES permit for dischargers at that site.

29. NH3-N – means the pollutant parameter ammonia, measured as nitrogen.

30. Permit application - means forms and additional information that is required by ADEM Administrative Code Rule 335-6-6-.08 and applicable permit fees.

31. Point source - means "any discernible, confined and discrete conveyance, including but not limited to any pipe, channel, ditch, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, . . . from which pollutants are or may be discharged." Section 502(14) of the FWPCA, 33 U.S.C. Section 1362(14).

32. Pollutant - includes for purposes of this permit, but is not limited to, those pollutants specified in Code of Alabama 1975, Section 22-22-1(b)(3) and those effluent characteristics specified in Provision I. A. of this permit.

33. Privately Owned Treatment Works - means any devices or system which is used to treat wastes from any facility whose operator is not the operator of the treatment works, and which is not a "POTW".

34. Publicly Owned Treatment Works – means a wastewater collection and treatment facility owned by the State, municipality, regional entity composed of two or more municipalities, or another entity created by the State or local authority for the purpose of collecting and treating municipal wastewater.

35. Receiving Stream – means the "waters" receiving a "discharge" from a "point source".

36. Severe property damage - means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

37. Significant Source – means a source which discharges 0.025 MGD or more to a POTW or greater than five percent of the treatment work's capacity, or a source which is a primary industry as defined by the U.S. EPA or which discharges a priority or toxic pollutant.

38. TKN – means the pollutant parameter Total Kjeldahl Nitrogen.

39. TON – means the pollutant parameter Total Organic Nitrogen.

40. TRC – means Total Residual Chlorine.

41. TSS – means the pollutant parameter Total Suspended Solids.

42. 24HC – means 24-hour composite sample, including any of the following:

    a. the mixing of at least 12 equal volume samples collected at constant time intervals of not more than 2 hours over a period of 24 hours;

    b. a sample collected over a consecutive 24-hour period using an automatic sampler composite to one sample. As a minimum, samples shall be collected hourly and each shall be no more than one twenty-fourth (1/24) of the total sample volume collected;

    c. a sample collected over a consecutive 24-hour period using an automatic composite sampler composited proportional to flow.

43. Upset - means an exceptional incident in which there is an unintentional and temporary noncompliance with technology-based permit discharge limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

44. Waters - means "[a]ll waters of any river, stream, watercourse, pond, lake, coastal, ground or surface water, wholly or partially within the state, natural or artificial. This does not include waters which are entirely confined and retained completely upon the property of a single individual, partnership or corporation unless such waters are used in interstate commerce." Code of Alabama 1975, Section 22-22-1(b)(2). Waters "include all navigable waters" as defined in Section 502(7) of the FWPCA, 22 U.S.C. Section 1362(7), which are within the State of Alabama.

45. Week - means the period beginning at twelve midnight Saturday and ending at twelve midnight the following Saturday.

46. Weekly (7-day and calendar week) Average – is the arithmetic mean of all samples collected during a consecutive 7-day period or calendar week, whichever is applicable. The calendar week is defined as beginning on Sunday and ending on Saturday. Weekly averages shall be calculated for all calendar weeks with Saturdays in the month. If a calendar week overlaps two months (i.e., the Sunday is in one month and the Saturday in the following month), the weekly average calculated for the calendar week shall be included in the data for the month that contains the Saturday.

I. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

PART IV

A. EFFLUENT TOXICITY LIMITATIONS AND BIOMONITORING REQUIREMENTS FOR CHRONIC TOXICITY

1. The permittee shall perform short-term chronic toxicity tests on the wastewater discharges required to be tested for chronic toxicity by Part I of this permit.

   a. Test Requirements

      (1) The samples shall be diluted using appropriate control water, to the Instream Waste Concentration (IWC) which is 3.6 % effluent. The IWC is the actual concentration of effluent, after mixing, in the receiving stream during a 7-day, 10-year flow period. Should future modeling efforts indicate the IWC should be greater than the value used for this location, then the permit may be re-opened to modify the IWC.

      (2) Any test result that shows a statistically significant reduction in survival, growth or reproduction between the control and the test at the 95% confidence level indicate chronic toxicity and constitute noncompliance with this permit.

   b. General Test Requirements

      (1) A minimum of three (3) 24-hour composite samples shall be obtained for use in the above biomonitoring tests and collected every other day so that the laboratory receives water samples on the first, third and fifth day of the seven-day test period. The holding time for each composite sample shall not exceed 36 hours. The control water shall be a water prepared in the laboratory in accordance with the EPA procedure described in EPA 821-R-02-013 or the most current edition or another control water selected by the permittee and approved by the Department.

      (2) Effluent toxicity tests in which the control survival is less than 80%, *P. promelas* dry weight per surviving control organism is less than 0.25 mg, Ceriodaphnia number of young per surviving control organism is less than 15, Ceriodaphnia reproduction where less than 60% of surviving control females produce three broods or in which the other requirements of the EPA Test Procedure are not met shall be unacceptable and the permittee shall rerun the tests as soon as practical within the monitoring period.

      (3) In the event of an invalid test, upon subsequent completion of a valid test, the results of all tests, valid and invalid, are reported with an explanation of the tests performed and results.

   c. Reporting Requirements

      (1) The permittee shall notify the Department in writing within 48 hours after toxicity has been demonstrated by the scheduled test(s).

      (2) Biomonitoring test results obtained during each monitoring period shall be summarized and reported using the appropriate Discharge Monitoring Report (DMR) form approved by the Department. In accordance with Section 2. of this part, an effluent toxicity report containing the information in Section 2. shall be included with the DMR. Two copies of the test results must be submitted to the Department no later than 28 days after the month in which the tests were performed.

   d. Additional Testing Requirements

      (1) If chronic toxicity is indicated (noncompliance with permit limit), the permittee shall perform two additional valid chronic toxicity tests in accordance with these procedures to determine the extent and duration of the toxic condition. The toxicity tests shall run consecutively beginning on the first calendar week following the date on which the permittee became aware of the permit noncompliance and the results of these tests shall be submitted no later than 28 days following the month in which the tests were performed.

      (2) After evaluation of the results of the follow-up tests, the Department will determine if additional action is appropriate and may require additional testing and/or toxicity reduction measures. The permittee may be required to perform a Toxicity Identification Evaluation (TIE) and/or a Toxicity Reduction Evaluation (TRE). The TIE/TRE shall be performed in accordance with the most recent protocols/guidance outlined by EPA (e.g., EPA/600/2-88/062, EPA/600/R-92/080, EPA/600/R-91-003, EPA/600/R-92/081, EPA/833/B-99/022 and/or EPA/600/6-91/005F,etc.)

e. Test Methods

(1) The tests shall be performed in accordance with the latest edition of the "EPA Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms." The Larval Survival and Growth Test, Methods 1000.0, shall be used for the fathead minnow (*Pimephales promelas*) test and the Survival and Reproduction Test, Method 1002.0, shall be used for the cladoceran (*Ceriodaphnia dubia*) test.

2. Effluent Toxidity Testing Reports

The following information shall be submitted with each discharge monitoring report unless otherwise directed by the Department. The Department may at any times suspend or reinstate this requirement or may decrease or increase the frequency of submittals.

a. Introduction

(1) Facility name, location and county
(2) Permit number
(3) Toxicity testing requirements of permit
(4) Name of receiving water body
(5) Contract laboratory information (if tests are performed under contract)

(a) Name of firm
(b) Telephone number
(c) Address

(6) Objective of test

b. Plant Operations

(1) Discharge Operating schedule (if other than continuous)
(2) Volume of discharge during sample collection to include Mean daily discharge on sample collection dates (MGD, CFS, GPM)
(3) Design flow of treatment facility at time of sampling

c. Source of Effluent and Dilution Water

(1) Effluent samples

(a) Sampling point
(b) Sample collection dates and times (to include composite sample start and finish times)
(c) Sample collection method
(d) Physical and chemical data of undiluted effluent samples (water temperature, pH, alkalinity, hardness, specific conductance, total residual chlorine (if applicable), etc.)
(e) Lapsed time from sample collection to delivery
(f) Lapsed time from sample collection to test initiation
(g) Sample temperature when received at the laboratory

(2) Dilution Water

(a) Source
(b) Collection/preparation date(s) and time(s)
(c) Pretreatment (if applicable)
(d) Physical and chemical characteristics (water temperature, pH, alkalinity, hardness, specific conductance, etc.)

d. Test Conditions

(1) Toxicity test method utilized
(2) End point(s) of test
(3) Deviations from referenced method, if any, and reason(s)
(4) Date and time test started
(5) Date and time test terminated
(6) Type and volume of test chambers

(7) Volume of solution per chamber
(8) Number of organisms per test chamber
(9) Number of replicate test chambers per treatment
(10) Test temperature, pH and dissolved oxygen as recommended by the method (to include ranges)
(11) Specify if aeration was needed
(12) Feeding frequency, amount and type of food
(13) Specify if (and how) pH control measures were implemented
(14) Light intensity (mean)

e. Test Organisms

(1) Scientific name
(2) Life stage and age
(3) Source
(4) Disease(s) treatment (if applicable)

f. Quality Assurance

(1) Reference toxicant utilized and source
(2) Date and time of most recent chronic reference toxicant test(s), raw data and current control chart(s). The most recent chronic reference toxicant test shall be conducted within 30 days of the routine.
(3) Dilution water utilized in reference toxicant test
(4) Results of reference toxicant test(s) (NOEC, IC25, PASS/FAIL, etc.), report concentration-response relationship and evaluate test sensitivity
(5) Physical and chemical methods utilized

g. Results

(1) Provide raw toxicity data in tabular form, including daily records of affected organisms in each concentration (including controls) and replicate
(2) Provide table of endpoints: NOECs, IC25s, PASS/FAIL, etc. (as required in the applicable NPDES permit)
(3) Indicate statistical methods used to calculate endpoints
(4) Provide all physical and chemical data required by method
(5) Results of test(s) (NOEC, IC25, PASS/FAIL, etc.), report concentration-response relationship (definitive test only), report percent minimum significant difference (PMSD) calculated for sublethal endpoints determined by hypothesis testing.

h. Conclusions and Recommendations

(1) Relationship between test endpoints and permit limits
(2) Actions to be taken

1/ Adapted from "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms", Fourth Edition, October 2002 (EPA 821-R-02-013), Section 10, Report Preparation

B. BEST MANAGEMENT PRACTICES (BMP) PLAN REQUIREMENTS

1. BMP Plan

The permittee shall develop and implement a Best Management Practices (BMP) Plan which prevents, or minimizes the potential for, the release of pollutants from ancillary activities, including material storage areas; plant site runoff; in-plant transfer, process and material handling areas; loading and unloading operations, and sludge and waste disposal areas, to the waters of the State through plant site runoff; spillage or leaks; sludge or waste disposal; or drainage from raw material storage.

2. Plan Content

The permittee shall prepare and implement a best management practices (BMP) plan, which shall:

a. Establish specific objectives for the control of pollutants:

(1) Each facility component or system shall be examined for its potential for causing a release of significant amounts of pollutants to waters of the State due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc.
(2) Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g. precipitation), or circumstances to result in significant amounts of pollutants reaching surface waters, the plan should include a prediction of the direction, rate of flow, and total quantity of pollutants which could be discharged from the facility as a result of each condition or circumstance.

b. Establish specific best management practices to meet the objectives identified under paragraph a. of this section, addressing each component or system capable of causing a release of significant amounts of pollutants to the waters of the State, and identifying specific preventative or remedial measures to be implemented;

c. Establish a program to identify and repair leaking equipment items and damaged containment structures, which may contribute to contaminated storm water runoff. This program must include regular visual inspections of equipment, containment structures and of the facility in general to ensure that the BMP is continually implemented and effective.

d. Prevent the spillage or loss of fluids, oil, grease, gasoline, etc. from vehicle and equipment maintenance activities and thereby prevent the contamination of storm water from these substances;

e. Prevent or minimize storm water contact with material stored on site, where practicable;

f. Designate by position or name the person or persons responsible for the day to day implementation of the BMP;

g. Provide for routine inspections, on days during which the facility is manned, of any structures that function to prevent storm water pollution or to remove pollutants from storm water and of the facility in general to ensure that the BMP is continually implemented and effective;

h. Provide for the use and disposal of any material used to absorb spilled fluids that could contaminate storm water;

i. Develop a solvent management plan, if solvents are used on site. The solvent management plan shall include as a minimum lists of the total organic compounds on site; the method of disposal used instead of dumping, such as reclamation, contract hauling; and the procedures for assuring that toxic organics do not routinely spill or leak into the storm water;

j. Provide for the disposal of all used oils, hydraulic fluids, solvent degreasing material, etc. in accordance with good management practices and any applicable state or federal regulations;

k. Include a diagram of the facility showing the locations where storm water exits the facility, the locations of any structures or other mechanisms intended to prevent pollution of storm water or to remove pollutants from storm water, the locations of any collection and handling systems;

l. Provide control sufficient to prevent or control pollution of storm water by soil particles to the degree required to maintain compliance with the water quality standard for turbidity applicable to the waterbody(s) receiving discharge(s) under this permit;

m. Provide spill prevention, control, and/or management sufficient to prevent or minimize contaminated storm water runoff. Any containment system used to implement this requirement shall be constructed of materials compatible with the substance(s) contained and shall prevent the contamination of groundwater. The containment system shall also be capable of retaining a volume equal to 110 percent of the capacity of the largest tank for which containment is provided;

n. Provide and maintain curbing, diking or other means of isolating process areas to the extent necessary to allow segregation and collection for treatment of contaminated storm water from process areas;

o. Be reviewed by plant engineering staff and the plant manager; and

p. Bear the signature of the plant manager.

3. Compliance Schedule

The permittee shall have reviewed (and revised if necessary) and fully implemented the BMP plan as soon as practicable but no later than six months after the effective date of this permit.

4. Department Review

a. When requested by the Director or his designee, the permittee shall make the BMP available for Department review.

b. The Director or his designee may notify the permittee at any time that the BMP is deficient and require correction of the deficiency.

c. The permittee shall correct any BMP deficiency identified by the Director or his designee within 30 days of receipt of notification and shall certify to the Department that the correction has been made and implemented.

5. Administrative Procedures

a. A copy of the BMP shall be maintained at the facility and shall be available for inspection by representatives of the Department.

b. A log of the routine inspection required above shall be maintained at the facility and shall be available for inspection by representatives of the Department. The log shall contain records of all inspections performed for the last three years and each entry shall be signed by the person performing the inspection.

c. The permittee shall provide training for any personnel required to implement the BMP and shall retain documentation of such training at the facility. This documentation shall be available for inspection by representatives of the Department. Training shall be performed prior to the date that implementation of the BMP is required.

d. BMP Plan Modification. The permittee shall amend the BMP plan whenever there is a change in the facility or change in operation of the facility which materially increases the potential for the ancillary activities to result in a discharge of significant amounts of pollutants.

e. BMP Plan Review. The permittee shall complete a review and evaluation of the BMP plan at least once every three years from the date of preparation of the BMP plan. Documentation of the BMP Plan review and evaluation shall be signed and dated by the Plant Manager.

C. REQUIREMENTS APPLICABLE TO COOLING WATER INTAKE STRUCTURES

Not later than January 7, 2008, the Permittee shall submit to the Department, at a minimum, biological monitoring data collected in accordance with the Permittee's Proposal for Information Collection (PIC) plan as developed under the 316(b) requirements prior to their suspension by EPA.

This permit may be reopened to address compliance with 316(b) requirements upon issuance of a new rule or final guidance by EPA.

D. 316(a) DEMONSTRATION REQUIREMENTS

A variance request under CWA Section 316(a) for the thermal component of the discharge must be filed with the application for permit renewal in accordance with 40 CFR Part 125.70 Subpart H – Criteria for Determining Alternative Effluent Limitations Under Section 316(a) of the Act and 40 CFR 122.21(m)(6) Subpart B – Permit Application and Special NPDES Program Requirements, Variance Requests by Non-POTWs. The application must be received 180 days prior to permit expiration. The application shall include necessary technical data and relevant information to include data collected within the life of the permit to support the request for a variance.

E. ASH POND FREE BOARD REQUIREMENTS

There shall be no discharge of plant wastes to the ash pond unless the permittee provides and maintains at all times a minimum free water volume (between the top of the sediment level and the minimum discharge elevation) equivalent to the sum of the maximum 24-hour plant discharges plus all direct runoff and all runoff flows to the pond resulting from a 10-year, 24-hour rainfall event, when using a runoff coefficient of 1.0. The permittee shall remove settled material from the pond or otherwise enlarge the available storage capacity in order to maintain the required minimum volumes at all times. Not later than 180 days after the effective date of the permit, the permittee shall determine and report to the Department:

A certification that the required volume is available with adequate safety factor to include all solids expected to be deposited in the ponds for the life of the permit. Any changes to plant operations affecting such certification shall be reported to the Director within 5 days.

F. STORM WATER FLOW MEASUREMENT AND SAMPLING REQUIREMENTS

1. Storm Water Flow Measurement

   a. All storm water samples shall be collected from the discharge resulting from a storm event that is greater than 0.1 inches.

   b. The total volume of storm water discharged for the event must be monitored, including the date and duration (in hours) and rainfall (in inches) for storm event(s) sampled. The duration between the storm event sampled and the end of the previous measurable (greater than 0.1 inch rainfall) storm event must be a minimum of 72 hours. This information must be recorded as part of the sampling procedure and records retained according to Part I.B. of this permit.

   c. The volume may be measured using flow measuring devices, or estimated based on a modification of the Rational Method using total depth of rainfall, the size of the drainage area serving a storm water outfall, and an estimate of the runoff coefficient of the drainage area. This information must be recorded as part of the sampling procedure and records retained according to Part I.B of this permit.

2. Storm Water Sampling

   a. A grab sample, if required by this permit, shall be taken during the first thirty minutes of the discharge (or as soon thereafter as practicable); and a flow-weighted composite sample, if required by this permit, shall be taken for the entire event or for the first three hours of the event.

   b. All test procedures will be in accordance with part I.B. of this permit.

ATTACHMENT 1 - PRIORITY POLLUTANTS

4-bromophenyl phenyl ether
Bis(2-chlorocthoxy) methane
Methyl chloride (dichloromethane)
Bromoform (tribromomethane)
Chlorodibromomethane
Hexachloromyclopentadiene
Naphthalene
2-nitrophenol
2,4-dinitrophenol
N-nitrosodimethylamine
N-nitrosodi-n-propylamin
Phenol
Butyl benzyl phthalate
Di-n-octyl phthalate
Dimethyl phthalate
Benzo(a)pyrene (3,4-benzo-pyrene)
11,12-benzofluoranthene (benzo(b) fluoranthene)
Acenaphthylene
1,12-benzoperylene (benzo(ghi) perylene)
Phenanthrene
Indeno (,1,2,3-cd) pyrene (2,3-o-pheynylene pyrene)
Tetrachloroethylene
Trichloroethylene

Bis(2-chloroisopropyl) ether
Methylene chloride (dichloromethane)
Methyl bromide (bromomethane)
Dichlorobromomethane
Hexachlorobutadiene
Isophorone
Nitrobenzene
4-nitrophenol
4,6-dinitro-o-cresol
N-nitrosodiphenylamine
Pentachlorophenol
Bis(2-ethylhexyl) phthalate
Di-N-Butyl Phthalate
Diethyl Phthalate
1,2-benzanthracene (benzo(a) anthracene
3,4-Benzofluoranthene (benzo(b) fluoranthene)
Chrysene
Anthracene
Fluorene
1,2,5,6-dibenzanthracene (dibenzo(,h) anthracene)
Pyrene
Toluene
Vinyl chloride (chloroethylene)

Aldrin
Chlordane (technical mixture and metabolites)
4,4-DDE (p,p-DDX)
Alpha-endosulfan
Endosulfan sulfate
Endrin aldehyde
Heptachlor epoxide (BHC-hexachlorocyclohexane)
Beta-BHC
Delta-BHC (PCB-polychlorinated biphenyls)
PCB-1254 (Arochlor 1254)
PCB-1232 (Arochlor 1232)
PCB-1260 (Arochlor 1260)
Toxaphene
Arsenic
Beryllium
Chromium
Cyanide, Total
Mercury
Selenium
Thallium
2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCD)

Dieldrin
4,4-DDT
4,4-DDD (p,p-TDE)
Beta-endosulfan
Endrin
Heptachlor
Alpha-BHC
Gamma-BHC (lindane)
PCB-1242 (Arochlor 1242)
PCB-1221 (Arochlor 1221)
PCB-1248 (Arochlor 1248)
PCB-1016 (Arochlor 1016)
Antimony
Asbestos
Cadmium
Copper
Lead
Nickel
Silver
Zinc

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION – INDUSTRIAL AND MUNICIPAL SECTIONS
NONCOMPLIANCE NOTIFICATION FORM

PERMITTEE NAME: _____ PERMIT NO: _____

FACILITY LOCATION: _____

DMR REPORTING PERIOD: _____

1. DESCRIPTION OF DISCHARGE: (Include outfall number (s))

2. DESCRIPTION OF NON-COMPLIANCE: (Attach additional pages if necessary):

LIST EFFLUENT VIOLATIONS (If applicable)			
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Result Reported (Include units)	Permit Limit (Include units)

LIST MONITORING / REPORTING VIOLATIONS (If applicable)		
Outfall Number (s)	NONCOMPLIANCE PARAMETER(S)	Monitoring / Reporting Violation (Provide description)

3. CAUSE OF NON-COMPLIANCE (Attach additional pages if necessary):

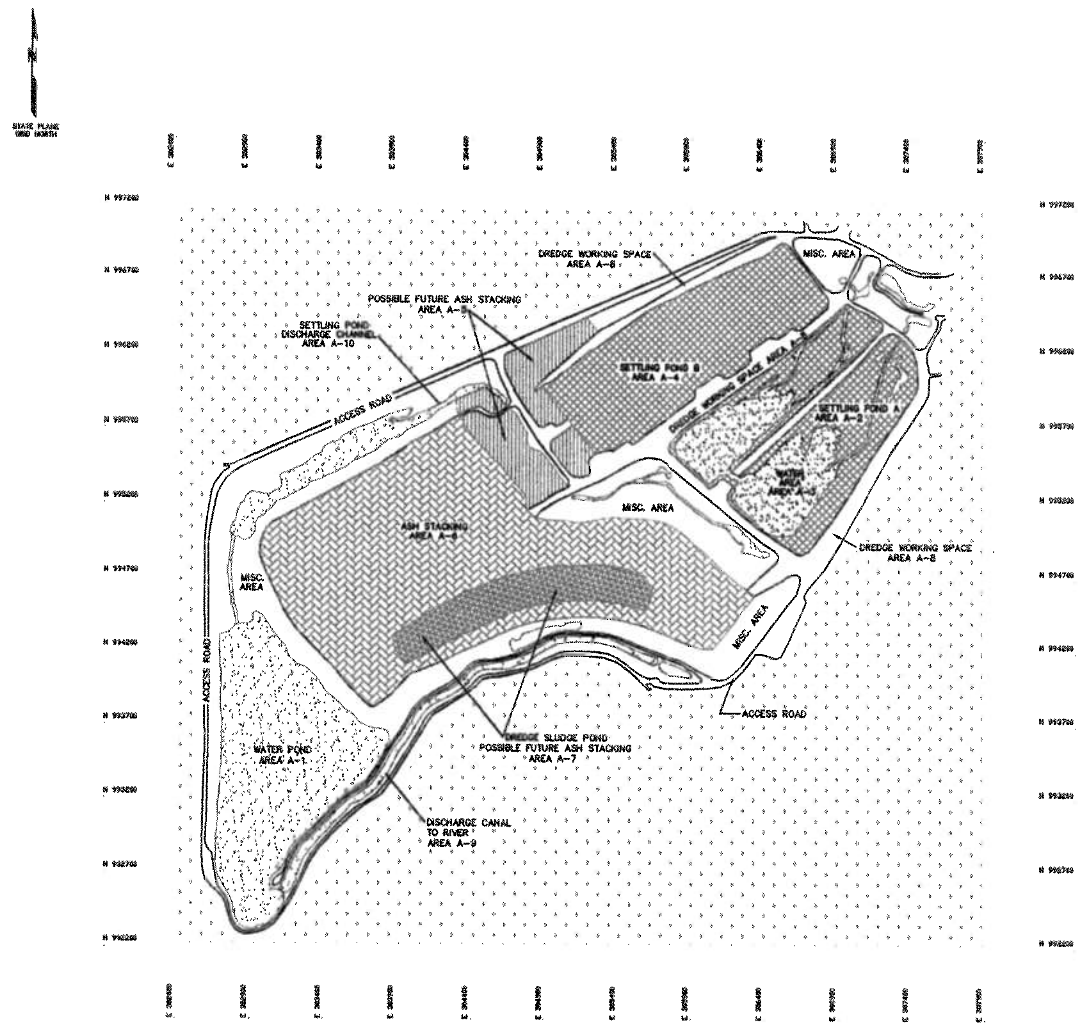
4. PERIOD OF NONCOMPLIANCE: (Include exact date(s) and time(s) or, if not corrected, the anticipated time the noncompliance is expected to continue):

5. DESCRIPTION OF STEPS TAKEN AND/OR BEING TAKEN TO REDUCE OR ELIMINATE THE NONCOMPLYING DISCHARGE AND TO PREVENT ITS RECURRENCE (attach additional pages if necessary):

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

_____
NAME AND TITLE OF RESPONSIBLE OFFICIAL (type or print)

_____ / _____
SIGNATURE OF RESPONSIBLE OFFICIAL / DATE SIGNED



AREA NAME	SURFACE AREA SQUARE FEET	APPROX. ACRES
A-1 (SEE NOTE 1)	1,441,836	33.1
A-2	1,502,620	34.5
A-3	(SEE NOTE 2)	(SEE NOTE 2)
A-4	1,245,816	28.6
A-5	583,704	13.4
A-6	2,940,300	67.5
A-7	522,720	12.0
A-8	1,084,644	24.9
A-9	149,031	3.4
A-10	260,223	6.0
ACCESS ROADS & MISC. AREAS	1,724,987	39.6

TOTAL APPROX. ACRES: 263

NOTES:

1) SURFACE AREA FOR A-1 DOES NOT INCLUDE OVERFLOW DITCH OR DISCHARGE CANAL TO RIVER.

2) SURFACE QUANTITIES AND RESULTING ACREAGE ARE INCLUDED IN A-2 QUANTITIES

CAD D-GS-SK1.DWG
ACAD | CMF-R14

Southern Company Services, Inc.

ALABAMA POWER COMPANY
E. C. GASTON STEAM PLANT
ASH STORAGE POND STUDY – 1999

REV A | DATE: 11/18/99

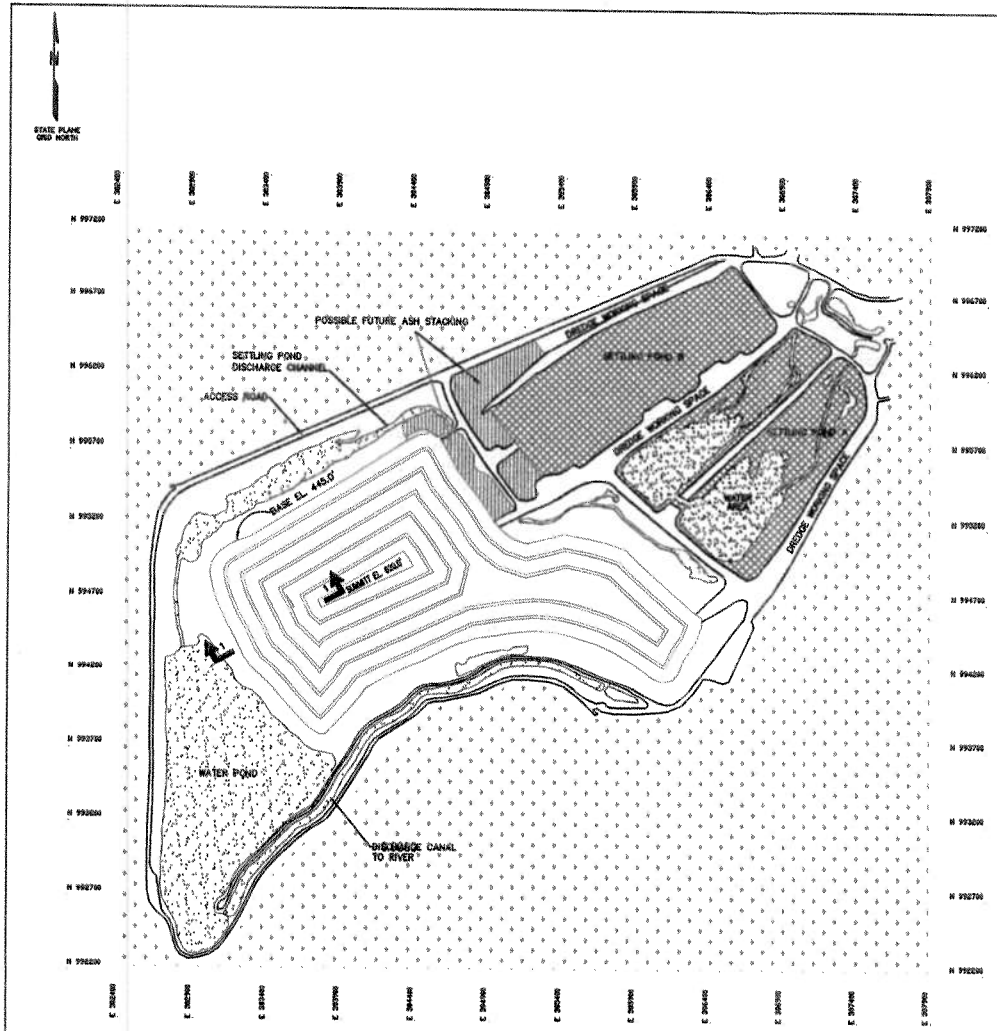
CMF | FDB

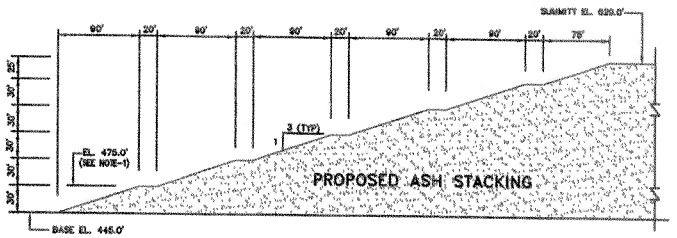
1=300

1 of 1

D-GS-SK1 | REV A

GAS-API-0018





PROPOSED ASH STACKING
SECTION 1 – 1

STACKING PROGRESSION ELEVATION	SURFACE AREA SQUARE FEET
475	2,523,356 END 2,370,391 BEG
505	1,683,135 END 1,546,324 BEG
535	906,980 END 835,633 BEG
565	526,808 END 469,720 BEG
595	236,512 END 195,068 BEG
620	59,099 END

NOTE:
1) VOLUME ESTIMATES PERFORMED USING TOPO MAPS FOR NOV, 1998 , USE AVERAGE BASE ELEVATION OF 475 MSL

CAD D-GS-SK2.DVG
ACAD CHT-814

Southern Company Services, Inc.

ALABAMA POWER COMPANY
E. C. GASTON STEAM PLANT
ASH STORAGE POND STUDIES - 1999
ASH STACKING PLAN-CONCEPT FOR STACKING LEVELS
SCALE 1=300' SIZE
DRAWN CMF CHKD FDR
APPROVED
DATE
SHEET 1 OF 1
D-GS-SK2 REV A

REV	DATE
A	12/4/98

CONFIDENTIAL

GEN-10003, Rev. 0
APPROVAL:

TITLE,
Southern Company
Generation

SIGNATURE 6-29-09

Safety Procedure for Dams and Dikes

ATTORNEY CLIENT PRIVILEGE

This correspondence/communication was prepared at the direction of legal counsel, and is privileged, protected and confidential under attorney work product doctrine.

CONFIDENTIAL

Table of Contents

10003.000 Purpose

Safe operation of water retaining structures is required to ensure public safety, environmental safety and to protect Company assets. A comprehensive dam safety program sets forth guidelines for the safe operation of water retaining structures.

A coordinated, pre-planned, effective emergency response is crucial to lessen the danger to public and environmental safety and to minimize the risk to Company assets.

This procedure documents responsibility for dam safety actions including inspection, reporting, analysis, regulatory compliance, and emergency response.

This procedure also documents vegetation control standards for dams and dikes.

10003.100 General Information

10003.110 Definitions

Toe – the junction of the downstream slope or surface with the original ground surface

Water retaining structure – an artificial barrier that has the ability to impound water, wastewater, or any liquid-borne material for the purpose of storage: dam, dike

Water control structure – structure appurtenant to a water retaining structure that allows conveyance of water, controls the direction or rate of discharge or maintains a prescribed water elevation, such as a spillway gate or discharge structure

Crest – top of the dam

Dam Safety Engineer – Individual determined by the Hydro Services Principal Engineer responsible for condition assessment of dams and the General Manager - Hydro to be qualified to conduct dam safety inspections and evaluations based on education, experience or other qualifications.

10003.120 Dam Safety Criteria

10003.120.1 FERC-Licensed Structures

FERC-licensed structures shall be governed by the FERC criteria as set forth in the FERC Engineering Guidelines or as approved by FERC on a case-by-case basis.

10003.120.2 Other Structures

Where structures are under the jurisdiction of a state dam safety program, the criteria set forth in that program shall apply. Where structures are not governed by a state dam safety program, generally accepted engineering criteria for slope stability, structural stability, and hydraulic adequacy shall apply.

10003.130 Regulatory Interface

The environmental organizations of the individual operating companies will be responsible for the interface with State and Federal environmental regulatory agencies. In practice, SCG Hydro Services may provide technical interface with State and Federal regulatory agencies regarding dam safety.

10003.140 Compliance

SCG dams and dikes will meet applicable dam safety requirements or have a plan for investigation and remediation to meet these requirements.

The plant manager will be responsible for ensuring on-site compliance with dam safety requirements. Appropriate reference to and/or provisions of this procedure should be included in the plant's general emergency plan documents.

10003.200 Inspections

10003.210 Inspection Applicability

This procedure is applicable to the following water retaining structures:

- hydroelectric project dams
- ash pond dams and dikes (active or water retaining)
- cooling water and make-up water pond dams and dikes
- gypsum pond dikes
- other similar structures as requested by generating plants

10003.220 Inspection Scheduling

10003.220.1 Inspections by Plant Personnel

Plant personnel will inspect the water retaining structures weekly at a minimum, unless more frequent inspection is warranted by previous maintenance history or by site specific conditions.

10003.220.2 Inspections by Dam Safety Engineers

Structures will be inspected by SCG Hydro Services dam safety engineers annually at a minimum, unless more frequent inspection is warranted by previous maintenance history or by unusual events. If deemed necessary, Hydro Services may obtain assistance in the inspections from qualified personnel working in other SCG engineering departments or the operating companies.

Plant management will be contacted (ideally 30 days or more prior to the inspection date) by SCG Hydro Services to schedule a mutually acceptable date. The following items shall be discussed at this time:

a) Status of previous inspection recommendations
b) Proper vegetation control to ensure the Dam Safety Engineer has adequate visibility to perform a comprehensive inspection.
c) Identify plant personnel to take part in the inspection (should include personnel who conduct weekly plant inspections to the extent possible).
d) Any necessary arrangements such as safety equipment or transportation needed to conduct the inspection.

10003.220.3 Unusual Circumstances

The water retaining and control structures should be inspected by either plant personnel and/or a Dam Safety Engineer any time one of the following unusual circumstances occurs:

a) Severe rain event
b) Post storm (hurricane, tornado, etc.)
c) High river or stream flow (if adjacent to a river or stream)
d) Unusually high tide (if adjacent to a tidal area)
e) Earthquake

Plant personnel will notify SCG Hydro Services if any of these events occurs at their site. SCG Hydro Services will notify plant management in the event of an earthquake.

This inspection will be conducted as soon as safety allows and/or there is sufficient visibility. SCG Hydro Services may request plant personnel to perform these inspections. Results of such inspections shall be reported to SCG Hydro Services immediately upon completion. Depending on the findings of the inspection by plant personnel, a follow-up inspection may be conducted by SCG Hydro Services.

10003.230 Inspection Methodology

Inspections should be conducted using a checklist that is specific to the water retaining structure and/or water control structure being inspected.

10003.230.1 Checklist for Inspection by Plant Personnel

The inspection checklist should be developed cooperatively by SCG Hydro Services dam safety engineers and plant personnel and may include some or all of the following items:

a) Inspector(s)
b) Date / time
c) Checklist revision number
d) Pond level
e) Weather conditions
f) Rainfall since last inspection
g) Instrumentation readings (if applicable)
h) Condition of slopes, crest, and toe (i.e. evidence of seepage, wet/saturated ground surface, water-boils etc)
i) Drains – drainage ditches / weir flows
j) Vegetation
k) Erosion
l) Animal damage
m) Anthills
n) Depressions
o) Misalignment of retaining structures
p) Condition of outlet structures (i.e. emergency spillway, gates)

10003.230.2 Checklist for Inspection by Dam Safety Engineers

The Dam Safety Engineer Inspection Checklist should contain the same information as the Plant Personnel Inspection Checklist, with the addition of the following information at minimum:

a) Instrumentation readings review
b) Instrumentation reading spot check
c) Condition of instrumentation
d) Maintenance / remediation performed since last inspection
e) Status of prior inspection recommendations
f) Check for posting of current emergency notification information

10003.240 Inspection Documentation

10003.240.1 Documentation of Inspections by Plant Personnel

Inspections performed by plant personnel shall be documented on the checklist described in section 10003.230.1.

Any areas of concern identified during the inspection should be brought to the attention of the assigned SCG Hydro Services Dam Safety Engineer immediately by phone. If unable to contact the assigned Dam Safety Engineer, call the Dam Safety Referral Line number noted on the checklist for the Engineer on duty. Fax or email a copy of the checklist noting the unusual condition or concern to SCG Hydro Services.

Inspection reports with no areas of concern identified shall be retained for the current year plus one year. Inspection reports with areas of concern identified shall be retained for the life of the plant plus ten years.

10003.240.2 Documentation of Inspections by Dam Safety Engineers

Inspections performed by the Dam Safety Engineer shall be documented on the checklist described in section 10003.230.2. Once the inspection is concluded, the Dam Safety Engineer will conduct an exit meeting with the plant personnel to discuss the observations made during the inspection and to point out any items that need immediate attention. The Dam Safety Engineer will prepare a standardized report for distribution in a timely manner that provides more detailed information regarding inspection observations.

This report shall contain (at a minimum):

a) Instrumentation review (if applicable)
b) Findings
c) Recommendation items requiring immediate attention for the safety of the structure (if any are identified)
d) Items requiring attention to assure the long-term safety of the structure (if any are identified).

These reports shall be retained by SCG Hydro Services for the life of the corporation.

10003.240.2.1 Dam Safety Engineer Inspection Recommendation Tracking

Inspection reports will include the outstanding recommendations from previous inspections and the status of the recommendations. SCG Hydro Services will track the recommendations to completion.

10003.240.2.2 Dam Safety Engineer Inspection Report Distribution

Inspection reports will be distributed to the following:

1. SPO
2. Plant Manager or Superintendent (as addressee)
3. OPCO Environmental Manager
4. Hydro General Manager
5. Plant Compliance Manager (if applicable)

6. Any other personnel designated by the Plant Manager

10003.300 Instrumentation

If dam safety instrumentation is installed at the site, instrument readings are to be reported to SCG Hydro Services as soon as possible, but within a maximum of five working days of being taken. Instrument readings will be reviewed by SCG Hydro Services as soon as possible, but within a maximum of five working days of receipt. (These maximums may be reduced as necessary if site specific conditions at a particular location dictate that a shorter review time is appropriate.) The schedule for instruments read by the plant shall be entered into the Plant's work order management system for compliance tracking.

Data from installed instrumentation can provide early warning for potential problems and is important to the success of the Dam Safety Program. Readings from installed instruments should be made on schedule and should be taken by a qualified individual who has undergone applicable training.

Abnormal instrument readings should be brought to the attention of SCG Hydro Services immediately by phone. If necessary, call the Dam Safety Referral Line for the contact information of the Engineer on Duty.

Dam movement surveys require a significant amount of post-processing and therefore cannot be accommodated in the five working day window cited above. These results should be forwarded to SCG Hydro Services as soon as possible. The movement survey results will be reviewed by SCG Hydro Services as soon as possible after receipt.

10003.400 Emergency Response

10003.410 Emergency Notification

SCG Hydro Services maintains two dam safety referral phone numbers, one each for the Atlanta and Birmingham offices. Each office will maintain an on-call roster so that an engineer is available for response at all times. The referral phone number will connect with a recorded message that provides the caller with the name and contact information for the Engineer on Duty at the time. The referral phone number and the contact information for the individual Dam Safety Engineers will be included on cards distributed to the SCG plants. These cards shall be posted in the Control Room and other conspicuous locations as designated by the plant manager.

10003.420 Dam Safety Problem Reporting

Suspected dam safety problems should be brought to the attention of the assigned SCG Hydro Services Dam Safety Engineer immediately by phone. If unable to contact the

assigned Dam Safety Engineer, call the Dam Safety Referral Line number for contact information for the Engineer on duty.

FERC requires that any condition affecting the safety of a FERC-licensed hydro project be reported to them immediately. FERC describes a condition affecting safety by saying: "Such conditions may include, but are not limited to, gate operation failure, piping, seepage, slides, unusual instrumentation readings, sinkholes, sabotage, natural disasters (floods, earthquakes) and other signs of instability of any project works. Additional conditions, include, but are not limited to, reservoir monitoring instrumentation and communication systems malfunction or failure, and remote control systems malfunction or failure."

For problems occurring at hydro plants, SCG Hydro Services will be responsible for notification of FERC and, if applicable, state dam safety agencies.

10003.430 Emergency Equipment

In conjunction with the designated plant management team, equipment present at the plant location for loading or moving material (or other uses) may be utilized, as necessary, to respond to emergency conditions at the dams.

10003.440 Emergency Supplies

In order to be able to deal with boils or large seeps in a timely manner, granular materials for constructing filters should be stockpiled at earth embankments. These stockpiles should be located as near to the toe of the embankment as practical so that the material can readily be moved to any location along the toe of the dam. The amounts and specifications for material to be stockpiled at each location will be determined by SCG Hydro Services. These stockpiles should be protected with a silt fence or safety fence enclosure and should be labeled "Emergency Filter Stockpile, Emergency Use Only".

10003.500 Training

SCG Hydro Services will be responsible for development and maintenance of a training program for plant personnel who conduct safety inspections of water retaining structures. The training may include instructor-led classroom training and on-the-job-training with Dam Safety Engineers and shall be required on an annual basis. Video-based training may be used as appropriate for refresher training or for new or temporary employees.

The classroom training may consist of technical presentations using training materials such as FEMA publications and Association of State Dam Safety Officials or United States Society on Dams training programs as well as materials developed by SCG Hydro Services.

Dam Safety Engineers will provide on-the-job-training on the actual retaining structures and demonstrate appropriate inspection procedures and techniques. The Dam Safety Engineer will also conduct training on proper instrument reading procedures and data recording for the sites with installed instrumentation that is read by plant personnel.

10003.600 Vegetation Control

A uniform cover of a suitable species of grass shall be maintained on all earth dams or dikes. The grass should be mowed at least twice a year at a reasonable height to facilitate adequate inspection, unless drought or other circumstances make mowing unnecessary. Mowing should be done with appropriate equipment in such a way as to minimize damage to the dam or grass cover from mower tires or blades.

Dam crests should be protected by a suitable granular surface material if traffic prevents establishment of a good grass cover. The use of bottom ash or similar CCB materials for this purpose should be limited to material that is free of pyrites or other components that would be harmful to grass.

Generally, trees and woody brush should not be allowed on the slopes, crest or along the water line of any dam or dike. Exceptions to this provision (in the case of beneficial vegetation or other situations) may be made as deemed appropriate by SCG Hydro Services dam safety engineers. The areas adjacent to the toe of the dam and the contact of the dam and the abutment should also be clear of trees and woody brush to distances deemed appropriate by SCG Hydro Services dam safety engineers (ideally a minimum of 20 feet).

Outlet structures and associated inlet and outlet channels should be kept free of vegetation that would impede the flow of water.

10003.700 Modification of Retaining Structures and Water Levels

The FERC and state safe dams organizations require that any modifications to water retaining structures (that they regulate) be reviewed and approved by their organization prior to construction. In addition, FERC requires that any soil boring program on a FERC-regulated structure be reviewed and approved by FERC prior to implementation. For FERC regulated structures, SCG Hydro Services will serve as the contact with FERC and, if applicable, with the state dam safety regulatory agencies in these matters.

Proposed new water retaining structures and proposed modifications to existing dams and associated structures (including discharge structures, internal retaining structures, diversion dikes and dry ash storage within existing ponds) should be reviewed with SCG Hydro Services prior to and during design and construction. SCG Hydro Services shall be included in the review and approval process for new water retaining structures and for modifications to existing structures.

Increases in maximum pond elevations should be reviewed with SCG Hydro Services prior to exceeding existing maximum elevations.

10003.900 References

The documents listed below contain both general and specific guidance on topics related to the safety of dams and dikes. Requirements and provisions of these documents may or may not apply to a specific dam or dike covered under this procedure.

FEMA-93 Federal Guidelines for Dam Safety Rev. April, 2004

FEMA-473 Technical Manual for Dam Owners - Impacts of Animals on Earthen Dams Rev. September, 2005

FEMA-534 Technical Manual for Dam Owners - Impacts of Plants on Earthen Dams Rev. September, 2005

FERC Engineering Guidelines, Ch. 14 Dam Safety Performance Monitoring Program Rev. July 2005

Georgia Environmental Protection Division Rules for Dam Safety Environmental Rule 391-3-8. Authorized by OCGA 12-5-370 GA Safe Dams Act of 1978.

Georgia Safe Dams Program Engineering Guidelines v.3.1, Georgia EPD Safe Dams Program, 2007.

Mississippi Commission on Environmental Quality Dam Safety Regulation LW-4 Revised August 2005

Northwest Florida Water Management District, Chapter 40A-4, Florida Administrative Code

Southern Company Records Management home page
http://compliance.southernco.com/records-mgmt/SoCoRecordsMgtHome.html

The Southern Company Records and Information Management Retention Schedule, Revision 12, June 16, 2009.
http://compliance.southernco.com/records-mgmt/SOCORIMRetentionSchedule_06_16_2009.pdf

SOUTHERN COMPANY

Engineering and Construction Services Calculation

Calculation Number: TV-GS-ECS8825-001

Project/Plant: Plant Gaston Ash Pond	**Unit(s):** Units 1-5	**Discipline/Area:** ES&EE
Title/Subject: Ash Pond Storm Event Hydraulic Capacity		
Purpose/Objective: Evaluate the ability of the ash pond to store water from the design storm event		
System or Equipment Tag Numbers: NA	**Originator:** Benjamin J. Gallagher, P.E.	

Contents

Revision Record

Rev. No.	Description	Originator Initial / Date	Reviewer Initial / Date	Approver Initial / Date
0	Issued for Information	BJG/6-23-10	RAM/7-2-10	JCP/7-2-10

Notes:

Purpose of Calculation

Plant Gaston is a coal-fired steam plant that produces ash as a combustion residual. Presently, the facility sluices fly ash to the pond, dewaters the ash, and stores the ash in a stack. The pond is approximately 270 acres in area and is contained by perimeter dike approximately 16,000 ft. long. The pond has an NPDES permit to discharge to the Coosa River.

The purpose of this calculation is to confirm the ability of the ash pond to contain a 100-year/24-hour storm event without overtopping the dike.

Methodology

The 100-year/24-hour design rainfall event was determined from the rainfall frequency map in *Rainfall Frequency Atlas of the United States*. The topography and layout of the ash pond was obtained from the December 2009 "Topographic Map of Gaston Ash Pond". Volumes within the pond were determined using a digital model of the mapped topography in AutoCAD Civil 3D 2010. The topography of the drainage area south of the pond was obtained from the USGS Topographic Map. The rainfall runoff calculations were performed using the rational method.

Criteria and Assumptions

The capacities were calculated based upon the following assumptions and design criteria:

1. All process waters from the plant enter and exit the ash pond normally.
2. All rainfall within the dike perimeter flows into the pond.
3. Approximately 40 acres located south of the pond drain into the pond.
4. No infiltration occurs.
5. No evaporation occurs.
6. Rainwater does not leave the pond during the event.

There is no regulatory requirement to store the entire rainfall volume from a 100-year/24-hour event. However, sufficient storage capacity will prevent overtopping the dike during design events and mitigate the need for an emergency spillway.

Summary of Conclusions

The ash pond has present water capacity of about 500 acre-ft above the normal operating level, based on the December 2009 topographical survey. The rainwater volume during a 100-year/24-hour design rainfall event is 230 acre-ft. The excess water capacity remaining after a 100-year/24-hour event is 270 acre-ft.

The normal pool at the outlet is approximately Elev. 431. After a 100-year/24-hour event, water will reach approximately Elev. 439. This leaves approximately 4 feet of freeboard at the outlet location. The rainfall from a 100-year/24-hour design event will not overtop the existing dike.

Design Inputs/References

Technical Paper No. 40, Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years, 100-year 24-hour Rainfall (Inches), p. 56, May 1961

Technical Report NWS No. 33, Evaporation Atlas for the Contiguous 48 United States, Annual Free Water Surface Evaporation, Map 3, June 1982

Topographic Map of Gaston Ash Pond, Southern Company Services, December 2009

Body of Calculation

The following calculation outlines the water capacity of the ash pond:

The design 100-year/24-hour rainfall event for Shelby County, Alabama is 9 inches. Over a catchment area of 310 acres, the runoff is:

9 inches * 310 acres = 232.4 acre-ft

The annual lake evaporation is for Shelby County, Alabama is 40 inches. The daily evaporative loss from the 30 acre normal pool that does not occur during the design event is:

40 inches * 30 acres = 0.2 acre-ft

Thus, the total water volume needed to store a 100-year/24-hour rainfall event is:

232.4 acre-ft + 0.2 acre-ft = 233 acre-ft

The water capacity of the pond above normal operating level is 505 acre-feet. The excess water capacity following the design event is:

505 acre-ft – 233 acre-ft = 272 acre-ft

The 233 acre-feet of storm water will fill the pond to approximately Elev. 439. The remaining freeboard is:

Elev. 443 – Elev. 439 = 4 ft of free board

MAP 3.

ANNUAL

FREE WATER SURFACE EVAPORATION

(SHALLOW LAKE)

1956-1970

INCHES

EXPLANATION OF ISOPLETHS

WESTERN STATES INTERVALS

6 inches - < 80 inches

10 inches - > 80 inches

Interval irregular where crowded

Areas of limited data

Additional information for areas of shallow gradient above 60 inches

EASTERN STATES INTERVALS

4 inches - standard interval

2 inch interval used for areas of shallow gradient

Western States Interval

Eastern States Intervals

Shelby County PLANT GASTON

U.S. DEPT. OF COMMERCE NATIONAL WEATHER SERVICE NOAA

OFFICE OF HYDROLOGY

HYDROLOGIC RESEARCH LABORATORY

ALBERS EQUAL AREA PROJECTION

STANDARD PARALLELS 29° AND 45°

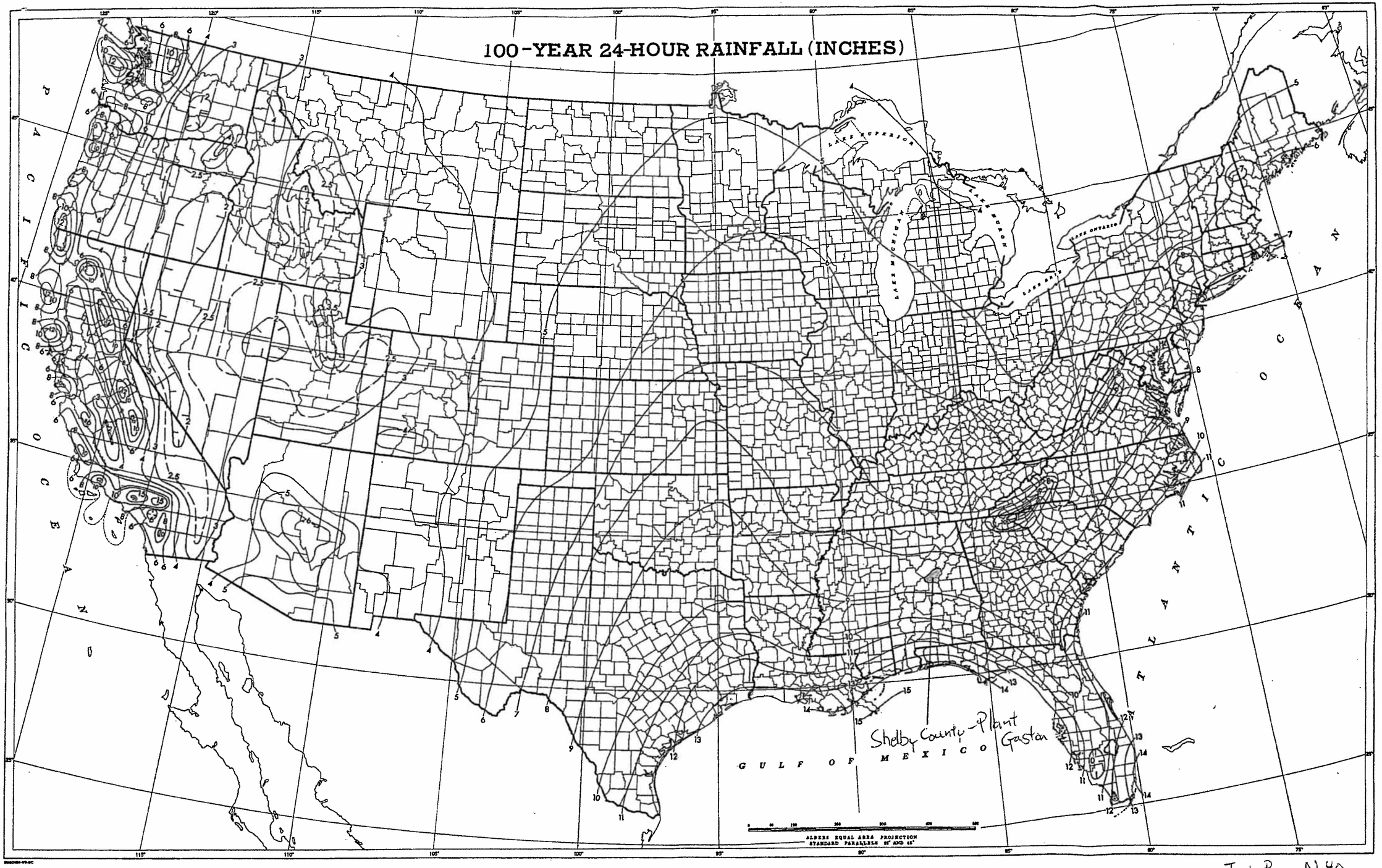
NOAA Technical Report NWS 33

Map 3 of 4: Annual FWS Evaporation

June 1982

CONFIDENTIAL

100-YEAR 24-HOUR RAINFALL (INCHES)



Tech. Paper No 40
Rainfall Frequency Atlas
May 1961

CONFIDENTIAL

E.C. GASTON STEAM PLANT - ASH POND DAM SURVEILLANCE
VISUAL INSPECTION CHECK LIST AND REPORT

Inspection Date: _____ **Time:** _____ **Ash Pond Pool Level:** _____ **ft. msl**

Rainfall Since Last Inspection: _____ **inches** **Weather Conditions:** _____

Conditions Noted During Inspection	Yes	No	Conditions Noted During Inspection	Yes	No
UPSTREAM SLOPE			**DAM CREST**		
Slumping or Sliding			Cracks		
Sinks or Depressions			Differential Settlement		
Significant Erosion			Excessive Vegetation		
Excessive Vegetation			Significant Erosion		
Cracks			**DOWNSTREAM TOE**		
Animal Burrows			Changes in Seepage Volume or Location		
Fire Ant Hills			Heaving		
DOWNSTREAM SLOPE			Sinks or Depressions		
Slumping or Sliding			Excessive Vegetation		
Sinks or Depressions			Animal Burrows / Beaver Activity		
Significant Erosion			**OTHER CONDITIONS OF NOTE**		
Wet Zones on Slope					
Seepage on Slope					
Shrinkage Cracks					
Animal Burrows					
Excessive Vegetation					
Fire Ant Hills					

If any conditions noted 'Yes", provide comments below (including locations, attach location plan):

_____

_____

_____

NOTE: If any observations noted during the inspection represent a notable change in condition, SCG Hydro Services should be contacted immediately. (24-hour Hydro On-Call #205-257-2344)

Inspector Signature: _____

Rev. 1 - 09/09/09

E.C. GASTON STEAM PLANT - ASH POND DAM SURVEILLANCE
INSPECTION CHECKLIST - UNUSUAL CONDITION LOCATION PLAN

Appendix B—Fly Ash Pond Photographs

Dam Crest

Photograph 1: Crest of East Dike View North, 6/23/2010

Photograph 2: East Dike Crest & Upstream East Dike View to South, 6/23/2010

Photograph 3: Crest - East Dike View to South, 6/23/2010

Photograph 4: West Dike Crest (Right Side) Central Section, 6/23/2010

Photograph 5: West Dike Crest North End View South, 6/23/2010

Upstream/Interior Slopes

Photograph 6: West Dike South End Interior Drainage, 6/23/2010

Photograph 7: West Dike Spoil Pile at Upstream Slope, 6/23/2010

Photograph 8: West Embankment Interior Slope North End, 6/23/2010

Downstream/Exterior Slope and Toe

Photograph 9: East Dike Downstream Erosion Rill, 6/23/2010

Photograph 10: Animal Burrow at East Dike Downstream Slope, 6/23/2010

Photograph 11: East Dike North End, 6/23/2010

Photograph 12: Erosion Seep - Mid-slope East Dike, 6/23/2010

Photograph 13: East Dike - Downstream Slope View South, 6/23/2010

Photograph 14: Side Scarp of Slump - East Dike, 6/23/2010

Photograph 15: Slump Top Slope East Dike, 6/23/2010

Photograph 16: South End - East Dike, 6/23/2010

Photograph 17: Storage Container at Top East Dike South End, 6/23/2010

Photograph 18: Toe of East Dike, 6/23/2010

Photograph 19: West Dike Downstream Slope, 6/23/2010

Photograph 20: West Dike Erosion Maintenance, 6/23/2010

Photograph 22 West Dike - Surface Drain Near Dike Toe, 6/23/2010

Photograph 23: West Dike Central Section View South, 6/23/2010

Photograph 21: West Dike South End View North, 6/23/2010

Photograph 24: West Dike North End Adjacent to Toe, 6/23/2010

Photograph 25: West Dike Soft Wet Area at Toe, 6/23/2010

Abutments and Groins

Photograph 26: West Dike North End Groin, 6/23/2010

Photograph 27: West Dike Rail Drain at Toe North Abutment, 6/23/2010

Photograph 28: Primary Riser Spillway, 6/23/2010

Photograph 29: Primary Spillway Riser, 6/23/2010

Photograph 30: Flow into Spillway Riser

Photograph 31: Riser Spillway Outfall Channel, 6/23/2010

Photograph 32: Spillway Outfall Channel

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name: Gaston Steam Plant Date: 6/23/2010

Unit Name: Gaston Ash Pond Operator's Name: Alabama Power

Unit I.D.: Hazard Potential Classification: (High) Significant Low

Inspector's Name: Joseph P. Klein III, P.E. Julia Molina, E.I.T, CFM

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?	Weekly		18. Sloughing or bulging on slopes?	✓	
2. Pool elevation (operator records)?	442.66		19. Major erosion or slope deterioration?		✓
3. Decant inlet elevation (operator records)?	431.09		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	None		Is water entering inlet, but not exiting outlet?		✓
5. Lowest dam crest elevation (operator records)?	445		Is water exiting outlet, but not entering inlet?		✓
6. If instrumentation is present, are readings recorded (operator records)?		N/A	Is water exiting outlet flowing clear?	✓	
7. Is the embankment currently under construction?		✓	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation,stumps, topsoil in area where embankment fill will be placed)?	NA		From underdrain?		✓
9. Trees growing on embankment? (If so, indicate largest diameter below)	✓		At isolated points on embankment slopes?		✓
10. Cracks or scarps on crest?		✓	At natural hillside in the embankment area?		✓
11. Is there significant settlement along the crest?		✓	Over widespread areas?		✓
12. Are decant trashracks clear and in place?		✓	From downstream foundation area?		✓
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		✓	"Boils" beneath stream or ponded water?		✓
14. Clogged spillways, groin or diversion ditches?		✓	Around the outside of the decant pipe?		✓
15. Are spillway or ditch linings deteriorated?			22. Surface movements in valley bottom or on hillside?		✓
16. Are outlets of decant or underdrains blocked?		✓	23. Water against downstream toe?	✓	
17. Cracks or scarps on slopes?	✓		24. Were Photos taken during the dam inspection?	✓	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments
1.	Weekly inspections by Plant personnel. Annual inspections by SCG Hydro Services dam safety engineers
2	Pool elevation for active cell in northwester corner of impoundment
3	Decant inlet located in southeast corner of impoundment.
8.	1959 construction drawings available indicate dike constructed on "natural ground". Foundation preparation not available.

Coal Combustion Dam Inspection Checklist Form

US Environmental Protection Agency

Site Name:	Plant Gaston	Date:	6/23/2010
Unit Name:	Ash Pond	Operator's Name:	Alabama Power
Unit I.D.:		Hazard Potential Classification:	(High) Significant Low
Inspector's Name:	Joseph P. Klein, III, P.E. Julia Moline, E.I.T, CFM		

Inspection Issue #	Comments
9	A short line of trees planted along crest of south end of west dike. Trees planted for purpose of dust control and noise abatement for homes near the toe of the embankment. Trees (Bradford Pear, Mimosa and Bamboo) selected for shallow root system. Trees generally 4 to 6 inches in diameter.
17 & 18	Minor sloughing observed on the downstream slope of east and west dikes. Some sloughing had associated shallow scarps. Areas of sloughing were generally small and widely spaced.
23	A small area of standing water and soft ground observed along the toe of the west dike. Standing water was located in a track print of a tracked construction vehicle. Undetermined if location was soft/moist prior to construction traffic, or track depression trapped surface water from recent thunder storm rain.

U. S. Environmental Protection Agency

Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # AL0003140 INSPECTOR Joseph R Klein III
Date 6/23/2010

Impoundment Name Gaston Steam Plant Ash Pond
Impoundment Company Alabama Power Co.
EPA Region 4
State Agency (Field Office) Addresss 110 Vulcan Road
Birmingham, AL 35209-4702
Name of Impoundment Gaston Steam Plant Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New _____ Update ✓

	Yes	No
Is impoundment currently under construction?	_____	✓
Is water or ccw currently being pumped into the impoundment?	✓	_____

IMPOUNDMENT FUNCTION: Fly ash storage

Nearest Downstream Town : Name Wilsonville, AL (Cross gradient)
Distance from the impoundment 1 mile
Impoundment
Location: Longitude -86 Degrees 28 Minutes 09.78 Seconds
Latitude 33 Degrees 14 Minutes 06.33 Seconds
State AL County Shelby

Does a state agency regulate this impoundment? YES ✓ NO _____

If So Which State Agency? Alabama Dept. of Environmental Management

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

ED **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

WD **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

Failure of east dike will discharge directly into the Coosa River. Based on height of dam, distance of pool from dam and lack of development along river, failure or misoperation is not expected to result in a probable loss of life. However, discharge of stored ash is expected to cause economic loss and environmental damage. Thus the east dike is considered a Significant Hazard Potential.

There are a few homes cross-gradient, but in close proximity to the west dike. Failure or misoperation of the west dike is expected to be a probable cause of loss of life. Thus the west dike is considered a High Hazard Potential

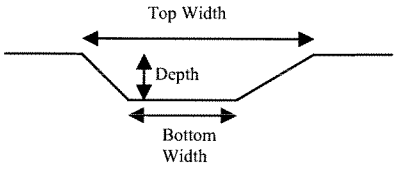
The north and south sides are formed by natural topographic ridges rather than constructed embankments.

TYPE OF OUTLET (Mark all that apply)

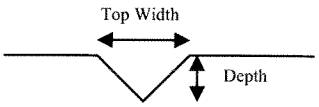
_____ **Open Channel Spillway**
_____ Trapezoidal
_____ Triangular
_____ Rectangular
_____ Irregular

_____ depth
_____ bottom (or average) width
_____ top width

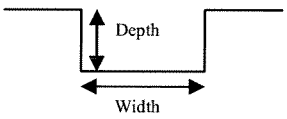
TRAPEZOIDAL



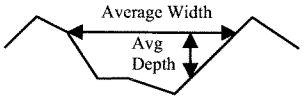
TRIANGULAR



RECTANGULAR

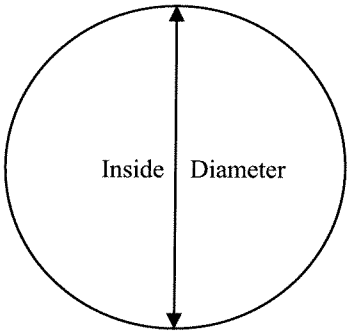


IRREGULAR



✓ **Outlet**

36" inside diameter



Material
_____ corrugated metal
_____ welded steel
✓ concrete
_____ plastic (hdpe, pvc, etc.)
_____ other (specify) _____

Is water flowing through the outlet? YES ✓ NO _____

_____ **No Outlet**

_____ **Other Type of Outlet** (specify) _____

The Impoundment was Designed By Alabama Power Company

Has there ever been a failure at this site? YES _____ NO ✓

If So When? _____

If So Please Describe : _____

Has there ever been significant seepages at this site? YES _____ NO ✓

If So When? _____

IF So Please Describe: _____

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site? YES _____ NO ✓

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____