PowerSouth Energy Cooperative

Charles R. Lowman Power Plant
Leroy, AL

History of Construction
Unit 2 / 3 Bottom Ash Pond

Issued October 2016

CDG Engineers and Associates, Inc.
1840 East Three Notch St.
Andalusia, AL 36421
| cdge.com

PowerSouth
ENERGY COOPERATIVE

REPORT
History of Construction
Unit 2/3 Bottom Ash Pond
Charles R. Lowman Power Plant

October 2016

CDG
Engineering. Environmental. Answers.

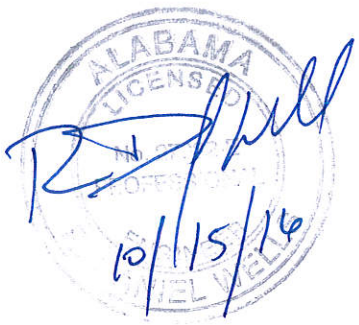

TABLE OF CONTENTS

Appendix A

Appendix B

Appendix C

1.0 UNIT 2/3 BOTTOM ASH POND

1.1 Operator Information

Name: Unit 2/3 Bottom Ash Pond

Owner/Operator: PowerSouth Energy Cooperative, Inc.
Charles R. Lowman Power Plant
Leroy, AL 36458

State ID: None Assigned

1.2 Location

The Unit 2/3 Bottom Ash Pond is located in Section 18, Township 6N, Range 2E in Washington, County Alabama and more specifically on the Western bank of the Tombigbee River. Figures 1 and 2 of this report show the location of the Pond.

1.3 Statement of Purpose

The Unit 2/3 Bottom Ash Pond is currently used as a settling pond for CCR wastes containing bottom ash, fly ash, and other plant wastes. Bottom ash from Unit 2 and Unit 3 is transported to the impoundment via wet sluicing. In addition to the bottom ash sluicing operation, the Plant periodically disposes of fly ash and scrubber waste within the impoundment through similar methods.

1.4 Watershed Identification

The CCR unit lies within the Stave Creek watershed (HUC12 031602030901) as delineated by the U.S. Geologic Survey in the State of Alabama Hydrologic Unit Maps, {published 2013}. The Stave Creek watershed is approximately 23,449 acres.

1.5 Foundation and Embankment Description

The Unit 2/3 Bottom Ash Pond was constructed in 1975-1979 in conjunction with Units 2 and 3 of the Charles R. Lowman Power Plant. Based on a review of the available documentation, the Unit 2/3 Bottom Ash Pond was constructed by excavating below the original ground surface and placing the excavated soils as fill to form the pond floor and surrounding embankments. The original ground surface within the pond area ranged from ±EL 12' to EL 30'. Plans indicate that the pond was excavated to EL 13' and returned to EL 15' with a soil fill described as Type "A" embankment material. Two feet of Type "A" embankment material was also placed on the interior slopes of the embankment.

The Unit 2/3 Bottom Ash Impoundment contains exterior embankments located on its southern and western sides. A shared, interior embankment is located to the north adjacent to the Scrubber Waste Pond. A shared, interior embankment is located to the east adjacent to the Unit 1 Bottom Ash Pond which serves as the Plant's entrance road. The plans indicated that the embankments were constructed with Type "B" embankment material.

In reviewing previously conducted topographic surveys of the impoundment the crest of the embankments range from approximately EL 39' to EL 43'. Per the available information shown on the Sheets Y32 and Y33 of the Tombigbee Generating Plant Unit 2 & 3 (Burns and McDonnel, circa 1975)

the embankments were constructed at an inclination of 2(H):1(V) and flatter. The height of exterior embankments is a maximum of approximately 11 feet.

A toe embankment was constructed along the exterior face of the western embankment in 2015. The toe embankment is approximately 13 feet wide and a maximum of 16 feet in height extending to ±EL 38'. The embankment face was constructed on a ±2.5(H):1(V) inclination or flatter with select, structural fill. The structural fill was placed in thin lifts with individual lifts being moisture conditioned, compacted and tested to ensure a high consistency. The exterior slope of the toe embankment was lined with rip-rap to minimize the potential for erosion and sloughing during flood events of the Tombigbee River.

Based on soil boring information, the Unit 2/3 Bottom Ash Pond embankments and underlying foundation soils consist of fill, Low Terrace Deposits and Coastal Plain Deposits. Fill thicknesses ranged from approximately 17' to 28'. The fill soils are comprised of silty and clayey, fine to medium-grained sand with rock fragments. Standard Penetration Tests (SPT) in the fill generally indicated a high consistency with N-values typically ranging from 15 to greater than 50 blows per foot (bpf).

The foundation soils underlying the embankments consist of Low Terrace Deposits and Coastal Plain Deposits. Low Terrace Deposits are water-deposited soils typically resulting from meanderings of rivers and streams. The Charles R. Lowman Power Plant is located along the western bank of the Tombigbee River. Therefore, the Terrace Deposits at this site appear to have resulted from meanderings and flooding of the Tombigbee River.

Coastal Plain Deposits are naturally occurring soils that appear to have formed by the gradual deposition of sediment in an ancient marine environment. The Low Terrace and Coastal Plain Deposits consisted of silty and clayey sand, sandy clay and highly plastic clay and extended to the boring termination depths ranging from approximately 40 to 60 feet below the existing ground surface. The deposits exhibited a variable consistency with SPT N-values ranging from 4 to greater than 50 bpf.

Additional information and analyses associated with the foundation and embankments is addressed in the Report of Safety Factor Assessment – Coal Combustion Residuals Impoundment Embankments, by CDG Engineers & Associates, Inc. dated October 2016.

1.6 Description of Construction Zones

Based on a review of the available documentation, the Unit 2/3 Bottom Ash Pond was constructed by excavating soils from below the original ground surface and placing these soils as fill to form the surrounding embankments. The original ground surface within the pond area ranged from ±EL 13' to EL 30'. Plans indicate that the pond was excavated to EL 13' and backfilled to EL 15' with Type "A" Embankment material. Cross sectional representations of the pond can be found in Figures 4 and 5.

Based on a review of the Tombigbee Generating Plant Unit 2 & 3 plans created by Burns & McDonnel circa 1975, the Unit 2/3 Bottom Ash Pond floor and embankment was constructed with native soils which are generally described in Section 1.5 and indicated in Appendix B. There have been no additional studies conducted within the impoundment to determine whether the pond was constructed with a lining system that meets the permeability performance criteria specified in the CCR rule.

Based on our review of the Tombigbee Generating Plant Unit 2 & 3 plans created by Burns & McDonnel circa 1975, knowledge of the local geology, and the subsurface information obtained and presented in Appendix B of this report, CDG recommends that the Unit 2/3 Bottom Ash Pond be classified as an unlined impoundment and treated as such in administering the requirements of the CCR Rule.

1.7 Detailed Dimensional Drawings

Appendix C - Tombigbee Generating Plant Unit 2 & 3 plans created by Burns & McDonnel circa 1975, contains detailed construction drawings for the Unit 2/3 Bottom Ash Pond. Additionally, Appendix A - Figures 3 through 5 contain summary dimensional drawings of the pond including cross-sectional representations of the pond which were developed through a review of the available information, previously completed topographic surveys, and the subsurface information obtained and presented in Appendix B of this report.

1.8 Existing Instrumentation

The Plant maintains normal pool information using stage boards located adjacent to the Unit 2/3 intake structure. The intake structure is discussed in greater detail in Section 1.10 of this report. The stage board is manually read and recorded.

1.9 CCR Unit Area Capacity Curves

Below is the Stage-Storage Curve for the Unit 2/3 Bottom Ash Pond.

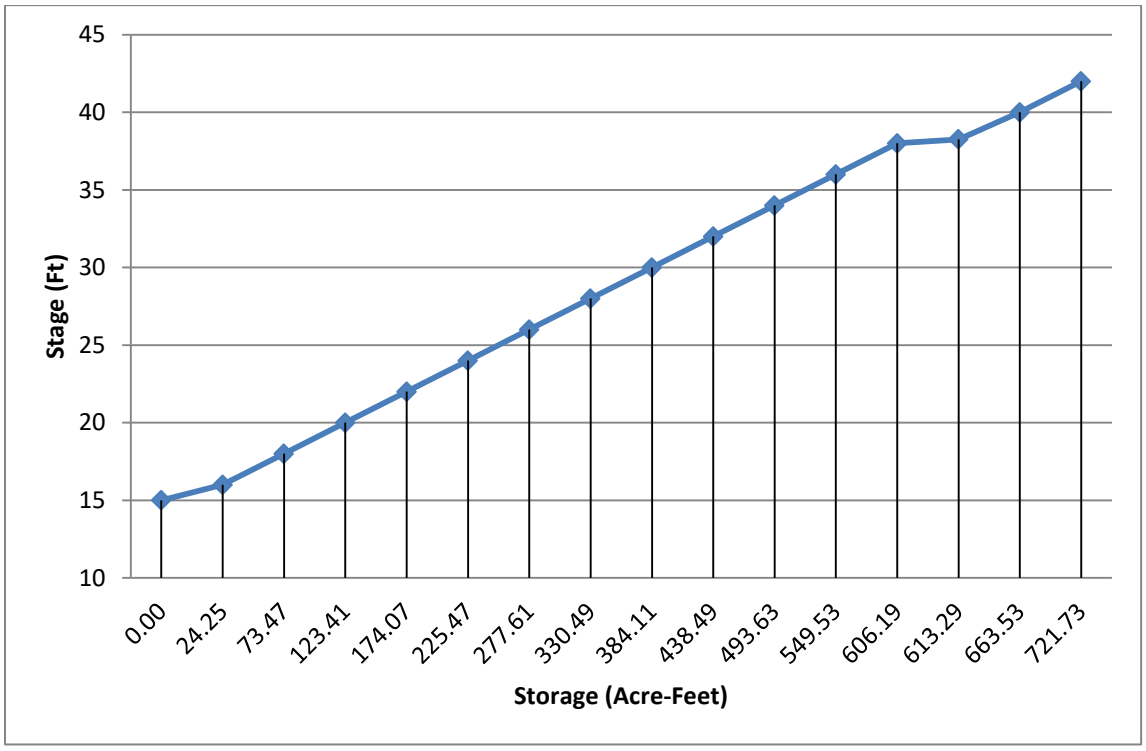

Figure 1 – Unit 2/3 Bottom Ash Stage-Storage Curve

1.10 Spillways and Diversion Systems

The Unit 2/3 Bottom Ash Intake structure is an enclosed pumping facility. The water from the pond passes over a weir structure and into a concrete sump structure. The water is then pumped out of the sump and into the Scrubber Waste Pond. The Unit 2/3 Intake consists of two suction lift pumps with a normal operating flow of 825 gpm (1.84 cfs). Ponds are drained by pumping systems and do not have identified gravity spillways. During high rainfall events, mobile suction lift pumps are utilized at the pond to supplement permanent intake structures to control the flood event and to maintain pool operating levels.

Additional information and analyses associated with the spillway and diversion systems' is addressed in the Unit 2/3 Inflow Design Control Plan, by CDG Engineers & Associates, Inc. dated October 2016.

1.11 Surveillance, Maintenance, and Repair

Plant personnel conduct surveillance and inspections on set intervals. Maintenance and repair items that are identified during the inspections are addressed at that time.

1.12 Prior Structural Instability

-None Noted.

2.0 GENERAL REMARKS AND CLOSING

The findings in this report were developed based on documents provided by the Owner and from the limited information obtained through field and laboratory testing programs. If significant changes are made to the use, capacity or geometry of the embankments and/or impoundments, CDG should be allowed to review our findings in light of the changes to determine if additional testing and revised conclusions are needed.

This report is intended to meet the requirements of the CFR 40.257.73 (4) for the History of Construction report for the Unit 2/3 Bottom Ash Pond.

The conclusions, analyses, and recommendations presented in this report are based upon information provided, currently accepted engineering principles, practices, and existing testing standards in the area where the services were provided. No other warranty, expressed or implied, is made.

Appendix A

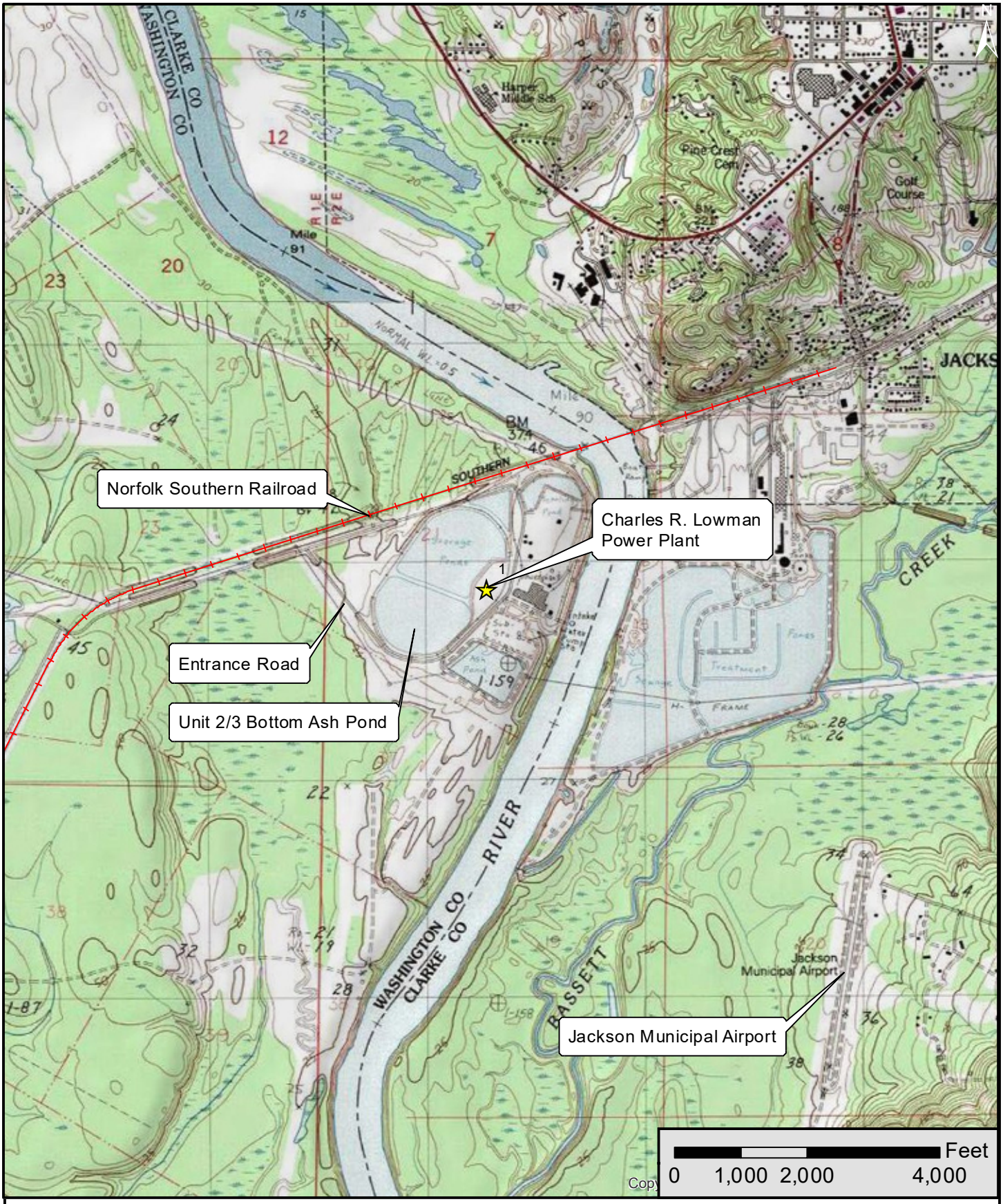

Figure 1 - Unit 2/3 Bottom Ash Pond Location Map

Charles R. Lowman Power Plant
PowerSouth Energy Cooperative
Leroy, AL

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Figure 2 - Aerial Map of Impoundments

Charles R. Lowman Power Plant
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Figure 3 - Unit 2/3 Bottom Ash Pond
Impoundment Overview

Charles R. Lowman Power Plant

Leroy, AL

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Sheet No.
Fig. 3

Drawn By:	JRA
Checked by:	RDW
Date:	October 2016

UNIT 2/3 BOTTOM ASH POND
SECTION S - S'

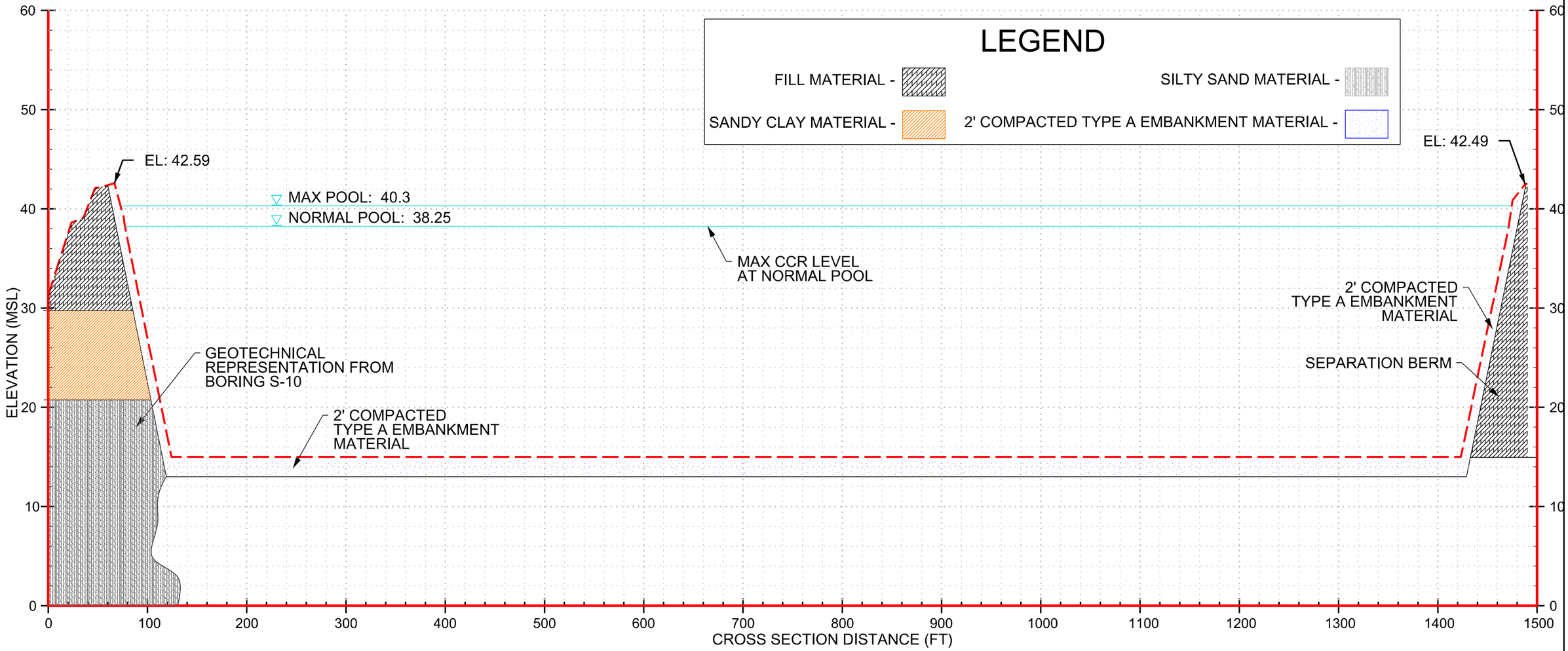

Figure 4 - Unit 2/3 Bottom Ash Pond Section S-S'
Charles R. Lowman Power Plant
Leroy, AL

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Fig.4

Scale:	H:1"=100'; V:1"=10'
Drawn By:	JRA
Checked by:	RDW
Date:	October 2016

UNIT 2/3 BOTTOM ASH POND
SECTION T - T'

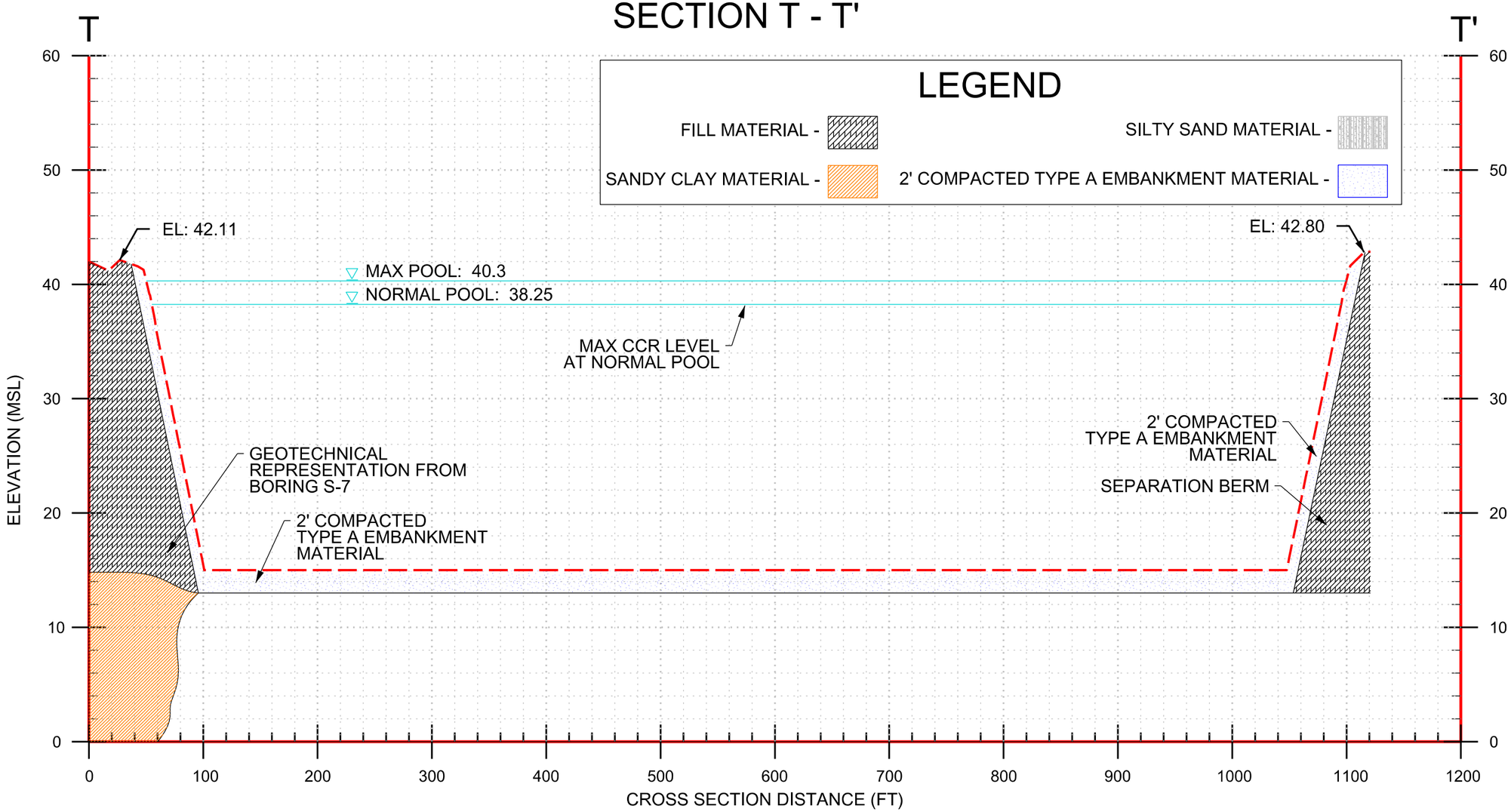

Figure 5 - Unit 2/3 Bottom Ash Pond Section T-T'
Charles R. Lowman Power Plant
Leroy, AL

CDG
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Fig.5

Scale:	H:1"=100'; V:1"=10'
Drawn By:	JRA
Checked by:	RDW
Date:	October 2016

Appendix B

Boring Logs

CDG Engineers & associates

Albertville, AL
Tel:(256) 891-3458

Andalusia, AL
Tel:(334) 222-9431

Birmingham, AL
Tel:(205) 733-9431

Hoover, AL
Tel:(205) 463-2600

Defuniak Springs, FL
Tel:(850) 892-0225

Dothan, AL
Tel:(334) 677-9431

BORING LOG

Project Name:	Berm Stability Evaluation - Lowman Power Plant
Project Number:	060921201
Boring Number:	B-1
Date Drilled:	July 15, 2009 Page 1 of 2

Notes: SS = Split Spoon

PPqu = Pocket Penetrometer Unconfined Compressive Strength

Depth (feet)	Approx. Elev. (feet)	Graphic Scale	MATERIAL DESCRIPTION	TYPE	BLOWS/ 6 INCHES	N	CORE REC. (%)	RQD (%)	REMARKS
0	44		Crushed aggregate						
			Very dense, red, silty fine to medium SAND, with numerous rock fragments	SS	26-27-28	50+			
5	39			SS	20-22-23	45			
			...same	SS	24-24-26	50			
10	34								
			... with numerous rock fragments	SS	29-37-40	50+			
15	29								
			Very dense, silty, coarse-grained SAND, with trace rock fragments	SS	26-38-43	50+			▽ Groundwater encountered at 20 feet at time of boring
20	24								
			Stiff, brown, fine sandy CLAY with gravel	SS	6-6-7	13			
25	19								

CDG Engineers & associates

Albertville, AL
Tel:(256) 891-3458

Andalusia, AL
Tel:(334) 222-9431

Birmingham, AL
Tel:(205) 733-9431

Hoover, AL
Tel:(205) 463-2600

Defuniak Springs, FL
Tel:(850) 892-0225

Dothan, AL
Tel:(334) 677-9431

BORING LOG

Project Name:	Berm Stability Evaluation - Lowman Power Plant
Project Number:	060921201 Phase 3
Boring Number:	B-1
Date Drilled:	July 15, 2009 Page 2 of 2

Notes: SS = Split Spoon
PPqu = Pocket Penetrometer Unconfined Compressive Strength

Depth (feet)	Approx. Elev. (feet)	Graphic Scale	MATERIAL DESCRIPTION	TYPE	BLOWS/ 6 INCHES	N	CORE REC. (%)	RQD (%)	REMARKS
25	19		Stiff, brown, fine sandy CLAY with gravel (Fill)						
30	14		Medium, grey and tan, fine sandy CLAY	SS	2-3-4	7			
35	9		... stiff, grey	SS	3-5-5	10			PPqu = 1.25 tsf
40	4		(Low Terrace Deposits)	SS	4-4-7	11			PPqu = 1.25 tsf
			Boring Terminated at 40 feet						
45	-1								
50	-6								Boring backfilled with grout upon completion.

CDG Engineers & associates

Albertville, AL
Andalusia, AL
Birmingham, AL
Dothan, AL
Huntsville, AL

Boring S-6

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/13/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0		Loose, red, silty fine to medium SAND	☒	0-4-5 (9)								
5			...medium dense	☒	10-9-10 (19)								
	35.0		...very dense	☒	26-29-30 (59)								
10			... red and tan, with trace rock	☒	24-26-28 (54)								
	30.0												
15			... dense, tan and grey with rock fragments	☒	12-20-28 (48)								▼ Groundwater at +/-EL28 ft. on 12/13/2011.
	25.0												
20			...very dense, tan	☒	14-34-36 (70)								
	20.0												
25			... red	☒	15-31-35 (66)								
	15.0		(Fill)										
			Stiff, red and grey CLAY with fine sand and rock fragments	☒	6-7-7 (14)							1.25	

(Continued Next Page)

Boring S-6

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/13/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			Stiff, red and grey CLAY with fine sand and rock fragments										
	10.0												
35			... same	☒	5-7-6 (13)							2.0	
	5.0												
40			... soft, light grey and tan	☒	3-3-3 (6)		41	17	24			0.5	USCS=CL
	0.0												
45			... medium, light grey and brown	☒	3-4-4 (8)							0.5	
	-5.0												
50			Medium dense, grey, silty fine SAND	☒	9-14-13 (27)								
	-10.0												
55			... grey and tan	☒	9-10-12 (22)								
	-15.0												Borehole backfilled with grout upon completion.
			...same (Coastal Plain Deposits)	☒	12-14-14 (28)								

Boring terminated at 60.0 feet.

CDG Engineers & associates

Albertville, AL
Andalusia, AL
Birmingham, AL
Dothan, AL
Huntsville, AL

Boring S-7

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 11/30/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0		Medium dense, silty fine to medium SAND with rock fragments	☒	0-7-10 (17)		NP	NP	NP		27.7		USCS = SM
5			... red, brown and tan, with trace rock fragments	☒	10-13-14 (27)								
	35.0		... very dense, reddish tan with numerous rock fragments	☒	18-27-30 (57)								
10			... dense, reddish brown and tan with trace rock fragments	☒	11-15-16 (31)		NP	NP	NP		24.9		USCS = SM
	30.0												
15			... medium dense, reddish tan with rounded rock fragments	☒	5-6-11 (17)								▽ Groundwater at +/-EL27.5 ft. on 11/30/2011.
	25.0												▽ Groundwater at +/-EL25.5 ft. on 5/1/2012.
20			Medium dense, grey, clayey SAND with trace rock fragments	☒	7-9-12 (21)		30	20	10		28.4		USCS = SC
	20.0			■									(No Recovery)
25			...very loose, grey and tan	☒	2-2-2 (4)								
			(Fill)										
	15.0			■									
			Stiff, red and grey CLAY with fine sand	☒	3-6-7 (13)							1.5	

(Continued Next Page)

Boring S-7

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 11/30/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			Stiff, red and grey CLAY with fine sand										
	10.0			■									
35			...same	☒	8-11-13 (24)							2.0	
	5.0												
40			... light grey and brown	☒	3-5-7 (12)							1.5	
	0.0												
45			...grey and tan	☒	4-6-8 (14)							1.25	
	-5.0												
50			...same	☒	2-2-3 (5)								
	-10.0												
55			Very dense, silty fine to medium SAND with numerous rock fragments	☒	28-38-40 (78)								
	-15.0												Piezometer Installed.
			... with rounded rock fragments (Coastal Plain Deposits)	☒	30-30-28 (58)								

Boring terminated at 60.0 feet.

CDG Engineers & associates

Albertville, AL
Andalusia, AL
Birmingham, AL
Dothan, AL
Huntsville, AL

Boring S-8

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/12/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0		Dense, red and brown, silty fine to medium SAND with trace organics		11-20-21 (41)								
5			...red		17-15-17 (32)								
	35.0		... with trace rock fragments		17-20-20 (40)								
10			...very dense, reddish tan with numerous rock fragments		28-30-50 (80)								▽ Groundwater at +/-EL32 ft. on 12/12/2011.
	30.0												▽ Groundwater at +/-EL30 ft. on 12/14/2011.
15			... red and grey		50/5"								
	25.0		(Fill)										
20			Loose gravel fragments		5-4-3 (7)						2.3		
	20.0												
25			... with clay		3-4-3 (7)								
	15.0												
			Stiff, red and grey CLAY with fine sand		3-6-8 (14)							1.25	

(Continued Next Page)

Boring S-8

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/12/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			Stiff, red and grey CLAY with fine sand										
	10.0												
35			...same	☒	3-4-5 (9)		71	21	50			1.0	USCS=CH
	5.0												
40			...same	☒	5-6-7 (13)							1.25	
	0.0												
45			Very dense, tan, silty fine SAND	☒	14-22-28 (50)								
	-5.0												
50			Dense, tan, clayey fine SAND	☒	12-20-20 (40)								
	-10.0												
55			Dense gravel fragments	☒	14-16-18 (34)								
	-15.0												Borehole backfilled with grout upon completion.
			...very dense, with fine sand (Coastal Plain Deposits)	☒	18-24-28 (52)								

Boring terminated at 60.0 feet.

CDG Engineers & associates

Albertville, AL
Andalusia, AL
Birmingham, AL
Dothan, AL
Huntsville, AL

Boring S-9

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/6/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0		Medium dense, red and brown, silty fine to medium SAND with trace organics										
5			... red	☒	19-14-14 (28)								
	35.0		... dense	☒	10-14-17 (31)								
10			... medium dense, red and tan with trace rock fragments	☒	11-12-13 (25)								▽ Groundwater at +/-EL32.5 ft. on 12/6/2011.
	30.0												
15			... very dense, red	☒	14-40-50 (90)								
	25.0		(Fill)										
20			Very stiff, brown and grey, fine sandy CLAY	☒	9-13-20 (33)								
	20.0												
25			Loose, grey, silty fine SAND	☒	2-2-3 (5)								
	15.0												
			Medium, grey CLAY with fine sand	☒	2-3-4 (7)								

(Continued Next Page)

Boring S-9

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/6/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			Medium, grey CLAY with fine sand										
	10.0			■									(No Recovery)
35			... red and grey	☒	2-3-3 (6)								
	5.0			■									(No Recovery)
40			... stiff	☒	2-5-6 (11)							1.5	
	0.0												
45			...soft, grey	☒	2-2-2 (4)							<0.25	
	-5.0												
50			... same	☒	2-4-5 (9)							0.25	
	-10.0												
55			...hard, grey and tan	☒	40-50-6 (56)								
	-15.0												Borehole backfilled with grout upon completion.
			Very dense, tan, clayey fine to medium SAND with rock fragments (Coastal Plain Deposits)	☒	30-36-40 (76)								

Boring terminated at 60.0 feet.

CDG Engineers & associates

Albertville, AL
Andalusia, AL
Birmingham, AL
Dothan, AL
Huntsville, AL

Boring S-10

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/6/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0		Dense, red and black, silty fine to medium SAND		0-17-23 (40)								
5			... same		13-23-24 (47)								
	35.0		... red		18-19-20 (39)								
10			...very dense		26-25-30 (55)								▽ Groundwater at +/-EL32.5 ft. on 12/6/2011.
	30.0												
15			... with rock fragments		11-24-28 (52)								
	25.0												
20			... same		18-23-29 (52)								
	20.0		(Fill)										
25			Medium dense, brown, silty fine to medium SAND		9-9-8 (17)								
	15.0												(No Recovery)
			Stiff, grey and red CLAY with fine sand		3-4-5 (9)							1.0	

(Continued Next Page)

Boring S-10

Project Name: Lowman Berm Stability Analysis
Project Location: Leroy, Alabama Hammer Type: Automatic
CDG Project Number: 221141100 Method: Mud-Rotary
Date Drilled: 12/6/2011 Approx. Ground Elevation: +/-42 feet

Notes:
+/- 18" of railroad ballast at ground surface.

PPqu = Unconfined Compressive Strength.

☒ - Split Spoon Sample ■ - Undisturbed Sample

Depth (ft.)	Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			Stiff, grey and red CLAY with fine sand										
	10.0			■									(No Recovery)
35			... grey	☒	2-4-5 (9)		74	22	52			1.5	USCS=CH
	5.0			■									(No Recovery)
40			... same	☒	4-5-7 (12)							1.0	
	0.0												
45			... same	☒	5-6-7 (13)							1.5	
	-5.0												
50			... same	☒	4-5-5 (10)							1.75	
	-10.0												
55			... soft	☒	2-2-3 (5)							0.5	
	-15.0												Borehole backfilled with grout upon completion.
			Dense, light brown and tan, silty fine to medium SAND (Coastal Plain Deposits)	☒	15-18-31 (49)								

Boring terminated at 60.0 feet.

Boring T-2

Project Name: Lowman CCR Rule Phase I
Project Location: Leroy,AL Hammer Type: Automatic
CDG Project Number: 061521207 Method: Diedrich D-50 Mud Rotary
Date Drilled: 8/9/2016 Approx. Ground Elevation: +/-42.0 feet

Notes:
+/- 18" of railroad ballast at ground surface

☒ - Split Spoon Sample

Depth (ft.)	Approx. Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
	40.0												
5			Dense, red and tan, silty fine to medium SAND with rock fragments		11-27-23 (50)								
	35.0												
10			...medium dense		7-7-8 (15)								
	30.0												
15			...same (Fill)		1-12-14 (26)		NP	NP	NP		20.1		USCS=SM Small amount of Costal Plain Deposits observed in sample
	25.0												
20			Dense, gray, silty fine to medium SAND		8-17-18 (35)								
	20.0												
25			...loose		3-4-6 (10)		NP	NP	NP		14.7		USCS=SM

(Continued Next Page)

Boring T-2

Project Name: Lowman CCR Rule Phase I
Project Location: Leroy,AL Hammer Type: Automatic
CDG Project Number: 061521207 Method: Diedrich D-50 Mud Rotary
Date Drilled: 8/9/2016 Approx. Ground Elevation: +/-42.0 feet

Notes:
+/- 18" of railroad ballast at ground surface

☒ - Split Spoon Sample

Depth (ft.)	Approx. Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			...loose *(Continued from previous page)*										
	15.0												
30			Stiff, light gray and brown, plastic CLAY with fine sand		3-3-4 (7)							1.25	
	10.0												
35			...same		4-4-6 (10)							1.25	
	5.0												
40			...trace sand		4-5-5 (10)		70	25	45		97.6	1.0	USCS=CH
	0.0												
45			...same		5-4-5 (9)							1.25	
	-5.0												
50			...medium, with trace organics		3-3-3 (6)							0.75	

(Continued Next Page)

Boring T-2

Project Name: Lowman CCR Rule Phase I
Project Location: Leroy,AL Hammer Type: Automatic
CDG Project Number: 061521207 Method: Diedrich D-50 Mud Rotary
Date Drilled: 8/9/2016 Approx. Ground Elevation: +/-42.0 feet

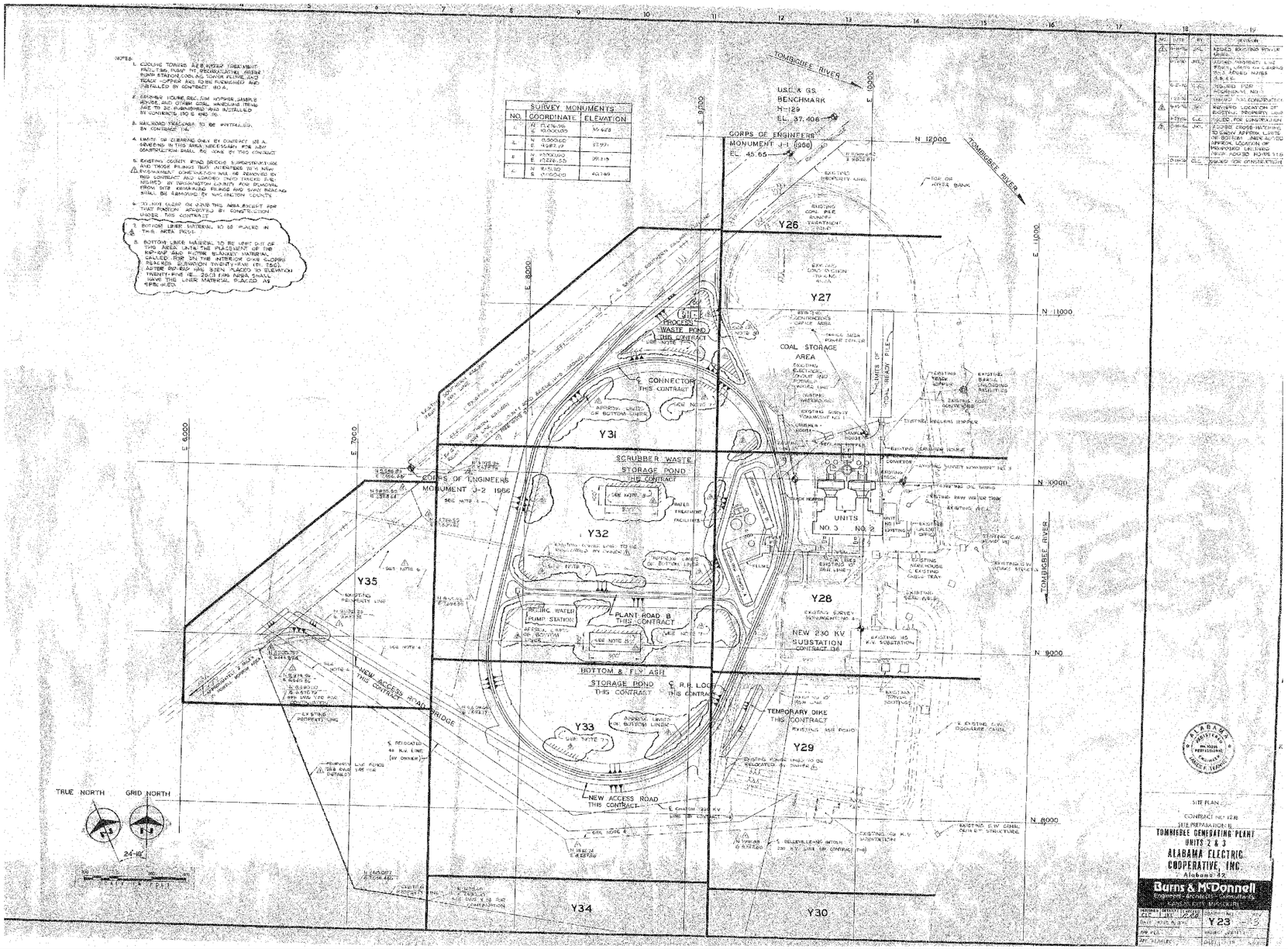
Notes:
+/- 18" of railroad ballast at ground surface

☒ - Split Spoon Sample

Depth (ft.)	Approx. Elev. (ft.)	Graphic Log	Material Description	Type	Blows/6" (N-Value)	Rec. % (RQD)	LL	PL	PI	MC	Fines (%)	PPqu (tsf)	Remarks
			...medium, with trace organics *(Continued from previous page)*										
55			...light gray, with trace organics	X	4-2-3 (5)							0.5	
	-15.0												
			Dense, tan, silty fine to medium SAND with few rock fragments (Coastal Plain Deposits)	X	16-20-18 (38)								Borehole backfilled with grout upon completion.
60			Boring terminated at 60.0 feet.										
	-20.0												
65													
	-25.0												
70													
	-30.0												
75													
	-35.0												

Appendix C

SHEET SHOWN IS EXCERPT FROM THE TOMBIGBEE GENERATING PLANT UNIT 2&3 PLANS CREATED BY BURNS & MCDONNEL CIRCA 1975.



Appendix C - Plan Copy of TOMBIGBEE GENERATING PLANT UNIT 2&3 PLANS CREATED BY BURNS & MCDONNEL CIRCA 1975.

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Engineering. Environmental. Answers.

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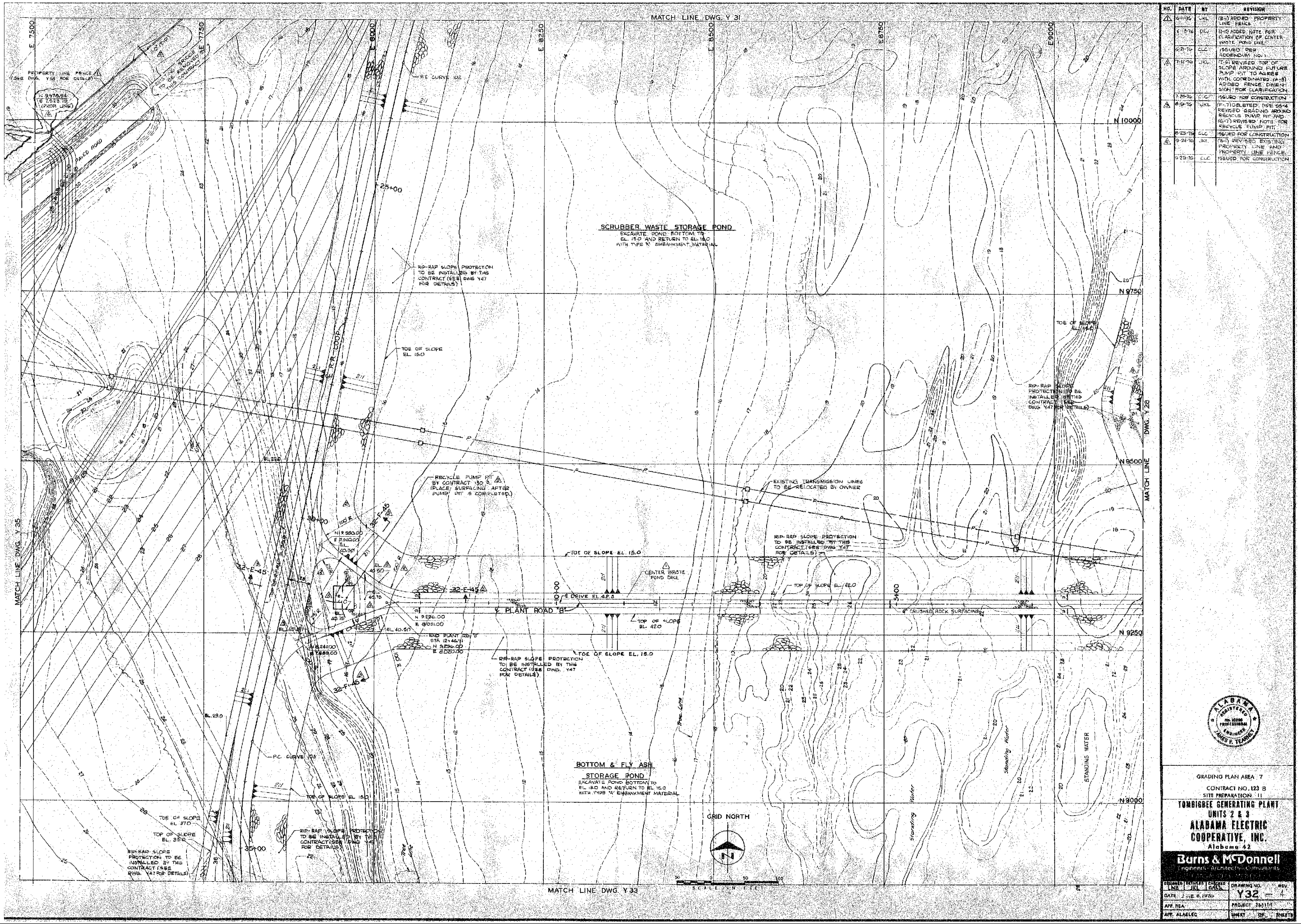
C

NOT TO SCALE

Drawn By: JRA

Checked by: RDW

Date: OCTOBER 2016



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Drawn By:	JRA
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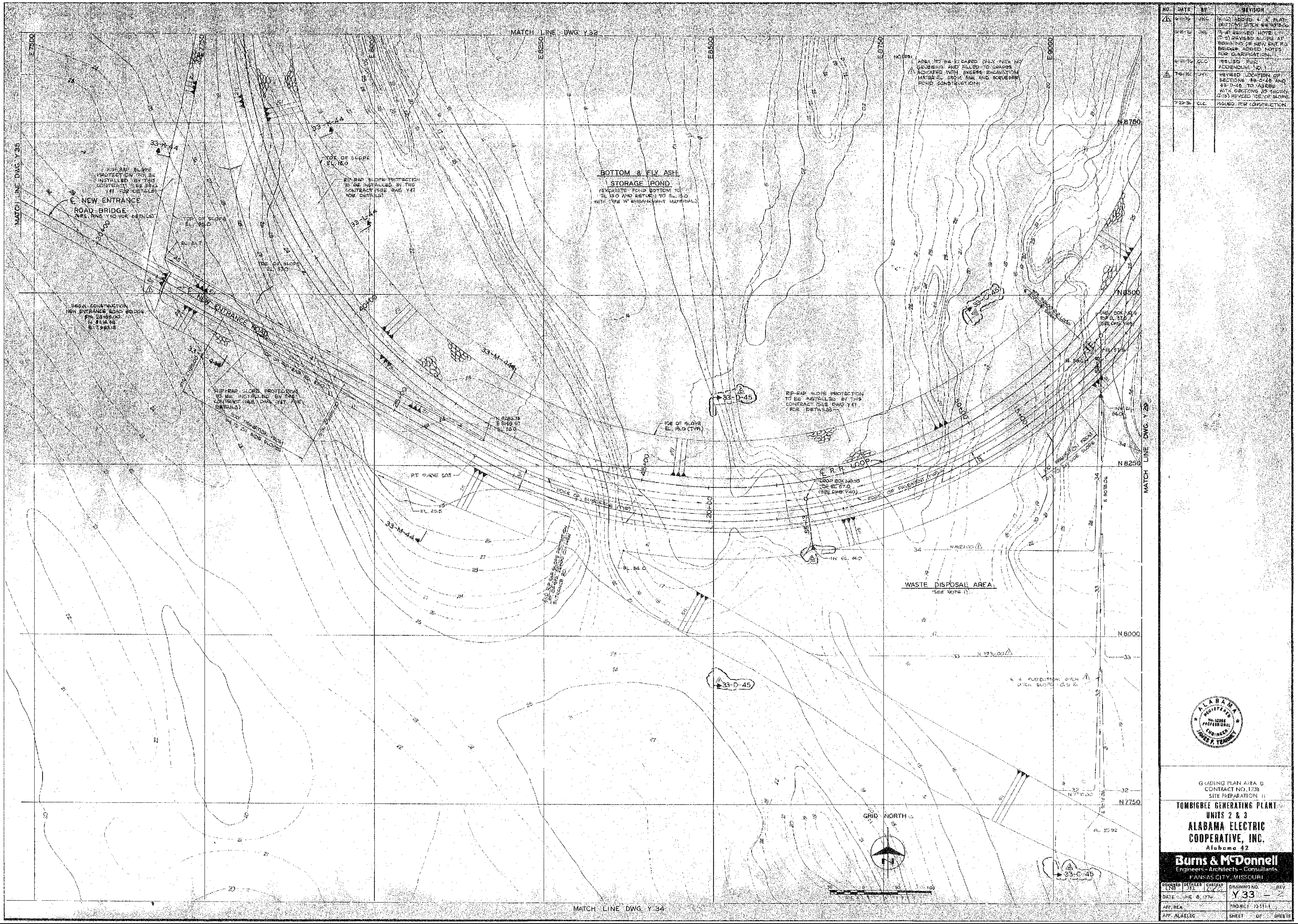

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