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October 12, 2016

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

Existing Liner Assessment
Gypsum Disposal Area and Stilling Ponds 1 & 2
EPA Final CCR Rule
TVA Paradise Fossil Plant
Drakesborow, Kentucky

1.0 PURPOSE

This letter documents AECOM's certification of the existing liner assessment for the TVA Paradise Fossil Plant's Gypsum Disposal Area and Stilling Ponds 1 & 2.

2.0 EXISTING LINER ASSESSMENT

As required in 40 CFR 257.71, an existing surface impoundment must be evaluated as to whether or not it was constructed with a liner as described in 40 CFR 257.71(a)(1)(i)-(iii).

3.0 SUMMARY OF FINDINGS

The attached report presents the analysis for the existing liner assessment. Based on the assessment, there is insufficient data to support the Gypsum Disposal Area and Stilling Ponds 1 & 2 being constructed with a liner that meets the requirements in the Final CCR Rule at 40 CFR 257.71(a)(1). Following the review of historical subsurface information on the Gypsum Disposal Area and Stilling Ponds 1 & 2 impoundments, it was determined that any underlying clayey soil layers do not meet EPA's interpretation of a mechanically place soil liner. Additional information regarding these soils is described in the attached report.

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AECOM

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Nicholas S Golden PE, being a Professional Engineer in good standing in the State of Kentucky, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;

2. that the information contained herein is accurate as of the date of my signature below; and

3. that the TVA Paradise Fossil Plant's Gypsum Disposal Area and Stilling Ponds 1 & 2 were not constructed with a liner system as described in 40 CFR 257.71(a)(1).

SIGNATURE _____ DATE 10/12/16

ADDRESS: AECOM
564 White Pond Drive
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TELEPHONE: (330) 836-9111

ATTACHMENTS: Liner Design Demonstration 40 CFR for §257.71 for Coal Combustion Residuals (CCR)

STATE OF KENTUCKY
NICHOLAS
GOLDEN
30816
LICENSED
PROFESSIONAL ENGINEER

COAL COMBUSTION PRODUCT DISPOSAL PROGRAM

TENNESSEE VALLEY AUTHORITY – GYPSUM DISPOSAL AREA AND STILLING PONDS 1 AND 2
DRAKESBORO, KENTUCKY

LINER DESIGN DEMONSTRATION (40 CFR §257.71) FOR COAL COMBUSTION RESIDUALS (CCR)
EXISTING SURFACE IMPOUNDMENTS - PARADISE FOSSIL PLANT

Prepared for

TVA

Tennessee Valley Authority
1101 Market Street
Chattanooga, TN 37402-2801

October 12, 2016

Prepared by

AECOM

STATE OF KENTUCKY
NICHOLAS GOLDEN
30816
LICENSED PROFESSIONAL ENGINEER

10/12/16

TVA CONFIDENTIAL INFORMATION – PREDECISIONAL AND DELIBERATIVE

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1.0 BACKGROUND

1.1 INTRODUCTION

On April 17, 2015 the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (EPA Final CCR Rule) was published in the Federal Register. AECOM was contracted by the Tennessee Valley Authority (TVA) to demonstrate liner design criteria for the Paradise Fossil Plant (PAF) Gypsum Disposal Area and Stilling Ponds 1 and 2, which are existing CCR surface impoundments, and evaluate compliance relative to §257.71 of the EPA Final CCR Rule.

The PAF facility is located at 13246 Kentucky 176 in Muhlenberg County, Kentucky on the west bank of the Green River, approximately five miles northeast of the center of the City of Drakesboro. The property occupies approximately 3,400 acres of land. The Gypsum Disposal Area manages FGD gypsum and some fly ash from the plant.

1.2 OBJECTIVE

The objective of this demonstration is to evaluate compliance related to §257.71, specifically whether Gypsum Disposal Area and Stilling Ponds 1 and 2 were constructed with one of the following:

- A liner consisting of a minimum of two feet of compacted soil with a hydraulic conductivity of no greater than 1×10^{-7} cm/sec;
- A composite liner that meets the requirements of § 257.70(b); or
- An alternative composite liner that meets the requirements of § 257.70(c).

The Rule was clarified by the EPA during a presentation on April 15, 2015 titled, "Top 20 Questions on EPA's CCR Final Rule". First, an existing natural clay layer, regardless of its hydraulic conductivity, does not meet the Rule as an acceptable clay liner. Second, "compacted soil" means soil that is mechanically compacted in lifts.

1.3 SUMMARY OF HISTORICAL INFORMATION

In 1985, the Gypsum Disposal Area and Stilling Ponds 1 and 2 were developed by the construction of two dikes. The first dike serves as the southern dike for Stilling Pond 1, and the splitter dike between Stilling Ponds 1 and 2. The second dike serves as the north dike of Stilling Pond 1. The remaining boundaries of the Gypsum Disposal Area and Stilling Pond 1 and 2 were defined by existing road embankments and topography.

In 1993, additional construction actives were performed for the Gypsum Disposal Area. Construction included the raising the southern dike, construction of eastern and western perimeter dikes, and an internal divider dike. See drawings **Appendix A** for historical construction drawings.

2.0 FIELD INVESTIGATION

There have been no additional field explorations at this facility. Historical geotechnical explorations have revealed select areas indicating clayey minespoil material beneath the impoundments. This clayey minespoil has variable thickness, rock fragment content, and permeability. New field explorations of the Gypsum Disposal Area and Stilling Ponds 1 and 2 at Paradise Fossil Plant were not undertaken.

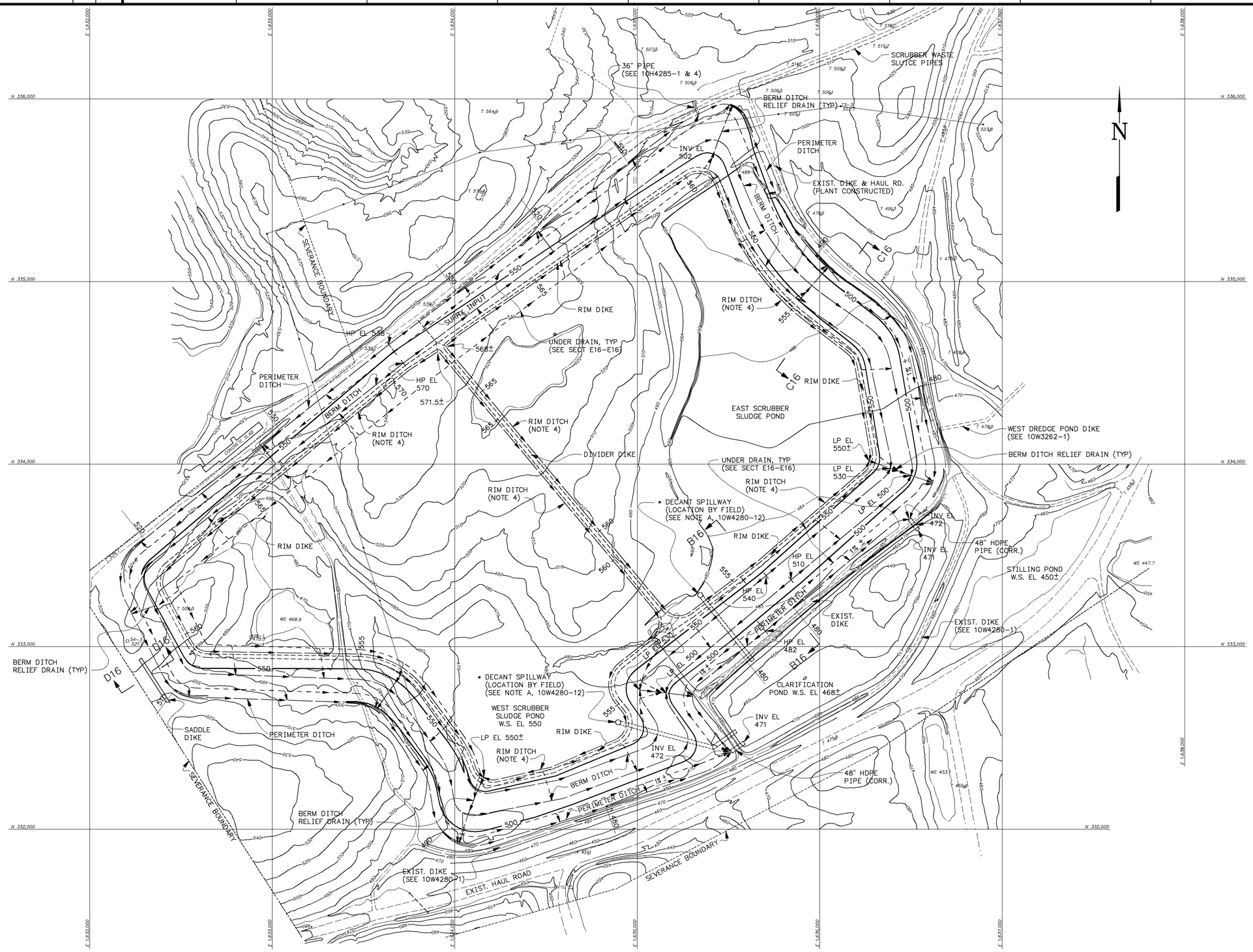
3.0 CONCLUSION

Historical construction documents were reviewed in order to evaluate status relative to the EPA Final CCR Rule criteria. Based on our review we were not able to confirm that, Gypsum Disposal Area and Stilling Ponds 1 and 2 at Paradise Fossil Plant was constructed with a liner that complies with the requirements of §257.71 of the EPA Final CCR Rule. This unit is therefore an unlined surface impoundment in accordance to the EPA Final CCR Rule and is allowed to remain in operation in compliance with the requirements of §257.101(a).

4.0 REFERENCES

- AECOM, Safety Factor Assessment §257.73 for prepared for CCR Certification, Gypsum Disposal Area Stilling Ponds 1 and 2, 2016.
- GEI Consultants, Engineer's Certificate of Initial Safety Factor Assessment for Coal Combustion Residuals (CCR), Scrubber Sludge Complex, 2016

APPENDIX A – HISTORICAL DRAWINGS



NOTES:
1. FOR GENERAL NOTES FOR GYPSUM STACK CONSTRUCTION SEE DRAWING 10W4280-12.

REV. NO.	DATE	DSGN	DRWN	CHKD	SUPV	RVWD	APPD	ISSD	PROJECT ID	AS CONST	REV CD
R											
R 0	INITIAL ISSUE	RDP	MGH	JLG	JLG	KWB	RGJ	WDH	423F		D

DISCIPLINE INTERFACE

SCALE: 1" = 200' EXCEPT AS NOTED

YARD: FGD SYSTEM
UNITS 1 & 2

WET SCRUBBER SYSTEM
GYPSUM STACKING
PLAN – RIM DITCH L.P. @ 550±

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SUPERVISED BY:	REVIEWED BY:	APPROVED BY:	ISSUED BY:
R.D.POWELL	M.G.HRANEK	J.L.GLOVER	J.L.GLOVER	K.W.BURNETT	R.G.JOHNSON	W.D.HALL

PARADISE FOSSIL PLANT
TENNESSEE VALLEY AUTHORITY
FOSSIL AND HYDRO ENGINEERING

AUTOCAD R12 | DATE | 64 | C | 10W4280-14 | R 0

TASK COMPLETED BY: | REV NO.

PLOT FACTOR:2400
W-SIZE
FILENAME: PF428014.DWG

C.A.D. DRAWING
DO NOT ALTER MANUALLY