October 2016 Project No. 1648164

Luminant
1601 Bryan Street
Dallas, Texas 75201

RE: INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT
CCR SURFACE IMPOUNDMENTS, OAK GROVE SES
ROBERTSON COUNTY, TX

1.0 INTRODUCTION

The "Disposal of Coal Combustion Residuals (CCR) from Electric Utilities rule" (40 Code of Federal Regulations (40 CFR) Part 257), effective October 19, 2015, requires that the owner or operator of all existing non-incised CCR units conduct an initial and period hazard potential classification assessments. This letter provides the initial hazard potential classification assessment pursuant to §257.73(a)(2) for the Oak Grove Steam Electric Station's (OGSES) CCR Impoundments, identified as flue gas desulphurization (FGD) Ponds FGD-A, FGD-B, and FGD-C.

2.0 HAZARD POTENTIAL CLASSIFICATION ASSESSMENT - §257.73(a)(2)(i)

A volumetric breach study was conducted to determine the impacts a breach of the CCR surface impoundments at Luminant's Oak Grove Steam Electric Station would have on the receiving waters. The three CCR surface impoundments evaluated include the FGD-A, FGD-B and FGD-C ponds. If breached, each surface impoundment would discharge to an isolated section of the Twin Oak Reservoir.

Near the Oak Grove surface impoundments, the Twin Oak Reservoir is divided into three hydraulically connected areas in series separated by berms extending 5 to 10 feet above the normal pool elevation as shown in Figure 1. The three CCR facilities are located adjacent to the Upper Secondary Discharge Pond, with potential breach flows discharging directly into it. A median berm separates the Upper Secondary Discharge Pond from the Secondary Discharge Canal, which are hydraulically connected by culverts through the berm. A second berm separates the Secondary Discharge Canal from the main Twin Oak Reservoir with the Tertiary Discharge Canal allowing flow to the main reservoir at a controlled rate.

Table 1 lists the approximate storage volumes of the CCR surface impoundments and Table 2 lists the surcharge volume of sections of the Twin Oak Reservoir. The total volume of any one CCR surface impoundment or the combined volume of FGD-A and FGD-B (215 acre-feet maximum) would be fully contained within the Upper Secondary Discharge Pond (1,000 acre-feet above normal pool). A failure of FGD-A into FGD-B may cause a subsequent failure of FGD-B. However, the combined failure of FGD-C with FGD-A or FGD-B is highly unlikely as they are not interconnected.

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Potential breach water entering the Upper Secondary Discharge Pond may enter the Secondary Discharge Canal through the connecting culverts; however, CCR product would likely settle within the Upper Secondary Discharge Pond. Because of a large spatial separation between the Upper Secondary Discharge Pond and the discharge point to the main reservoir, potential breach water would likely remain within the Upper Secondary Discharge Pond and the Secondary Discharge Canal, displacing and sending fresh water downstream into the main reservoir.

The Secondary Discharge Pond and Canal and the main Twin Oak Reservoir would provide primary, secondary and tertiary protection preventing the uncontrolled release of CCR product into Duck Creek downstream of the Twin Oak Dam, located over 2 miles of the discharge point into Twin Oak Reservoir.

Table 1: CCR Surface Impoundment Storage Volumes

CCR Facility	Released Volume (acre-feet)
FGD-A	190
FGD-B	125
FGD-C	248

Note: Released volume is based on as-built survey information developed for each surface impoundment.

Table 2: Surcharge Volumes

Receiving Section of Twin Oak Reservoir	Surcharge Volume (acre-feet)
Upper Secondary Discharge Pond	1,000
Secondary Discharge Canal	1,000
Twin Oaks Reservoir	6,000

Note: Surcharge volume is approximate storage between the normal pool and top of dike elevation for the upper and lower Secondary Discharge Pond, and normal pool to auxiliary spillway elevation for the main reservoir.

A breach of a CCR surface impoundment at Luminant's Oak Grove Steam Electric Station does not pose a probable loss of life. Luminant controls access to the Twin Oak Reservoir, and no public access or fishing is allowed. Consequently, a breach within any of the three CCR surface impoundments will not cause an economic loss or significant environmental damage.

According to the definitions included in §257.53, a "low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment's owner's property."

3.0 CONCLUSION

Based on the conditions described above, each of the three CCR surface impoundments at the Oak Grove Steam Electric Station (FGD-A, FGD-B, and FGC-C) meet the definition of a Low Hazard Surface Impoundment.

Golder appreciates the opportunity to assist Luminant with this project. If you have any questions, or require further assistance from Golder, please contact the undersigned at (281) 821-6868.

Sincerely,

GOLDER ASSOCIATES INC.

Michael Chilson, PE (GA)
Senior Civil Engineer

Jeffrey B. Fassett, PE
Senior Consultant and Associate

MC/JBF/

Attachments:

Figure 1 – Site Layout

4.0 CERTIFICATION

I hereby certify that this report has been prepared in general accordance with normally accepted civil engineering practices and in accordance with the requirements of 40 CFR 257.73(a)(2).

Jeffrey B. Fassett, PE
Golder Associates Inc.
Firm Registration Number F-2578

5.0 REFERENCES

Texas Water Development Board Website
https://www.twdb.texas.gov/mapping/doc/maps/plates/brazos/existing/twin_oak.pdf

0 600 1,200
1" = 600'
FEET

TERTIARY DISCHARGE CANAL

SECONDARY DISCHARGE CANAL
NORMAL POOL ELEV: ~410 FT-MSL
AVERAGE AREA: ~270 AC
SURCHARGE DEPTH: ~6 FT
SURCHARGE STORAGE: ~1,600 AC-FT

MULTIPLE CULVERTS HYDRAULICALLY CONNECT IMPOUNDMENTS

TOD: 423 FT-MSL

TOD: 416 FT-MSL

TWIN OAK RESERVOIR

NORMAL POOL:	401 FT	30,300 AC-FT
AUXILIARY SPILLWAY:	407 FT	46,300 AC-FT
SURCHARGE STORAGE:		6,000 AC-FT

UPPER SECONDARY DISCHARGE POND
NORMAL POOL ELEV: ~410 FT-MSL
AVERAGE AREA: ~80 AC
SURCHARGE DEPTH: ~13 FT
SURCHARGE STORAGE: ~1,000 AC-FT

TOD: 431.5 FT

BOT: 416 FT

FGD-B
HYDRAULIC HEAD: 15.5 FT
AVERAGE AREA: 8.1 AC
STORAGE: 125 AC-FT

TOD: 450 FT

FGD-A
HYDRAULIC HEAD: 28 FT
AVERAGE AREA: 6.8 AC
STORAGE: 190 AC-FT

BOT: 443 FT

TOD: 464 FT

BOT: 422 FT

FGD-C
HYDRAULIC HEAD: 21 FT
AVERAGE AREA: 11.8 AC
STORAGE: 248 AC-FT

WATERSHED AREA TO SUMPS

WATERSHED AREA TO LIGNITE RUNOFF POND

10/11/16
STATE OF TEXAS
JEFFREY B. FASSETT
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LICENSED PROFESSIONAL ENGINEER

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IMAGE REFERENCE
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

CLIENT
LUMINANT

PROJECT
OAK GROVE CCR SURFACE IMPOUNDMENTS
INITIAL HAZARD CLASSIFICATION

TITLE
SITE LAYOUT

CONSULTANT
Golder Associates

YYYY-MM-DD	2016-10-06
DESIGNED	MTC
PREPARED	MTC
REVIEWED	WEG
APPROVED	JBF

PROJECT NO. 1648164
REV. 2
FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: Q:\GIS\Luminant\1648164 Oak Grove CCR Assessment\Lumi0G_Setup.mxd PRINTED ON: 2016-10-06 AT: 11:41:18 AM