



Submitted to
Southern Indiana
Gas & Electric Company
dba Vectren Power
Supply, Inc. (SIGECO)
One Vectren Square
Evansville, IN 47708

Submitted by
AECOM
9400 Amberglen Boulevard
Austin, Texas 78729

October 2016

CCR Certification:
Initial Hazard Potential
Classification

§257.73 (a)(2)

for the

Ash Pond

at the

A.B. Brown Generating Station

Revision 0

Table of Contents

Executive Summary ES-1

1 Introduction 1-1

 1.1 Purpose of This Report..... 1-1

 1.2 Brief Description of Impoundments..... 1-1

2 Hazard Potential Classification2-1

 2.1 Method of Analysis2-1

 2.2 Dam Breach Analysis Report.....2-1

 2.3 Dam Breach Topographic Review2-1

 2.4 EPA Assessment.....2-1

3 Conclusions.....3-1

4 Certification4-1

5 Limitations5-1

Tables

Table ES-1 Certification Summary

Table 1-1 CCR Rule Cross Reference Table

Appendices

Appendix A Figures

 Figure 1 – Location Map

 Figure 2 – Site Map

 Figure 3 – Discharge Path Map

Executive Summary

This Coal Combustion Residuals (CCR) Initial Hazard Potential Classification (Hazard Potential Classification) for the Ash Pond at the Southern Indiana Gas & Electric Company, dba Vectren Power Supply, Inc., A.B. Brown Generating Station has been prepared in accordance with the requirements specified in the USEPA CCR Rule under 40 Code of Federal Regulations §257.73 (a)(2). These regulations require that the specified documentation, assessments and plans for an existing CCR surface impoundment be prepared by October 17, 2016.

This Hazard Classification meets the regulatory requirements as summarized in **Table ES-1**.

Table ES-1 – Certification Summary				
Report Section	CCR Rule Reference	Requirement Summary	Requirement Met?	Comments
Initial Hazard Potential Classification				
3	§257.73 (a)(2)	<i>An initial hazard potential classification assessment is required for each CCR unit of High, Significant or Low.</i>	Yes	This Initial Hazard Assessment has been prepared based on conditions of the CCR unit as of October 16, 2016.

The Brown Ash Pond is currently an active surface impoundment, classified as a Significant hazard as described in the CCR Rule. Documentation to support this classification is included within this report.

1 Introduction

1.1 Purpose of This Report

The purpose of the Initial Hazard Potential Classification (Hazard Potential Classification) is to document the classification requirements specified in Code of Federal Regulations (CFR) §257.73 (a)(2) have been met to support the certification required under each of those regulatory provisions for the A.B. Brown Generating Station (Brown) Ash Pond. The Brown Ash Pond is an existing coal combustion residual (CCR) surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the hazard potential classification for an existing CCR surface impoundment be prepared by October 17, 2016.

The Brown station has an interconnected existing CCR surface impoundment, the Ash Pond, which consists of a lower pool and an upper pool. The following table summarizes the documentation required within the CCR Rule and the sections that specifically respond to those requirements of this assessment.

Table 1-1 – CCR Rule Cross Reference Table

Report Section	Title	CCR Rule Reference
2	Hazard Potential Classification	§257.73 (a)(2)(i)

1.2 Brief Description of Impoundment

The Brown station is a coal-fired power plant located approximately 10 miles east of Mount Vernon in Posey County, Indiana and is owned and operated by Southern Indiana Gas & Electric Company, dba Vectren Power Supply, Inc. (SIGECO). The station is situated just west of the Vanderburgh-Posey County line and north of the Ohio River with the Ash Pond positioned on the east side of the generating station.

The Ash Pond was commissioned in 1978. An earthen dam was constructed across an existing valley to create the impoundment. In 2003, a second dam was constructed east of the original dam and further up the valley to increase the storage capacity. This temporarily created an upper pond and a lower pond. The upper and lower ponds were operated separately until 2016 when the upper dam was decommissioned. A 10' wide breach was installed in the upper embankment and the normal pool elevation was lowered. Currently, the upper pool and the lower pool act as one CCR unit referred to as the Ash Pond, which has a surface area of approximately 159 acres.

The lower pool dam embankment is approximately 1,540 feet long, 30 feet high, and has 3 to 1 (horizontal to vertical) side slopes covered with grassy vegetation. The embankment crest elevation is 450.9 feet¹ and has a crest width of 20 feet. An earthen buttress was constructed against the outboard slope of the dam. The buttress crest extends the length of the dam, is up to 200 feet wide and varies in elevation from 442 feet to 432 feet. A Site

¹ Unless otherwise noted, all elevations in this report are in the NAVD88 datum.

Location Map showing the area surrounding the station is included as **Figure 1 of Appendix A**. **Figure 2 in Appendix A** presents the Brown Site Map.

2 Hazard Potential Classification

2.1 Method of Analysis

A number of historic analyses and evaluations have been performed on the Ash Pond. These reports include the Dam Breach Analysis and Summary Report prepared by ATC Associates, Inc. (ATC) dated January 2011, the EPA Lower Ash Pond Dam – A.B. Brown Station Assessment Report prepared by O'Brien and Gere dated September 2009, and EPA Upper Ash Pond Dam – A.B. Brown Station Assessment Report prepared by O'Brien and Gere dated September 2009. The data from these reports (as well as observations of physical setting and topography) have been used to provide the basis for this Hazard Potential Classification.

2.2 Dam Breach Analysis Report

ATC Associates Inc. completed a dam breach analysis and summary report in January, 2011. For this report, the US Army Corps of Engineers HEC-RAS (Version 4.0-2008) model was used to complete the dam breach analyses. The HEC-RAS model has the ability to simulate a dam failure and estimate the resulting downstream flood conditions. HEC-RAS can be used to model failure due to overtopping, as well as piping failure breaches for earthen dams. The resulting flood wave is routed downstream using unsteady flow equations through topographic cross-sections to estimate the corresponding water surface elevations that could occur.

The dams for this study were modeled as in-line structures with cross-sections upstream of each structure to characterize the impoundment storage areas and cross-sections downstream of the lower impoundment to characterize the channel and floodplain areas downstream through West Franklin Road. Two (2) potential flood wave pathways were modeled, including a breach into the South Valley and a breach into the Brown station. While the report modelled the former conditions prior to the installation of the Upper Dam breach, the resulting downstream conditions in the event of a failure are believed generally similar to current conditions as the downstream topography is unchanged from the date of the report.

The report indicated that the surrounding roads and some plant building areas could be inundated if there is a breach of the dam and recommended a notification plan be prepared for the surrounding areas.

The report recommended a "Significant" classification for the pond based on proximity to the Ohio River and potential economic impacts caused by a potential failure.

2.3 Dam Breach Topographic Review

Appendix A, Figure 3 shows the location of the Ash Pond dam. Upon failure of the lower dam, the flow path would follow the local topography surrounding the site and follow the path of the stream west of the dam. Similar to the conclusions of the EPA report, no residences are located directly adjacent to the dam or are located within the downgradient release pathway. Review of the area suggests that loss of life would not be considered probable upon failure, but the close proximity to the Ohio River may cause an environmental and economic impact.

2.4 EPA Assessment

Following the TVA Kingston dike failure in 2008, the EPA embarked on an initiative to prevent the catastrophic failure from occurring at other such facilities located at electric utilities in an effort to protect lives and property

from the consequences of a dam or impoundment failure of the improper release of impounded slurry. As part of the EPA's effort, O'Brien and Gere performed a site assessment at the A.B. Brown Power Generating Station. This report summarizes the observations and findings of the site assessment that occurred on June 4, 2009 (O'Brien and Gere, 2009).

The report recommended a "Significant" classification for the pond based on proximity to the Ohio River and potential economic impacts caused by a potential failure.

3 Conclusions

Regulatory Citation: 40 CFR §257.73 (a)(2) Period hazard potential classification assessments.

- *(i) The owner or operator of the CCR unit must conduct initial and periodic hazard potential classification assessments of the CCR unit ... The owner or operator must document the hazard potential classification of each CCR unit as either a high hazard potential CCR surface impoundment, a significant hazard potential CCR surface impoundment, or a low hazard potential CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.;*

Background and Assessment

CCR units are designated as one of three classes depending on likelihood of losses resulting from mis-operation or failure.

1. High hazard potential CCR surface impoundments are likely to cause loss of human life upon failure. The CCR Rule design storm for a High hazard potential facility is the full Probable Maximum Flood (PMF).
2. Significant hazard potential CCR surface impoundments are likely to cause economic loss, environmental damage, disruption of lifeline facilities, or other impacts; but not loss of life. The CCR Rule design storm for a Significant hazard potential facility is the 1000-year event.
3. Low hazard potential CCR surface impoundments are not likely to cause loss of life or significant economic or environmental losses. The design storm for a Low hazard potential facility is the 100-year event.

Likelihood of loss of human life is primarily discussed within this report, which is the deciding factor between Hazard Potential Classifications of Significant and High. Loss of life is not deemed probable based on the local topography. The Ash Pond does not qualify for a Low hazard potential due to its proximity to an adjacent industry rail staging area and the possibility of economic loss.

Conclusion and Recommendation

Based upon the analyses reviewed, and completed by AECOM, we confirm the Hazard Potential Classification of the Ash Pond at the Brown station impoundment facility as “Significant” in regards to the requirement in §257.73 (a)(2).

4 Certification

This Certification Statement documents that the Ash Pond at the A.B. Brown Generating Station meets the Initial Hazard Potential Classification requirements specified in 40 CFR §257.73 (a)(2). The Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the Initial Hazard Potential Classification for an existing CCR surface impoundment be prepared by October 17, 2016.

CCR Unit: Southern Indiana Gas & Electric Company; A.B. Brown Generating Station; Ash Pond

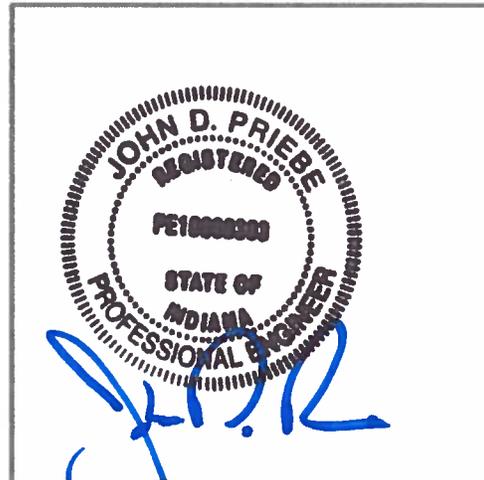
I, John Priebe, being a Registered Professional Engineer in good standing in the State of Indiana, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the above referenced CCR Unit, that the Initial Hazard Potential Classification dated October 13, 2016 meets the requirements of 40 CFR § 257.73 (a)(2).

JOHN D. PRIEBE

Printed Name

10/13/16

Date



5 Limitations

Background information, design basis, and other data which AECOM has used in preparing this report have been furnished to AECOM by SIGECO. AECOM has relied on this information as furnished, and is not responsible for the accuracy of this information. Our recommendations are based on available information from previous and current investigations. These recommendations may be updated as future investigations are performed.

The conclusions presented in this report are intended only for the purpose, site location, and project indicated. The recommendations presented in this report should not be used for other projects or purposes. Conclusions or recommendations made from these data by others are their responsibility. The conclusions and recommendations are based on AECOM's understanding of current plant operations, maintenance, stormwater handling, and ash handling procedures at the station, as provided by SIGECO. Changes in any of these operations or procedures may invalidate the findings in this report until AECOM has had the opportunity to review the findings, and revise the report if necessary.

This hazard potential classification analysis was performed in accordance with the standard of care commonly used as state-of-practice in our profession. Specifically, our services have been performed in accordance with accepted principles and practices of the engineering profession. The conclusions presented in this report are professional opinions based on the indicated project criteria and data available at the time this report was prepared. Our services were provided in a manner consistent with the level of care and skill ordinarily exercised by other professional consultants under similar circumstances. No other representation is intended.

Appendix A Figures

Figure 1 – Location Map

Figure 2 – Site Map

Figure 3 – Discharge Path Map



9400 Amberglenn Boulevard
Austin, TX 78729-1100
512-454-4797 (phone)
512-454-8807 (fax)

**SOUTHERN INDIANA
GAS AND ELECTRIC
COMPANY**
dba VECTREN POWER
SUPPLY, INC.

One Vectren Square
Evansville, IN 47708
1-800-227-1376 (phone)

**A.B. BROWN
GENERATING STATION
MT. VERNON, IN**

**CCR CERTIFICATION
ASH POND**

**ISSUED FOR
CERTIFICATION**

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS		
NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO:	60442676
DRAWN BY:	MJC
DESIGNED BY:	MJC
CHECKED BY:	TLE
DATE CREATED:	
PLOT DATE:	4/22/2016
SCALE:	AS SHOWN
ACAD VER:	2014

SHEET TITLE

LOCATION MAP

FIGURE 1



9400 Amberglen Boulevard
Austin, TX 78728-1100
512-454-4797 (phone)
512-454-8807 (fax)

**SOUTHERN INDIANA
GAS AND ELECTRIC
COMPANY**
dba VECTREN POWER
SUPPLY, INC.

One Vectren Square
Evansville, IN 47708
1-800-227-1376 (phone)

**A.B. BROWN
GENERATING STATION
MT. VERNON, IN**

**CCR CERTIFICATION
ASH POND**

**ISSUED FOR
CERTIFICATION**

ISSUED FOR BIDDING _____ DATE BY _____

ISSUED FOR CONSTRUCTION _____ DATE BY _____

REVISIONS

NO.	DESCRIPTION	DATE
△		
△		
△		
△		
△		

AECOM PROJECT NO: 60442676

DRAWN BY: MJC

DESIGNED BY: MJC

CHECKED BY: TLE

DATE CREATED:

PLOT DATE: 4/22/2016

SCALE: AS SHOWN

ACAD VER: 2014

SHEET TITLE

SITE MAP

FIGURE 2

J:\Project\Vector\60442676_CCR_Support\Data-Tech\GIS\Layers\Culley



0 300 600
Feet

Legend

- Surface Elevation Contour (5')
- Discharge path defined by ATC Associates Dam Breach Analysis

BASE MAP SOURCE: Image courtesy of USGS Image courtesy of the

Figure 3

Discharge Path Map: AB
Brown Ash Pond

AECOM

9400 Amberglen Boulevard
Austin, Texas 78729
1-512-454-4797

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of \$6 billion.