AECOM

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 13, 2016

CCR Certification:
Initial Structural Stability Assessment
§257.73 (d)

for the

Ash Pond

at the

A.B. Brown Generating Station

Revision 0

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Executive Summary

This Coal Combustion Residuals (CCR) Initial Structural Stability Assessment (Structural Stability Assessment) 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 (d)(1). These regulations require that the specified documentation, assessments and plans for an existing CCR surface impoundment be prepared by October 17, 2016.

This Structural Stability Assessment for the Ash Pond 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
2.1	§257.73 (d)(1)(i)	*Foundations and Abutments*	Yes	The CCR Unit has stable foundations
2.2	§257.73 (d)(1)(ii)	*Slope Protections*	Yes	The CCR Unit has sufficient slope protection
2.3	§257.73 (d)(1)(iii)	*Dike Compaction*	Yes	The CCR Unit has appropriate dike Compaction
2.4	§257.73 (d)(1)(iv)	*Vegetated Slopes*	Yes	The CCR Unit has vegetated slopes or other forms of protection
2.5	§257.73 (d)(1)(v)	*Spillways*	Yes	The CCR Unit spillways are sufficient for the 1000 year event
2.6	§257.73 (d)(1)(vi)	*Stability and Structural Integrity of Hydraulic Structures*	Yes	Hydraulic structures passing through the base of the unit are free from noticeable defects which may negatively affect the operation of the unit
2.7	§257.73 (d)(1)(vii)	*Downstream Slope Inundation / Stability*	Yes	The CCR Unit maintains structural stability during low pool or sudden drawdown of adjacent water body

The Brown Ash Pond is currently an active surface impoundment. All structural stability assessment requirements were evaluated and the surface impoundment was found to meet all requirements as required within each individual structural stability assessment in §257.73 (d)(1).

1 Introduction

1.1 Purpose of this Report

The purpose of the Initial Structural Stability Assessment (Structural Stability Assessment) presented in this report is to document that the requirements specified in 40 Code of Federal Regulations (CFR) §257.73 (d) have been met to support the certification required under each of the applicable 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 structural stability assessment 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
2.1	Foundations and Abutments	§257.73 (d)(1)(i)
2.2	Slope Protection	§257.73 (d)(1)(ii)
2.3	Dike Compaction	§257.73 (d)(1)(iii)
2.4	Vegetated Slopes	§257.73 (d)(1)(iv)
2.5	Spillways	§257.73 (d)(1)(v)
2.6	Stability and Structural Integrity of Hydraulic Structures	§257.73 (d)(1)(vi)
2.7	Downstream Slope Inundation / Stability	§257.73 (d)(1)(vii)

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 Brown 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 feet[1] 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 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.

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

2 Structural Stability Assessment Description

Regulatory Citation: 40 CFR §257.73 (d)(1);

- *The owner or operator of the CCR unit must conduct initial and periodic structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR unit has been designed, constructed, operated, and maintained with [the standards in (d)(1)(i)-(vii)]:*

The Structural Stability Analysis for the Ash Pond is described in this section. Information about operational and maintenance procedures was provided by Brown plant personnel. The Brown station follows an established maintenance program that quickly identifies and resolves issues of concern.

2.1 Foundations and Abutments

Regulatory Citation: 40 CFR §257.73 (d)(1);

- *(i) Stable foundations and abutments;*

Background and Assessment

The stability of the foundations was evaluated using soil data from field investigations and reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. Additionally, slope stability analyses were performed to evaluate slip surfaces passing through the foundations.

The foundation soils consist of interbedded stiff to very stiff clay and loose to medium dense silt soils. While the silts are susceptible to liquefaction as a result of strong earthquake shaking, the slope stability analyses exceed the criteria listed in §257.73(e)(1) for slip surfaces passing through the foundation (including the post-liquefaction loading condition). Therefore, the foundation soils are considered to be stable under all loading conditions. The slope stability analyses are discussed in the *CCR Certification Report: Initial Safety Factor Assessment for the Ash Pond at the A.B. Brown Generating Station* (October 2016). A review of operational and maintenance procedures as well as current and past performance of the dikes has determined appropriate processes are in place for continued operational performance.

Conclusion and Recommendation

Based on the conditions observed by AECOM, the Ash Pond was designed and constructed with stable foundations. Operational and maintenance procedures are in place to address any issues related to the stability of foundations.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(i).

2.2 Slope Protection

Regulatory Citation: 40 CFR §257.73 (d)(1);

- *(ii) Adequate slope protection to protect against surface erosion, wave action and adverse effects of sudden drawdown;*

Background and Assessment

The adequacy of slope protection was evaluated by reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM.

The exterior slopes of the lower pool berm are covered with grass vegetation. The interior slopes of the lower pool and upper pool berms are covered with rip-rap which has an approximate median diameter of 15-inches. No evidence of significant areas of erosion or wave action was observed during AECOM's site visit on February 23, 2016. See **Appendix B** for further details from AECOM's site visit.

Due to the recent installation of a buttress at the toe of the lower pool embankment, vegetation has not been fully established on the buttress. After construction of the buttress was completed in October 2016, seed was placed on the disturbed areas, and a straw mat was installed to protect the area from erosion during the growing season. Grass has begun to grow, but will require additional time to become adequately established.

Conclusion and Recommendation

Based on this evaluation, adequate slope protection was designed and constructed at the Ash Pond. Areas outside of the limits of construction of the buttress show no evidence of significant areas of erosion or wave action. However, areas within the limits of the buttress construction that are not fully vegetated due to recent construction are protected against wind and stormwater erosion with straw mat and must be inspected regularly and repaired as necessary until they are adequately vegetated. Operational and maintenance procedures to repair the vegetation (exterior slopes) and rip-rap (interior slopes) as needed are appropriate to protect against surface erosion or wave action. Sudden drawdown of the pool in the Ash Pond is not expected to occur. See Section 2.7 of this report for further information on sudden drawdown.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(ii).

2.3 Dike Compaction

Regulatory Citation: 40 CFR §257.73 (d)(1)

- *(iii) Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR unit;*

Background and Assessment

The density of the dike materials was evaluated using soil data from field investigations and reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. Additionally, slope stability analyses were performed to evaluate slip surfaces passing through the dike over the range of expected loading conditions as defined within §257.73 (e)(1).

Historical construction drawings for the dam required that the embankment be compacted to 95% of the Standard Proctor maximum dry density (ASTM D 698). Based on the geotechnical field evaluations, the dam embankment consists of stiff to very stiff clayey soils that have consistency and strength indicative of well-compacted materials. The soil buttress that exists against the downstream slope of the dam was constructed in 8-inch loose lifts and was mechanically compacted to at least 95% of the Standard Proctor maximum dry density. Soil densities for the buttress were verified using nuclear methods. Slope stability analyses exceed the criteria listed in §257.73 (e)(1) for slip surfaces passing through the dike. The slope stability analyses and results are discussed in the *CCR Rule Report: Initial Safety Factor Assessment for the Ash Pond at the A.B. Brown Generating Station* (October 2016).

Conclusion and Recommendation

Based on the conditions observed by AECOM, the Ash Pond was designed and constructed with sufficient dike compaction.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(iii).

2.4 Vegetated Slopes

Regulatory Citation: 40 CFR §257.73 (d)(1)

- *(iv) Vegetated slopes of dikes and surrounding areas, except for slopes which have an alternate form or forms of slope protection;*[2]

Background and Assessment

The adequacy of slope vegetation was evaluated by reviewing design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM.

The exterior slopes of the lower pool berm are covered with grass vegetation. No evidence of significant areas of erosion was observed during AECOM's site visit on February 23, 2016. See **Appendix B** for further details from AECOM's site visit.

Due to the recent installation of a buttress at the toe of the lower pool embankment, vegetation was not fully established in the construction area. After construction of the buttress was completed in October 2016, seed was placed on the disturbed areas, and a straw mat was installed to protect the seed from erosion during the growing season. Grass has begun to grow, but will require additional time to become adequately established.

Conclusion and Recommendation

Based on this evaluation, the vegetation on the exterior slopes of the areas outside of the limits of construction of the buttress is adequate as no substantial bare or overgrown areas were observed. Therefore, the original design and construction of the Ash Pond included adequate vegetation of the dikes and surrounding areas. Areas within the limits of the buttress construction that are not fully vegetated due to recent construction are protected against wind and stormwater erosion with straw mat and must be inspected regularly and repaired as necessary until they are adequately vegetated. Adequate operational and maintenance procedures are in place to regularly manage

[2] As modified by court order issued June 14, 2016, Utility Solid Waste Activities Group v. EPA, D.C. Cir. No. 15-1219 (order granting remand and vacatur of specific regulatory provisions).

vegetation growth, including mowing and seeding any bare areas, and to address erosional issues as they occur, as evidenced by the conditions observed by AECOM.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(iv).

2.5 Spillways

Regulatory Citation: 40 CFR §257.73 (d)(1)

- *(v) single spillway or a combination of spillways configured as specified in [paragraph (A) and (B)]:*
  - *(A) All spillways must be either:*
    - *(1) of non-erodible construction and designed to carry sustained flows; or*
    - *(2) earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.*
  - *(B) The combined capacity of all spillways must adequately manage flow during and following the peak discharge from a:*
    - *(1) Probable maximum flood (PMF) for a high hazard potential CCR surface impoundment; or*
    - *(2) 1000-year flood for a significant hazard potential CCR surface impoundment; or*
    - *(3) 100-year flood for a low hazard potential CCR surface impoundment.*

Background and Assessment

The plant operates as a zero-discharge facility during normal operating conditions, so it is uncommon for water to discharge from the lower pool. However, if a discharge does occur, the runoff drains through the permitted NPDES outfall to an unnamed tributary which travels west for approximately 0.5 mile before turning south for approximately one mile and discharging into the Ohio River.

There are five spillways available for discharge runoff from the lower pool. These spillways were evaluated using design drawings, operational and maintenance procedures, and conditions observed in the field by AECOM. The conditions of each structure were observed in the field by AECOM February 23, 2016. See Site Visit Report in **Appendix B** for additional details.

The first outlet is a 12-inch HDPE Ash Pond Discharge Line that goes to a chemical precipitation treatment system prior to mixing with other plant water and going to an NPDES permitted outfall. The HDPE pipe is a non-erodible material.

The second outlet is a Low Pressure Recirculation System. This system is comprised of three pumps that are rated for 2,750 gpm each. All three pumps discharge into individual 8-inch diameter carbon steel pipes before combining into a common header and proceeding as a 20-inch diameter carbon steel pipeline to the plant. The carbon steel pipe is a non-erodible material.

The third outlet is a High Pressure Recirculation System. This system is comprised of two high pressure pumps that are rated for 2,100 gpm each. Both pumps discharge into individual 8-inch diameter carbon steel pipes before combining into a common header and proceeding as a 10-inch diameter carbon steel pipeline to the plant. The carbons steel pipe is a non-erodible material.

The fourth outlet is the Principal Spillway which consists of a metal gooseneck inlet structure connected to a 36-inch RCP drop inlet. Discharge from the inlet flows to a 36-inch diameter RCP pipe that discharges near the toe of the embankment. The steel and RCP pipes of the Principal Spillway are non-erodible material.

The fifth outlet is the Emergency Spillway which is a grass-lined, trapezoidal channel spillway. Class II rip-rap, which has a median diameter of approximately 15-inches, was used to line the discharge channel to prevent erosion. The grass-lined spillway and the rip-rap lined channel of the Emergency Spillway discharge channel were designed to prevent erosion. The velocities through the spillways during peak discharge were analyzed to determine if erosion would occur within preparation of the *CCR Certification: Initial Inflow Design Flood Control System Plan for the Ash Pond at the A.B. Brown Generating Station* (October 2016).

Additionally, hydrologic and hydraulic analyses were completed to evaluate the capacity of the spillway relative to inflow estimated for the 1,000-year flood event for the significant hazard potential for the Ash Pond. The ability of the spillway design to carry sustained flows, as well as the capacity of the spillway, was evaluated using hydrologic and hydraulic analysis performed per §257.82(a). The hydrologic and hydraulic analyses are discussed in the *CCR Certification: Initial Inflow Design Flood Control System Plan for the Ash Pond at the A.B. Brown Generating Station* (October 2016).

Conclusion and Recommendation

All outlet devices were designed to prevent erosion. The HDPE, steel and RCP pipes of the outlets are non-erodible material, while the channel of the Emergency Spillway is lined with rip-rap.

The analysis found that the spillways can adequately manage flow during peak discharge resulting from the 1,000-year storm event without overtopping of the embankments. The peak water surcharge elevation is 446.8 feet during the IDF, and the minimum crest elevation of the Ash Pond dike is 450.9 feet, resulting in 4.1 feet of freeboard. This also indicates that the design of the spillway is adequate to carry sustained flows. Operational and maintenance procedures are in place to remove debris or other obstructions from the spillway, if observed after normal inspections. As a result, these procedures are appropriate for maintaining the spillway.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(v).

2.6 Stability and Structural Integrity of Hydraulic Structures

Regulatory Citation: 40 CFR §257.73 (d)(1)

- *(vi) Hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation of the hydraulic structure.*

Background and Assessment

The stability and structural integrity of hydraulic structures penetrating the dike of the Ash Pond was evaluated using design drawings, operational and maintenance procedures, inspections, and conditions observed in the field by AECOM.

The only hydraulic structure that penetrates the lower pool embankment is the Principal Spillway. This gooseneck inlet structure is attached to a vertical 36-inch RCP drop inlet which connects to a horizontal 36-inch diameter

RCP pipe that outlets near the toe of the embankment. A visual inspection of this spillway structure was completed by AECOM on February 23, 2016. See AECOM's Site Visit Report in **Appendix B** for additional information.

SIGECO contracted Stantec Consulting Service, Inc. (Stantec) to inspect the gooseneck structure. This inspection was completed December 4th and 5th, 2014 by Hydromax USA via closed-circuit television (CCTV) for the vertical and horizontal portions of this structure. Stantec reviewed this video and noted 4, grade 5 areas, all notated as "Surface Reinforcement Visible." Stantec concluded there was no indication of active staining of the interior of the pipe, which would have indicated possible intrusion of the surrounding soil into the pipe at these locations or at any pipe joints. The signed report by Stantec concludes that the noted defects are not expected to adversely impact the structural integrity of the discharge pipes, but that they should be CCTV inspected periodically and the inspection video compared to the original video. Stantec also noted a 15-inch diversion conduit SIGECO identified as plugged with concrete. The historical drawings indicate that the pipe is 24-inch, reinforced concrete with anti-seep collars, plugged at the upstream end. Stantec was unable to verify the plug location and length of plugged segment. Other inspection methods were considered for the vertical stand of the Principal Spillway but were discarded due to the physical impracticality of the methods and potential employee or contractor safety concerns.

Conclusion and Recommendation

Based on this evaluation, the Principal Spillway structure did not display any areas of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, or debris that may negatively affect the operation of the structure. Operational and maintenance procedures are in place to remove debris or other obstructions from the hydraulic structures, and address any deficiencies, as evidenced by conditions observed by AECOM. As a result, these procedures are appropriate for maintaining in the stability and structural integrity of the hydraulic structure.

There is no current evidence of ash transport within the pipe and no noted signs of failure. However, since the pipe is a potential pathway for ash release from the impoundment, AECOM recommends a CCTV inspection of the Principal Spillway every other year, including the previous diversion conduit, as far as practical. Comparison of a current, bi-annual video to the baseline video established in 2014 provides for identification of potential changes in the pipe, joints, or staining which could be indicative of deterioration, deformation or distortion.

Therefore, the Ash Pond meets the requirements in §257.73 (d)(1)(vi).

2.7 Downstream Slope Inundation / Stability

Regulatory Citation: 40 CFR §257.73 (d)(1)

- *(vii) For CCR units with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.*

Background and Assessment

The structural stability of the downstream slopes of the Ash Pond was evaluated by comparing the location of the Ash Pond relative to adjacent water bodies using published United States Geological Survey (USGS) topographic maps, aerial imagery, and conditions observed in the field by AECOM.

Based on this evaluation, water bodies adjacent to the downstream slopes of the Ash Pond are not present. The nearest downstream water body is the Ohio River, which is approximately 2,500 lateral feet beyond the downstream slopes of the Ash Pond. The 100 year flood event (elevation 373 feet) from the Ohio River is 77 feet below the elevation of the toe of the lower pool berm. Therefore, there are no adjacent water bodies that can inundate the downstream slopes of the Ash Pond.

Conclusion and Recommendation

Based on this evaluation, the requirements in §257.73 (d)(1)(vii) are not applicable to the Ash Pond, as inundation of the downstream slopes is not expected to occur.

3 Certification

This Certification Statement documents that the Ash Pond at the A. B. Brown Generating Station meets the Initial Structural Stability Assessment requirements specified in 40 CFR §257.73 (d). The Ash Pond is an existing CCR surface impoundment as defined by 40 CFR §257.53. The CCR Rule requires that the Initial Structural Stability Assessment 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

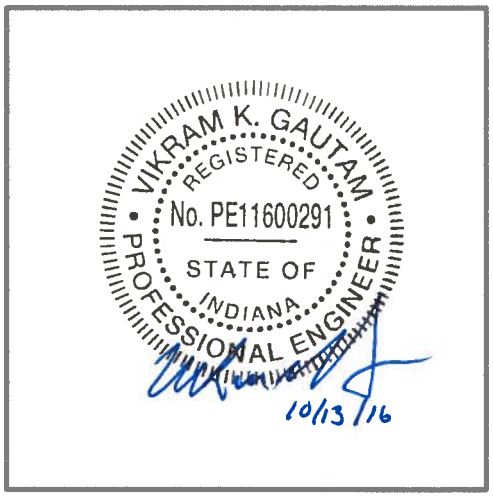
I, Vikram K. Gautam, being a Registered Professional Engineer in good standing in the State of Indiana, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification has been prepared in accordance with the accepted practice of engineering.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

Vikram K. Gautam

Printed Name

10/13/2016

Date



4 Limitations

Background information, design basis, and other data which AECOM has used in preparation of 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 development of the Initial Structural Stability Assessment 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

AECOM
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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

AECOM
9400 Amberglen 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

SITE MAP

FIGURE 2

Appendix B
AECOM Site Visit Report

AECOM

STATION SITE VISIT SUMMARY

Station:	A.B. Brown Generating Station
Station Location:	Indiana
Site Visit Date:	02/23/2016
Prepared by:	Teresa L. Entwistle, PE (AECOM)
Checked by:	John Davis, PE (AECOM)
ITR by:	Vik Gautam, PE (AECOM)
Distribution to:	File

Background:

AECOM engineering and program management team visited the A.B. Brown Generating Station (Brown) and were accompanied by Vectren personnel. AECOM personnel inspected the Ash Pond at the Brown station to assess the unit in regards to the CCR Rule and to better understand the operating methods of the surface impoundment for the analysis required under the CCR Rule. Engineering design personnel that toured the facility included Teresa Entwistle, John Davis, Vik Gautam, and John Priebe. AECOM program management personnel included Tommy Bell, Milton Owen, Ty Cloud and Steven Kosler. Vectren personnel present included Lisa Messinger, Chris Leslie, and John Minnette.

Summary of Observation/Comments on Site Visit:

AECOM performed a visual inspection of the Ash Pond and the areas surrounding the Ash Pond. Inspections were conducted from the top of the downstream berm of the unit along an access road and from the west side of the impoundment via an access road between the unit and the generating station. The surface impoundment was created by the construction of an earthen dam across an existing valley. A secondary berm is located upstream of the lower berm to separate the Ash Pond into two operating pools, the upper pool and the lower pool.

Drainage into the surface impoundment is from pumped process flows, rainfall falling directly onto the surface impoundment and from runoff from upstream areas. Discharge from the unit is via an active pumping station that recycles the water back to the generating station for process use. The plant operates as a zero-discharge facility during normal conditions, so it is uncommon for water to discharge from the unit. However, if a discharge does occur, the runoff drains through the permitted NPDES outfall to an unnamed tributary which travels west for approximately 0.5 mile before turning south for approximately one mile and discharging into the Ohio River.

Two emergency overflow structures are present, a primary spillway consisting of a gooseneck that penetrates the lower berm and a grass lined trapezoidal secondary emergency spillway channel. The gooseneck ties into a vertical riser that ties into a 36-inch Class V, reinforced concrete pipe (RCP). A junction chamber enables the transition from the vertical section of the RCP to the horizontal section of the RCP. No seepage was observed on the exterior of the berm at the locations of these penetrations or along the downstream slope of the berm. Vectren personnel informed AECOM that a video-taped inspection of the interior of the gooseneck was performed by others and will be submitted to AECOM for review. The secondary emergency spillway is protected by established grass cover. The discharge from this spillway is a riprap lined channel.

Slope protection included established grass cover along the external slopes of the impoundment berm and rip-rap along the interior slopes.

No downstream structures were observed between the unit and the Ohio River.

Photo No. 1	Date: 02/23/2016
Location: A.B. Brown Generating Station	
Description: Standing at east end of berm, looking west. Picture shows slope protection on downslope of berm. Photographer: Entwistle	

Photo No. 2	Date: 11/04/2015
Location: A.B. Brown Generating Station	
Description: Standing at west end of berm, looking east. Picture shows slope protection on downslope of berm. Photographer: Entwistle	

Photo No. 3	Date: 02/23/2016
Location: A.B. Brown Generating Station	
Description: Standing on western leg of berm, looking north. Picture shows slope protection on exterior face of berm. Photographer: Entwistle	
Photo No. 4	Date: 11/04/2015
Location: A.B. Brown Generating Station	
Description: Standing midway along southern berm, looking back over surface impoundment. Picture shows stability of berm into surface impoundment. Photographer: Entwistle	

Photo No. 5	Date: 02/23/2016
Location: A.B. Brown Generating Station	
Description: Standing in secondary emergency spillway looking downstream. Picture shows adequate slope protection and no evidence of erosion. Photographer: Entwistle	
Photo No. 6	Date: 02/23/2016
Location: A.B. Brown Generating Station	
Description: Standing at top of secondary emergency spillway, showing riprap lining of discharge channel Picture shows adequate erosion protection. Photographer: Entwistle	

Photo No. 7	Date: 02/23/2016
Location: A.B. Brown Generating Station	
Description: Standing on the pumping station. Picture shows inlet to gooseneck emergency overflow penetration into lower berm. Video of this structure provided separately. Photographer: Entwistle	

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About AECOM

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