

US EPA ARCHIVE DOCUMENT

**COAL ASH IMPOUNDMENT
SITE ASSESSMENT DRAFT REPORT**



**E.D. Edwards Power Generating Station
Ameren Energy Generating Company
Bartonville, Illinois**



Prepared by:

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KLEINFELDER PROJECT NUMBER 112618-2

September 20, 2010

I acknowledge that the management units referenced herein:

- E.D. Edwards Power Generating Station Cooling Pond
- E.D. Edwards Power Generating Station Ash Pond
- E.D. Edwards Power Generating Station Clarification Pond

were assessed on August 12, 2010.

Signature: _____

Date: _____

Brian T. Havens, PE
Lead Geotechnical Engineer

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EXECUTIVE SUMMARY

Background information taken from the U. S. Environmental Protection Agency's (EPA's) website:

"Following the December 22, 2008 dike failure at the TVA/Kingston, Tennessee coal combustion waste (CCW) ash pond dredging cell that resulted in a spill of over 1 billion gallons of coal ash slurry, covered more than 300 acres and impacted residences and infrastructure, the EPA is embarking 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 impoundment or impoundment failure of the improper release of impounded slurry."

As part of the EPA's effort to protect lives and the environment from a disaster similar to that experienced in 2008, Kleinfelder was contracted to perform a site assessment at the E.D. Edwards Power Generating Station that is owned and operated by Ameren Energy. This report summarizes the observations and findings of the site assessment that occurred on August 12, 2010.

The coal combustion waste impoundments observed during the site assessment included:

- Cooling Pond – Commissioned in the early 1960's.
- Ash Pond – Commissioned in in the early 1960's.
- Clarification Pond – Commissioned in the early 1960's.

Preliminary observations made during the site assessment are documented on the Site Assessment Checklist presented in Appendix A. A copy of this checklist was transmitted to the EPA following the field walk-through. A more detailed discussion of the observations is presented in Section 4, "Site Observations."

The cooling pond, ash pond, and clarification pond impoundments are not regulated by any state agency and therefore do not currently have a designated hazard potential classification. Due to the potential environmental and economic impacts that a failure of the west or south embankment of these impoundments would present to the Illinois River, it is recommended that a Hazard Potential Classification of "Significant" be assigned to all three impoundments.

Overall, the site is reasonably well maintained and operated with a few areas of concern as discussed in Section 6, "Recommendations."

On the date of this site assessment, there appeared to be no immediate threat to the safety of the impoundment embankments. No assurance can be made regarding the impoundments

condition after this date. Subsequent adverse weather and other factors may affect the condition.

A brief summary of the Priority 1 and 2 Recommendations is given below. A more detailed discussion is provided in Section 6, "Recommendations."

Priority 1 Recommendations

1. Prepare an EAP for the facility.
2. Perform a hydrologic and hydraulic study.
3. Review stability and seismic analyses that are being prepared by Ameren Energy.
4. Evaluate the depth and rate of movements of the west slope.
5. Monitor potential erosion in creek.
6. Perform video assessments of culvert piping.
7. Control vegetation on the upstream and downstream slopes.

Priority 2 Recommendations

1. Repair erosion of embankments.
2. Maintain a log of maintenance and other activities at the fly ash impoundments and supporting facilities.
3. Monitor groundwater levels.
4. Develop an Operation and Maintenance (O&M) manual for the impoundments and the facility.

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SECTION 1 – INTRODUCTION

1.1 General

This report has been prepared for the United States Environmental Protection Agency (EPA) to document Kleinfelder's findings and observations from a site assessment of the cooling pond, ash pond, and clarification pond impoundments at the E.D. Edwards Power Generating Station on August 12, 2010.

The following sections present a summary of data collection activities, site information and performance history of the facility's ponds made available by the owner (Ameren Energy), a summary of site observations, and recommendations resulting from the site assessment.

1.2 Project Location

The E.D. Edwards Power Generating Station is located on the western bank of the Illinois River approximately four miles south of Bartonville, Illinois. The generating station is located in Peoria County at approximately latitude 40° 35' 37" and longitude -89° 39' 50". The area around the plant is a relatively flat to gently rolling rural agricultural area with some urban development nearby.

SECTION 2 – SITE ASSESSMENT

2.1 Attendees

The site assessment was performed on August 12, 2010 by Brian Havens, PE (Illinois) and Matt Gardella, EIT of Kleinfelder. Other persons present during the site assessment include:

- Paul Pike – Ameren Energy
- Michael Wagstaff – Ameren Energy
- William Henning – Ameren Energy
- Mike Davis – Ameren Energy
- Craig Dufficy – United States Environmental Protection Agency

2.2 Impoundments Assessed

The coal combustion waste impoundments observed during the site assessment included:

- Cooling Pond – Commissioned in the early 1960's.
- Ash Pond – Commissioned in in the early 1960's.
- Clarification Pond – Commissioned in the early 1960's.

Preliminary observations made during the site assessment are documented on the Site Assessment Evaluation Checklist presented in Appendix A. A more detailed discussion of the observations is presented in Section 4.

2.3 Weather during Inspection

The weather experienced during the field walk-through was sunny and clear with high humidity. Temperatures ranged from 95° to 100° F, and wind ranged from 0 to 5 miles per hour (mph).

SECTION 3 – SITE INFORMATION AND HISTORY

3.1 Site Information and History

The E.D. Edwards Power Generating Station is a coal-fired facility that has been in operation since 1951. The facility currently sluices bottom ash, fly ash, and boiler slag (by-products of coal fired energy generation) into two separate impoundments. These impoundments are referred to as the “Cooling Pond” and the “Ash Pond.” After being sluiced into the cooling pond or the ash pond, the power plant process water containing the fly ash and bottom ash is then diverted into another impoundment. This impoundment is referred to as the “Clarification Pond” and from here is discharged into the Illinois River. An aerial image of these impoundments can be seen in Figure 2. These ponds act as settling basins for the bottom ash, fly ash, and boiler slag prior contained in the process water before it is released back into the Illinois River. Bottom ash, fly ash, and boiler slag residuals at the site are eventually removed from the various impoundments and disposed of either in a landfill or through use in the Red Amber Mine reclamation project.

The cooling pond is a combination earthen embankment and incised impoundment. Sluice pipes transporting boiler slag and other solids from power generating operations outlet at the northeastern corner of the cooling pond. While impounded in the cooling pond, the majority of solids contained in the sluiced water are allowed to drop out of suspension and the process water is then allowed to flow into the clarification pond intake channel via a 24-inch CMP at the southwest corner of the pond. There is not a spillway associated with the cooling pond.

The fly ash pond is a combination earthen embankment and incised impoundment. Multiple bottom ash and fly ash slurry pipes inlet at the northeast corner of the pond. These pipes spill directly into a small diversion pool that direct the bottom ash and fly ash slurry into one of two settling channels (depending on plant operations) via CMP pipes. These settling channels are created by internal dikes made up of fly ash and bottom ash that have been placed within the ash pond. These channels provide a lengthened flow path for the slurries which in turn allow a higher time of concentration for the process water. This longer time of concentration allows more time for suspended solids to drop out of the process water before the water is directed into the clarification pond intake channel via a CMP culvert. Once one of the fly ash pond settling channels fills with fly and bottom ash solids, process water is directed into the other fly ash pond settling channel. This allows the channel that has become full of fly and bottom ash residuals to be dried and cleared of ash, which is hauled off site for disposal, while the other channel continues to handle the process water. This operation can then be repeated as necessary. There is not a spillway associated with the ash pond.

The clarification pond is a combination earthen embankment and incised impoundment. Power plant process water containing low level concentrations of bottom ash, fly ash, and boiler slag is directed from both the fly ash pond and cooling

pond into the clarification pond by an intake channel on the northwest side of the pond. Once the process water enters the clarification pond, the remaining solids are allowed to drop out of suspension before being discharged to the Illinois River via the outlet structure on the eastern side of the pond. This outlet structure consists of an intake riser connected to a 36-inch bituminous coated CMP that runs east to the Illinois River. The intake structure for the outlet works has a fixed intake elevation, and discharge flow is regulated by a sluice gate. The outlet pipe is protected from backflow via a flap gate on the discharge location as well as the sluice gate. There is not a spillway associated with the clarification pond.

Prior to the current operational layout at the E.D. Edwards Power Generating Station, there had been additional fly ash and bottom ash impoundments at the site that were utilized until the current layout had been established in 1960. The old impoundment, located immediately east of the current cooling pond, was filled in and is now located under the switch yard.

Also, prior to the current operational layout at the E.D. Edwards Power Generating Station, the rail spurs used for coal delivery to the plant had been organized differently. Prior to the current layout, trains delivering coal to the site had to stop, disconnect a single car, unload the car at the coal stockpile, and then move the car to another location in preparation for leaving the site. In November 2003, plans were issued for construction to raise the embankment surrounding the cooling pond, ash pond, and clarification pond and construct a railroad loop track on the crest of the raised embankment. This would allow trains delivering coal to simply pull forward to the unloading area and unload cars as the train makes its way around the loop. This eliminated the need for unhooking cars and thus increased efficiency.

3.2 Pertinent Data

A. GENERAL

1. Name..... E.D. Edwards Power Generating Station
2. State..... Illinois
3. County..... Peoria
4. Latitude..... 40° 35' 37"
5. Longitude..... -89° 39' 50"
6. River used for operations Illinois River
7. Year Constructed 1960
8. Modifications..... Railroad embankment modifications - all impoundments
9. Current Hazard Potential Classification None
10. Proposed Hazard Potential Classification..... Significant
11. Size Classification (See Section 7) Intermediate

B. IMPOUNDMENT DETAILS

Cooling Pond

1. Type Earthen Diked/Incised Combination
2. Crest Elevation 455± feet with Railroad Modifications at 462¹ feet
3. Crest Width..... 14 feet
4. Embankment Height..... ~25 feet
5. Upstream Slope..... 2H:1V

6. Downstream Slope..... 2H:1V

Ash Pond

1. Type Earthen Diked/Incised Combination
2. Crest Elevation 455± feet with Railroad Modifications at 462¹ feet
3. Crest Width..... 14 feet
4. Embankment Height..... ~25 feet
5. Upstream Slope..... 2H:1V
6. Downstream Slope..... 2H:1V

Clarification Pond

1. Type Earthen Diked/Incised Combination
2. Crest Elevation 455± feet with Railroad Modifications at 462¹ feet
3. Crest Width..... 8 feet
4. Embankment Height..... ~25 feet
5. Upstream Slope..... 2H:1V
6. Downstream Slope..... 2H:1V

C. DRAINAGE BASIN

1. Area of Drainage Basin Minimal/Unknown
2. Downstream Description Rural agricultural areas with small towns

D. IMPOUNDMENT CAPACITY AND INLET

Cooling Pond

1. Impoundment Capacity Unknown – Normal Operating Elevation is 449.5¹ feet
2. Impoundment Inlet..... Inlet sluice pipe from the generating station

Ash Pond

1. Impoundment Capacity Unknown – Normal Operating Elevation is 447.1¹ feet
2. Impoundment Inlet..... Multiple inlet sluice pipes from the generating station

Clarification Pond

3. Impoundment Capacity Unknown – Normal Operating Elevation is 447.3¹ feet
4. Impoundment Inlet..... Culvert inlets from Ash Pond and Cooling Pond

E. PRIMARY SPILLWAY

Cooling Pond

1. Description N/A – No Spillway Present

Ash Pond

1. Description N/A – No Spillway Present

Clarification Pond

2. Description N/A – No Spillway Present

F. OUTLET WORKS

Cooling Pond

1. Description ~24-inch CMP to the intake channel for the clarification pond
2. Location..... Near southwest corner of the cooling pond
3. Intake Structure None – CMP stubbed through embankment without flared end section

- a. Intake Invert Elevation Unknown
- 4. Discharge Conduit CMP
 - a. Length ~80 feet
 - b. Diameter ~24 inches
- 5. Outlet Structure None – CMP stubbed through embankment without flared end section
 - a. Outlet Invert Elevation Approx. 449.4¹ feet
 - b. Energy Dissipation None
- 6. Discharge Channel ~10-foot-wide channel that empties into the Clarification Pond Intake Channel
- 7. Discharge Capacity with Water Surface at Top of Bank Unknown

Ash Pond

- 1. Description 24" CMP culvert to Clarification Pond (1 per fly ash settling channel)
- 2. Location Near west embankment of the fly ash settling channels
- 3. Intake Structure None – CMP stubbed through embankment without flared end section
 - a. Intake Invert Elevation Unknown
- 4. Discharge Conduit CMP
 - a. Length Approximately 100 feet
 - b. Diameter Approximately 24 inches
- 5. Outlet Structure None – CMP stubbed through embankment without flared end section
 - a. Outlet Invert Elevation Approx. 447.1¹ feet
 - b. Energy Dissipation None
- 6. Discharge Channel ~20-foot-wide channel that empties into the Clarification Pond Intake Channel
- 7. Discharge Capacity with Water Surface at Top of Bank Unknown

Clarification Pond

- 1. Description 36" CMP Riser with belled "morning glory" inlet
- 2. Location Near east embankment (app. 50 feet from the edge of the pond)
- 3. Intake Structure Pipe riser with belled inlet (fixed intake elevation)
 - a. Intake Invert Elevation 447.2 feet
- 4. Discharge Conduit 36" CMP with internal bituminous coating
 - a. Length Appx. 1,100 feet
 - b. Diameter 36 inches
- 5. Outlet Structure 36" CMP connected to a flap gate
 - a. Outlet Invert Elevation Unknown
 - b. Energy Dissipation Unknown
- 6. Discharge Channel ~20-foot-wide channel that discharges into the Illinois River
- 7. Discharge Capacity with Water Surface at Top of Bank Unknown

G. MANAGEMENT

- 1. Owner Ameren Energy
- 2. Purpose Coal-fired energy generation

Note: 1. Elevations are obtained from the Operations and Maintenance manual provided by Ameren Energy.

3.3 Regional Geology and Seismicity

The plant site is situated in the Illinois River Valley. As such, the subsurface conditions are expected to include Quaternary alluvial deposits overlying sedimentary bedrock. Based on the available data, it is uncertain whether the regional glacial deposits are present at the plant site between the alluvium and the bedrock.

Based on our review of historical soil borings and information from the Web Soil Survey, it appears that the upper alluvial deposits at the site include combinations of silty clay and clayey silt. Based on our review of data published by the United States Geological Survey (USGS), the sedimentary rock formations in Peoria County include shale, sandstone, and limestone.

The plant site is situated in a Seismic Zone 1 area. We have noted that the New Madrid Fault has a documented history of seismic activity but is located more than 200 miles south of the plant site.

3.4 Hydrology and Hydraulics

The cooling pond, ash pond, and clarification pond are situated in such a manner that the watershed drainage contributing to the stored volume of the ponds appears to be minimal and most likely limited to stormwater runoff from the immediate plant site east of the impoundments and precipitation that falls within the impoundments themselves. However, the exact extents of the watershed cannot be determined without a current topographic survey of the site and of the impoundments themselves.

During the site assessment, no documents relating to a hydrologic study, hydraulic design calculations and assumptions, or impoundment break analyses were provided for review. It is unknown what the designed inflow, capacity of the ponds, freeboard, or other important components of the impoundment designs are without these studies and documents.

The outlet works of the clarification pond and other impoundments appear to be functioning as intended. Based on discussions with Ameren Energy, we noted that the outlet works had, at times, been required to stop discharging water from the clarification pond to the Illinois River, when the Illinois River was at flood levels. Kleinfelder understands that the longest amount of time that the outlet works were required to remain shut was approximately three weeks. During this time, the E.D. Edwards Power Station continued to operate and sluice fly ash, bottom ash, and boiler slag into the various impoundments. According to Ameren Energy, the impoundments did not overtop and maintained adequate freeboard during the three weeks that discharge to the river was not possible.

3.5 Geotechnical Considerations

Kleinfelder understands that embankment stability analyses are currently being completed for each of the impoundments by another consultant retained by Ameren Energy. In addition, two zones of embankment slope instability were reported on the widened western embankment (widened for rail spur construction). Specifically, one zone of surface instability was reported by Ameren Energy near the north end of the west embankment and was apparently stabilized and covered with riprap. Another zone of surface instability was reported by Ameren Energy on the west embankment. We observed the surface scarp and were informed that Ameren continues to monitor the scarp for signs of additional movement. Ameren reported that this slope failure is

located in an area where the original embankment was widened with a combination of soil and ash from the plant.

Kleinfelder understands that seepage has been previously observed by Ameren Energy along the western embankment and that the seepage was believed to be caused by overtopping of the clay core of the original embankment. We understand that Ameren Energy lowered the pond levels to limit the risk of additional seepage in this area. We also understand that possible seepage was observed along the east embankments in the coal yard, but the extent of seepage is difficult to determine due to the presence of surface water runoff in this area from the coal pile.

3.6 Structural Considerations

General

Kleinfelder understands that there are three major CMP inlets and outlets within the three ponds that are approximately 36 inches in diameter. CMP pipes can deteriorate and corrode with time in some situations. Video inspection would be useful to determine the condition and functionality of these pipes but was not available for our review. Based on the provided as-built information, no analysis was present for review of the CMP pipes within the facility. Further evaluation is recommended to ensure the integrity of the inlets and outlets.

Documentation of the structural portions of the impoundments under seismic loading was not available for our review. Although the plant site is located in a zone of relatively low risk for damaging seismic activity, evaluation of the structural components of the impoundments under applicable seismic loading conditions merits consideration.

Clarification Pond

The clarification pond includes an outlet structure with a catwalk access platform. As-built drawings for this structure were not available for our review, so we were unable to make a structural evaluation of the access platform. According to an inspection conducted in March 2010, the outlet structure was stated as being in good condition. Based on our visual assessment, the catwalk bridge access portion appears to be in good condition, and the outlet superstructure within the pond appears to be intact with minor corrosion.

3.7 Performance History

There have been no previous federal or state inspections of the ash pond impoundments at the E.D. Edwards Power Generating Station. Ameren Energy's local plant personnel perform weekly inspections of the impoundments with annual inspections by Ameren Energy's Impoundment Safety team. Based on observations made by Ameren Energy personnel during their in-house inspections, there have been no major incidents involving the cooling pond, fly ash pond, or clarification pond.

3.8 Hazard Potential Classification

The cooling pond, ash pond, and clarification pond impoundments are not regulated by any state agency and therefore do not currently have a designated Hazard Potential Classification. Due to the potential environmental and economic impacts that a failure at any of these impoundments would present by breaching their embankments, it is recommended a Hazard Potential Classification of "Significant" be assigned to both impoundments. A "High" Hazard Potential Classification was not assigned to the impoundments, because loss of life would not be likely in the event of a failure. A loss of life scenario is not expected as the impoundments are located in an area without any homes, recreational facilities, businesses, roads, or other structures immediately downstream.

3.9 Site Access

Following a security point check-in to gain permission for access from Ameren Energy personnel, the owner's representative lead the assessment team to the impoundments. The impoundments can be accessed by a standard vehicle under normal weather conditions.

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SECTION 4 – SITE OBSERVATIONS

The upstream and downstream embankment slopes, downstream toes, and outlet works of the cooling pond, ash pond, and clarification pond were observed during the August 12, 2010 site assessment. A brief summary of the features observed is presented below.

A copy of the Site Assessment Evaluation Checklist generated during the field walk-through for each impoundment is provided in Appendix A.

4.1 Cooling Pond

4.1.1 Upstream Slope

Overall, the upstream slope of the impoundment was in fair condition. Photos 33 and 34 in Appendix B show the conditions of the upstream slope. Specific observations include:

- The upstream slope was laid back at approximately 2H:1V.
- Minor erosion, less than 6 inches, was noted on some of the upstream slopes, especially in areas where new fill had been added to widen haul routes at the north end of the pond.
- Vegetation was present on the majority of the upstream slope. However, vegetation with stem diameters greater than one inch was not noted during the inspection.
- Mowing/vegetation control had not been completed on the majority of the upstream slope.

4.1.2 Crest

Overall, the crest of the impoundment was in good condition. Photos 41 and 42 show the condition of the crest. Specific observations include:

- The impoundment crest consists of a graded fill used as a haul route for plant operations and removal of fly ash, bottom ash, and boiler slag residue. The crest is also used for a railroad line that is utilized in the delivery of coal for the facility.
- Overall, the crest was clear of all vegetation with only some sparse grasses and minimal bushes observed on the crest.
- No major depressions or rutting were noted on the impoundment crest.
- A chain link fence is located on the eastern side of the cooling pond at the crest. The chain link pole penetrations are at least 40 feet away from the upstream slope of the impoundment.
- Minor erosion was noted on crest in limited locations. This erosion was typically less than six inches and depth and typically appeared on the edges of the crest, where grade breaks occurred when transitioning to embankment

slopes. Typically, this erosion was noted at the northern edge of the pond, where additional fill had been used to widen the haul route.

4.1.3 Downstream Slope

Overall, the downstream slope was in fair to poor condition. Photos 36 through 40 show the conditions of the downstream slope. Specific observations include:

- Erosion, some areas greater than 6 inches, was noted on some of the downstream slope.
- Penetrations into the downstream embankment, including manholes, were present.
- A large scarp, approximately two feet in depth, was present for a significant portion of the western embankment slope.
- Grasses and woody bushes were observed on the downstream slope.

4.1.4 Downstream Toe Area

The toe areas of the embankment were in fair to poor condition. Key features and observations of these areas include:

- Grasses and woody bushes were observed on the downstream slope for the majority of the western embankment.
- A stormwater ditch was present at the western embankment downstream toe with water that was constantly flowing during the inspection.

4.1.5 Outlet Works

The outlet works of the cooling pond consist of a 24-inch CMP culvert at the southwestern corner of the impoundment that discharges into the clarification pond intake channel. The culvert does not include a trash rack and has a pool gauge located in its vicinity.

- The intake location of the outlet pipe was surrounded with riprap.
- The CMP appears to be in newer condition with no visible rust or other damage.
- No video monitoring of the CMP culvert was available at the time of inspection.
- Overall, the outlet works system appears to be functioning as intended at this time.

4.1.6 Impoundment Inlet

Inflow into the cooling pond is via metal piping on the northeastern corner of the impoundment, as well as stormwater runoff that flows naturally into the pond. From this inlet location, the boiler slag and process water slurry flow through an

interior settling channel and into the larger storage pool of the impoundment. The inlet pipe appears to be in satisfactory condition.

4.2 Ash Pond

4.2.1 Upstream Slope

Overall, the upstream slope of the impoundment was in satisfactory condition. Photo 4 in Appendix B shows the conditions of the upstream slope. Specific observations include:

- The upstream slope was laid back at approximately 2H:1V.
- Grasses and woody bushes were observed on the upstream slope. No vegetation with a stem diameter greater than 1 inch was noted during the inspection.
- Grasses, bushes, and woody debris were observed on the slope.
- Penetrations into the ash pond embankment were noted on the upstream slope. These penetrations were in the form of various stormwater pipes.
- Minor erosion, less than 6 inches, was noted during the inspection on the upstream slopes.

4.2.2 Crest

Overall, the crest of the impoundment was in good condition. Photos 3 through 5 show the condition of the crest. Specific observations include:

- The impoundment crest is a gravel road with railroad tracks over the majority of the western embankment.
- Sparse grasses and bushes were observed on the crest.
- No major depressions or rutting was noted on the impoundment crest.
- Minor erosion was noted on crest in multiple locations. This erosion was typically less than six inches and depth and typically appeared on the edges of the crest, where grade breaks occurred when transitioning to embankment slopes.

4.2.3 Downstream Slope

Overall, the downstream slope was in fair condition. Photos 44 and 45 show the conditions of the downstream slope (at the sheet pile wall portion). Specific observations include:

- Grasses and woody bushes were observed on the downstream slope and at the toe of the embankment for a large portion of the impoundment.
- Typically, the embankment was very close to the natural ground elevation and only elevated from the natural ground elevations in some locations.
- Typically, the embankment was well maintained with what appears to be regular mowing and grading operations.

- A sheet pile wall was located on the east side of the east embankment to separate the impoundment from the coal stockpile area.

4.2.4 Downstream Toe Area

The toe areas of the embankment were in fair condition. See photos 44 and 45 for the condition of these areas. Key features and observations of these areas include:

- Minor possible seepage from the impoundment was noted at the base of the sheet pile wall. This seepage could also be surfacewater runoff seeping through the coal stockpile.
- The toe area had a few locations where vegetation and woody growth were noted.

4.2.5 Outlet Works

The outlet works of the fly ash pond consist of two 24-inch CMP culverts - one at the end of each fly ash settling channel. Both culverts discharged into the clarification pond intake channel on the western side of the impoundment. Key features and observations of the outlet works include:

- The uncontrolled CMP pipe discharged into a small bay of the clarification pond inlet channel. The embankment surrounding this outlet was heavily vegetated, but no vegetation over 1 inch in diameter was noted.

4.2.6 Impoundment Inlet

Inflow into the Fly Ash Pond occurs through multiple inlet pipes on the northeastern corner of the impoundment that discharge into a diversion pool. From this diversion pool, flow can be directed into one of two ash settling channels as discussed in Section 3.1. The inlet pipes and pipes connecting the diversion pool to the ash settling channels appear to be in functional condition.

4.3 Clarification Pond

4.3.1 Upstream Slope

Overall, the upstream slope of the impoundment was in fair condition. Photos 7, 13, and 22 in Appendix B show the conditions of the upstream slope. Specific observations include:

- The upstream slope was laid back at approximately 2H:1V and at approximately 2H:1V on the downstream slope.
- Minor erosion, less than 6 inches, was noted on some of the upstream slopes.
- Grasses and woody bushes were observed on the upstream slope for the majority of the impoundment.

- Mowing/vegetation control had not been completed on the majority of the upstream slope.
- The majority of the upstream slope was protected by riprap that extended below the water surface during the time of inspection.

4.3.2 Crest

Overall, the crest of the impoundment was in fair condition. Photos 11 through 14 show the condition of the crest. Specific observations include:

- The impoundment crest is a combination of a gravel road, railroad track embankment, and vegetated embankment.
- Grasses and bushes were observed on the crest.
- No major depressions or rutting were noted on the impoundment crest.
- Some significant erosion, greater than 6 inches, was noted on the crest in multiple locations. This erosion typically appeared on the edges of the crest where grade breaks occurred when transitioning to embankment slopes.
- Lack of vegetation was noted in multiple locations along the crest.

4.3.3 Downstream Slope

Overall, the downstream slope was in fair condition. Photos 8, 9, 12, 15 through 25, and 28 show the conditions of the downstream slope. Specific observations include:

- There were areas of riprap slope protection present on the downstream slope. This riprap had been vegetated in some locations but was mostly clear of vegetation.
- Significant erosion, greater than 6 inches deep, was noted on some of the downstream slopes, particularly on the southern embankment of the impoundment.
- Grasses and woody bushes were observed on the downstream slope and at the toe of the embankment for the majority of the impoundment.
- Penetrations into the downstream slope included manholes and power line poles.

4.3.4 Downstream Toe Area

The toe areas of the embankment were in fair to poor condition. See photos 8, 9, and 15 for the condition of these areas. Key features and observations of these areas include:

- A flowing creek was present immediately at the toe of the west embankment.
- The toe area had grasses, some bushes, and multiple small trees.
- On the toe of the southern and eastern embankments, vegetation had been cleared for at least 15 feet from the toe and the area had been recently mowed.

- Minor erosion, less than 6 inches deep, was noted at some locations of the southern embankment toe.

4.3.5 Outlet Works

The outlet works of the clarification pond consist of a metal pipe riser with a belled end section, located near the eastern embankment of the impoundment. The outlet was accessible via a metal catwalk that terminated directly above the intake riser. The metal pipe riser is set at elevation 447.2 feet and cannot be adjusted. The intake pipe riser connects to a 36-inch CMP that discharges into the Illinois River. A manually-operated sluice gate is present on the 36-inch CMP. The discharge pipe includes a flap gate to prevent water from back flowing into the clarification pond during times of flooding on the Illinois River.

- We understand that video monitoring of the 36-inch CMP had been recently performed, but the video was unavailable at the time of inspection.
- Overall, the outlet works system appears to be functioning as intended at this time.

4.3.6 Impoundment Inlet

Inflow into the clarification pond is via the intake channel on the northwestern side of the impoundment as well as stormwater runoff that flows naturally into the pond. The inlet channel can be seen in photos 27 and 33 of Appendix B. The inlet pipes from both the ash pond settling channels and cooling pond appear to be in satisfactory condition.

4.4 Other

Internal dikes of the fly ash pond cells appear to be laid back at approximately a 2.5H:1V slope. Surface erosion up to 12 inches in depth can be seen along the crest and slope of the majority of the internal dikes. Sparse vegetation can be observed on the slopes of the dikes but provides little or no protection against surface erosion.

During the inspection it was inquired if Ameren Energy had developed an Emergency Action Plan (EAP) documenting what specific actions and personnel should be implemented or contacted in the case of an emergency at the plant. Currently, there is not an EAP for the site.

Ameren Energy has developed an Operation and Maintenance (O&M) manual for the E.D. Edwards Power Generating Station. This O&M manual documents day-to-day operation of the plants impoundments, how to monitor instrumentation of the ponds, and what actions should correspond with those measurements.

SECTION 5 – OVERALL CONDITION OF THE FACILITY IMPOUNDMENTS

5.1 Analysis and Conclusions

Our analysis is summarized in three general considerations that are presented as follows:

Safety of the Impoundments Including Maintenance and Methods of Operation

Kleinfelder understands that the impoundments have a history of safe performance. However, the future performance of these impoundments will depend on a variety of factors that may change over time, including surface water hydrology, changes in groundwater levels, changes in embankment integrity, etc. Kleinfelder has noted several items, as follows, that present some concern in this regard:

- Trees exist at some locations on embankment slopes.
- An Emergency Action Plan (EAP) is not currently in place at the site to mitigate damage in the event of an emergency related to failure of the impoundment(s).
- Analyses of the slope stability for the embankment and groundwater conditions are not currently available for our review. However, we understand that analyses are in the process of being developed.
- Documentation of the impoundment capacity under potential hydrologic and hydraulic loading is not currently available for review.
- We understand that an Operation and Maintenance (O&M) manual is not currently in place for the site. Developing an O&M manual, which includes a section that discusses the safety inspection and monitoring program, would be recommended to standardize safety inspection and monitoring practice.

Changes in Design or Operation of the Impoundments Following Initial Construction

The primary change in design of the impoundments involves construction of the rail loop around the perimeter of the ash ponds. Construction of this loop involved widening of the perimeter embankments at several locations around the ash ponds. Kleinfelder understands that the embankments were widened with a combination of soil and ash from the plant. The widened portion of the west embankment has experienced some sloughing as noted earlier in this report. The embankment widening also involved filling a portion of the south part of the clarification pond.

Adequacy of Program for Monitoring Performance of the Impoundments

The present monitoring program primarily involves visual inspections by plant personnel and by the Ameren Energy Dam Safety Group. These visual inspections seem to be adequate to address issues, such as surface erosion and general condition of the impoundments. However, a more detailed monitoring program is recommended to be established to quantify various important factors associated with embankment stability. Those factors include, but are not limited to, seepage

quantities through the embankment, the amount of sediments carried by the seepage water, and the fluctuation of ground water levels.

5.2 Summary Statement

I acknowledge that the management unit(s) referenced herein was personally inspected by me and found to be in the following condition:

FAIR

Signature: _____ Date: _____

Brian T. Havens, P.E.
Lead Geotechnical Engineer

DRAFT

SECTION 6 – RECOMMENDATIONS

6.1 Definitions

Priority 1 Recommendation: Priority 1 Recommendations involve the correction of severe deficiencies where action is required to ensure the structural safety and operational integrity of a facility that may threaten the safety of the impoundment.

Priority 2 Recommendation: Priority 2 Recommendations occur when action is needed or required to prevent or reduce further damage or impair operation and/or improve or enhance the O&M of the facility, that do not appear to threaten the safety of the impoundment.

Based on observations during the site assessment, it is recommended that the following actions be taken at the Meredosia Power Generating Station.

6.2 Priority 1 Recommendations

1. **Prepare an EAP for the facility by 3/1/2011.** An Emergency Action Plan (EAP) should be prepared for all of the impoundments as well as any other pertinent features at the facility. The EAP should be added to the current O&M Manual but should also function as a stand-alone document.
2. **Perform a hydrologic and hydraulic study by 12/31/2010.** This study should be performed to determine if the existing ponds are capable of impounding the appropriate stormwater inflow from the plant site and precipitation within the ponds. An impoundment break analysis should also be completed to determine the possible effects on the safety of people and the environment downstream of the facility.
3. **Review stability and seismic analyses that are being prepared by Ameren Energy by 12/31/2010.** The slopes of the impoundments all had flowing water at their western toe. In addition, sloughing was noted in two areas along these slopes. The stability of these slopes especially under seismic loading is unknown at this time. We understand that this task is currently being completed by another consultant retained by Ameren Energy. The results of this evaluation should be reviewed by Kleinfelder.
4. **Evaluate the depth and rate of movements of the west slope by 7/1/2011.** Install and monitor at least one inclinometer to facilitate this evaluation.
5. **Monitor potential erosion in creek on at least a quarterly basis.** Significant erosion in creek could impact west slope stability.
6. **Control vegetation on the upstream and downstream slopes. Remove the remaining trees from the embankments by 12/31/2010.** Refer to FEMA Manual 534, Impact of Plants on Earthen Impoundments for guidance on vegetation removal. This manual is available on the FEMA website.
7. **Perform video assessments of culvert piping by 12/31/2010.** Culvert piping used for the outlet works of the impoundments is CMP. As this pipe is either past or nearing the end of its life expectancy, a video assessment

should be performed of all culvert pipes to determine their effectiveness and if remedial actions are necessary.

6.3 Priority 2 Recommendations

1. **Repair erosion of embankments on an as-needed basis to limit depth of surface erosion to less than 6 inches.** Minor erosion was noticed on various slopes of all the impoundments. Slopes and areas where erosion has occurred should be filled in with the appropriate material and re-dressed and reseeded to keep erosion from cutting into and compromising the embankment further.
2. **Maintain a log of maintenance and other activities at the fly ash impoundments and supporting facilities on an on-going basis.**
3. **Monitor ground water levels on at least a quarterly basis following well installation.** Piezometers should be installed where applicable to determine the phreatic surface of water between impoundments and surrounding areas. Records of these levels should be regularly checked and recorded.
5. **Develop an Operation and Maintenance (O&M) manual for the impoundments and the facility by 7/1/2011.** The O&M manual should include at least the following three key elements:
 - o Procedures needed for operation and maintenance of the impoundments during typical operating conditions
 - o Procedures for monitoring performance of the impoundments, including visible changes such as surface erosion, settlement, and sloughing; internal embankment changes (such as erosion) due to uncontrolled seepage; and fluctuations in groundwater level
 - o The EAP

SECTION 7 – GLOSSARY OF TERMS

For the EPA ash pond inspection program, the following glossary of terms shall be used unless otherwise noted.

Hazard Potential Classification

“Hazard Potential” means the possible adverse consequences that result from the release of water or stored contents due to the failure of an impoundment embankment, impoundment, or reservoir, or the mis-operation of the impoundment, reservoir, or appurtenances. The Hazard Potential Classification of an impoundment or reservoir shall not reflect in any way on the current condition of the impoundment or reservoir and its appurtenant works, including the impoundment or reservoir safety, structural integrity, or flood routing capacity. The classifications are described below:

1. Low Hazard Potential

“Low Hazard” means a impoundment or reservoir failure will result in no probable loss of human life and low economic or environmental loss. Economic losses are principally limited to the owner’s property.

2. Significant Hazard Potential

“Significant Hazard” means an impoundment or reservoir failure will result in no probable loss of human life but can cause major economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification impoundments or reservoirs are often located in predominantly rural or agricultural areas but could be located in areas with increased population density and significant infrastructure.

3. High Hazard Potential

“High Hazard” means a impoundment or reservoir failure will result in probable loss of human life.

Size Classification

In accordance with the Illinois Department of Natural Resources (IDNR) Administrative Code for Impoundment Safety, “Part 3702, Construction and Maintenance of Impoundments” dated January 13, 1987, an impoundment system is classified by size based on its height and potential storage capacity. Size classification is determined by which category (storage or height) is greatest (produces the larger size classification).

Category	Storage (acre-feet)	Height (feet)
Small	<1,000	<40
Intermediate	≥ 1,000 to <50,000	≥ 40 to <100
Large	≥ 50,000	≥ 100

Overall Classification of Impoundment

In a system similar to the U.S. Department of Interior, "Safety Evaluation of Existing Impoundments" (Seed 1995), when the following terms are capitalized they denote and shall be used to describe the overall classification of the impoundment as follows:

SATISFACTORY - No existing or potential impoundment safety deficiencies are recognized. Acceptable performance is expected under all applicable loading conditions (static, hydrologic, and seismic) in accordance with the applicable criteria. Minor maintenance items may be required.

FAIR – Acceptable performance is expected under all required loading conditions (static, hydrologic, and seismic) in accordance with the applicable safety regulatory criteria. Minor deficiencies may exist that require remedial action and/or secondary studies or investigations.

POOR - A management unit safety deficiency is recognized for any required loading condition (static, hydrologic, and seismic) in accordance with the applicable impoundment safety regulatory criteria. Remedial action is necessary. POOR also applies when further critical studies or investigations are needed to identify any potential impoundment safety deficiencies.

UNSATISFACTORY – Facility is considered unsafe. An impoundment safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. Reservoir restrictions may be necessary.

Condition Rating Criteria

In a system similar to the U.S. Department of Interior, "Safety Evaluation of Existing Impoundments" (Seed 1995), the terms satisfactory, fair, poor, and unsatisfactory are used in a general sense when describing the structural condition and the operational adequacy of the equipment for an impoundment or reservoir and its appurtenant works during the visual inspection. In addition, the term unknown may be utilized as applicable.

Satisfactory – Expected to fulfill intended function.

Fair – Expected to fulfill intended function, but maintenance or other actions are recommended.

Poor – May not fulfill intended function; maintenance, repairs, or other actions are necessary.

Unsatisfactory – Is not expected to fulfill intended function; repair, replacement, or modification is necessary.

Unknown – Not visible, not accessible, not inspected, or unable to determine the condition rating based on the observation taken.

Recommendations

Recommendations shall be written concisely and identify the specific actions to be taken. The first word in the recommendation should be an action word (i.e. "Prepare," "Perform," or "Submit"). The recommendations shall be prioritized and numbered to provide easy reference. Impoundment safety recommendations shall be grouped, listed, or categorized similar to the U.S. Department of Interior, "Reclamation Manual, Directives and Standards, Review/Examination Program for High- and Significant-Hazard Impoundments," FAC 01-07 dated July 1998 as follows:

Priority 1 Recommendations: Priority 1 Recommendations involve the correction of severe deficiencies where action is required to ensure the structural safety, operational integrity of a facility, and the safety of the impoundment.

Priority 2 Recommendations: Priority 2 Recommendations are where action is needed or required to prevent or reduce further damage, impair operation, and/or improve or enhance the O&M of the facility. These items do not appear to threaten the safety of the impoundment.

SECTION 8 – REFERENCES

- US Department of Agriculture (USDA)/ Natural Resources Conservation Service (NRCS) Web Soil Survey - online
- Illinois Department of Natural Resources (IDNR), Administrative Code for Impoundment Safety, "Part 3702 – Construction and Maintenance of Impoundments", January 13, 1987.
- US Department of the Interior, Safety and Evaluation of Existing Impoundments (SEED), 1995.
- New Jersey Department of Environmental Protection, Impoundment Safety Guidelines for the Inspection of Existing Impoundments, January 2008.
- US Department of Interior, Reclamation Manual – Directives and Standards – Review/Examination Program for High and Significant Hazard Impoundments, July 1998.



AERIAL IMAGE

NTS

IMAGE SOURCE: GOOGLE EARTH PRO - IMAGE DATE 08/23/10

 KLEINFELDER <i>Bright People. Right Solutions.</i> www.kleinfelder.com	PROJECT NO.	112618	E.D. EDWARDS POWER STATION VICINITY MAP	FIGURE 1
	DATE:	08/23/10		
	DRAWN BY:	MAG		
	CHECKED BY:	BDH	E.D. EDWARDS POWER GENERATING STATION 7800 CILCO LANE BARTONVILLE, IL 61607-9352	
	FILE NAME:			

OUTLET OF POND 1

**POND 1
COOLING POND**

INLET

OUTLET OF ASH
POND SETTLING
CHANNEL

ASH POND SETTLING
CHANNEL

ASH POND SETTLING
CHANNEL

**POND 2
ASH POND**

COAL STOCKPILE

OUTLET OF ASH
POND SETTLING
CHANNEL

INTAKE CHANNEL
FOR POND 3

**POND 3
CLAIRIFICATION POND**

OUTLET WORKS
STRUCTURE

RAILROAD
LOOP IMPROVEMENT

POND 3 MODIFICATION
(FILLED IN)

STORM WATER
RUNOFF DITCH

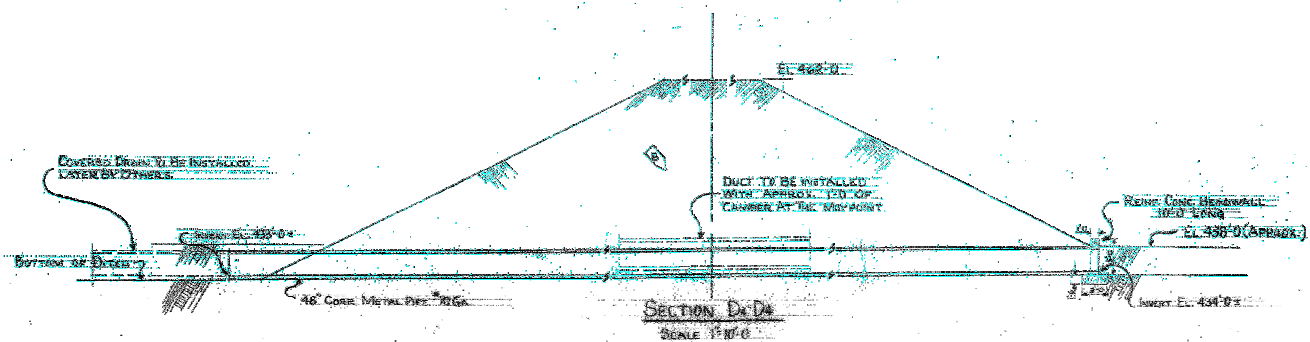
AERIAL IMAGE

NTS

IMAGE SOURCE: SURDEX CORPORATION - EDWARDS POWER STATION AERIAL IMAGE - IMAGE DATE 10/01/09



	PROJECT NO.	112618	E.D. EDWARDS POWER STATION AERIAL LOCATION MAP	FIGURE 2
	DATE:	08/23/10		
	DRAWN BY:	MAG	E.D. EDWARDS POWER GENERATING STATION 7800 CILCO LANE BARTONVILLE, IL 61607-9352	
	CHECKED BY:	BDH		
	FILE NAME:			



TYPICAL EMBANKMENT SECTION - IMPOUNDMENTS PRIOR TO RAILROAD IMPROVEMENTS

NTS



PROJECT NO.	112618
DATE:	08/23/10
DRAWN BY:	MAG
CHECKED BY:	BDH
FILE NAME:	

TYPICAL CROSS SECTION BOTTOM & FLY ASH PONDS

E.D. EDWARDS POWER GENERATING STATION
7800 CILCO LANE
BARTONVILLE, IL 61607-9352

FIGURE

3



Appendix A

Site Assessment Evaluation Checklists

DRAFT



Site Name: E.D. EDWARDS POWER STA. Date: 08/12/10
 Unit Name: POND 1 - COOLING POND Operator's Name: AMERON ENERGY
 Unit I.D.: _____ Hazard Potential Classification: High Significant Low
 Inspector's Name: BRIAN HAVENS + MATT CARDENA

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

	Yes	No		Yes	No
1. Frequency of Company's Dam Inspections?		<u>WEEKLY BY APPROPRIATE PERSON</u>	18. Sloughing or bulging on slopes?		<u>X</u>
2. Pool elevation (operator records)?		<u>450.25</u>	19. Major erosion or slope deterioration?		<u>X</u>
3. Decant inlet elevation (operator records)?		<u>N/A</u>	20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?		<u>N/A</u>	Is water entering inlet, but not exiting outlet?		<u>X</u>
5. Lowest dam crest elevation (operator records)?		<u>462</u>	Is water exiting outlet, but not entering inlet?		<u>Y</u>
6. If instrumentation is present, are readings recorded (operator records)?		<u>N/A</u>	Is water exiting outlet flowing clear?	<u>X</u>	
7. Is the embankment currently under construction?		<u>X</u>	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?		<u>N/A</u>	From underdrain?		<u>X</u>
9. Trees growing on embankment? (If so, indicate largest diameter below)		<u>X</u>	At isolated points on embankment slopes?		<u>X</u>
10. Cracks or scarps on crest?		<u>X</u>	At natural hillside in the embankment area?		<u>X</u>
11. Is there significant settlement along the crest?		<u>X</u>	Over widespread areas?		<u>X</u>
12. Are decant trashracks clear and in place?		<u>X</u>	From downstream foundation area?		<u>X</u>
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		<u>X</u>	"Boils" beneath stream or ponded water?		<u>X</u>
14. Clogged spillways, groin or diversion ditches?		<u>X</u>	Around the outside of the decant pipe?		<u>X</u>
15. Are spillway or ditch linings deteriorated?		<u>X</u>	22. Surface movements in valley bottom or on hillside?		<u>X</u>
16. Are outlets of decant or underdrains blocked?		<u>X</u>	23. Water against downstream toe?	<u>X</u>	
17. Cracks or scarps on slopes?	<u>X</u>		24. Were Photos taken during the dam inspection?	<u>X</u>	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #

Comments

17

SCARP ON WEST SLOPE IN WIDENED
EMBANKMENT; NOT IN PRIMARY SLOPE

U. S. Environmental Protection Agency



Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # IL00019710

INSPECTOR BRIAN HAVENS & MATT GARDNER

Date 08/12/10

Impoundment Name POND 1 - COOLING POND

Impoundment Company AMEREN ENERGY

EPA Region II

State Agency (Field Office) Addresss 5415 N. UNIVERSITY

PEORIA, IL 61614

Name of Impoundment POND 1 - COOLING POND

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

Is impoundment currently under construction?

Yes

No

Is water or ccw currently being pumped into

the impoundment?

X

X

IMPOUNDMENT FUNCTION: COOLING POND FOR WATER USED IN PLANT OPERATIONS

Nearest Downstream Town : Name BARTONVILLE

Distance from the impoundment 1 MILE

Impoundment

Location: Longitude W 89 Degrees 40 Minutes 4 Seconds

Latitude N 40 Degrees 35 Minutes 46 Seconds

State ILLINOIS County PEORIA

Does a state agency regulate this impoundment? YES _____ NO N/A

If So Which State Agency? _____

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

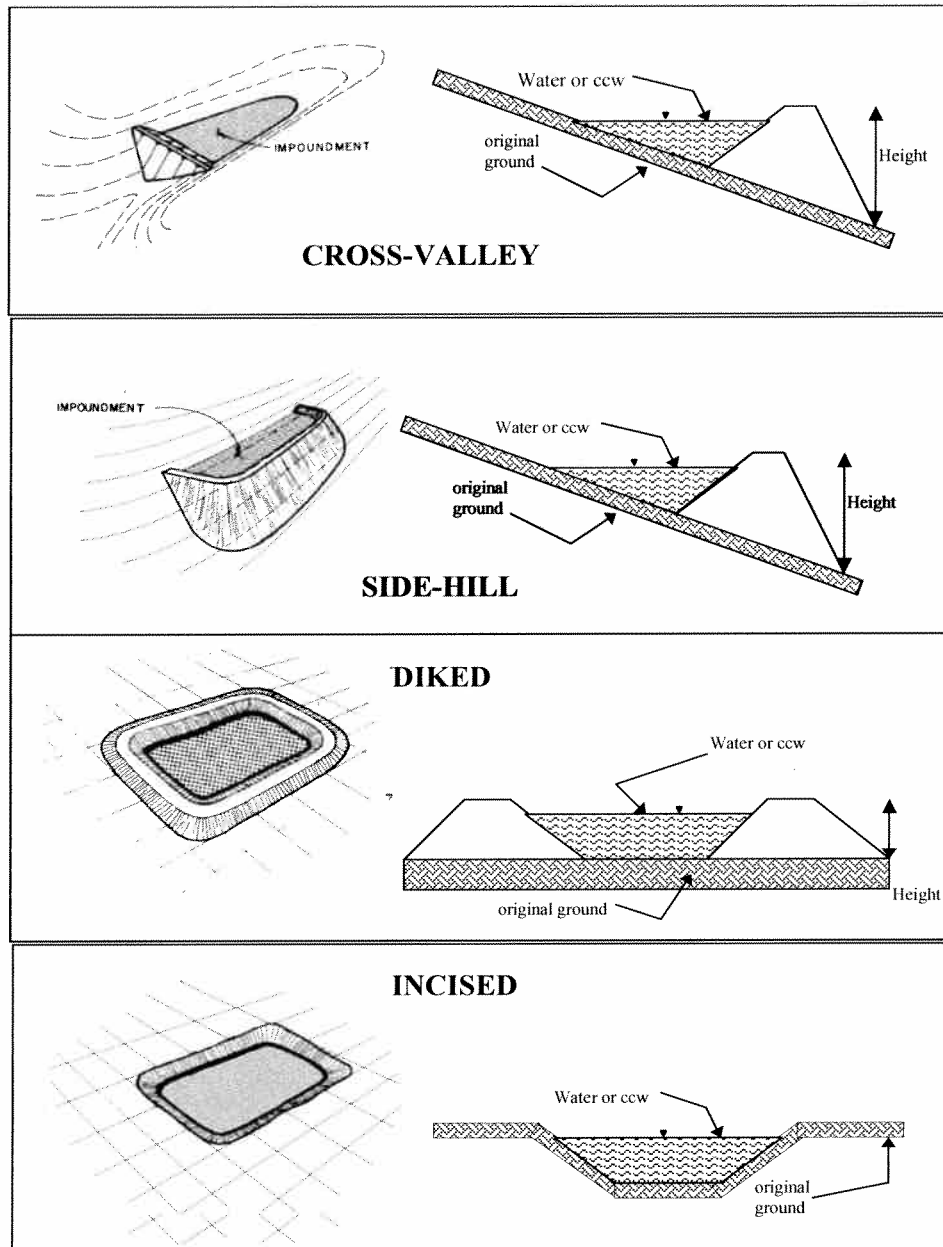
_____ **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

FAILURE OF EMBANKMENT OR OVERTOPPING COULD RESULT
IN DISCHARGE TO STORMWATER CHANNEL AT WESTERN TOW.
THIS COULD RESULT IN THE RELEASE OF WATER + ASH SURGE
DOWNSTREAM CAUSING ENVIRONMENTAL + ECONOMIC
CONCERNS. LOSS OF LIFE WOULD NOT BE EXPECTED AS
THERE ARE NO STRUCTURES / INHABITANTS IMMEDIATELY DOWNSTREAM
OF THE EMBANKMENTS.

CONFIGURATION:



- ☐ Cross-Valley
- ☐ Side-Hill
- ☐ Diked
- ☐ Incised (form completion optional)
- ☒ Combination Incised/Diked

Embankment Height 29 feet Embankment Material CLAY
 Pool Area ~12 acres Liner N/A
 Current Freeboard 5 feet Liner Permeability N/A

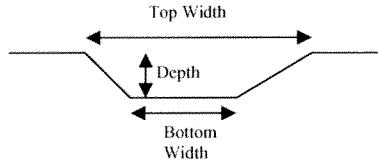
TYPE OF OUTLET (Mark all that apply)

Open Channel Spillway

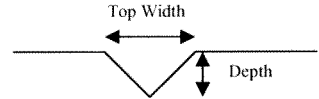
- ☐ Trapezoidal
☐ Triangular
☐ Rectangular
☐ Irregular

- ☐ depth
☐ bottom (or average) width
☐ top width

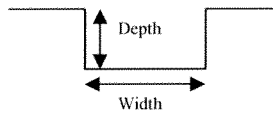
TRAPEZOIDAL



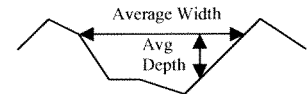
TRIANGULAR



RECTANGULAR



IRREGULAR



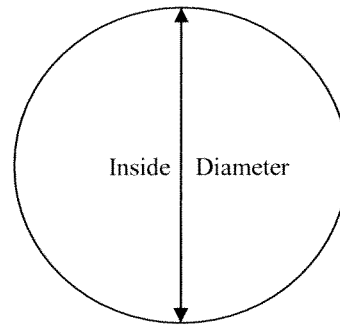
Outlet

N/A

☐ inside diameter

Material

- ☐ corrugated metal
☐ welded steel
☐ concrete
☐ plastic (hdpe, pvc, etc.)
☐ other (specify) _____



Is water flowing through the outlet? YES _____ NO _____

No Outlet

Other Type of Outlet (specify) _____

The Impoundment was Designed By COMMONWEALTH ASSOCIATES

YES ~~X~~ NO

If so Please Describe : OUTLET CULVERT HAS BEEN ADJUSTED TO MAINTAIN A LOWER POND LEVEL TO LIMIT SEEPAGE OVER CLAY CORE OF ORIGINAL EMBANKMENT.



Site Name: E.D EDWARDS Date: 08/12/10
 Unit Name: POND 2- ASH POND SETTLING CH Operator's Name: AMEREN ENERGY
 Unit I.D.: _____ Hazard Potential Classification: High Significant Low
 Inspector's Name: BRIAN HAVENS + MATT GARDELLA

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

Yes		No	Yes		No
1. Frequency of Company's Dam Inspections?	<u>WEEKLY w/ ANNUAL INSP</u>		18. Sloughing or bulging on slopes?		<u>X</u>
2. Pool elevation (operator records)?	<u>445</u>		19. Major erosion or slope deterioration?		<u>X</u>
3. Decant inlet elevation (operator records)?	<u>N/A</u>		20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?	<u>N/A</u>		Is water entering inlet, but not exiting outlet?		<u>X</u>
5. Lowest dam crest elevation (operator records)?	<u>462</u>		Is water exiting outlet, but not entering inlet?		<u>X</u>
6. If instrumentation is present, are readings recorded (operator records)?	<u>N/A</u>		Is water exiting outlet flowing clear?	<u>X</u>	
7. Is the embankment currently under construction?		<u>X</u>	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?	<u>N/A</u>		From underdrain?		<u>X</u>
9. Trees growing on embankment? (If so, indicate largest diameter below)		<u>X</u>	At isolated points on embankment slopes?		<u>X</u>
10. Cracks or scarps on crest?		<u>X</u>	At natural hillside in the embankment area?		<u>X</u>
11. Is there significant settlement along the crest?		<u>X</u>	Over widespread areas?		<u>X</u>
12. Are decant trashracks clear and in place?		<u>X</u>	From downstream foundation area?	<u>X</u>	
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		<u>X</u>	"Boils" beneath stream or ponded water?		<u>X</u>
14. Clogged spillways, groin or diversion ditches?		<u>X</u>	Around the outside of the decant pipe?		<u>X</u>
15. Are spillway or ditch linings deteriorated?		<u>X</u>	22. Surface movements in valley bottom or on hillside?		<u>X</u>
16. Are outlets of decant or underdrains blocked?		<u>X</u>	23. Water against downstream toe?	<u>X</u>	
17. Cracks or scarps on slopes?	<u>X</u>		24. Were Photos taken during the dam inspection?	<u>X</u>	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #	Comments
<u>17</u>	<u>SCARP ON WEST SLOPE IN WIDENED EMBANKMENT; NOT PRIMARY EMBANKMENT</u>
<u>21</u>	<u>POSSIBLE SEEPAGE AT EAST TOE</u>

**Coal Combustion Waste (CCW)
Impoundment Inspection**Impoundment NPDES Permit # 1L00019710INSPECTOR BRIAN HAVENS + MATT GARDELLADate 08/12/10Impoundment Name POND 2 - ASH POND SETTLING CHANNELSImpoundment Company AMEREN ENERGYEPA Region VState Agency (Field Office) Addresss 5415 N. UNIVERSITY
PEORIA, IL 61614Name of Impoundment POND 2 - ASH POND SETTLING CHANNELS
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)New X Update _____

Is impoundment currently under construction?

Yes

No

Is water or ccw currently being pumped into the impoundment?

X

IMPOUNDMENT FUNCTION: SETTLING POND FOR FLY ASH SCURRYNearest Downstream Town : Name BALTONVILLE, ILDistance from the impoundment 1 MILE

Impoundment

Location: Longitude W 89 Degrees 40 Minutes 02 SecondsLatitude N 40 Degrees 35 Minutes 34 SecondsState ILLINOIS County PEORIADoes a state agency regulate this impoundment? YES _____ NO _____ N/A

If So Which State Agency? _____

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

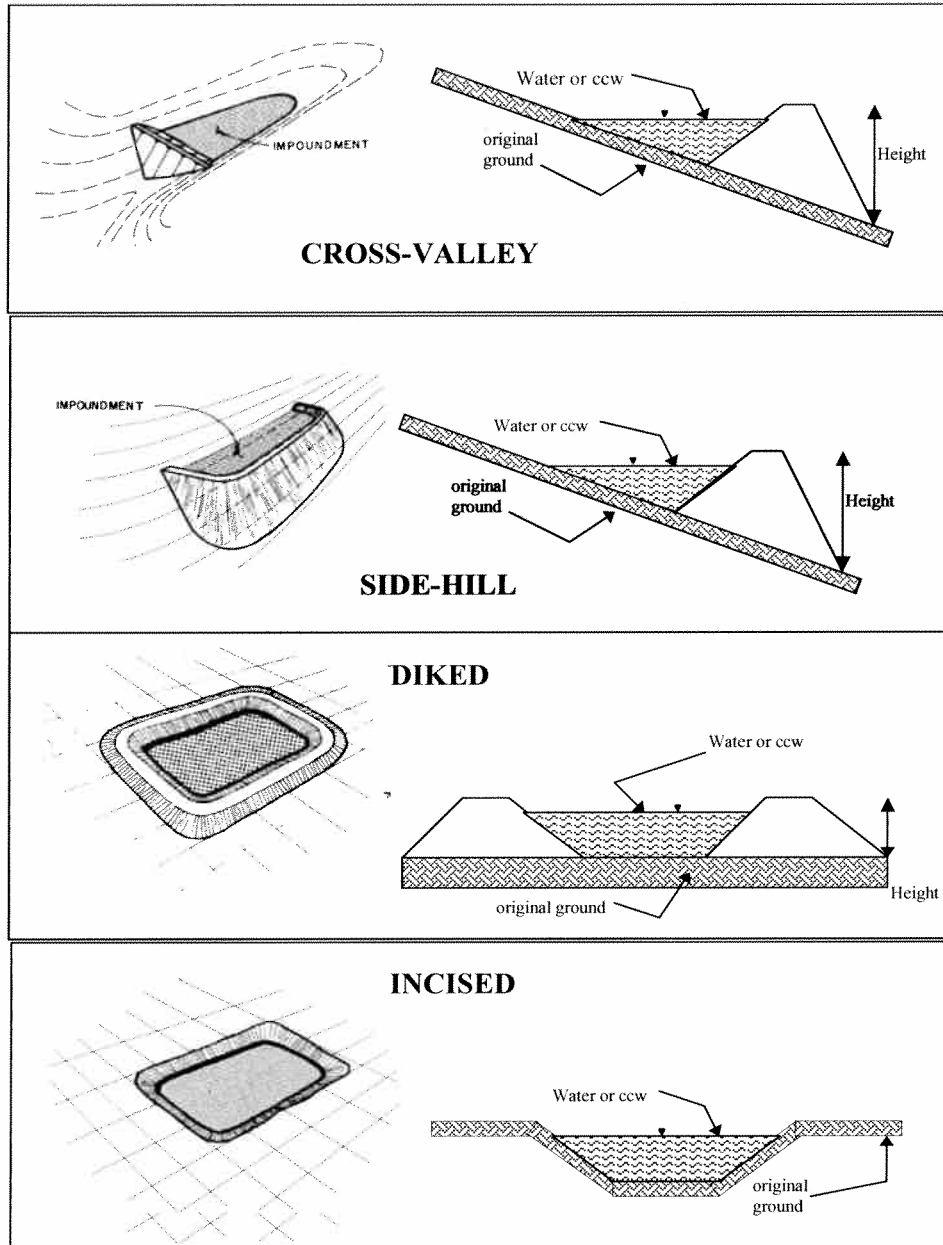
 X **SIGNIFICANT HAZARD POTENTIAL:** Dams assigned the significant hazard potential classification are those dams where failure or misoperation results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

_____ **HIGH HAZARD POTENTIAL:** Dams assigned the high hazard potential classification are those where failure or misoperation will probably cause loss of human life.

DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

FAILURE OF EMBANKMENT OR OVERTOPPING COULD RESULT
IN DISCHARGE TO STORMWATER CHANNEL AT WESTERN TOE.
THIS COULD BE CARRIED DOWNSTREAM CAUSING ENVIRONMENTAL
& ECONOMIC CONCERNS. LOSS OF LIFE WOULD NOT
BE EXPECTED AS THERE ARE NO STRUCTURES/INHABITANTS IMMEDIATELY
DOWNSTREAM OF THE EMBANKMENTS

CONFIGURATION:



- ☐ Cross-Valley
- ☐ Side-Hill
- ☐ Diked
- ☐ Incised (form completion optional)
- ☒ Combination Incised/Diked

Embankment Height 26 feet Embankment Material CLAY
 Pool Area ~ 32 acres Liner N/A
 Current Freeboard 5 feet Liner Permeability N/A

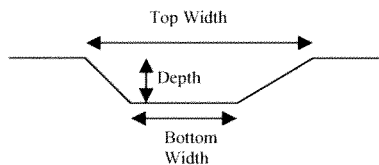
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

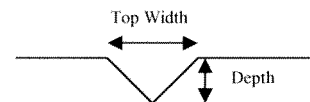
- Trapezoidal
 Triangular
 Rectangular
 Irregular

- depth
 bottom (or average) width
 top width

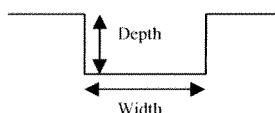
TRAPEZOIDAL



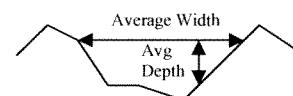
TRIANGULAR



RECTANGULAR



IRREGULAR

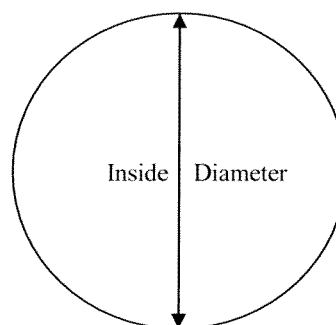


 X **Outlet**

 18" inside diameter

Material

- X corrugated metal
 welded steel
 concrete
 plastic (hdpe, pvc, etc.)
 other (specify) _____



Is water flowing through the outlet? YES X NO _____

 No Outlet

 Other Type of Outlet (specify) _____

The Impoundment was Designed By COMMONWEALTH ASSOCIATES

YES _____ NO X

#####

Table 1. *Staphylococcus aureus* strains and their antibiotic resistance patterns. The strains were isolated from the nasal cavity of patients with nasal polyps. The strains were identified by PCR and confirmed by sequencing. The antibiotic resistance patterns were determined by agar diffusion assay. The strains were classified into two groups: S. aureus strains with a high degree of resistance (S. aureus strains with a resistance to more than 10 antibiotics) and S. aureus strains with a low degree of resistance (S. aureus strains with a resistance to 10 or fewer antibiotics). The strains were also classified into two groups: S. aureus strains with a high degree of resistance (S. aureus strains with a resistance to more than 10 antibiotics) and S. aureus strains with a low degree of resistance (S. aureus strains with a resistance to 10 or fewer antibiotics).

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Site Name: E.D. EDWARDSDate: 08/12/10Unit Name: POND 3 - CLARIFICATION PONDOperator's Name: AMERON ENERGY

Unit I.D.:

Hazard Potential Classification: High Significant LowInspector's Name: BRIAN MAVERNS & MAT GARDIELLA

Check the appropriate box below. Provide comments when appropriate. If not applicable or not available, record "N/A". Any unusual conditions or construction practices that should be noted in the comments section. For large diked embankments, separate checklists may be used for different embankment areas. If separate forms are used, identify approximate area that the form applies to in comments.

Yes		No	Yes		No
1. Frequency of Company's Dam Inspections?		<u>WEEKLY W/ ANNUAL REVIEW</u>	18. Sloughing or bulging on slopes?		<u>X</u>
2. Pool elevation (operator records)?		<u>445</u>	19. Major erosion or slope deterioration?		<u>X</u>
3. Decant inlet elevation (operator records)?		<u>N/A</u>	20. Decant Pipes:		
4. Open channel spillway elevation (operator records)?		<u>N/A</u>	Is water entering inlet, but not exiting outlet?		<u>X</u>
5. Lowest dam crest elevation (operator records)?		<u>462</u>	Is water exiting outlet, but not entering inlet?		<u>X</u>
6. If instrumentation is present, are readings recorded (operator records)?		<u>N/A</u>	Is water exiting outlet flowing clear?	<u>X</u>	
7. Is the embankment currently under construction?		<u>X</u>	21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?		<u>N/A</u>	From underdrain?		<u>X</u>
9. Trees growing on embankment? (If so, indicate largest diameter below)		<u>X</u>	At isolated points on embankment slopes?		<u>X</u>
10. Cracks or scarps on crest?		<u>X</u>	At natural hillside in the embankment area?		<u>X</u>
11. Is there significant settlement along the crest?		<u>X</u>	Over widespread areas?		<u>X</u>
12. Are decant trashracks clear and in place?		<u>X</u>	From downstream foundation area?	<u>POSSIBLE</u>	
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		<u>X</u>	"Boils" beneath stream or ponded water?		<u>X</u>
14. Clogged spillways, groin or diversion ditches?		<u>X</u>	Around the outside of the decant pipe?		<u>X</u>
15. Are spillway or ditch linings deteriorated?		<u>X</u>	22. Surface movements in valley bottom or on hillside?		<u>X</u>
16. Are outlets of decant or underdrains blocked?		<u>X</u>	23. Water against downstream toe?	<u>X</u>	
17. Cracks or scarps on slopes?		<u>X</u>	24. Were Photos taken during the dam inspection?	<u>X</u>	

Major adverse changes in these items could cause instability and should be reported for further evaluation. Adverse conditions noted in these items should normally be described (extent, location, volume, etc.) in the space below and on the back of this sheet.

Inspection Issue #

Comments

21POSSIBLE SEEPAGE AT EAST TOE

U. S. Environmental Protection Agency



Coal Combustion Waste (CCW)
Impoundment Inspection

Impoundment NPDES Permit # IL000197D

INSPECTOR BRIAN HAVES & MAT GARDELL

Date 08/12/10

Impoundment Name POND 3 - CLARIFICATION POND

Impoundment Company AMEREN ENERGY

EPA Region V

State Agency (Field Office) Address 5415 N. UNIVERSITY

PEORIA, IL 61614

Name of Impoundment POND 3 - CLARIFICATION POND

(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New X Update _____

Is impoundment currently under construction?

Yes

No

X

Is water or ccw currently being pumped into

the impoundment?

X

IMPOUNDMENT FUNCTION: FINAL SETTLING POND FOR FLY ASH SLURRY

Nearest Downstream Town : Name BARTONVILLE, IL

Distance from the impoundment 1 MILE

Impoundment

Location: Longitude W 89 Degrees 39 Minutes 55 Seconds

Latitude N 40 Degrees 35 Minutes 23 Seconds

State ILLINOIS County PEORIA

Does a state agency regulate this impoundment? YES _____ NO _____ N/A

If So Which State Agency? _____

HAZARD POTENTIAL (In the event the impoundment should fail, the following would occur):

_____ **LESS THAN LOW HAZARD POTENTIAL:** Failure or misoperation of the dam results in no probable loss of human life or economic or environmental losses.

_____ **LOW HAZARD POTENTIAL:** Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.

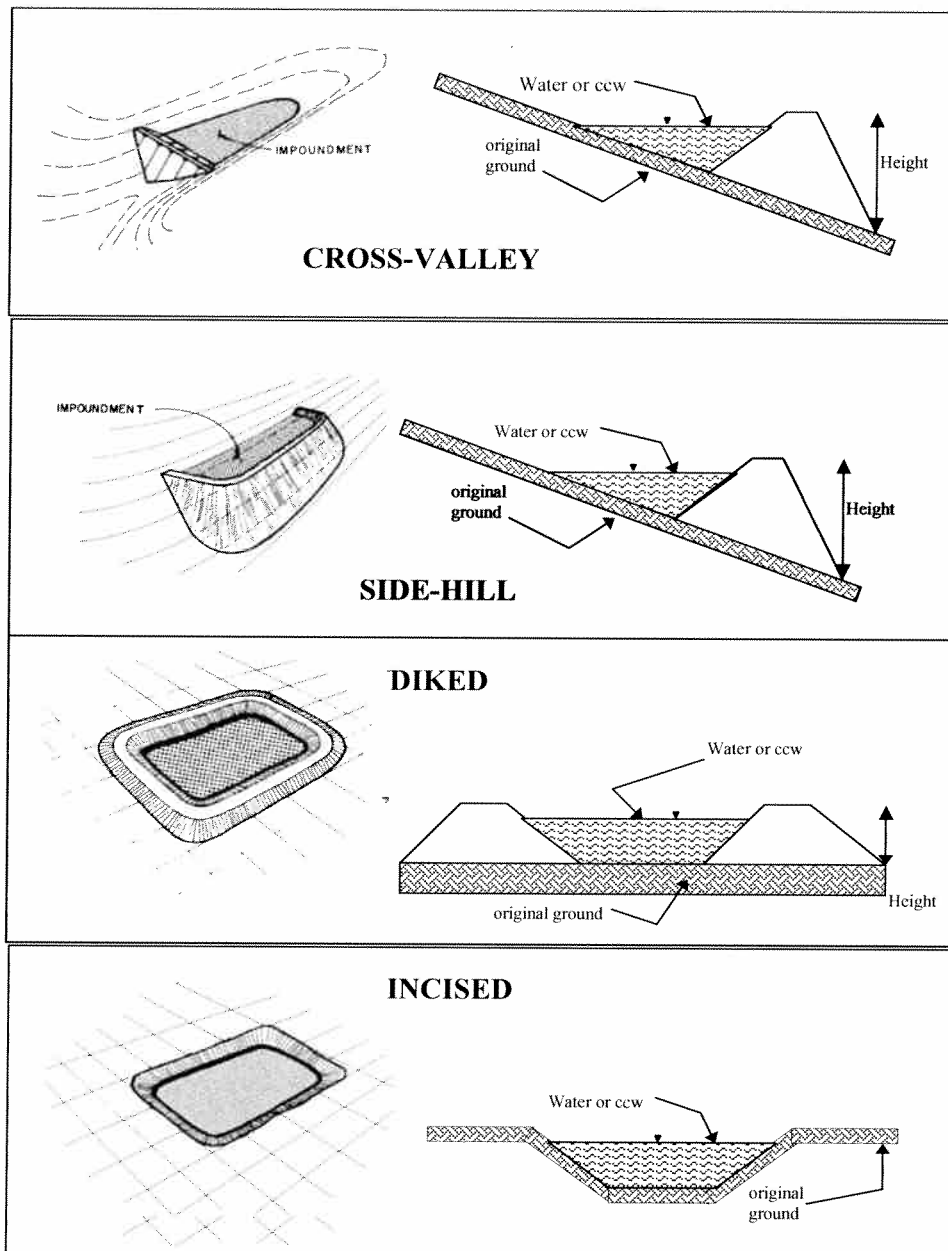
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DESCRIBE REASONING FOR HAZARD RATING CHOSEN:

FAILURE OF EMBANKMENT OR OVERTOPPING COULD RESULT
IN DISCHARGE TO STORMWATER CHANNEL AT WESTERN TOE. THIS
COULD RESULT IN THE RELEASE OF WATER + ASH SLURRY
DOWNSTREAM CAUSING ENVIRONMENTAL + ECONOMIC CONCERNS.
LOSS OF LIFE WOULD NOT BE EXPECTED AS THERE ARE
NO STRUCTURES / INHABITANTS IMMEDIATELY DOWNSTREAM OF
THE EMBANKMENTS.

CONFIGURATION:



- ☐ Cross-Valley
- ☐ Side-Hill
- ☐ Diked
- ☐ Incised (form completion optional)
- ☒ Combination Incised/Diked

Embankment Height 26 feet Embankment Material CLAY
 Pool Area ~ 23 acres Liner N/A
 Current Freeboard 5 feet Liner Permeability N/A

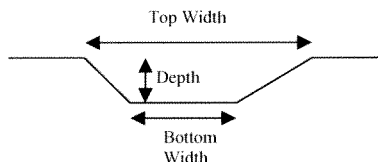
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

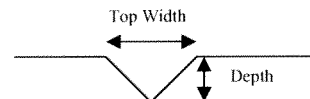
- Trapezoidal
 Triangular
 Rectangular
 Irregular

- depth
 bottom (or average) width
 top width

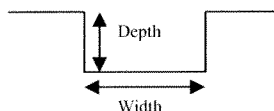
TRAPEZOIDAL



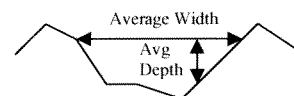
TRIANGULAR



RECTANGULAR



IRREGULAR

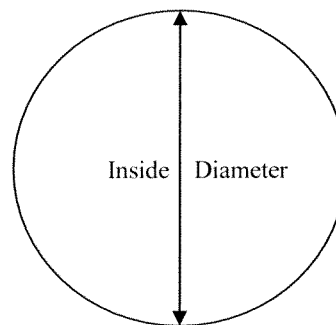


 X **Outlet**

 36" inside diameter

Material

- X corrugated metal w/ BITUMINOUS COATING
 welded steel
 concrete
 plastic (hdpe, pvc, etc.)
 other (specify) _____



Is water flowing through the outlet? YES X NO _____

 No Outlet

 Other Type of Outlet (specify) _____

The Impoundment was Designed By COMMONWEALTH ASSOCIATES INC.

Has there ever been significant seepages at this site? YES _____ NO X

If So When? _____

IF So Please Describe: SMALL AREA OF POSSIBLE SEEPAGE AT D/S
CHANNEL OF COAL PILE. COULD ALSO BE A RESULT OF
SEEPAGE OF WATER THROUGH COAL PILE

Has there ever been any measures undertaken to monitor/lower Phreatic water table levels based on past seepages or breaches at this site?

YES _____ NO X

If so, which method (e.g., piezometers, gw pumping,...)? _____

If so Please Describe : _____

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Appendix B

Site Assessment Photographs



Photo 1 – Sluice Pipes at the Inlet to the Ash Pond



Photo 2 – Elevated Sluice Pipe Structure



Photo 3 – Active Ash Pond Settling Channel



Photo 4 – Active Intake Pipe and Ash Settling Channel



Photo 5 – Railroad Tracks on Crest of Ash Pond and Clarification Pond Embankment



Photo 6 – Inlet Piping for Clarification Pond Outlet Works



Photo 7 – Outlet Works Access Platform



Photo 8 – Cleared Toe of Downstream Slope on Eastern Embankment



Photo 9 – Cleared Toe of Downstream Slope (Note Riprap and Minor Rutting)



Photo 10 – Vegetated Riprap on Embankment Slope (Typical)



Photo 11 – Vegetation on Upstream Slope of Clarification Pond (Note Steep Slopes)



Photo 12 – Riprap and Railroad Tracks at Crest of Clarification Pond Embankment



Photo 13 – Minor Erosion on Crest of Clarification Pond (Typical of Ash Pond and Clarification Pond)



Photo 14 – Area of Clarification Pond Filled in After Completion of Railroad Improvements



Photo 15 – Area of Sparse Vegetation and Erosion on Embankment Slope and Toe



Photo 16 – Typical Southern Embankment of Clarification Pond



Photo 17 – Erosion Greater than 12 Inches Forming on Downstream Slopes of Southern Embankment



Photo 18 – Erosion and Sparse Vegetation on Downstream Slopes of Southern Embankment



Photo 19 – Sparse Vegetation on Crest and Downstream Slope of Southern Embankment



Photo 20 – Sparse Vegetation on Crest and Downstream Slope of Southern Embankment



Photo 21 – Erosion on Southern Downstream Slopes and Crest (Typical)



Photo 22 – Clarification Pond General Condition



Photo 23 – Clarification Pond Inlet Channel



Photo 24 – Original Embankment with Raised Railroad Embankment Improvements Visible



Photo 25 – Typical Western Embankment of Clarification Pond, Clarification Pond Inlet and Pond 1



Photo 26 –Clarification Pond Inlet Channel with Riprap (Note Ash Pond Settling Channel Inlets)



Photo 27 – Outlet of Ash Pond Settling Channel into Clarification Pond Inlet Channel



Photo 28 – Waste Water Sewer Line Manhole in Downstream Slope (Near Toe of Original Embankment)



Photo 29 – Electric Line Penetration near Toe of Downstream Embankment



Photo 30 – Waste Water Sewer Line Manhole in Downstream Slope with Erosion Present



Photo 31 – Erosion Greater Than 12” Present at Sides of Waste Water Sewer Manhole



Photo 32 – Small Diameter Vegetation Growing on Crest



Photo 33 – Outlet Piping from Pond 1 into Clarification Pond Inlet Channel



Photo 34 – Pond 1 Pool Elevation Gauge



Photo 35 – Pond 1 General Conditions



Photo 36 – Scarp on Western Pond 1 Downstream Slope (Note Post for Observational Purposes)



Photo 37 – Scarp on Western Pond 1 Downstream Slope Approximately 18"-24" Deep



Photo 38 – Scarp on Western Pond 1 Downstream Slope



Photo 39 – Waste Water Sewer Manhole on Downstream Slope of Pond 1



Photo 40 – Scarp that has Been Repaired on Western Pond 1 Downstream Slope



Photo 41 – Pond 1 General Conditions (Note Access Road Expansion into Pond)



Photo 42 – General Crest Conditions of Pond 1 (Note Piezometer in Crest)



Photo 43 – Typical Newly Installed Monitoring Well



Photo 44 – Floodwall Separating Ash Pond Settling Channels and Coal Pile



Photo 45 – Storm Water Channel between Coal Pile and Floodwall (Possible Seep Location)

Appendix C

Response Letter to the EPA's Section 104(e) Request for Information

Ameren Services

Environmental Services
314.554.2388 (Phone)
314.554.4182 (Facsimile)
ppike@ameren.com

One Ameren Plaza
1901 Chouteau Avenue
PO Box 66149
St. Louis, MO 63166-6149

March 26, 2009

Mr. Richard Kinch
US Environmental Protection Agency (53306P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460



RE: Request for Information under Section 104 (e) of the Comprehensive
Environmental Response, Compensation, and Liability Act, 42 U.S.C.
9604(e)

Dear Mr. Kinch:

This letter and attachments are AmerenEnergy Generating and AmerenEnergy Resources Companies' response to the United States Environmental Protection Agency's request for information relating to the surface impoundments or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material from a surface impoundment used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals.

AmerenEnergy Generating and AmerenEnergy Resources Companies have received requests for information about their five coal-fired power stations in Illinois. Although most of our surface impoundments are not considered to be dams by State or Federal regulations, we are subject to State and Federal NPDES regulations and have had Agency personnel inspect these units. We are providing a full and complete response to each separate request for information set forth in your Enclosure A (attached) with responses corresponding to numbering in your questions. If you have any further questions please feel free to contact Paul Pike at (314) 554-2388.

I certify that the information contained in this response to EPA's request for information and the accompanying documents is true, accurate, and complete. As to the identified portions of this response for which I cannot personally verify their accuracy, I certify under penalty of law that this response and all attachments were prepared in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, those persons directly responsible for gathering the information, the information submitted is, to the best of my

knowledge, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael L. Menne". The signature is fluid and cursive, with the first name "Michael" and last name "Menne" clearly distinguishable.

Michael L. Menne
Vice President – Environmental Services

Enclosure A

Please provide the information requested below for each surface impoundment or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals. This includes units that no longer receive coal combustion residues or by-products, but still contain free liquids. .

1. Relative to the National Inventory of Dams criteria for High, Significant, Low, or Less-than-Low, please provide the potential hazard rating for each management unit and indicate who established the rating, what the basis of the rating is, and what federal or state agency regulates the unit(s). If the unit(s) does not have a rating, please note that fact.
2. What year was each management unit commissioned and expanded? ;
3. What materials are temporarily or permanently contained in the unit? Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other. If the management unit contains more than one type of material, please identify all that apply. Also, if you identify "other," please specify the other types of materials that are temporarily or permanently contained in the unit(s).
4. Was the management unit(s) designed by a Professional Engineer? Is or was the construction of the waste management unit(s) under the supervision of a Professional Engineer? Is inspection and monitoring of the safety of the waste-management unit(s) under the supervision of a Professional Engineer?
5. When did the company last assess or evaluate the safety (i.e., structural integrity) of the management unit(s)? Briefly describe the credentials of those conducting the structural integrity assessments/evaluations. Identify actions taken or planned by facility personnel as a result of these assessments or evaluations. If corrective actions were taken, briefly describe the credentials of those performing the corrective actions, whether they were company employees or contractors. If the company plans an assessment or evaluation in the future, when is it expected to occur?
6. When did a State or a Federal regulatory official last inspect or evaluate the safety (structural integrity) of the management unit(s)? If you are aware of a planned state or federal inspection or evaluation in the future, when is it expected to occur? Please identify the Federal or State regulatory agency or department which conducted or is planning the inspection or evaluation. Please provide a copy of the most recent official inspection report or evaluation.
7. Have assessments or evaluations, or inspections conducted by State or Federal regulatory officials conducted within the past year uncovered a safety issue(s) with the management unit(s), and, if so, describe the actions that have been or are being taken to deal with the issue or issues. Please provide any documentation that you have for these actions.

8. What is the surface area (acres) and total storage capacity of each of the management units? What is the volume of materials currently stored in each of the management unit(s)? Please provide the date that the volume measurement(s) was taken. Please provide the maximum height of the management unit(s). The basis for determining maximum height is explained later in this. Enclosure.

9. Please provide a brief history of known spills or unpermitted releases from the unit within the last ten years, whether or not these were reported to State or federal regulatory agencies. For purposes of this question, please include only releases to surface water or to the land (do not include releases to groundwater).

10. Please identify all current legal owner(s) and operator(s) at the facility.

AmerenEnergy Generating Company Response

Meredosia Power Station
800 W. Washington
Meredosia, Illinois 62665

1. Coal-combustion by-product surface impoundments at this Station are not classified as dams by State or Federal regulatory agencies so they have not been rated.

2. See table below.

Management Unit	Year Commissioned or Expanded
Fly Ash Pond	1968
Bottom Ash Pond	1972

3. See table below.

Management Unit	Materials Contained in Unit*
Fly Ash Pond	1
Bottom Ash Pond	2

*Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other.

Other types of materials that are temporarily or permanently contained in the unit(s) include, but are not limited to residual wastes remaining following treatment of wastewater from these systems: primary water treatment; boiler water make-up treatment; laboratory and sampling streams; boiler blowdown; floor drains; coal pile run off; house service water systems; and pyrites.

4. The management units at this facility were designed by a Professional Engineer. The construction of the management units were done under the supervision of a Professional Engineer. And, inspection and monitoring of the safety of the waste management units is under the supervision of a Professional Engineer.
5. The most recent annual internal professional engineering inspection of the management units occurred in 2009. Since these management units are not classified by regulation as dams the evaluation only included a visual inspection of the units. AmerenEnergy Resources Company has formed a Dam Safety Group consisting of civil engineers who oversee the

implementation of the company Dam Safety Program and this Group is supervised by a licensed Professional Engineer. The Dam Safety Program requires routine, annual and special inspection of the ash ponds and employees performing these inspections receive dam safety training. If maintenance issues are identified in these visual inspections, then corrective actions are taken by either plant employees or contractors to remedy the issue and final acceptance of the work is reviewed and evaluated by Dam Safety Group personnel.

6. No State, or Federal regulatory official has inspected or evaluated the safety (structural integrity) of the management unit(s), and we are not aware of a planned state or federal inspection or evaluation in the future.
7. Not applicable, see response to Question 6.
8. See table below.

Management Unit	Surface Area (Acres)	Total Storage Capacity (Acre-ft)	Volume of Stored Ash (Acre-ft)	Maximum Height of Unit (ft.)
Fly Ash Pond	186	700	650	24
Bottom Ash Pond	34	186	139	24

The volume measurement includes area excavated below natural surface level and was determined in 2007.

9. Assuming that brief history means incident(s) which could have occurred in the last ten (10) years, we are only aware of one instance when there was a release from our surface impoundments to the land. The incident occurred in late December, 2006, when we released a small amount of water (less than 500 gallons) from the fly ash pond to the land. In response, we modified the pond and developed internal procedures to prevent a recurrence of the situation. We are not aware of any other spills or unpermitted releases of coal-combustion by-products from our surface impoundments to surface water or to the land.
10. The current legal owner and operator at the facility is AmerenEnergy Generating Company.

AmerenEnergy Generating Company Response

Hutsonville Power Station
 15142 East 1900 Avenue
 Hutsonville, Illinois 62433

1. One of the coal-combustion by-product surface impoundments at this Station is classified as a dam by State or Federal regulatory agencies. The unit that we refer to as Ash Pond A is classified under Illinois regulations as a Class III dam which is considered to be a low risk unit. The potential hazard rating was established by company employees, and the basis of the rating was the size of the pond and that in case of a failure, it has a low probability for causing loss of life, where there are no permanent structures for human habitation, or minimal economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed.. The Illinois Department of Natural Resources is the agency that regulates the unit. All the remaining coal-combustion by-product surface impoundments at this Station are not classified as dams by State or Federal regulatory agencies so they have not been rated.
2. See table below.

Management Unit	Year Commissioned or Expanded
Ash Pond A	1986
Ash Pond B	2000
Ash Pond C	2000
Bottom Ash Pond	1940

3. See table below.

Management Unit	Materials Contained in Unit*
Ash Pond A	1
Ash Pond B	1, 2
Ash Pond C	1, 2, 5
Bottom Ash Pond	2

*Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other.

Other types of materials that are temporarily or permanently contained in the unit(s) include, but are not limited to residual wastes remaining following treatment of wastewater from these systems: primary water treatment; boiler water make-up treatment; sanitary wastewater treatment; laboratory and sampling streams; boiler blowdown; floor drains; coal pile run off; house service water systems; and pyrites.

4. The management units at this facility were designed by a Professional Engineer. The construction of the management units were done under the supervision of a Professional Engineer. And, inspection and monitoring of the safety of the management units is under the supervision of a Professional Engineer.
5. The most recent annual internal professional engineering inspection of the management units occurred in 2009. AmerenEnergy Resources Company has formed a Dam Safety Group consisting of civil engineers who oversee the implementation of the company Dam Safety Program and this Group are supervised by a licensed Professional Engineer. The Dam Safety Program requires routine, annual and special inspection of the ash ponds and employees performing these inspections receive dam safety training. If maintenance issues are identified in these visual inspections, then corrective actions are taken by either plant employees or contractors to remedy the issue and final acceptance of the work is reviewed and evaluated by Dam Safety Group personnel.

Ash Pond A was evaluated for its structural integrity during its design in March, 1984. The individual who conducted the structural integrity assessments/evaluations was a geotechnical engineer who is licensed by the State of Illinois as a professional engineer. The evaluation was used to guide construction of the facility and no corrective actions other than possible design changes of the proposed unit were required based on the evaluation.

6. No State, or Federal regulatory official has inspected or evaluated the safety (structural integrity) of the management unit(s), and we are not aware of a planned state or federal inspection or evaluation in the future.
7. Not applicable, see response to Question 6.
8. See table below.

Management Unit	Surface Area (Acres)	Total Storage Capacity (Acre-ft)	Volume of Stored Ash (Acre-ft)	Maximum Height of Unit (ft.)
Ash Pond A	14	250	50	22
Ash Pond B	4.4	70	10	17
Ash Pond C	2	20	5	12

Bottom Ash Pond	1.2	6	3	15
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The volume measurement includes area excavated below natural surface level and was determined in 2007.

9. Assuming that brief history means incident(s) which could have occurred in the last ten (10) years, we are not aware of any spills or unpermitted releases of coal-combustion by-products from our surface impoundments to surface water or to the land.
10. The current legal owner and operator at the facility is AmerenEnergy Generating Company.

AmerenEnergy Generating Company Response

Newton Power Station
6725 North 500th Street
Newton, Illinois 62448

1. Coal-combustion by-product surface impoundments at this Station are not classified as dams by State or Federal regulatory agencies so they have not been rated.
2. See table below.

Management Unit	Year Commissioned or Expanded
Primary Ash Pond	1977
Secondary Ash Pond	1977

3. See table below.

Management Unit	Materials Contained in Unit*
Primary Ash Pond	1, 2, 5
Secondary Ash Pond	1, 2, 5

*Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other.

Other types of materials that are temporarily or permanently contained in the unit(s) include, but are not limited to residual wastes remaining following treatment of wastewater from these systems; primary water treatment; boiler water make-up treatment; laboratory and sampling streams; boiler blowdown; floor drains; coal pile run off; house service water systems; and pyrites.

4. The management units at this facility were designed by a Professional Engineer. The construction of the management units were done under the supervision of a Professional Engineer. And, inspection and monitoring of the safety of the waste management units is under the supervision of a Professional Engineer.
5. The most recent annual internal professional engineering inspection of the management units occurred in 2009. Since these management units are not classified by regulation as dams the evaluation only included a visual inspection of the units. AmerenEnergy Resources Company has formed a Dam Safety Group consisting of civil engineers who oversee the implementation of the company Dam Safety Program and this Group is supervised by a

licensed Professional Engineer. The Dam Safety Program requires routine, annual and special inspection of the ash ponds and employees performing these inspections receive dam safety training. If maintenance issues are identified in these visual inspections, then corrective actions are taken by either plant employees or contractors to remedy the issue and final acceptance of the work is reviewed and evaluated by Dam Safety Group personnel.

6. No State, or Federal regulatory official has inspected or evaluated the safety (structural integrity) of the management unit(s), and we are not aware of a planned state or federal inspection or evaluation in the future.
7. Not applicable, see response to Question 6.
8. See table below.

Management Unit	Surface Area (Acres)	Total Storage Capacity (Acre-ft)	Volume of Stored Ash (Acre-ft)	Maximum Height of Unit (ft.)
Primary Ash Pond	400	9250	2000	47
Bottom Ash Pond	9.3	83	minimal	29

The volume measurement includes area excavated below natural surface level and was determined in 2007.

9. Assuming that brief history means incident(s) which could have occurred in the last ten (10) years, we are not aware of any spills or unpermitted releases of coal-combustion by-products from our surface impoundments to surface water or to the land.
10. The current legal owner and operator at the facility is AmerenEnergy Generating Company.

AmerenEnergy Resources Generating Company Response

Duck Creek Power Station
17751 N. Cilco Road
Canton, Illinois 61520

1. Coal-combustion by-product surface impoundments at this Station are not classified as dams by State or Federal regulatory agencies so they have not been rated.
2. See table below.

Management Unit	Year Commissioned or Expanded
Ash Pond 1	1976
Ash Pond 2	1986

3. See table below.

Management Unit	Materials Contained in Unit*
Ash Pond 1	1, 2, 4
Ash Pond 2	1, 2, 4

*Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other.

Other types of materials that are temporarily or permanently contained in the unit(s) include, but are not limited to residual wastes remaining following treatment of wastewater from these systems: primary water treatment; boiler water make-up treatment; sanitary wastewater treatment; laboratory and sampling streams; boiler blowdown; floor drains; coal pile run off; house service water systems; and pyrites.

4. The management units at this facility were designed by a Professional Engineer. The construction of the management units were done under the supervision of a Professional Engineer. And, inspection and monitoring of the safety of the waste management units is under the supervision of a Professional Engineer.
5. The most recent annual internal professional engineering inspection of the management units occurred in 2009. Since these management units are not classified by regulation as dams the evaluation only included a visual inspection of the units. AmerenEnergy Resources Company has formed a Dam Safety Group consisting of civil engineers who oversee the implementation of the company Dam Safety Program and this Group is supervised by a

licensed Professional Engineer. The Dam Safety Program requires routine, annual and special inspection of the ash ponds and employees performing these inspections receive dam safety training. If maintenance issues are identified in these visual inspections, then corrective actions are taken by either plant employees or contractors to remedy the issue and final acceptance of the work is reviewed and evaluated by Dam Safety Group personnel.

6. No State, or Federal regulatory official has inspected or evaluated the safety (structural integrity) of the management unit(s), and we are not aware of a planned state or federal inspection or evaluation in the future.
7. Not applicable, see response to Question 6.
8. See table below.

Management Unit	Surface Area (Acres)	Total Storage Capacity (Acre-ft)	Volume of Stored Ash (Acre-ft)	Maximum Height of Unit (ft.)
Ash Pond 1	58	1300	1900	50
Ash Pond 2	85	1000	800	45

The volume measurement includes area excavated below natural surface level and was determined in 2007.

9. Assuming that brief history means incident(s) which could have occurred in the last ten (10) years, we are not aware of any spills or unpermitted releases of coal-combustion by-products from our surface impoundments to surface water or to the land.
10. The current legal owner and operator at the facility is AmerenEnergy Resources Generating Company.

AmerenEnergy Resources Generating Company Response

E. D. Edwards Power Station
7800 South Cilco Lane
Bartonville, Illinois 61607

1. Coal-combustion by-product surface impoundments at this Station are not classified as dams by State or Federal regulatory agencies so they have not been rated.

2. See table below.

Management Unit	Year Commissioned or Expanded
Ash Pond	1960

3. See table below.

Management Unit	Materials Contained in Unit*
Fly Ash Pond	1, 2, 5

*Use the following categories to respond to this question: (1) fly ash; (2) bottom ash; (3) boiler slag; (4) flue gas emission control residuals; (5) other.

Other types of materials that are temporarily or permanently contained in the unit(s) include, but are not limited to residual wastes remaining following treatment of wastewater from these systems: primary water treatment; boiler water make-up treatment; laboratory and sampling streams; boiler blowdown; floor drains; coal pile run off; house service water systems; and pyrites.

4. The management units at this facility were designed by a Professional Engineer. The construction of the management units were done under the supervision of a Professional Engineer. And, inspection and monitoring of the safety of the waste management units is under the supervision of a Professional Engineer.
5. The most recent annual internal professional engineering inspection of the management units occurred in 2009. Since these management units are not classified by regulation as dams the evaluation only included a visual inspection of the units. AmerenEnergy Resources Company has formed a Dam Safety Group consisting of civil engineers who oversee the implementation of the company Dam Safety Program and this Group is supervised by a licensed Professional Engineer. The Dam Safety Program requires routine, annual and special inspection of the ash ponds and employees performing these inspections receive dam safety training. If maintenance issues are identified in these visual inspections, then

corrective actions are taken by either plant employees or contractors to remedy the issue and final acceptance of the work is reviewed and evaluated by Dam Safety Group personnel.

6. No State, or Federal regulatory official has inspected or evaluated the safety (structural integrity) of the management unit(s), and we are not aware of a planned state or federal inspection or evaluation in the future.
7. Not applicable, see response to Question 6.
8. See table below.

Management Unit	Surface Area (Acres)	Total Storage Capacity (Acre-ft)	Volume of Stored Ash (Acre-ft)	Maximum Height of Unit (ft.)
Fly Ash Pond	89	1,800	1,000	32

The volume measurement includes area excavated below natural surface level and was determined in 2007.

9. Assuming that brief history means incident(s) which could have occurred in the last ten (10) years, we are not aware of any spills or unpermitted releases of coal-combustion by-products from our surface impoundments to surface water or to the land.
10. The current legal owner and operator at the facility is AmerenEnergy Resources Generating Company.