2019 ANNUAL DAM AND DIKE INSPECTION REPORT

BOTTOM ASH PONDS

PIRKEY POWER PLANT

HALLSVILLE, TEXAS

November 2019

Prepared by: American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215

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Dam & Dike Inspection Report
ASH Ponds

GERS-19-040
Revision 0

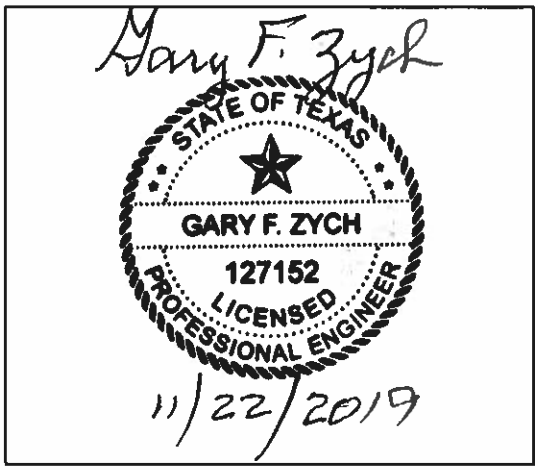
PIRKEY POWER PLANT
HALLSVILLE, TEXAS

INSPECTION DATE **October 22, 2019**

PREPARED BY Brett A. Dreger, P.E. **DATE** 11/19/2019

REVIEWED BY Pedro J. Amaya, P.E. /For **DATE** 11/20/2019

APPROVED BY Gary F. Zych, P.E. **DATE** 11/22/2019
Manager - Geotechnical Engineering



PROFESSIONAL ENGINEER SEAL & SIGNATURE

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

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1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.83 and to provide South Western Electric Power Company (SWEPCO) and Pirkey Power Plant with an evaluation of the facility.

The AEP H.W. Pirkey Plant is located in southern Harrison County, approximately 5 miles southeast of Hallsville, Texas, and approximately 8 miles southwest of Marshall, Texas.

American Electric Power Service Corporation's Civil Engineering Division administers the Pirkey Power Plant's Dam Inspection and Maintenance Program (DIMP). As part of the DIMP, staff from the Geotechnical Engineering Services Section annually conducts dam and dike inspections. This report contains the inspection findings, observations, photographic descriptions, conclusions, and maintenance recommendations. This inspection report addresses the Bottom Ash Ponds at the Pirkey Power plant.

Mr. Brett Dreger, PE, a staff from the Geotechnical Engineering Services Section, conducted the Ash Ponds Inspection. Mr. William G. Carter, P.E. of AEP Plant Engineering Region 5, was the facility contact for the inspection and accompanied Mr. Brett Dreger during the inspection. The inspection was performed on October 22, 2019. Weather conditions were mostly sunny, with temperatures ranging from 50° F in the morning to 70° F in the afternoon. There was 2.5 inches of rainfall over the seven days prior to the inspection.

This report has been prepared by Mr. Brett Dreger, PE, under the direct supervision of Mr. Gary Zych, PE, AEP's Geotechnical section manager. The report presents: (i) Description of the impoundments, (i) Summary of Visual Observations; (ii) Conclusions; and (iii) Recommendations. Photographs identifying typical conditions, problem areas, items that need correction or requiring additional monitoring, have been selected from the inspection field photographic file and provided in the Attachments A and B, to this report.

2.0 DESCRIPTION OF IMPOUNDMENTS

2.1 EAST BOTTOM ASH POND

The East BAP CCR unit is located at the north end of the Plant and approximately 2,000 feet north-northwest of Brandy Branch Reservoir. The East BAP is partially incised below the existing natural ground surface with an embankment height of approximately 4 feet. The East BAP embankments are constructed of compacted clay on a 3:1 slope (3 feet horizontal, 1 foot vertical). The elevation of the top of the embankment around the perimeter of the East BAP is approximately 357 feet above msl, and the normal operating level is approximately 354 feet above msl. At the time of inspection, the EBAP was in service and the pool level was at 354.5 feet above msl. The interior bottom elevation of the East BAP is approximately 347.0 feet above msl.

Surface water elevation in the East BAP is controlled by a stop log regulated window cut into a concrete riser and a manually operated gate valve on a 36-inch-diameter discharge pipe at the southwest corner of the pond. Clear water overflow from the East BAP discharges through the 36-inch-diameter corrugated metal pipe into the 2.7- acre Secondary Bottom Ash Pond located directly south of the East BAP. Water in the Secondary Bottom Ash Pond is either pumped (recirculated) back into the boiler ash hopper, or gravity discharged through a pipe at the southwest corner of the Secondary Bottom Ash Pond into an

unnamed intermittent tributary of Hatley Creek via Outfall 006 in accordance with Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0002496000.

2.2 WEST BOTTOM ASH POND

The West BAP CCR unit is located at the north end of the Plant and approximately 3,000 feet northwest of Brandy Branch Reservoir. The West BAP embankments have a maximum height of approximately 25 feet and are constructed of compacted clay on a slope ranging from 2.5:1 (2.5 feet horizontal, 1 foot vertical) to 3:1. The elevation at the top of the embankment around the perimeter of the West BAP is approximately 357 feet above msl, and the normal operating level is approximately 354 feet above msl. At the time of inspection, the WBAP was out of service and the pool level was at 348.5 feet above msl. The interior bottom elevation of the East BAP is approximately 347 feet above msl.

Surface water elevation in the West BAP is controlled by a stop log regulated window cut into a concrete riser and a manually operated gate valve on a 36-inch-diameter discharge pipe at the southeast corner of the pond. Clear water overflow from the West BAP discharges through the 36-inch-diameter corrugated metal pipe into the 2.7- acre Secondary Bottom Ash Pond located southeast of the West BAP. Water in the Secondary Bottom Ash Pond is either pumped (recirculated) back into the boiler ash hopper, or gravity discharged through a pipe at the southwest corner of the Secondary Bottom Ash Pond into an unnamed intermittent tributary of Hatley Creek via Outfall 006 in accordance with Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0002496000.

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

A review of available information regarding the status and condition of the CCR Ponds, which include files available in the CCR operating record, such as design and construction information, periodic structural stability assessments, previous 7 day inspection reports, 30-day instrumentation data, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

4.0 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the East and West Bottom Ash Ponds since the 2018 annual inspection. The geometry of the impoundment has remained essentially unchanged.

5.0 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the East and West Bottom Ash Ponds since the last annual inspection that would affect the stability or operation of the impounding structure.

6.0 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

6.1 EAST BOTTOM ASH POND

Table 1 is a summary of the minimum, maximum, and present depth and elevation of the impounded water

and CCR material since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water at the time of the inspection.

Table 1 Summary of Relevant Storage Information for East bottom Ash Pond

	Primary Ash Pond
Approximate **Minimum** depth of impounded water since last annual inspection	0.5ft (347.5)
Approximate **Maximum** depth of impounded water since last annual inspection	7.5ft (354.5)
Approximate **Present** depth of impounded water at the time of the inspection	7.5 ft (354.5)
Approximate **Minimum** depth of CCR since last annual inspection	0.5ft (347.5)
Approximate **Maximum** depth of CCR since last annual inspection	7.5ft (354.5)
Approximate **Present** depth of CCR at the time of the inspection	2.0ft (349.0)
Storage Capacity of impounding structure at the time of the inspection	188 acre-ft
Approximate volume of impounded water at the time of the inspection	40 Million Gallons at El. 354.5
Approximate volume of CCR at the time of the inspection	60,000 c.y.

6.2 WEST BOTTOM ASH POND

Table 2 is a summary of the minimum, maximum, and present depth and elevation of the impounded water and CCR material since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water at the time of the inspection.

Table 2 Summary of Relevant Storage Information for West Bottom Ash Pond

	Bottom Ash Storage Pond
Approximate **Minimum** depth of impounded water since last annual inspection	0.5ft (347.5)
Approximate **Maximum** depth of impounded water since last annual inspection	7.5ft (354.5)
Approximate **Present** depth of impounded water at the time of the inspection	1.5ft (348.5)
Approximate **Minimum** depth of CCR since last annual inspection	0.5ft (347.5)
Approximate **Maximum** depth of CCR since last annual inspection	7.5ft (354.5)
Approximate **Present** depth of CCR at the time of the inspection	1.0ft (348.0)

Storage Capacity of impounding structure at the time of the inspection	188 acre-ft
Approximate volume of impounded water at the time of the inspection	5 Million Gallons at El. 348.5
Approximate volume of CCR at the time of the inspection	15,000 c.y.

7.0 INSPECTION (257.83(b)(1)(ii))

7.1 GENERAL

The summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. Their meaning is understood as follows:

Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair or Satisfactory:

A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually, conditions that have been previously identified in the previous inspections, but have not yet been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

In addition, a "deficiency" is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observe it is

considered uncontrolled seepage. [Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored frequently.]

2. Displacement:

   Displacement of the embankment is large scale movement of part of the dam. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.

3. Blockage of Control Features:

   Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion:

   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

7.2 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the CCR Ponds Complex was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as upstream and downstream slopes, crest, and toe.

EAST BOTTOM ASH POND

In general, the crest, interior and exterior slopes of the dike appear to be in satisfactory and stable condition. No significant change to the exterior slope was noted from the previous inspection. No significant settlement or misalignment was observed. Seeps were not observed during the inspection. No animal burrows were observed during the inspection.

1. Photographs No. 1 illustrates the crest area and interior slopes of the eastern side of the east bottom ash pond. The crest has signs of rutting form truck traffic and the vegetation on the interior slopes is overgrown. There were no other signs of settlement, misalignment and cracking observed.

2. Photographs No. 2 illustrates the condition of the perimeter ditch on the east side of the pond. The perimeter ditch shows signs of a washout from a recent rain event. The sediment and vegetation buildup from the washout is causing standing water in the bottom of the ditch.

3. Photograph No. 3 shows the general condition of the interior area of the East Bottom Ash Pond. The east bottom ash pond was in service at the time of inspection.

4. Photograph No. 4 illustrates the typical condition of the crest area on the north side of the pond. In general, the crest area appeared to be in satisfactory condition with no signs of rutting, cracks or misalignment.

5. Photographs No. 5 shows the general condition of the interior slopes of the east bottom ash pond. The slope appeared in satisfactory and stable condition. There were no signs of settlement, misalignment, sloughing or erosion.

6. The overflow discharge structure walkway, railings, metal decking, and visible concrete were found to be in satisfactory, functional condition. However, there was overgrown vegetation adjacent to the access platform. Photographs No. 6 illustrate the access stairs, metal walkway, metal deck, and concrete structure of the overflow discharge structure.

Overall the facility is in satisfactory condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which may be disrupting to the safe operation of the impoundment.

WEST BOTTOM ASH POND

In general, the crest, interior and exterior slopes of the dike appear to be in satisfactory and stable condition. No significant change to the exterior slope was noted from the previous inspection. No significant settlement or misalignment was observed. Seeps were not observed during the inspection. No animal burrows were observed during the inspection.

7. Photographs No. 7 and 8 illustrate a typical overview of the dike crest. The crest appears to be in good and stable condition. There were no other signs of settlement, misalignment and cracking observed.

8. Photographs No. 9 and 10 illustrate the condition of the interior slopes and vegetation management of the west bottom ash pond. The interior slopes and vegetation of the interior dikes appeared to be in satisfactory and stable condition.

9. Photograph No. 11 show the general condition of the interior area of the west bottom ash pond. There is some overgrown vegetation surrounding the sluicing pipe platform that extends out into center of the pond. The west bottom ash pond was out of service at the time of inspection.

10. The overflow discharge structure walkway, railings, metal decking, and visible concrete were found to be in satisfactory, functional condition. However, there was some overgrown vegetation adjacent to the access stairs. Photographs No. 12 illustrates the overgrown vegetation around the access metal walkway, metal deck, and concrete structure of the overflow discharge structure.

11. Photographs No. 13, 14 and 16 shows the general condition of the exterior slope and toe areas of the west bottom ash pond. The slopes appeared in satisfactory and stable condition. There were no signs of wet areas, settlement, misalignment, sloughing or erosion. The north and west exterior slopes had overgrown vegetation.

12. Photograph No. 15 shows a significant tire rut on the upper south exterior slope near the crest. The tire rut is likely caused from recent mowing activities.

13. Photograph No. 17 shows the development erosion formed along the edge of an access ramp on the southeast side of pond. There also are some minor erosion formed on another access ramp at the southwestern corner of the embankment. The erosion is taking place in

areas along these access ramps to the crest, but does not appear to be a detrimental condition to the integrity of the structure.

Overall the facility is in satisfactory condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which maybe disrupting to the safe operation of the impoundment.

7.3 INSTRUMENTATION (257.83(b)(2)(ii))

The monitoring instrumentation for the West Bottom Ash Pond include open pipe type piezometers. The piezometers are located in the crest areas and are flush mount design. There is no monitoring instrumentation for the East Bottom Ash Pond.

Monitoring instrumentation data is reviewed as part of the annual inspection program for the Pirkey Bottom Ash Ponds. The maximum levels measured since the last inspection of the West Bottom Ash Pond are reported below:

Pond Name	Crest Elevation msl	Boring/Piezometer	Min/Max/Present WSEL msl
West Bottom Ash	357.0	W-1	323.80/338.31/323.80
West Bottom Ash	357.0	W-3	319.27/328.85/319.27

Piezometers W-1 and W-3 are in service and water level readings are measured on a monthly basis. The readings of the piezometers are in good agreement with the operating levels of the pond and are within the tolerance that would provide for a greater than minimum required stability for a facility of this type.

8.0 SUMMARY OF FINDINGS

Based on the visual observations during the inspection, the dam and appurtenances are generally in good condition. Specific conclusions related to this inspection include:

- There is no evidence of distress that would indicate the possibility of immediate sliding, slope instability, settlement, misalignment or cracking of the bottom ash pond embankments. As such it is concluded that the dam and dikes are performing as designed.

- Overall, the slope conditions of the dam and levees are generally fair with the exception of some tire ruts caused from truck traffic and mowing activities. These areas overtime can lead to significant erosion and stability problems.

- Vegetation management for the facilities is considered satisfactory. However, some areas are overgrown and the vegetation should be maintained at least 25 feet from the toe of the embankment.

9.0 RECOMMENDATIONS

A summary of our recommendations for general maintenance and continued monitoring, as well as any recommendations for remedial activities, is provided as follows:

9.1 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection:

- Overall, the slope conditions of the dam and levees are generally fair with the exception of some tire ruts caused from truck traffic and mowing activities. These areas overtime can lead to significant erosion and stability problems.
- Vegetation management for the facilities is considered satisfactory. However, some areas are overgrown and the vegetation needs to be maintained at least 25 feet from the toe of the embankments.

9.2 ITEMS TO MONITOR

- No Items to monitor

9.3 DEFICIENCIES (257.83(b)(2)(vi))

There were no deficiencies or signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during any of the quarterly inspections. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

If you have any questions with regard to this report, please contact Brett Dreger at Audinet: 200-2258 or Gary Zych at Audinet: 200-2917.

APPENDIX A:

Inspection Photographs – CCR Ponds Complex

Photo # 1	
View of the East Bottom Ash Pond Crest Area. Crest Area has Minor Tire Ruts.	

Photo # 2	
View of the East Bottom Ash Pond Perimeter Ditch. Perimeter Ditch has a Washout From Previous Rain Event.	

Photo # 3	
View of the East Bottom Ash Pond Interior Area. East Bottom Ash Pond is Currently In Service.	

Photo # 4	
View of the East Bottom Ash Pond Crest Area. Crest Conditions area Satisfactory.	

Photo # 5	
View of the East Bottom Ash Pond Interior Area and Slope Conditions. East Bottom Ash Pond is Currently In Service.	

Photo # 6	
View of the Discharge Structure at the East Bottom Ash Pond.	

Photo # 7	
View of the West Bottom Ash Pond Crest Area. Crest Conditions are Satisfactory.	

Photo # 8	
View of the West Bottom Ash Pond Crest Area. Crest Conditions are Satisfactory.	

Photo # 9	
View of the Interior Slope Conditions of the West Bottom Ash Pond.	

Photo # 10	
View of the Interior Slope Conditions of the West Bottom Ash Pond. West Bottom Ash Pond is Currently Out of Service.	
Photo # 11	
View of the Sluicing Pipe Structure of the West Bottom Ash Pond.	
Photo # 12	
View of the Discharge Structure of the West Bottom Ash Pond.	

Photo # 13	
View of the North Exterior Slope of the West Bottom Ash Pond. Vegetation is overgrown.	
Photo # 14	
View of the West Exterior Slope of the West Bottom Ash Pond. Vegetation is overgrown.	
Photo # 15	
View of the South Exterior Slope of the West Bottom Ash Pond. Upper Section Slope has Significant Tire Rut.	

Photo # 16	
View of the South Exterior Slope the West Bottom Ash Pond.	
Photo # 17	
View of the Erosion Rills on the Access Ramp to the Crest Area on the Southeast corner of West Bottom Ash Pond.	

APPENDIX B:

Site Map – CCR Ponds Complex

SOUTHWESTERN ELECTRIC POWER COMPANY
An AEP Company
BOUNDLESS ENERGY

Appendix B:Pirkey Bottom Ash Ponds
Drawn By: Dan Murphy

N

0 350 700 Feet

AMERICAN ELECTRIC POWER
BOUNDLESS ENERGY