2022 ANNUAL DAM AND DIKE INSPECTION REPORT

BOTTOM ASH PONDS

PIRKEY POWER PLANT HALLSVILLE, TEXAS

November, 2022

Prepared for: Southwestern Electric Power Company - H.W. Pirkey Plant

Prepared by: American Electric Power Service Corporation

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Dam & Dike Inspection Report (CCR - Bottom Ash Ponds)

H.W. Pirkey Plant Hallsville, Texas

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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 30 TAC 352.831 (40 CFR 257.83) and to provide Southwestern 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 as shown in Figure 1 – Vicinity Map in Appendix A.

American Electric Power Service Corporation's Geotechnical Engineering Services section 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 and Mr. Ron Franklin of Pirkey Plant were the facility contact for the inspection and accompanied Mr. Brett Dreger during the inspection. The inspection was performed on August 16 & 17, 2022. Weather conditions were mostly sunny with some clouds, with temperatures ranging from upper 80's to low 90's (°F). There was 2.05 inches of rainfall over the seven days prior to the inspection and 0.00 inches of rainfall on the day of inspection. Portions of the Bottom Ash Ponds had been recently mowed.

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, (ii) Summary of Visual Observations; (iii) Conclusions; and (iv) Recommendations. Photographs identifying typical conditions, problem areas, items that need correction or requiring additional monitoring, have been identified from the inspection and provided in Appendix B of this report.

2.0 DESCRIPTION OF IMPOUNDMENTS

2.1 EAST BOTTOM ASH POND

The East Bottom Ash Pond (EBAP) CCR unit is located at the north end of the Plant and approximately 2,000 feet north-northwest of Brandy Branch Reservoir. The EBAP 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 out of service and the pool level was at 349.3 feet above msl. The interior bottom elevation of the EBAP is approximately 347.0 feet above msl. These features, including the approximate limits of each area, are shown on the Site Map in Appendix A.

Surface water elevation in the EBAP 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 EBAP discharges through the 36-inch-diameter corrugated metal pipe into the 2.7- acre Secondary Bottom Ash Pond located directly south of the EBAP. 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 Bottom Ash Pond (WBAP) CCR unit is located at the north end of the Plant and approximately 3,000 feet northwest of Brandy Branch Reservoir. The WBAP 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 WBAP 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 in service and the pool level was at 353.0 feet above msl. The interior bottom elevation of the WBAP is approximately 347 feet above msl. These features, including the approximate limits of each area, are shown on the Site Map in Appendix A.

Surface water elevation in the WBAP 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 WBAP. 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))

Since the 2021 Annual Inspection, some modifications have been made to the geometry of the East and West Bottom Ash Ponds. An interior separation berm has been installed inside the East Bottom Ash Pond to reduce the size of the active pond area and allow for closure by removal activities to occur in the northern portion of the pond. The West Bottom Ash Pond is permanently out of service and is being closed by removal. The southern berm of the West Bottom Ash Pond is being lowered as a result of the closure activities.

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

Since the 2021 Annual Inspection, some modifications have been made to the east and wet bottom ash ponds that will affect stability and operations. An interior separation berm has been installed inside the East Bottom Ash Pond to reduce the size of the active pond area and allow for closure by removal activities to occur in the northern portion of the pond. The southern berm of the West Bottom Ash Pond is being lowered as a result of the closure activities. The changes to the East Bottom Ash Pond do not affect its

overall stability since the height of the interior berm crest is below the outside crest height and prevents the operating pool of the pond from exceeding critical levels. The changes to the West Bottom Ash Pond do not affect the stability since the pond is permanently out of service and is being closed by removal.

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

	East Bottom Ash Pond		
Approximate Minimum depth of impounded water	0.5 ft		
since last annual inspection	(347.5)		
Approximate Maximum depth of impounded	6.5 ft		
water since last annual inspection	(353.5)		
Approximate Present depth of impounded water at	2.3 ft		
the time of the inspection	(349.3)		
Approximate Minimum depth of CCR since last	0.0 ft		
annual inspection	(347.0)		
Approximate Maximum depth of CCR since last	7.5 ft		
annual inspection	(354.5)		
Approximate Present depth of CCR at the time of	7.5 ft		
the inspection	(354.5)		
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	8 Million Gallons at El. 349.3		
Approximate volume of CCR at the time of the inspection	20,000 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

	West Bottom Ash Pond
Approximate Minimum depth of impounded water	0.0 ft
since last annual inspection	(347.0)
Approximate Maximum depth of impounded water	6.0 ft
since last annual inspection	(353.0)

Approximate Present depth of impounded water at the	0.0 ft
time of the inspection	(347.0)
Approximate Minimum depth of CCR since last	0.0 ft
annual inspection	(347.0)
Approximate Maximum depth of CCR since last	7.5 ft
annual inspection	(354.5)
Approximate Present depth of CCR at the time of the inspection	0.00 ft (347.0)
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	0 Gallons at El. 347.0
Approximate volume of CCR at the time of the inspection	0 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, scarps, 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. Selected photographs taken during the inspection and used to illustrate the visual observations presented in the report are presented in Appendix B. Additional inspection photos can be made available to the Plant upon request.

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 of the southern side of the east bottom ash pond. The crest has signs of minor rutting from truck traffic. 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 overgrown cattails and some standing water. The relative flatness of the ditch, overgrown cattails and tire ruts from mowing activities 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 on the west side of the pond. The crest has signs of minor rutting from truck traffic. There were no other signs of settlement, misalignment and cracking.
- 5. Photographs No. 5 and No. 6 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. Photographs No. 7 illustrate the access stairs, metal walkway, metal deck, and concrete structure of the overflow discharge structure.
- 7. Photograph No. 8 shows the general condition of the East Bottom Ash Pond interior berm. This interior berm will allow the north section of the east bottom ash pond to be closed by removal while the rest of the east bottom ash pond remains in service. The interior berm is performing as intended and show no signs of settlement, misalignment, sloughing or erosion.
- 8. Photograph No. 9 show the general conditions of the interior north section of the east bottom ash pond. This section is currently out of service and is being closed by removal.

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

The West Bottom Ash Pond is currently out of service and is being closed by removal. 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. The only significant change that has occurred is the excavation and removal of a part of the southern berm as a part of the closure by removal activities. No significant settlement or misalignment was observed. Seeps were not observed during the inspection. No animal burrows were observed during the inspection.

- 9. Photographs No. 10 and 11 illustrate a typical overview of the dike crest. The crest appears to be in good and stable condition. Minor rutting from truck traffic was observed during the inspection. There were no other signs of settlement, misalignment and cracking observed.
- 10. Photographs No. 12, 13 and 14 illustrate the condition of the interior slopes and bottom area of the west bottom ash pond. The southern berm is being excavated and lowered as

- part of the closure activities. The interior slopes appeared to be in satisfactory and stable condition. The West Bottom Ash Pond is out of service and is being closed by removal.
- 11. Photograph No. 15 show the general condition of the interior area of the west bottom ash pond and the sluicing pipe platform concrete columns that extends out into center of the pond. The pipe platform structure has been removed as part of the closure activities.
- 12. The overflow discharge structure walkway, railings, metal decking, and visible concrete were found to be in satisfactory condition. Photographs No. 16 illustrates the access metal walkway, metal deck, and concrete structure of the overflow discharge structure. The West Bottom Ash Pond is out of service and is being closed by removal.
- 13. Photographs No. 17, 18 and 19 shows the general condition of the exterior slope and toe areas of the west bottom ash pond. The southern berm is being excavated and lowered as part of the closure activities. The slopes appeared in satisfactory and stable condition. There were no signs of wet areas, settlement, misalignment, sloughing or erosion.
- 14. Photograph No. 20 shows the general condition of the southern slope near the east end of the pond. A notch has been excavated out of berm to allow for the installation of a drainage culvert to drain the pond area after closure by removal activities are complete.
- 15. Photograph No. 21 shows the condition of the access ramp on the southeast side of pond. In general, the access ramp appears to be in satisfactory conditions with no signs of cracking, misalignment or erosion. There are some minor tire ruts from the construction traffic of the closure by removal activities.

Overall the facility is in satisfactory condition. The West Bottom Ash Pond is out of service and is being closed by removal.

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	Crest Elevation	Boring/Piezometer	Min/Max/Present WSEL	
<u>Name</u>	msl		msl	
West Bottom Ash	357.0	W-1	323.68/328.71/323.78	
West Bottom Ash	357.0	W-3	318.47/323.55/318.47	

Piezometers W-1 and W-3 are in service and water level readings are measured monthly. 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 pond dikes are performing as designed.
- Overall, the crest and slope conditions of the dam and levees are generally fair with the exception of some minor 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 to promote adequate growth and aid in inspection activities.
- There was standing water observed in the perimeter ditches along the east and south side of the
 pond. The perimeter ditch flow lines are relatively flat but they do maintain positive flow.
 However, overgrown cattails and tire ruts from mowing activities have develop isolated areas of
 standing water along the ditch.

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 crest and slope conditions of the dam and levees are generally fair with the exception
 of some minor tire ruts caused from truck traffic and mowing activities. The tire rut areas should
 be repaired/regraded as part of regular maintenance 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 and controlled to promote adequate growth
 and aid in inspection activities.
- The perimeter ditches should be maintained for overgrown vegetation and damage from mowing activities should be repaired in a timely manner to promote positive flow along the ditches.

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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.

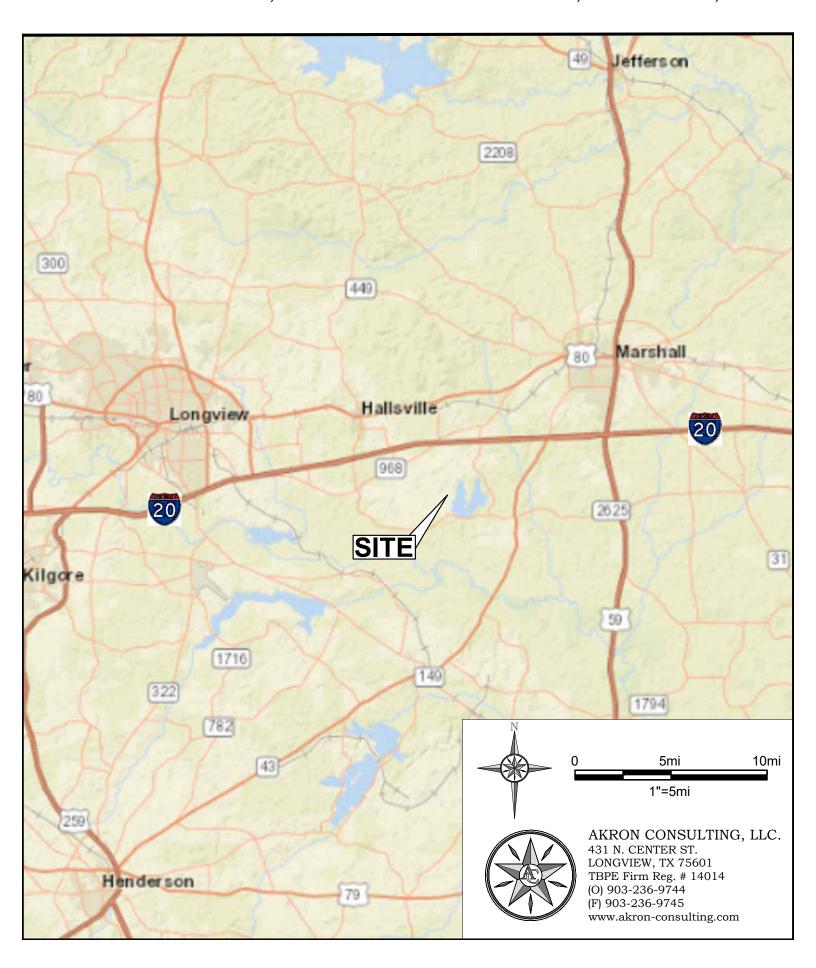
APPENDIX A:

Figure 1 - Vicinity Map — Bottom Ash Ponds

Site Map – Bottom Ash Ponds

FIGURE 1 - VICINITY MAP

BOTTOM ASH POND, H.W. PIRKEY POWER PLANT, HALLSVILLE, TX





SITE MAP: BOTTOM ASH PONDS PIRKEY POWER PLANT

APPENDIX B:

Inspection Photographs – Bottom Ash Ponds

View of the East Bottom Ash Pond Crest. Crest Conditions are Satisfactory with Some Minor Tire Ruts.



Photo # 2

View of the East Bottom Ash Pond perimeter ditch. Perimeter ditch has overgrown a cattails and tire ruts from mowing activities.

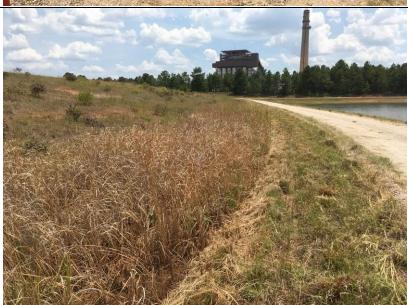


Photo #3

View of the East Bottom Ash Pond Interior Area. East Bottom Ash Pond is currently in service.



View of the East Bottom Ash Pond Crest. Crest conditions are satisfactory with some minor tire ruts.



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 East Bottom Ash Pond interior area and slope conditions. East Bottom Ash Pond is currently in service.



View of the discharge structure at the East Bottom Ash Pond.



Photo #8

View of the East Bottom Ash Pond interior separation berm. This berm will allow the northern section of the East Bottom Ash Pond to be closed by removal.



Photo #9

View of the interior of the northern section of the East Bottom Ash Pond Area. This area is out of service and is currently being closed by removal.



View of the West Bottom Ash Pond crest looking south. Crest conditions are satisfactory with some minor tire ruts. West Bottom Ash Pond is currently out of service and is being closed by removal.



Photo # 11

View of the West Bottom Ash Pond crest looking west. Crest conditions are satisfactory with some minor tire ruts. West Bottom Ash Pond is currently out of service and is being closed by removal.



Photo # 12

View of the interior slope conditions of the West Bottom Ash Pond. West Bottom Ash Pond is currently out of service and is being closed by removal.



View of the interior slope conditions of the West Bottom Ash Pond. West Bottom Ash Pond is currently out of service and is being closed by removal.



Photo # 14

View of the sluicing pipe structure of the West Bottom Ash Pond. West Bottom Ash Pond is currently out of service and is being closed by removal.



Photo # 15

View of the interior slope conditions of the West Bottom Ash Pond southern berm. West Bottom Ash Pond is currently out of service and is being closed by removal. The southern berm is being lowered as part of the closure activities.



View of the discharge structure of the West Bottom Ash Pond. West Bottom Ash Pond is currently out of service and is being closed by removal.



Photo # 17

View of the north exterior slope of the West Bottom Ash Pond. Slope vegetation is well managed.



Photo # 18

View of the west exterior slope of the West Bottom Ash Pond. Slope vegetation is well managed.



View of the south exterior slope the West Bottom Ash Pond. Slope vegetation is well managed.



Photo # 20

View of the south exterior slope of the West Bottom Ash Pond. Upper section of the southern slope is being removed as part of the closure activities.



Photo # 21

View of the access ramp to the crest area on the southeast corner of West Bottom Ash Pond. Access road is in fair condition due to construction activities.

