

# 2021 ANNUAL DAM AND DIKE INSPECTION REPORT

**BOTTOM ASH PONDS**

**PIRKEY POWER PLANT  
HALLSVILLE, TEXAS**

**September, 2021**

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

Prepared by: American Electric Power Service Corporation

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Columbus, OH 43215



**GERS-21-031**

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

H.W. Pirkey Plant  
Hallsville, Texas

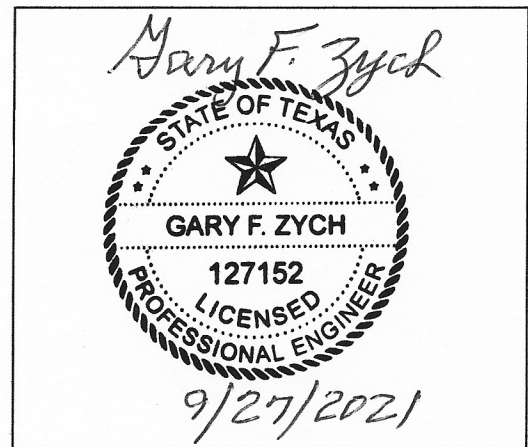
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**PROFESSIONAL ENGINEER  
SEAL & SIGNATURE**

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).

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION</b> .....	<b>1</b>
<b>2.0 DESCRIPTION OF IMPOUNDMENTS</b> .....	<b>1</b>
2.1 EAST BOTTOM ASH POND.....	1
2.2 WEST BOTTOM ASH POND.....	2
<b>3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))</b> .....	<b>2</b>
<b>4.0 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))</b> .....	<b>2</b>
<b>5.0 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))</b> .....	<b>2</b>
<b>6.0 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))</b> .....	<b>3</b>
6.1 EAST BOTTOM ASH POND.....	3
6.2 WEST BOTTOM ASH POND.....	3
<b>7.0 INSPECTION (257.83(b)(1)(ii))</b> .....	<b>4</b>
7.1 GENERAL.....	4
7.2 VISUAL INSPECTION (257.83(b)(2)(i)).....	5
7.3 INSTRUMENTATION (257.83(b)(2)(ii)) .....	7
<b>8.0 SUMMARY OF FINDINGS</b> .....	<b>7</b>
<b>9.0 RECOMMENDATIONS</b> .....	<b>8</b>
9.1 MAINTENANCE ITEMS .....	8
9.2 ITEMS TO MONITOR.....	8
9.3 DEFICIENCIES (257.83(b)(2)(vi)).....	8

### LIST OF TABLES

Table 1 Summary of Relevant Storage Information for the East Bottom Ash Pond

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

### ATTACHMENTS

APPENDIX A: Figure 1 – Vicinity Map –Bottom Ash Ponds  
Site Map – Bottom Ash Ponds

APPENDIX B: Inspection Photographs – Bottom Ash Ponds

## **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 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 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 18, 2021. Weather conditions were mostly cloudy with rain showers, with temperatures ranging from upper 70’s to low 80’s (°F). There was 0.08 inches of rainfall over the seven days prior to the inspection and 1.51 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, (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 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 347.5 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))**

No modifications have been made to the geometry of the East and West Bottom Ash Ponds since the 2020 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**

	<b>Primary Ash Pond</b>
Approximate <b>Minimum</b> depth of impounded water since last annual inspection	0.5ft (347.5)
Approximate <b>Maximum</b> depth of impounded water since last annual inspection	7.5ft (354.5)
Approximate <b>Present</b> depth of impounded water at the time of the inspection	0.5 ft (347.5)
Approximate <b>Minimum</b> depth of CCR since last annual inspection	0.0ft (347.0)
Approximate <b>Maximum</b> depth of CCR since last annual inspection	7.5ft (354.5)
Approximate <b>Present</b> depth of CCR at the time of the inspection	0.0 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	1 Million Gallons at El. 347.5
Approximate volume of CCR at the time of the inspection	0 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**

	<b>Bottom Ash Storage Pond</b>
Approximate <b>Minimum</b> depth of impounded water since last annual inspection	0.5ft (347.5)
Approximate <b>Maximum</b> depth of impounded water since last annual inspection	7.5ft (354.5)
Approximate <b>Present</b> depth of impounded water at the time of the inspection	6.0ft (353.0)
Approximate <b>Minimum</b> depth of CCR since last annual inspection	0.5ft (347.5)

Approximate <b>Maximum</b> depth of CCR since last annual inspection	7.5ft (354.5)
Approximate <b>Present</b> depth of CCR at the time of the inspection	6.5ft (353.0)
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	35 Million Gallons at El. 353.0
Approximate volume of CCR at the time of the inspection	75,000 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. 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 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. There was



a 1.51 inch rain event the night before the inspection. The relative flatness of the ditch and overgrown cattails 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 out of service at the time of inspection.
4. Photograph No. 4 illustrates the typical condition of the crest on the north side of the pond. The crest has signs of 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.

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. 8 and 9 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.
8. Photographs No. 10 and 11 illustrate the condition of the interior slopes and vegetation management of the west bottom ash pond. The interior slopes appeared to be in satisfactory and stable condition. The vegetation appears to be overgrown near the water line.
9. Photograph No. 12 show the general condition of the interior area of the west bottom ash pond and the sluicing pipe platform that extends out into center of the pond. Both the pond interior and the pipe platform structure appeared to be in satisfactory condition. The west bottom ash pond was in 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. Photographs No. 13 illustrates the access metal walkway, metal deck, and concrete structure of the overflow discharge structure.

11. Photographs No. 14, 15 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 south slope has some standing water in tire ruts at the toe of the slope.
12. Photograph No. 17 shows the general condition of the southern slope near the east end of the pond. The toe area appear to be wet and there is overgrown vegetation near the culvert that passes under the access road to the dam.
13. Photograph No. 18 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 rutting, cracking, misalignment or erosion.

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.

### 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	323.88/328.58/323.98
West Bottom Ash	357.0	W-3	319.07/321.67/319.37

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 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 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.

### **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.

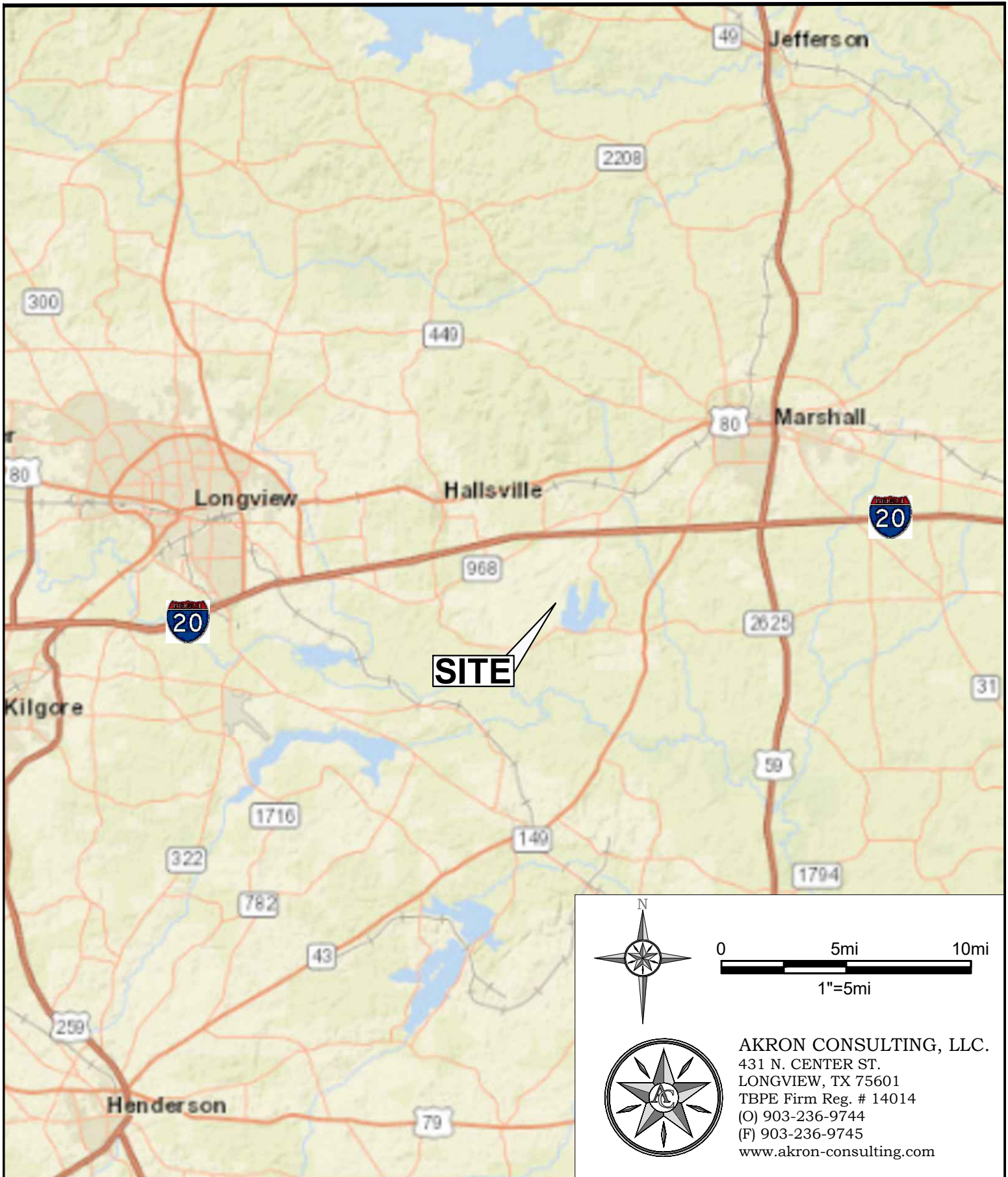
**APPENDIX A:**

**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



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**SITE MAP: BOTTOM ASH PONDS  
PIRKEY POWER PLANT**

**APPENDIX B:**

**Inspection Photographs – Bottom Ash Ponds**



<p>Photo # 1</p>	
<p>View of the East Bottom Ash Pond Crest. Crest Conditions are Satisfactory with Some Minor Tire Ruts.</p>	
<p>Photo # 2</p>	
<p>View of the East Bottom Ash Pond Perimeter Ditch. Perimeter Ditch has overgrown a cattails and tire ruts from mowing activities.</p>	
<p>Photo # 3</p>	
<p>View of the East Bottom Ash Pond Interior Area. East Bottom Ash Pond is Currently Out of Service.</p>	



Photo # 4

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 Out of Service.



Photo # 6

View of the East Bottom Ash Pond Interior Area and Slope Conditions. East Bottom Ash Pond is Currently Out of Service.





Photo # 7

View of the Discharge Structure at the East Bottom Ash Pond.



Photo # 8

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



Photo # 9

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





Photo # 10

View of the Interior Slope  
Conditions of the West Bottom  
Ash Pond. West Bottom Ash  
Pond is Currently In Service.  
Vegetation is slightly  
Overgrown near the Waterline.



Photo # 11

View of the Interior Slope  
Conditions of the West Bottom  
Ash Pond. West Bottom Ash  
Pond is Currently In Service.  
Vegetation is slightly  
Overgrown near the Waterline.



Photo # 12

View of the Sluicing Pipe  
Structure of the West Bottom  
Ash Pond.





Photo # 13

View of the Discharge Structure of the West Bottom Ash Pond.



Photo # 14

View of the North Exterior Slope of the West Bottom Ash Pond. Slope Vegetation is Well Managed.



Photo # 15

View of the West Exterior Slope of the West Bottom Ash Pond. Slope Vegetation is Well Managed.





Photo # 16

View of the South Exterior Slope the West Bottom Ash Pond. Slope Vegetation is Well Managed. Notice standing Water in tire Ruts.



Photo # 17

View of the South Exterior Slope of the West Bottom Ash Pond. Lower Section Has Overgrown Vegetation Near Culvert Pipe.



Photo # 18

View of the Access Ramp to the Crest Area on the Southeast corner of West Bottom Ash Pond. Access Road in Satisfactory Condition.

