

Report of Dam Safety Assessment of Coal
Combustion Surface Impoundments
American Electric Power (AEP) and Southwest
Electric Power Company (SWEPCO)
H.W. Pirkey Power Plant, Hallsville, TX

AMEC Project No. 3-2106-0183.0003

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I certify that the management units referenced herein:

American Electric Power (AEP) and Southwestern Electric Power Company (SWEPCO) H.W. Pirkey Power Plant West Ash Pond, East Ash Pond, Secondary Ash Pond, Surge Pond, Auxiliary Surge Pond, Landfill Runoff Pond, were assessed on October 19, 2010.

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1.0 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Introduction

AMEC was contracted by the United States Environmental Protection Agency (EPA) contract BPA EP09W001702, to perform assessments of selected coal combustion byproducts surface impoundments. As part of this contract with EPA, AMEC was assigned to perform an assessment of American Electric Power and Southwest Electric Power Company's (AEP-SWEPCO) H. W. Pirkey Power Plant (Pirkey). This plant is located in rural Harrison County, Texas, as shown on Figure 1, the Site Location Map.

A site visit to Pirkey was made by AMEC on October 19, 2010. The purpose of the visit was to perform visual observations, to inventory coal combustion waste (CCW) surface impoundments, assess the containment dikes, and to collect relevant historical impoundment documentation.

AMEC engineers, Don Dotson, P.E. and Mary Sawitzki, P.E., were accompanied during the site visit by the following individuals:

Table 1. Site Visit Attendees

Company or Organization	Name and Title
AEP-SWEPCO	Drew Seidel - Pirkey Plant Manager
AEP-SWEPCO	Ron Franklin - Environmental Services
AEP-SWEPCO	Brett Dreger - Geotechnical Engineer
AEP-SWEPCO	Brian Whatley - Environmental Services
AEP-SWEPCO	Kelly Spencer - Plant Environmental Support

1.2 Project Background

Coal fired power plants, like AEP-SWEPCO's Pirkey, produce CCW as a result of the power production process. At Pirkey, impoundments (dams) were designed and constructed to provide storage and disposal for the CCW that is produced. AEP-SWEPCO personnel refer to the six CCW impoundments at the Pirkey facility as West Bottom Ash Pond, East Bottom Ash Pond, Secondary Bottom Ash Pond, Surge Pond, Auxiliary (North or Upper) Surge Pond, and Scrubber Sludge Landfill Stormwater Runoff Pond (Landfill Runoff Pond). The Pirkey facility was constructed and placed into operation in 1985.

The National Inventory of Dams (NID), administered by the U.S. Army Corps of Engineers (USACE), provides a hazard rating for many dams within the United States. None of the CCW impoundments at the Pirkey plant are listed on the NID.

As part of the observations and evaluations performed at Pirkey, AMEC completed EPA's Coal Combustion Dam Inspection Checklists and CCW Impoundment Inspection Forms. Inspection forms for each pond are presented in Appendix A. The Impoundment Inspection Forms include a section that assigns a "Hazard Potential" that is used to indicate what would occur following failure of an impoundment. "Hazard Potential" choices include "Less than Low," "Low,"

“Significant,” and “High.” As defined on the Inspection Form, dams assigned a “Significant Hazard Potential” 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.” “Low Hazard Potential” classification definition is reserved for dams 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.” “Less than Low Hazard Potential” classification is reserved for dams where “failure or misoperation results in no probable loss of human life and no economic or environmental losses.”

Based on the site visit evaluation of the impoundments, AMEC engineers assigned a “Low Hazard” potential to the following ponds: East Ash, Secondary Ash, Surge, Auxiliary Surge, and Landfill Runoff. A “Significant Hazard” potential was assigned to the West Ash Pond.

1.2.1 State Issued Permits

The Texas Commission on Environmental Quality has issued Texas Pollutant Discharge Elimination System (TPDES) Permit No. 02496 to AEP-SWEPCO. This TPDES Permit authorizes AEP-SWEPCO to discharge CCW related materials from Pirkey to unnamed tributaries of Hatley Creek, which flow to Hatley Creek and on to the Sabine River above the Toledo Bend Reservoir. The effective date of the permit is May 14, 2007. The permit expires at midnight on April 1, 2011.

There are no state issued permits that pertain directly to the CCW impoundments at the Pirkey facility.

1.3 Site Description and Location

AEP-SWEPCO’s Pirkey Plant is located in Harrison County, Texas, approximately 7 miles southwest of Marshall, Texas. The area surrounding the plant boundary is rural. Discharges from the plant are directed to an unnamed tributary of Hatley Creek. The distance between the southwestern corner of the West Bottom Ash Pond and Hatley Creek is approximately 1 mile. The Aerial Site Plan, included as Figure 2, provides a view of the six ponds that are the subject of this assessment.

Figure 3, the Critical Infrastructure Map, provides an aerial view of the region and indicates the location of the Pirkey ash ponds and other impoundments in relation to schools, hospitals, and other critical infrastructure that is located within approximately 5 miles down gradient of the impoundments.

1.4 Ash Ponds

Pirkey utilizes coal in the production of electricity. In this process, two types of ash are generated: fly ash and bottom ash. Bottom ash, the heavier and coarser of the two, is sluiced into either the West or East Ash Pond. Decant water from the West and East Ash Ponds is discharged into the Secondary Ash Pond. Decant from the Secondary Ash Pond is pumped back to the plant for reuse or gravity discharged to Hatley Creek via permitted TPDES Outfall 006. Ash dredged and excavated from the drained ash ponds is hauled by truck to either the nearby mine operation for beneficial reuse or it is used in the landfill as a drainage medium. A percentage of the fly ash produced is sold as a concrete supplement or is landfilled after being

mixed with scrubber sludge. Flue gas desulfurization (FGD) is practiced at Pirkey and sludge produced from this process is sent to the Surge Pond. The Auxiliary Surge Pond is used only when additional sludge storage volume is required. The Landfill Runoff Pond receives stormwater runoff and leachate from the on-site landfill facility.

The ash handling summary detailed above was based on review of provided documentation as well as communication with AEP-SWEPCO facility personnel who are knowledgeable concerning the facility's operational processes. A 2009 document, written by AEP-SWEPCO in response to EPA's Request for Information under Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C 9604(e), provided the following general background for the ash, surge and landfill runoff ponds.

- The West and East Ash Ponds as well as the Secondary Ash Pond each contain bottom ash and sluice water. Bottom ash content in the Secondary Pond was noted to be minimal.
- The Surge and Auxiliary Surge Ponds, as well as the Landfill Runoff Pond contain flue gas emission control residuals..
- Each of the six subject ponds were designed by a professional engineer.
- Each of the six subject ponds were constructed under the supervision of a professional engineer.
- Each of the six subject ponds is inspected/monitored under the supervision of a professional engineer.
- The Landfill Runoff Pond was commissioned in 1993. All other CCW impoundments were commissioned in 1985.

Provided documentation indicates that a "cohesive lining verification program" was followed during construction of the CCW ponds that related to a certain thickness of compacted liner being installed. Although not confirmed with facility personnel, design documents indicate that a compacted, three feet thick clay liner (CL, CH, or SC) exists in each of the ponds that contain CCW material. Additional information that is specific to each ash pond is presented in the following sections. Current descriptive information resulting from the site visit, as well as photographic references, are provided in Section 2, Field Assessment.

Figure 4, the Site Stormwater Flow Plan, illustrates existing pond embankment locations as well as directional routing for site stormwater at the Pirkey facility.

1.4.1 West Bottom Ash Pond

AEP-SWEPCO's response to the EPA request for information provided the following information.

The West Bottom Ash Pond (West Ash Pond) is located northwest of the main plant buildings and shares its eastern border with the western border of the East Bottom Ash Pond. The West Ash Pond receives sluiced bottom ash and has a surface area of 30.9 acres and a storage capacity of 188 acre-feet. The volume of material stored in the unit in early 2009 was reported to be 150,000 cubic yards (CY). The maximum embankment height is 25 feet. Design materials included in the provided documentation indicate that the main upstream embankment slopes are 3 feet horizontal to 1 foot vertical (3:1 H:V); while the main downstream slopes are 2.5:1 (H:V). Figure 5 illustrates a typical cross section from the pond's south embankment.

1.4.2 East Bottom Ash Pond

The East Ash Pond, which also receives sluiced bottom ash, is located directly adjacent to and east of the West Ash Pond. The surface area of the East Ash Pond is 30.9 acres. The pond contains a storage capacity of 188 acre-feet, with an early 2009 reported stored material volume of 150,000 CY. The pond is almost entirely incised, with a reported maximum embankment height of 4 feet.

1.4.3 Secondary Ash Pond

The Secondary Ash Pond, which is located immediately below the western portion of the East Ash Pond, receives decant from both ponds. This pond is entirely incised and has a reported surface area of 2.7 acres. The volume of materials reported stored in the pond in early 2009 was approximately 200 yards.

Figure 6 illustrates the Secondary Ash Pond and the decant discharge locations in the West and East Ash Ponds.

1.4.4 Surge Pond

The Surge Pond, which is located below the Secondary Ash Pond, receives flue gas emission control residuals from the facility. This pond has a surface area of 4.7 acres, a storage capacity of 18.8 acre-feet, and is entirely incised. The volume of stored material, as of March 2009, was reported to be approximately 1,500 CY.

1.4.5 Auxiliary Surge Pond

The Auxiliary Surge Pond is located to the north and east of the Surge Pond. This pond is used to provide additional storage volume for flue gas emission control residuals should the Surge Pond volume be deficient during peak flow periods. This pond is primarily diked, but is incised along its northern boundary. The reported maximum embankment height is 15.9 feet, the pond's surface area is 4.3 acres, and it has a total storage volume of 63.7 acre-feet. The stored material volume as of March 2009 was reported to be approximately 1,000 CY. Design materials included in the provided documentation indicate that the main downstream slopes are 3:1 (H:V). While the main upstream embankment slopes are unmarked, they appear to be 3:1 (H:V) as well. This pond and a typical cross section are illustrated in Figure 7.

1.4.6 Landfill Runoff Pond

The Landfill Runoff Pond is located away from the main pond area and southwest of the on-site landfill. An embankment exists along the southern and western portions of the pond. Design materials included in the provided documentation indicate that the main upstream embankment slopes are 4:1 (H:V); while the main downstream slopes are 3:1 (H:V). The reported maximum embankment height is 19 feet, the pond's surface area is 12.9 acres, and it has a total storage volume of 25 acre-feet. The stored material volume as of March 2009 was reported to be approximately 10,000 CY.

1.5 Previously Identified Impoundment Safety Issues

Discussions with plant personnel and review of provided documentation indicate that there are no current or previously identified impoundment safety issues from the previous 5 years at the Pirkey facility.

1.6 Site Geology

In October 2010, E TTL Engineers & Consultants completed an investigation entitled *Pirkey Power Station, Existing Ash, Surge, Lignite and Limestone Runoff, and Landfill Stormwater Ponds Embankment Investigation* (AEP-PRK000001). Geologic information was provided in this report for the Pirkey facility. It was noted, in terms of geologic history that;

The stratigraphy of Harrison County, as it relates to the occurrence of fresh groundwater, consists of alternating sequences of continental, deltaic, and marine sediments that are predominantly of Eocene age. Continental and deltaic units that are composed predominantly of quartz sand with varying quantities of silt and clay contain the fresh ground water in the area and form the major conduits for its movement. Marine portions of the section, consisting largely of clay or shale with lesser quantities of silt and glauconitic sandstone, form the intervening aquitards.

A geologic map of the region is presented as Figure 8.

In terms of regional geology, the Reklaw Formation, Carrizo Sand, and the Wilcox Group, were each described as existing at the Pirkey site and influencing the subsurface conditions.

The Reklaw is typically composed of thin beds of gray to brown silty clay. The upper portion of the formation commonly contains brownish black to brownish gray silty sand. The lower portion of the formation commonly contains interbeds of silt and very fine to fine-grained, grayish green, glauconitic, quartz sand and may be transitional with the underlying Carrizo Sand.

The Carrizo Sand outcrops at the Pirkey site “along the tributary of Hatley Creek and near Brandy Branch.” Composition of this material is typically “fine- to medium-grained quartz sand with minor occurrences of interbedded gray clay.”

The report then notes that, “Characteristic lithologies of the Wilcox Group are gray, silt and sandy clay with localized beds of clay, lignite, silt, and quartz sand.” Finally, “calcareous siltstone and ironstone concretions may appear as continuous ledges within the formation.”

1.7 Inventory of Provided Materials

AEP-SWEPCO provided AMEC with several documents pertaining to the design and operation of Pirkey. These documents were used in the preparation of this report and are listed in Appendix C, Inventory of Provided Materials.

2.0 FIELD ASSESSMENT

2.1 Visual Observations

AMEC performed visual assessments of Pirkey's Ash Ponds (1, 2, and Secondary), Surge Ponds (1, 2, and Auxiliary), and Fly Ash/FGD Landfill Pond on October 20, 2010. Assessment of the ash ponds was completed in general accordance with *FEMA's Federal Guidelines for Dam Safety, Hazard Potential Classification System for Dams, April 2004*. The EPA Coal Combustion Dam Inspection Checklist and Coal Combustion Waste (CCW) Impoundment Inspection Form were completed for each ash pond during the site visit and provided to the EPA via email within five business days following the site visit. Appendix A contains copies of the completed checklist forms. Photo location site maps for each ash pond, as well as descriptive photos, can be found in Appendix B. Rainfall data for the Shreveport, Louisiana area was collected for September and October, 2010 for the days prior to the site visit. Table 2, below, summarizes the rainfall data for the days and month immediately preceding AMEC's site visit.

Table 2. Pirkey Rainfall Data

Rainfall Prior to Site Visit	
Date	Rainfall (in.)
October 11, 2010	0.00
October 12, 2010	0.00
October 13, 2010	0.00
October 14, 2010	0.00
October 15, 2010	0.00
October 16, 2010	0.00
October 17, 2010	0.00
October 18, 2010	0.00
October 19, 2010	0.00
Total (9 days prior to visit)	0.00
October Rainfall	0.00
Total (30 days prior to visit)	0.11

2.2 Visual Observations - West Ash Pond

The West Ash Pond, which is located north and west of the main facility buildings, receives bottom ash from the facility. Bottom ash is discharged into the pond through an influent pipe that is supported on an elevated structure as shown on the right side of Photo WAP-4.

2.2.1 West Ash Pond - Embankments and Crest

This pond is almost entirely diked (Photos WAP-6 and WAP-11 through WAP-14). The pond's eastern boundary is incised (Photo WAP-14). A railroad bed is located just to the east of the eastern boundary, with the ground beyond increasing in elevation. The embankment crest is generally well covered with gravel (Photos WAP-1, WAP-13, and WAP-14). The embankment slopes were grass covered; however, much of those areas had an existing grass cover (Photos WAP-5 and WAP-6), or newly surfaced grass cover (Photos WAP-11 and WAP-12), that was not well established. The region and facility had recently suffered through an extremely hot and dry summer that may have affected the condition of the grass surface. Two tree stumps, ruts, an animal burrow, and surface erosion were visible at locations along the southern embankment (Photos WAP-7 through WAP-10).

2.2.2 West Ash Pond - Outlet Control Structures

Decant is discharged from the West Ash Pond to the Secondary Ash Pond through a vertical box weir structure that contains a 36-inch discharge pipe and manually operated gate valve. Water elevation and discharge is controlled through valve operation. The structure and the gate valve operator are located at the southeast corner of the pond (Photos WAP-2 and WAP-3).

2.3 Visual Observations - East Ash Pond

The East Ash Pond, which is located to the east of the West Ash Pond, receives bottom ash from the facility through a pipe supported on an elevated structure as shown in the background of Photo EAP-13.

2.3.1 East Ash Pond - Embankments and Crest

This pond is completely incised and was not in service during the site visit. Photos EAP-1, EAP-5, and EAP-6 show the interior of the East Ash Pond, as well as areas of stacked ash. A drainage swale, to redirect runoff flows away from the pond, exists outside the pond's southeast, east and north perimeter crest road. The crest road is gravel covered as shown on Photos EAP-2, EAP-10, and EAP-11. A piezometer was noted on the northwest crest road (Photo EAP-3). Photo EAP-8 illustrates a gas pipeline indicator located off the northeast crest road.

2.3.2 East Ash Pond - Outlet Control Structure

Decant is discharged from the East Ash Pond to the Secondary Ash Pond through a vertical box weir structure that contains a 36-inch discharge pipe and manually operated gate valve. Water elevation and discharge is controlled through valve operation. The structure and gate valve operator are located in the southwestern corner of the pond (Photo EAP-13).

2.4 Visual Observations - Secondary Ash Pond

The Secondary Ash Pond is located directly adjacent to and to the south of the East Ash Pond. This pond receives decant flow from both the West and East Ash Ponds. The decant flow enters the pond at the northwest corner. Boiler blowdown flow enters the pond on the southwest corner (Photo SAP-2).

2.4.1 Secondary Ash Pond - Embankments and Crest

This pond is entirely incised and the roadway around the pond's perimeter is gravel covered (Photo SAP-1). A piezometer is located on the roadway at the pond's southwest corner (Photo SAP-5).

2.4.2 Secondary Ash Pond - Outlet Control Structure

Discharge from the Surge Pond to TPDES outfall 006 is by gravity from the southwest area of the pond. Photo SAP-3 shows the discharge headwall, the gate valve operator, and the pond level gauge. The pond level during the site visit measured 353.8 feet.

Additionally, the Secondary Pond provides pumped reuse water for the facility. Photo SAP-6 shows the pond marker indicating the location of the suction pipe and Photo SAP-7 shows the reuse water pump house.

2.5 Visual Observations - Surge Pond

The Surge Pond is triangularly shaped and is located just to the northwest of the facility buildings. This pond receives discharge on its southeast side from the facility flue gas desulfurization scrubbers (Photo SP-7).

2.5.1 Surge Pond - Embankments and Crest

This pond is primarily incised. However, a road and railroad are located along its western boundary. The ground immediately to the west of the railroad slopes away steeply (Photos SP-1 and SP-2). Additionally, there is a below grade limestone unloading area beneath a portion of the railroad (Photo SP-3). A stormwater culvert was visible through the embankment south of the limestone unloading area (Photo SP-4). A monitoring well was noted at the southwest corner of the pond (Photo SP-5).

2.5.2 Surge Pond - Outlet Control Structure

Discharge from the Surge Pond is by pump. Photo SP-6 shows the pumps and platform that are located on the southwest corner of the pond. The pond level gauge indicated the water surface elevation in the Surge Pond during the site visit was 355.4 feet.

2.6 Visual Observations - Auxiliary Surge Pond

The Auxiliary Surge Pond is located north of the Surge Pond and south of the East Ash Pond.

2.6.1 Auxiliary Surge Pond - Embankments and Crest

The northern portion of the Auxiliary Surge Pond is incised, while the remainder is diked (Photo ASP-1 and ASP-2). A piezometer was noted on the southwest corner of the pond embankment (Photo ASP-3).

2.6.2 Auxiliary Surge Pond - Outlet Control Structure

This pond does not contain any outlet/discharge mechanism.

2.7 Visual Observations - Landfill Runoff Pond

The Landfill Runoff Pond receives stormwater runoff and leachate flows from the on-site landfill. This pond is located southwest from the landfill and the main plant buildings. Photo LRP-9 shows the pond as viewed from the top of the landfill. Photo LRP-1 shows the view across the pond from the southern embankment crest looking north.

Flow enters the pond via a trapezoidal channel that is lined with 60 mil HDPE as shown on Photo LRP-6. A monitoring well was noted located to the southeast of the influent channel above the northern reach of the pond (Photo LRP-7).

2.7.1 Landfill Runoff Pond - Embankments and Crest

Embankments, with approximate widths of 10 feet, exist across the southern and western portions of this pond. A flow control diversionary embankment exists along the northwestern pond boundary. The embankment crests are covered in gravel, as shown on Photo LRP-8.

2.7.2 Landfill Runoff Pond - Outlet Control Structure

Flow is discharged from the pond via a gate valve controlled pipe that was constructed across the southern embankment. The upstream outlet control and downstream discharge pipe are shown in Photos LRP-2 and LRP-3, respectively. Although flow was not exiting the pond in the discharge pipe at the time of the site visit, flow was visible adjacent to the pipe discharge location (Photo LRP-4). AEP-SWEPCO personnel responded that the flow was most likely from leachate underdrains. A review of provided documentation did not confirm the presence of underdrains.

An emergency, earthen spillway was noted to exist to the west of the main discharge pipe, as shown on Photo LRP-8.

2.8 Monitoring Instrumentation

Several monitoring wells and piezometers were noted during the site visit as referenced above. Section 3.4.1, Instrumentation, provides more specific information.

3.0 DATA EVALUATION

3.1 Design Assumptions

AMEC has reviewed provided documentation related to design assumptions regarding both hydraulic adequacy and dike stability. However, some design assumptions were not available in the documentation, and have been listed as not provided where necessary.

3.2 Hydrologic and Hydraulic Design

3.2.1 Long Term Hydrologic Design Criteria

The Mine Safety and Health Administration provides minimum hydrologic criteria relevant to CCW impoundments in Impoundment Design Guidelines of the Mining Safety and Health Administration (MSHA) Coal Mine Impoundment Inspection and Plan Review Handbook (Number PH07-01) published by the U.S. Department of Labor, Mine Safety and Health Administration, Coal Mine Safety and Health, October 2007.

When detailing impoundment design storm criteria, MSHA states that dams need “to be able to safely accommodate the inflow from a storm event that is appropriate for the size of the impoundment and the hazard potential in the event of failure of the dam.” Additionally, MSHA notes that sufficient freeboard, adequate factors of safety for embankment stability, and the prevention of significant erosion to discharge facilities, are all design elements that are required for dam structures under their review. Additional impoundment and design storm criteria are as shown in Table 3, MSHA Minimum Long Term Hydrologic Design Criteria.

Table 3. MSHA* Minimum Long Term Hydrologic Design Criteria

Hazard Potential	Impoundment Size	
	< 1000 acre-feet < 40 feet deep	≥ 1000 acre-feet ≥ 40 feet deep
Low - Impoundments located where failure of the dam would result in no probable loss of human life and low economic and/or environmental losses.	100 - year rainfall**	½ PMF
Significant/Moderate - Impoundments located where failure of the dam would result in no probably loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities.	½ PMF	PMF
High - Facilities located where failure of the dam will probably cause loss of human life.	PMF	PMF

*Mining Safety and Health Administration (MSHA) Coal Mine Impoundment Inspection and Plan Review Handbook (Number PH07-01) published by the U.S. Department of Labor, Mine Safety and Health Administration, Coal Mine Safety and Health, October 2007

**Per MSHA, the 24-hour duration shall be used with the 100-year frequency rainfall.

All of the impoundments at the Pirkey facility are sized such that they are in the smaller impoundment size (left) column. In addition, the majority of CCW impoundments at the facility were given a “Low” hazard rating; therefore, according to MSHA, the acceptable hydrologic design level would be the 100-year, 24-hour event. However, the West Ash Pond was given a “Significant” hazard rating, which places it in the category requiring an acceptable level of hydrologic design being the ½ PMF.

Probable maximum flood (PMF) is, per MSHA, “the maximum runoff condition resulting from the most severe combination of hydrologic and meteorological conditions that are considered reasonably possible for the drainage area.” Additionally, MSHA notes the designer should consider several components of the PMF that are site specific. These components are said to include: “antecedent storm; principal storm; subsequent storm; time and spatial distribution of the rainfall and snowmelt; and runoff conditions.” Basic agreement, it was noted, exists between dam safety authorities regarding “combinations of conditions and events that comprise the PMF;” however, there are “differences in the individual components that are used.” MSHA provided the following as a “reasonable set of conditions for the PMF:

- Antecedent Storm: 100-year frequency, 24 hour duration, with antecedent moisture condition II (AMC II), occurring 5 days prior to the principal storm.
- Principal Storm: Probable maximum precipitation (PMP), with AMC III. The principal storm rainfall must be distributed spatially and temporally to produce the most severe conditions with respect to impoundment freeboard and spillway discharge.
- Subsequent Storm: A subsequent storm is considered to be handled by meeting the “storm inflow drawdown criteria,” as described subsequently in the document.

With regard to storm inflow drawdown criteria, MSHA Impoundment Design Guidelines noted that:

Impoundments must be capable of handling the design storms that occur in close succession. To accomplish this, the discharge facilities must be able to discharge, within 10 days, at least 90 percent of the volume of water stored during the design storm above the allowable normal operating water level. The 10-day drawdown criterion begins at the time the water surface reaches the maximum elevation attainable for the design storm. Alternatively, plans can provide for sufficient reservoir capacity to store the runoff from two design storms, while specifying means to evacuate the storage from both storms in a reasonable period of time - generally taken to be at a discharge rate that removes at least 90% of the second storm inflow volume within 30 days.....When storms are stored, the potential for an elevated saturation level to affect the stability of the embankment needs to be taken into account.

In, Mineral Resources, Department of Labor, Mine Safety and Health Administration, Title 30 CFR § 77.216-2 *Water, sediment, or slurry impoundments and impounding structures; minimum plan requirements; changes or modifications, certification*, information relevant to the duration of the probable maximum precipitation is given. Sub-section (10) of 77.216-2 states that a “statement of the runoff attributable to the probable maximum precipitation of 6-hour duration

and the calculations used in determining such runoff” shall be provided at minimum in submitted plans for water, sediment or slurry impoundments and impounding structures.

The definition of design freeboard, according to the MSHA Guidelines, is “the vertical distance between the lowest point on the crest of the embankment and the maximum water surface elevation resulting from the design storm.” Additionally, the Handbook states that “Sufficient documentation should be provided in impoundment plans to verify the adequacy of the freeboard.” Recommended items to consider when determining freeboard include “potential wave run-up on the upstream slope, ability of the embankment to resist erosion, and potential for embankment foundation settlement.” Lastly, the Handbook states, “Without documentation, and absent unusual conditions, a minimum freeboard of 3 feet is generally accepted for impoundments with a fetch of less than 1 mile.”

3.2.2 CCW Impoundments Hydrologic Criteria

West, East, and Secondary Bottom Ash Ponds

The West Bottom Ash Pond is a primarily diked impoundment that receives negligible runoff from outside its perimeter. A drainage interceptor channel exists outside the incised East and Secondary Bottom Ash Ponds. The channel is located along the east and south sides of the ponds and appears to intercept permitted discharge from the Secondary Pond at that pond’s permitted TPDES Outfall 006.

Sargent & Lundy Engineers completed a Wastewater Ponds Permit Data Report (AEPPRK000573), dated April 1984, that describes the hydrologic and hydraulic design capacity of the bottom ash ponds. The ponds, working as a hydraulically connected system, were provided with capacity above the normal operating level “to capture and hold the 10 year - 24 hour runoff from the basin and pond drainage areas.” The report further notes that runoff from rainfall in excess of the 10 year - 24 hour storm will be discharged from the Secondary Ash Pond through a spillway. The spillway design capacity was noted to be for the 100-year 24-hour event; additionally, pond freeboard was provided “above the maximum water level” that would result from that 100-year 24-hour event. [ADD INFO REGARDING THE DISCHARGE PIPE DIAMETER AND ELEVATION]. Clarifying calculations in support of the information above were not provided.

Surge and Auxiliary Surge Ponds

Information regarding the hydrologic and hydraulic design criteria for the Surge and Auxiliary Surge Ponds was provided in a September 1983 document from Sargent & Lundy (AEPPRK000739). According to the document, the Auxiliary Surge Pond is used only in emergency conditions, when the “thickeners or sludge treatment systems are out of service and cannot process waste slurry from the SO₂ removal system.” In such circumstance, the slurry would be placed into the Auxiliary Pond. The document indicates that the Surge Pond and Auxiliary Surge Pond are sized to detain the 10-year 24-hour and 10-year 12-hour rainfall events, respectively (AEPPRK000748). Clarifying calculations in support of the information above were not provided.

As noted in Section 2.6.2, entitled Auxiliary Surge Pond - Outlet Control Structure, the Auxiliary Surge does not contain an outlet control structure.

Landfill Runoff Pond

Calculations in the provided documentation (AEPPRK000157) describe the result of a 12-inch rainfall event occurring over the pond and its tributary area. A 12-inch rainfall in eastern Texas is greater than the 100-year, 24-hour event rainfall of 10.7 inches. A “C” factor of 0.5 was used to represent impervious surfaces within the 72-acre watershed. The following calculated values were provided.

Tributary Area:	72 acres
Runoff:	12 inches
Impervious Surface Adjustment Factor:	0.5
Total Runoff volume:	1,568,160 cubic feet
Pond Volume at Elev. 292 ft.:	1,744,794 cubic feet
Pond Volume at Elev. 294 ft.:	2,424,000 cubic feet
Volume between Elev. 292 ft. and 294 ft.:	856,000 cubic feet

Although the documentation stated that the 12-inch storm occurred over the pond and its tributary area, a verifiable area breakdown was not provided. If it is assumed that the tributary area of 72 acres did not include the 19-acre Landfill Runoff Pond. A 12-inch rainfall distributed over the 19-acre pond would result in nearly 828,000 cubic feet of additional rainfall volume. Therefore,

Recalculated Total Runoff Volume (including impervious pond area):	2,395,800 cubic feet
Pond Volume at Elev. 294 ft.:	2,424,000 cubic feet
Recalculated Volume between Elev. 292 ft. and 294 ft.:	28,200 cubic feet

Additional provided documents (AEPPRK000155) note that the Landfill Pond was designed “to contain the entire runoff anticipated from the 25-year 24-hour rainfall event.” With regards to piping, the document stated that “Piping has been designed to allow complete drainage of the sedimentation ponds in a period of less-than 24-hours.” Further, the pond’s spillway was designed with the capacity to pass the difference between the 25-year event and the 100-year event. Basins “were designed to include a minimum of two feet of freeboard above the height of the 25-year storage capacity.” Supporting piping, spillway design, and routing calculations documentation were not provided.

3.3 Structural Adequacy & Stability

3.3.1 Comparative Stability Factor of Safety Standards

Two well regarded sources for embankment design and evaluation criteria include The United States Army Corps of Engineers (USACE) and the United States Mine Safety and Health Administration (MHSA). Minimum recommended factors of safety for different loading conditions can be found in those agency publications, as shown in Table 4 below.

Table 4. Minimum Stability Factors of Safety

Loading Condition	MSHA ¹	USACE ²
Rapid Drawdown	1.3	1.1 ³ - 1.3 ⁴
Long-Term Steady Seepage	1.5	1.5
Earthquake Loading	1.2	--- ⁵

¹ Coal Mine Impoundment Inspection and Plan Review Handbook, 2007, US Mine Safety and Health Administration

² Slope Stability Publication, EM1110-2-1902, 2003, US Army Corps of Engineers, Table 3-1: New Earth and Rock-Fill Dams

³ Applies to drawdown from maximum surcharge pool

⁴ Applies to drawdown from maximum storage pool

⁵ Referred to USACE Engineer Circular "Dynamic Analysis of Embankment Dams" document that is still in preparation

To analyze the structural adequacy and stability of the ash ponds at Dolet Hills Power Station, AMEC reviewed stability analysis material provided by SWEPCO with respect to the load cases shown in Table 4. Factors of safety documented in the provided material were compared with those factors outlined in the table to help determine whether the impoundments meet the requirements for acceptable stability.

3.3.2 October 2010 Embankment Investigation

In October 2010, E TTL Engineers & Consultants completed an investigation entitled *Pirkey Power Station, Existing Ash, Surge, Lignite and Limestone Runoff, and Landfill Stormwater Ponds Embankment Investigation* (AEP PRK000001). Slope stability analyses descriptions and results will be presented for the West Ash Pond, the Auxiliary (North) Surge Pond, and the Landfill Runoff Pond. E TTL did not perform stability analyses for the East Ash, Secondary, or Surge Ponds due to the incised design of those ponds.

Soil borings were advanced at the crests and the toe of outside embankments. Several laboratory tests were performed on the samples; those tests include Standard Penetration, Atterberg liquid and plastic limits, Percentage of Fines Passing the No. 200 sieve and Natural Moisture content, Unconsolidated Undrained Triaxial tests, Hydrometer, Permeability, and Direct Shear. The report noted the tests were "conducted to classify the soil strata according to widely used engineering classification system; identify, and provide quantitative data for soils; define shear strength characteristics; predict total settlement; and determine the slope stability of the existing embankments.

Table 5 summarizes borings that were advanced, piezometers that were installed, and descriptions of soils that were encountered.

Table 5. Stability Analysis Boring, Piezometer, and Soils Summary

Pond ID	Boring ID (depth, ft)	Piezometer ID (depth, ft)	Soil Summary
West Ash	W-1 (50)	PW-1 (50)	Berm fill material is primarily stiff to very stiff lean clay (CL) and/or fat clay (CH), overlying native soils consisting primarily of medium dense to very dense clayey sand (SC) with layers of dense gravel (GC) and very dense silty clayey sand (SC-SM).
West Ash	W-2	None	
West Ash	W-3 (50)	PW-3 (50)	
West Ash	W-4	None	
North Surge	S-1 (50)	PS-1 (50)	Berm fill material is primarily stiff to very stiff lean clay (CL) and /or fat clay (CH) overlying the native soils which consist of stiff to very stiff lean clay (CL) and /or fat clay (CH) with medium dense to very dense clayey sand (SC) near the terminal depth.
North Surge	S-2	None	
Landfill Runoff	L-1 (50)	PL-1 (50)	Berm fill material is primarily stiff sandy lean clay (CL) overlying the native soils which consist of loose to very dense silty sand (SM), silty clayey sand (SC-SM), and sandy silt (ML) with a lignite layer and hard lean clay (CL) near the terminal depth.
Landfill Runoff	L-2	None	

The Geostase computer program, developed by Gregory Geotechnical Software, was used to evaluate slope stability. It was noted that “the program calculates the factor of safety for potential failure circles using several different methods,” and that “these analyses were conducted using the modified Bishop method.”

Although the embankments were noted to have been surveyed as part of this stability analysis, it was noted that “some of the ponds had significant amounts of water (or ash) which hindered the measurement of the upstream toe of slope.” Therefore, those locations “were predicted based on the constructed slope angles and a topographical survey conducted prior to the construction of the ponds.”

Worst case embankments, chosen “based on visual observations during the initial site visit”, were modeled. Figure 9 illustrates the location of each stability cross section. Soil strengths were noted to have been “modeled using 85 percent of the strength values determined from testing where a test was conducted.” Where triaxial tests were not conducted, the report noted that “average values of the fill and native soils were used based on soil types.” Finally, to accommodate possible variations in the soil, ETTL engineers reduced determined soil strengths by 15 percent. Table 6 summarizes the results of Triaxial and Direct Shear tests.

Table 6. Summary of Triaxial and Direct Shear Tests

Boring	Depth Range (ft)	Fill or Native	Soil Classification	Effective Stress Parameters		Total Stress Parameters	
				Cohesion (psf)	Friction Angle	Cohesion (psf)	Friction Angle
R-1*	8-11	F	SC w/gr	490	27.6	760	15.5
R-3*	5-7	N	SC	335	32.6		
LR-1*	13-15	N	SC	70	33	675	15
W-1	13-20	F	CH	660	17.5	500	13.3
W-1	38-40	N	SC	290	29.7	0	30.4
W-2	13-16	N	SC	685	33.5		
W-3	10-20	N	CH	360	19.3	590	14.9
S-1	5-10	F	CH	0	33.9	260	19
S-2	28-30	N	CH	650	21.9	590	14
S-3	5-10	N	CL	475	18.5	520	12.6

*Non-CCW ponds, included here because Triaxial and Direct Shear results were used to determine and average characteristic values.

The report notes that the “four native clayey sands (SC), three native clays (CL/CH), [and] two fill clays (CH) in the table were averaged and used in several of the analyses.” Relatively undisturbed sandy soil samples were not obtained; therefore, “these soils were modeled using conservative estimates of the friction angle based on the SPT blow counts according to published data.” No parameter results from Triaxial and Direct Shear Tests were reported for the Landfill Runoff Pond (L-1 and L-2). Clarification of these Landfill Runoff Pond parameters should be provided. Additionally, clarification should be provided regarding the steps taken as well as the calculations and assumptions that were utilized to determine the values provided in Table 6.

Results of the stability analyses were provided for each slope and included long-term steady state, steady state with seismic loads, and rapid drawdown load cases. The report noted that the West Ash Pond was analyzed for rapid drawdown without the ash since the ash, currently present in the pond, will likely be removed. Effective stress parameters were used when evaluating steady-state conditions; however, total stress parameters were used for the rapid drawdown analysis. Table 7 provides a summary of the calculated factors of safety. The required minimum factors, per ETTL, are provided below the parameter type.

Table 7. Summary of Soil Stability Analyses Factors of Safety

Pond	Factor of Safety		
	Steady State (>1.5)	Steady State with Seismic (>1.2)	Rapid Drawdown (>1.3)
West Ash Section #1 (NW corner)	2.6	1.8	2.2
West Ash Section #2 (South berm)	2.0	1.5	2.0
North Surge	2.6	1.6	2.8
Landfill Stormwater	3.7	1.8	2.2

The results of the stability analyses indicate that each embankment’s calculated factor of safety exceeded the industry regarded minimum for each condition.

3.3 Foundation Conditions

Information regarding impoundment foundations is provided in the October 2010 *Pirkey Power Station, Existing Ash, Surge, Lignite and Limestone Runoff, and Landfill Stormwater Ponds Embankment Investigation* (AEP-PRK000001), completed by E TTL Engineers & Consultants Inc. E TTL notes that the primary embankment materials are cohesive soils consisting of lean clay (CL) and/ or fat clay (CH). Additionally, seams and soft or loose soils were not encountered.

3.4 Operations and Maintenance

A safety assessment of the ash pond dikes was performed on March 19 and 20, 2009 by URS Corporation in conjunction with an inspection of the Brandy Branch Dam (AEP-PRK000269).

Concerning the West Ash Pond, the only observed deficiencies “were heavy tree growth on the outside slopes, and some areas of sparse vegetative covering.” “Tree growth consisted of large pine trees in excess of 16 inches in diameter.” Additionally, “minor erosion was noted on the slopes.”

Brushy vegetation was observed on the west dike of the Auxiliary Surge Pond, but URS noted that “all trees along the dike have been cut.” Poor vegetation had resulted in some rilling on the slopes. URS reported that, “Soils are acidic according to AEP reports and maintaining grass cover has been difficult.”

With respect to the Landfill Runoff Pond, URS noted that inspection of the dike “revealed mostly good vegetative cover with some bare areas along the west dike. The emergency spillway was noted to be in good condition. Although the pond had been overtopped previously according to AEP, “no erosion was observed along the dike itself.” URS recommended that AEP “verify the hydraulic adequacy of this pond as soon as possible to ensure that the dam can safely pass the design flood flows without overtopping.”

According to AEP’s response to EPA’s Request for Information, the next safety assessment is scheduled for the year 2012. AEP considers the Pirkey facility to be Low Hazard.

3.4.1 Instrumentation

Provided documentation indicates that the Pirkey Plant currently has seventeen groundwater quality monitoring wells in operation. These wells are sampled semi-annually. Figure 10 illustrates well location and Table 8 provides a well summary (AEP-PRK000370). A summary of the previous five year’s groundwater elevation data for these monitoring wells is included in Appendix D.

Table 8. Monitoring Well Summary

Well ID	Date Installed	Reported Well Depth (ft)	Top of Casing Elev. (ft)
M-2	January 1986	29.46	305.02
M-3	July 1993	38.35	355.26
MW-1	October 1983	28.83	335.75
MW-2	October 1983	41.00	342.08
MW-3	October 1983	57.75	372.79
MW-4	October 1983	45.92	365.78

Well ID	Date Installed	Reported Well Depth (ft)	Top of Casing Elev. (ft)
MW-5	October 1983	47.67	365.50
MW-6	October 1983	42.08	363.67
MW-7	October 1983	38.83	359.72
MW-8	October 1983	29.33	358.05
MW-9	October 1983	29.63	355.35
MW-10	October 1983	41.83	360.60
MW-11	January 1986	45.92	364.61
MW-12	January 1986	48.83	380.99
MW-13	February 1988	40.42	364.35
MW-14	February 1988	42.42	363.67
MW-15	February 1988	40.83	361.60

Monitoring wells are constructed with cement/bentonite grout, a bentonite seal thickness of two feet above the screen, a screen length of 10 feet, and screen slot openings of 0.010 inches. A sand and gravel pack is used as typical screen filter material.

A total of nine piezometers were installed at the Pirkey facility in October 2009 in support of the geotechnical investigation performed by E TTL Engineers & Consultants Inc. (AEP PRK000001). The piezometers were constructed of schedule 40, 2-inch diameter, PVC pipe consisting of new, box-wrapped, flush-jointed threaded screen (0.010-inch mil slot) and casing. Six of the piezometers were installed at CCW impoundments and are as shown on Table 9.

Table 9. Piezometers Located at CCW Impoundments

Piezometer ID	Depth (feet)	Location
PE-1	30	North side of East Ash Pond
PE-3	30	South side of Secondary Ash Pond
PL-1	50	South side of Landfill Runoff Pond
PS-1	50	South side of Auxiliary (North) Surge Pond
PW-1	50	West side of West Ash Pond
PW-3	50	South side of West Ash Pond

No information was provided regarding planned data collection frequency from the recently installed piezometers.

3.4.2 State or Federal Inspections

The Texas Commission on Environmental Quality performed an “investigation of ash management operations” at the Pirkey Plant on January 13, 2009 (AEP PRK000313). The West and East Ash Ponds, as well as on-site Landfill, were inspected on this date. The Surge Ponds and Landfill Runoff Pond were not inspected. The only noted issue was the tree growth on the west side of the West Ash Pond. AEP officials responded that this issue had already been identified as a maintenance concern and that the trees would be removed. No future State inspections have been scheduled.

4.0 COMMENTS AND RECOMMENDATIONS

Condition assessment definitions, as accepted by the National Dam Safety Review Board, are as follows:

SATISFACTORY

No existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines.

FAIR

No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range to take further action.

POOR

A dam safety deficiency is recognized for loading conditions which may realistically occur. Remedial action is necessary. POOR may also be used when uncertainties exist as to critical analysis parameters which identify a potential dam safety deficiency. Further investigations and studies are necessary.

UNSATISFACTORY

A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution.

NOT RATED

The dam has not been inspected, is not under state jurisdiction, or has been inspected but, for whatever reason, has not been rated.

4.1 Acknowledgement of Management Unit Conditions

I certify that the management units referenced hereinafter were personally assessed by me and was found to be in the following condition:

West Ash Pond: Poor

East Ash Pond: Satisfactory

Secondary Ash Pond: Satisfactory

Surge Pond: Satisfactory

Auxiliary Surge Pond: Poor

Landfill Runoff Pond: Poor

The West Ash Pond, Auxiliary Surge Pond, and Landfill Runoff Pond were rated poor due to the lack of critical analyses which would verify the unit's stability under required loading conditions. Namely, for these ponds, sufficient storage or runoff routing ability for the hydrologic event equivalent to the hazard condition specified for the facility.

In addition, although the factors of safety determined in the 2010 Embankment Investigation were acceptable for the Landfill Runoff Pond, Triaxial and Direct Shear values for the Landfill Runoff Pond were not provided in the Investigation.

4.2 Hydrologic and Hydraulic Recommendations

4.2.1 West Bottom Ash Pond

AMEC recommends that an appropriate design storm rainfall and freeboard depth in accordance with MSHA guidelines be applied to the impoundment's watershed to assess whether the dam and decant system can safely store, control, and discharge the design flow. Based on the size and rating for the West Bottom Ash Pond, the design storm would be the ½ PMF. Hydraulic calculations should also be completed to determine the rate at which the discharge structure and associated piping could pass the design storm, if necessary, or draw down elevated water surfaces following such an event. The analysis should consider all critical stages over the life of the pond including full pond conditions. Additionally, the analysis should take into account the connectivity between the West, East, and Secondary Bottom Ash Ponds.

4.2.2 East Bottom Ash Pond

The East Bottom Ash Pond is incised, therefore, no hydrologic or hydraulic recommendations are provided.

4.2.3 Secondary Bottom Ash Pond

The Secondary Bottom Ash Pond is incised, therefore, no hydrologic or hydraulic recommendations are provided.

4.2.4 Surge Pond

The Surge Pond is incised, therefore, no hydrologic or hydraulic recommendations are provided.

4.2.5 Auxiliary Surge Pond

AMEC recommends that an appropriate design storm rainfall and freeboard depth in accordance with MSHA guidelines be applied to the impoundment's watershed to assess whether the dam can safely store the design flow, as there is no decant or discharge capability in this pond. Based on the size and rating for the Auxiliary Surge Pond, the design storm, per MSHA recommendations, would be the 100-year, 24-hour event.

If it is determined that addition of a discharge structure is warranted, hydraulic calculations should also be completed to determine the rate at which the discharge structure and associated piping could pass the design storm, if necessary, or draw down elevated water surfaces following such an event. The analysis should consider all critical stages over the life of the pond including full pond conditions.

4.2.6 Landfill Runoff Pond

URS recommended, following their March 2009 inspection, that AEP “verify the hydraulic adequacy of this pond as soon as possible to ensure that the dam can safely pass the design flood flows without overtopping.”

AMEC is in agreement and recommends that an appropriate design storm rainfall and freeboard depth in accordance with MSHA guidelines be applied to the impoundment, watershed to assess whether the dam and outlet system can safely store, control, and discharge the design flow. Based on the size and rating for the Landfill Runoff Pond, the design storm would be the 100-year, 24-hour event. Hydraulic calculations should also be completed to determine the rate at which the discharge structure and associated piping could pass the design storm, if necessary, or draw down elevated water surfaces following such an event.

4.3 Geotechnical and Stability Recommendations

Regarding the West Bottom Ash, Auxiliary Surge, and Landfill Runoff Ponds, analyses and factors of safety reported in the October 2010 Embankment Investigation met acceptable minimum criteria. However, final verification will be provided once clarification is provided regarding the steps taken, as well as the calculations and assumptions that were utilized to determine the Triaxial and Direct Shear Tests values. These values are provided in Table 6 of this assessment report. Additionally, Triaxial and Direct Shear Test results were not reported for Landfill Runoff Pond borings L-1 and L-2. These values need to be reported.

The East and Secondary Bottom Ash Ponds and the Surge Pond feature incised configurations and geotechnical or stability recommendations are not provided.

4.4 Monitoring and Instrumentation Recommendations

Associated monitoring wells should continue to be sampled semi-annually. In addition, any associated piezometers installed in support of the 2010 Embankment Investigation, should be read semi-annually with levels recorded.

In order to monitor change of water surface in the West and East Bottom Ash Ponds, a level gauge, similar to those in the Secondary Bottom Ash Pond and Surge Pond, should be added to those ponds. Routine monitoring should be established.

4.5 Inspection Recommendations

Although AEP/SWEPCO believes Pirkey to be a low hazard facility, that does not minimize the need for a more detailed and documented record of inspection activities. AMEC recommends that an inspection program be completed monthly by the plant, as well as being expanded to identify observation date, describe the conditions of crests, embankments, and other areas that are observed, identify potential problems, remark on maintenance response to previous concerns, and note conditions of monitoring instrumentation and pond levels. Inspections of the ponds should be performed after significant rainfall events.

AMEC understands a Professional Engineer performed an inspection in March 2009, and the next inspection is planned for 2012. We recommend this type of inspection program and report by a Professional Engineer be continued at least annually, in addition to the recommended monthly inspections by facility personnel.

The presence of trees, excessive vegetation and animal burrows are also related to the maintenance of the facility. More frequent (monthly) inspections would allow for these maintenance concerns to be recognized and addressed in a timely manner.

DRAFT

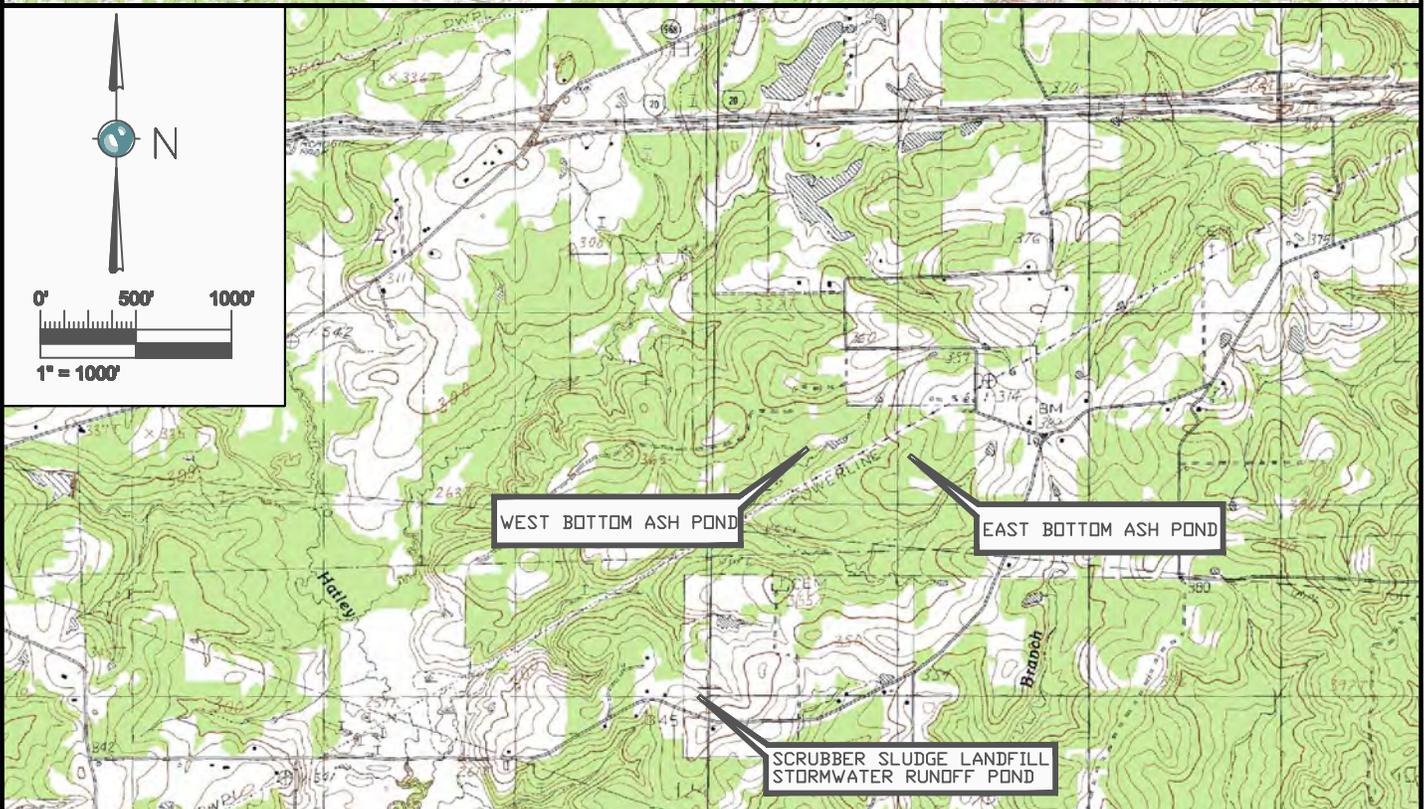
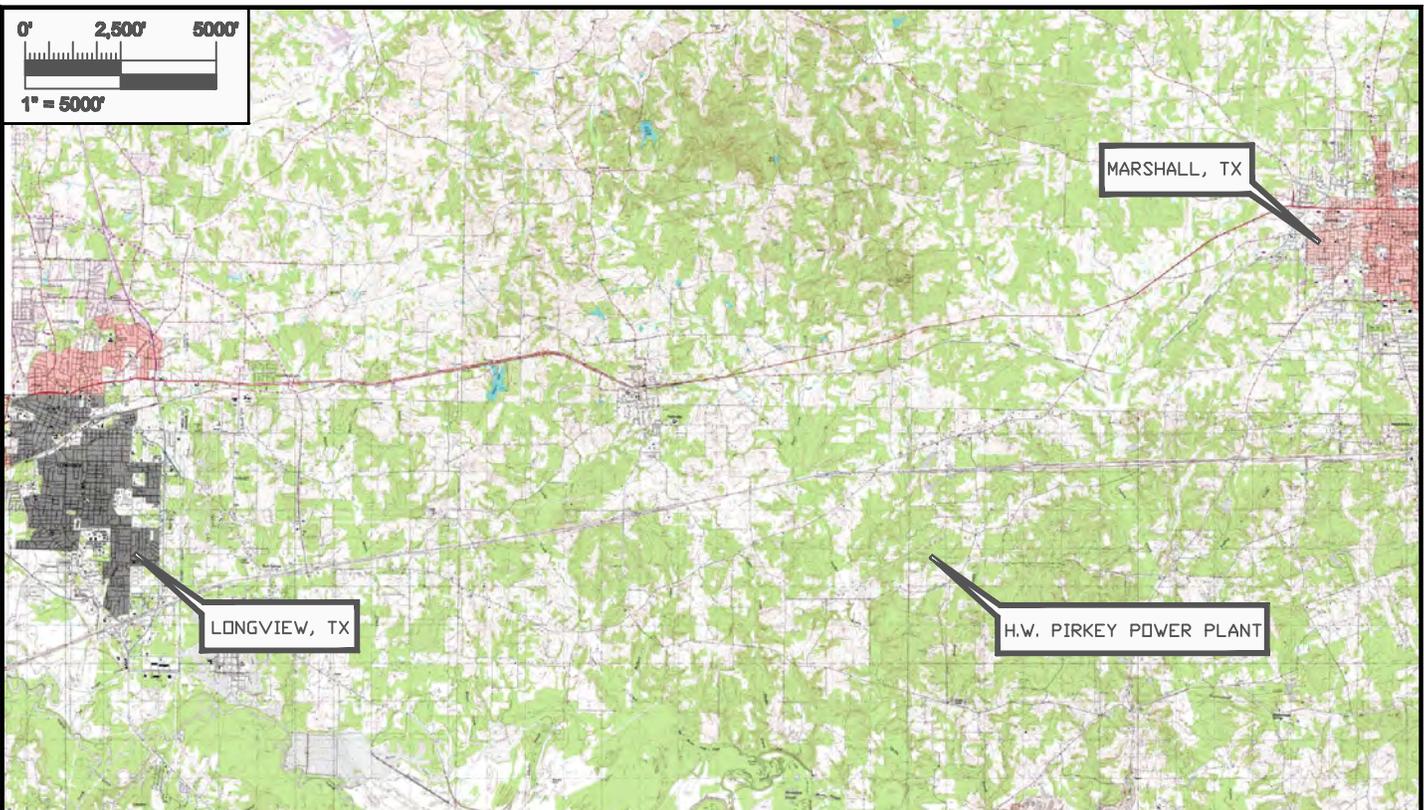
5.0 CLOSING

This report is prepared for the exclusive use of the Environmental Protection Agency for the site and criteria stipulated herein. This report does not address regulatory issues associated with storm water runoff, the identification and modification of regulated wetlands, or ground water recharge areas. Further, this report does not include review or analysis of environmental or regional geo-hydrologic aspects of the site, except as noted herein. Questions or interpretation regarding any portion of the report should be addressed directly by the geotechnical engineer.

Any use, reliance on, or decisions to be made based on this report by a third party are the responsibility of such third parties. AMEC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions and recommendations given in this report are based on visual observations, our partial knowledge of the history of Pirkey impoundments, and information provided to us by others. This report has been prepared in accordance with normally accepted geotechnical engineering practices. No other warranty is expressed or implied.

FIGURES



AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATE: 11/9/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SITE LOCATION & VICINITY MAP				CHK'D BY: MOS		REV. NO.:	
				PROJECTION:		SCALE: AS SHOWN	
						PROJECT NO: 3-2106-0183.0003 FIGURE No. 1	



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY

AMEC Earth & Environmental
690 Commonwealth Business Center
11003 Bluegrass Parkway
Louisville, KY 40299



DWN BY: DJC
CKD BY: MS
Datum: NAD 83
Projection: UTM 15
Scale: As Shown

ASSESSMENT OF DAM SAFETY OF
COAL COMBUSTION SURFACE IMPOUNDMENTS

AMERICAN ELECTRIC POWER (AEP) AND
SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)
H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
AERIAL SITE PLAN

REV. No.: A
Date: 11-9-10
Project No: 3-2106-0183-0003
Figure No: 2

Legend

-  Church
-  School
-  Railroad



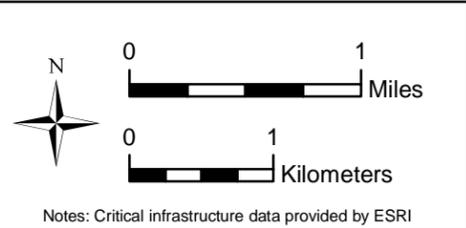
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4	New Point Church	-94.3913091	32.404876
5	Pleasant Hill Church	-94.5482592	32.438485
6	Red Oaks Church	-94.4724228	32.472929
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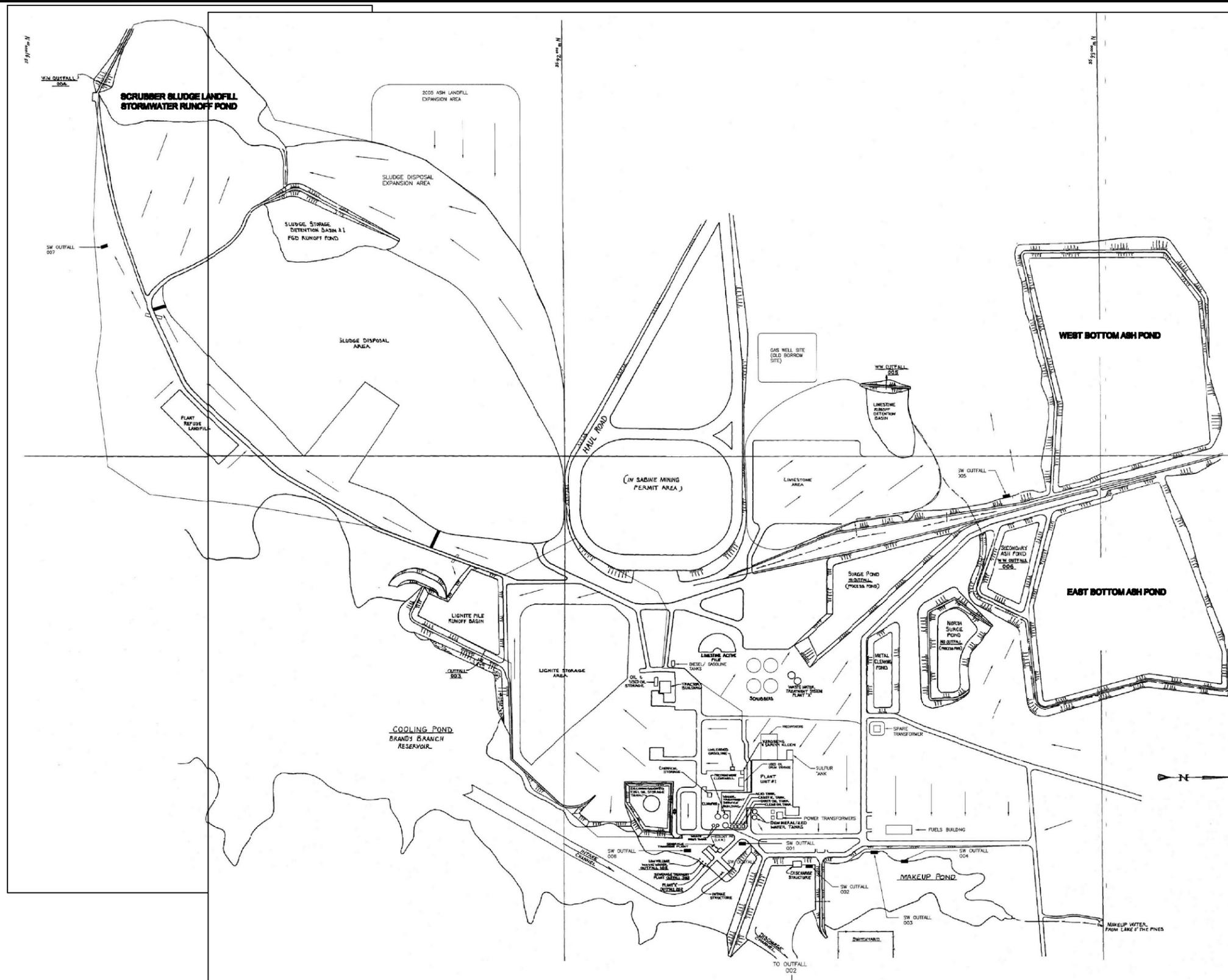
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SCALE: AS SHOWN
DATE: 11/9/2010

**ASSESSMENT OF DAM SAFETY OF
COAL COMBUSTION SURFACE IMPOUNDMENTS**

AMERICAN ELECTRIC POWER (AEP) AND
SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)
H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
CRITICAL INFRASTRUCTURE



**FIGURE
3**



NOTE: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC EARTH & ENVIRONMENTAL REPORT



CLIENT: UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

AMEC Earth & Environmental
 690 Commonwealth Center
 11003 Bluegrass Parkway
 Louisville, Ky 40299
 (502) 267-0700

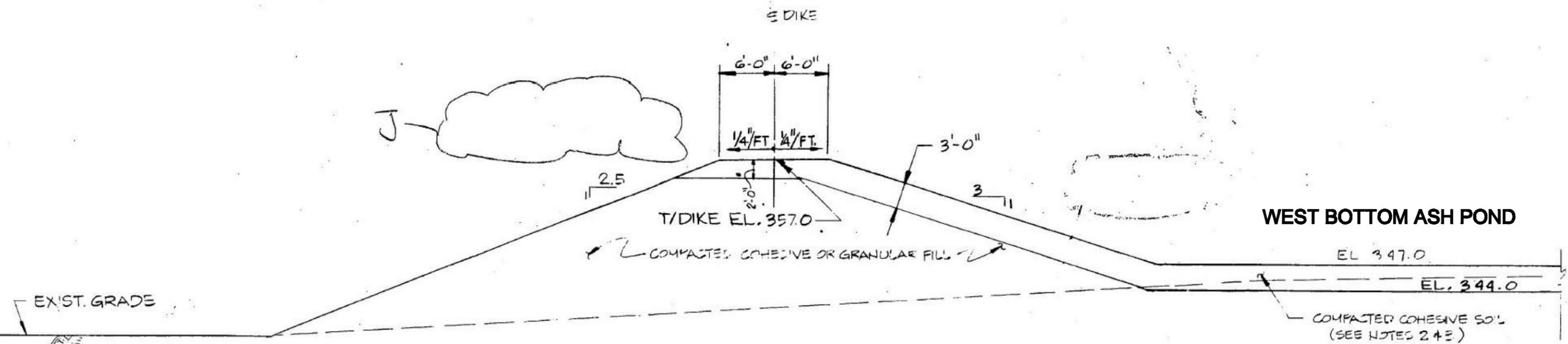


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 PROJECTION:
 SCALE: AS SHOWN

PROJECT **ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS**

TITLE **AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
 PIRKEY SITE STORMWATER FLOW PLAN**

DATE: 11/9/10
 PROJECT NO: 3-2106-0183.0003
 REV. NO:
 FIGURE No. 4



SECTION 3.3-10
SCALE: N.T.S.

NOTE: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC EARTH & ENVIRONMENTAL REPORT



CLIENT: **UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

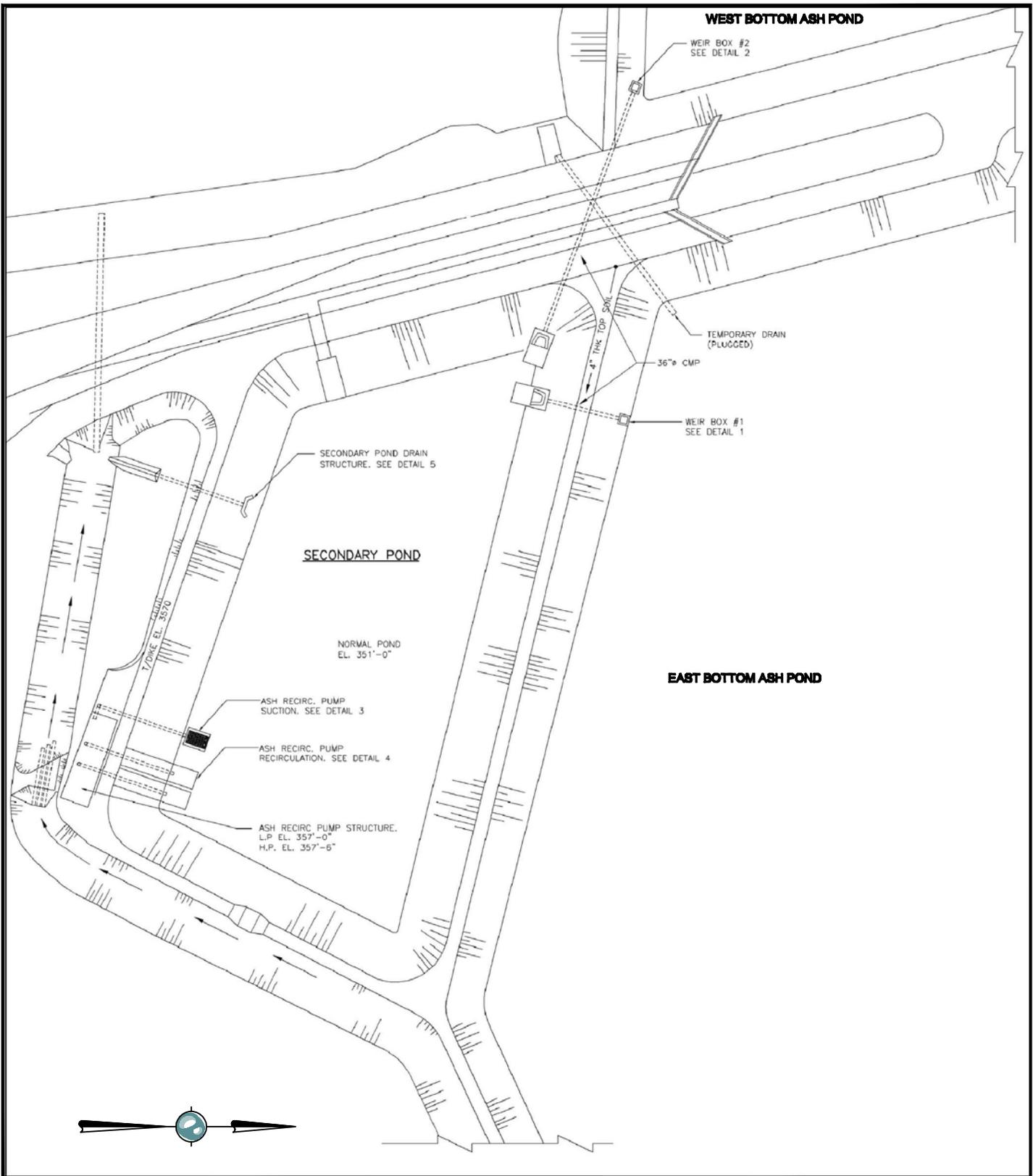
AMEC Earth & Environmental
690 Commonwealth Center
11003 Bluegrass Parkway
Louisville, Ky 40299
(502) 267-0700

DWN BY: CAE
CHK'D BY: MOS
DATUM:
PROJECTION:
SCALE: AS SHOWN

PROJECT **ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS**

TITLE **AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX TYPICAL CROSS SECTION - WEST ASH POND SOUTH EMBANKMENT**

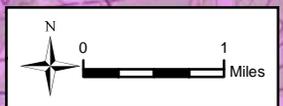
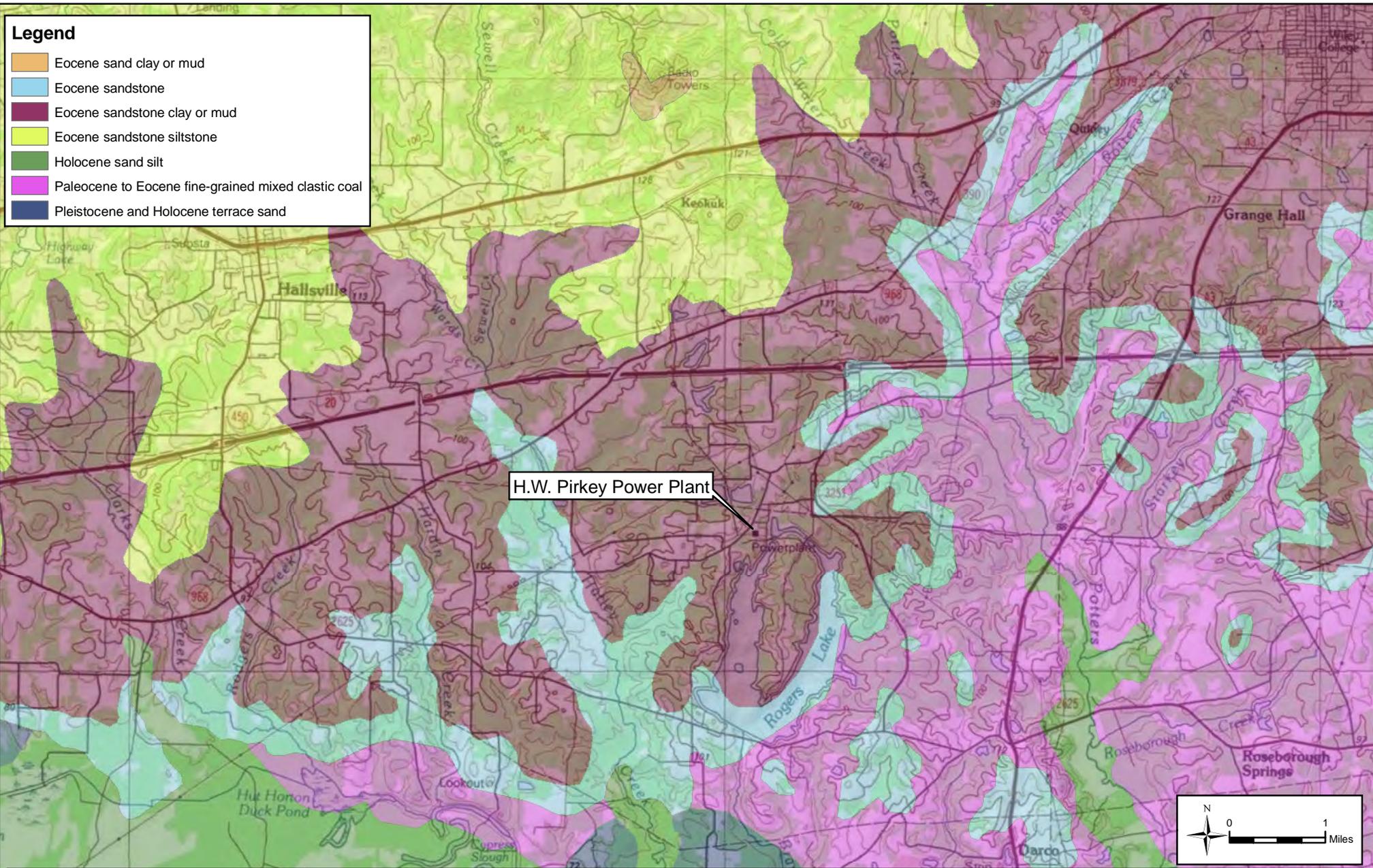
DATE: 11/8/10
PROJECT NO: 3-2106-0183.0003
REV. NO.:
FIGURE No. 5



AMEC Earth & Environmental 890 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY			
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/9/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX BOTTOM ASH PONDS DISCHARGE STRUCTURE LOCATIONS AND SECONDARY BOTTOM ASH POND PLAN				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2108-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		FIGURE No. 6	

Legend

- Eocene sand clay or mud
- Eocene sandstone
- Eocene sandstone clay or mud
- Eocene sandstone siltstone
- Holocene sand silt
- Paleocene to Eocene fine-grained mixed clastic coal
- Pleistocene and Holocene terrace sand



**UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY**

DWN BY: DJC

CKD BY: MS

Datum: NAD 83

Projection: UTM 15

Scale: As Shown

**ASSESSMENT OF DAM SAFETY OF
COAL COMBUSTION SURFACE IMPOUNDMENTS**

**AMERICAN ELECTRIC POWER (AEP) AND
SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO)
H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
GEOLOGIC MAP**

REV. No.: A

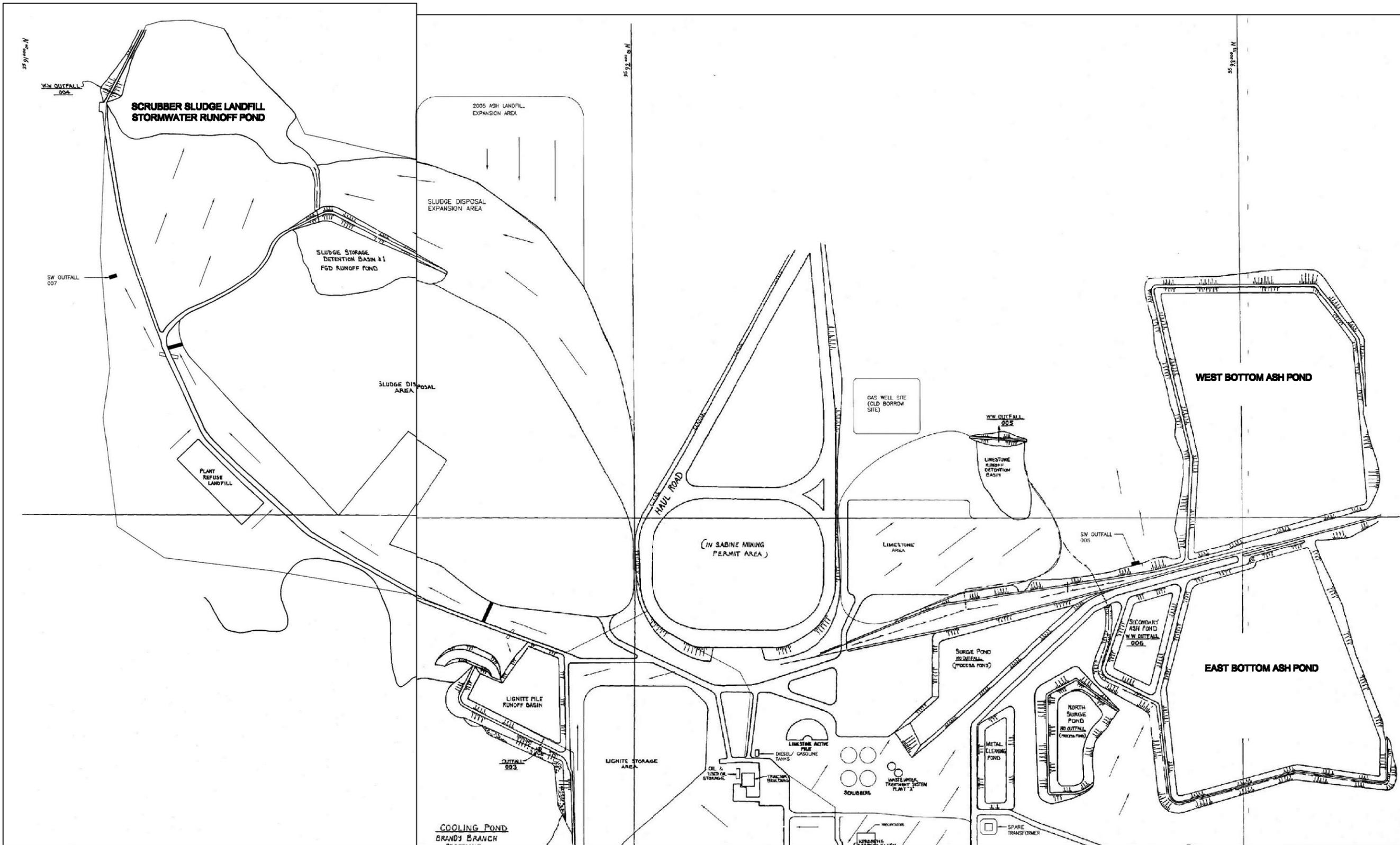
Date: 11-9-10

Project No: 3-2106-0183-0003

Figure No: **8**

AMEC Earth & Environmental
690 Commonwealth Business Center
11003 Bluegrass Parkway
Louisville, KY 40299





NOTE: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC EARTH & ENVIRONMENTAL REPORT

CLIENT LOGO



CLIENT: **UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

AMEC Earth & Environmental
 690 Commonwealth Center
 11003 Bluegrass Parkway
 Louisville, Ky 40299
 (502) 267-0700



DWN BY: CAE
 CHK'D BY: MOS
 DATUM:
 PROJECTION:
 SCALE: AS SHOWN

PROJECT **ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS**

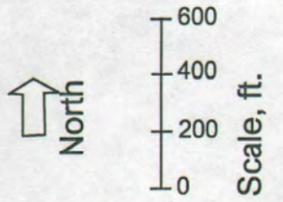
TITLE **AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX STABILITY ANALYSIS BORING AND CRITICAL CROSS SECTION LOCATIONS**

DATE: 11/9/10

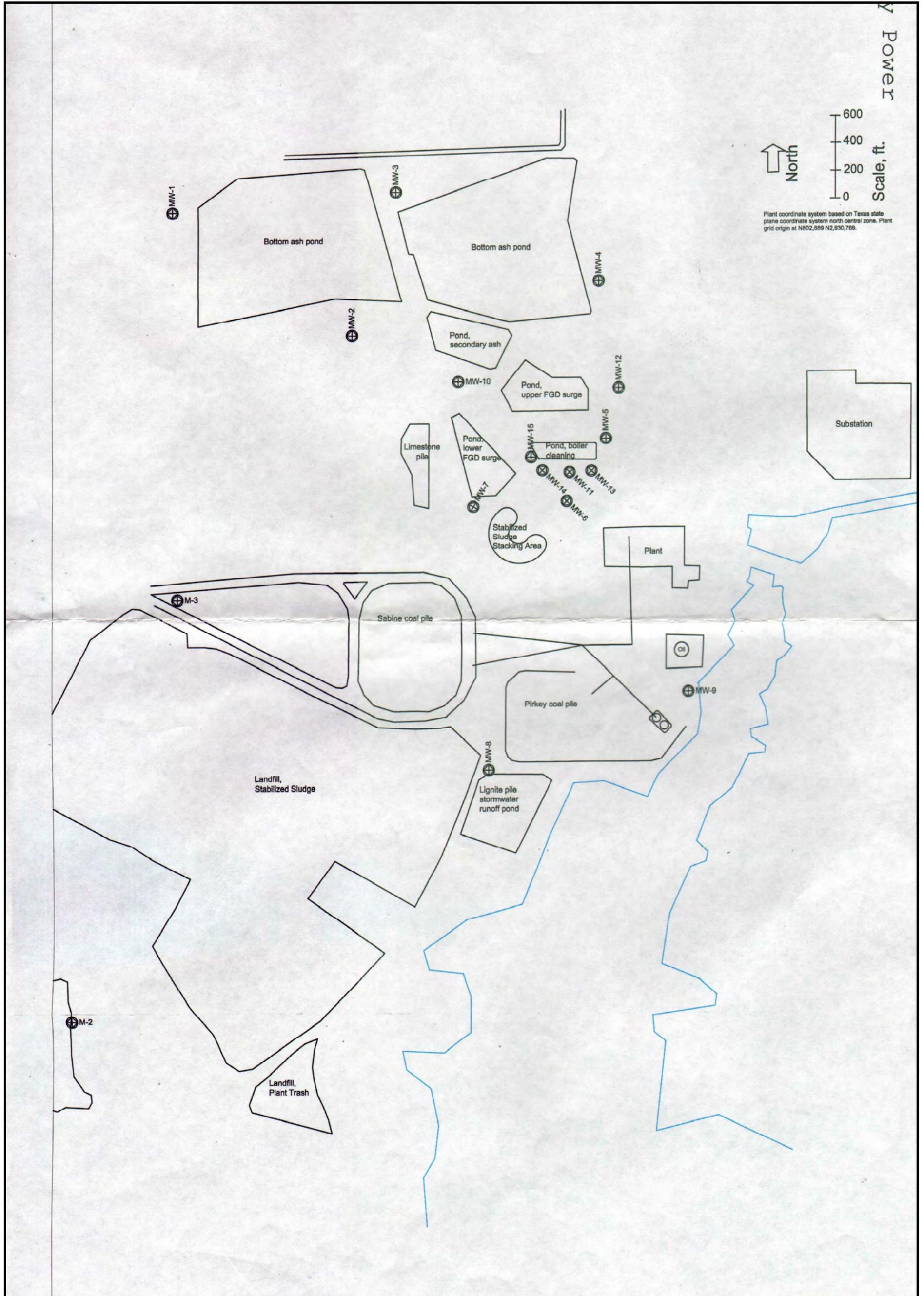
PROJECT NO: 3-2106-0183.0003

REV. NO.:

FIGURE No. 9



Plant coordinate system based on Texas state plane coordinate system north central zone. Plant grid origin at N602,889 N2,930,768.



CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	DWN BY: CAE	PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	REV. NO.:
		CHK'D BY: XXX		DATE: 11/9/10
AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		DATUM:	TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX MONITORING WELL LOCATION MAP	PROJECT NO.: 3-2106-0183.0003
		PROJECTION:		FIGURE No. 10
		SCALE: AS SHOWN		

APPENDIX A
Waste Impoundment Inspection Forms



Site Name: H.W. Pirkey	Date: October 19, 2010
Unit Name: West Bottom Ash Pond	Operator's Name: SWEPCO
Unit I.D.: ---	Hazard Potential Classification: High Significant Low
Inspector's Name: Don Dotson/AMEC and Mary Sawitzki/AMEC	

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?			See note		X
2. Pool elevation (operator records)?			Not provided		X
3. Decant inlet elevation (operator records)?			Not provided		
4. Open channel spillway elevation (operator records)?			N/A		
5. Lowest dam crest elevation (operator records)?			Not provided		
6. If instrumentation is present, are readings recorded (operator records)? See note					
7. Is the embankment currently under construction?		X			
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?			see note		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X			X
10. Cracks or scarps on crest?		X			X
11. Is there significant settlement along the crest?		X			X
12. Are decant trashracks clear and in place?			N/A		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X			X
14. Clogged spillways, groin or diversion ditches?		X			X
15. Are spillway or ditch linings deteriorated?		X			X
16. Are outlets of decant or underdrains blocked?		X			X
17. Cracks or scarps on slopes?		X			
			18. Sloughing or bulging on slopes?		X
			19. Major erosion or slope deterioration?		X
			20. Decant Pipes: N/A, SEE NOTE		
			Is water entering inlet, but not exiting outlet?		
			Is water exiting outlet, but not entering inlet?		
			Is water exiting outlet flowing clear?		
			21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):		
			From underdrain?		X
			At isolated points on embankment slopes?		X
			At natural hillside in the embankment area?		X
			Over widespread areas?		X
			From downstream foundation area?		X
			"Boils" beneath stream or ponded water?		X
			Around the outside of the decant pipe?		X
			22. Surface movements in valley bottom or on hillside?		X
			23. Water against downstream toe?		X
			24. Were Photos taken during the dam inspection?	X	

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.

<u>Inspection Issue #</u>	<u>Comments</u>
1.	SWEPCO conducts daily inspections (visual); AEP Geotechnical conducts annual inspections (written)
2.	Two (2) feet of freeboard is maintained on all ponds
6.	Piezometers and monitoring wells exist, but information was not provided regarding frequency of reading
8.	Unknown
20.	West Bottom Ash Pond is hydraulically connected to Secondary Ash Pond via valved, submerged pipe (diameter not provided), CCW is not decanted directly from West Bottom Ash Pond, pond levels appeared to be even at time of site visit.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # TPDES-WQ0002496000
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name West Bottom Ash Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment H.W. Pirkey West Bottom Ash 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

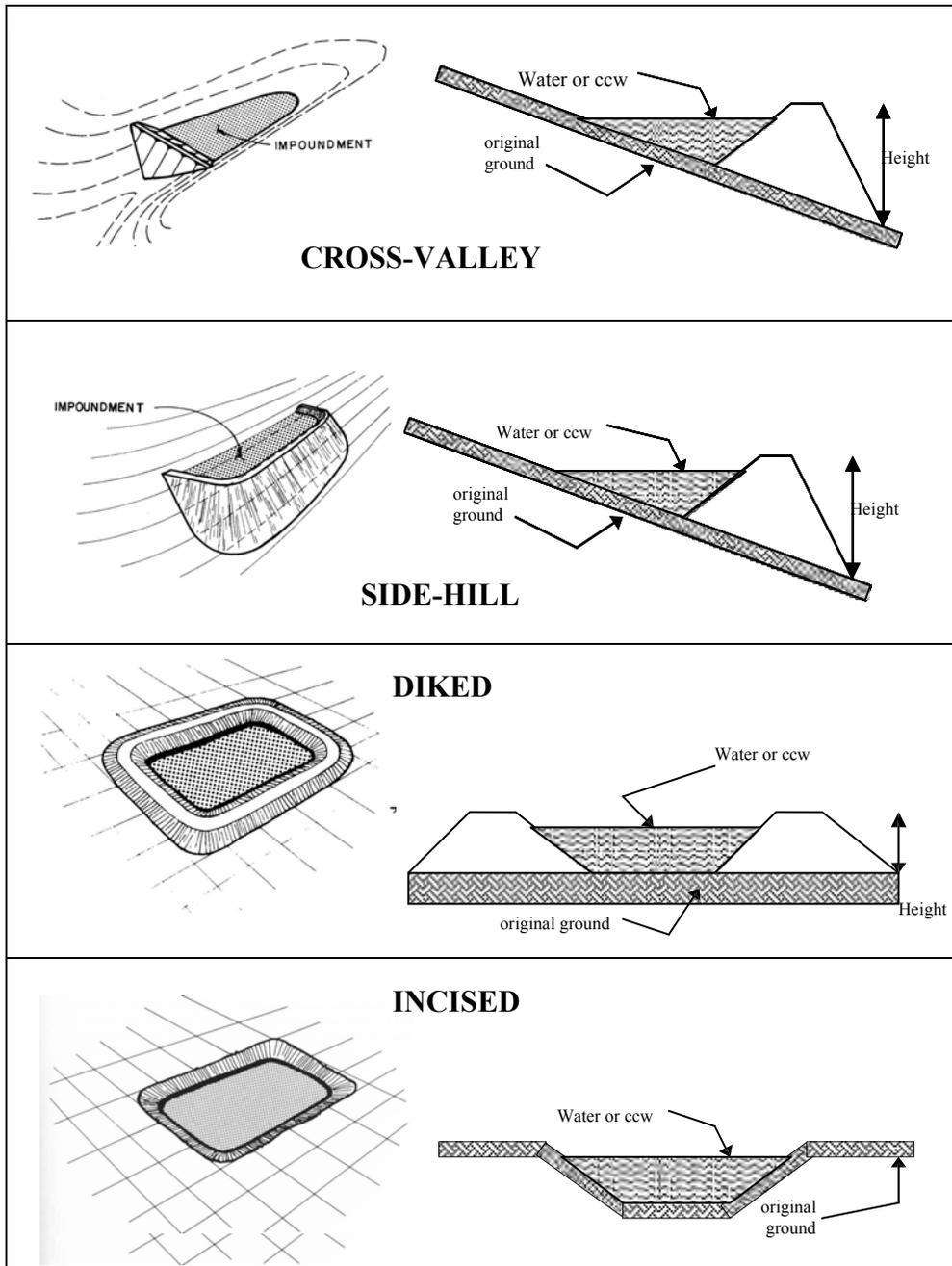
IMPOUNDMENT FUNCTION: Receives bottom ash from coal combustion process

Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment approximately 60 miles
Impoundment Location: Longitude -94 Degrees 29 Minutes 30.2 Seconds
Latitude 32 Degrees 28 Minutes 2.5 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES X NO

If So Which State Agency? Texas Commission on Environmental Quality (TCEQ)

CONFIGURATION:



Cross-Valley
 Side-Hill
 Diked (primarily)
 Incised (form completion optional)
 Combination Incised/Diked (90% diked)

Embankment Height 25 feet Embankment Material unknown
 Pool Area 30.85 acres Liner unknown
 Current Freeboard 2 feet Liner Permeability unknown

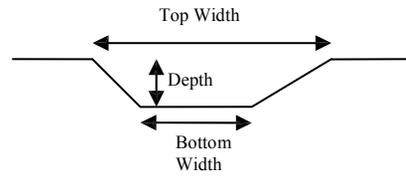
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

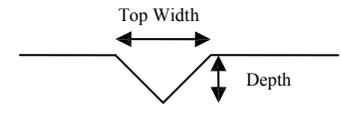
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

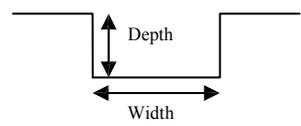
TRAPEZOIDAL



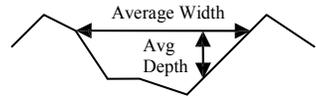
TRIANGULAR



RECTANGULAR



IRREGULAR

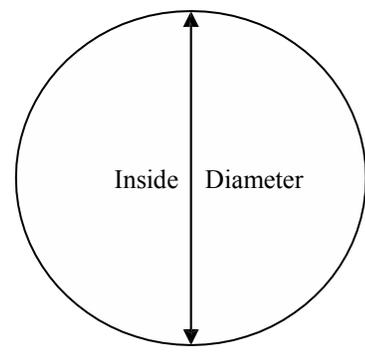


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO X _____

At time of site visit, Pirkey Facility was not discharging CCW.

 No Outlet

X **Other Type of Outlet** (specify) Connected hydraulically via valved pipe (unknown diameter) to Secondary Ash Pond, water surface elevations in both ponds appeared to be approximately even.

The Impoundment was Designed By Sargent & Lundy



Site Name: H.W. Pirkey	Date: October 19, 2010
Unit Name: East Bottom Ash Pond	Operator's Name: SWEPCO
Unit I.D.: ---	Hazard Potential Classification: High Significant <u>Low</u>
Inspector's Name: Don Dotson/AMEC and Mary Sawitzki/AMEC	

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?			See note		X
2. Pool elevation (operator records)?			Not provided		X
3. Decant inlet elevation (operator records)?			Not provided		
4. Open channel spillway elevation (operator records)?			N/A		
5. Lowest dam crest elevation (operator records)?			Not provided		
6. If instrumentation is present, are readings recorded (operator records)? SEE NOTE					
7. Is the embankment currently under construction?		X			
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?			see note		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X			X
10. Cracks or scarps on crest?		X			X
11. Is there significant settlement along the crest?		X			X
12. Are decant trashracks clear and in place?			N/A		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X			X
14. Clogged spillways, groin or diversion ditches?		X			X
15. Are spillway or ditch linings deteriorated?		X			X
16. Are outlets of decant or underdrains blocked?		X			X
17. Cracks or scarps on slopes?		X			
18. Sloughing or bulging on slopes?					
19. Major erosion or slope deterioration?					
20. Decant Pipes: N/A, SEE NOTE					
Is water entering inlet, but not exiting outlet?					
Is water exiting outlet, but not entering inlet?					
Is water exiting outlet flowing clear?					
21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):					
From underdrain?					X
At isolated points on embankment slopes?					X
At natural hillside in the embankment area?					X
Over widespread areas?					X
From downstream foundation area?					X
"Boils" beneath stream or ponded water?					X
Around the outside of the decant pipe?					X
22. Surface movements in valley bottom or on					X
23. Water against downstream toe?					X
24. Were Photos taken during the dam inspection?	X				

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.

<u>Inspection Issue #</u>	<u>Comments</u>
1.	SWEPCO conducts daily inspections (visual); AEP Geotechnical conducts annual inspections (written)
2.	Two (2) feet of freeboard is maintained on all ponds
6.	Piezometers and monitoring wells exist, but information was not provided regarding frequency of reading
8.	Unknown
20.	Pond is hydraulically connected to Secondary Ash Pond via submerged pipe (diameter not provided), CCW is not decanted directly from pond, East Ash Pond was out of service for dredging at time of site visit.



**Coal Combustion Waste (CCW)
Impoundment Inspection**

Impoundment NPDES Permit # TPDES-WQ0002496000
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name East Bottom Ash Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment H.W. Pirkey East Bottom Ash Pond
(Report each impoundment on a separate form under the same Impoundment NPDES Permit number)

New Update _____

	Yes	No
Is impoundment currently under construction?	_____	<u>X</u>
Is water or ccw currently being pumped into the impoundment?	_____	<u>X</u>

IMPOUNDMENT FUNCTION: Receives bottom ash from coal combustion process

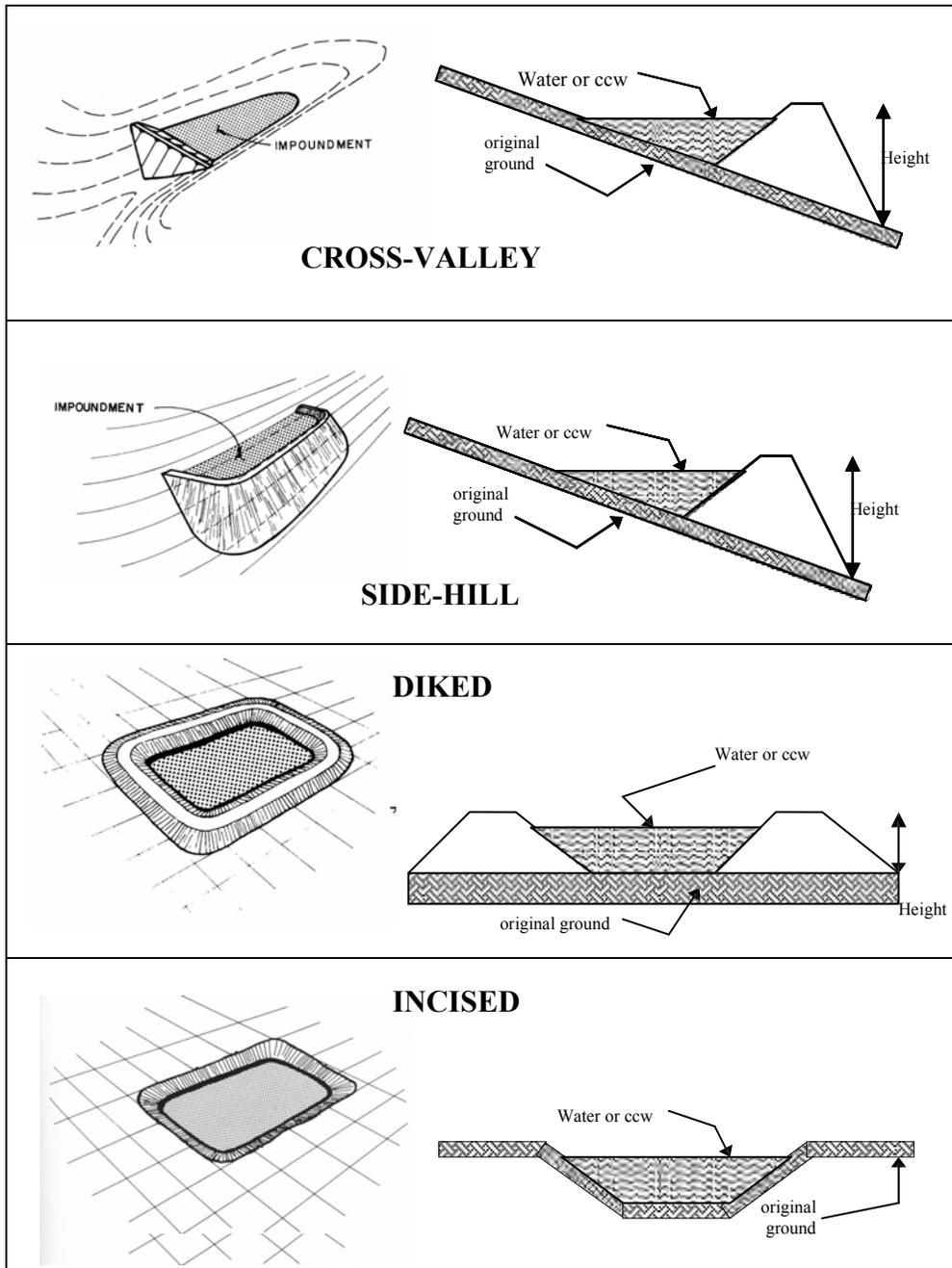
Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment approximately 60 miles

Impoundment Location: Longitude -94 Degrees 29 Minutes 12.3 Seconds
Latitude 32 Degrees 28 Minutes 1.4 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES NO _____

If So Which State Agency? Texas Commission on Environmental Quality (TCEQ)

CONFIGURATION:



Cross-Valley
 Side-Hill
 Diked (primarily)
 Incised (form completion optional)
 Combination Incised/Diked (primarily diked)

Embankment Height 4 feet Embankment Material unknown
 Pool Area 30.85 acres Liner unknown
 Current Freeboard 2 feet Liner Permeability unknown

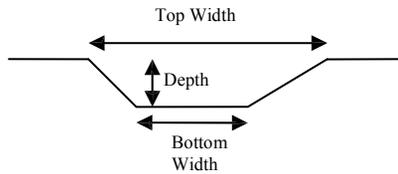
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

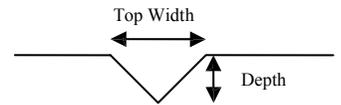
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

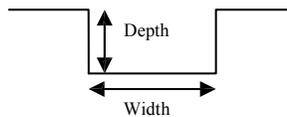
TRAPEZOIDAL



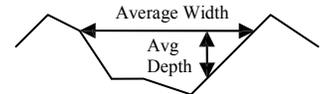
TRIANGULAR



RECTANGULAR



IRREGULAR

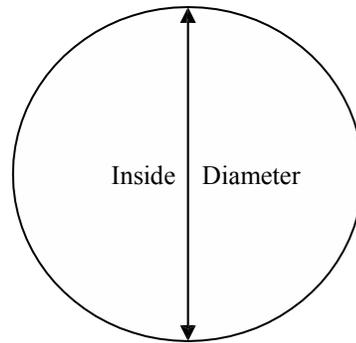


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO X _____

At time of site visit, Pirkey Facility was not discharging CCW to pond, pond was dry and undergoing solids excavation .

 No Outlet

X **Other Type of Outlet** (specify) Connected hydraulically via valved pipe (unknown diameter) to Secondary Ash Pond.

The Impoundment was Designed By Sargent & Lundy



Site Name: H.W. Pirkey	Date: October 19, 2010
Unit Name: Secondary Bottom Ash Pond	Operator's Name: SWEPCO
Unit I.D.: ---	Hazard Potential Classification: High Significant <u>Low</u>
Inspector's Name: Don Dotson/AMEC and Mary Sawitzki/AMEC	

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?			See note		X
2. Pool elevation (operator records)?			353.8 feet		X
3. Decant inlet elevation (operator records)?			Not provided		
4. Open channel spillway elevation (operator records)?			N/A		
5. Lowest dam crest elevation (operator records)?			Not provided		
6. If instrumentation is present, are readings recorded (operator records)? SEE NOTE					
7. Is the embankment currently under construction?		X			
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?			see note		X
9. Trees growing on embankment? (If so, indicate largest diameter below)		X			X
10. Cracks or scarps on crest?		X			X
11. Is there significant settlement along the crest?		X			X
12. Are decant trashracks clear and in place? N/A					X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X			X
14. Clogged spillways, groin or diversion ditches?		X			X
15. Are spillway or ditch linings deteriorated?		X			X
16. Are outlets of decant or underdrains blocked?		X			X
17. Cracks or scarps on slopes?		X			
18. Sloughing or bulging on slopes?					X
19. Major erosion or slope deterioration?					X
20. Decant Pipes: SEE NOTE					
Is water entering inlet, but not exiting outlet?					
Is water exiting outlet, but not entering inlet?					
Is water exiting outlet flowing clear?					
21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):					
From underdrain?					X
At isolated points on embankment slopes?					X
At natural hillside in the embankment area?					X
Over widespread areas?					X
From downstream foundation area?					X
"Boils" beneath stream or ponded water?					X
Around the outside of the decant pipe?					X
22. Surface movements in valley bottom or on					X
23. Water against downstream toe?					X
24. Were Photos taken during the dam inspection?	X				

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.

<u>Inspection Issue #</u>	<u>Comments</u>
1.	SWEPCO conducts daily inspections (visual); AEP Geotechnical conducts annual inspections (written)
2.	Two (2) feet of freeboard is maintained on all ponds
6.	Monitoring wells and piezometers exist, but no clear information provided on frequency of reading
8.	Unknown
16 and 20.	Secondary Ash Pond is hydraulically connected to West and East Bottom Ash Ponds via valved, submerged

pipes (diameter not provided), decant is pumped directly from Secondary Bottom Ash Pond to facility for reuse or to TXPDES discharge ID 006, pond levels (Secondary and West Bottom Ash) appeared to be even at time of site visit, connecting pipe open. (East Ash Pond was dry and undergoing solids excavation at time of site visit).



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # TPDES-WQ0002496000
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name Secondary Bottom Ash Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment Pirkey Secondary Bottom Ash 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*
*Receives gravity (not pumped) flow from Bottom Ash Ponds

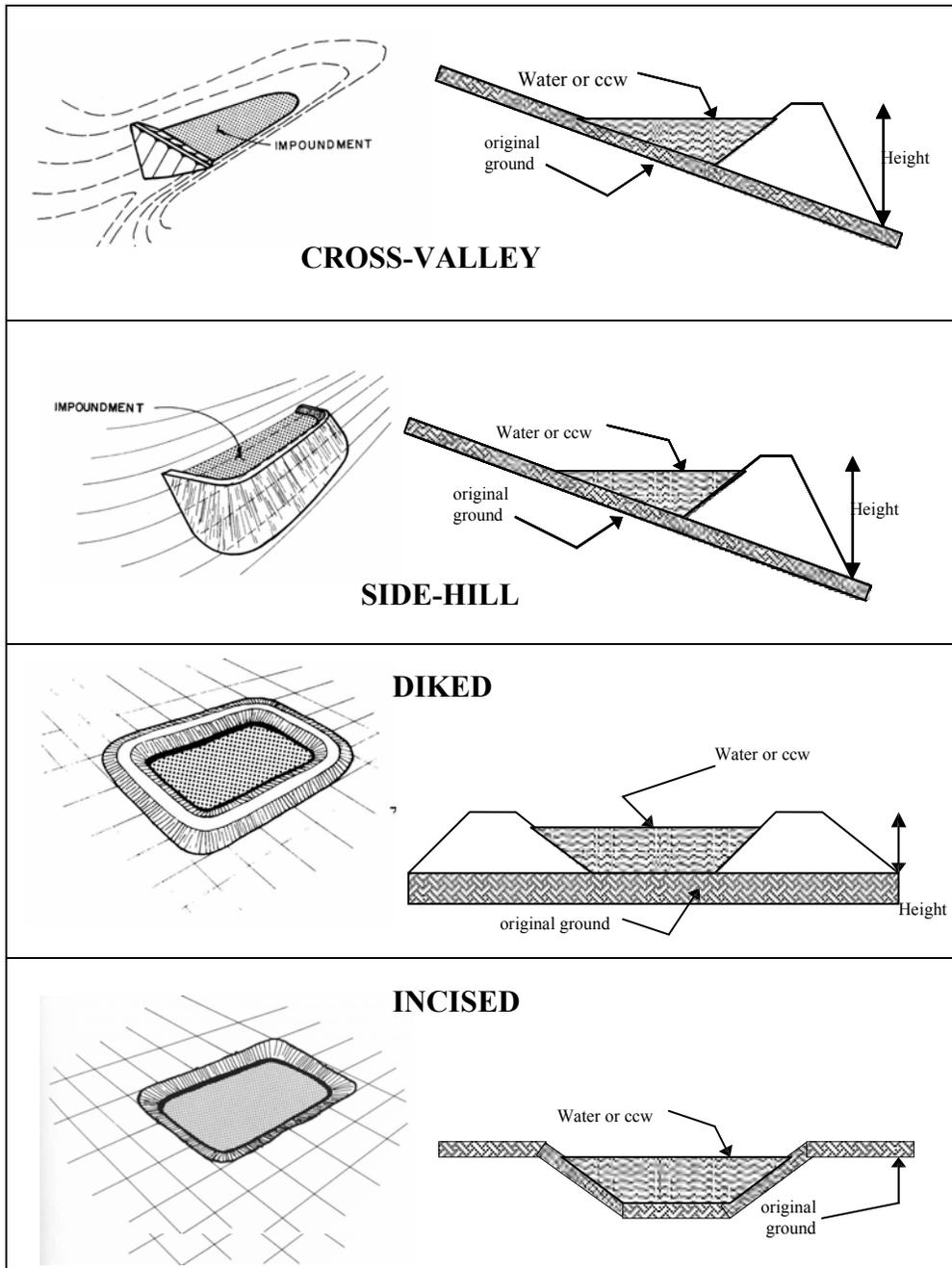
IMPOUNDMENT FUNCTION: Equalization, receives flow from Bottom Ash Ponds, source for facility reuse water, and location of TXPDES discharge point

Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment 60 miles
Impoundment Location: Longitude -94 Degrees 29 Minutes 15.8 Seconds
Latitude 32 Degrees 27 Minutes 55.4 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES X NO

If So Which State Agency? Texas Commission on Environmental Quality (TCEQ)

CONFIGURATION:



- Cross-Valley
- Side-Hill
- Diked (small section on southwest corner)
- Incised (form completion optional)
- Combination Incised/Diked (primarily incised, small area on SW corner diked)

Embankment Height 0 feet Embankment Material unknown

Pool Area 2.65 acres Liner unknown

Current Freeboard 2 feet Liner Permeability unknown

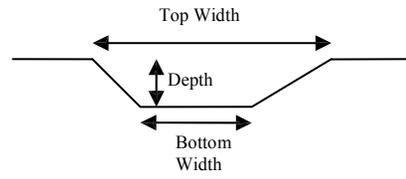
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

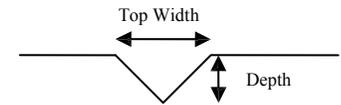
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

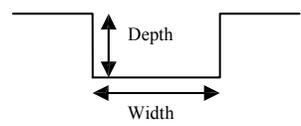
TRAPEZOIDAL



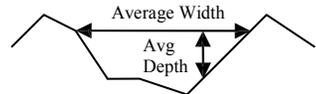
TRIANGULAR



RECTANGULAR



IRREGULAR

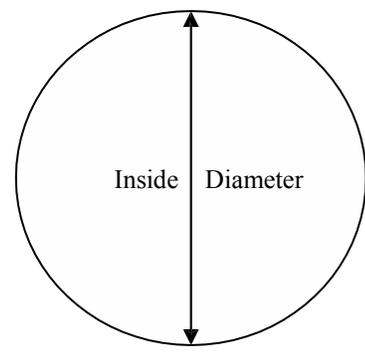


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO X _____

At time of site visit, Pirkey Facility was not discharging from Secondary Ash Pond

 No Outlet

X **Other Type of Outlet** (specify) discharged via pump, not gravity

The Impoundment was Designed By Sargent & Lundy



Site Name: H.W. Pirkey	Date: October 19, 2010
Unit Name: Surge Pond	Operator's Name: SWEPCO
Unit I.D.: ---	Hazard Potential Classification: High Significant Low
Inspector's Name: Don Dotson/AMEC and Mary Sawitzki/AMEC	

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?			See note		X
2. Pool elevation (operator records)?			355.4 feet		X
3. Decant inlet elevation (operator records)?			Not provided		
4. Open channel spillway elevation (operator records)?			N/A		
5. Lowest dam crest elevation (operator records)?			Not provided		
6. If instrumentation is present, are readings recorded (operator records)? See note					
7. Is the embankment currently under construction?		X			
8. Foundation preparation (remove vegetation, stumps, topsoil in area where embankment fill will be placed)?			N/A		X
9. Trees growing on embankment? (If so, indicate largest diameter below)			N/A		X
10. Cracks or scarps on crest?		X			X
11. Is there significant settlement along the crest?		X			X
12. Are decant trashracks clear and in place?			N/A		X
13. Depressions or sinkholes in tailings surface or whirlpool in the pool area?		X			X
14. Clogged spillways, groin or diversion ditches?		X			X
15. Are spillway or ditch linings deteriorated?		X		N/A	
16. Are outlets of decant or underdrains blocked?		X		N/A	
17. Cracks or scarps on slopes?		X		X	
18. Sloughing or bulging on slopes?					
19. Major erosion or slope deterioration?					
20. Decant Pipes: N/A, SEE NOTE					
Is water entering inlet, but not exiting outlet?					
Is water exiting outlet, but not entering inlet?					
Is water exiting outlet flowing clear?					
21. Seepage (specify location, if seepage carries fines, and approximate seepage rate below):					
From underdrain?					X
At isolated points on embankment slopes?					X
At natural hillside in the embankment area?					X
Over widespread areas?					X
From downstream foundation area?					X
"Boils" beneath stream or ponded water?					X
Around the outside of the decant pipe?					X
22. Surface movements in valley bottom or on hillside?				N/A	
23. Water against downstream toe?				N/A	
24. Were Photos taken during the dam inspection?	X				

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.

<u>Inspection Issue #</u>	<u>Comments</u>
1.	SWEPCO conducts daily inspections (visual); AEP Geotechnical conducts annual inspections (written)
2.	Per operators: two (2) feet of freeboard is maintained on all ponds
6.	Monitoring wells exist, but no clear information provided on frequency of reading
8.	N/A – pond is incised
20.	Water discharges from surge pond via pump, either reused at facility or directed to TXPDES outfall



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # TPDES-WQ0002496000_
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name Surge Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment Pirkey Surge 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*
*Water is entering pond, whether by pump or gravity flow is unknown.

IMPOUNDMENT FUNCTION: Receives discharge from flue gas desulfurization process

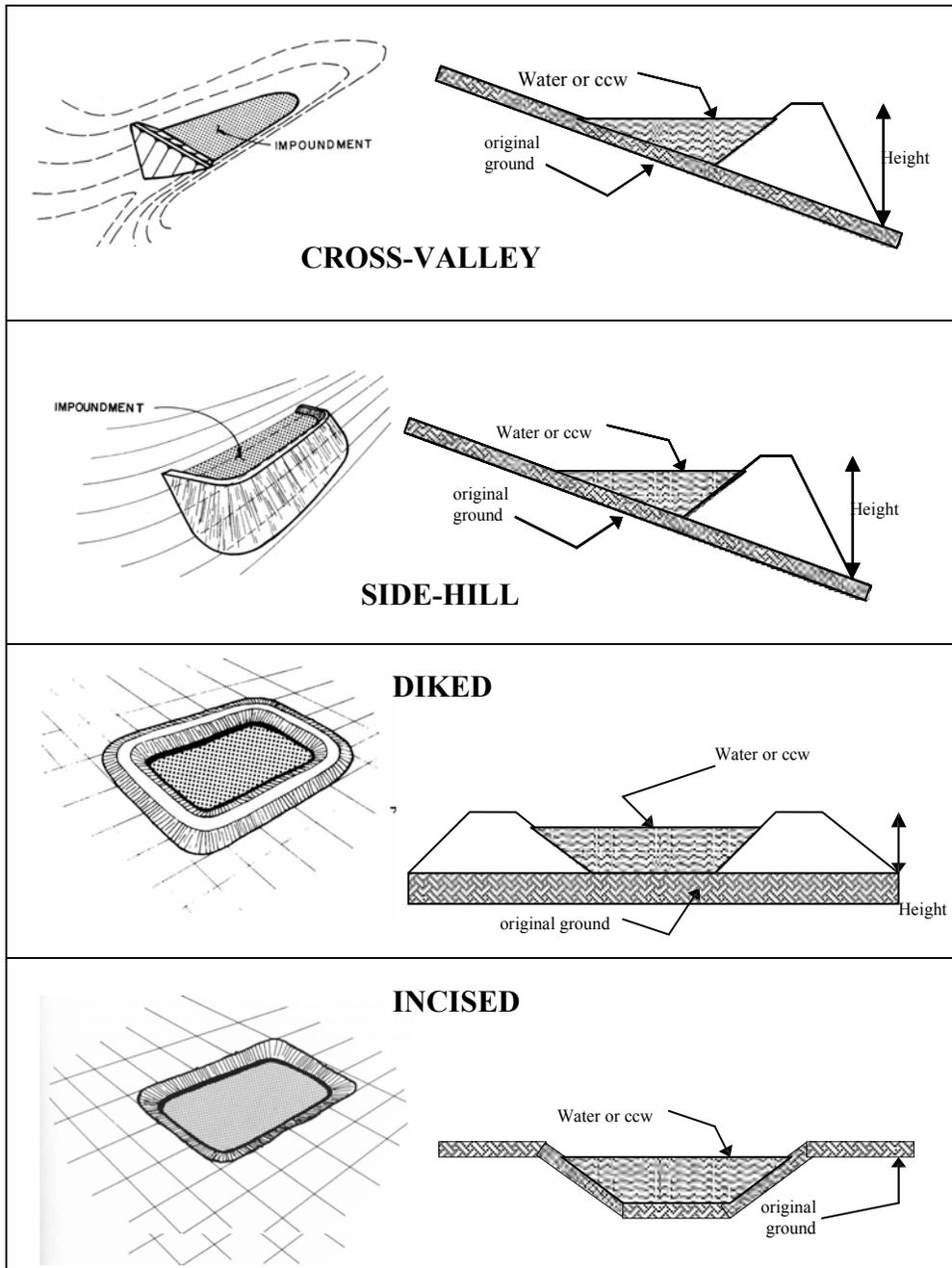
Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment 60 miles

Impoundment Location: Longitude -94 Degrees 29 Minutes 14.7 Seconds
Latitude 32 Degrees 27 Minutes 46.7 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES NO X

If So Which State Agency?

CONFIGURATION:



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

Embankment Height 0 feet Embankment Material N/A
 Pool Area 4.7 acres Liner unknown
 Current Freeboard 2 feet Liner Permeability unknown

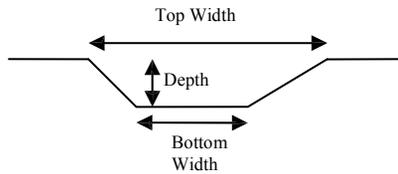
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

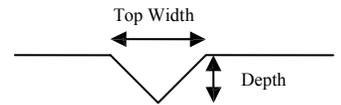
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

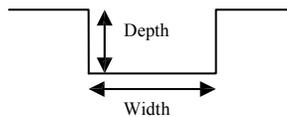
TRAPEZOIDAL



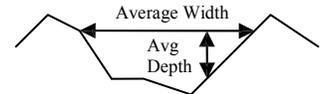
TRIANGULAR



RECTANGULAR



IRREGULAR

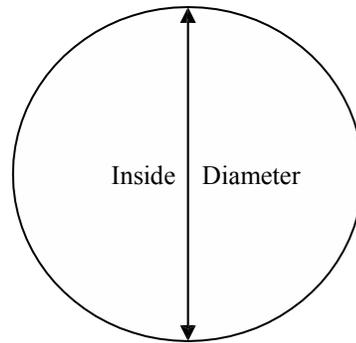


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO X _____

At time of site visit, Pirkey Facility was not discharging CCW.

 No Outlet

X **Other Type of Outlet** (specify) Discharge via pump for facility reuse or to TPDES Outfall

The Impoundment was Designed By Sargent & Lundy



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # TPDES-WQ0002496000
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name Auxiliary Surge Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment Pirkey Auxiliary Surge 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*
*Pond was dry during site visit, per operators, due to excessively dry summer and fall weather.

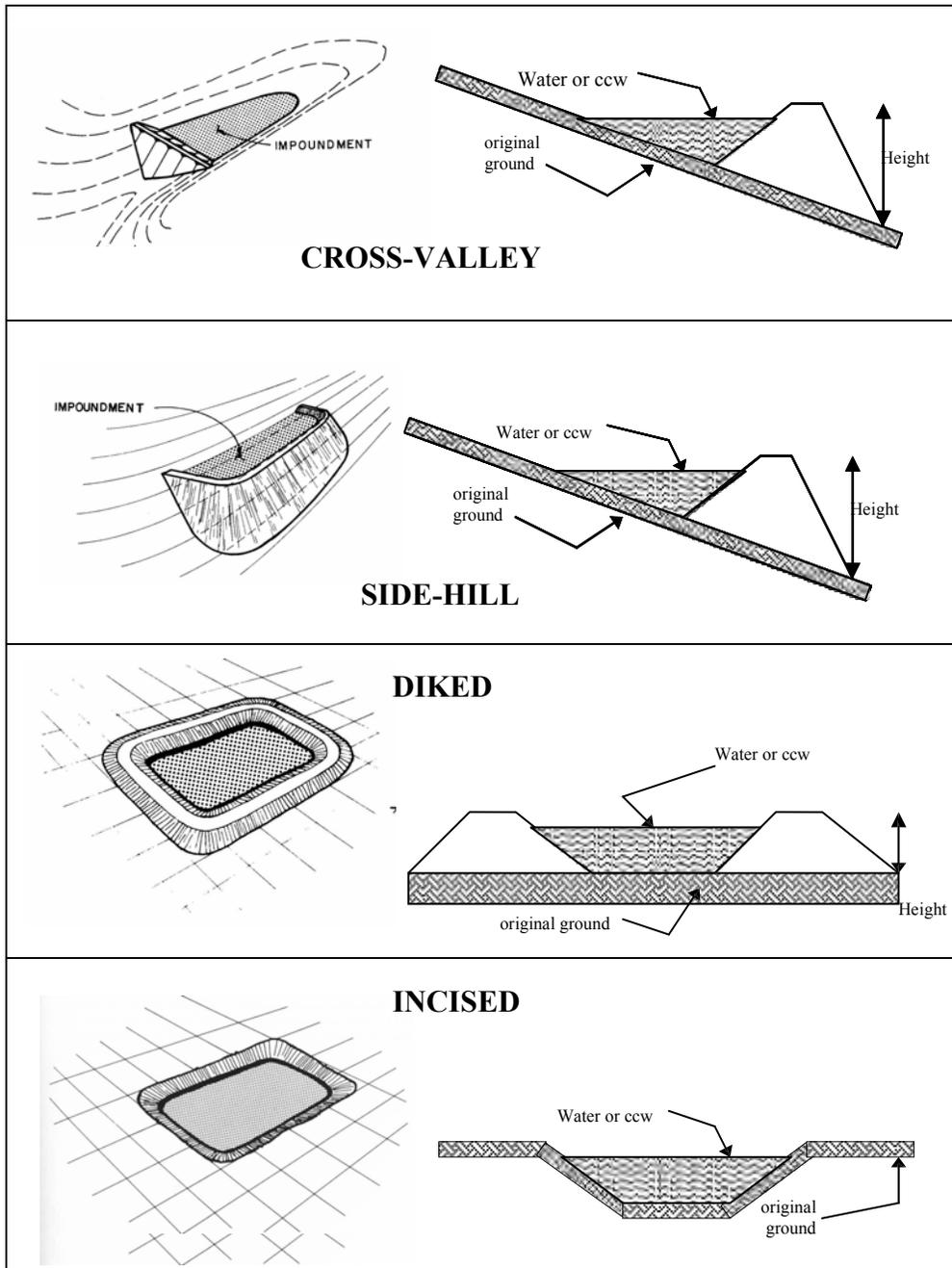
IMPOUNDMENT FUNCTION: Receives discharge (flue gas desulfurization process) from Surge Pond when volume is too high for single pond

Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment 60 miles
Impoundment Location: Longitude -94 Degrees 29 Minutes 8.9 Seconds
Latitude 32 Degrees 27 Minutes 52.1 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES NO X

If So Which State Agency?

CONFIGURATION:



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

Embankment Height 15.9 feet Embankment Material N/A
 Pool Area 4.3 acres Liner unknown
 Current Freeboard dry feet Liner Permeability unknown

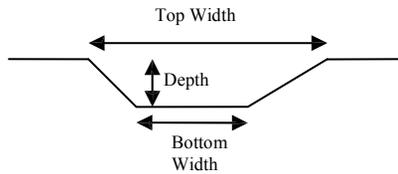
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

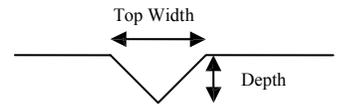
- Trapezoidal
- Triangular
- Rectangular
- Irregular

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

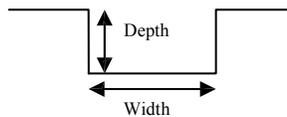
TRAPEZOIDAL



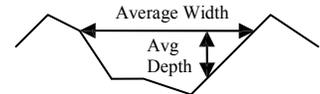
TRIANGULAR



RECTANGULAR



IRREGULAR

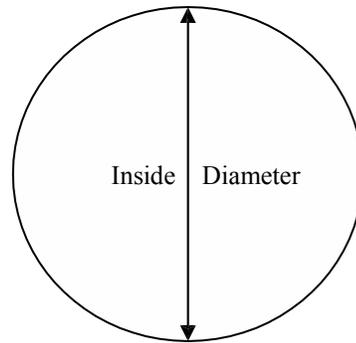


 Outlet

- inside diameter

Material

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



Is water flowing through the outlet? YES _____ NO X _____

At time of site visit, Pirkey Facility was not discharging CCW.

X **No Outlet**

 Other Type of Outlet (specify) _____

The Impoundment was Designed By AEP/SWEPCO Engineering



Site Name: H.W. Pirkey	Date: October 19, 2010
Unit Name: Scrubber Sludge Landfill	Operator's Name: SWEPCO
Unit I.D.: --- Storm Water Runoff Pond	Hazard Potential Classification: High Significant Low
Inspector's Name: Don Dotson/AMEC and Mary Sawitzki/AMEC	

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

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

1. SWEPCO conducts daily inspections (visual); AEP Geotechnical conducts annual inspections (written)

2. Per operators: two (2) feet of freeboard is maintained on all ponds

6. Monitoring wells and piezometers exist, information was not provided regarding frequency of reading

8. Unknown 16. Not visible

20. Bottom Ash Pond is hydraulically connected to Secondary Ash Pond via submerged pipe (diameter not provided),

CCW is not decanted directly from West Bottom Ash Pond, pond levels appeared to be even at time of site visit.



Coal Combustion Waste (CCW) Impoundment Inspection

Impoundment NPDES Permit # TPDES WQ0002496000
Date October 19, 2010

INSPECTOR Don Dotson/AMEC
Mary Sawitzki/AMEC

Impoundment Name Scrubber Sludge Landfill Stormwater Runoff Pond
Impoundment Company AEP/Southwester Electric Power Company (SWEPCO)
EPA Region 6
State Agency (Field Office) Address: Texas Commission of Environmental Quality (TCEQ)
12100 Park 35 Circle
Austin, TX 78753

Name of Impoundment H.W. Pirkey Scrubber Sludge Landfill Storm Water Runoff 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? Stormwater runoff from the landfill does enter the pond via gravity flow with each rainfall event

IMPOUNDMENT FUNCTION: Contains stormwater runoff and any leachate from the facility's Scrubber Sludge Landfill

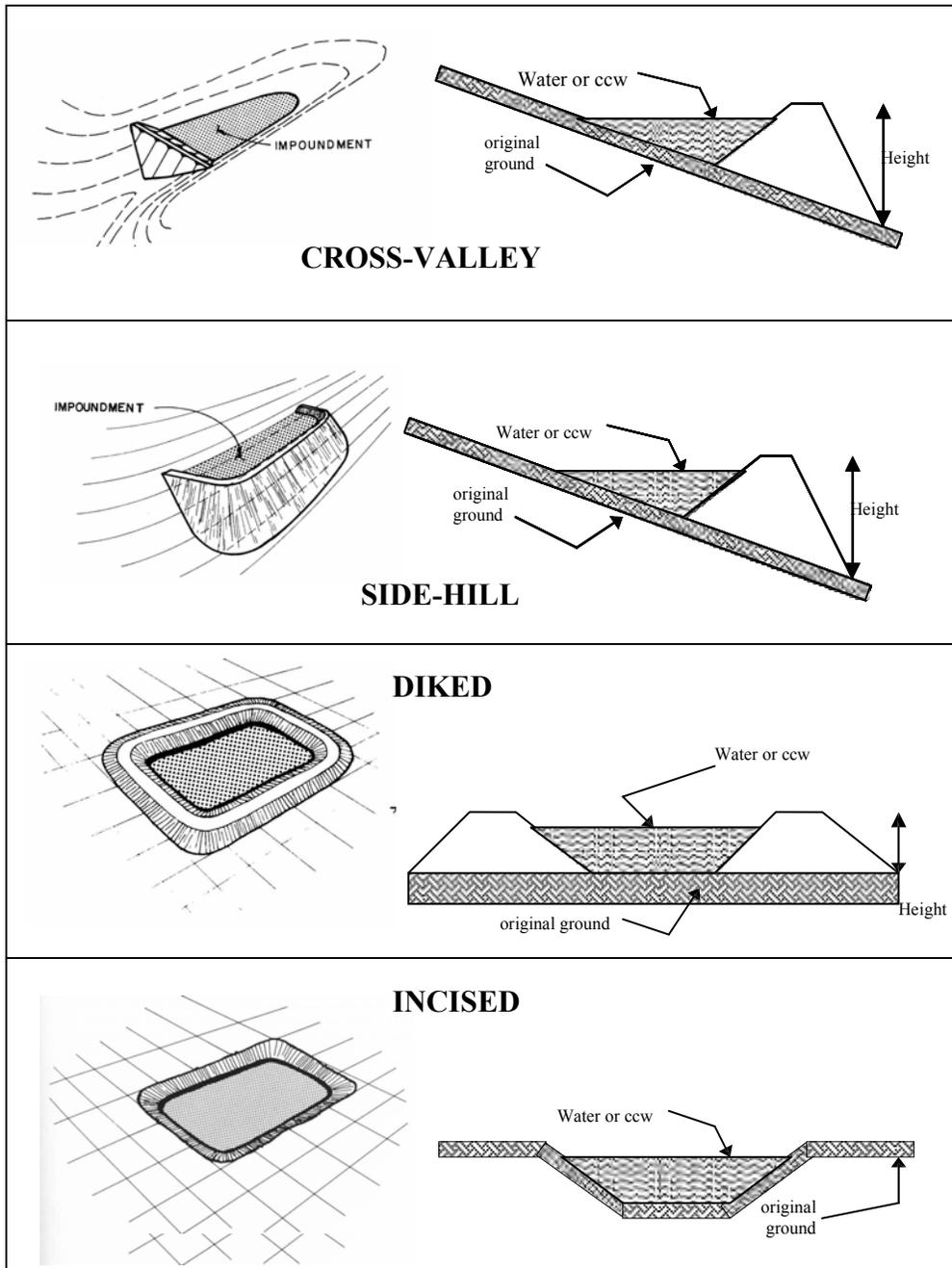
Nearest Downstream Town: Name Logansport, LA
Distance from the impoundment 60 miles

Impoundment Location: Longitude -94 Degrees 29 Minutes 54.4 Seconds
Latitude 32 Degrees 27 Minutes 4.9 Seconds
State TX County Harrison

Does a state agency regulate this impoundment? YES NO X

If So Which State Agency?

CONFIGURATION:



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

Embankment Height 19 feet Embankment Material unknown
 Pool Area 12.88 acres Liner unknown
 Current Freeboard 2 feet Liner Permeability unknown

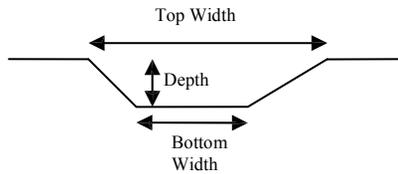
TYPE OF OUTLET (Mark all that apply)

 Open Channel Spillway

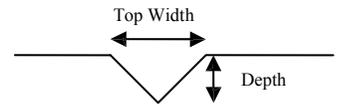
- Trapezoidal (emergency)
- Triangular
- Rectangular
- Irregular

 depth
~ 20 ft bottom (or average) width
~ 45 ft top width

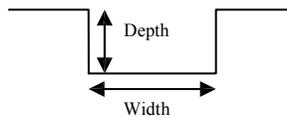
TRAPEZOIDAL



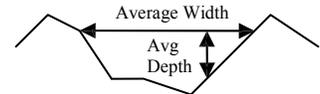
TRIANGULAR



RECTANGULAR



IRREGULAR

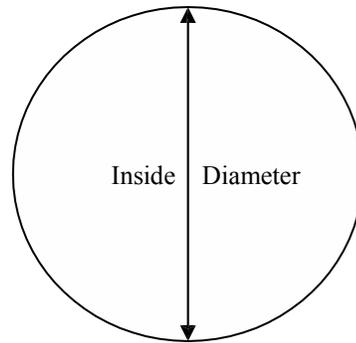


 Outlet

 inside diameter

Material

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



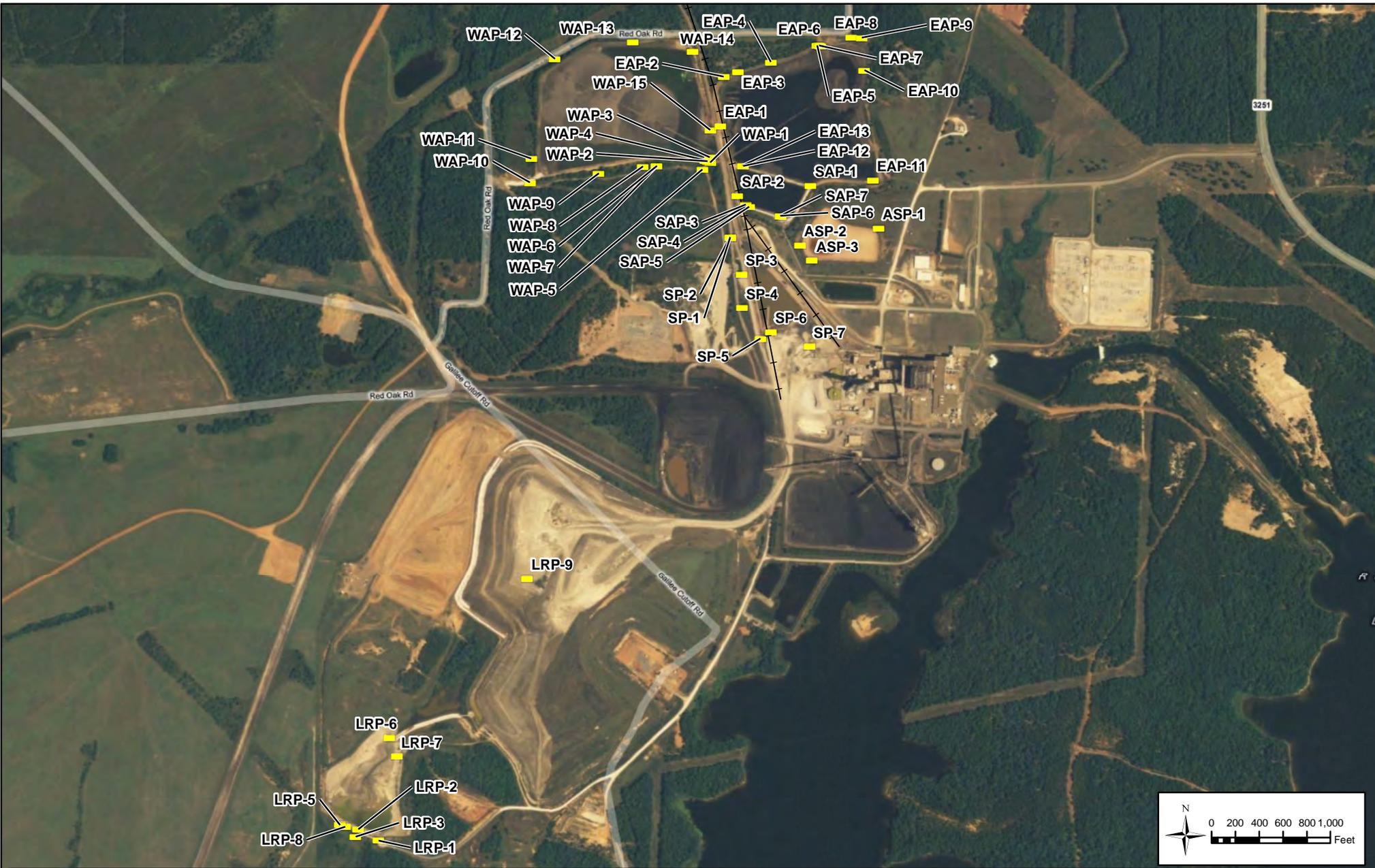
Is water flowing through the outlet? YES _____ NO X _____

 No Outlet

X **Other Type of Outlet** (specify) pumped-suction pipe diameter approx. 16-inch

The Impoundment was Designed By internal – AEP/SWEPCO

APPENDIX B
Site Photo Log Map and Site Photos



	<p align="center">UNITED STATES ENVIRONMENTAL PROTECTION AGENCY</p>	DWN BY:	DJC	<p align="center">ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS</p>	REV. No.:	A
		CKD BY:	MS		Date:	11-9-10
<p>AMEC Earth & Environmental 690 Commonwealth Business Center 11003 Bluegrass Parkway Louisville, KY 40299</p>		Datum:	NAD 83	<p align="center">AMERICAN ELECTRIC POWER (AEP) AND SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX PHOTO LOCATION MAP</p>	Project No.:	3-2106-0183-0003
		Projection:	UTM 15		Figure No.:	B-1
		Scale:	As Shown			

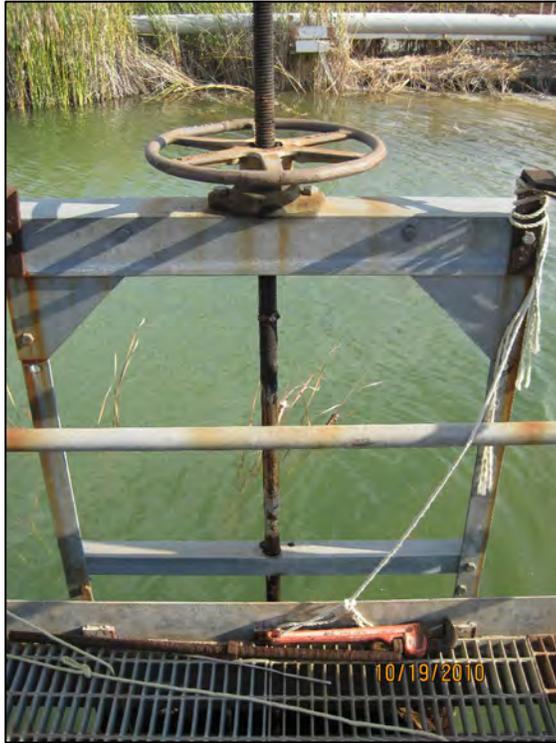


WAP-1
CREST AT SOUTHEAST CORNER CREST LOOKING WEST



WAP-2
TOP OF DISCHARGE STRUCTURE

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY			
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-1	



**WAP-3
DISCHARGE PIPE VALVE OPERATOR**



**WAP-4
UPSTREAM SLOPE AT SOUTHEAST CORNER LOOKING WEST**

<p>AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700</p>		<p>CLIENT LOGO </p>	<p>CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY</p>	
<p>PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS</p>	<p>DWN BY: CAE</p>	<p>DATUM:</p>	<p>DATE: 11/8/10</p>	
<p>TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO</p>	<p>CHK'D BY: MOS</p>	<p>REV. NO.:</p>	<p>PROJECT NO: 3-2106-0183.0003</p>	
		<p>PROJECTION:</p>	<p>SCALE: AS SHOWN</p>	<p>APPENDIX: B-2</p>



**WAP-3
DISCHARGE PIPE VALVE OPERATOR**



**WAP-4
UPSTREAM SLOPE AT SOUTHEAST CORNER LOOKING WEST**

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-3	



WAP-5
LOOKING NORTH UP DOWNSTREAM SLOPE AT SOUTHEAST CORNER



WAP-6
LOOKING EAST ON SOUTH DOWNSTREAM EMBANKMENT

AMEC Earth & Environmental

890 Commonwealth Center
 11003 Bluegrass Parkway
 Louisville, Ky 40299
 (502) 267-0700



CLIENT LOGO



CLIENT

**UNITED STATES
 ENVIRONMENTAL
 PROTECTION AGENCY**

PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-4



WAP-9

ANIMAL BURROW ON SOUTH DOWNSTREAM EMBANKMENT



WAP-10

SURFACE EROSION AT SOUTHWEST EMBANKMENT CORNER

AMEC Earth & Environmental

690 Commonwealth Center
11003 Bluegrass Parkway
Louisville, Ky 40299
(502) 267-0700



CLIENT LOGO



CLIENT

**UNITED STATES
ENVIRONMENTAL
PROTECTION AGENCY**

PROJECT
ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS

DWN BY: CAE

DATUM:

DATE: 11/8/10

TITLE
**AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC
POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
WEST ASH POND SITE PHOTO**

CHK'D BY: MOS

REV. NO.:

PROJECT NO:
3-2106-0183.0003

PROJECTION:

SCALE:
AS SHOWN

APPENDIX:
B-5



WAP-11
LOOKING NORTH ALONG WESTERN DOWNSTREAM
EMBANKMENT AT RECENT SURFACE WORK



WAP-12
LOOKING NORTHEAST ALONG NORTHERN DOWNSTREAM
EMBANKMENT AT RECENT SURFACE WORK

AMEC Earth & Environmental

690 Commonwealth Center
 11003 Bluegrass Parkway
 Louisville, Ky 40299
 (502) 267-0700



CLIENT LOGO



CLIENT

UNITED STATES
ENVIRONMENTAL
PROTECTION AGENCY

PROJECT
ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS

DWN BY: CAE

DATUM:

DATE: 11/8/10

TITLE
AMERICAN ELECTRIC POWER (AEP) AND SOUTHWEST ELECTRIC
POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
WEST ASH POND SITE PHOTO

CHK'D BY: MOS

REV. NO.:

PROJECT NO:
3-2106-0183.0003

PROJECTION:

SCALE:
AS SHOWN

APPENDIX:
B-6



WAP-13
LOOKING WEST FROM CREST OF NORTHERN EMBANKMENT



WAP-14
LOOKING SOUTH FROM CREST OF EASTERN EMBANKMENT

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-7	



**WAP-15
LOOKING SOUTH AT INFLUENT PIPE-NEUTRALIZED
WASTE FROM DEMINERALIZER**

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX WEST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-8	



EAP-1
LOOKING EAST ACROSS POND FROM WESTERN CREST



EAP-2
LOOKING NORTHEAST FROM
CREST OF NORTHERN EMBANKMENT

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-9



**EAP-3
PIEZOMETER ON CREST OF NORTHERN EMBANKMENT**



**EAP-4
LOOKING NORTH FROM NORTHERN
EMBANKMENT AT HIGHER GROUND**

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-10	



EAP-5
LOOKING SOUTH FROM NORTHERN EMBANKMENT



EAP-6
LOOKING SOUTHWEST FROM NORTHERN EMBANKMENT AT STACKED ASH

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-11	



EAP-7
GATE TO ROAD NORTH OF NORTHERN EMBANKMENT



EAP-8
GAS PIPELINE ON NORTHEAST CORNER ?????? ASK DON

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-12	



EAP-9

????????? AT NORTHEAST CORNER ???????? ASK DON



EAP-10

**LOOKING SOUTH FROM EASTERN CREST AT
ASH STACK AND HIGHER GROUND TO EAST**

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PROTECTION AGENCY**

PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-13



EAP-11
LOOKING WEST FROM SOUTHEAST CORNER CREST



EAP-12
LOOKING NORTHEAST FROM SOUTHWEST CORNER ACROSS DISCHARGE STRUCTURE

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY			
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-14	



**EAP-13
SOUTHWEST CREST LOOKING NORTHWEST
PAST DUST CONTROL LOAD OUT PIPE**

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX EAST ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-9	



SAP-1
LOOKING WEST ACROSS POND FROM NORTHEAST CORNER



SAP-2
INFLUENT OF BOILER BLOWDOWN
DISCHARGE PIPE AT SOUTHWEST CORNER

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SECONDARY ASH POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-16



SAP-3
NPDES DISCHARGE OUTFALL 006 AT SOUTHWEST CORNER



SAP-4
TRANSFER PIPE CARRYING REUSE
FLOW TO ADJADENT LIGNITE MINE

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 Louisville, Ky 40289
 (502) 267-0700



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PROJECT
ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS

DWN BY: CAE

DATUM:

DATE: 11/8/10

TITLE
AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC
POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX
SECONDARY ASH POND SITE PHOTO

CHK'D BY: MOS

REV. NO.:

PROJECT NO:
3-2106-0183.0003

PROJECTION:

SCALE:
AS SHOWN

APPENDIX:
B-17



**SAP-5
PIEZOMETER AT SOUTHWEST CORNER**



**SAP-6
FROM SOUTHEAST CORNER LOOKING NORTHWEST AT
MARKER INDICATING LOCATION OF PLANT REUSE PIPE**

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SECONDARY ASH POND SITE PHOTO	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-18



SAP-7
REUSE PUMP HOUSE ON SOUTH SHORE OF POND

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SECONDARY ASH POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-19	



SP-1
RAILROAD TRACKS WEST OF SURGE POND-FROM
NORTHERN CORNER LOOKING SOUTHEAST



SP-2
NORTHWEST OF POND LOOKING
SOUTH AT LIMESTONE UNLOADING AREA

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS		DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO		CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
		PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-20	



SP-3
WEST OF SURGE POND LOOKING NORTHWEST
AT LIMESTONE UNLOADING AREA



SP-4
STORM WATER CULVERT (18-INCH) THROUGH
EMBANKMENT SOUTH OF LIMESTONE UNLOADER

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS		DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO		CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
		PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-21



**SP-5
MONITORING WELL LOCATED ADJACENT
TO SOUTHWEST CORNER OF POND**



**SP-6
LOOKING NORTH SOUTH EDGE OF POND
AT FACILITY REUSE PUMP STATION**

AMEC Earth & Environmental 890 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40289 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWEST ELECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-22	



SP-7

SOUTHEAST CORNER OF POND LOOKING AT FLOWING FLUE GAS DESULFURIZATION PROCESS INFLUENT PIPE (18-INCH)

<p>AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700</p>		<p>CLIENT LOGO </p>	<p>CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY</p>	
<p>PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS</p>	<p>DWN BY: CAE</p>	<p>DATUM:</p>	<p>DATE: 11/8/10</p>	
<p>TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO</p>	<p>CHK'D BY: MOS</p>	<p>REV. NO.:</p>	<p>PROJECT NO: 3-2106-0183.0003</p>	
	<p>PROJECTION:</p>	<p>SCALE: AS SHOWN</p>	<p>APPENDIX: B-23</p>	



ASP-1
LOOKING WEST FROM NORTHEAST
CORNER EMBANKMENT



ASP-2
LOOKING EAST ACROSS POND
FROM WESTERN EMBANKMENT

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY			
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-24	



**ASP-3
PIEZOMETER ON SOUTHWEST
CORNER OF POND EMBANKMENT**

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX SURGE POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-25	



LRP-1
LOOKING NORTH ACROSS POND FROM
SOUTHEASTERN EMBANKMENT CREST



LRP-2
POND DISCHARGE STRUCTURE-NPDES OUTFALL 004

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40239 (502) 267-0700				CLIENT LOGO 		CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY			
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS				DWN BY: CAE		DATUM:		DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX LANDFILL RUNOFF POND SITE PHOTO				CHK'D BY: MOS		REV. NO.:		PROJECT NO: 3-2106-0183.0003	
				PROJECTION:		SCALE: AS SHOWN		APPENDIX: B-26	



**LRP-3
DOWNSTREAM DISCHARGE-NPDES OUTFALL 004**



**LRP-4
POSSIBLE SEEPAGE ON DOWNSTREAM SIDE OF
EMBANKMENT ADJACENT TO NPDES OUTFALL 004**

AMEC Earth & Environmental 690 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY	
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX LANDFILL RUNOFF POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-27	



**LRP-5
PIEZOMETER ON EMBANKMENT CREST**



**LRP-6
LOOKING EAST AT DOWNSTREAM DISCHARGE OF 60
ML HDPE LINED LANDFILL RUNOFF/LEACHATE CHANNEL**

AMEC Earth & Environmental 890 Commonwealth Center 11003 Bluegrass Parkway Louisville, Ky 40299 (502) 267-0700		CLIENT LOGO 	CLIENT UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX LANDFILL RUNOFF POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-28



LRP-7
MONITORING WELL ADJACENT TO
NORTHEASTERN CORNER OF POND



LRP-8
LOOKING WEST FROM CREST AT
UNLINED EARTHEN EMERGENCY SPILLWAY

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS		DWN BY: CAE	DATUM:	DATE: 11/8/10
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX LANDFILL RUNOFF POND SITE PHOTO		CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003
		PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-29



LRP-9
ATOP LANDFILL LOOKING SOUTHWEST AT LANDFILL PERIMETER CHANNEL AND LANDFILL RUNOFF POND

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PROJECT ASSESSMENT OF DAM SAFETY OF COAL COMBUSTION SURFACE IMPOUNDMENTS	DWN BY: CAE	DATUM:	DATE: 11/8/10	
TITLE AMERICAN ELECTRIC POWER (AEP) AND SOUTHWESTLECTRIC POWER COMPANY (SWEPCO) H.W. PIRKEY POWER PLANT, HALLSVILLE, TX LANDFILL RUNOFF POND SITE PHOTO	CHK'D BY: MOS	REV. NO.:	PROJECT NO: 3-2106-0183.0003	
	PROJECTION:	SCALE: AS SHOWN	APPENDIX: B-30	

APPENDIX C
Inventory of Provided Materials

DOCUMENT TITLE/DESCRIPTION	ORIGINAL DOCUMENT NAME	(CD) SCANNED FILE NUMBER
PIRKEY POWER PLANT		
ETTL Final Slope Stability Report 3241-09 Revision 3	ETTL Final Slope Stability Report 3241-09 rev03.pdf	AEPPRK000001.pdf
Sludge Disposal Area Expansion Plan, Site Work Plan	HP-69-20.tif	AEPPRK000149.pdf
Sludge Disposal Area Expansion Plan, Basin #2 Plan and Details	HP-69-21.tif	AEPPRK000150.pdf
North Surge Pond, Unit 1	HP-91-2.TIF	AEPPRK000151.pdf
SPCC & Storm Water Site Plan	HP-134prevhp-104.TIF	AEPPRK000152.pdf
Landfill Pond Design Rainfall Event Report	Landfill Pond Design Rainfall event.pdf	AEPPRK000153.pdf
Landfill Pond Volume Calculations	Landfill Pond Volume Calculations.pdf	AEPPRK000157.pdf
Southwestern Laboratories Liner Verification S Borings	Liner Verification S Borings 10 11 1984.pdf	AEPPRK000162.pdf
Monitoring Wells with 2009 Aerial	Monitoring Wells with 2009 Aerial.pef	AEPPRK000197.pdf
North Surge Pond Liner Field Work	North Surge Pond Liner Field Work.pdf	AEPPRK000198.pdf
North Surge Pond SW Labs	North Surge Pond SW labs.pdf	AEPPRK000246.pdf
Pirkey Final 2009 Inspection Report	Pirkey FINAL 2009 Inspection Report.pdf	AEPPRK000266.pdf
Pirkey Groudwater Elevations, Revision 7	Pirkey Groundwater elevations rev7-2010.xls	AEPPRK000312.pdf
Pirkey TCEQ Inspection Memo January 14, 2009	Pirkey TCEQ Inspection Memo Jan 14, 2009.pdf	AEPPRK000313.pdf
Monitor Wells Boring Logs	PRK MW borings 01.pdf	AEPPRK000315.pdf
Monitor Wells Boring Logs	PRK MW borings 02a.pdf	AEPPRK000322.pdf
Monitor Wells Boring Logs	PRK MW borings 02b.pdf	AEPPRK000331.pdf
Monitor Wells Boring Logs	PRK MW borings 03.pdf	AEPPRK000343.pdf
Monitor Wells Boring Logs	PRK MW borings 04.pdf	AEPPRK000347.pdf
Monitor Wells Boring Logs	PRK MW borings 05.pdf	AEPPRK000351.pdf
Monitor Wells Boring Logs	PRK MW borings 06.pdf	AEPPRK000359.pdf
Monitor Wells Boring Logs	PRK MW borings 07.pdf	AEPPRK000364.pdf
Monitor Wells Boring Logs	PRK MW borings 07.pdf	AEPPRK000370.pdf
PRK MW Data Table with notes	PRK MW Data Table w notes.xls	AEPPRK000372.pdf
PRK TPDES Water Flow Diagram	PRK TPDES Water Flow Diagram.pdf	AEPPRK000372.pdf
Sargent & Lundy Boring Location Plan	prk 1 aep c1 f.tif	AEPPRK000373.pdf
Site Development Grading & Drainage Plan – Sheet 3	prk 1 aep c12-3 m[1].tif	AEPPRK000374.pdf
Site Development Grading & Drainage Plan – Sheet 5	prk 1 aep c14 l.tif	AEPPRK000375.pdf
Site Development Grading & Drainage Plan – Sheet 6	prk 1 aep c15-6 k[1].tif	AEPPRK000376.pdf
Bottom Ash Basin Plan – Sheet 1	prk 1 aep c19-1 l.tif	AEPPRK000377.pdf
Bottom Ash Basin Plan – Sheet 2	prk 1 aep c20-2 k.tif	AEPPRK000378.pdf
Bottom Ash Basin Plan – Sheet 3	prk 1 aep c21-3 j1.tif	AEPPRK000379.pdf
Bottom Ash Basin Sections & Details	prk 1 aep c22 j.tif	AEPPRK000380.pdf
Surge Pond Plan & Sections	prk 1 aep c28 h Surge Pond.tif	AEPPRK000381.pdf
Grading Sections Sheet 4	prk 1 aep c34 h[1].tif	AEPPRK000382.pdf
Waste Water Ponds Lining Verification and Monitoring Wells	prk 1 aep hp56 g.tif	AEPPRK000383.pdf
Bottom Ash Pond Structures	prk 1 aep hp119 a.tif	AEPPRK000384.pdf
Property Development	prk 1 aep m2 j.tif	AEPPRK000385.pdf
Plant Water Usage and Waste Water Scheme 1 of 2	prk 1 aep m69-1 l orig water balance.tif	AEPPRK000386.pdf
Plant Water Usage and Waste Water Scheme 2 of 2	prk 1 aep m69-2 d orig water balance.tif	AEPPRK000387.pdf
Ash Pond Weir Box Structure Plan, Sections & Details	prk 1 aep s466 e Bottom Ash Outlet Structure.tif	AEPPRK000388.pdf
Design Summary for Lignite Storage Area and Wastewater Pond Facilities Document 1	S&L WW Pond Original Design Basis 1-31-83 - Doc #1.pdf	AEPPRK000389.pdf
Design Summary for Lignite Storage Area and Wastewater Pond Facilities Document 2	S&L WW Pond Original Design Basis 1-31-83 - Doc #2.pdf	AEPPRK000478.pdf

APPENDIX D
Monitoring Well Groundwater Elevation Data
(2005 – 2010)

Pirkey monitoring well groundwater elevations

Well ID	M-1	M-2	M-3	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12	MW-13	MW-14	MW-15
TOC, ft	341.05	305.02	355.26	335.75	342.08	372.79	365.78	365.50	363.67	359.72	358.05	355.35	360.60	364.61	380.99	364.35	363.67	361.60
Date																		
6/3/2005	298.86	329.48	319.63	326.75	342.06	351.98	350.16	349.95	344.70	342.53	340.07	342.04	350.31	360.31	350.19	352.06	350.40	
12/20/2005	298.01	326.57	319.18	326.56	338.08	350.86	348.05	347.75	342.76	340.51	338.10	341.71	348.29	355.58	347.94	349.15	346.84	
6/27/2006	297.55	326.43	319.26	325.95	339.54	351.28	348.34	348.48	342.66	340.03	338.50	340.90	348.30	356.86	348.13	348.11	346.64	
12/13/2006	298.16	326.04	320.19	326.71	339.75	350.50	348.53	348.32	343.43	339.27	338.32	342.00	348.48	358.24	348.40	349.21	347.97	
6/21/2007	299.14	335.33	320.14	326.73	341.12	354.07	351.64	350.86	345.78	340.64	340.20	342.81	351.52	363.35	351.40	352.20	351.88	
12/19/2007	298.59	326.67	319.30	326.72	340.37	351.91	350.16	349.70	344.84	340.24	339.36	342.63	350.08	359.86	350.04	351.45	350.94	
7/2/2008	298.60	328.21	320.10	326.69	342.91	353.85	351.42	351.04	345.61	341.71	339.99	342.92	351.33	363.18	351.28	352.40	352.10	
12/5/2008	299.28	327.25	319.99	326.98	340.26	357.03	352.15	350.72	345.74	340.56	338.99	343.56	351.60	367.58	351.02	353.21	352.32	
6/10/2009	299.20	328.75	319.99	326.70	343.54	354.39	351.59	351.05	345.35	341.48	339.19	343.18	351.54	363.87	351.48	353.53	352.55	
12/8/2009	299.62	331.75	322.91	327.74	343.48	358.52	353.96	352.79	348.66	343.29	341.19	344.32	353.44	371.45	353.20	356.53	354.36	
7/7/2010	299.11	329.63	319.64	326.33	340.99	352.01	350.60	350.08	344.30	342.31	339.51	341.82	350.09	359.74	350.45	352.28	349.49	