AEP H. W. Pirkey Power Plant
Hallsville, Texas
US EPA Inspection – October 19, 2010
Action Plan based on Final Recommendations – September 9, 2011

AEP has reviewed the final report provided by AMEC Earth & Environmental (AMEC) as part of their assessment of the impoundments at the Pirkey Plant and would like to offer the following comments. AEP's comments are denoted in *italic* print after each excerpt from the AMEC final report.

4.2 Hydrologic and Hydraulic Recommendations

In comments to the Draft report, AEP took exception to the application of MSHA criteria to the hydrologic and hydraulic operations of the ash ponds. Per EPA's directive, the impoundments were assessed using the resources and guidelines as set forth in Sections 1.1 of this report.

In comments to the Draft report, AEP concurred that "a revised hydraulic analysis may be beneficial to perform according to the current criteria established by the Texas Commission on Environmental Quality for small, low hazard dams, for completeness and updating the records." The May 2011 *Hydrologic & Hydraulic Report* authored by Johnson & Pace Incorporated and included in AEP's comments to the Draft Report, provided that revised hydraulic analysis and summary of pond freeboard resulting from design storm events for the West Bottom, North (Auxiliary) Surge, and Landfill Runoff Ponds.

Response:

These ponds are currently under the guidelines of the plant's TPDES permit and are specifically exempt for the TCEQ dam safety regulations. However, AEP concurs that a revised hydraulic analysis may be beneficial to perform according to the current criteria established by the Texas Commission on Environmental Quality (TCEQ) for small, low hazard dams, for completeness and updating the records. Therefore, AEP completed these analyses and showed that the ponds maintained the minimum 2 feet of free board during the associated design storm (100 year – 24 hour storm). Because these ponds are primarily self-contained, AEP believes that maintaining the minimum 2 feet of freeboard is adequate protection. At this point, AEP does not need to perform any additional activities for this recommendation.

4.2.1 West Bottom Ash Pond

Draft Report

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 hazard rating for the West Bottom Ash Pond, the design storm per MSHA guidelines 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.

Final Report

A "Significant Hazard" potential was originally assigned to the West Ash Pond. However, following receipt of Draft Report comments from AEP, the hazard potential of the West Ash Pond was changed from "Significant" to "Low" as described in Section 1.2 of this report. That hazard potential change resulted in reduction of the required MSHA design storm criteria from ½ PMF to 100-Year 24-hour.

The West Bottom Ash Pond, shown to operate at elevation 354.0 feet, would be capable of containing the 100-year 24-hour design storm of between 10 and 11 inches while maintaining a freeboard of approximately two feet based on the reported crest elevation of 357.0 feet. Ideally, per MSHA and other frequently referenced sources, a freeboard of three feet should exist above the maximum water surface elevations that result from a design storm.

Response:

AEP's comments addressing the recommended hydraulic analysis are provided as a part of the comments under the Section 4.2 Recommendations above.

4.2.5 Auxiliary Surge Pond

Draft Report

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.

Final Report

The Auxiliary Surge Pond, shown to operate at elevation 373.0 feet, would be capable of containing the 100-year 24-hour design storm of between 10 and 11 inches while maintaining a freeboard of approximately two feet based on the reported crest elevation of 376.0 feet. Ideally, per MSHA and other frequently referenced sources, a freeboard of three feet should exist above the maximum water surface elevations that result from a design storm.

Response:

AEP's comments addressing the recommended hydraulic analysis are provided as a part of the comments under the Section 4.2 Recommendations above.

4.2.6 Landfill Runoff Pond

Draft Report

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's 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.

Final Report

The May 2011 hydrologic and hydraulic analyses completed by Johnson & Pace Incorporated indicated that the proposed spillway design would pass 12.8 inches (25% PMF) of runoff with less than 5 inches of freeboard with respect to the pond's top of embankment elevation. The nearly 11 inches resulting from the 100-year 24-hour design storm (MSHA requirement for Low hazard impoundment) would produce a similar, if slightly greater, freeboard. AMEC recommends that AEP revisit the proposed pond design to produce a spillway/crest elevation combination that will work to provide a freeboard for the 100-year 24-hour design storm routing that would more closely mirror that recommended by MSHA.

Response:

Based on the April 2011 Landfill Pond Expansion Engineering Report and the May 2011 Hydrologic and Hydraulic Analysis Report completed by Johnson & Pace, Inc., Johnson & Pace, Inc. designed a pond expansion to meet the TCEQ criteria. The pond will be operated with 14 feet of freeboard and will provide adequate freeboard in the event of the 100-yr, 24-hr storm. Construction for the pond expansion began in August 2011 and will be completed by December 31, 2011.

We also would like to take this opportunity to point out that this pond collects contact stormwater runoff from the landfill area. We believe that this does not meet the original definition of coal combustion residual surface impoundments that were subject to EPA's Section 308 inquiry. That definition said:

"... surface impoundments or similar diked or bermed management unit(s) or management units designated as landfills which receive liquid-borne material from a surface impoundment used for the storage or disposal of residuals or by-products from the combustion of coal, including, but not limited to, fly ash, bottom ash, boiler slag, or flue gas emission control residuals."

Conservatively, AEP had included this pond in the list of surface impoundments for the Pirkey Plant, and it has since been subject of the dam/dike assessments along with the other ash ponds at the plant. Since it does not receive "liquid-borne material" in the sense that we believe EPA had intended, but only incidental solids from runoff, we believe it should not have been part of the program.

4.3 Geotechnical and Stability Recommendations

Draft Report

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.

Final Report

In their comments to the Draft Report, AEP noted that *USACE Engineering Manual 110-2-1902 Section 3.3 stated that "computed factors of safety less than the preferred values for new dams (FS = 1.5 static conditions) may be acceptable based on past performance and current condition of the dam. It should be pointed out that the Factors of Safety for the*

facilities presented in the report of the independent consultant, ETTL, (Table 6.1.2) meet or exceed the minimum requirement for new dams."

Also, AEP noted that "it is common practice and accepted professional standards that soil properties are selected based on a combination of the results of site specific drilling and testing programs as well as published data and local knowledge of the subsurface conditions. AEP believes that the selection of design parameters for the facilities is well documented in the ETTL report. Additional testing seems to be unwarranted given the Factor of Safety calculated for the facilities."
Based on the response to comments, AMEC considers all issues noted in the Draft Report with regard to the geotechnical stability analyses to have been satisfactorily resolved.

Response:

AEP does not need to perform any additional activities for this recommendation.

4.4 Monitoring and Instrumentation Recommendations

Associated existing 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, as well, 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.

Response:

AEP will continue to sample the monitoring wells on a semi-annual basis.

AEP installed level gauges, similar to those in the Secondary Ash Pond and Surge Pond, in the West and East Bottom Ash Ponds. This was complete as of August 1, 2011.

4.5 Inspection Recommendations

Draft Report

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.

Final Report

AMEC noted comments provided by AEP with respect to inspection type and frequency. AMEC continues to recommend standard annual inspections by a professional engineer and well documented monthly inspections by plant personnel as described in the first paragraph of this report section. The inspection form that AEP provided in their comments to the Draft report should have added columns based on the additional types of information outlined in that first paragraph.

Response:

As noted in AEP comments to the draft report, the company has a well developed, formal inspection program of all dams and dikes owned by AEP and its affiliates. The program is consistent with State and FEMA guidelines. Because these ponds are considered small, low hazard dams by the TCEQ, AEP plans to continue to inspect on a quarterly basis and perform bi-annual inspections by a Professional Engineer. AEP will modify where necessary, the quarterly inspection forms to identify the 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 on monitoring instrumentation and pond levels.

AEP will complete this by September 1, 2012.