

US EPA ARCHIVE DOCUMENT



AEP Big Sandy Power Plant
Louisa, Lawrence County, Kentucky
US EPA Inspection – October 2009
Ash Pond Complex
Action Plan based on Final Recommendations - February 2010

4.2 General Condition Monitoring and Maintenance

The following recommendations are based upon observations and review of data provided to CHA. Recommendations provided by the state, utility company, and other consultants should also be implemented.

4.2.1 Saddle Dam and Horseford Creek Dam

Visually, the upstream and downstream slopes of the Saddle and Horseford Creek Dams were found to be in satisfactory condition. A few areas were observed that warrant monitoring on a routine basis to confirm that changes are not occurring or if periodic maintenance is required.

These areas are as follows:

- An area of irregular grading was observed on the south end of the upstream slope. This area should be monitored to ensure that the irregularity is not the result of slope movement.

Response:

AEP will monitor this area as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. AEP Engineering will evaluate any changing conditions.

- Brush and trees have grown in the abutment area of the Saddle Dam and near the water's edge on the Horseford Creek Dam. Per the recommendation of KY Dam Safety, these trees should be cut. The resulting stumps should be monitored for decay.
- Vegetation should be kept clear from the toe drain outlets to permit observation of the flow.
- CHA recommends that the Horseford Creek Dam toe drains be located and cleared to facilitate monitoring for changed conditions.

Response:

Since the date of the inspection, Big Sandy Plant personnel have completed removal of trees and brush as noted in the above three recommendations. AEP will continue to monitor these areas as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. AEP Engineering will evaluate any changing conditions.

4.2.2 Bottom Ash Complex Dikes

The slope of Bottom Ash Complex dikes were found to be in satisfactory condition. A few areas were observed that warrant monitoring on a routine basis to confirm that changes are not occurring or if periodic maintenance is required. These areas are as follows:

- Portions of the SBAP have recently be regraded and covered with grouted rip rap. We understand that this treatment is currently planned to extend to around the NBAP.

Response:

Since the date of the inspection, all of the regrading and placement of grouted rip rap has been completed within the south and north bottom ash ponds.

- Cut larger brush from the embankment where mowers cannot access the area.

Response:

Since the date of the inspection, the interior slopes of the ash pond complex have been cleared of large brush. No addition work is required. The annual mowing program will incorporate periodic manual trimming to maintain vegetation control on these slopes.

4.3 Toe Drain Cleaning

The end of one underdrain pipe at the toe of the Horseford Creek Dam was observed to be partially blocked by gravel and cobbles and we understand that other pipes may be similarly blocked. CHA recommends that the pipes be located and cleared so that the discharge can be observed and monitored.

Response:

Since the date of the inspection, the area around the underdrain pipe has been cleared. AEP will continue to monitor this area as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. AEP Engineering will locate the other existing pipes according to the design/construction drawings and clear that area as well. AEP Engineering will evaluate any changing conditions.

4.4 Bottom Ash Complex Standing Water

Standing water was observed along the crest of the splitter dikes in the Bottom Ash Complex. Long term standing water can contribute to softening of the embankment toe and foundation soils. CHA recommends improving the drainage in this area to provide positive drainage of stormwater from the dike crests.

Response:

Since the date of the inspection, the improvements to the bottom ash complex dikes has been completed, including the grading of the crests to promote positive drainage. No additional action is required at this time. AEP will continue to monitor this area as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. If items requiring maintenance are noted during the inspections, repairs will be performed within a timely fashion relative to the scope of work.

4.5 Seepage at the Fly Ash Pond

Calcium deposits were observed at the seepage drain pipe outlet within the old emergency spillway. Plant personnel indicated that deposit is likely from the limestone sand used in the drainage blanket and that the size of the deposit has stabilized since the end of construction.

CHA recommends that the collected calcium deposit be removed and the discharge monitored for additional deposits. If the calcium continues to collect, an engineer should review the discharge conditions.

Response:

Since the date of the inspection, the calcium deposits at the outlet of the seepage drain pipe have been removed. AEP will continue to monitor this area as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. AEP Engineering will evaluate any changing conditions and assess the impact of the deposits on the performance of the dam.

Seepage from the east abutment of the Horseford Creek Dam is milky from calcium deposits in the water from the limestone formation. CHA recommends that an engineer make an assessment of the impact of the deposits on the limestone underlying the dam.

Response:

The abutment seepage is monitored as part of its Dam Inspection and Maintenance Program (DIMP). To date, there are not been any significant change in the seepage volume or visual appearance. Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. AEP Engineering will evaluate any changing conditions and assess the impact of the deposits on the performance of the dam.

4.6 Instrumentation

We understand that AEP reviews the instrumentation data from the Fly Ash Pond approximately every six months. However, the most recent survey data provided for the survey monitoring points is from October 21, 2008. CHA recommends that survey data be collected every 6 months to be consistent with the AEP data review. CHA noted significant scatter in the survey data and potential heave at the toe of the Horseford Creek Dam. CHA therefore recommends a review of the survey methods and evaluation of this data given the history of past movement at this dam.

Response:

AEP performed deformation surveys in April and October 2009. At the time of data gathering for the inspections, the April 2009 survey may not have been available. AEP continues to collect surveys on a six-month timeline. These surveys are reviewed by AEP engineering for significant changes or trends.

4.7 Rapid Drawdown Stability Analysis

A rapid drawdown analysis has not been performed for the Fly Ash Pond. Although the potential for this type of loading condition is low, it is standard dam safety practice to evaluate the condition for full understanding of the behavior of the upstream embankment should water need to be evacuated from the reservoir rapidly. There have also been documented case histories where other types of failure (such as a gate failure) have resulted in rapid drawdown conditions developing which have led to a domino effect and made the situation worse. Therefore, CHA recommends that a rapid drawdown analysis be performed for the Horseford Creek Dam and Saddle Dam.

Response:

AEP will develop a rapid draw-down scenario for the fly ash dam and perform a stability analysis. This analysis will be completed by April 1, 2011.

4.8 Analysis for Bottom Ash Complex

We understand that geotechnical exploration program and analysis are being conducted for the Bottom Ash Complex. The report should include slope stability analysis for the load cases described herein and a hydraulic and hydrologic evaluation.

Response:

AEP has conducted a site investigation and is performing engineering analyses for the stability of the diking system. This work, including a hydraulic and hydrologic evaluation, will be completed by April 1, 2011.