

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

June 27, 2011

OFFICE OF  
SOLID WASTE AND  
EMERGENCY RESPONSE

VIA E-MAIL AND FEDERAL EXPRESS

Mr. John Voyles, Jr.  
Vice President,  
Transmission and Generation Services  
EON US  
220 West Main Street  
PO Box 32020  
Louisville, Kentucky 40232

Dear Mr. Voyles,

On August 5, 2010 the United States Environmental Protection Agency ("EPA") and its engineering contractors conducted a coal combustion residual (CCR) site assessment at the Pineville facility. The purpose of this visit was to assess the structural stability of the impoundments or other similar management units that contain "wet" handled CCRs. We thank you and your staff for your cooperation during the site visit. Subsequent to the site visit, EPA sent you a copy of the draft report evaluating the structural stability of the units at the Pineville facility and requested that you submit comments on the factual accuracy of the draft report to EPA. Your comments were considered in the preparation of the final report.

The final report for the Pineville facility is enclosed. This report includes a specific condition rating for each CCR management unit and recommendations and actions that our engineering contractors believe should be undertaken to ensure the stability of the CCR impoundment(s) located at the Pineville facility. These recommendations are listed in Enclosure 2.

Since these recommendations relate to actions which could affect the structural stability of the CCR management units and, therefore, protection of human health and the environment, EPA believes their implementation should receive the highest priority. Therefore, we request that you inform us on how you intend to address each of the recommendations found in the final report. Your response should include specific plans and schedules for implementing each of the recommendations. If you will not implement a recommendation, please explain why. Please provide a response to this request by July 27, 2011. Please send your response to:

Mr. Stephen Hoffman  
U.S. Environmental Protection Agency (5304P)  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

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If you are using overnight or hand delivery mail, please use the following address:

Mr. Stephen Hoffman  
U.S. Environmental Protection Agency  
Two Potomac Yard  
2733 S. Crystal Drive  
5<sup>th</sup> Floor, N-5838  
Arlington, VA 22202-2733

You may also provide a response by e-mail to [hoffman.stephen@epa.gov](mailto:hoffman.stephen@epa.gov)

You may assert a business confidentiality claim covering all or part of the information requested, in the manner described by 40 C. F. R. Part 2, Subpart B. Information covered by such a claim will be disclosed by EPA only to the extent and only by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when EPA receives it, the information may be made available to the public by EPA without further notice to you. If you wish EPA to treat any of your response as “confidential” you must so advise EPA when you submit your response.

EPA will be closely monitoring your progress in implementing the recommendations from these reports and could decide to take additional action if the circumstances warrant.

You should be aware that EPA will be posting the report for this facility on the Agency website shortly.

Given that the site visit related solely to structural stability of the management units, this report and its conclusions in no way relate to compliance with RCRA, CWA, or any other environmental law and are not intended to convey any position related to statutory or regulatory compliance.

Please be advised that providing false, fictitious, or fraudulent statements of representation may subject you to criminal penalties under 18 U.S.C. § 1001.

If you have any questions concerning this matter, please contact Mr. Hoffman in the Office of Resource Conservation and Recovery at (703) 308-8413. Thank you for your continued efforts to ensure protection of human health and the environment.

Sincerely,  
/Suzanne Rudzinski/, Director  
Office of Resource Conservation and Recovery

Enclosures

#### 4.1.1 Hydrologic and Hydraulic Recommendations

##### *September 2010 Draft Report*

Neither hydrologic nor hydraulic data was presented for the Pineville Ash Pond. Provided KPDES *Water Balance Diagrams* documentation indicated only flow volumes entering and exiting the pond. The current ash pond configuration with lower crest heights and steepened slopes are not as designed. The recent topographic mapping of the site indicates crest elevations at the pond range from 1013.3 feet at the southwest corner to 1014.7 feet at the north portion of the west dike. The average crest elevation is about 1014 feet. The dimensions and pond stages used for the water balance diagrams are unknown. In order to confirm that the impoundment will not be overtopped during a design storm event, as well as determine whether acceptable freeboard conditions exist, the appropriate design storm rainfall (per MSHA guidelines), or 100-year, 24-hour (6.3 inches per Bell County, KY), should be applied to the impoundment's entire tributary watershed to determine the resulting water surface elevation in the pond. Accurate impoundment volumes and embankment elevations must be utilized in any model that is used to determine the structure's storage and/or routing capabilities.

##### *Final Report*

In comments included in the January 26, 2011 response to the draft report by Kentucky Utilities and comments from Kentucky Department of Water to EPA dated January 31, 2011 both parties take exception to the use of MSHA guidelines to evaluate CCW impoundments. AMEC followed the guidelines presented in our scope of work for assessment of CCW impoundments which was provided by EPA.

Based upon additional information provided by KU on January 26, 2011, in AMEC's opinion, the

analyses that were provided address the ability of the impoundment to safely control or pass the appropriate design storm event once, as KU stated, the southwest embankment corner of the pond is raised to an elevation of 1,014 feet. With this improvement to the crest elevation, a uniform freeboard of nearly 2.0 feet will be maintained for this less than fully operational impoundment. AMEC recommends repairs to portions of the crest that will create elevation uniformity be completed in 2011.

#### 4.1.2 Geotechnical and Stability Recommendations

##### *September 2010 Draft Report*

In the opinion of the assessing professional engineer, the criteria for minimum safety factors should be in accordance with USACE EM 1110-2-1902 with a minimum seismic safety factor of 1.2 as recommended by 2007 *MSHA Coal Mine Impoundment Inspection and Plan Review Handbook*, page 88. Likewise, if the dam does not meet the above seismic factor of safety, then the stability of the embankment should be analyzed and the amount of embankment deformation or settlement that may occur should be evaluated to assure that sufficient section of the crest will remain intact to prevent a release from the impoundment.

The stability analysis, which was provided by MACTEC and dated August 31, 2010, analyzed three sections including one on the central portion of the west dike (Section 1), one near the southwest corner (Section 2) and one on the south dike (Section 3). The stability analyses were performed using the existing over-steepened slopes, existing loading conditions, and a seismic acceleration. The minimum safety factors are generally in line with the recommended criteria as stated above. The results generally indicate safety factors above the minimums with borderline acceptable values for the seismic analysis on Section 1. However, in the opinion of the assessing professional engineer, the analyses should be revised in accordance with the following recommendations. The analysis should consider all critical stages over the life of the pond including pond full conditions. These conditions would need to be determined in conjunction with the hydrologic and hydraulic recommendations above. The hydrologic analysis will provide a phreatic surface through the embankment. The almost vertical phreatic surfaces shown in the 2010 Stability Analyses are not typically recognized as an acceptable condition. The friction angle value of 30 degrees used for the CCW (ash) in the analysis appears high. More typical ash friction values are 28 degrees for compacted, 24 degrees for loosely

compacted, and 11 degrees for uncompacted material. Consideration should be given to lowering strength values to account for exhibited lower strengths or inconsistencies within the fill or foundation materials. Lowering the friction value by one or two degrees, or more for weaker soils would be conservative and more appropriate. More layering of the embankment materials is needed to model these lower strength materials. Phreatic levels in Sections 2 and 3 are lower than levels in Section 1. Consideration should also be given to allowing some time for water levels in the piezometers to develop and stabilize. Some of the analyses presented appear limited to a circular surface; different types of failure surfaces should be analyzed and optimized. The analyses should include a discussion on how each parameter was derived and data sheets of the computer runs should be included to facilitate review.

#### *Final Report*

In comments included in the January 26, 2011 response to the draft report by Kentucky Utilities and comments from Kentucky Department of Water to EPA dated January 31, 2011 both parties take exception to the use of MSHA guidelines to evaluate CCW impoundments. AMEC followed the guidelines presented in our scope of work for assessment of CCW impoundments which was provided by EPA.

In AMEC's opinion, additional information provided by KU on January 26, 2011 adequately documents the soil strength parameters and the analyses address the stability of the impoundment under the noted load cases.

#### **4.1.3 Monitoring and Instrumentation Recommendations**

##### *September 2010 Draft Report*

Two piezometers were recently installed, August 2010, as part of the stability analysis investigation. It would be prudent for KU to maintain and protect these instruments, and document monitoring frequently until base line phreatic readings are apparent. After that time, a regular inspection and reading frequency should be maintained and the results evaluated by an engineer. Monitoring should include pond and river levels and should include additional readings and evaluation in response to elevated pond levels or specific rainfall events. AMEC recommends that, at minimum, additional instrumentation be installed at the crest and toe of critical slopes. Installation should occur as budgets allow, or immediately upon development of future problems.

#### *Final Report*

Additional information provided by KU included two additional piezometers readings as discussed in Section 3.5.1. AMEC recommends KU continue the current instrument monitoring and review practices. AMEC reiterates our recommendations for frequency of readings and the inclusion of pond and river levels.

#### **4.1.4 Inspection Recommendations**

##### *September 2010 Draft Report*

Kentucky Utilities stated that on-site personnel perform safety and surveillance inspections for the ash pond at the Pineville Generating Station every two weeks. However, no record of inspection dates or observations were provided to AMEC. Furthermore, no information was provided to indicate the general procedure or extent of the inspection area(s). AMEC recommends that the current inspection program by the plant be expanded to include at least monthly documented inspections which identify potential problems, areas inspected, instrumentation monitoring, and pond and river levels.

AMEC has reviewed provided information consisting of one inspection record conducted by ATC on October 23, 2009 for the Pineville Ash Pond. This inspection indicates there are past inspections by an engineer. We recommend this type of annual inspection program and report by a Professional Engineer be continued at least yearly, in addition to the recommended monthly inspections by facility personnel, for this ash pond.

#### *Final Report*

Additional information provided by KU included one inspection report by ATC dated January 25, 2011. Documents provided by KU indicate continuing regular inspections of the impoundment by a Professional Engineer.

The January 2011 inspection by ATC generally noted routine maintenance items including repair of animal burrows, filling, seeding, etc. and provides an overall condition rating of "fair". Of particular concern was item 8 of the action items which noted wet area(s) on the concrete lip

adjacent to the weir. AMEC disagrees with the “normal” rating assigned to Item 8. Any “wet” signs on the embankment or structures should be cause for concern. The size of the wet area is not provided in the inspection report and the recommendation to monitor in future inspections does not provide a clear schedule. No documented on-site personnel inspections were provided. Documented on-site inspections would indicate attention and monitoring of any special problems that develop such as the wet area. AMEC reiterates our recommendation to document on-site inspections.