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

March 24, 2010

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

VIA E-MAIL AND FEDERAL EXPRESS

Mr. Alan Wood
American Electric Power
1 Riverside Plaza,
Columbus, Ohio 43215-2373

Dear Mr. Wood,

On October 21-22, 2009 the United States Environmental Protection Agency ("EPA") and its engineering contractors conducted a coal combustion residual (CCR) site assessment at the Muskingum River 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 Muskingum River 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 Muskingum River facility is enclosed. This report includes a specific 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 Muskingum River 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 April 27, 2010. Please send your response to:

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

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

Mr. Stephen Hoffman
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Drive
5th Floor, N-237
Arlington, VA 22202-2733

You may also provide a response by e-mail to hoffman.stephen@epa.gov

This request has been approved by the Office of Management and Budget under EPA ICR Number 2350.01.

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 ongoing efforts to ensure protection of human health and the environment.

Sincerely,
/Matt Hale/, Director
Office of Resource Conservation and Recovery

Enclosures

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Enclosure 2
Muskingum River Recommendations

In the sections below, CHA presents recommendations for maintenance and further studies to bring these facilities into satisfactory condition. CHA also recommends that the recommendations presented in BBCM's March 12, 2009 inspection report and ODNR's November 3, 2008 Dam Safety Inspection Reports be addressed.

4.2 Monitoring of Seeps

Seeps were observed in the following locations during CHA's site assessment and by ODNR, BBCM and AEP Service Corporation:

Mill Stone Creek Dam – isolated seep in the natural hillside at the right (southeast) abutment outside of the rock lined ditch (Section 2.2.1);

Mill Stone Creek Dam – downstream face of the collection pond embankment (Section 3.5.1);

No-Name Creek Dam – adjacent to the rock outcrop above the right (southeast) abutment ditch (Section 2.2.2) and BBCM noted that it is possible that seepage is passing under the embankment and emerging in the pond undetected (Section 3.5.1);

Lower Fly Ash Dam (cement-bentonite-fly ash slurry wall installed, Section 1.4.4 and Section 2.4.1);

Lower Fly Ash Dam – seeps at the downstream toe.

It is recommended that AEP develop a procedure to observe these areas on a routine basis (i.e. monthly) and document these observations in written reports that are kept on file at the facility. The procedure should outline steps that should be taken in the event that increased flow, muddy flow, or instability on or adjacent to an area of seepage is observed.

4.3 Repair of Erosion

Areas of erosion were observed in the following locations during CHA's site assessment and by ODNR, BBCM and AEP Service Corporation:

Wing Dam – upstream embankment slope where compacted ash was exposed (Section 2.2.3);

Freeboard Dam – downstream embankment slope, particularly in the locations were ash is exposed and upstream embankment slope (Section 2.2.5);

No-Name Creek Dam – on the crest of the dam (Section 3.5.1);

Middle Fly Ash Dam – downstream embankment slope in the unarmored surface (Section 2.3.1);

Emergency Spillway Dam – observed in the crest surface adjacent to the upstream slope (Section 2.3.2);

Lower Fly Ash Reservoir Dam - beaching erosion on the upstream slope and downstream slope (Section 2.4.1);

Units 1-4 Bottom Ash Pond – exterior slope (Section 2.5.1) and interior slopes (Section 3.5.1);

These areas typically had intermittent erosion rills, likely exacerbated when grading activities pushed loose material to the crest edge and sheet flow became concentrated during rain events. These erosion rills should be filled in with compacted material and stabilized (seeded and mulched).

Surface sloughs were noted in over-steepened areas (i.e. Units 1-4 Bottom Ash Pond interior slopes). These areas should be re-graded to a flatter slope where possible and re-seeded or

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armored with a stone material. Monitoring of these areas should be conducted to check for any continued movement.

4.4 Repair of Rodent Burrows

Evidence of animal burrows was observed in the following locations during CHA's site assessment and by ODNR, BBCM and AEP Service Corporation:

Mill Stone Creek Dam – right (southeast) abutment in the natural hillside (Section 2.2.1);

Lower Fly Ash Reservoir Dam – observed in the portion of the embankment not armored with rip rap (Section 2.4.1);

Units 1-4 Bottom Ash Pond – exterior slope (Section 2.5.1 and Section 3.5.1);

CHA recommends that AEP keep notes of areas disturbed by animal activity, trapping of the animals, and repair to the areas. BBCM recommended that burrow be filled with bentonite slurry.

4.5 Additional Stability Analyses – Upper Fly Ash Reservoir

CHA recommends that rapid drawdown analyses be performed for the current conditions and for the final raised embankment condition at the Upper Fly Ash Reservoir. While CHA understands that rapid drawdown via pumping or other discharge methods may be undesirable for a waste disposal impoundment, CHA suggests that in the event of an emergency at the facility, rapid drawdown may be more desirable to reduce hydrostatic pressures on the dam, thereby preventing a more catastrophic collapse. 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. For these reasons, CHA recommends that a rapid drawdown analysis be performed.

4.6 Additional Stability Analyses – Middle Fly Ash Reservoir

CHA recommends that an updated stability analysis be performed for the Middle Fly Ash Reservoir Dam using the data obtained during the recent subsurface investigation. The analyses should reflect the current phreatic surface in the embankment. Soil properties to be used in the analysis should be reflective of the material encountered in the three borings advanced at the structure in September 2009 as well as historical data available for the structure. Loading conditions that should be considered in the analyses should include: steady state conditions at present pool or maximum storage pool elevation, rapid drawdown conditions from present pool elevation, maximum surcharge pool (flood) condition, seismic conditions from present pool elevation and liquefaction.

4.7 Additional Stability Analyses – Lower Fly Ash Reservoir

CHA recommends that an updated stability analysis be performed for the Lower Fly Ash Reservoir Dam using the data obtained during the recent subsurface investigation. The analyses should reflect the current phreatic surface in the embankment. Soil properties to be used in the analysis should be reflective of the material encountered in the four borings advanced at the structure in November 2009 as well as historical data available for the structure. Loading conditions that should be considered in the analyses should include: steady state conditions at present pool or maximum storage pool elevation, rapid drawdown conditions from present pool elevation, maximum surcharge pool (flood) condition, seismic conditions from present pool elevation and liquefaction.

4.8 Stability of the Units 1-4 Bottom Ash Pond East Dike

The stability analyses conducted by BBCM (outlined in Section 3.3.4) indicated that at three of the four cross sections examined through the active pond east embankments factors of safety

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were found to be below 1.5. According to the USACE, computed factors of safety less than the preferred values for new dams may be acceptable based on past performance and current condition of the dam. BBCM suggested that a revetment would significantly increase the factor of safety against failure of the east embankment. Factors of safety were computed for a section of the northern slope which was repaired in such a manner. Based on observed conditions on the Muskingum Riverbank which supports the east dike, and a past history of ash release from failure of the Riverbank impacting the dike stability, CHA recommends that AEP improve the east dike as suggested by BBCM. CHA understands that such improvements to the present stream bank will have to be coordinated with the USACE with respect to navigable waters and acceptable river bank preservation measures.

4.9 Trees and Stumps

Trees were noted on Units 1-4 Bottom Ash Pond east dike at the lower portion of the slope. Some trees observed were on the order of 12 inches in diameter (Section 2.5.1 and 3.5.2). Tree roots can allow for seepage of the retained water through the dikes, which could lead to internal erosion such as is the concern in an impoundment with free water. Internal erosion would weaken the dike, and could result in a slope failure.

Additionally, the uprooting of trees during storms can create large voids in the embankment that are then susceptible to erosion. Considering the progressive erosion that could occur during a storm which blows the tree over during heavy rains (i.e., hurricane type storm systems) progressive erosion could potentially result in enough loss of soil from the dike to create an unstable situation, which if failure occurs could result in a release of ash. CHA recommends the removal of tree, brush and roots at the locations notes above. Large trees and roots should be removed and the areas repaired with the direction of a qualified engineer. Once tress and roots are removed, proper, short vegetation should be established to allow for more thorough observation or changing conditions that may require routine maintenance before they become larger problems.

4.10 Establishing Vegetation

CHA recommends that AEP seed the sparse areas on the upstream slope of the Middle Fly Ash Reservoir to establish a proper grass cover. A healthy grass cover should also be established on the Units 1-4 Bottom Ash pond east embankment adjacent to the Muskingum River through routine mowing. Mowing frequency on grassed portions of the embankment should be conducted at least twice a year. If grass does not become established on portions of the embankment following an increased mowing schedule, seeding, spraying or other maintenance may be necessary.

4.11 Monitoring of Middle Fly Ash Reservoir Principal Spillway

As noted by ODNR, a spillway conduit system must perform properly without endangering the safety of the dam. The condition of the pipe joints in the principal spillway outlet pipe should be investigated and, as necessary, plans and specifications prepared for the repair of the pipe joints. Regardless of the results of the investigation, the condition of the entire spillway conduit system, must be monitored yearly.

4.12 Repair of Damaged Instrumentation

The staff gauge to obtain accurate water level readings for the Middle Fly Ash Reservoir should be replaced. The staff gauge at the Lower Fly Ash Reservoir next to the principal spillway inlet should be repaired so that elevations can be determined.

4.13 Routine Observations, Data Collection and Documentation

CHA was not provided with documentation that facility personnel perform routine observations

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of the dams and dikes or record data from monitoring instrumentation (piezometers, surface monuments, inclinometers). CHA recommends that AEP update their OMI for the structures to include the recommendation from BBCM, ODNR and CHA. Tasks that should be included in the OMI updates are:

Establish 'action levels' for instruments. It was recommended to establish two criteria for action; change from previous reading and change from a baseline established for each instrument. Action levels recommended – Alert, Warning and Emergency Procedures.

A procedure for monitoring repairs (such as the low point on the crest of the Middle Fly Ash Reservoir Dam) for recurrence.

Monitor piezometers in the dam for any rise or fall of the phreatic surface within the embankments on a routine basis.

Document monitoring of the condition of the Middle Fly Ash Reservoir concrete spillway riser yearly for further deterioration.

Document monitoring of the condition of the Lower Fly Ash Reservoir discharge pipe outlet yearly for further deterioration of the interior bituminous coating.

Record observations of flow exiting the toe drain outlet and the seepage quarterly. Have procedures in place should there be any sign of increased flow, muddy flow, or instability on or adjacent to the embankment.

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