

US EPA ARCHIVE DOCUMENT



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

March 13, 2013

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

VIA E-MAIL

Mr. Carson Leikam
NRG Huntley Power LLC Huntley Electric Generating Station
3500 River Road
Tonawanda, NY 14150

Re: Request for Action Plan regarding NRG Huntley Power, LLC's – Huntley Electric Generating Station

Dear Mr. Leikam,

On June 15, 2011 the United States Environmental Protection Agency ("EPA") and its engineering contractors conducted a coal combustion residual (CCR) site assessment at the NRG Huntley Power, LLC's – Huntley Electric Generating Station 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 NRG Huntley Power, LLC's – Huntley Electric Generating Station 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 NRG Huntley Power, LLC's – Huntley Electric Generating Station facility can be accessed at the secured link below. The secured link will expire in 60 days.

Here is the link: <http://www.yousendit.com/download/UVJqV28wNXZFc0xMYnNUQw>

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 NRG Huntley Power, LLC's – Huntley Electric Generating Station facility. These recommendations are listed in Enclosure 1.

Since these recommendations relate to actions which could affect the structural stability of the CCR management unit(s) 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 provide a rationale. Please provide a response to this request by **April 15, 2013**. Please send your response to:

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

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
5th Floor, N-5838
Arlington, VA 22202-2733

You may also provide a response by e-mail to hoffman.stephen@epa.gov, dufficy.craig@epa.gov, kelly.patrickm@epa.gov and englander.jana@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

Enclosure

Enclosure 1

**NRG Huntley Power, LLC's – Huntley Electric Generating Station
Recommendations (from the final assessment report)****CONCLUSIONS**

Pond 2 and Pond 3 were noted in the Draft Report to lack of documentation including hydrologic and hydraulic (H&H) study and stability analysis. NRG has since submitted H&H studies and stability analysis for these ponds. AMEC noted that the strength parameters used in the stability analysis are not based on specific borings at the ponds.

The South Ash Settling Pond was noted in the draft Report to lack hydrologic and hydraulic study for the pond, and more complete stability analysis for the ponds. NRG has since submitted an H&H study for the pond and provided additional stability analysis. AMEC notes that rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. More specifically, strength parameters used for the fill material could be less than assumed with a marginal calculated factor of safety above the required minimum.

RECOMMENDATIONS**Hydrologic and Hydraulic Recommendations**

In comments to the draft report by NRG, GZA's letter response dated September 13, 2012, Pages 6-14 with attachments, includes hydrologic/hydraulic analyses for the six ponds at the site. GZA used a design flood event for the ponds as ½ Probable Maximum Flood (1/2 PMF) in the calculations. The analysis assumed a 500-year flood elevation for the Niagara River. The SCS (Soil Conservation Service, now known as Natural Resources Conservation Service, i.e. NRCS) Dimensionless Unit Hydrograph method was used in this analysis. The results of the analyses indicated the North Ponds (Ponds 1, 2 and 3) have the ability to safely pass the ½ PMF with calculated minimum freeboard ranging from 2.1 to 2.9 feet. The results of the analyses for the South Ponds (North and South Equalization Basins, and the South Ash Pond) indicated overtopping of the equalization basins during the ½ PMF when the initial water surface is below El.578.7 with no process inflow or below El.577.7 with a maximum process inflow of 500 gpm). The North and South EQ Basins will not be overtopped during the ½ PMF, under either condition, if NRG lowers the top of the existing overflow pipe, and associated maximum operating level, from Elevation 579.3' to 578.3'. The outflow pipe for South Ash Settling Basin can pass the ½ PMF with a freeboard greater than 3 feet, regardless of the conditions in the equalization basins.

AMEC's comments on review of the submitted analysis include:

Calculation of the PMP is in keeping with the current NOAA guidance for the best available method of determining the all-season PMP for most of the eastern United States, including western New York State.

The 72-hour All-Season PMP generated by BOSS HMR52 specifically for this site is 33.0 inches and reasonable. The material submitted does not indicate the drawdown time of the impoundments to determine if a longer design storm duration is necessary due to long storage time in the ponds.

The report states that the ½ PMF was generated by taking 50% of the calculated discharge from application of the PMP to each watershed. The full model or output was not provided, so it is now known how this reduction was done in HEC-HMS.

The 500-year flood elevation on the Niagara River was used as the tailwater condition for the pond H&H analysis. This elevation is given in the report as 570.65 when converted to the IGLD 1955 datum used in the H&H analysis. It is incorrectly labeled on the drawings accompanying the report as the ½ PMF water surface elevation for the river. The 500-year flood event is not directly related to the PMF, and the ½ PMF flow in the Niagara River could be larger or smaller

than the 500-year flow. There may be a determination of the of the PMF for the Niagara River performed by a State, Federal, or Canadian agency. If it is possible to obtain a PMF flowrate for the river it could be compared to the flowrates given in the effective FIS to determine if the $\frac{1}{2}$ PMF flow is similar to the 500-year flow. If no estimate of the PMF exists for the Niagara River, using the 500-year elevation as an example extreme flood condition is defensible, especially as it falls approximately 2.7 ft lower than the lowest outlet of the North Basins, 1.1 ft lower than the bottom of the equalization basins and 8.6 ft lower than the overflow outlet, and the South Ash Settling Pond has over 3 feet of freeboard even with the tailwater condition.

The HEC-HMS models were not provided for review, and no output was included with the report. This review is based only on the given input and output tables in the report and the attached routing diagram. No drainage area maps were provided. The elevations of the various pipe inlets and outlets and tops of the berms are given in the report and the attached drawings. These have been assumed to be correct and entered into the HEC-HMS model accurately, but this can't be verified.

South Basins (South Ash Settling Basin and Equalization Basins)

The Equalization Basins drainage area is equal to its total pond footprint of 132,400, which matches up with the aerial photo, and indicates that no rainfall runoff from adjacent areas will surface drain into it. The drainage area of the South Ash Settling Pond is 343,700, which is larger than the pond footprint and indicates some adjacent area flowing to the pond. Page 6 of the report states that some roadway and building areas flow to this pond. The drainage area for this pond should be delineated on a map for review.

Case B, considering the tailwater impacts of Ponds 2 and 3 on Pond 1 is the most appropriate scenario to consider for the North Basins. It shows freeboard of at least 2.1 ft in each pond. The Conclusion section of the report (Page 17-19), however, shows different ponding elevation for each pond that does not match the values in the results table (Table 8, Page 12). The freeboard values from the conclusion are less than 2 feet for Ponds 2 and 3. No model or detailed output was submitted to verify the results presented in the report and to determine which freeboard values are correct.

The Equalization Basins range from overtopping to minimal freeboard for most scenarios, and only have substantial freeboard when the starting elevation is very low and no process flow is being discharged into them. In this scenario (H), the freeboard is 2.4 in the Equalization Basins. The Alternate scenario lowering the overflow outlet pipe and results in minimal freeboard (0.2 ft) when the pond starts full and process flow is being discharged to the basins.

Freeboard Guidelines

The freeboard guidelines as stated in Chapter 8, Section 9 of the MSHA Coal Mine Impoundment Inspection and Plan Review Handbook states: "Items that should be considered in determining freeboard requirements include: frequency of the design storm, duration of high water level, effective wind fetch, water depth, potential wave run-up on the upstream slope, ability of the embankment to resist erosion, potential for embankment/foundation settlement, and potential for mine subsidence. 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." The South Settling basin meets this general minimum requirement based on using the 500-year water surface elevation in the Niagara River as a tailwater. The freeboards of less than three feet in the North Basins are arguably adequate for these small impoundments in the extreme $\frac{1}{2}$ PMF event, assuming that the drainage areas can be verified. The Equalization Basins have zero or less freeboard throughout many operating scenarios, even with the suggested plan to lower the overflow outlet pipe.

Geotechnical and Stability Recommendations

Conventional minimum factor of safety criteria are 1.3 for rapid drawdown, 1.5 for static longterm stability and 1.0 for earthquake stability (by pseudo-static method). Likewise, if the dam does not meet the 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.

North Ponds (Ponds 2 and 3)

Pond 1 is considered incised and stability analyses are not required. Stability analysis was presented for Ponds 2 and 3 in the September 2012 response letter (Appendix G). There is no specific boring information to verify the strength parameters used in the analyses. If NRG would like these ponds to be considered for a Satisfactory rating, AMEC recommends a geotechnical study be performed to confirm the strength parameters used in the analyses. If a geotechnical study is performed, AMEC recommends at least one piezometer be installed at each pond to monitor the phreatic level in the embankment.

At the time of AMEC's site visit, vegetation on the embankment slopes of the North Ponds was too tall to inspect the embankments closely. No visible signs of major slope failures were observed. NRG mowed these areas and had a third party inspection (GZA GeoEnvironmental) of the embankments in September 2012. No signs of embankment problems were observed. AMEC recommends NRG continue regular mowing to allow inspection of the embankments and detection of any problems.

South Ponds (North and South Equalization Basins and South Ash Settling Pond)

Stability analysis was not performed for the North and South Equalization Basins. In the September 2012 response letter GZA stated they do not believe that a stability analysis is required based on the low height of the embankment slopes, highest embankment of about 5 feet high in the southwest corner of the South Basin where the embankment is curved providing radial reinforcement. GZA also provided their opinion that an elevated phreatic condition is highly unlikely to occur through the embankment section since filling of the basins is alternated so the water in each basin has a low occupancy period, and the pond interior is constructed with asphalt.

The southwest corner of the south basin is adjacent to the bank of the Niagara River. With a top embankment height of 580.3 feet and the bottom of the river at approximate elevation 565 feet, the embankment height is about 15 feet. Boring information dated June, 1983 for borings performed prior to construction of the equalization basins indicate the North and South Equalization basins are constructed within an ash management area. The borings indicate generally stiff to medium stiff material in the upper 10 feet in the borings along the west (Niagara River) side of the basins, and soft ash below this depth, i.e. below surrounding grade. Since these ponds are not considered CCW impoundments, stability analysis are not required. However, given the close proximity of the basins to the Niagara River, AMEC suggests a geotechnical study and static and seismic stability analysis would be prudent engineering practice.

South Ash Settling Pond

A July 2009 report by GZA, titled *Settling Pond Outlet Embankment Evaluation*, for the Huntley Generating Station presents stability analyses for the South Ash Pond. One cross section was analyzed for static long term conditions. The location of the cross section was selected to represent the most critical area on the southwest or outlet embankment. In the letter response dated September 2012, GZA provided justification for the strength parameters used in the analysis and submitted results for long term, seismic and rapid draw down conditions. The calculated factors of safety meet or exceed the minimum required factors of safety from Table 6. A condition rating of Fair was given to this pond due to the seismic calculated factor of safety (1.05) being marginally above the minimum required factor of safety (1.0) in light of the interpretation and use of the 30 degree friction angle for the fill soils. This friction angle may be high due to the presence of soft zones and debris noted in the borings. Using the Infinite Slope Analysis as presented in the report for a 3H:1V slope, a friction angle of 26 degrees corresponds to a factor of safety of 1.46, neglecting the additional slope stability provided by the surface rip-rap. Based on the Infinite Slope Analysis, it appears that the calculated factor of safety of the outlet embankment of the South Pond approximately meets the minimum required factor of

safety from Table 6. AMEC recommends this embankment be monitored for any signs of distress, especially during extreme events. If NRG would like this pond to be considered for a Satisfactory rating, AMEC recommends a geotechnical study be performed to confirm the strength parameters used in the analyses. If a geotechnical study is performed, AMEC recommends at least one piezometer be installed to monitor the phreatic level in the embankment.

At the time of AMEC's site visit, vegetation on the embankment slopes of the South Ash Pond was too tall to inspect the embankments closely. Although steep interior slopes were observed, no visible signs of major slope failures affecting the overall stability of the embankments were observed. NRG mowed these areas and had a third party inspection (GZA GeoEnvironmental) of the embankments in September 2012. No signs of embankment problems were observed. AMEC recommends NRG continue regular mowing to allow inspection of the embankments and detection of any problems.

Inspection Recommendations

Inspection procedures at the Huntley Generating Station include weekly (North Ponds) and daily (South Ponds), undocumented inspection of the grounds by plant personnel.

AMEC recommends NRG perform periodic documented inspections of the impoundments, preferably bi-annual inspections with one performed by a Professional Engineer, either by a consultant or by internal, off-site personnel. Maps and/or photos, preferably both, can maintain a visual record of the location of problems and can be used to develop work orders. Inspection reports should be maintained by the facility. Additionally, routine inspections (daily or weekly) performed by facility O&M personnel could be supported by an inspection checklist to serve as documentation of the inspection. A record of work items can also be used to document work performed and work needed to be done.

In comments to the draft report submitted by NRG, Appendix B consisted of a "Current Inspection Report for all Huntley Ponds and Basins" performed by GZA in September 2012. The inspection report notes NRG had mowed heavy vegetation to allow better inspection of the embankments, and had patched distressed asphalt areas and applied asphalt sealant on the bottom liners and embankments of the South and North Equalization Basins. Photographs were submitted with the inspection and denoted as Attachments 1 through 4. The photographs show a better view of the embankments as a result of the mowing and show the improvements to the basins. The report noted the results of this visual inspection indicated the embankments were in good to fair condition, with no signs of structural, erosion or animal activity deficiencies. The inspection report recommended the vertical-walled incised embankments located at the north end of the South Ash Pond be sloped back or reinforced with large-size riprap/concrete slabs to provide better stabilization. GZA made this recommendation for safety purposes for dredging noting they did not feel that these embankments pose an environmental concern.

In comments to the draft report by NRG, GZA's response in Appendix C, Conclusions, page 17, 18 and 20 include hazard mitigation plans should deficiencies occur in the embankments.

AMEC recommends NRG develop formal emergency actions plans for the ponds.

Vegetation on the impoundments should be aggressively managed. We further recommend that vegetation be managed based on guidance in (a) Corps of Engineers EM 1110-2-301, *Guidelines for Landscape Planting and Vegetation Management at Floodwalls, Levees, and Embankment Dams* and (b) FEMA 534, *Technical Manual for Dam Owners: Impacts of Plants on Earthen Dams*. Additionally, animal impact can be mitigated based on guidance in FEMA 473, *Technical Manual for Dam Owners: Impacts of Animals on Earthen Dams*.