

**Ameren Energy Generating Company  
Newton Power Station  
Jasper County, Illinois**

**National Pollutant Discharge Elimination System (NPDES)  
Permit Modification Responsiveness Summary**

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**Final January 31 , 2012**

## ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

Ameren Energy Generating Company  
Newton Power Station  
Jasper County, Illinois  
Modified NPDES Permit  
NPDES Permit Number IL 0049191

### Agency Permit Decision

On January 31, 2012, the Illinois Environmental Protection Agency (Illinois EPA or IEPA or Agency) issued the modified NPDES permit for Ameren Energy Generating Company, Newton Power Station.

The following modifications have been made to the final permit:

- The outfall 001 flow has been increased from 8.31 MGD to 17.2 MGD due to the proposed addition of wet sluicing from Unit 2. This modification is reflected on page 2 of the permit.
- Phosphorus limits have been added to outfalls A01 and 003 due to the November 12, 2007 approval of the, "Little Wabash River II TMDL." The phosphorus load limits for Outfall 003 were modified since the July 14, 2011 public noticed draft to reflect the DAF and DMF. The new Outfall 003 load limits are 0.125 lbs/day for 30-day Average and 0.734 lbs/day for Daily Maximum.
- Special Condition 21 was added which requires the installation of a continuous flow meter at Outfall 001.
- Special Condition 22 was added which requires the monitoring of various metals at Outfall 001.
- Special Condition 23 was added which requires influent monitoring for Flow, Phosphorus, and TSS.
- Monthly phosphorus monitoring has been added to Outfall 001.
- Special Condition 20 was modified to reflect a name change for a currently used additive.
- Special Condition 4: The sulfate mixing zone designation has been removed from the permit.
- The phosphorus load limits for Outfall 003 have been modified as noted above.
- An annual average mercury limit of 12 ng/L has been added to Outfall 001.
- The requirement for 12 total mercury samples for Outfall 001 previously noted in Special Condition 18 has been changed to monthly sampling.
- Special Condition 26 has been added and requires an investigation to determine what the ash pond's current detention time is and how much available freeboard is present in both the primary and secondary ash ponds.
- Special Condition 25 has been added requiring groundwater monitoring and an assessment of impacts. It also includes requirements if additional impacts to groundwater are occurring.

## **Pre-Hearing Public Outreach**

The public hearing notice, including the NPDES Permit Public Notice/Fact Sheet, was published on July 14, 2011 in the *Newton Press Mentor*. Two successive publications of a public hearing notice were made in the same newspaper on July 21 and 28, 2011. During the week of July 18, 2011, the public hearing notice was also mailed or e-mailed to persons on a public hearing notice service list maintained by the Illinois EPA. The notice was sent to local state legislators, Jasper County and City of Newton officials, and the Illinois EPA Bureau of Water permit public notice mail-out list. The public hearing notice was also posted at the Illinois EPA Springfield Office and on the Illinois EPA website at: <http://www.epa.state.il.us/public-notices/2011/npdes-notices.html#ameren-newton>

The hearing notice was revised August 16, 2011, updated on the agency web site and re-sent to those on the e-mail list that same day. The revised notice corrected an error in the original notice's text.

## **Public Hearing**

At 6 p.m. August 30, 2011, Illinois EPA Hearing Officer Dean Studer opened the public hearing in the second floor Court Room of the Jasper County Courthouse, Newton, Illinois. After the Hearing Officer's opening statement and hearing panel introductions, Paul Hardiek, Technical Services Superintendent for permittee, Ameren Energy Generating Company, made a statement concerning the permit modification. Brian Cox, Illinois EPA Permit Engineer, explained the draft NPDES permit modification. Members of the audience made comments on the permit modification and asked questions of the hearing panel.

The Hearing Officer closed the public hearing at 7:25 p.m. on August 30, 2011 after reminding the audience of the close of the comment period and hearing record at midnight on September 29, 2011. A transcript of the entire Public Hearing was made and posted on the Illinois EPA web site on September 8, 2011.

Illinois EPA personnel were available before and after the hearing to meet elected officials, news media and concerned citizens. Eleven people, including representatives of the Illinois Chapter of the Sierra Club, the Prairie Rivers Network, the Jasper County Board of Review and Ameren Energy Resources, participated in or attended the hearing.

The public hearing notice, the hearing transcript, the draft and final modified NPDES permits and this responsiveness summary are available on the Illinois EPA website: <http://www.epa.state.il.us/public-notices/2011/npdes-notices.html#ameren-newton>.

## Draft NPDES Permit Background Information

The Illinois EPA Bureau of Water prepared a draft modified National Pollutant Discharge Elimination System (NPDES) permit for the Newton Power Station. The address of the discharger is Ameren Energy Generating Company, 1901 Chouteau Ave (MC-602), P.O. Box 66149, St. Louis, Missouri. The Newton Power Station facility address is 6725 500<sup>th</sup> St., Newton, Illinois.

The following modifications to the facility's permit were requested by the applicant:

- The secondary ash pond discharge from outfall 001 was proposed to increase from 8.31 MGD to 17.2 MGD due to the addition of fly ash sluice water from Generating Unit 2, the increase of fly ash sluice water from Generating Unit 1, some minor increases to water treatment plant related wastewaters, and some corrections to existing flows due to previous calculation errors. The increased flow from fly ash sluice water is due to the installation of an activated carbon injection (ACI) system which injects halogenated activated carbon into the flue gas stream. This system was required in accordance with Ameren's Multi Pollutant Reduction Agreement with the State of Illinois. The ACI system is used primarily to reduce mercury and sulfur oxides (SOx) concentrations from the flue gas waste stream. In addition, due to the use of a proprietary fuel additive, there are also nitrogen oxides (NOx) reductions in the flue gas. The ACI system was installed on both Generating Units and was required by the Multi-Pollutant Reduction Agreement to become operational by July 2009.
- A revision in Special Condition 20 to reflect a name change for a currently used additive.

Previously, Newton Power Station sold the majority of their fly ash to be used as an additive in the cement industry. The installation of the activated carbon injection system has caused the commingling of fly ash and halogenated activated carbon which has resulted in unmarketable fly ash due to the carbon content.

As a result of the fly ash being unmarketable, Ameren proposed an increase in fly ash sluice water from Generating Unit 1, the addition of fly ash sluice water from Generating Unit 2, and an increase in wastewater sump flows. These flows will discharge to the primary ash settling pond which is tributary to the secondary ash settling pond which ultimately discharges through Outfall 001.

## Public Comments and Agency Responses

### NPDES Permit Modification:

1. There won't be more ash created at the site; the ash just won't be leaving the site for other uses, correct? I understand the fly ash sluice water increase but can you explain what the wastewater sump discharges are made up of that are going to increase in volume and why they are increasing? Are the wastewater sumps all involved in moving the ash from the plant to the ash pond? Why will those volumes increase?

**Response:** No increase is expected in the ash volume generated at the site. The wastewater sump discharge components are listed on page 2 of the permit and include soot blower thermal drains, ash hopper overflow, ash pit sumps, boiler house floor drains, strainer backwash, and other miscellaneous contributory flows. These discharges are routed through a 45,000 gallon capacity oil/water separator before discharge to the ash pond system. The volume increases are related to the activated carbon injection; more water is required now because of the sluicing, and consequently the other flows will also increase slightly.

2. Special Condition 18 says, "Upon modification of the permit, Outfall 001 will be monitored for mercury on a monthly basis till 12 samples have been collected." Since we know practices are changing at the power plant, will those operational changes be in effect at the power plant when this monitoring requirement goes into effect, or are those changes already occurring at the plant? Are we already getting increased ash disposal in the ash pond? When do you anticipate that increased ash disposal will begin? My concern is that the mercury monitoring proposed in Special Condition 18 reflect the worst case scenario when all the fly ash sluices that are proposed are actually being sent to the ash pond.

**Response:** The ash sluice from Generating Unit 1 has already increased and the fly ash from Generating Unit 2 may be sluiced to the Ash Pond immediately following the issuance of the modified permit. The modified permit has replaced the draft Special Condition 18 requirement to collect 12 total mercury samples with a monthly monitoring requirement for an indefinite amount of time. Therefore, once the modification becomes effective, the new mercury monitoring requirements become effective and increased volumes of fly ash sluice water may begin to be sent to the ash holding pond from Generating Unit 2 as well as Generating Unit 1. The mercury monitoring will reflect whatever discharge conditions are current at the facility. Therefore, if both generating units are discharging all fly ash sluice water to the ash ponds, then the monitoring will reflect those conditions. Additionally, an annual average mercury limit has been added to Outfall 001 which will be protective of the water quality in Newton Lake.

## Antidegradation Assessment

3. The Antidegradation section entitled "Identification of Proposed Pollutant Load Increases or Potential Impacts on Uses" on page 3 of the public notice/fact sheet, states that Ameren had prepared a summary of proposed load increases and that loadings of most of these constituents in the discharge ash pond effluent will increase, but there's no listing of those constituents. Please list the constituents that are anticipated to increase in loading.

**Response:** The constituent list of proposed load increases in the discharged ash pond effluent is found in supporting documents provided by Ameren and reproduced below:

- Total Hardness was assumed to be 170mg/L as CaCO<sub>3</sub>, based on available Newton Power Station laboratory data.

The resulting calculations of the projected Outfall 001 characterization based on the data and assumptions previously described are provided in the following table:

*Projected Outfall 001 Discharge Characterization*

| Constituent         | Concentration, ug/L | Mass, pounds/day | Estimated change from existing, pounds/day |
|---------------------|---------------------|------------------|--|
| Arsenic             | 6                   | 0.71             | 0.26                                       |
| Barium              | 430                 | 51               | 18.3                                       |
| Cadmium             | 1                   | 0.12             | 0.04                                       |
| Chromium            | 11                  | 1.29             | 0.47                                       |
| Lead                | 3                   | 0.35             | 0.13                                       |
| Mercury             | <2                  | <0.2             | <0.2                                       |
| Selenium            | <10                 | <1.2             | <0.4                                       |
| Silver              | <10                 | <1.2             | <0.4                                       |
| Aluminum            | 2,957               | 348              | 126  |
| Antimony            | <20                 | <2.4             | <0.9                                       |
| Beryllium           | <5                  | <0.6             | <0.2                                       |
| Boron               | 786                 | 92               | 33   |
| Cobalt              | <5                  | <0.6             | <0.2                                       |
| Copper              | <10                 | <1.2             | <0.4                                       |
| Iron                | 43                  | 5.1              | 1.8  |
| Manganese           | <10                 | <1.2             | <0.4                                       |
| Molybdenum          | 55                  | 6.5              | 2.3  |
| Nickel              | <10                 | <1.2             | <0.4                                       |
| Vanadium            | 1                   | 0.12             | 0.04                                       |
| Zinc                | <10                 | <1.2             | <0.4                                       |
| Titanium            | 5                   | 0.59             | 0.21                                       |
| Hexavalent Chromium | <5                  | <0.6             | <0.2                                       |
| Sulfate             | 120mg/L             | 14,110           | 5,100                                      |

All samples reported on Form 2C, including the leachate extract, were analyzed in accordance with 40 CFR 136 that were applicable as of the date of analysis. Values listed under the headings "Maximum 30 Day Value" and "Long Term Average Value" were compiled from data required by the existing NPDES permit during the February 2007 – January 2008 period. Mass discharges under these headings were calculated using the appropriate anticipated long-term average flow rates. Rounding of all calculations was performed in accordance with Standard Methods, 19<sup>th</sup> Edition.

4. The pollutants for which additional loading is expected should be in the documents that are publicly noticed. I understand that the antidegradation assessment addressed boron, sulfate and total suspended solids, but all of the other pollutants for which increases in loading are expected should also have to be in the antidegradation assessment and be publicly noticed.

**Response:** The antidegradation review prepared by Illinois EPA staff and included in the public notice/fact sheet document is a summary of the analysis intended to provide pertinent information to the permit writer and the public.

Illinois EPA staff review proposed increases in pollutant loading and identify the notable parameters involved in antidegradation assessment reviews. Illinois EPA staff focus on the identified pertinent chemical substances for the activity in question (see response to comment #3 of this document for the list of constituents and their concentrations in the discharge from Outfall 001). In this case, the antidegradation assessment review focused on boron, mercury, phosphorus and TSS as these are pertinent effluent constituents. Other substances are found in the ash pond effluent at background concentrations for Illinois waters.

5. The fact sheet includes a statement that the concentrations of most of these substances are predicted to remain at the same level. But Newton Lake is more like a bathtub than the flowing waters of a river. When there is discharge to a lake as opposed to a stream, do you perform modeling to assess whether these pollutants have a potential for accumulating in the sediments or in the algae and other aquatic life in the lake?

Would Ameren have to submit additional information to you concerning changes in water quality of the discharge to Outfall 002 due to increased concentration of minerals in the water because of evaporation of the cooling source water?

Given the phosphorus and algal impairments in Newton Lake and the use of lake water for cooling, reasonable potential analyses are needed on phosphorus discharges from outfalls 001 and 002 given the potential for source water phosphorus to become concentrated in the effluent as a result of evaporation during cooling. The agency must perform "reasonable potential" analysis for phosphorus. If a reasonable potential exists for these discharges to cause or contribute to a violation of the phosphorus water quality standard or the state's offensive conditions standard prohibiting algal growth of unnatural origin, then the agency must set phosphorus limits to achieve the water quality standards at these outfalls.

**Response:** Newton Lake does not resemble a bathtub that never overflows. In 2011, the lake discharged water over the spillway on 144 days or 39.4% of the year. Given the flow of water into and out of the lake, the evaporation that occurs in the power plant will not cause lake concentrations of substances discharged from the ash pond to exceed water quality

standards. Concentrations of substances discharged from the ash pond such as sulfate and boron meet existing and proposed water quality standards at end-of-pipe. The only bioaccumulative substance discharged is mercury, and this only at very low levels (see Response to Comment #22). Boron and sulfate, the two most prevalent substances present in the effluent relative to the other constituents, are very soluble and will not accumulate significantly in organisms or lake sediment. Phosphorus is discussed in the responses to comments #9 through #11 below. Other effluent constituents are present in such low concentrations that sediment will not become contaminated. No modeling has been conducted of the fate and transport of effluent constituents because there is no indication that the effluent has or will cause problems within the lake.

6. The antidegradation assessment says that the subject facility discharges to Newton Lake at a point where there's zero CFS flow existing upstream of the outfall. Later, referring to trace metals, the antidegradation assessment states, "The concentrations of these substances are not significantly different from the background water entering the lake." From where was that background water quality information taken that would be considered comparable in trace metal concentrations?

**Response:** The background values were based on un-impacted waters in that area of the state. (Please review the response to comment #3 of this document for the list of constituents in the discharge at Outfall 001 and the concentrations predicted.) Many of the trace metal constituents are below detection and those at higher concentrations are typical of background conditions in Illinois. Background water quality conditions for Newton Lake are the ambient conditions in most streams in Illinois.

7. When do you expect the flue gas desulfurization system to be added at the power plant? Does this permit and its antidegradation analysis reflect the additional pollutant loading that would come from that ash scrubber sludge?

**Response:** Illinois EPA has yet to be informed of an exact date that Ameren expects the flue gas desulfurization (FGD) system to be added. The Agency has been informed that the FGD system is still in its planning phase and Ameren does not expect to produce a wastewater discharge from this system. This will be achieved through recycling the wastewater to be reused in the FGD system and landfilling the waste from the treatment of the FGD wastewater. Because the Agency has not yet received a written modification request, at this time the Agency is unable to consider any possible loading increase that may be caused by the installation of a FGD system in the future. However, if the Agency receives a request to add a waste stream from a new FGD system, a separate antidegradation assessment and permit modification will be required at that time.



8. Please explain why this permit is addressing one major outflux of pollutants knowing that in the near future there are going to be more. In terms of antidegradation, that's not looking at the full anticipated impact to Newton Lake; instead, you're handling antidegradation in a way that really doesn't address what is likely to impact the aquatic uses in the long run. Ameren is currently installing wet flue gas desulfurization equipment at the Newton station. This puts IEPA on notice that the waste stream at this site is likely to increase substantially in the near future. Such expansion should be considered now when evaluating waste storage/disposal capacities, designs and costs. A discharge of scrubber sludge would likely result in additional releases of boron, chlorides, sulfates, metals and ammonia.

**Response:** Ameren is required to submit a permit modification application if future activities would result in any new pollutant loadings to waters of the state. An antidegradation assessment and water quality based effluent limit analysis will be conducted at that time. The Agency has not received notification that there will be any additional pollutant loading attributed to the FGD system. Furthermore, Ameren has stated that they currently do not anticipate any new pollutant loading to Newton Lake from the installation of the FGD system. Therefore, the Agency can only address the situation as it has been presented. (Please also see Response to Comment #7.)

### **Phosphorus Issues**

9. How is the phosphorus monitoring proposed in the permit consistent with the TMDL for Newton Lake that says there needs to be a 61 percent reduction in loading to the lake? Are you asking Ameren to contribute to that reduction in phosphorus loading to the lake? Will the permit as written help Ameren be a part of the solution to the phosphorus problems in the lake?

**Response:** Ameren provided data that the fly ash increase will not increase the phosphorus loading from the discharge. It is not the Agency's intent to require Ameren to remove phosphorus from Newton Lake. Therefore, the influent and effluent monitoring requirements will allow the Agency to determine if there is any phosphorus loading that can be attributed to something other than the sanitary wastewater and background concentrations.

In addition, permit limits for phosphorus have been added to the two outfalls containing treated sanitary wastewater. Special Condition 24 provides a schedule of compliance for phosphorus limitations from the sewage treatment plant discharges. The phosphorus limitations that were included in this modification are set at the Title 35 IAC 304.123 standards of 1 mg/L for the 30-day average and 2.0 mg/L for the daily maximum. The load limits in the permit are more stringent than the waste load allocations provided in the TMDL. Therefore, the phosphorus limits on Outfalls A01 and 003 will require Ameren to discharge

even less phosphorus than the waste load allocations in the TMDL. Currently there is not enough information available to limit phosphorus from Outfall 001. The additional monitoring requirements will allow the Agency to assess Ameren's claims that the phosphorus loading will not be increased due to the additional fly ash sluice water.

10. The TMDL assigns a phosphorus waste load allocation to this facility. The water quality standard for phosphorus at Newton Lake is 0.05 milligrams per liter, but the effluent limit applied is a 30-day average of 1 milligram per liter. Has an evaluation been done to determine whether this effluent limitation would allow for that lake water quality standard to be met? Was the TMDL done using that 0.05 mg/L water quality standard? Even if Ameren meets this effluent limit, won't they be further exacerbating water quality degradation?

The phosphorus water quality standard applicable to lakes is 0.05 mg/L. *35 IAC 302.205*. Although the permit contains effluent limits for phosphorus discharges from outfalls A01 and 003, these limits are based on wasteload allocations assigned by the TMDL for the Little Wabash River. Upon review of the TMDL, we cannot determine whether the wasteload allocations were established at levels necessary to attain and maintain the phosphorus water quality standard for lakes in accordance with 40 CFR 130.7(c). Please provide evidence that the phosphorus wasteload allocation (and permit limit) was established at levels necessary to attain the applicable phosphorus water quality standard.

The agency must perform "reasonable potential" analysis for phosphorus. If a reasonable potential exists for these discharges to cause or contribute to a violation of the phosphorus water quality standard or the state's offensive conditions standard prohibiting algal growth of unnatural origin, then the agency must set phosphorus limits to achieve the water quality standards at these outfalls.

**Response:** Illinois EPA typically bases TMDL allocations on permit limits. Because there were no permit limits for phosphorus in Ameren's sanitary effluent, an estimated load based on literature values of treated sanitary waste was used. The phosphorus water quality standard for lakes was also considered in the TMDL study, however, the TMDL does not require the power plant effluents to meet the lake phosphorus water quality standard at end-of-pipe or, in fact, to dictate any phosphorus reduction at all.

Given the small component of lake phosphorus originating in the effluents, complete phosphorus removal from the effluents could not bring the lake water phosphorus concentration down to the water quality standard for Illinois lakes. Conversely, the TMDL states, "The largest potential sources of pollutant loading in the watershed are agricultural practices." The TMDL continues to provide BMPs for reducing pollutants contributed by agricultural practices. Placing phosphorus limits of 1.0 mg/L on the two sanitary wastewater discharges is in addition to any waste load allocation of the TMDL because the TMDL does

not dictate any reduction of phosphorus from these effluents. The TMDL indicates that the effluents are not significant contributors of phosphorus to the lake and are not listed as a cause or contributing factor of the algae impairment noted on the 303(d) List. Ameren contributes less than 1% of the phosphorus load to Lake Newton based on the Illinois EPA's TMDL calculations.

11. Do you know what the current phosphorus concentrations are from outfalls A01 and 003 [from sewage treatment plants #2 and #1]?

**Response:** Ameren was not required to monitor phosphorus as part of the previous permit. We have several samples that were submitted as part of the application for a previous NPDES renewal, but there are not many data points. Under this modification, Outfalls A01 and 003 have phosphorus monitoring requirements that will become effective immediately following the issuance of the modified permit. Additionally, Outfalls A01 and 003 have phosphorus limitations established that will be applicable upon completion of the compliance schedule provided in Special Condition 24.

### **Sulfate Issues**

12. What is the applicable water quality standard for sulfate in Newton Lake (page 6 of the permit does not list a load limit)? What's the water quality standard that needs to be met in the lake? You must have calculated it because Special Condition 4 identifies a mixing zone for sulfate.

**Response:** Using average hardness (124.6 mg/L) from the Illinois EPA sampling on Newton Lake and average chloride (24.77 mg/L) from a sampling station representing similar watershed characteristics on the Little Wabash River (AWQMN Station C-21 at Effingham) because chloride data was not collected on Newton Lake, the sulfate standard in Newton Lake under these best available average water quality conditions is 1304 mg/L.

Since the predicted ash pond effluent concentration for sulfate is 120 mg/L once Unit 2 fly ash sluice water is discharged to the ash pond, there is no reasonable potential to exceed the water quality standard in the ash pond effluent. No mixing zone is required and the sulfate mixing zone designation has been removed from the permit. The previous designation of a sulfate mixing zone was made when the sulfate water quality standard was 500 mg/L and the differential between the standard and the effluent concentration was less pronounced.

Please note that there is a boron mixing zone that also may no longer be needed as we anticipate the Illinois Pollution Control Board will adopt a higher limitation/standard than

the current standard. At that time, Special Condition 4 of the permit could be further modified to remove mention of mixing zones where it is no longer needed.

### **Mercury Issues**

13. We're concerned about mercury at very low levels. The antidegradation statement says that mercury is expected to undergo a decrease in loading. I understand that you've looked at some [research] papers but have you looked specifically at the mercury discharges here? For example, what is the concentration of mercury currently coming out of the ash ponds and what is the future concentration since we know the volume is going up? Please provide the numbers/calculations that showed that the loading would be going down.

**Response:** The final modified permit now requires monitoring of mercury at six outfalls (001, 004, 007, 008, 009, 010) using the low level methodology, method 1631E, so we will be able to determine future mercury concentrations in the effluent discharged. However, since the previous permit did not require that particular monitoring, we do not yet have data for the suggested comparison. The future concentration of mercury in the ash pond effluent is predicted to remain the same as it is now. (See the response to comment #19 for recent mercury results from the ash pond discharge.) Increasing the volume of wastewater in the pond will not necessarily influence concentration. "Loading" is different than concentration; loading is dependent on effluent volume as well as contaminant concentration. Loading of mercury from the ash pond effluent is predicted to approximately double due to the increase in effluent volume by adding sluice from Generating Unit 2. However, as explained in the response to comment #22, overall loading of mercury to Newton Lake is expected to decrease with the advent of mercury removal from air emissions.

14. The Agency must identify and quantify the proposed load increases and the impacts of those increases in accordance with 35 IAC 302.105(f). The public notice states that mercury loadings are expected to decrease, despite a more than doubling of sluice water discharges, because mercury in the ash will be absorbed by activated carbon. When asked at hearing for the basis of this claim, IEPA stated that it relied on reports provided by Ameren prepared by the Electric Power Research Institute and US EPA, but admitted that it has never analyzed the mercury content in discharges from other coal-fired power plants in Illinois that employ activated carbon injection. Coal-fired generating facilities using activated carbon injection and ash ponds are present in the Midwest and should be assessed for on-the-ground performance of ash and associated pollutant particles to help predict expectations of settling pond performance at the Newton facility. The agency needs to properly quantify expected loadings of mercury by evaluating data from one or more of these sites.

**Response:** Reduction of mercury in power plant air emissions is considered a large step forward in remediating mercury contamination in the nation's waters. U.S.EPA approved

the method of activated carbon injection that Ameren will employ and is already utilizing on another unit at the Newton Station to accomplish the air emission reductions. Studies were conducted at the national level, such as those cited in the antidegradation assessment review produced by Illinois EPA, that indicate the mercury will stay sorbed to the carbon and that this carbon will settle. The Electric Power Research Institute's publication Activated Carbon Injection: Effect on Simulated Fly Ash Sluice Water, relates the results of experiments done with simulated ash sluice water after activated carbon treatment and settling. At page 2-3, the publication states that "the low magnitude of the concentrations would suggest that mercury captured from the flue gas by the carbon is generally stable and does not leach out." Also, "the carbon does not have a significant effect on the concentration of TSS in the fly ash sluice water" (page 2-2).

New technologies rely on laboratory experiments to judge whether they may be effective. When the technology is applied at full scale, measurements may then be taken to determine the actual, as opposed to predicted, effectiveness. In the process of developing new pollution control technologies a determination may be made that a reasonable outcome is likely. In this event, governmental bodies approve the practice and the technology is installed. At this time there has not been an extensive record created of the mercury concentrations in ash pond effluents because of the recent advent of the method. There are no facilities in Illinois with a track record of use of this technology that provides the longer-term data that Illinois EPA would need to evaluate the effectiveness of the method at this time. However, mercury limits have been added to Outfall 001 due to a reasonable potential to exceed water quality standards. These limits will require the discharge to meet the human health water quality standard found at 35 IAC Part 302.208(f). In addition, as explained in the response to comment #22, overall loading of mercury to Newton Lake is expected to decrease with the advent of mercury removal from air emissions.

15. Could you provide us with the U.S.EPA and Electric Power Research Institute documents indicating that the mercury would stay adsorbed to the activated carbon that you reviewed and relied on as part of your conclusions that the mercury loading was going to decrease?

**Response:** These documents are under copyright protection so cannot be provided directly by the Illinois EPA. The document citations are: Electric Power Research Institute's "Mercury Control Technology" March 31, 2008 (Product ID: 1014172) and U.S.EPA's "Characterization of Mercury Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Mercury Sorbants for Mercury Control," January 2006 (EPA/600/R-06/008). The website page for the U.S.EPA document is: <http://www.epa.gov/nrmrl/pubs/600r06008/600r06008.pdf> The Electric Power Research Institute document may be obtained through inter-library loan. It is not available online as a free download.

16. Is the mercury 1631 test a water column test?

**Response:** Yes. Grab samples are obtained from the water to be tested and no filtering is allowed resulting in a total mercury result.

17. Can you describe for me how this activated carbon looks? Illinois EPA's Bob Mosher testified that it's going to settle in the ash pond, but I think of activated carbon as fine particles, so I'm trying to understand how it's going to just settle in the ash pond and not be washed out into Newton Lake.

Concerning the mercury, the fly ash and the activated carbon particles going into the lake: During the antidegradation assessment evaluation, why did you assume that there will be no increase in loading of mercury into the lake? Even though there will be some settling of the activated carbon in the ash pond, there's also bound to be some of the activated carbon released into Newton Lake, carrying with it the adsorbed mercury.

**Response:** The halogenated activated carbon is a powder injected into the flue gas and consequently becomes mixed with the fly ash. It is collected by the air emissions control equipment with the fly ash; it is not a separate waste product.

The Electric Power Research Institute's publication Activated Carbon Injection: Effect on Simulated Fly Ash Sluice Water relates the results of experiments done with simulated ash sluice water after activated carbon treatment and settling. The results of a settling experiment comparing simulated fly ash sluice water containing activated carbon with sluice water containing ordinary fly ash indicate after 12 hours of settling no visible carbon was present in the sample and the total suspended solids content was well within regulatory requirements (page 2-1). The Newton Plant ash pond provides much more than 12 hours of settling time. According to this document, the activated carbon appears as a black suspended substance until it settles.

While mercury loading from the ash pond may increase slightly, mercury being deposited in Newton Lake and its watershed will decrease due to the removal of mercury from air emissions at the Newton station and from other power plants subject to new mercury air emissions controls. (See response to comment #22.)

18. Aside from reviewing those two documents that point to most of [the mercury and activated carbon] staying in the ash pond, was there any additional investigation done such as looking at sister facilities or other facilities in the state or out of state that have used activated carbon and ash sluice in ash pond systems?

**Response:** Mercury air emission controls are very recent additions to power plant pollution reduction facilities. The Illinois EPA knows of no other examples of power plants in Illinois that have been removing mercury from air emissions for a long enough period to judge whether the practice is having an impact on mercury concentrations in ash pond discharges.

19. We note that Ameren's claim that existing average effluent mercury equals 6.1 ng/L is not supported by the discharge monitoring records. According to information found in US EPA's Enforcement and Compliance History Online (ECHO) database, Ameren's Newton mercury discharges from outfall 001 have been increasing steadily since 2009 when the facility began using activated carbon injection. In the first quarter of 2011, mercury effluent measured 17.8 ng/L, and in the second quarter of 2011, it was 18 ng/L.

**Response:** Illinois EPA has discussed the effluent mercury data with Ameren representatives. Because mercury is a difficult parameter to monitor due to the very low part per trillion level of detection with inherent susceptibility to contamination of the sample and the difficult laboratory test involved, mercury data sets often contain aberrant sample results and are difficult to interpret. Ameren stated that they reviewed the past data and found no abnormalities.

The mercury sample for the ash pond effluent for November 2011 is again very low, 3.42 ng/L. Ameren stated that they also examined the effluent using a microscope and saw no evidence of carbon particles. Even so, the Agency has added an annual average mercury limit of 12 ng/L to Outfall 001, based on the monitoring results indicated above. Illinois EPA will follow future results at this facility and other ash ponds receiving activated carbon mercury sorbent to track trends. If future results indicate that elevated mercury concentrations are present, then further investigation will be needed to determine the exact cause of the mercury increase.

20. Given the high concentrations of mercury reported in discharges from Outfall 001, the twelve months of mercury monitoring required by Special Condition 18 are not sufficient.

**Response:** The modified permit has replaced the draft Special Condition 18 requirement to collect 12 total mercury samples with a monthly monitoring requirement for an indefinite period of time. In addition, the modified permit includes an annual average effluent limit of 12 ng/L for mercury at Outfall 001.

21. Is any mercury monitoring of the sediment of Newton Lake being done?

**Response:** Illinois EPA sampled Newton Lake sediment for mercury on two occasions. On August 14, 2001, samples were collected at three locations on the lake. The mercury content in each of these sediment samples was below the analytical detection limit of 0.01

mg/kg. On March 4, 2009, samples were collected at two locations on the lake. One of these had a result of 0.06 mg/kg mercury and the other 0.03 mg/kg mercury. An Illinois EPA publication entitled Sediment Classification for Illinois Inland Lakes (1996 Update) by Jeffery D. Mitzelfelt, September 1996, gives a relative classification scheme for metals and organic substances in lake sediments. Ranges of sediment concentration for Low, Normal, Elevated and Highly Elevated categories are given. The two samples where mercury was measured in Newton Lake sediment are both in the "Normal" category.

22. Mercury accumulates in the environment, and especially in fish tissue, over time. The body burden of mercury in Newton Lake fish is not currently known. However, it must be assumed that additional mercury will accumulate in those fish, posing further risk to those consuming fish flesh. We can also assume there is a buildup of mercury sorbed to sediment particles that have settled to the lake bottom. When bottom sediments are stirred, particles containing some degree of attached pollutants are released into the water column where they are available for uptake by fish. An analysis of the mercury found in the sediment in the lake would aid in determining the extent to which additional loadings of mercury to the lake from the power plant should be allowed. Additionally, temperature loading to Newton Lake may contribute to periods of anoxic zones in the lake, facilitating the methylation or release of mercury available to aquatic organisms such as fish.

IEPA must perform a reasonable potential analysis on mercury discharges and determine whether there is a reasonable potential for Ameren's proposed discharge to contribute to the fish consumption use impairment. The modified permit should set a limit for mercury discharges from Outfall 001 based on the reasonable potential analysis.

**Response:** The goal behind adoption of air emission regulations for mercury removal was to stop mercury from entering the atmosphere where it would then be transported and eventually deposited on the surface where it could contaminate lakes and rivers. Newton Lake along with all other water bodies will benefit from the reduction in mercury emissions.

The information available supports the determination that the net loading of mercury to Newton Lake will decrease as a result of the mercury air emission limits even if the concentration in the ash pond increases slightly. The mercury contribution from the ash pond is now and is predicted to stay very low. Assuming a mercury concentration of 5 ng/L, which is the approximate current average, and the current ash pond discharge of 8.31 MGD, 0.0035 pounds per day of mercury is discharged (0.126 pounds per year). If this concentration is maintained with the expansion of the ash pond discharge to 17.2 MGD, the daily mercury discharge is 0.0007 pounds per day or 0.225 pounds per year. If the mercury concentration increases to the maximum allowable under the human health water quality standard of 12 ng/L, the daily mercury discharge will be 0.0017 pounds per day or 0.62 pounds per year. The maximum increase of less than one-half pound per year should be



more than offset by the reduction in atmospheric mercury being deposited on the lake and its watershed.

The USGS and Indiana Department of Environmental Management published a document in December 2006 entitled Monitoring Program for Mercury in Precipitation in Indiana: Data Summary for 2001- 2005. This study concluded that the average precipitation event mercury deposition in samplers located at five sites in Indiana was 12 micrograms per square meter per year. The sites were not associated with coal fired power plants where we would expect mercury deposition to be greater. Also, dry atmospheric mercury deposition was not measured in this study. These two factors mean that simply measuring wet deposition at ambient sites will underestimate mercury loading to water bodies from the atmosphere. If the Indiana study rate of mercury deposition is applied to Newton Lake and its watershed, 3.47 pounds per year of atmospheric mercury falls on the 32,420 acres of the lake and its watershed. A reduction of only 17% of this atmospheric mercury contribution would more than offset the maximum contribution of the ash pond increase if atmospheric mercury is the same at the Newton Station as it is across Indiana. The activated carbon injection process itself is anticipated to remove approximately 90% of the mercury from the Newton Station flue gas, theoretically reducing considerably the nearby atmospheric mercury concentrations and mercury deposition to the watershed.

Data do not exist to allow a site-specific comparison of “before” and “after” mercury deposition for this plant. The anticipated reduction in atmospheric mercury brought about by air emission controls will reduce mercury input into Newton Lake and bring about mercury reductions in sediment, water and fish flesh. Newton Lake should not receive an overall increase in mercury as a result of the increased discharge to the ash pond from the mercury air emissions control project and therefore the fish in the lake should not experience an increase in mercury body burden from the ash pond effluent contribution. Sediment analysis measures mercury concentrations resulting from the history of mercury input to the lake but will not provide much useful information for the future. Monitoring of fish flesh will be the most effective measure of the success of new mercury controls. Illinois EPA, in cooperation with IDNR and the IDPH, will continue to measure mercury in Newton Lake fish.

23. Have fish tissue samples from Newton Lake been collected and analyzed for mercury or selenium? If not, are there plans to do so?

A finding that the facility is discharging on average below the applicable human health water quality criterion of 12 ng/L is an insufficient basis, standing alone, to conclude that the discharge will not cause or contribute to the fish consumption use impairment, since an assessment of impact on fish tissue concentrations is also necessary.

**Response:** Fish flesh analysis data for Newton Lake from 1985 to the present includes only 2 samples tested for mercury. Each sample was the composite of the fillets of 5 Largemouth Bass collected in May of 2003: one of these composites was of smaller bass and had a mercury concentration of 0.12 mg/kg; the other composite was made up of larger bass and had a mercury concentration of 0.27 mg/kg.

Given the protocol for establishing fish advisories, the existing data for Newton Lake led to a predator fish consumption advisory of one meal per week for the most sensitive populations (small children and women of childbearing age). This is the advisory that is in effect in all Illinois waters unless site-specific data indicates that a more stringent fish advisory is appropriate. The Illinois EPA has requested mercury analysis of Largemouth and White Bass caught in 2005 and has placed Newton Lake on the list of Illinois lakes which will undergo additional fish sampling in 2012. If new data indicate that a more stringent advisory is mandated this will be accomplished through the usual cooperative process among Illinois EPA, Illinois DNR and the Illinois Department of Public Health.

#### **TSS Issues:**

24. In NPDES permits for some mine facilities, we'll often see a special condition that requires that the sedimentation ponds be maintained for a certain capacity so that the actual function of the treatment is realized. I didn't see anything in this permit that says that these ash ponds have to be maintained so they actually are getting that settling treatment. If more ash is going to these ponds, they may fill up faster. If there's more sediment and less water, they're more susceptible to being physically disturbed (stirred up). Has the Agency considered any requirements of Ameren to maintain their ponds in a certain way [to maintain the settling capacity and the retention time]?

Ameren should be required to reexamine the findings or assumptions made 30 plus years ago regarding loss of treatment capacity of the ash settling pond due to sedimentation, buildup of pollutants in bottom sediments, change in residence time, and changes in flow and discharge rates of upstream contributing stream segments. Changes in the watershed due to land use changes and the potential increase in runoff should also be considered. These factors must be reexamined now, before any increase is permitted, rather than waiting to address these issues in a 2012 renewal. Based on this requested reexamination, the permit should include a special condition specifying how discharges to and from the ash pond should be managed to maximize the settling capacity of the pond.

**Response:** The original detention time for the holding ponds was approximately 361 days. As noted in the response to comment #17, 12 hours of settling time is expected to be sufficient to meet regulatory requirements for suspended solids. If the treatment ponds were no longer effective due to reduced capacity, there would be a rise in TSS

concentrations in the effluent. However, there has been no such rise. Even so, the Agency has added a special condition requiring Ameren to submit a report identifying the average detention time in the ash pond system after both units begin discharging all fly ash sluice water. In addition, this condition will require Ameren to determine the average freeboard in the primary ash pond and in the secondary ash pond.

25. The antidegradation assessment states that, "Based on influent and effluent monitoring, Ameren determined that they had a net removal of total suspended solids for lake water that was used at the facility and passed through the ash pond and polishing pond. The analysis also determined that increased flow will continue to have a net removal of total suspended solids and that total suspended solids loading will not increase due to this increased discharge." Please expand on that.

Newton Lake is impaired for total suspended solids. Is the permit limit set so that there should also be a reduced concentration of the total suspended solids?

The state's offensive conditions standard prohibits discharges that cause or contribute to turbidity of other than natural origin. 35 IAC 302.203. Newton Lake is already impaired by total suspended solids (TSS). An analysis of the reasonable potential for TSS discharges to cause or contribute to a violation of the narrative standard is needed, and if such potential found, the final permit must contain a water quality based effluent limit for TSS. Ameren erroneously concludes that because TSS concentrations in the effluent will be less than TSS concentrations in the source water, no reductions or offsets of TSS are required. But the concentration of TSS in the source water is irrelevant to the question of whether the discharge will comply with the narrative water quality standard. The only relevant question is whether TSS in the effluent will cause or contribute to a violation of the narrative standard by causing or contributing to turbidity of other than natural origin.

Newton Lake is already impaired by excess TSS. Adding more TSS by more than doubling the fly ash sluice water flow to the ash pond creates the need for a reasonable potential analysis and water quality based effluent limits where such potential is found. The agency must perform "reasonable potential" analysis for TSS and set appropriate effluent limits.

**Response:** The permit limit for TSS is 30 milligrams per liter for the 30-day average and 50 milligrams per liter for the daily maximum. These limits are site specific limits found at 35 IAC Part 304.216.

Studies conducted by Ameren of Newton Lake water and ash pond effluent TSS concentrations show that the ash pond consistently removes TSS from the lake water. Lake water acquires TSS from the watershed in the form of soil particles and also internally generates TSS in algae growth. The Ameren plant takes in lake water for use in ash sluicing

and this lake water ends up in the ash pond where the TSS settles. On average, the water discharged back to the lake in the ash pond effluent has less TSS than the incoming lake water. On an annual basis, the TSS removed by the ash pond is estimated to be 35,000 pounds per year. When Generating Unit 2 begins sluicing ash to the ash pond, the amount of lake water used for this purpose will increase and the amount of TSS removed from the lake will increase to an estimated 73,000 pounds per year. The ash pond outfall has the same concentration limits with the addition of the Unit 2 ash. Therefore, the TSS loading in the Outfall 001 effluent will increase. However, taking into consideration the reduced TSS concentration from influent to effluent, the net loading of TSS to the lake will decrease.

The narrative water quality standard at 35 IAC 302.203 is usually based on a visual interpretation of offensive conditions. In the case of the Newton Power Station ash pond discharge, this visual determination of compliance with the narrative water quality standard involves a comparison of the color or turbidity (or any of the other offensive conditions listed in the standard) of the ash pond effluent vs. that of the lake receiving the discharge. The question becomes, is the effluent notably different in color or turbidity than the lake? Illinois EPA has evaluated Newton Lake for the Illinois Integrated Water Quality Report and 303(d) List for the past several biannual periods and has not noted an offensive condition. Illinois EPA is unaware of complaints by any of the thousands of visitors to the lake each year that the ash pond discharge constitutes an offensive condition under this regulation. The Illinois EPA Champaign Regional Office facility inspector familiar with the site states that no observations of offensive conditions of the discharge were noted during three inspections. Given the conclusion of the TSS studies conducted by the plant showing a net reduction in TSS in the ash pond compared to lake concentrations, the lack of a finding of an offensive condition is understandable. If no violation of the narrative standard is observed, no water quality based TSS permit limits are justified.

### **Alternatives to Ash Ponds**

26. What is the anticipated life of the power station? When evaluating different ways of treating the ash under the antidegradation assessment, what time frame was Ameren station considering? Are we looking at ten more years of operation, 30 more years? Because that makes a difference in which of those alternatives might be economically feasible.

**Response:** The economic analysis considered the on-site landfill option would have a lifetime of 7.5 years. Ameren has estimated that the ash impoundment will be a viable treatment option for more than 20 years. Even if the power station's lifetime were only 7.5 years the wet sluicing option is still considered the most economically reasonable option for Ameren. The anticipated life of the power plant is greater than 7.5 years. The longer the power plant operates, the more reasonable the wet sluicing disposal option becomes.

27. It seems that some of the assumptions of the antidegradation assessment were that there were previous markets for the ash material and now, because of the increased metals from the activated carbon injection system, that ash is now considered unmarketable. What previous markets existed for the ash material and what attempts were made to market the currently produced ash with higher metals concentrations? I would argue that those are things that should be in the antidegradation assessment because those are assumptions that much of the rest of the antidegradation assessment were based on.

Ameren has submitted an antidegradation assessment that is deficient in a number of respects. First, Ameren asserts that fly ash will “no longer be marketable due to carbon inclusions and must be disposed of on-site.” Please provide evidence of Ameren’s reuse or sales of ash prior to beginning activated carbon injection and provide evidence that those contracts are no longer in place and feasible, necessitating additional disposal capacities.

**Response:** The installation of the activated carbon injection system has caused the commingling of fly ash and activated carbon. Prior to injection of activated carbon for mercury control at the Newton Power Station, nearly all of the fly ash from the two generating units was beneficially used for the production of cement. Concrete is composed of cement, water, aggregate, and air. Activated carbon scavenges the air from the concrete and this results in undesirable changes in the concrete and effectively renders fly ash containing activated carbon useless as a cement additive. The Agency has taken Ameren at their word that the fly ash is no longer marketable; other facilities have made similar claims.

Ameren evaluated other beneficial use opportunities for the Newton Power Station fly ash that is considered to be a "lower-quality" than other fly ash that does not contain activated carbon. Currently, there are very few opportunities to use Newton Power Station fly ash as flowable fill material. Ameren continues to seek beneficial uses for Newton Power Station fly ash. If Ameren had the option to sell the fly ash rather than spend money to dispose of it, we presume they would have chosen that option.

28. While we recognize and applaud the additional air pollution controls employed by Newton Power Station, it is inappropriate that the pollutants being removed from air emissions are simply being moved to water. In addition to the threats from the buildup of mercury concentrations in fish flesh, power plant waste in the form of fly ash, bottom ash and activated mercury sorbent contains concentrated levels of arsenic, chromium and cadmium that can damage nervous systems and other organs, especially of children.

In many locations nationwide, these wastes have degraded public ground- and surface waters adversely impacting consumptive, agricultural, and industrial uses. Studies have also documented multiple developmental, physiological and behavioral abnormalities in many

species of amphibians inhabiting wetlands near coal ash disposal sites and toxicity to fish. This is the perfect opportunity for Ameren to retire its wet ash ponds at Newton Lake and to invest in both clean air and clean water technology by disposing of its waste in a lined dry ash landfill. Ameren has already demonstrated the feasibility of this option at its Coffeen power station; why is it not being proposed here? Why is the coal ash not being handled as dry material?

**Response:** Concentrations of metals, including those mentioned in this comment, meet water quality standards in the ash pond effluent and in Newton Lake. With one exception, there is no exposure to metals or other harmful substances at Newton Lake that would adversely impact aquatic life, wildlife, human health, agricultural or industrial uses. Mercury exposure, in the form of accumulation in fish flesh, occurs at Newton Lake and results in the same fish consumption advisory as is present in all waters of the State, although some other waters have an even more stringent advisory. (Please see the Response to Comment #23.) Ameren is not retiring the ash pond and building additional landfill capacity for future ash disposal because it has found that it is financially infeasible to do so. (Please see the Responses to Comments #30 and #31.)

29. Isn't there already a landfill out there?

**Response:** Yes, there is a landfill unit on-site accepting the ash but it is already near capacity. Currently Ameren is disposing of the ash in that landfill unit with the expectation that this modification will be approved. Since the landfill unit has limited remaining capacity, Ameren needed to find an alternative for ash disposal. An expansion of the existing, active landfill unit was one of the alternatives explored by Ameren.

30. Ameren had provided an affordability analysis of the fly ash landfill alternative using the USEPA Economic Guidance for Water Quality Standards. Kim Knowles at Prairie Rivers has reviewed those documents. Based on Ameren's own worksheets, it appears to us that they have the liquidity, solvency and leverage to finance a dry ash landfill.

Illinois' antidegradation rules prohibit the lowering of water quality without a showing that the lowering of water quality is necessary to accommodate important economic or social development. 35 IAC 302.105 (c)(1). A showing of necessity requires a demonstration that protection of existing water quality is not technically or economically feasible. *Des Plaines River Watershed Alliance v. Illinois EPA and Village of New Lenox*, PCB no. 04-88 (April 19, 2007) ("*New Lenox*") at \*99. The analysis must demonstrate that all technically and economically reasonable alternatives to avoid or minimize the extent of the proposed increase in pollutant loading have been incorporated into the proposed expansion. *New Lenox* at \*98. The Illinois Pollution Control Board has directed the IEPA to apply US EPA's Interim Economic Guidance for Water Quality Standards in making a determination as to what

is economically reasonable. The guidance provides a method by which to conduct affordability analyses on treatment alternatives.

...[T]he analysis failed to consider a reasonable range of alternatives. Ameren considered just three options, 1) increasing the discharge to the existing ash pond treatment system, 2) a wetting head system and 3) dry ash landfills. According to US EPA guidance for wastewater discharges from coal combustion residual (CCR) impoundments, ash pond treatment systems do not effectively remove soluble metals. "Pollutants such as selenium, boron, and magnesium, are present [in coal combustion residual] mostly in soluble form and are not effectively and reliably removed by wastewater settling ponds. For metals present in both soluble and particulate forms (such as mercury), the settling pond will not effectively remove the dissolved fraction. Technologies more advanced than settling ponds are available and more effective at removing both soluble and particulate forms of metals, and for removing other pollutants such as nitrogen compounds and total dissolved solids." *Technology-based Effluent Limits Flue Gas Desulfurization (FGD) Wastewater at Steam Electric Facilities*, Memo of James Hanlon, EPA Director Wastewater Management (June 7, 2010).

Why was there was no cost estimate provided for the option to remove metals through microfiltration, demineralization or reverse osmosis treatment? Were those treatments options eliminated because they weren't effective or useful for what was being proposed to be removed?

Alternative technologies discussed in the EPA guidance include chemical precipitation, biological treatment, and vapor-compression evaporation. IEPA should require Ameren to evaluate both the economic and technical feasibility of employing these additional treatment measures in order to minimize increased mercury discharges, discharges of the bioaccumulative selenium, and other heavy metals and salts. Given the mercury fish consumption impairment in Newton Lake, it is imperative that reductions in heavy metal pollution be seriously addressed.

...Ameren's antidegradation alternatives analysis examined the affordability of just one alternative, a dry ash landfill, and then failed to show that the landfill alternative is not economically feasible. To the contrary, it appears that the landfill alternative is both technically and economically feasible, rendering the increased pollutant loadings to Newton Lake unnecessary. In fact, a dry landfill for the storage and disposal of coal combustion residuals was deemed both technically feasible and economically reasonable at Ameren's Coffeen Power Station.

**Response:** The response to comment #22 provides an explanation of how mercury will be reduced in Newton Lake. Metals concentrations in the ash pond effluent are low. If the proposed new boron water quality standards are considered, all metals meet the lowest

available water quality standard in the effluent before mixing. Using the listed treatment methods to further lower the ash pond metals concentrations is not necessary or practical. The antidegradation alternatives analysis concentrated on options that deal with the overall method of handling ash, specifically, whether the facility should continue to use dry ash handling methods as opposed to sluicing additional ash to the ash pond. The alternative that was deemed reasonable, dry ash disposal, was thoroughly explored by Ameren in the antidegradation assessment and found to be unaffordable.

31. Ameren provided an affordability analysis on December 4, 2009 using US EPA's Interim Economic Guidance for Water Quality Standards. The analysis applied the guidance to just one alternative, a dry ash landfill, and estimated the capital cost of an expanded landfill at \$8.5 million. A Supplemental Alternatives Analysis dated August 19, 2010 inexplicably increased the capital cost of the landfill to \$10.5 million. Regardless of the unexplained \$2 million cost increase, the results of the August 19<sup>th</sup> analysis fail to show that use of a dry ash landfill is not economically feasible. For instance, in Worksheet I, Ameren demonstrated that use of a dry ash landfill would result in just a 6% change in the profit rate.

Worksheet J demonstrates that Ameren has enough liquidity to cover its short term obligations. According to the EPA guidance, the current ratio (a measure of liquidity) of the discharger in question should be compared with ratios of other dischargers in the same line of business. If the discharger's ratio compares favorably with that of similar businesses, it should be able to cover its short term obligations. According to Ameren, its current ratio is "believed to be similar to other Illinois merchant electricity generation companies." See Worksheet J, Affordability Analysis, 8/19/10. As such, Ameren should be liquid enough to meet one of the prerequisites for obtaining financing for the landfill.

Worksheet K measures a company's solvency, or its ability to meet fixed and long-term obligations. If the beaver ratio is  $> 0.20$ , the company is considered solvent. Ameren's calculations of the beaver ratio show that it was solvent in 2 of the 4 years examined. According to the EPA guidance, the beaver ratio should be compared with that of firms in similar businesses. A favorable comparison demonstrates solvency. Again, according to Ameren, its beaver ratio is "believed to be similar to other Illinois merchant electricity generation companies." See Worksheet K, Affordability Analysis, 8/19/10.

Finally, Worksheet L measures the degree of leverage a company has, which indicates how much more money a firm is capable of borrowing. If the debt-to-equity ratio compares favorably with that of similar businesses, the firm should be able to borrow additional funds. According to Ameren, its debt-to-equity ratio is "believed to be similar to other Illinois merchant electricity generation companies. See Worksheet L, Affordability Analysis, 8/19/10.



By Ameren's own calculations and findings, it appears to have the liquidity, solvency and leverage needed to finance a dry ash landfill. At a minimum, Ameren's analysis fails to demonstrate that a dry ash landfill is not economically feasible. Because Ameren has failed to meet its burden regarding the showing of necessity, the increased pollutant loadings of TSS, phosphorus, mercury, and other heavy metals to Newton Lake cannot be permitted.

**Response:** The Illinois EPA noticed an error in U.S.EPA's Worksheet G; the formula for the annualization factor is not correct. The annualization factor results as calculated from the worksheet formula were compared to Appendix B and the Agency noted that the results were not the same. The annualization factor should be  $= (i (1 + i)^n) / ((1 + i)^n - 1)$ . This makes the total annual cost of the pollution control project \$2,835,000 instead of the reported \$1,491,200.

According to Worksheet J, the average current ratio is 0.75 for the 4 years reported. According to the U.S.EPA guidance, a current ratio greater than 2 indicates that the entity should be able to cover its short-term obligations. No current ratio values were above 2, indicating that the entity may not be able to cover its short-term obligations.

According to Worksheet K, the average beaver ratio is 0.197 for the 4 years reported. According to the U.S.EPA guidance, if the beaver ratio is  $>0.20$ , the company is considered solvent. When the beaver ratio is between 0.15 and 0.20, then the future solvency of the company is uncertain.

Based on the information provided by Ameren in the Affordability Analysis dated August 19, 2010, the Illinois EPA has determined that the cost of landfill construction represents a substantial impact and an undue financial burden.

32. Was mine filling of the ash material considered as an alternative to the filling of the ash pond?

**Response:** Mine filling was considered. However, the source of the coal is not near the power plant, and therefore the ash would have to be hauled many miles to the source mine. Consequently, Ameren excluded that option.

33. When I looked at the alternatives, I saw landfilling, using the existing ash ponds, and additional treatment. Nothing stood out as preventing additional pollutant loading for the existing system. Can you describe what preventive measures were suggested by the Agency?

**Response:** One obvious alternative existed for the prevention of pollutant load increases at this facility. Keeping the ash handling in the dry disposal mode stood out as the one reasonable alternative that required further study. Ameren completed studies on this alternative and concluded that the creation of additional landfill space that would allow

continuation of dry ash disposal was less affordable than the wet sluicing of the ash to the existing ash pond.

Groundwater Monitoring Issues:

34. Groundwater monitoring results from other coal ash ponds in our state indicate [groundwater] problems and I note that the ash ponds here are located in the floodplain of the two tributaries going to Newton Lake. Has either Ameren or Illinois EPA been monitoring groundwater between those ash ponds and the tributaries to Newton Lake, and has groundwater been contaminated? Is there any evidence that there is a link between those ash ponds to Newton Lake through the groundwater?

**Response:** Four groundwater monitoring wells monitor the impoundment, one upgradient and three downgradient of the ash pond. Ameren has been monitoring that area's groundwater since the fall of 2010 and has provided to the Illinois EPA's BOW the results from five quarters of sampling. There are elevated concentrations of some constituents at the three downgradient wells based upon these data. (See also responses to questions #36 and #41.) Special Condition 25 has been added to the permit which requires groundwater monitoring and an assessment of impacts. It also includes requirements if additional impacts to groundwater are occurring.

35. The antidegradation assessment states that in January of 2009, Ameren installed an in-situ formed fiberglass liner on their existing discharge pipe from the secondary ash pond, and that the liner patched holes in the discharge pipe which slightly increased the flow to Outfall 001. Am I correct in understanding that this is the connection between the primary ash pond and secondary ash pond that the fiberglass liner was put underneath?

**Response:** Both the overflow pipe from the primary ash pond to the secondary ash pond and the discharge pipe from the secondary ash pond into Newton Lake were relined.

36. It sounds like there were losses of ash sluice water from the holes in the [ash pond connecting] pipes; is groundwater monitoring being done in that area to see what impact those losses might have had on groundwater?

**Response:** There is no groundwater monitoring well located near these pipes. The existing groundwater monitoring system is designed to monitor groundwater contamination from the site as a whole.

37. Are there active groundwater wells in the vicinity of Newton Lake?

**Response:** Ameren performed a potable well survey within 2,500 feet of their facility. There were eight community water supply wells within the area. Five private wells were definitely identified within the area, and another eight private wells were possibly within the area but locational data was insufficient. None were located downgradient of the ash pond.

38. Is there any reason why Illinois EPA can't prevent Ameren from moving more ash through the systems while this investigation is taking place? There's a lot of acreage out there. It seems like the ash could be held somewhere else other than pushed through those ash ponds while the Agency determines how bad a [groundwater] problem exists.

**Response:** This ash is a pollution control waste therefore its management as a non-hazardous special waste would be subject to Illinois EPA's Bureau of Land (BOL) regulation if the ash were stored in a waste pile rather than managed in the ash ponds. Storing dry ash on the ground surface would not be an improvement to the ash ponds. The ash ponds not only provide for storage of the ash, but also provide treatment -- extended settling time -- for the ash slurry. Dry ash stored in a temporary waste pile would be exposed to wind and stormwater and ultimately could enter Lake Newton.

The Agency's BOW evaluated Ameren's request for authorization to discharge increased loadings to the ash pond and based its decision on whether that proposal complied with Clean Water Act regulations.

39. Illinois EPA has one calendar quarter's worth of groundwater data that shows that there are exceedances of some constituents downgradient of the ash pond but has a permit out on public notice to increase the amount of ash that's going through those ash ponds and the loading of multiple constituents to the lake.

Prairie Rivers Network requests that this permit remain on public notice until the extent of groundwater problems has been completely investigated at those ash ponds so that current groundwater problems are not exacerbated by something permitted in the future.

**Response:** Groundwater impacts from the ash pond have been confirmed. Special Condition 25 has been added to the permit which requires groundwater monitoring and an assessment of impacts. It also includes requirements if additional impacts to groundwater are occurring.

40. What is the IEPA doing to prevent pollutants that are or will be in the ash pond from leaching into groundwater or from exceeding water quality standards at Newton Lake?

**Response:** Special Condition 25 has been added to the permit which requires groundwater monitoring and an assessment of impacts. It also includes requirements if additional impacts to groundwater are occurring.

We already have data on the surface water discharge to Newton Lake. There are additional metals monitoring requirements in the permit. There should be sufficient data once the discharge occurs that we can demonstrate that our assumptions on water quality are correct. The purpose of the additional monitoring is to have enough data to demonstrate there is not a reasonable potential to exceed water quality standards for other constituents.

41. Illinois' groundwater quality standards prohibit the release of any contaminant that causes an exceedance of a groundwater quality standard. 35 IAC 620.405. IEPA has evidence of exceedances of manganese and sulfate standards in the groundwater wells at Newton Station. This data suggests leakage from the ash ponds. Contamination of Newton Lake via groundwater flows from leaky ash ponds is also a real possibility given the fact that arms of the lake nearly surround the Ameren site.

Before the agency permits a two-fold increase in flow to these ponds, it should identify the source of the contamination through more rigorous monitoring. Quarterly monitoring, as proposed, is grossly deficient and will not allow for observation of seasonal and temporal variation or for achievement of statistical significance for years to come.

Monitoring should be designed to determine if contaminants are reaching the lake via groundwater. At a minimum, the agency should require monthly monitoring of groundwater and a delay or denial of permit reissuance until the data show no contamination.

**Response:** The Agency' BOW has received five quarters of groundwater data from the site. This data confirms that there are impacts to groundwater from the impoundment. Special Condition 25 has been added to the permit which requires groundwater monitoring and an assessment of impacts. It also includes requirements if additional impacts to groundwater are occurring.

The spatial and temporal variation of concentrations over four calendar quarters is adequate to reliably determine statistical background concentrations in order to assess groundwater and determine future actions that may be needed. For example, a T-table in a typical statistical analysis contains T values representative of four samples, which is similar to the quarterly monitoring we asked the facility to conduct. In addition, 35 IAC Section 742.410 (b)(C) refers to Appendix A, Table B which provides tolerance factors for as few as 3 samples for determination of area background.

42. We learned at the public hearing, that ash is currently disposed of in an onsite landfill managed by the Bureau of Land. We also learned that the landfill is operating under a groundwater management zone (GMZ) because it has contributed to contamination of underlying groundwater. According to IEPA's webpage on establishing groundwater management zones:

For a GMZ to be established, the groundwater within the proposed GMZ must be managed to mitigate impairment caused by the release of contaminants from a site. Source removal actions to prevent additional contamination from reaching groundwater must occur along with groundwater management.

<http://www.epa.state.il.us/land/regulatory-programs/permits-and-management/establishing-groundwater-management-zone.html>

Increasing the source materials at a site where a GMZ has been granted and is ongoing would appear to be inconsistent with this requirement.

**Response:** There are two landfill units at Ameren's Newton Station: Phase 1 and Phase 2. Phase 1 (site ID# 0798080002), has a GMZ established but, since 1996, has not accepted ash. Phase 1 has applied for closure. Phase 2 (site ID# 0798085001) is actively accepting ash but has had no releases to groundwater.

The GMZ at the Phase 1 unit was established to address impaired groundwater and requires corrective action activities at the ash landfill to mitigate groundwater impacts pursuant to agreement with the Illinois EPA's Bureau of Land (BOL). In the case of a landfill regulated by BOL, "source removal actions" typically means leachate removal or control of leachate generation. Releases of leachate are typically identified as the source of groundwater contamination at landfills. In other words, leachate removal is source removal, which is what Ameren is doing at its Phase 1 ash landfill.

35 IAC Section 620.250 a) defines the GMZ as "a three dimensional region containing groundwater being managed to mitigate impairment caused by the release of contaminants from a site:

- 1) That is subject to a corrective action process approved by the Agency; or
- 2) For which the owner or operator undertakes an adequate corrective action in a timely and appropriate manner and provides a written confirmation to the Agency. Such confirmation must be provided in a form as prescribed by the Agency.

- b) A groundwater management zone is established upon concurrence by the Agency that the conditions as specified in subsection (a) are met and groundwater management continues for a period of time consistent with the action described in that subsection.
- c) A groundwater management zone expires upon the Agency's receipt of appropriate documentation which confirms the completion of the action taken pursuant to subsection (a) and which confirms the attainment of applicable standards as set forth in Subpart D. The Agency shall review the on-going adequacy of controls and continued management at the site if concentrations of chemical constituents, as specified in Section 620.450(a)(4)(B), remain in groundwater at the site following completion of such action. The review must take place no less often than every 5 years and the results shall be presented to the Agency in a written report."

### **Issues Outside the Scope of this NPDES Permit Modification**

43. We noted that there were two sewage treatment plant discharges (at outfalls A01 and 003), but we didn't see any monitoring requirements or limits for fecal coliform. Is disinfection happening at those two discharges?

We would like to see that disinfection is taking place at both those outfalls or that there's a demonstration that there aren't going to be exceedances of the fecal coliform levels of concern considering there is contact recreation at Newton Lake.

Ameren is discharging undisinfected sewage into the lake and must disinfect the waste stream in order to protect the existing recreational uses of the lake.

**Response:** Disinfection exemptions were effective for Outfalls A01 and 003 on February 5, 1998 and January 6, 1994 respectively, which is why there are currently no fecal coliform limitations for these effluents. This permit modification did not affect the disinfection exemption, but it will be reviewed as part of the separate permit renewal.

44. Outfall 002 looks like it's in the middle of a long channel. Why is outfall 002 located where it is? It looks like the actual release of the cooling water is going to be much further upstream and closer to the plant. Is there something special about that location?

**Response:** The Outfall 002 location was correctly identified on the map contained in the public notice/fact sheet. However, the coordinates noted on page 2 of the public notice/fact sheet have been changed to more accurately reflect the actual outfall location. The corrected Outfall 002 coordinates are 38°56'29" North and 88°18'25" West.

45. Temperature and total residual chlorine monitoring at outfall 002 is continuous; where is the actual monitoring of temperature taking place? Special Condition 8 provides a 26 acre mixing zone for temperature.

**Response:** Temperature monitoring for Outfall 002 occurs in Lake Newton at the edge of the regulatory mixing zone described in Special Condition 8.

46. I know that this is a reservoir so it's flooded streams, but that section, that segment of what's called a lake where Outfall 002 is located looks much more like a stream environment, so it could be inhabited by mussels. Has a mussel survey has been done anywhere in that region?

**Response:** Illinois EPA is not aware of mussel surveys in the upper regions of Newton Lake.

47. Maybe this is a leftover from the last permit, but Special Condition 5 authorizes additional temporary supplemental cooling towers to be built; have any been built?

**Response:** The intent of Special Condition 5 was a construction authorization to allow Ameren to add supplemental cooling towers if needed. There have not been any supplemental cooling towers constructed in the last five years.

48. This permit expires January 31, 2012. This hearing is about the modifications you have described. Will there be another permit action for the renewal?

**Response:** We will have another permit process for the permit renewal with an additional period for public participation.

### **Distribution of Responsiveness Summary**

An announcement of the NPDES permit decision and the availability of the responsiveness summary has been sent to all who registered at the hearing and to all who provided written comments. The Responsiveness Summary has been posted on the Illinois EPA web site at: <http://www.epa.state.il.us/public-notices/npdes-notices.html#ameren-newton>. Printed copies of this responsiveness summary are available from Illinois EPA Hearing Officer Dean Studer (217-558-8280).

**For Further Information:**

**Illinois EPA Bureau of Water Hearing Panel:**

NPDES technical issues..... Brian Cox..... 217-782-0610  
NPDES legal issues ..... Stefanie Diers..... 217-782-5544  
Surface water quality issues ..... Bob Mosher ..... 217-782-3362  
Groundwater quality issues..... Amy Zimmer ..... 217-557-3181  
Public hearing issues..... Dean Studer ..... 217-558-8280

**Illinois EPA Bureau of Land:**

Landfill issues..... Chris Liebman ..... 217-524-3294



## Acronyms and Abbreviations

|        |  |
|--------|--|
| BOD    | Biochemical oxygen demand  |
| COD    | Chemical oxygen demand   |
| CFR    | Code of Federal Regulations  |
| DMR    | Discharge Monitoring Report  |
| IDNR   | Illinois Department of Natural Resources   |
| IEPA   | Illinois Environmental Protection Agency   |
| ILCS   | Illinois Combined Statutes   |
| IAC    | Illinois Administrative Code   |
| mg/L   | milligrams per liter   |
| MGD    | Million Gallons per Day  |
| NPDES  | National Pollutant Discharge Elimination System                                  |
| pH     | A measure of acidity or alkalinity of a solution                                 |
| TDS    | total dissolved solids   |
| TMDL   | total maximum daily load   |
| TSS    | total suspended solids   |
| 303(d) | Section of federal Clean Water Act dealing with surface water quality standards. |
| 7Q10   | Lowest continuous seven-day flow during a 10-year period.                        |