ILLINOIS POLLUTION CONTROL BOARD
October 7, 2010

IN THE MATTER OF:	)	
	)	
AMEREN ASH POND CLOSURE RULES	)	R09-21
(HUTSONVILLE POWER STATION):	)	(Rulemaking - Land)
PROPOSED 35 ILL. ADM. CODE PART	)	
840.101 THROUGH 840.152	)	

Proposed Rule. First Notice.

OPINION AND ORDER OF THE BOARD (by A.S. Moore):

Ameren Energy Generating Company (Ameren) originally filed a proposal for a site-specific rule with the Board on May 19, 2009. Ameren sought adoption of standards under which it could close Ash Pond D, a surface impoundment managing coal combustion waste at Ameren's Hutsonville Power Station (Station) located near Hutsonville, Crawford County. After the Illinois Environmental Protection Agency (Agency or IEPA) responded to that proposal by offering various revisions, Ameren and the Agency on September 22, 2009, submitted a joint rulemaking proposal.

For the reasons described in this opinion, the Board today submits the joint proposal without significant substantive amendments to first notice publication in the *Illinois Register*. The Board's order directs the Clerk to cause publication of the Board's proposal, which commences a 45-day public comment period. The Board's first-notice proposal includes requirements for a final cover system for Ash Pond D, a groundwater monitoring system and program, a groundwater collection trench to address off-site impacts, and various procedures for Agency oversight of the closure process.

GUIDE TO THE BOARD'S OPINION AND ORDER

In this opinion and order, the Board first provides at pages 2-4 the procedural history before addressing two preliminary issues at pages 5-7. The Board then summarizes at pages 7-16 the background of the Hutsonville Station, including its history and operation, site geology, groundwater flow, existing groundwater monitoring network, groundwater impacts, groundwater use at and near the Station, groundwater modeling, surface water, and regulation of coal combustion waste surface impoundments. Next, the Board addresses at pages 16-33 various closure options, including their projected costs and environmental impacts. The Board then summarizes at pages 33-45 its January 7, 2010 order requesting more information and the responses to that order filed by Ameren and the Agency. The Board next discusses at pages 45-70 contested issues including the description of the area affected, the projected environmental impact of the joint proposal, requirements of federal law, the Agency's request for a temporary moratorium on additional site-specific rules of this nature, and the technical feasibility and economic reasonableness of closure alternatives. The Board then undertakes a section-by-section summary of the Board's first-notice proposal at pages 70-113. The Board at page 113

then directs the Clerk to cause first notice publication of the Board's proposal in the *Illinois Register*. The proposal itself appears in the Board's order at pages 113-40.

PROCEDURAL HISTORY

On May 19, 2009, Ameren filed its original proposal for site-specific regulation (Orig. Prop.) addressing the closure of Ash Pond D at the Station. Both a Statement of Reasons (SR) and a Technical Support Document (TSD) accompanied the original proposal. Also on May 19, 2009, Ameren filed a motion to waive signature requirements and a motion for expedited review. On June 1, 2009, the Agency filed its response opposing Ameren's motion for expedited review. On June 3, 2009, Ameren filed a motion for leave to file a reply in support of its motion for expedited review, accompanied by its reply. In an order dated June 18, 2009, the Board accepted Ameren's proposal for hearing, granted Ameren's motion to waive signature requirements, granted Ameren's motion for leave to file a reply, and denied Ameren's motion for expedited review.

In a letter dated June 30, 2009, the Board requested that the Department of Commerce and Economic Opportunity (DCEO) conduct an economic impact study of Ameren's site-specific rulemaking proposal. *See* 415 ILCS 5/27(b) (2008). DCEO has not responded to this request.

In an order dated June 30, 2009, the hearing officer scheduled a hearing beginning September 29, 2009, in Robinson, Crawford County. The order also set deadlines of August 18, 2009, for pre-filing testimony; September 1, 2009, for pre-filing questions; and September 15, 2009, for pre-filing answers to those questions. On August 18, 2009, Ameren pre-filed the testimony of Mr. Michael F. Bollinger (Bollinger Test.).

On August 18, 2009, the Agency pre-filed its proposed amendments to Ameren's proposed regulations (Agency Prop.) and testimony by Mr. William E. Buscher (Buscher Test.), Mr. Lynn E. Dunaway (Dunaway Test.), Mr. Richard P. Cobb (Cobb Test.), Mr. Christian J. Liebman (Liebman Test.), and Mr. Stephen F. Nightingale (Nightingale Test.). On the same date, the Agency filed a motion for waiver of filing requirements, which the Board granted on October 1, 2009.

On September 1, 2009, Prairie Rivers Network (PRN) pre-filed questions (PRN Questions) addressed separately to Ameren with regard to its Statement of Reasons, to Mr. Bollinger specifically with regard to his pre-filed testimony, to the Agency generally with regard to its pre-filed proposed amendments, and to Mr. Nightingale specifically with regard to his pre-filed testimony. Also on September 1, 2009, Ameren filed a motion for extension of time to pre-file questions and answers. In an order dated September 10, 2009, the hearing officer granted Ameren's motion for an extension, extending the deadline to pre-file questions to September 15, 2009, and the deadline to pre-file answers to September 22, 2009.

On September 22, 2009, the Agency and Ameren filed a joint rulemaking proposal (Joint Prop.)[1] accompanied by a joint statement (Joint Statement). Also on September 22, 2009, the Board received responses to the questions pre-filed by PRN from both the Agency (Agency Resp.) and Ameren (Ameren Resp.).

The hearing took place as scheduled on September 29, 2009. The Board received the transcript of the hearing (Tr.) on October 9, 2009. During the hearing, the hearing officer admitted eights exhibits into the record:

Pre-Filed Testimony of Michael Bollinger (Exh.1);
Pre-Filed Testimony of Richard P. Cobb, P.G., on Ameren's Proposal and the Agency's Proposed Amendments to Sections 840.116 and 840.118 (Exh. 2);
Pre-Filed Testimony of Stephen F. Nightingale on Ameren's Proposal, the Agency's Proposed Amendment at Section 840.152, and Request to Board to Consider Temporary Moratorium on Additional Site-Specific Rules for Closure of Coal Combustion Waste Surface Impoundments (Exh. 3);
Pre-Filed Testimony of Christian J. Liebman on Ameren's Proposal and the Agency's Proposed Amendments to Sections 840.124 through 840.130, 840.134, 840.136 and 840.146 (Exh. 4);
Pre-Filed Testimony of William E. Buscher, P.G., on Ameren's Proposal and the Agency's Proposed Amendments to Sections 840.100 through 840.106, 840.120 through 840.122, 840.132, and 840.138 through 840.150 (Exh. 5);
Pre-Filed Testimony of Lynn E. Dunaway, P.G., on Ameren's Proposal and the Agency's Proposed Amendments to Sections 840.110 through 840.114 (Exh. 6);
Joint Statement in Support of Proposed Revisions (Exh. 7); and
Joint Revisions to Proposed Part 840 (Exh. 8). *See* Tr. at 18, 20.

On October 23, 2009, the Board received post-hearing comments from the Agency (PC 2). On October 30, 2009, the Board received post-hearing comments from PRN (PC 3) and from Ameren (PC 4).

On November 10, 2009, Ameren filed a motion for leave to file additional comment accompanied by its additional post-hearing comment (PC 5). In an order dated November 13, 2009, the hearing officer granted Ameren's motion. The order allowed any participant to file a response to the post-hearing comments filed during the period ending October 30, 2009, or to the

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[1] Although Ameren's original proposed regulations included Sections 840.100 through 840.144, both the Agency's proposed amendments and the subsequent joint proposal include additional Sections 840.146, 840.148, 840.150, and 840.152. The Board has amended the caption in this proceeding to reflect that Ameren and the Agency have jointly proposed these additional provisions.

Also, Ameren in its post-hearing comment states that, although the joint proposal amended some of the details of its original proposal, it did not change "the conceptual framework and general approach." PC 4 at 4. Ameren further stated that the TSD, its own testimony, and the Agency's testimony "provide the technical support for the joint proposal." *Id*.

additional comment allowed in the order by November 30, 2009. On November 30, 2009, PRN filed additional comments (PC 6).

In an order dated January 7, 2010, the Board addressed issues raised in those post-hearing comments and directed Ameren to submit additional information. The Board directed Ameren as the original proponent to submit both specified groundwater quality monitoring data and an environmental impact assessment of the proposed discharge into the Wabash River. On February 22, 2010, Ameren filed its response to the Board's request for more information (Ameren Info.). On February 26, 2010, Ameren filed a supplemental response (Ameren Supp. Info.) On March 9, 2010, the Agency filed a motion for leave to file a response to the Board's order of January 7, 2010 (Mot. Leave), accompanied by its response to that order (Agency Info.).

On July 6, 2010, the Board received a public comment on coal ash from Peter Illyn, Executive Director of Restoring Eden, and James Ennis, Executive Director of the National Catholic Rural Life Conference (PC 7).

On July 28, 2010, Ameren filed motion to adopt the joint proposal for first notice (Mot. Adopt).

Filing Public Comments

First-notice publication of these proposed amendments in the *Illinois Register* will start a period of at least 45 days during which any person may file a public comment with the Board, regardless of whether the person has already filed a public comment. *See* 5 ILCS 100/5-40(b) (2008) (Illinois Administrative Procedure Act). The Board encourages persons to file public comments on these proposed amendments. The docket number for this rulemaking, R09-21, should be plainly indicated on the public comment.

Public comments must be filed with the Clerk of the Board. Public comments may be filed at the following address:

Pollution Control Board
John T. Therriault, Assistant Clerk
James R. Thompson Center
100 W. Randolph Street, Suite 11-500
Chicago, IL 60601

Public comments may be filed electronically through the Board's Clerk's Office On-Line, or COOL, at www.ipcb.state.il.us. Questions about electronic filing through COOL should be directed to the Clerk's Office at (312) 814-3629.

Please note that all filings with the Clerk of the Board must be served on the hearing officer and on those persons on the Service List for this rulemaking. Before filing any document with the Clerk, please check with the hearing officer or the Clerk's Office to verify the most recent version of the Service List.

PRELIMINARY ISSUES

Agency Motion for Leave

Summary

On March 9, 2010, the Agency filed a motion for leave to file a response to the Board's order of January 7, 2010. The Agency noted that the Board's order directed Ameren "to provide additional information concerning environmental impacts from contaminated groundwater to irrigation wells on agricultural property south of the Hutsonville facility and on environmental impacts to the Wabash River from the discharge of contaminated groundwater from the proposed groundwater collection system." Mot. Leave at 1. The Agency also noted the Board's statement that the information "would be helpful in evaluating the alternative options for the management of contaminated groundwater. . . ." *Id.*, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station): Proposed 35 Ill. Adm. Code 840.101-840.144, slip op. at 4 (Jan. 7, 2010). The Agency stated that Ameren filed a response on February 22, 2010, and a supplemental response on February 26, 2010. Mot. Leave at 1.

Although the Agency professes to be "uncertain of the Board's intention concerning the additional information," it notes PRN's argument that

> the proposal cannot be adopted consistent with 35 Ill. Adm. Code 102.210(d) because Ameren has not provided sufficient information to characterize the impact of off-site groundwater contamination to irrigation wells and the environmental impact of the discharge of contaminated groundwater to the Wabash River from the collection system must be submitted to an antidegradation analysis in this proceeding. Mot. Leave at 1-2, citing PC 6 at 10-2

The Agency states that it "disagrees with both assertions by PRN." Mot. Leave at 2.

The Agency argues that it "testified to its general conclusions as to the extent and effects of off-site groundwater contamination based on independent analysis of information contained in the Technical Support Document." Mot. Leave at 2. The Agency adds that it "did not provide an explanation of the underlying analysis leading to those conclusions and believes the attached explanation now might provide an additional level of assurance that the potential for off-site impacts to irrigation wells has already been considered." *Id*.

The Agency also adopts the position "that conducting an antidegradation analysis of discharge options for contaminated groundwater in this proceeding would be premature." Mot. Leave at 2. The Agency argues that "[t]he proposed rule provides a mechanism for conducting the analysis, if necessary, at the appropriate time under applicable legal procedures." *Id*. The Agency further argues that "Section 102.210(d) does not require the analysis in this proceeding." *Id*.; *see* 35 Ill. Adm. Code 102.210(d).

The Agency cites the Board's procedural rules that "a participant's comment will not be considered if filed outside a comment period unless allowed by the hearing officer or the Board

to prevent material prejudice." Mot. Leave at 2, citing 35 Ill. Adm. Code 102.108(d). The Agency claims "that the concerns raised by PRN already have been addressed and accounted for in the record and proposal." Mot. Leave at 2. The Agency further argues that "[t]he additional information and procedures advocated by PRN will unnecessarily prolong the proceeding and consume scarce resources." *Id*. The Agency concludes by seeking leave to file the response accompanying its motion "to prevent material prejudice to the Agency's interest in a thorough and efficient proceeding that does not unnecessarily consume scarce resources." *Id*. at 3.

Board Discussion and Decision on Motion

Section 100.500(d) of the Board's procedural rules provides in pertinent part that, "[w]ithin 14 days after service of a motion, a party may file a response to the motion. If no response is filed, the party will be deemed to have waived objection to the granting of the motion, but the waiver of objection does not bind the Board or the hearing officer in its disposition of the motion." 35 Ill. Adm. Code 101.500(d). The Board has received no response to the Agency's motion for leave to file a response to the Board's order of January 7, 2010.

Having reviewed the Agency's motion and in the absence of any opposition to it, the Board under the circumstances of this case grants the motion for leave and accepts into the record of this proceeding the Agency's accompanying response to the Board's order of January 7, 2010.

Ameren Motion to Adopt Joint Proposal for First Notice

Summary

Ameren states that it has discussed standards for closing Ash Pond D with the Agency "[f]or more than a decade." Mot. Adopt at 1. Ameren notes that it originally sought adoption of such standards by filing a petition for an adjusted standard from the Board's landfill regulations. *Id*., citing Petition of Ameren Energy Generating Company for Adjusted Standards from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS9-1 (Aug. 11, 2008). Ameren further notes that the Board in that adjusted standard proceeding determined that site-specific rulemaking is the more appropriate mechanism through which to propose standards for closing Ash Pond D. Mot. Adopt at 1-2, citing Petition of Ameren Energy Generating Company for Adjusted Standards from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS9-1, slip op. at 11-12 (Mar. 5, 2009).

Ameren states that it filed a proposal for a site-specific rule with the Board on May 19, 2009. Mot. Leave at 2. Ameren further states that discussion of that proposal with the Agency culminated on September 22, 2009, in the submission of a joint proposal "supported by both Ameren and the Agency." *Id*. After reviewing the procedural history of that joint proposal, Ameren states that "[t]he record has been complete since March 9, 2010," and expresses the belief that "all technical and factual issues have been resolved and that there are no outstanding disputed issues to the resolved by the Board." *Id*. at 2-3. While acknowledging "the Board's heavy docket and resource constraints," Ameren states that closing Ash Pond D requires adoption of the regulatory approach embodied in the joint proposal. *Id*. at 3. Concluding,

"Ameren respectfully requests that the Board accept this proposed rulemaking and adopt it for first-notice publication in the *Illinois Register* as soon as possible so the parties may move toward second notice and final adoption as expeditiously as possible." *Id*. at 3. Ameren reports that "the Agency does not object to this motion." *Id*.

Board Discussion and Decision on Motion

Section 100.500(d) of the Board's procedural rules provides in pertinent part that, "[w]ithin 14 days after service of a motion, a party may file a response to the motion. If no response is filed, the party will be deemed to have waived objection to the granting of the motion, but the waiver of objection does not bind the Board or the hearing officer in its disposition of the motion." 35 Ill. Adm. Code 101.500(d). The Board has received no response to Ameren's July 28, 2010 motion to adopt the joint proposal for first notice.

However, based upon its conclusion below to submit the joint proposal without significant substantive amendment to first notice publication and its order below directing the Clerk to cause publication of the Board's proposal, the Board denies Ameren's motion as moot.

BACKGROUND ON STATION

History and Operation of Station

Ameren[2] generates electricity at the Station, which is located on a site approximately 205 acres in size along the Wabash River near Hutsonville. SR at 7; *see* TSD at 2 (Site Location Map). The Station includes "a variety of physical and operational features such as the power house building, transmission lines and substations, security fencing, coal yards, access roads, storage and parking lots, piping systems, and a series of impoundments." Bollinger Test. at 2. "The Wabash River forms the eastern border of the Hutsonville Power Station site, while farmland comprises the southern and western borders. The northern border is undeveloped, wooded land." SR at 7. The Station employs 58 persons. *Id*. at 8. The nearest residence to the Station is approximately one-half mile from it. *Id*. at 7.

Electric generating equipment at the Station "includes two coal-fired boilers for steam production and steam-driven turbine generators." SR at 7. The Station also includes a circulating water system that draws water from the Wabash River for use in the boiler and turbine equipment. *Id*. The system removes ash, a byproduct of coal combustion, from the boilers and then sluices it through pipelines to an ash impoundment system. *Id*. at 8. That system consists of a series of ponds in which solids settle and sluicewater "decants from pond to pond before discharging to the Wabash River via an NPDES [National Pollutant Discharge Elimination System] permitted outfall." *Id*.; *see* TSD at 4 (Site Plan), 14 (Background); *see also*

[2] "Ameren Corporation was formed following the 1997 merger of Union Electric Company and Central Illinois Public Service Company ("CIPS")." SR at 2; *see* Bollinger Test. at 2. The Hutsonville Station "is now owned by Ameren Energy Generating Company, a non-rate regulated generating company that is a subsidiary of Ameren Energy Resources. All of the Ameren companies are subsidiaries of Ameren Corporation." SR at 2 n.1.

Bollinger Test. at 3. The surface impoundment system accepts coal combustion waste including both bottom ash and fly ash, low-volume waste consisting of demineralizers and boiler blow-down, and sanitary wastewater. SR at 8; *id*. n.4.

The joint proposal addresses an unlined ash impoundment designated as "Pond D." SR at 8; TSD at 14. Pond D was constructed from indigenous earthen materials and operated as the Station's primary ash management unit from 1968 until the construction of a synthetically-lined Pond A during the 1980s. SR at 8; TSD at 14. In 2000, Ameren constructed two additional lined ponds, Ponds B and C. SR at 8. Ameren then removed Pond D from service and allowed it to dewater. *Id*. Pond D is no longer covered by Water Pollution Control Permit number 2005-EO-3689. *Id*. n.6. From wells near Pond D, Ameren has been monitoring groundwater for constituents including boron since 1999. Bollinger Test. at 3.

Ameren estimates that, during 30 years of active operation, Pond D accumulated approximately 750,000 cubic yards of ash. SR at 9. Ameren further estimates that 280,000 cubic yards, or approximately one-third of that volume, lie below the water table. *Id*., citing TSD at 16, 75, 194-96, 215, 517. Ameren states that "the Agency approved the addition of approximately 200,000 cubic yards of ash to Ash Pond D after it was taken out of service to enable the establishment of an acceptable final grade." SR at 9.

Site Geology

In his pre-filed testimony on behalf of Ameren, Mr. Bollinger stated that, as part of its evaluation of Ash Pond D, it "retained the services of a hydrogeologist, Bruce Hensel, formerly of STMI and now employed by Natural Resources Technology "NRT," to perform a variety of technical assessments and field tasks consistent with the norms and professional practices of such assessments." Bollinger Test. at 5. Mr. Bollinger reports that Mr. Hensel conducted this assessment in 1998-99 in part to characterize the geology of the site. *Id*. at 6; *see* TSD at 16, 193-96. The TSD indicates that "[a]dditional field investigation was performed in 2001 and 2004. . . ." TSD at 16.

Four hydrostratigraphic units comprise the geology of the site. SR at 9. First, "[t]he upland portion of the power plant property and the western portion of Pond D, are underlain by a thin (less than 20 feet thick) layer of sand-rich soil, which is underlain by Pennsylvanian-age sandstone and then shale." TSD at 16, citing *id*. at 32 (Figure 2-1, Geologic Cross Section A-A'); *see id*. at 193, 542-43. This unit has "a combined thickness that is typically between 15 and 35 feet." SR at 9. Ameren states that "[t]he western portion of Ash Pond D overlies the upland sand." *Id*.

Second, there are "unlithified fine-grained alluvial sediments within the Wabash River bedrock valley that are approximately 20 feet thick." SR at 9, citing TSD at 32 (Figure 2-1, Geologic Cross Section B-B'). Ameren reports that "[t]he eastern portion of Ash Pond D overlies the fine-grained alluvium in the Wabash River Valley." SR at 9. This alluvium consists chiefly of "silt and clay with thin sand lenses." TSD at 17; *see id*. at 193-94, 543.

The TSD states that "[t]he shallow upland sand and sandstone, and sand lenses in the fine-grained alluvium, are referred to as the upper migration zone, and constitute the uppermost aquifer at this site." TSD at 17; *see* SR at 9, citing TSD at 32, 215; *see id*. at 543.

Third, there are "coarse-grained alluvial sediments within the Wabash River bedrock valley that are as much as 70 or more feet thick." SR at 9; *see* TSD at 17, 32, 543. "[S]and and gravel" comprise this coarse-grained alluvium. TSD at 17. The TSD indicates that "[t]he coarse-grained alluvium is referred to as the deep alluvial aquifer." *Id*.; *see* SR at 9, citing TSD at 32, 215. It further states that "[t]his aquifer is not present beneath most of the site, including the power plant, Ponds A, B, and C, and the northern and western portions of Pond D." TSD at 17.

Fourth, there exists "Pennsylvanian-age shale that underlies the sandstone in the upland area and the coarse-grained alluvium in the bedrock valley." SR at 9; *see* TSD at 17, 193. The TSD states that "[t]he shale underlying the upland sandstone and the silts and clays of the fine grained alluvium separate the upper migration zone from the deep alluvial aquifer." TSD at 17, 543. Ameren states that "[t]he fine-grained alluvial deposits overlying the deep alluvial aquifer occur over an elevation range that overlaps the upland shale . . ., combining to form a confining layer that restricts vertical migration of groundwater between the upper migration zone and deep alluvial aquifer." SR at 10, citing TSD at 16-17, 32; *see id*. at 543.

Groundwater Flow at the Station

The TSD states that "[g]roundwater flow was mapped for four consecutive quarters during which complete sample sets were available." TSD at 17. The TSD acknowledges that "depth to water readings for all of the upper migration zone and one of the deep alluvial aquifer maps were not collected on the same day during this period. While this discrepancy did not appear to change map depictions of the overall direction of groundwater flow, it affected relative readings between wells." *Id*. When same date measurements began in 2006, NRT produced a second set of maps based on the new data. *Id*. Those maps show that, in both the upper migration zone and in the deep alluvial aquifer, groundwater flow at the Station is eastward toward the Wabash River. SR at 10; TSD at 17, 33-48 (Figures 2-2 through 2-17); *see also id*. at 197-99, 543.

Existing Groundwater Monitoring Network

In his pre-filed testimony, Mr. Bollinger stated that, "[s]ince 1984 and as part of requirements set forth in the Station's Operating permit(s), Ameren has monitored groundwater quality at the Station through a monitoring well network." Bollinger Test. at 8; *see* SR at 10, citing TSD at 4 (Site Plan), 17, 59 (Table 2-5 Monitoring Well Programs, Monitored Aquifers, and Positions Relative to Pond D); *see also* PC 4 at 4. Mr. Bollinger indicates that Ameren has since that time monitored "for the following constituents: boron, iron, sulfate, manganese, pH, and TDS." Bollinger Test. at 9. At hearing, Mr. Bollinger clarified that this monitoring began in 1984 with "a very limited set of five wells, and it was targeted at pond A at the site and it was part of the construction permit for pond A. . . ." Tr. at 53. He further stated that, "[i]n 1998, 2001 and 2004 Ameren installed additional groundwater monitoring wells in order to define

groundwater impacts associated with Pond D." Bollinger Test. at 8. The TSD reports that there are 13 monitoring wells screened in the upper migration zone, six of which are monitored for Ash Pond D and four of which are downgradient from it. TSD at 17, citing *id*. at 4, 59. In addition, the TSD notes that there are five monitoring wells screened in the deep alluvial aquifer, all of which are monitored for Pond D. *Id*. at 16, 59.

Mr. Bollinger's testimony notes that "[t]wo wells (MW-1 and MW-10) provide upgradient data for the upper migration zone." Bollinger Test. at 8. He argues that "[t]here are no upgradient wells finished in the deep alluvial aquifer because there are no suitable locations on Ameren's property for such wells." *Id.* The TSD summarizes results of the analysis of groundwater quality in monitoring wells. TSD at 205-07; *see id*. at 222 (Figure 10), 224-29 (Figures 12-17), 237 (Table 7: Groundwater Concentration Results from Monitoring Wells Compared to Coal and Ash Thickness).

The TSD reports that, "[f]rom August 25-29, 1998, soil and groundwater samples were collected at 23 locations across the site using direct-push sampling methods." TSD at 186; *see id*. at 213 (Site Plan). Ameren performed this sampling for purposes including gauging groundwater quality. *Id*. at 186-87. Mr. Bollinger stated that, because of the potential for off-site migration of contaminants, Ameren obtained "direct-push (Geoprobe) samples downgradient of Ash Pond D in the actively farmed agricultural field immediately south of the property line." SR at 11, citing TSD at 4 (Site Plan), 231 (Direct-Push Sampling Data), 236 (Monitoring Well Slug Test Results); *see* Bollinger Test. at 8. The TSD summarizes results of the analysis of the direct-push groundwater samples. TSD at 202-04; *see id*. at 292-319 (Water Analysis Reports).

Groundwater Impacts

Ameren reports that its existing groundwater monitoring network reveals that "groundwater impairments associated with Ash Pond D are generally localized to the area adjacent to and south of the pond." SR at 10; *see* Bollinger Test. at 5; *see also* TSD at 4 (Site Map). Ameren states that ash leachate impacts appear "within the upper migration zone immediately downgradient and adjacent to Ash Pond D." SR at 10, citing TSD at 17-18 (Groundwater Quality), 49 (Box Whisker Plots for boron and sulfate), 60-72 (Groundwater Monitoring Results). Specifically, the TSD indicates that boron and sulfate concentrations in Pond D monitoring wells MW6, MW7, MW8, and MW11R are higher than Class I groundwater quality standards. TSD at 18, citing TSD at 49, 60-72; *see* 35 Ill. Adm. Code 620.410 (Class I standards); TSD at 205-06 (Groundwater Results), 543 (Groundwater Quality); SR at 11.

Because monitoring wells along the southern boundary of the Station property show the possibility of off-site migration, Ameren reports that it "investigated the extent of any offsite groundwater plume by obtaining direct-push (Geoprobe) samples downgradient of Ash Pond D in the actively farmed agricultural field immediately south of the property line." SR at 11, citing TSD at 4 (Site Plan), 231, 236 (results from direct push samples). The TSD reports that "[o]ff-site (south of the impoundment) boron concentrations were less than one-fifth the groundwater standard, and sulfate concentrations were less than one-third the standard." TSD at 202. The TSD further reports that "[m]anganese was less than one-tenth the standard at the five off-site

probe hole locations south of the impoundments, but was above the standard in off-site boring GP-14 (0.93 mg/L), located southeast of the impoundments." *Id*. at 203; *see id*. at 236.

The TSD states that "[g]roundwater within the deep alluvial aquifer complies with Class I groundwater quality standards and reflects only nominal impacts from Pond D in only one of five wells." TSD at 18; *see id*. at 543; SR at 12-13. Ameren acknowledges that "[s]ampling from one monitoring well, MW 14, immediately southeast of Ash Pond D reflects level of boron and sulfate above background concentrations." SR at 13, citing TSD at 17-18, 51-52 (Box Whisker Plots), 68-72 (monitoring results), 236, 426-28. Ameren states that these concentrations of boron and sulfate nonetheless comply with Class I groundwater standards. SR at 13. Ameren further states that "elevated concentrations of manganese in MW 14 are consistent throughout the deep alluvial aquifer and are attributable to natural geochemical conditions. . . ." *Id*., citing TSD at 426-28 (Naturally Occurring Manganese Concentrations in the Deep Alluvial Aquifer at Hutsonville). The TSD also states that "[t]he lack of significant groundwater impacts in the deep alluvial aquifer after more than 40 years of Pond D operation provides further evidence that the silts and shales separating the upper migration zone from the deep alluvial aquifer are an effective confining layer." *Id*.; *see id*. at 543.

In his pre-filed testimony, Mr. Cobb noted that potentiometric surface maps (MW-7 and MW-7D) and groundwater quality data (MW-14) indicate hydraulic connection between the upper and lower migration zones in some areas. *See* Cobb Test. at 7. The Agency requested that Ameren perform enriched tritium analysis on one sample taken from monitoring wells MW-7D, MW-14, MW-115D, MW-115S, and MW-121 in order to confirm whether the upper and lower migration zones are hydraulically connected in some areas. *Id*. n.4; PC 4, Exh. 3. Mr. Cobb elaborated that "[t]ritium concentrations in groundwater provide a useful method for determining the degree of confinement of the aquifer." Cobb Test. at 7 n.4. Mr. Cobb stated that five to ten tritium units (TU) is estimated to be the naturally occurring tritium level in rainwater. *Id*. Mr. Cobb further stated that, as a result of earlier atmospheric nuclear testing, "groundwater systems which have been recharged since the early 1950s will contain tritium levels at, or significantly above, the natural 'pre-bomb' background concentrations and are considered 'unconfined.'" *Id*.

Addressing tritium analysis performed by Ameren, Mr. Cobb emphasized the results from MW-14, as other wells could reflect tritium from the Wabash River "because of the changing elevation of the river stage." Tr. at 82. The analysis of MW-14 measured 4.00 tritium units. PC 4, Exh. 3. Mr. Cobb observed that the tritium concentration in MW-14 supports the Agency's position that the deep alluvial aquifer is hydraulically connected to the fine-grained alluvium in some areas of the site. Tr. at 82. Based on this finding, Mr. Cobb argues that the uppermost aquifer must include the deep alluvial aquifer in evaluating off-site impacts to the south and southeast of Adh Pond D. In this regard, Ameren agreed to comply off-site with the numeric Class I Groundwater Quality standards within the upper zone of the underlying aquifer and the nondegradation standards within the lower zone of the underlying aquifer. Joint Statement at 5.

Groundwater Use

Ameren reports that "[g]roundwater usage near the Station is limited." SR at 13. A search of the Illinois State Geological Survey (ISGS) database revealed six wells within a half-mile radius of the Station. *Id*.; TSD at 200 (Nearby Groundwater User), 482-84 (Potable Well Search). Two of these six are plant production wells. SR at 13; TSD at 200, 482-84. The remaining four are irrigation wells used by adjacent property owners. SR at 14; TSD at 482-84. Ameren states that all six of these wells pump from the deep alluvial aquifer, which complies with Class I Groundwater Quality standards. SR at 14. Ameren concludes that "Ash Pond D does not pose a risk to downgradient irrigation or production wells." *Id*.

Ameren notes that the City of Hutsonville relies upon groundwater drawn from the deep alluvial aquifer approximately one mile south of Ash Pond D for its public water supply. SR at 14. Ameren argues that, "[c]onsidering the relatively large distance to the City's wells, the observed easterly groundwater flow direction in the deep alluvial aquifer at the site, and the fact that only one monitoring well (located at the edge of Ash Pond D) in this aquifer has experienced nominal ash leachate impacts, the City wells are not likely to ever be impacted by leachate from Ash Pond D." *Id*.

When extended beyond the half-mile radius, the search found three wells servicing residences northwest of the Station and a single well serving a residence to the west of it. TSD at 483. Accordingly, the TSD states that "[t]here are no potable wells drawing groundwater from the upper migration zone downgradient or sidegradient of Ash Pond D." *Id*. The TSD further states that nearest residence to the south of the Station connects to the City of Hutsonville's public water supply. *Id*.; TSD at 483. Ameren notes that it "is establishing appropriate groundwater use restrictions for the site." SR at 14. In addition, Ameren states that "the adjacent property owner has agreed to certain use restrictions for the portion of the property that has been impacted by Ash Pond D." *Id*.; *see* TSD at 538-40 (Letter of Agreement for Restriction of Shallow Water Well Drilling).

In a question pre-filed for hearing, PRN noted that "[t]he City of Hutsonville's public water supply wells draw groundwater from the deep alluvial aquifer approximately one mile south of Ash Pond D." PRN Questions at 1 (¶3). PRN asked Ameren to "describe what effort has been made to determine whether these wells are experiencing any impact from Ash Pond D's operation?" *Id*. Ameren responded that it had "installed temporary wells across the river in Indiana and along the river south of the plant (located between Pond D and the City of Hutsonville's water well intake point). Water quality sampling from these wells complied with Class I Groundwater Quality Standards as do samples from <u>all</u> the deep wells located on Ameren's property." Ameren Resp. at 2 (emphasis in original). Ameren argues that, "[s]ince sampling from all of the deep wells performed over the course of a decade reflects compliance with water quality standards and groundwater flows toward the Wabash River, there is no reason to believe that Hutsonville's drinking water wells are impacted from Pond D." *Id*.

<u>Groundwater Modeling</u>

Ameren states that it "used a calibrated groundwater flow and transport model, in conjunction with information gained from some temporary push wells, to predict the extent of the impact to groundwater on the neighboring property." SR at 11; *see* Bollinger Test. at 6; PC 4

at 4. Modeling compared "existing 'in service' boron concentration and distribution levels to changes in such concentration variables resulting from removing the impoundment from service under a variety of capping scenarios. . . ." SR at 11; *see* PC 4 at 4. Mr. Bollinger's pre-filed testimony states that Ameren modeled boron concentrations "because it is an indicator parameter for coal ash leachate and is highly mobile." Bollinger Test. at 6; *see* TSD at 494. Ameren relied upon three model codes. SR at 11.

First, Ameren used the United States Environmental Protections Agency's (USEPA's) Hydrologic Evaluation of Landfill Performance (HELP) to model post-closure leachate percolation. *Id*.; *see* TSD at 494, 496-97; *see also* PC 4 at 4. The TSD states that "HELP predicts one-dimensional vertical percolation from a landfill or soil column based on precipitation, evapotranspiration, runoff, and the geometry and hydrogeologic properties of a layered soil and waste profile." TSD at 496; *see* Tr. at 30-31. Specifically, HELP estimated "percolation from Pond D during dewatering and after construction of the synthetic cap." *Id*. Second, Ameren used a three-dimensional groundwater flow (MODFLOW) analysis developed by the U.S. Geological Survey. SR at 11-12; *see* TSD at 497-98 (model description), 500-02 (MODFLOW Input Values and Sensitivity); *see also* PC 4 at 4; Tr. at 30-31. Third, Ameren also made contaminant transport calculation with the MT3DMS model. SR at 12; *see* TSD at 498 (model description), 502-04 (MT3DMS Input Values and Sensitivity); *see also* PC 4 at 4-5.

The TSD states that modeling sought to provide the following:

> [t]he southward extent to which off-site concentrations exceeded Illinois Class I Groundwater Quality Standard; [t]he reduction in boron loading to the Wabash River as a result of dewatering and closure of Pond D; [t]he effectiveness of the proposed remedial strategy for Pond D . . . ; and [t]he volume of groundwater that will be discharged to the groundwater collection trench. TSD at 494; *see* Bollinger Test. at 6.

Ameren reports that "modeling results indicate the off-site impacts in the upper migration zone extend a distance of approximately 500 feet from the southern property line downgradient of Ash Pond D." SR at 11, citing TSD at 505, 530; *see* Bollinger Test. at 7; *see also* PC 4 at 5. Ameren states that "the groundwater model indicates that the past dewatering together with the future geosynthetic membrane cap and groundwater collection trench will result in a dramatic improvement of groundwater quality south of Ash Pond D." SR at 12. Ameren further states that "the upper migration zone groundwater at the southern property boundary is expected to come into compliance with Class I groundwater quality standards within approximately 7-12 years. *Id*., citing TSD at 505-06; *see* Bollinger Test. at 7. Ameren indicates that "the adjacent landowner has agreed to use restrictions with respect to groundwater underlying the northern-most edge of the [adjacent] property." SR at 12, citing TSD at 538-40.

Wabash River

Ameren states that, "[b]ecause groundwater flows toward the Wabash River, Ameren determined potential impacts of groundwater discharge to the Wabash River." SR at 13. Ameren indicates that it relied on two methods to determine this impact. *Id*. First, Ameren

claims that "the daily loading rate for boron while the pond was in use, conservatively considering river water concentrations under the worst case (low flow conditions), were insufficient to significantly increase the boron concentration in the river." *Id*., citing TSD at 390 (Comparison of Estimated Surface Water Concentrations to Ecological Screening Levels for Surface Water). Ameren states that, "[w]ith dewatering of Ash Pond D, the daily loading rate for boron was decreased by approximately 85%." SR at 13, citing TSD at 506, 535 (Figure 18 Model-predicted boron loading rate to the Wabash River and tributaries). In addition, Ameren reports that "USEPA's STORET database for the closest downstream monitoring station, one mile south of Ash Pond D, indicates boron concentrations lower than the median concentrations in the upper migration zone upgradient of Ash Pond D." SR at 13, citing TSD at 607-08 (STORET Data, Wabash River near Hutsonville, IL). In addition, Ameren performed a mixing calculation "to determine whether or not discharge from a proposed groundwater collection trench has the potential to cause boron concentrations in the plant's NPDES-permitted outfall #002 (IL 0000175) to exceed the permit-specified limit of 10 mg/L." TSD at 610 (Mixing Calculation). Calculations indicated that the potential discharge would not do so. *Id*.

Regulation of Coal Combustion Waste Surface Impoundments

Ameren argues that there is a "gap" in the Board's current waste disposal regulations as they pertain to Ash Pond D, a surface impoundment for coal combustion waste. SR at 1; *see* Bollinger Test. at 5. Ameren claims that "operation of ash ponds is regulated pursuant to the Board's Water Pollution Control rules." SR at 2; *see* 35 Ill. Adm. Code Subtitle C. Ameren further claims that "upon closure the ash ponds do not fit any of the types of facilities covered by the Board's regulations, including the Waste Disposal rules. . . ." SR at 2; *see* 35 Ill. Adm. Code Subtitle G; Bollinger Test. at 5. Ameren argues that these ash ponds "are not landfills as defined in the Board's solid waste regulations." SR at 2, citing 35 Ill. Adm. Code 810.103; In the Matter of: Petition of Conversion Systems, Inc., for an Adjusted Standard from 35 Ill. Adm. Code Part 811 (Liner), AS 93-4, slip op. at 3 (Aug. 26, 1993).

Ameren claims that, in promulgating landfill regulations in 1990, "[t]he Board recognized the need for state-wide regulations addressing the closure of on-site ash ponds located at coal-fired electric generating facilities." *Id*., citing Development, Operating and Reporting Requirements for Non-Hazardous Waste Landfills, R 88-7 (Aug. 17, 1990). Ameren argues that, soon after adoption of the landfill regulations, the electric generating industry sought to clarify their applicability and regulate ash ponds under them. SR at 3, citing Amendments to the Development, Operating and Reporting Requirements for Non-Hazardous Waste Landfills: 35 Ill. Adm. Code 811, R90-25 (Nov. 29, 1990). Ameren claims that "regulating ash ponds at closure under the Landfill Regulations was found unworkable" and that "no provision for closure of ash ponds was ever adopted under the Landfill Regulations or any other Illinois regulation." SR at 3-4.

Mr. Bollinger testified that, after the merger that formed it, Ameren settled an enforcement case filed by the Attorney General on behalf of the People of the State of Illinois. Bollinger Test. at 2; *see* People v. Cent. Ill. Pub. Serv. Co. d/b/a Ameren CIPS, PCB 97-26 (June 7, 2001) (accepting proposed settlement). Mr. Bollinger stated that the case pertained "to alleged groundwater contamination associated with an ash impoundment at CIPS's Hutsonville Power

Station known as 'Pond D.'" Bollinger Test. at 2. He further stated that, "[a]s part of that 2001 settlement, Ameren continued to investigate groundwater conditions associated with Pond D, remove the impoundment from service, and initiate closure in accordance with 'applicable regulatory requirements.'" *Id*. He claims that, "[b]y re-directing sluice water through other ponds, Ameren was able to isolate Pond D and removed it from active service as a wastewater treatment basin." *Id*. at 4. Mr. Bollinger claims that "[b]ecause there are no specific requirements governing the closure of ash ponds, establishing the regulatory parameters governing such closure has proven to be extraordinarily challenging." *Id*. at 2.

In his pre-filed testimony on behalf of Ameren, Mr. Bollinger stated that "[e]xisting regulations addressing waste, waste hauling, and landfills do not sufficiently address the closure of surface impoundments such as Hutsonville wherein the ash material is intended to remain in place." Bollinger Test. at 5. When PRN questioned what other closure options Ameren had considered (PRN Questions at 3 (¶5)), Mr. Bollinger responded that "Ameren has been trying to seek regulatory approval to close this ash pond for years. . . ." Ameren Resp. at 3. He further stated that the Board had "noted the inapplicability of landfill regulations during the time when the pond was permitted and used as a water treatment device." *Id*. at 3-4. In his pre-filed testimony, Mr. Bollinger also stated that "landfill regulations impose requirements that cannot be met given the fact that ash ponds that pre-date modern landfill requirements are designed and regulated during their active service as waste treatment facilities in connection with management of coal combustion waste associated with coal-fired power plants." Bollinger Test. at 5. PRN sought additional explanation of how use during active service prevents ash ponds from being subject to and satisfying landfill regulations. PRN Questions at 4 (¶6). Mr. Bollinger responded that the Board's March 5, 2009 order and Ameren's petition for an adjusted standard summarize "the issues and difficulties surrounding the closure of ash impoundments that pre-date landfill regulations and modern design requirements." Ameren Resp. at 4.

Ameren states that it has spent ten years "trying to define the appropriate regulatory requirements for the closure of Pond D." Bollinger Test. at 4. Ameren reports that discussions with the Agency led it initially to propose an adjusted standard to the Board's landfill regulations as the mechanism for closing Ash Pond D. SR at 3, citing In the Matter of: Petition of Ameren Energy Generating Company for Adjusted Standards from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS 9-1 (Aug. 11, 2008). In an order dated September 16, 2008, the Board accepted Ameren's petition for an adjusted standard but directed Ameren and the Agency to address three issues: the authority to apply landfill regulations to Pond D; whether any permit issued to Ameren addressed requirements to close Pond D; and whether a site-specific rule is the appropriate mechanism through which to establish the requirements to close Pond D. Petition of Ameren Energy Generating Company for Adjusted Standard from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS 09-1, slip op. at 3-4 (Sept. 16, 2008).

After receiving responses from both Ameren and the Agency, the Board in an order dated March 5, 2009, dismissed Ameren's petition for an adjusted standard and concluded "that a site-specific rule is the appropriate regulatory relief mechanism under which to close Ameren's Pond D." Petition of Ameren Energy Generating Company for Adjusted Standard from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS 09-1, slip op. at 1, 11 (Mar. 5,

2009). The Board directed Ameren to propose an amendment to Subtitle G if it chose to proceed with a site-specific rulemaking." SR at 3, citing In the Matter of: Petition of Ameren Energy Generating Company for Adjusted Standards from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS 9-1, slip op. at 11 (Mar. 5, 2009). Ameren proposed its site-specific rule as a new subchapter j to Subtitle G, the Board's waste disposal regulations, because its review of the organization of Illinois' environmental standards did not reveal a "logical place for closure of ash ponds." SR at 3.

In a question pre-filed for hearing, PRN asked why Ameren had not proposed its site-specific rule under subchapter i, which addresses alternative standards for coal combustion power generating facilities waste landfills in Part 816. PRN Questions at 1 (¶1). Ameren responded that placing its proposed rule in "a separate subpart within the Solid Waste Regulations is consistent with the direction" of the Board in its March 5, 2009 order. Ameren Resp. at 1.

CLOSURE OPTIONS

Ameren states that it considered a number of treatment or control options for closing Pond D. *See* SR at 15-21; TSD at 10-174 ("Pond D Closure Alternatives Report"), Bollinger Test. at 10-11. Generally, Ameren's proposed regulations allow existing ash to remain in place and require "a geosynthetic membrane cap and final cover system that meet the performance requirements of the general landfill regulations along with a groundwater collection trench." SR at 15, citing 35 Ill. Adm. Code 811.314. Ameren states that its proposal relies where appropriate on "methods for measurement and performance criteria from the landfill regulations." SR at 15. Ameren estimates that the capital costs associated with this closure plan could range from $3 to $4 million, excluding engineering. *Id*. at 21. It expects annual operating and maintenance costs of approximately $50,000. *Id*. In addition, Ameren reports that it assessed the environmental impact of its proposed regulations. *Id*. at 22; *see* TSD at 331-492. That assessment concluded "that the closure plan and associated activities do not pose a threat to human health or the environment under current and reasonably foreseeable future conditions and land use." SR at 22.

The Board separately addresses various closure alternatives considered by Ameren in the following subsections of its opinion.

Objectives and Criteria for Evaluating Alternatives

The TSD states that Ameren identified and evaluated several closure alternatives "to determine whether or not they would effectively and efficiently meet the closure objectives." TSD at 19. The TSD identified as those objectives: 1) preventing "off-site migration of impacted groundwater;" 2) minimizing "infiltration of rain and snowmelt to the coal ash within Pond D;" and 3) protecting "human health and the environment." *Id*.; *see id*. at 73-74 (Table 3-1 "Closure Alternatives Screening Summary"). The TSD divides alternatives that might meet those objectives into two categories: "Groundwater Management and Final Cover Alternatives." *Id*. at 19. In addition, the TSD evaluated surface water management alternatives, "since surface water management is a necessary component of any final cover design." *Id*.

The TSD identified three criteria for evaluating closure alternatives in these categories. First, the evaluation examined the feasibility of construction and implementation. TSD at 19. The TSD states that

> [c]onstruction feasibility refers to the ability to build the system given site-specific conditions. Implementation feasibility refers to the ability of this alternative to meet technical factors, such as appropriateness or suitability, and availability of the technology given site-specific constraints, geographic location, and administrative factors, such as local and state permitting requirements and regulatory reviews for approval. *Id*.

Second, the evaluation considered effectiveness of the alternatives, which the TSD describes as "the ability of the alternative to achieve the three closure objectives." *Id*. These first two criteria were regarded as significant. The TSD states that, "[i]f an alternative failed these criteria, then it was not considered further." *Id*. at 20.

Third, the evaluation considered costs. The TSD indicates that "[c]osts for the purpose of initial screening refer to relative cost ranges for each of the alternatives, and include utilization of available published cost data from similar projects, vendor data, and engineering judgment." TSD at 20. The TSD stresses that, "[a]s such, *costs are for general comparative purposes, and are not used singly as a screening tool unless substantial cost differentials would immediately preclude the technology from further consideration.*" *Id*. (emphasis in original). In the evaluation for Ameren, "the criteria of cost was secondary unless substantial concerns were identified that would clearly eliminate the alternative, (*e.g.*, same feasibility and effectiveness with significantly higher cost)." *Id*.

Groundwater Management Alternatives

The TSD claims that "groundwater migration from Pond D to the Wabash River does not pose a threat to human health and the environment. Further, impacted groundwater is localized and limited to the pond area itself and a narrow band of shallow groundwater immediately south of the property." TSD at 20; *see* Bollinger Test. at 12. Ameren claims that, because "the impacted water is not and will not be utilized for potable water, . . . treatment of groundwater is not necessary." SR at 19. Ameren's goal in managing groundwater "is to prevent southward off-site migration of impacted groundwater in the upper migration zone." TSD at 20.

Ameren evaluated the following groundwater management alternatives: "[s]ite monitoring with no groundwater collection; [g]roundwater collection trench; and [c]ontainment using a low-permeability vertical barrier." TSD at 20; see Bollinger Test. at 12-13; *see generally* TSD at 73, 155. The Board separately addresses the record regarding those alternatives in the following subsections of its opinion.

Site Monitoring with No Groundwater Collection

The TSD characterizes this as "a no-action alternative," although it notes that a "groundwater monitoring component is a necessary part of any groundwater management

alternative." TSD at 21. The TSD refers to groundwater modeling performed apart from the evaluation of closure alternatives, which "suggests that groundwater quality at the south property boundary may achieve compliance with Class I groundwater quality within a period of about 17 years after closure of Pond D." *Id*. The TSD notes, however, that this "does not achieve the objective of *preventing* off-site migration of impacted groundwater." *Id*. (emphasis in original); *see id*. at 73 (effectiveness). Accordingly, Ameren did not carry forward the no-action component of this alternative. *Id*. Because monitoring is an element of any groundwater management alternative, the TSD did not separately evaluate costs for that monitoring. *Id*.; *see id*. at 73 (alternatives summary).

Low-Permeability Vertical Barrier

Ameren also evaluated "constructing a low-permeability barrier wall around Ash Pond D to prevent lateral migration of ash leachate." SR at 20; *see* Bollinger Test. at 12. The TSD considered two barrier configurations. The first, a partially encapsulating barrier,

> would be installed along the east and south (downgradient) sides of Pond D. The barrier would be completed with an interior hydraulic gradient control system utilizing groundwater collection trenches upgradient of the barrier or extraction wells within the impoundment. The hydraulic gradient control system would prevent hydraulic mounding by maintaining an inward gradient. TSD at 22.

The second, a fully encapsulating wall,

> would surround the entire perimeter of Pond D to fully encapsulate the saturated ash zone and deflect upgradient groundwater flow around Pond D. Internal hydraulic controls would be required to manage groundwater fluctuations that could potentially compromise containment integrity. However, since this type of barrier would deflect upgradient groundwater flow, a significantly lower volume of groundwater compared to the partially encapsulating barrier would need to be extracted to maintain an inward gradient. *Id*.

The TSD reports that there are available several vertical barrier technologies, each of which is capable of creating "a barrier with hydraulic conductivity approaching a $1x10^{-7}$ centimeters per second (cm/s) with proper design and construction quality control/assurance." *Id*. However, Ameren argues that "[c]onstruction of a vertical barrier or 'slurry wall' is dependent upon keying into a geologic formation with low hydraulic conductivity, such as shale bedrock or clay, that would prevent vertical migration of contaminants." SR at 20; *see* TSD at 22, Bollinger Test. at 12. Ameren notes the Board's earlier statement that "[t]he slurry wall must extend into the confining layer to a depth necessary to maintain a continuous hydraulic barrier and prevent seepage." SR at 20, citing Development, Operating, and Reporting Requirements for Non-Hazardous Waste Landfills, R88-7 (Mar. 1, 1990) (response to comments). Ameren argues that "[t]he sandstone bedrock beneath the western portion of Ash Pond D does not provide a sufficient key-in layer for an impermeable barrier wall." SR at 20; *see* TSD at 22, Bollinger Test. at 12-13. Ameren concluded that, because this alternative cannot achieve proper

containment, it is technically infeasible and did not merit consideration. SR at 20; *see* TSD at 22, Bollinger Test. at 13.

Groundwater Collection Trench

Ameren notes that the proposed rules would require it to "install a groundwater collection trench along the southern boundary of the property" south of Ash Pond D. SR at 12. The TSD describes the construction and operation of this trench, which

> would contain a perforated horizontal pipe surrounded by gravel bedding. A geotextile would be placed along the trench walls to filter out surrounding soils. The horizontal pipe would have a relatively shallow pitch to sumps placed along the alignment of the trench at a spacing determined by site-specific hydrogeologic conditions. Pumps would be placed in the sumps to extract groundwater from the trench. Extracted groundwater would be directly discharged to the interim pond (Pond B) for management and eventual discharge to the Wabash River via the existing NPDES permit. TSD at 21; *see* SR at 12, 19-20; *see also* Tr. at 32, PC 4 at 7 n.7 (addressing depth of trench).

Ameren argues that installation of such a trench "will isolate groundwater within Ash Pond D and preclude continued offsite migration." SR at 19. Ameren further argues that this process of isolation allows "impacted groundwater underlying the adjacent off-site property to attenuate." *Id*. at 12.

Ameren concluded that "the groundwater trench is an economically viable and environmentally justified option because it would mitigate the offsite migration of contaminants without any negative impact to the Wabash River." SR at 20; *see* TSD at 21. The TSD estimates that total construction capital costs for the collection trench will equal approximately $800,000 with annual operating and maintenance costs of approximately $47,000. TSD at 73, 155. The TSD reports that "[c]apital costs are lower than other groundwater management alternatives considered." *Id*..

Ameren also "performed groundwater transport modeling to evaluate its impact on groundwater quality." SR at 19, citing TSD at 494-535 (Groundwater Modeling of Hutsonville Pond D). With construction of the groundwater collection trench, the model predicted that boron concentrations south of the property boundary would be "below Class I standards after 10 years." TSD at 505-06, 531-32. Ameren also performed a mixing calculation "to determine whether or not discharge from a proposed groundwater collection trench has the potential to cause boron concentrations in the plant's NPDES-permitted outfall #002 (IL0000175) to exceed the permit-specified limit of 10mg/L." TSD at 610 (mixing calculation memorandum from Natural Resource Technology). The TSD reports that "[r]esults of this calculation indicate that concentrations [do] not exceed the 10 mg/L limit." *Id*.

In its post-hearing comments, PRN notes that Section 840.122 of the joint proposal provides that "[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option

as approved by the Agency in the closure plan or post-closure plan." PC 3 at 3, citing Joint Prop. at 17. PRN argues that this language is ambiguous about "the ultimate destination of contaminated groundwater" and thus fails to satisfy the requirements of the Board's regulations regarding site-specific rules. PC 3 at 3, citing 35 Ill. Adm. 102.210(d). PRN further argues that "neither the closure plan nor the post-closure plan are open for public notice and comment and therefore do not allow potentially impacted parties to voice concern or share relevant information regarding environmental impacts." PC 3 at 3.

PRN argues that the Board must conduct a thorough assessment of final plans for any contaminated groundwater before it adopts the proposed site-specific rule. PC 3 at 3. PRN claims that a discharge from the collection trench into the Wabash River "poses an unnecessary risk to fish and wildlife populations in the river." *Id*., citing Rowe, C.L., Hopkins, W.A., and Cogdon, J.D., Ecotoxicological implications of aquatic disposal of coal combustion residues in the United States: A review, *Environ. Monit. Assess*. 80, 207-76 (2002), United States Environmental Protection Agency, Steam Electric Power Generating, Point Source Category, EPA 821-R-09-008 (2009). Specifically, PRN argues that contaminants associated with coal ash, including arsenic, selenium, and lead, "are bioaccumulative so even relatively low concentrations of the metals can lead to significant impacts. . . ." PC 3 at 3. PRN identified selenium as having a "high bioaccumulation factor" and as presenting a "special concern." *Id*., citing Lemly, A.D., Guidelines for evaluating selenium data from aquatic monitoring and assessment studies, *Environ. Monit. Assess.* 28, 83-100 (1993). PRN argues that "[s]ome form of biological monitoring should be done in order to determine the actual threat posed by water discharged from the collection trench." PC 3 at 3, citing Lemly, A.D., Selenium assessment in aquatic ecosystems 161 (Springer 2002). PRN claims that the existing NPDES permit does not require monitoring for any contaminant associated with coal ash except for boron. *Id.* PRN also claims that neither the permit nor the closure plan addresses "potential impacts to fish and wildlife from the discharge of contaminated groundwater." *Id*.

Also in its post-hearing comments, PRN argued that the joint proposal "must demonstrate that the Board may grant the requested relief consistent with federal law governing the subject of the proposal." PC 3 at 5, citing 35 Ill. Adm. Code 102.210(e). PRN claims that, although the joint proposal seeks to allow the discharge of contaminated groundwater into the waters of the state, "[b]oth state and federal antidegradation laws requires identification of increased pollutant loadings as well as a demonstration that any such discharges will be fully protective of existing uses." PC 3 at 5, citing 40 C.F.R. 131.12, 35 Ill. Adm. 302.105(c). PRN argues that, because the joint proposal does not locate the discharge of the contaminated groundwater, it is "attempting an end run around antidegradation requirements." PC 3 at 5. PRN further argues that, "[w]ithout prior identification of the point of discharge to waters of the state, it is impossible to determine what the existing uses are or whether those uses will be protected by the proposed discharges." *Id*. PRN claims that the Board cannot adopt the proposed site-specific rule until proponents" can show the full extent of those impacts by demonstrating where the discharges will occur and by providing a scientifically supported assurance that existing uses will be protected despite the increase in pollutant loading." *Id*.

In addition, PRN argues that federal law "prohibits a new discharge of pollutants to impaired water bodies where the discharge would cause or contribute to a violation of water

quality standards." PC 3 at 5, citing 40 C.F.R. 122.4(i). PRN claims that the Wabash River "is already impaired by mercury, PCBs, and fecal coliform." PC 3 at 5. PRN again notes that Section 840.122 of the joint proposal provides that "[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure plan." PC 3 at 5, citing Joint Prop. at 17. PRN argues that Ameren might either direct contaminated groundwater to Ash Pond B, which has a permitted discharge to the Wabash River, or discharge it directly to the river. PC 3 at 5. PRN claims that the contaminated groundwater "would contain pollutants such as arsenic, barium, cadmium, chromium, lead, mercury, and selenium" that would contribute additional pollution to an impaired river. *Id*. PRN further claims that additional loadings "will place additional strains on an already impaired water body that could cause a violation of water quality standards." *Id*. PRN asserts that "[t]he requested relief should not be granted without further study and assurances that the diverted waste stream will not cause or contribute to the impairments in the Wabash River or other surface waterways." *Id*. PRN concludes that, "[b]y granting the site-specific standard requested without further evidence of the impact on water quality, the Board would be setting the stage for a possible violation of federal law." *Id*.

PRN also states that USEPA has drafted a rule addressing disposal of coal combustion wastes in surface impoundments. PC 3 at 5. When PRN filed its post-hearing comment on October 30, 2009, it expected USEPA to release its draft rule in mid-December. *Id*. PRN argues that, with publication of the rule foreseeable, it "seems prudent" for the Board to postpone any decision on the joint proposal until it can review USEPA's proposal.[3] *Id*.; *see* PC 6 at 2.

In its additional post-hearing comments, Ameren addresses PRN's suggestion that Ameren "is attempting an end run around anti-degradation requirements." PC 5 at 3; *see* PC 3 at 5. Ameren argues that "[t]hat statement could not be further from the truth." PC 5 at 3. Ameren states that, "as discussed at the hearing and as set forth in the proposed rule, Ameren will seek a modification to its existing NPDES permit to discharge the groundwater collected in the proposed groundwater collection trench." *Id*. Ameren further states that, "[a]s PRN, the Illinois Environmental Protection Agency and the Board are all well aware, the modification of an NPDES permit results in the re-opening of the permit allowing for public participation and for the Illinois Environmental Protection Agency to perform appropriate anti-degradation analysis at that time." *Id*.

In its additional post-hearing comments, PRN seeks to clarify its October 30, 2009 statement that, "[i]n failing to fully identify where the contaminated groundwater will ultimately be discharged, Petitioners are attempting an end run around antidegradation requirements." PC 6 at 1, *see* PC 3 at 5. PRN argues that antidegradation regulations "protect existing uses of all waters in the State of Illinois, maintain the quality of waters with quality that is better than water

[3] The Board notes that, on June 21, 2010, USEPA proposed two alternative regulations under the Resource Conservation and Recovery Act (RCRA) to address risks from disposal of coal combustion residuals generated from combustion of coal at electric utilities and independent power producers. Notice of the proposed alternatives set a September 20, 2010 deadline for comments. *See* 75 Fed. Reg. 35127-35264 (June 21, 2010).

quality standards, and prevent unnecessary deterioration of waters of the State." PC 6 at 1, citing 35 Ill. Adm. Code 302.105. PRN claims that adoption of the joint proposal would constitute approval of "the proposed design and use of a groundwater collection trench and pumping operation. . . ." PC 6 at 2. PRN also claims that adoption approves the language of proposed Section 840.122, which provides that "[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure plan." *Id*., *see* Joint Prop. at 17.

PRN argues that adoption of the joint proposal will result in a discharge of pollutants "without the scrutiny of alternatives and impacts afforded by a proper antidegradation analysis." PC 6 at 2. PRN further argues that "[t]he proposal does not even identify the waters that could be receiving the contaminated groundwater, let alone analyze whether those waters are fit to receive increased pollution." *Id*. PRN claims that "[a]uthorizing ash pond closure rules now without fully analyzing available alternatives may have the practical effect of precluding appropriate alternatives during a future NPDES permitting process." *Id*. at 1. PRN fears that, if that analysis is not performed now, it will not be meaningful because it "will be biased (if not precluded entirely) by construction and capital investments made toward Ameren's choice of groundwater collection trench, pump station, and ultimately, outfall." *Id*. at 2. PRN argues that "[a]n antidegradation analysis will only be meaningful if conducted now, before costly capital investments have been made into the project." *Id*. at 1. PRN concludes that, in the absence of a complete assessment, "the proposed rule represents an incomplete plan for discharge and a piecemeal approach to permitting that undermines state antidegradation law and erodes water quality." *Id*.

Treatment

During the hearing, Mr. Bollinger responded to a questions asking whether Ameren had considered "pumping contaminated groundwater as a corrective action to further pull the plume back?" Tr. at 82. He reported that Ameren had considered that option "in a prior evaluation of alternatives." *Id*. He expressed the belief that "the drain interceptor trench is more effective technology for the circumstances here." *Id*. at 82-83. He elaborated that, "as one goes eastward, to try and use a pumping mechanism would be challenging in that particularly when you get in the deeper zone, the aquifer is -- would take a considerable amount of pumping to actually draw down because it's a highly permeable aquifer on the eastern end. . . ." *Id*. at 83.

In its post-hearing comments, PRN argued that Ameren did not consider treatment of contaminated groundwater from the proposed collection trench. PC 3 at 4, PC 6 at 2. PRN claims that USEPA has indentified and analyzed technologies for treating ash transport wastestreams. *Id*. PRN further claims that, with one exception, "each of these treatment technologies is currently in use at several power generating stations and serve[s] to reduce the amount of pollution entering the environment." *Id*. PRN argues that this use demonstrates that these treatment options are economically reasonable and technically feasible. *Id*., citing United States Environmental Protection Agency, Steam Electric Power Generating, Point Source Category, EPA 821-R-09-008 (2009). PRN argues that Ameren must consider these alternatives in order to meet its burden. PC 3 at 4.

Ash Removal and On- and Off-Site Disposal Alternatives

Ameren claims that "Ash Pond D was not constructed as a landfill and is not a landfill upon closure." SR at 15. Ameren argues that it is "inappropriate" for Ash Pond D to comply "with current landfill engineering and design standards." *Id*. Ameren further argues that complying with those standards requires "removing the entire volume of ash and disposing of the ash off-site or reconstructing Ash Pond D in accordance with landfill regulations and replacing the ash." *Id*. Ameren concluded that neither of these options is feasible because of "exorbitant costs." *Id*.

Ameren reports that, in evaluating closure alternatives, it considered the following ash removal strategies: "(1) the injection of reagent material within the impounded ash to stabilize the material; (2) ash removal with off-site disposal; (3) ash removal, impoundment reconstruction, and the replacement of the ash in Ash Pond D; (4) ash removal with on-site disposal." SR at 16. The TSD states it considered these source control measures "with the groundwater management alternatives because they have a similar objective of preventing off-site migration." TSD at 20. Ameren concluded that none of these four measures is economically feasible or technologically reasonable and did not consider any of them "beyond a preliminary screening phase." *Id*.; *see* TSD at 22-24; Bollinger Test. at 7 (noting alternatives assessed in closure alternatives report).

Ash Stabilization

The TSD describes ash stabilization as "a technology designed to micro-encapsulate the ash in a cement-like matrix (monolith) to minimize the rate of groundwater infiltration and leaching of ash constituents to groundwater." TSD at 22; SR at 16; *see* Bollinger Test. at 11. This process stabilizes and solidifies the ash fill by delivering a reagent through either soil mixing or jet grouting technology. TSD at 22. Once this technology has stabilized the ash, "groundwater flows around, rather than through the ash, greatly reducing leachate volume and potentially eliminating the need for active groundwater management." *Id*.; *see* SR at 16.

The TSD states that "[s]oil mixing utilizes large-diameter augers (5 to 12 feet in diameter) that mechanically mix soils with a stabilizing reagent carried by drilling fluid." *Id*. at 22-23. The TSD further states that "[j]et grouting utilizes a small drill rig to advance a drill bit into the soils, through which grout is pumped under high pressure. As the drill string is rotated and slowly raised, a cylindrical grout column is created." *Id*. at 23. This technology "produces grout columns ranging from approximately 2 to 5 feet in diameter." *Id*. The TSD cites as a disadvantage of this process "maintaining the continuity and integrity of the grout column. Discontinuities or irregularities in subsurface conditions can lead to irregularity in grout column diameter." *Id*.; *see* SR at 16. This alternative frequently employs conservative overlapping in order to achieve uniform coverage. TSD at 23. Nonetheless, Ameren argues that "there is a high degree of uncertainty as to the effectiveness of this technology." SR at 16.

Ameren reports that "[t]he costs associated with ash stabilization are estimated at approximately $20 million (2005 dollars)." SR at 17, citing TSD at 73 (Table 3-1 Closure

Alternatives Screening Summary); *see* TSD at 156 (itemizing consulting and construction capital costs). Ameren states that it did not consider this alternative because of "technical uncertainties and relatively high cost compared to other groundwater management alternatives that have similar or better effectiveness and less technical uncertainty." TSD at 23; *see* Bollinger Test. at 11.

Ash Removal Generally

During the hearing, Ms. Barkley on behalf of PRN referred to other electric generating facilities removing ash from impoundments and suggested that Ameren had not persuasively demonstrated that ash removal is technically infeasible and economically unreasonable. *See* Tr. at 60-61. Responding, Mr. Bollinger stated that the technical feasibility of ash removal "is very much dependent upon the physical configuration of the pond." *Id*. at 61. He further stated that, particularly with approximately one-third of the ash in Pond D below the water table, removal would require substantial handling, including installation of dewatering facilities. *Id*. He claims that the "very limited" nature of the Hutsonville site contributes to the "extraordinary" cost of this option. *Id*.

Mr. Bollinger also addressed environmental impacts. He argued that removing ash from Pond D and closing it "doesn't have a gain in terms of improving groundwater impact unless one's able to get all the way down to what's deep. . . ." Tr. at 66. Mr. Bollinger claimed that "a partial cleanout that would be the surface materials would not be a very efficient means of trying to reduce the potential for leachate that we're facing with the ash at depth." *Id*. He further claimed that removing ash from the depths of Pond D "is what the cost figures show to be most challenging." *Id*.

On behalf of the Agency, Mr. Cobb stated that the site now presents "somewhat of a steady -- in groundwater terminology a steady state condition in terms of geochemistry and equilibrium with the hydrology." Tr. at 66-67. He expressed the view that excavation and removal of ash could theoretically result in "possibly releasing more contaminants than were there already in the contamination plume, which is something that hasn't been assessed by the groundwater flow modeling." *Id*. at 67. He expressed a concern that, as one outcome of excavation, "we may actually see some further degradation beyond what the current trends have shown." *Id*.

Mr. Bollinger acknowledged that Ameren "in some locations" does remove ash "for any number of either beneficial uses or other disposal alternatives. . . ." Tr. at 62. He stated, however, that he was "not aware of any significant project where this has occurred at Pond D" or other fly ash impoundments. *Id*. He attributed this to the absence of a market in the vicinity of the Hutsonville site and the cost of transporting ash beyond "a reasonable transport perimeter around the plant." *See id*. at 62-63. Mr. Bollinger referred to a bottom ash pond at the site, ash from which is used "typically for icing control by local counties and municipalities." *Id*. at 63; *see* SR at 3, n.2. However, he did not believe that there had been "any significant off-site utilization" from any of the fly ash impoundments. Tr. at 63. More generally, Mr. Bollinger suggested that the economic evaluation of ash removal from an impoundment that is "fully out of

service" differs significantly from evaluation of removal from a fully-lined pond that may continue wet sluicing of the ash. *See id*. at 62.

In its post-hearing comments, PRN cites a USEPA report to characterize ash removal alternatives as "common practice." PC 3 at 4, citing United States Environmental Protection Agency, Steam Electric Power Generating, Point Source Category, EPA 821-R-09-008 (2009). PRN argues that the TSD declined to consider this alternative, "due to its technical uncertainties and relatively high cost compared to other groundwater management alternatives that have similar or better effectiveness and less technical uncertainty." PC 3 at 4, citing TSD at 23-24. PRN claims that, because Ameren provided no cost estimates or technical evaluation of this option, it "has failed to adequately evaluate a closure alternative that could effectively and efficiently meet their stated closure objectives." PC 3 at 4; *but see* TSD at 73, 157-58 (estimating capital costs of ash removal with disposal, recycling, and beneficial reuse).

Ash Removal with Off-Site Disposal. The TSD states that, while "[r]emoval of ash from Pond D eliminates the source of groundwater impacts at the site," this option requires "[e]xcavation of a significant volume of ash and extensive site dewatering. . . ." TSD at 23. Ameren evaluated this alternative by comparing both the removal of all ash from Pond D and the removal of only the saturated ash. *Id*. Ameren argues that "[t]he effectiveness of this alternative is controlled largely by the ability to remove saturated ash from below the water table." SR at 17; *see* TSD at 23. Mr. Bollinger's pre-filed testimony states that "[r]emoval of approximately 950,000 cubic yards of ash from Pond D creates monumental challenges." Bollinger Test. at 11. He further stated that "[t]he saturated ash alone would require unconventional excavation techniques, such as dredging or mechanical sluicing (*i.e.*, mudcat auger excavation) and dewatering prior to transport to an off-site waste management facility." *Id*. He added that "[t]he physical configuration of the site and the narrow access around Pond D make it virtually impossible to implement these unconventional excavation and dewatering techniques." *Id*.; *see* TSD at 4, 6 (site maps).

Ameren characterizes as "exorbitant" the projected cost of up to $34 million for this alternative. SR at 17, citing TSD at 73; Bollinger Test. at 10; *see* TSD at 158 (itemizing consulting and construction capital costs). The TSD claims that the "technical and economic feasibility of this [alternative] is questionable." TSD at 23; *see* SR at 17; *see* Bollinger Test. at 11. The TSD also states that "there does not appear to be a regulatory requirement to remove ash from an IEPA-permitted impoundment facility such as Pond D." TSD at 23. Ameren concluded not to consider this alternative "because of the technical uncertainties and the high cost compared to other groundwater management alternatives." SR at 17; *see* TSD at 23-24; *id*. at 73; Bollinger Test at 11.

During the hearing, Ms. Barkley on behalf of PRN inquired whether Ameren had analyzed the affordability of "dredging up material and moving it to a lined facility." Tr. at 56. Specifically, she asked whether, instead of comparing various closure options, Ameren had examined its disposal costs over time. *Id*. at 57, 59. She subsequently suggested that, "if you look at it over time of generation of that waste material, it might look like a more reasonable option or it might help paint the picture differently when you're looking at this chosen alternative as opposed to others." *Id*. at 59. Responding, Mr. Bollinger stated that "[t]he cost to manage . . .

ash as it's being generated now and into the future would really not be a comparable cost because this ash is already in situ or in place, unlike an analysis one might conduct for a long-term ash management plan." *Id*. at 58. He acknowledged that Ameren has built and is continuing to build on-site landfills. *See id*. However, he stated that "that's for ash we are generating today in the predicted life of the plant versus a circumstance such as pond D where we're really trying to address the cumulative assemblage of ash from that operation for '68 through 2000." *Id*. at 59.

In its post-hearing comments, PRN noted "a common practice of dredging and moving ash from ponds. . . ." PC 3 at 4 (citing "EPA report"). PRN noted that Ameren had dismissed this closure option "due to its technical uncertainties and relatively high cost compared to other groundwater management alternatives that have similar or better effectiveness and less technical uncertainty." *Id*, citing TSD at 23. PRN argued that, "[c]onsidering that the Petitioner did not provide any cost estimates or an evaluation of its technical feasibility, the Petitioner has failed to adequately evaluate a closure alternative that could effectively and efficiently meet their stated closure objectives." PC 3 at 4.

In its post-hearing comments, Ameren noted PRN's suggestion "that removal of the ash to an off-site landfill of for beneficial uses may be a viable alternative to the proposed closure." PC 4 at 6, citing Tr. at 59-61. Ameren argues that it has considered a variety of closure options and determined that this option is not technically feasible or economically reasonable. PC 4 at 7, citing TSD at 23-24 and 73; Tr. at 61-63. Ameren argues that, although some beneficial use of bottom ash from the Hutsonville site does occur, no market exists for such uses. PC 4 at 7, citing *id.*, Exh 1 ("Ameren CCP Ash Beneficial Use"). Ameren also cited Mr. Cobb's testimony that excavation of the ash from Pond D could result in further degradation. PC 4 at 7, citing Tr. at 66-67. Ameren restates its conclusion that "off-site disposal and beneficial use are not viable alternatives." PC 4 at 7.

Ash Removal, Impoundment Reconstruction, and Disposal in Ash Pond D. The TSD states that it identifies this as a closure option "since the reconstructed facility would release significantly less leachate than Pond D." TSD at 24. Ameren states that "[r]econstruction would require extensive excavation and relocation of all ash currently contained in the pond. Because of the lack of space to temporarily store the ash on-site, all of the ash would have to be either temporarily stored off-site or disposed of off-site." SR at 17; *see* Bollinger Test. at 11-12. The TSD states that, "[u]pon completion of reconstruction activities, ash removed from Pond D could either be replaced or the unit could be operated as a new ash impoundment." TSD at 24.

As noted above, the cost of excavation and off-site disposal is estimated to be as much as $34 million. TSD at 73, 158; *see* SR at 17. In his pre-filed testimony, Mr. Bollinger stated that reconstruction of Ash Pond D "would not be feasible for the same reasons that off-site disposal is not feasible." Bollinger Test. at 11. The TSD indicates that, due to the feasibility of construction and excavation of all of the ash in Pond D, Ameren anticipated "very high" capital costs with this alternative. TSD at 73. The TSD also states that "regulatory uncertainties associated with this alternative rendered it infeasible." *Id*. at 24. Ameren concluded that, "[b]ecause this alternative has the same feasibility issues as removal and off-site disposal, detailed costs associated with this option were not evaluated, and this alternative was not

considered due to technical uncertainties and the high cost compared to other groundwater management alternatives." SR at 17-18; Bollinger Test. at 12.

Ash Removal and On-Site Disposal. Ameren argues that, beyond the costs associated with ash removal and off-site disposal, "the on-site disposal alternative poses significant technical feasibility challenges because there is insufficient land on-site to construct dewatering and storage facilities large enough to handle the ash." SR at 18. Ameren first cites "logistical hurdles." Ameren states that excavation of saturated ash requires "unconventional excavation techniques, such as dredging or mechanical sluicing (*i.e.*, mudcat auger excavation)." *Id*.; *see* Bollinger Test. at 11. Ameren also emphasizes that "[t]he physical configuration of the site and the narrow access around Ash Pond D significantly limit implementation of these unconventional excavation techniques." SR at 18; *see* Bollinger Test. at 11. Finally, Ameren notes the cost of excavating 950,000 cubic yards of ash from Ash Pond D. SR at 18; *see* Bollinger Test. at 11. Ameren states that it did not consider this alternative "because of operational impacts, technical uncertainties, and the high cost compared to other groundwater management alternatives." SR at 18; *see* Bollinger Test. at 11.

In a question pre-filed for the hearing, PRN noted Mr. Bollinger's pre-filed testimony regarding ash removal and asked why Ameren couldn't place the dredged material "in a lined landfill on the Ameren property or on adjacent farmland (purchase land polluted by leachate) similar to the more recently placed coal ash waste?" PRN Questions at 2 (¶8), citing Bollinger Test. at 10-11. Ameren responded that "[t]here is no available land at Hutsonville to construct a landfill and surrounding property is fully utilized for agricultural purposes." Ameren Resp. at 5. Ameren argued that "[t]he cost of removal of such a large quantity of saturated and sodden ash is both exorbitant and technically infeasible at this site." *Id*.

Final Cover Alternatives

The TSD states that Ameren considered four final cover alternatives for initial evaluation: geomembrane, compacted clay, earthen fill, and pozzolanic. TSD at 24; *see* SR at 20-21. The Board separately considers these alternatives in the following paragraphs of the opinion.

Geosynthetic Membrane

The TSD states that the geomembrane alternative consists from the bottom up of a low-permeability geomembrane "followed by a 3-foot thick soil layer designed to drain infiltrated surface water from above the low-permeability layer, protect the low-permeability layer from weathering and maintenance activities on the surface of the final cover, and support vegetation." TSD at 24-25. Ameren argues that, after installation of this cover, "the impounded ash will no longer be subject to precipitation and surface water infiltration." SR at 12. In its original proposed regulations, Ameren opted to require this alternative. SR at 12. In his pre-filed testimony, Mr. Bollinger stated that Ameren did so "because the cost is consistent with other low-permeability layers, it is more effective at minimizing infiltration than many of the other options, and its use has already been approved in other board regulations as being protective of human health and the environment." Bollinger Test. at 13; *see* PC 4 at 7. Specifically, Ameren states that it "meets the performance criteria set forth in the Landfill Regulations." SR at 21.

Ameren estimates that construction capital costs for the geosynthetic membrane would fall between $2.6 and $3.4 million and that consulting capital costs may equal approximately $520,000. SR at 21; *see* TSD at 73, 159.

Compacted Clay

The TSD states that the compacted clay alternative consists from the bottom up of a low-permeability compacted clay layer "followed by a 3-foot thick soil layer designed to drain infiltrated surface water from above the low-permeability layer, protect the low-permeability layer from weathering and maintenance activities on the surface of the final cover, and support vegetation." TSD at 24-25. The TSD projects that total construction capital costs for this alternative would be $4.2 million, with annual operating and maintenance costs of $5,000. TSD at 74, 160. The TSD further states that this alternative "was screened out because it has a higher estimated cost for similar effectiveness as the geomembrane alternative." *Id*. at 25; *see id.* at 74 ("[h]ighest cost final cover option").

Earthen Fill

The TSD states that the earthen fill alternative "reflects a simplified approach to conventional landfill cover design practices. Instead of relying on low-permeability clay or a geomembrane as a barrier, the design of a layered earthen cover incorporates the use of high-permeability sand and/or gravel layers to create a capillary break." TSD at 25. The TSD further states that "[t]he capillary break causes retention of water in the rooting zone, which increases transpiration to the atmosphere relative to covers without capillary breaks, and minimizes downward drainage." *Id*. The TSD claim that, "[i]f the rooting zone becomes saturated, the high-permeability sand and/or gravel layer(s) promote rapid lateral drainage and continue to limit infiltration. However, migration of water to the drainage layer would only occur after the retention capacity of the routing zone is reached." *Id*.

The TSD argues that the humid climate in the area of Hutsonville causes the layered earthen cover to be less effective than compacted clay or a geomembrane cover in minimizing infiltration. TSD at 25. However, the TSD also notes that this alternative is a lower cost approach than those two alternatives "because it relies on locally available materials. . . ." *Id*. The TSD projects that total construction capital costs for this alternative would be $2.9 million, with annual operating and maintenance costs of $5,000. *Id*. at 74 ("[l]owest cost cover alternative"), 161. The TSD further states that this alternative "was screened out because the geomembrane alternative is more effective at minimizing infiltration." *Id*. at 25; *see id*. at 74.

Pozzolonic Fly Ash

The TSD describes this as "an innovative approach to cover design." TSD at 25. With this alternative, "[f]ly ash from an on-site source (Pond A), would be collected and blended with a stabilizing agent (*e.g.*, quick lime, Portland cement, class C fly ash) to create a cement-like monolithic cover to minimize the rate of infiltration and leaching of ash constituents to groundwater." *Id*. The TSD states that "[a] 3-foot thick, low-permeability layer would be constructed from the pozzolonic fly ash mixture followed by a 3-foot thick earthen protective

layer." *Id*. The TSD states, however, that "mix design testing for this alternative was unable to identify a mix that achieves a permeability lower than $1x10^{-6}$ cm/s with adequate strength." *Id*.

The TSD projects that total construction capital costs for this alternative would be $4 million, with annual operating and maintenance costs of $5,000. TSD at 74, 162. The TSD further states that this alternative "was screened out because the geomembrane alternative is more effective at minimizing infiltration." *Id*. at 25; *see id*. at 74.

Final Slope and Stabilization

In his pre-filed testimony, Mr. Bollinger noted that Ameren's proposal requires "all final slopes to be designed and constructed to support vegetation and drain runoff to meet the stability criteria" of the Board's landfill regulations. Bollinger Test. at 13, citing 35 Ill. Adm. Code 811.304; *see* Orig. Prop. at 10 (proposed Section 840.122). He noted that "Ameren will perform a structural stability analysis to determine such factors as the level of saturation and the density of materials comprising the pond's embankments." Bollinger Test. at 13. He emphasized that Ameren's Dam Safety Group, which oversees the safety of a number of impoundments, will perform this stability analysis and other elements of closure. *Id*. He further noted that results of this analysis will determine the design of the final slope and loading factors. *Id*. Mr. Bollinger also stated that "storm water drainage and outfalls will be designed to ensure that proper drainage occurs post-closure." *Id*.

Mr. Bollinger also testified that Ameren "proposes to use, if necessary, coal combustion waste from Pond A as part of that final grading and slope." Bollinger Test. at 13; *see* Orig. Prop. at 10 (proposed Section 840.122(c)). He stated that "'[s]uch material would be placed a minimum of ten feet above the water table and would be covered with the geosynthetic liner thereby preventing the creation of leachate from the coal combustion waste and thus protective of the environment." Bollinger Test. at 13-14. He argued that "use of coal combustion waste in this manner is consistent with material already located in Pond D and would represent a cost-effective and less wasteful alternative to bringing in fill material for sloping purposes." *Id*. at 14.

In a question pre-filed for hearing, PRN noted Mr. Bollinger's testimony that "Ameren believes that Pond D contains in total nearly a million cubic yards of ash with approximately one-third of this volume lying below the water table. Ameren anticipates that as part of final closure additional materials, including ash, may be needed to establish a final slope and grade of this impoundment." PRN Questions at 1 (¶4), citing Bollinger Test. at 4. PRN questioned why Ameren proposes "adding material to the Pond D site, instead of removing it for final placement in a lined and permitted location?" PRN Questions at 1 (¶4).

In its response, Ameren states that "[a]s part of closure, fill material will be needed to create the proper slope and grade of the impoundment." Ameren Resp. at 3. Ameren claims that "[t]he plant property is fully utilized and consequently fill material is not available." *Id*. Ameren further claims that "[c]oal combustion material ("CCB") stacked and dewatering within Pond A is readily available and may be a cost-effective option." *Id*.

Ameren states, however, that it has not yet determined whether to use ash for those purposes. Ameren Resp. at 3. In the event that it does so, Ameren argues that "it would be placed well above the water table, covered with a synthetic capping material, and isolated from precipitation or groundwater." *Id*.; *see* Tr. at 27. Ameren further argues that the amount of ash "authorized for use in this manner is limited by slope and grade restrictions contained in the rule." *Id*. Ameren also claims that, if placed at Pond D in this manner, the ash "would not have an adverse environmental impact." *Id*. Ameren states that, if the ash is not used for cover at Pond D "or other beneficial purposes, then it would most likely be left within Pond A, which is a lined facility, and not transported to a landfill." *Id*. Ameren further testified that, other than final closure activity, it did not intend to store any additional materials at Pond D before the final cap is put into place. Tr. at 32.

In a separate pre-filed question, PRN again noted that Ameren has proposed the possibility of using coal combustion waste from Pond D as part of final grading and slope at Pond D. PRN Questions at 2 (¶9). PRN asked Ameren to "describe the material characterization and leachate testing that will [be] conducted to ensure that use of this material will not contribute additional pollutant loading to this site." *Id*.

Ameren responded that the ash "that would be used as part of closure is similar if not identical to the material that is already located in Ash Pond D." Ameren Resp. at 5. Ameren argues that its response to the previous question addresses the proposed placement of the ash from Pond A and the manner in which it may mitigate additional pollutant loading. *Id*. In that response, Ameren argued that use of ash would be "limited by slope and grade restrictions contained in the rule." *Id*. at 3. Ameren also argues that the proposed use of the ash from Pond A "would not have an adverse environmental impact." *Id*. Ameren stated that, if not used for final slope and grade, the ash was more than likely to remain in place than be transported to an off-site landfill. *Id*.

Final Cover

In his testimony on behalf of Ameren, Mr. Bollinger stated that "[t]he final protective layer covering the geosynthetic membrane will consist of soil material and be at least three feet thick or the thickness necessary to protect the low permeability layer from freezing and to provide for adequate root penetration to support vegetative growth." Bollinger Test. at 14. He further stated that the "final cover will be vegetated to stabilize this layer and minimize wind and water erosion." *Id*. Consequently, he argues, "[t]he membrane and final cover will minimize any infiltration of water due to precipitation and will route surface water from the site to the Wabash River." *Id*.; *see* Tr. at 81.

Groundwater Use Restriction.

In his testimony on behalf of Ameren, Mr. Bollinger stated that. "[a]s an added precaution, Ameren has entered into an agreement with the adjacent landowner to restrict the use of shallow groundwater at the northernmost edge of the property where we believe there may be limited off-site impacts above Class I standards from Pond D." Bollinger Test. at 15. He notes that "the agreement restricts the neighbor's groundwater use within the first 25 vertical feet of

the water table and extending 500 feet south of the Hutsonville Station property boundary." *Id*., citing TSD at 538-40 (Letter of Agreement for Restriction of Shallow Water Well Drilling dated April 14, 2009); *see* Tr. at 88.

At hearing, Ms. Barkley on behalf of PRN suggested that this agreement may not be enforceable or effective where groundwater from the Hutsonville site may cross property boundaries and affect other groundwater users. *See* Tr. at 89. Mr. Cobb indicated that the Agency had assessed this question. *See* Tr. at 90-91. He stated that, although a high-capacity irrigation well draws large amounts of groundwater on the adjacent downgradient property, it does so only on an intermittent basis from "abundant water" in the lower zone. *Id*. at 89-90. He suggested that conditions in the upper level of the groundwater would be affected only "after a full growing season, and then it flips back when the -- you know, the irrigation is done." *Id*. at 90. He opined that any additional wells would draw from "the more highly transmissive lower zone" and that demand from a well used for a private drinking water system would have only a "minimal" effect on the upper level of groundwater. *Id*. Emphasizing removal of groundwater by the proposed collection trench, Mr. Cobb suggested that Ameren's proposal satisfactorily addresses the risk of having contaminated groundwater cross the boundary of the adjacent property. *Id*. at 90-91.

Groundwater Monitoring Program

The TSD includes a groundwater monitoring program for Ash Pond D and notes that "[a] final monitoring plan will be included in the Pond D Closure Plan." TSD at 542; *see* Bollinger Test. at 6; *see generally id*. at 542-605 (Chapter 10). The plan lists eleven wells forming the monitoring plan. TSD at 547 (Program Summary), 548; *see id*. at 549 (Site Plan), 567-605 (well completion details). Of those eleven, "[m]onitoring wells MW-1 and MW-10 provide upgradient data for the upper migration zone." TSD at 544. The program documents note that "[t]here are no suitable locations for deep alluvial aquifer background monitoring points, because the Wabash River overlays the western edge of the deep alluvial aquifer north of Pond D." *Id*. Of the nine downgradient wells, the documents note that monitoring wells MW-6, MW-7, MW-8, and MW11-R are "impacted." *Id*. at 543.

Noting that boron and sulfate "are the primary indicators of coal ash leachate" (TSD at 544), the program provides that those constituents will be monitored in every sample. *Id*. at 545, 547. It also provides for monitoring iron, manganese, and TDS in each sample. *Id*. Addressing field parameters, the program provides that "[a]dditional monitoring of pH, specific conductance, groundwater elevation, and monitoring well depth will be completed during each sample event." *Id*. at 544; *see id*. at 547. Finally, the program establishes that, "[i]n addition to the field parameters and ash indicators, inorganic constituents with Illinois Class I groundwater quality standards will be analyzed at least once each year until a demonstration is made that the constituents can be removed from the monitoring program." *Id*. at 544. The program summary lists these constituents: antimony, arsenic, barium, beryllium, cadmium, chloride, chromium, cobalt, copper, cyanide, fluoride, lead, mercury, nickel, nitrate as N, selenium, silver, thallium, and zinc. *Id*. at 547. The program provides that, "[i]f any of the annual constituents are detected at a concentration higher than the Illinois Class I groundwater quality standard, then that

constituent will be analyzed in each sample until it can be demonstrated that a return to annual sampling is appropriate." *Id*. at 545; *see id*. at 547.

The program also provides a monitoring schedule. "Groundwater will be sampled on a quarterly basis for the first five years after closure." TSD at 544, *see id*. at 547. The program provides that, beginning five years after closure, this quarterly frequency may be reduced to semi-annual when all of the following have been demonstrated: "[t]hat monitoring effectiveness has not been compromised by the reduced frequency of monitoring; [t]hat sufficient quarterly data has been collected to characterize groundwater; and [t]hat concentrations of monitored constituents at the downgradient monitoring wells show no statistically significant increasing trends that are attributed to a release from Pond D." *Id*. at 544-45. The program further provides that, beginning fifteen years after closure, this semi-annual frequency may be reduced to annual monitoring "[f]ive years after concentrations of monitored constituents in downgradient groundwater show no statistically significant increasing trends that are attributed to Pond D." *Id*. at 545.

Projected Costs

As noted above (*see supra* at 16), Ameren expects that "capital costs associated with the selected closure scenario could range from $3 to $4 million dollars, excluding engineering design." SR at 21, citing TSD at 73-74; *see* TSD at 27, Bollinger Test. at 15. Ameren has also estimated that its "[a]nnual operating and maintenance costs associated with the trench and final cover system are expected to be around $50,000." SR at 21, citing TSD at 73-74; *see* TSD at 27, Bollinger Test. at 15.

Projected Environmental Impact

Ameren states that it has assessed the environmental impact of its proposed closure plan and found the geosynthetic membrane and the groundwater collection trench "to be protective of human health and the environment." SR at 21. Ameren notes that its consultant performed a human health and ecological risk assessment, which analyzed risk of the proposed closure option under current and reasonably foreseeable future land uses and conditions and groundwater uses. *Id*., citing TSD at 332-492 (AECON, Inc. assessment); *see* Bollinger Test. at 7, PC 4 at 4-6. Ameren argues that "[t]he assessment utilize a four step paradigm as identified by USEPA and was conducted consistent with USEPA guidance for conducting a risk assessment as well as the Agency's Tiered Approach to Corrective Action Objectives." PC 4 at 6, citing TSD at 332-492, Tr. at 86-87. Ameren states that "[t]he risk assessment concludes that the closure plan and associated activities do not pose a threat to human health or the environment under current and reasonably foreseeable future conditions and land use." SR at 22, citing TSD at 371; *see* PC 4 at 6; Bollinger Test. at 7-8. Ameren argues that its proposed closure plan "will be extremely effective in remediating the groundwater on-site and off-site and protecting both zones of the aquifer." PC 4 at 7. Testifying at the hearing, Mr. Cobb stated that the monitoring trend analysis "combined with the hydrogeologic analysis that was done and the detailed groundwater flow modeling, the predictive modeling and contaminant transport modeling, the capping and the interceptor trench, are, you know, extremely effective in remediating this groundwater on-site and off-site and protecting the two different zones of the aquifer. . . . " Tr. at 50-51 Ameren

further states that it and the owner of an adjacent property "have entered into an agreement restricting the neighbor's groundwater use within the first 25 vertical feet of the water table and extending 500 feet south of the Hutsonville Station property boundary." SR at 22, citing TSD at 538-40.

BOARD REQUEST FOR MORE INFORMATION

Summary of Board's January 7, 2010 Order

After conducting a hearing on September 29, 2009, the Board received post-hearing comments from the Agency, Ameren, and PRN. *See* PC 2 (Agency), PC 3 (PRN), PC 4 (Ameren), PC 5 (Ameren), PC 6 (PRN). In its January 7, 2010, order the Board noted that PRN opposed the joint proposal on bases including claims that the joint proposal failed adequately to describe the affected area, to assess environmental impacts, and to address the technical and economic infeasibility of complying with existing regulations. PRN also claimed that adoption of Ameren's proposal without consideration of the environmental impact of the proposed discharge of contaminated groundwater to the waters of the state would be inconsistent with federal law. In the Matter of: Ameren Ash Pond Closure Rules (Hutsonville Power Station): Proposed 35 Ill. Adm. Code 84.100 through 840.144, slip op. at 2 (Jan. 7, 2010). The Board stated that a review of the record "indicates that additional information pertaining to the impact of Ash Pond D on irrigation wells on adjacent property and an assessment of environmental impact of the proposed discharge of contaminated groundwater into the Wabash River would allow the Board to perform a fuller evaluation of Ameren's site-specific rulemaking proposal" *Id*. Accordingly, the Board directed Ameren as the original proponent to submit groundwater quality monitoring data and an environmental impact assessment of the proposed discharge into the Wabash River. *Id*. at 2-4.

Both Ameren and the Agency responded to the Board's order, and Ameren filed a supplemental response. *See* Ameren Info., Agency Info., Ameren Supp. Info. In the following subsections of this opinion, the Board summarizes these three filings.

Ameren Response

Groundwater Impacts

In its response to the Board's order, Ameren notes that "the Board requested additional groundwater quality information concerning the irrigation wells to further evaluate the joint proposal." Ameren Info. at 2, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 3 (Jan. 7, 2010). Ameren further notes that the Board directed Ameren to supply additional groundwater quality information concerning those irrigation wells through existing data, new sampling data addressing the same parameters of concern as the hydrogeologic assessment, or sampling results from a new monitoring well. Ameren Info. at 2, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 3 (Jan. 7, 2010). Ameren also notes that the Board addressed the location and sampling results from monitoring well MW-7D and stated that "it appears that there are no other deep

monitoring wells along the southern edge of Ash Pond D." Ameren Info. at 2-3, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 3 (Jan. 7, 2010). Ameren argues that the Agency has concluded that technical data in the record support the joint proposal and concurs that the joint proposal is protective of human health and the environment. Ameren Info. at 1, 2. Ameren nonetheless responded to the Board's request by reanalyzing the data in the record and providing "additional information to clarify and more accurately describe the area affected." *Id*. at 3.

Ameren first restates its position the "Ash Pond D does not threaten existing uses of down gradient wells." Ameren Info. at 3. Ameren states that, of the six wells within a half-mile of Ash Pond D, two are plant production wells and "the other four are irrigation wells utilized by adjacent property owners to the south." *Id*. Ameren further notes that all six draw from the lower zone of the aquifer, which complies with Class I groundwater quality standards. *Id*., citing TSD at 176-330 (hydrogeologic assessment), 482-84 (well search), 494-536 (modeling).

Ameren elaborates upon irrigation wells identified by PRN as situated 50 feet, one-half mile and three-quarters of a mile from the boundary of its property. Ameren Info. at 3, citing PC 3 at 2. Although Ameren acknowledges that groundwater flow maps did not identify all three of these wells, Ameren states that risk assessment documents identify all three of them. Ameren Info. at 3, citing TSD at 482-92 (potable well search). Ameren indicates that the closest of these three is identified in various groundwater flow maps as IRR-1 (*see* TSD as 33-48) and in the potable well search as well 66 (TSD at 483). Ameren Info. at 3-4. Ameren argues that "IRR-1 is the only irrigation well that is in the vicinity of Ash Pond D. The other two irrigation wells are either located up gradient of Ash Pond D or outside the potential zone of influence." *Id*. at 4. Ameren states that the TSD depicts these two other as Wells 64 and 60. *Id*., citing TSD at 483. Ameren claims that "[w]ell 64 is located approximately one-half mile from Ameren's property and is up gradient of Ash Pond D." Ameren Info. at 4. Ameren further claims that "[w]ell 60 is located approximately three-quarters of a mile from Ameren's property boundary which is clearly beyond the zone of potential influence." *Id*., citing TSD at 494-536 (groundwater modeling).

Ameren refers to Mr. Cobb's testimony that, "during the growing season, the direction of the groundwater flow appears to move from the east to the southeast." Ameren Info. at 4. Ameren notes Mr. Cobb's opinion that withdrawal of groundwater from IRR-1 causes this seasonal change. *Id*., citing Cobb Test. at 8; *id*., Att. V (flow contour); TSD at 40 (same). However, Ameren characterizes the impact of the well on the flow, if any, as "minimal." Ameren Info. at 4, citing Cobb Test., Att. V. Ameren argues that "the cone of depression from an intermittent irrigation well is limited to the growing season, and is not constant." Ameren Info. at 4. Ameren further argues that "[a] change in groundwater flow direction, if it occurs at all, is expected to occur toward the end of the growing season." *Id*. at 4-5, citing TSD at 40. Ameren concludes that "Ash Pond D is not a constant source of contamination to the irrigation well." Ameren Info. at 5.

Ameren continues that groundwater flowing toward IRR-1 does not threaten it. Ameren Info. at 5. Ameren argues that "groundwater in the lower zone of the underlying aquifer meets numeric Class I groundwater quality standards and has been only minimally impacted by Ash

Pond D." *Id*., citing TSD at 17-18, 201-07, 236. Ameren acknowledges that "[s]ampling from one monitoring well screened in the lower zone, MW 14, which is approximately 50 feet from IRR-1 and immediately southeast of Ash Pond D, reflects levels of boron and sulfate above background concentrations." Ameren Info. at 5, citing TSD at 17-18, 51-52 (box whisker plots), 68-72 (monitoring results), 236, 426-28. However, Ameren argues that "measured concentrations of boron and sulfate near MW 14 comply with numeric Class I groundwater quality standards." Ameren Info. at 5, citing TSD at 51; Cobb Test., Att. II (box whisker plots). Ameren states that the boron concentration at MW 14 is "less than or equal to 1.6 mg/l 90 percent of the time" and averages "less than 0.8 mg/l." Ameren Info. at 5, citing TSD at 51; Cobb Test., Att. II. Ameren cites the Class I groundwater quality standard of 2.0 mg/l and argues that this standard protects sensitive crops such as citrus. Ameren Info. at 5, citing 35 Ill. Adm. Code 620.410(a); Groundwater Quality Standards, R89-14, 14(B). Ameren argues that, because the measured boron concentrations falls below this limit, any contamination that does exist poses no threat to human health and the environment. Ameren Info. at 5-6.

Ameren states that any contamination originating from Ash Pond D could affect off-site wells only by migrating at least 50 feet through the lower zone of the underlying aquifer. Ameren Info. at 6. Ameren argues that, "[a]s contaminants migrate hydraulically down gradient from their source (*i.e.*, Ash Pond D), their concentrations tend to decline due to advection and dispersion." *Id*. Noting that the boron concentration at MW 14 is less than or equal to 1.6 mg/l 90 percent of the time and most often below 0.8 mg/l, Ameren argues that "any boron contamination from Ash Pond D that is entering the irrigation well is expected to be below 1.6 mg/l. . . ." *Id*. Ameren further argues that "boron concentrations will likely be further reduced by capping Ash Pond D and utilizing the groundwater collection trench." *Id*., citing Cobb Test. at 12.

Ameren also argues that "[i]nstalling an additional monitoring well along the southern property boundary in the lower zone of the underlying aquifer is unnecessary." Ameren Info. at 6. Ameren states that "MW 14 is screened in the lower zone of the underlying aquifer and is located down gradient from Ash Pond D, up gradient from the nearest irrigation well during a portion of the growing season . . . and approximately 50 feet from the nearest irrigation well." *Id*. Ameren concludes that "MW14 provides an accurate picture of what, if any, contamination might be migrating off-site in the lower zone of the underlying aquifer." *Id*. at 7.

Ameren further argues that "sampling the irrigation well is not necessary because there is no reason to suspect that groundwater contaminated above the Class I groundwater quality standards is entering the well." Ameren Info. at 7. Ameren expresses doubt that an irrigation well could provide reliable data "because the construction of an irrigation well does not comply with the quality control requirements set for constructing monitoring wells." *Id*.

Surface Water Impacts

Ameren notes that the Board "requested additional information on the environmental impacts of the potential discharge of groundwater into the Wabash River." Ameren Info. at 7. Ameren notes that its proposal does not require discharging groundwater from the collection trench into the river and does not seek the Board's approval of such a discharge. *Id*. Citing

Section 840.122, Ameren argues that the joint proposal allows groundwater from the trench to be managed according to an NPDES permit "or another option as approved by the Agency in the closure plan or post closure plan." *Id.*; *see* Joint Prop. at 17. Ameren emphasizes that discharging groundwater from the collection trench as part of closing Ash Pond D requires "(1) the Agency to approve plans for the groundwater discharge system, including a plan for operation and maintenance, in the closure plan; and (2) Ameren to construct the groundwater discharge system according to a construction quality assurance program." Ameren Info. at 7.

Ameren notes PRN's position "that the joint proposal is insufficient because Ameren has allegedly failed to adequately characterize the potential discharge to the Wabash River." Ameren Info. at 8, citing PC 3, PC 6. Specifically, Ameren attributed to PRN the view that the joint proposal does not satisfy the Board's regulations because it fails to describe the entire affected area. Ameren Info. at 8, citing PC 3 at 2; *see* 35 Ill. Adm. Code 102.210(d). Ameren cites the Board's request for "an assessment of the environmental impact of discharging contaminated groundwater into the Wabash River." Ameren Info. at 8, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 4 (Jan. 7, 2010).

Ameren argues that the TSD includes such an assessment. Ameren Info. at 8. Ameren emphasizes that that Agency through NPDES permitting has "determined that a discharge limit of 10 mg/l of boron into the Wabash River is protective of the environment." *Id*., citing *id*., Exh. 1 (permit reapplication). Ameren reports that it "performed a mixing calculation to determine whether a discharge from the existing ash pond system that includes groundwater collected from the groundwater collection trench has the potential to cause an exceedance of the facility's NPDES effluent limit." *Id*. at 8. Ameren states that including the groundwater in the existing discharge "will likely result in an average discharge of 2.0 mg/l of boron." *Id*., citing TSD at 610. Ameren claims that such a discharge is protective of the environment. *See* Ameren Info. at 8.

Ameren states that it "performed additional calculations to demonstrate that the potential discharge of groundwater from the collection trench into the Wabash River will not adversely impact human health or the environment and that the overall impact of the proposed closure scenario will benefit the environment by reducing impacts from Ash Pond D." Ameren Info. at 8-9. Ameren first relied upon information from the TSD to calculate "the increase in boron loading under worst case conditions" of the estimated maximum value of boron in groundwater and low flow river conditions. *Id*. at 9, citing TSD at 430, 610. Employing a mixing zone of 25% under water quality standards (Ameren Info. at 9-10, citing 35 Ill. Adm. Code 302.102(b)(8)), Ameren estimated "the additional amount of boron in-stream at the edge of the mixing zone under worst case conditions will be 0.02 mg/l. . . ." Ameren Info. at 9.

To depict more typical conditions and provide a comparison, Ameren "also calculated the additional amount of boron in-stream following discharge under average river conditions and estimated maximum boron concentrations." Ameren Info. at 10; *see id*., Exh. 2 (Wabash River flow data). Ameren characterizes this as "a very conservative approach" because it relies on estimated maximum rather than estimated average boron concentration in the groundwater. *Id*. at 10. Ameren's calculation estimated "the increase in boron at the edge of the mixing zone . . .

will be 0.002 mg/l. *Id*. at 10. Ameren argues that "[t]his level is considered negligible (as this concentration is at or below common method detection limits for boron in groundwater)." *Id*.

Ameren states that the general use surface water quality standard for boron is 1.0 mg/l. Ameren Info. at 10, citing 35 Ill. Adm. Code 302.208(g). Ameren argues that "[t]he worst cases scenario would result in a 0.02 mg/l increase in boron concentration which would increase the 'ambient' boron concentration to 0.091 mg/l." Ameren Info. at 10-11; *see id*. at 11 n.6 (describing determination of average concentration). Ameren further argues that, "[u]nder average flow conditions, the increase in boron concentration would be difficult to distinguish from the normal variability in the ambient river concentration." *Id*. at 11. In addition, Ameren states that the Agency is currently reviewing whether to relax the boron water quality standard. *Id*.; *see id*., Exh. 3 (Draft Water Quality Standards Updates).

Ameren argues that "[t]he magnitude of the expected change in boron concentration in the Outfall 002 discharge is very minor compared to both the historic and current ash pond discharge concentrations as well as the ash pond outfall effluent limitations contained in Ameren's NPDES permit." Ameren Info. at 11. Ameren notes that the TSD relied on data from a 2003 NPDES permit renewal to conclude that "including groundwater from the collection trench in the existing discharge will likely result in an average discharge of 2.0 mg/l of boron in the Outfall 002 discharge." *Id*., citing TSD at 609. Ameren argues, however, that more recent data reveal that "the discharge from Outfall 002 has a much lower average boron concentration of 0.69 mg/l, and a greater average flow of 3,870,000 gal/day." Ameren Info. at 11; *see id*., Exh 4 (concentration and flow rate). Relying on these figures and the estimated average boron concentration and flow from the collection trench, and assuming mixing of the two flows, Ameren determined that expected boron concentration in the Outfall 002 discharge would be 0.95 mg/l. *Id.* at 12; *see id*., Exh 5 (discharge calculations). While Ameren acknowledges that this estimate concentration is an increase of 0.26 mg/l from the current concentration, "[b]oth Ameren's environmental assessment in the TSD and the updated estimate are increases over the existing boron concentration that are well within the NPDES permit's 10 mg/l effluent limitation." *Id*. at 12; *see* TSD at 332-492.

Ameren states that the groundwater collection trench intends to collect groundwater now migrating to the southeast and transfer it to the Wabash River "in order to prevent offsite migration of leachate in this direction." Ameren Info. at 12. Ameren projects that, after removing Ash Pond D from service but before executing closure plans, leachate flowing from Ash Pond D directly to the Wabash River will contain approximately 25 lbs/day of boron. *Id*., citing TSD at 535. After dewatering and installation of a cap and cover, however, Ameren projects that leachate flowing directly from Ash Pond D to the river will contain approximately 5 lbs/day. Ameren Info. at 12-13, citing TSD at 535. Ameren further projects that, if groundwater from the collection trench is discharged through Outfall 002, "this discharge will result in an additional 10 lbs/day of boron." Ameren Info. at 13; *see id*. n.10 (calculation). Ameren argues that, despite this estimated load from the collection trench, there is a projected overall reduction of 10 lbs/day boron associated with the closure of Pond D." *Id*. at 13, 14. Ameren further argues that, "[w]hile the discharge of groundwater to the Wabash River will result in an increase in the quantity of water and may increase the amount of boron discharged pursuant to Ameren's NPDES permit, the joint proposal will result in a net decrease in boron loading to the river." *Id*.

at 12. Ameren concludes that "the overall impact of closure will not degrade water quality in the Wabash River." *Id*. at 13.

Ameren states that the Act provides the Agency authority to "restore, protect and enhance the quality of the environment.'' Ameren Info. at 13 (citations omitted). Ameren argues that "the joint proposal requires the Agency to authorize any additional discharge to the Wabash River or any alternative groundwater management option" as protective of human health and the environment. *Id*. In this case, Ameren notes that the Agency joins it in maintaining that "the proposed closure scenario, including the option of discharging groundwater from the collection trench to the Wabash River *via* Outfall 002 will result in a reduction of existing contamination." *Id*. at 14, citing PC 2 at 4. Ameren states that "[t]he proposed collection trench will simply intercept groundwater currently migrating offsite and redirect that water to Pond B, which ultimately discharges through Outfall 002 to the Wabash River." Ameren Info. at 14. Ameren further states that implementation of the joint proposal "will reduce boron loading to the Wabash River by approximately 10 lbs/day." *Id*. at 13, 14. Based on this projected reduction, Ameren claims that no further environmental assessment is warranted: "the joint proposal, including implementing the option discharge of groundwater to the Wabash River, will result in net loading reductions and an ultimate benefit to human health and the environment." *Id*. at 14.

Agency Response

Groundwater Impacts

In its response to the Board's January 7, 2010 order, the Agency noted that the Board addressed PRN's post-hearing comments by generally requesting "additional information characterizing the environmental impacts of Ash Pond D on the agricultural property immediately to the south of the Hutsonville facility. . . ." Agency Info. at 1. The Agency further noted that the Board "directed Ameren to provide water quality data related to irrigation wells located on the property south of the facility. . . ." *Id*., citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 4 (Jan. 7, 2010). The Agency emphasizes its testimony that Ameren's TSD sufficiently supports the proposal, including "information sufficient to determine that any contaminant concentrations from Ash Pond D in the irrigation wells to the south of the Hutsonville facility will remain below the applicable numeric groundwater quality standards and are likely to diminish with the installation and operation of the proposed remedy." Ameren Info. at 1-2, citing Tr. at 50-54 (Cobb testimony). The Agency states that, "in the interest of avoiding the collection of and evaluation of information that may be unnecessary, the Agency believes it would be useful to provide a more detailed explanation of the technical basis for its conclusions." *Id*. at 2.

The Agency first addresses this issue by summarizing general principles of hydrology and hydrogeology. The Agency states that water infiltrating soil that does not evaporate or transpire through plants "migrates downward through pore spaces in soil or rock, eventually reaching a zone where all pore spaces are saturated." Agency Info. at 5. The Agency describes the surface of this saturated zone as the "*water table*" and characterizes all water below the water table as groundwater. *Id*. (emphasis in original), citing 415 ILCS 5/3.210 (defining

"groundwater"), 35 Ill. Adm. Code 620.110 (Definitions). The Agency further states that one determines the water table "by measuring the elevation of water surfaces in wells that penetrate the saturated zone." Agency Info. at 5.

The Agency also describes the movement of groundwater, stating that it "flows from recharge zones, where infiltration occurs (*e.g.*, uncovered Ash Pond D), to discharge zones, where groundwater discharges into stream, lakes, and wells." Agency Info. at 5. The Agency compares this to the flow of surface water but states that groundwater moves much more slowly. *See id*. The Agency elaborates that "groundwater moves downgradient from areas of higher potential energy to areas of lower potential energy," and it characterizes areas of equal elevation as "*hydraulic head*." *Id*. (emphasis in original).

The Agency states that "[t]he *direction* of groundwater movement can be estimated from a map of the *potentiometric surface*, (*i.e.*, a contour map of the elevations of water levels in observation wells)." Agency Info. at 5 (emphasis in original). The Agency claims that groundwater generally flows in a direction perpendicular to the contours of the potentiometric surface. *Id*. The Agency states that "[t]he *rate* of groundwater movement is related to the permeability of the aquifer and the magnitude of the slope of the potentiometric surface." *Id*. at 6 (emphasis in original). The Agency further states that permeability is quantitatively expressed in terms of hydraulic conductivity, which "is a function of the size and shape of pore spaces, the degree of interconnection of these spaces, and the type of fluid . . . passing through the medium." *Id*.

The Agency states that contaminants dissolved in groundwater generally travel in the direction of groundwater flow. Agency Info. at 6. The Agency describes "advection" as the "transport of dissolved constituents (solutes) at the same speed as the average groundwater pore velocity." *Id*. The Agency cites hydraulic principles underlying Darcy's Law, an equation stating that "the flow rate of a liquid through a porous medium is proportional to the head loss and inversely proportional to the length of the flow path." *Id*. The Agency argues that Darcy's Law can be modified to determine "a velocity representing the *average* rate at which groundwater moves between two points. . . ." *Id*. (emphasis in original) (providing equation and key to variables).

The Agency applies these principles of hydrogeology to the effect on the potentiometric surface of pumping groundwater from wells. The Agency states that these withdrawals lower water levels in the water table around the well. Agency Info. at 7. The Agency further states that "[t]he difference between water levels during non-pumping and pumping conditions is called *drawdown*." *Id*. The Agency also states that, because the area of drawdown around wells resembles a cone, "the water table drawdown area affected by the pumping well is called the *cone of depression*." *Id*. (emphasis in original), citing *id*., Att. 1 (Conceptual cone of depression caused by a pumping well). The Agency characterizes the area defined by the cone's rim at ground level as the *lateral area of influence* (LAI). *Id*. (emphasis in original). The Agency characterizes "the entire three-dimensional area from which groundwater is eventually pulled into a pumping well" as the "*zone of capture* (ZOC)." *Id*. (emphasis in original); citing *id*., Att. 2 (Conceptual cone of depression, lateral are of influence (LAI), and zone of capture (ZOC)).

The Agency cites Mr. Cobb's pre-filed testimony regarding the site's hydrogeology and the effect of the off-site irrigation wells on upper and lower zones of the underlying aquifer south of Ash Pond D. That testimony recommended that "the upper and lower aquifers should be considered one hydrogeologic unit, especially in the southeast corner," where MW-14 reveals contamination. Cobb Test. at 6-7, citing TSD at 51 (Box Whisker Plots for boron and sulfate). The testimony stated that potentiometric surface maps also show that "[t]he deep alluvial aquifer is hydraulically connected to the fine-grained alluvium in some areas of the site." Cobb Test. at 7, citing TSD at 40 (flow contour), 214 (comparing nested wells MW-7 and MW-7D). Mr. Cobb also testified that contamination deep well MW-14 also reflects this hydraulic connection. Cobb Test. at 7; *see* TSD at 51-52. Mr. Cobb argues that, "[b]ased on the hydraulic connection, the uppermost aquifer must include the deep alluvial aquifer in relation to evaluating off-site impacts to the south and southeast of Ash Pond D." Cobb Test. at 7.

The Agency notes that the TSD includes "a *time series* of potentiometric surface maps at the Hutsonville facility for both the upper and lower zones of the underlying aquifer. . . ." Agency Info. at 8 (emphasis in original), citing TSD as 33-48. The Agency states that these maps reflect seasonal changes including any off-site pumping. Agency Info. at 8. The Agency argues that an October 2, 2007 map "illustrates the impact of off-site irrigation wells' LAI and ZOC on the upper migration zone of the aquifer due to the hydraulic connection between the upper and lower zones in the aquifer." *Id*., citing *id*., Att. 3, TSD at 40. Although this map shows that groundwater flow has shifted to the southeast, the Agency claims that "[t]his impact of the LAI and ZOC are not reflected in any of the other potentiometric surface maps. . . ." Agency Info. at 8. The Agency further claims that "[t]his makes sense because it would take time for the pumping stress in the lower zone of the aquifer to actually change the shape of the potentiometric surface in the upper zone of the aquifer." *Id*. The Agency argues that this October 2, 2007 map "shows that Ash Pond D, which is recharging the water table of the upper zone of the aquifer, is now up-gradient of MW-14 and IRR-1 and is in a position to recharge the LAI and ZOC of IRR-1 in the lower zone of the aquifer." *Id*. at 9; *see id*., Att. 3. The Agency further argues that MW-14 screened in the lower zone of the aquifer, "is down-gradient of Ash Pond D during the transient condition just described, and more importantly for the Board's concerns, it is up-gradient from the influence of IRR-1, the closest irrigation well." Agency Info. at 9, citing *id*., Att. 3, TSD at 40.

The Agency notes Mr. Cobb's testimony that box whisker plots usefully and concisely summarize "the distribution of data from a data set" and allow comparison of different monitoring wells at the Station. Agency Info. at 9-10, citing Tr. at 50-51, 53-54. The Agency notes the plot showing boron concentration at MW-14. Agency Info. at 10, citing *id*., Att. 4; *see* TSD at 51. That concentration is at or below 1.6 mg/l 90 percent of the time, and the median concentration is approximately 0.8 mg/l. Agency Info. at 10; *see id*., Att.4, TSD at 51. The Agency concludes that "the worst-case scenario for modeling contaminant transport would start with a concentration of 1.6 mg/l of boron. However, a more statistically accurate and representative starting place would be a concentration of 0.8 mg/l of boron." Agency Info. at 10.

The Agency describes the "transport of dissolved constituents (solutes) at the same speed as the average groundwater pore velocity" as *advection*. Agency Info. at 10-11 (emphasis in original). The Agency states that, in saturated flow through porous natural materials, "velocities

vary widely across any single pore and between pores." *Id*. at 11. The Agency further states that, when a fluid capable of being mixed "is introduced into a flow system[,] it will mix mechanically and diffuse . . . to occupy an ever increasing portion of the flow field." *Id*. The Agency describes this process as *dispersion*, a mechanism of *dilution*, which "acts to reduce peak concentration of material introduced into a flow field." *Id*. The Agency claims that, "[a]s water soluble contaminants migrate hydraulically down-gradient from their source . . . and are acted on by advection and dispersion, their peak concentrations tend to decline progressively. *Id*. at 11-12. The Agency states that a simplified analytical version of the *Advection-Dispersion Equation* describes solute transport. *Id*. at 11 (citation omitted).

The Agency states that "contaminant masses generally move either as a slug from a *one-time source* of contamination or as a contamination plume from a *continuous source* of contamination." Agency Info. at 12. The Agency claims that "Ash Pond D is not a continuous source of contamination to the lower zone of the underlying aquifer because of the transient nature of the groundwater flow direction due to the off-site influence of IRR-1 and any other pumping wells sufficiently close to influence groundwater movement during a limited growing season." *Id*. The Agency argues that Ash Pond D "is an *intermittent source of contamination* to the lower zone of the aquifer." *Id*. (emphasis in original). The Agency further argues that this intermittent nature diminishes "concentrations of contaminants in groundwater as it migrates from Ash Pond D and down-gradient from MW-14." *Id*. The Agency concludes that, "[t]herefore, even using the worst cases scenario of 1.6 mg/l (versus the more likely starting concentration of 0.8 mg/l or lower), the concentration of boron (or other contaminants from Ash Pond D) in groundwater will be reduced via the process of hydrodynamic dispersion as the plume moves down-gradient toward IRR-1." *Id*.

In addition, the Agency relied upon a USEPA contaminant transport model "to predict the concentration of 1.6 mg/l of boron as it moves down-gradient from MW-14 toward off-site irrigation wells." Agency Info. at 13. The Agency states that it ran the model "under extremely conservative conditions for a ten year period assuming *steady state* conditions and a *constant source* of contamination to the *lower zone* of the aquifer. *Id*. (emphasis in original); *see id*., Att. 5 (model inputs), Att. 6 (dissolved boron transport along plume center line), Att. 7 (dispersion in x, y, z directions). The Agency argues that, even beginning with a worst-cases scenario, modeling shows "that concentrations will drop off rapidly from the concentration assumed at MW-14" as groundwater migrates toward IRR-1. *Id*. at 12.

The Agency argues that at no point in this migration will the boron concentration "equal or exceed the numeric groundwater quality standard for boron of 2.0 mg/l." Agency Info. at 13. The Agency states that this standard is based upon irrigation, as boron can be toxic to certain sensitive plants including citrus and other fruit and nut crops. *Id*. at 14 (citations omitted). The Agency describes corn and wheat as "semi-tolerant" crops. *Id*. (citation omitted). The Agency characterizes the soils south of the Station as appropriate for the 2.0 mg/l boron standard for irrigation water even for sensitive crops. *Id*. at 14-15(citations omitted).

The Agency concludes on the basis of modeling that boron will undergo "a slight decrease in concentration over the 50 feet from MW-14 to IRR-1, but at no time does the predicted boron concentration increase." Agency Info. at 16. The Agency argues that, "[a]t the

next closest irrigation well one-half mile away, the boron concentration, if groundwater could flow that direction, would be less than 0.6 mg/l." *Id*. The Agency further argues that, "[u]nder the more likely scenario of boron concentration of 0.8 mg/l at MW-14, concentrations would be reduced even further by hydrodynamic dispersion even if steady-state conditions and a continuous source of contamination are assumed." *Id*. The Agency claims that adoption of the joint proposal would provide additional reduction of boron concentrations. *Id*. The Agency attributes this projected reduction to three factors of the joint proposal: capping Ash Pond D, decreasing recharge to the lower zone of the aquifer with the discontinuation of pumping from irrigation wells, and reducing "the groundwater source area due to the effects of the groundwater collection trench." *Id*.

Surface Water Impacts

In its response to the Board's January 7, 2010 order, the Agency noted that the Board has addressed PRN's post-hearing comments by requesting generally additional information "assessing the environmental impacts of the discharge of contaminated groundwater to the Wabash River." Agency Info. at 1; *see id*. at 17. The Agency further noted that the Board directed Ameren to provide "an environmental assessment of a discharge to the Wabash 'that would be helpful in evaluating the alternative options for the management of contaminated groundwater. . . .'" *Id*., citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 4 (Jan. 7, 2010).

The Agency states that the Board's direction responds to "PRN's comment that the joint proposal fails to meet the requirements of 35 Ill. Adm. Code 102.210(d) because it does not provide an antidegradation analysis and resolve once and for all the ultimate destination of the contaminated groundwater." Agency Info. at 17. The Agency attributes to PRN the view "that the contaminated groundwater management issues must be resolved in this proceeding." *Id*. The Agency emphasizes its position that "[t]he joint proposal is protective as proposed because all the available options for management of contaminated groundwater are regulated by existing and well-settled laws subject to Agency administration." Agency Info. at 2. The Agency nonetheless states that it "wishes to provide its perspective regarding assessments and evaluation *in this proceeding* of alternatives for the management of contaminated groundwater from the proposed collection trench." Agency Info. at 2 (emphasis in original).

The Agency disagrees with what it describes as PRN's "rigid interpretation of Section 102.210(d)" that issues such as assessing environmental impacts and evaluating discharge alternatives must always be resolved in site-specific rulemakings. Agency Info. at 18; *see* 35 Ill. Adm. Code 102.210(d). The Agency argues that the Act and the Board's regulations authorize it to review applications and issue permits. Agency Info. at 18, citing 415 ILCS 5/4(g), 39(a), 39(b); 35 Ill. Adm. Code 309 (Permits). The Agency acknowledges that "[t]here undoubtedly are situations when it would be essential in a site-specific rulemaking for the Board to require a level of finality similar to that advocated by PRN." Agency Info. at 18. However, the Agency argues that "[t]here are also situations when it is appropriate to defer the resolution of unresolved matters to existing procedures outside the site-specific rule that have been developed for the purpose of revolving those matters." *Id*. The Agency claims that this case "represents a particularly striking example of when deference to established procedures is warranted." *Id*.

The Agency opines that "a comprehensive assessment of environmental impacts to the Wabash River from discharges of contaminated groundwater at the Hutsonville facility and a final determination of the groundwater management option are premature, unnecessary, and not required in this proceeding." *Id*. at 23.

The Agency argues that the joint proposal recognizes the existence of numerous options for the management of contaminated groundwater. Agency Info. at 19. The Agency states that those options include, but are not limited to, the following:

> 1) [d]ischarge to the Wabash by Ameren at the Hutsonville facility through an existing outfall; 2) discharge to the Wabash by Ameren at the Hutsonville facility through an new outfall; 3) discharge by Ameren to a publicly-owned treatment works (POTW) or other waste treatment facility; 4) discharge by Ameren or another entity to another stream with greater assimilative capacity; 5) deep well injection; 5) [sic] use as process water; and 6) [sic] land application. *Id*.

The Agency argues that "[s]ome of the options do not involve discharge to the Wabash River by Ameren, some do not involve discharge to the Wabash River, and some do not involve discharge to the waters of the state." *Id*. The Agency further argues that some of these options would not require an NPDES permit or the antidegradation assessment upon which PRN insists. *Id*. The Agency states that each of the options is regulated in some fashion under the Act and the Board's regulations. *Id*. at 18. The Agency elaborates that "[t]here is no unregulated scenario under which Ameren could manage the contaminated groundwater as it pleases without restriction." *Id*. at 18-19. The Agency concludes that "[e]valuating options that might not come to pass would be premature and a waste of resources." *Id*. at 19.

The Agency supports its position by reviewing the development of the joint proposal. The Agency notes that Ameren's original proposal provided only one alternative for managing contaminated groundwater: "direction to Ash Pond B for discharge to the Wabash as authorized in the Hutsonville station's NPDES permit." Agency Info. at 19, citing SR at 19-20; Orig. Prop. at 9 (proposed Section 840.120). After reviewing the original proposal, the Agency determined that

> 1) [o]utcomes of application for NPDES permits or permit modifications could not be prejudged in this proceeding because a federally-delegated, independent regulatory structure exists for making that determination; 2) it was possible that any such application would be rejected; and 3) a proposal with one uncertain method for management of the contaminated groundwater was unacceptable. Agency Info. at 19-20.

The Agency argues that, if it denied an application for a permit or permit modification and the Board upheld the denial, then Ameren would have been unable to implement the closure plan. *Id*. at 20. The Agency claims that, in the joint proposal, "[t]he closure plan and post-closure plan mechanisms with administrative review and approval authority exercised by the Agency provide Ameren the opportunity to select a legally available management option while insuring that all applicable legal steps are followed for approval and implementation of that option." *Id*.

The Agency, without objection by Ameren, proposed one clarifying amendment to proposed Section 840.122 in order "to make even clearer that these decisions will not be left unaddressed but are merely being deferred to other appropriate mechanisms." *Id*. In summarizing proposed Section 840.122 above, the Board accepted this amendment and incorporated it into its order below with single modification. *Supra* at 91.

The Agency states that Ameren's original proposal has been amended "to recognize that other options may be available for management of contaminated groundwater." Agency Info. at 21. The Agency acknowledges that Ameren may select its original plan and seek a permit modification to discharge to the Wabash River from an existing outfall. *Id*. In that event, the Agency argues that "[t]he NPDES application review procedures and antidegradation assessment procedures set forth in the Board's rules have been developed to make precisely the evaluations PRN has argued must take place in this proceeding, and they are better suited to this task." *Id*. The Agency emphasizes that these procedures include public notice and comment (*id*., citing 35 Ill. Adm. Code 309.109), notice to governmental agencies (Agency Info. at 21, citing 35 Ill. Adm. Code 309.114), opportunity for a public hearing (Agency Info. at 21, citing 35 Ill. Adm. Code 309.115), and reopening the comment period after hearing if the draft permit undergoes significant modification after the initial comment period or hearing (Agency Info. at 21, citing 35 Ill. Adm. Code 309.120). In light of requirements such as these, "[t]he Agency recommends that the Board trust in the procedures it has established for resolution of these matters. . . ." Agency Info. at 23. In addition, the Agency notes that the Act confers to the third parties the right to appeal final Agency determinations to the Board. Agency Info. at 21, citing 415 ILCS 5/40(e) (2008). The Agency states that these procedures comply with federal requirements regarding NPDES permitting. Agency Info. at 21. The Agency emphasizes that "[a]s a state administrator of a delegated federal program, the Agency must take care to conduct reviews in accordance with the federally approved procedures, standards and requirements including an antidegradation assessment." *Id*.

The Agency notes PRN's assertion that adoption of the joint proposal might bias the results of the NPDES/antidegradation review or even preclude it if Ameren opts to discharge to the Wabash River. Agency Info. at 21-22, citing PC 6 at 1, 2. The Agency notes that the joint proposal allows Ameren "180 days after the effective date of the rule to complete its engineering and design activities, submit its closure plan and post-closure care plan to the Agency for review, and, if necessary, submit an application for the NPDES permit or permit modification and/or state operating permits." Agency Info. at 22, citing Joint Prop. at 20, 22-23, 24 (proposed Sections 840.128(a); 840.132; 840.134(a), (b); 840,138(a)). The Agency further notes that it "then has 90 days for review and approval or rejection of the closure and post-closure care plans." Agency Info. at 22, citing Joint Prop. at 30-31 (proposed Section 840.148(a)). The Agency also states that, if it approves the plans, then "Ameren has eighteen months to implement the construction phase of the approve closure plan 'unless the Agency approves an alternative timeline.'" Agency Info. at 22, citing Joint Prop. at 23 (proposed Section 840.134(b)). The Agency argues that, if Ameren fails to obtain a deadline extension "and its expenditures get too far ahead of the permit process," Ameren will bear the financial risk of doing so. Agency Info. at 22.

The Agency notes that the joint proposal added the phrase "unless the Agency approves an alternative timeline." Agency Info. at 22. The Agency accounts for this addition by stating that it expects review of the NPDES permit application, including the antidegradation assessment, to take "twelve months or more." *Id*. The Agency argues that, if approval remains uncertain, "Ameren thus has the option of requesting additional time for the construction phase rather than making costly construction and capital investments." *Id*. The Agency argues that it will be able to evaluate a request for an extension of this nature "because it will have the best information available on the progress of the permit application(s)." *Id*. at 22-23. The Agency argues that it "disagrees with PRN's assessment on both bias and preclusion." *Id*. at 22.

DISCUSSION

As described above, PRN raised issues concerning the joint proposal during the hearing process and by filing post-hearing comments opposing adoption of the proposal. PRN's issues relate primarily to the impact of Ash Pond D closure under the proposed rules on groundwater and surface waters. PRN also expressed concerns regarding the description of the affected area, technical feasibility and economic reasonableness, and the effects of federal law and regulations. On January 7, 2010, the Board directed Ameren as the original proponent to submit groundwater quality monitoring data and an environmental impact assessment of the proposed discharge into the Wabash River. Both Ameren and the Agency submitted additional information in response to the Board's order. The Board has reviewed this additional information with the pre-existing record and finds that the proposed closure regulations for Ash Pond D are protective of the environment and consistent with applicable federal authorities. The Board in the following subsections discusses and reaches its findings on the issues raised by PRN.

The Board's discussion begins with a brief summary of the Board's authority to adopt site-specific rules under the Act. The Board next discusses issues raised by PRN, including the description of the affected area, environmental impact, technical feasibility and economic reasonableness, and the requirements of federal law. The Board also addresses the Agency's request for a temporary moratorium on additional site-specific rules proposing to close coal combustion waste surface impoundments before considering the economic reasonableness and technical feasibility of the proposal.

Board's Rulemaking Authority

The Board adopts rules under Title VII of the Act. *See* 415 ILCS 5/26-29 (2008). The Board's rulemaking authority is derived primarily from Section 27 of the Act (415 ILCS 5/27 (2008)), which provides in pertinent part that rules adopted by the Board "may include regulations specific to individual persons or sites." 415 ILCS 5/27(a) (2008). Section 27(a) of the Act also provides that,

> [i]n promulgating regulations under this Act, the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be, and the

> technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution. 415 ILCS 5/27(a) (2008).

The Board's review in rulemakings is the same whether the rule is specific to one region or discharge or the rule is of generally applicable statewide. Therefore, the Board must determine whether the proposed rule is technically feasible and economically reasonable.

PRN Issues

Description of Affected Area

PRN Comments

PRN claims that the proposal and supporting documents fail to describe the entire affected area. *See* PC 3 at 2; 35 Ill. Adm. Code 102.210(d). Specifically, PRN argues that information from monitoring wells installed on property adjacent to the Station does "not seem to have been used in the effort conducted by Ameren (and reviewed by IEPA) in developing a groundwater cleanup plan and modeling potential scenarios." PC 3 at 2. PRN asks whether Ameren "was aware that there is a groundwater well, actively pumped for irrigation, located within 50' of Ameren's property boundary?" *Id*. PRN argues that the "well location is not recorded on any of the maps or tables detailing wells acknowledged and studied as part of Ameren's ten-year effort to develop the current petition." *Id*. PRN also asks whether Ameren was aware that three irrigation wells within three-quarters of a mile of the boundary of the Station property "are pumped at a rate of 1000 gallons per minute, on average, during the months of May through September every year?" *Id*. PRN argues that "[t]his information does not appear to have been included in the assumptions and data input for the modeling of the design and operation of the groundwater collection trench to mitigate off-site impacts." *Id*. PRN suggests that, because these withdrawals are similar to the amount of groundwater drawn from the proposed collection trench, it may take longer than the projected 10 years for the contamination plume to recede. *Id*., citing TSD at 506.

Ameren Response.

Ameren claims that PRN's position does "not involve a close or detailed review of the evidence of record." PC 5 at 1, 2. Ameren states that "[t]he irrigation well closest to the Ameren property was documented on various figures, including cross-sections and flow maps, in the April 2009 closure alternatives analysis report." *Id*. at 2, citing TSD at 31-48. Ameren further states that, of the six wells within a half-mile of Ash Pond D, two are on-site plant production wells and "the other four are irrigation wells utilized by adjacent property owners to the south." *Id*. Ameren states that all six draw from the lower zone of the aquifer, which complies with Class I groundwater quality standards. *Id*., citing TSD at 176-330 (hydrogeologic assessment), 482-84 (well search), 494-536 (modeling).

In its supplemental response to the Board's order, Ameren clarified "the number and location of those wells to avoid any possible confusion." Ameren Supp. Info. at 1. Ameren noted that PRN's two post-hearing comments had referred separately to three and four active

irrigation wells on the adjacent property. *Id*., citing PC 3 at 2, PC 6 at 1. Ameren indicated that Well 66, also identified as IRR-1, is located approximately 50 feet from the Station boundary. Ameren Supp. Info. at 1, citing Ameren Info. at 3-4. Ameren also indicated that "Well 64 is approximately one-half mile, and Well 60 is approximately three-quarters of a mile from Ameren's property boundary." Ameren Supp. Info. at 1, citing Ameren Info. at 4. Regarding Well 61, Ameren states that, "from a review of aerial photos and visual inspection, it appears that Well 61 is no longer present." Ameren Supp. Info. at 2. Ameren argues that, even if Well 61 is present, "it is located in approximately the same location as Well 66 (IRR-1), and is, therefore, not at risk. . . ." *Id*., citing TSD at 484 (ISGS map).

Board Discussion and Finding.

The Board notes that Section 102.210(d) of its procedural rules, which addresses the contents of a proposal for a site-specific rule, provides in pertinent part that "[t]he proposal must describe the person or site for which regulatory change is sought and the area affected by the proposed change." 35 Ill. Adm. Code 102.210(d). A review of Ameren's proposal indicates that Ameren has described in sufficient detail the area affected by the proposed closure requirements. Specifically, as noted by Ameren, the well survey included in the TSD shows the location of irrigation wells in the vicinity of Ash Pond D. TSD at 482-484. The proposal also includes the boring logs for the irrigation wells, which indicate that the wells draw from the lower zone of the underlying aquifer. While the proposal does not rely on groundwater data sampled directly from the irrigation wells, as explained below under the environmental impact, the joint proponents have demonstrated on the basis of hydrogeologic data and groundwater contaminant transport modeling that the proposed closure requirements are protective of the groundwater. The Board concludes that the joint proposal and supporting documents have adequately provided the location of wells, including irrigation wells, in the area affected by the proposal. The record in this proceeding does not include a persuasive argument that the proposal fails in any other manner to describe the affected area. The Board thus finds that this requirement provides no basis to deny the joint proposal and proceeds to address contested issues regarding its projected environmental impact.

Environmental Impact of Proposed Rule

Groundwater Impacts

PRN Comments. In its post-hearing comments, PRN argues that the joint proposal fails to adequately characterize the impact of Pond D upon groundwater used by the adjacent landowner for irrigation purposes. PC 3 at 2. PRN claims that Ameren has at no time offered to assess water pumped from the active irrigation wells on the adjacent property south of the Station. *Id*. PRN further claims that, although Ameren has installed five monitoring wells on that adjacent property, it has never shared sampling results with the owner or used the monitoring information in "developing a groundwater cleanup plan and modeling potential scenarios." *Id*. PRN suggests that, without results of sampling those wells, the owner cannot determine the impact of those active irrigation wells, including bioaccumulation of metals, on crops and those who will consume them. *See id*. (citation omitted). PRN indicates that Ameren obtained an agreement under which the current and future owners of the property "restrict their

groundwater usage from the upper 25' feet of the table, in perpetuity, through a contract made legal by the exchange of $1." *Id*.; *see* TSD at 528-40 (showing restricted area running 500 feet south from Station boundary).

In addition, PRN notes that three irrigation wells within three-quarters of a mile of the boundary of Ameren's property "are pumped at a rate of 1000 gallons per minute, on average, during the months of May through September every year." *Id*. PRN argues that "[t]his information does not appear to have been included in the assumptions and data input for the modeling of the design and operation of the groundwater collection trench to mitigate off-site impacts." *Id*. PRN suggests that, because these withdrawals are similar to the amount of groundwater drawn from the proposed collection trench, it may take longer than the projected 10 years for the contamination plume to recede. *Id*., citing TSD at 506.

Ameren Response. In its post-hearing comments, Ameren restated that "[g]roundwater usage near the Station is limited and no downgradient potable wells are known to exist." PC 4 at 5, citing TSD at 482-84; *see* SR at 13-14. Ameren also restated that the City of Hutsonville's public water supply wells approximately one mile south of the Station "are not likely ever to be impacted by leachate from Ash Pond D." PC 4 at 5, citing Tr. at 69-71, 90-91. Ameren argues that this conclusion finds support in the groundwater modeling it conducted, "which indicates that off-site impacts in the upper zone of the underlying aquifer extend a distance of approximately 500 feet from the southern property line downgradient of Ash Pond D." PC 4 at 5, citing TSD at 505, 530. Ameren further argues that "there is no indication that off-site impacts above Class I Groundwater Quality Standards exist or that there is an increasing trend in any of the wells in the lower zone of the underlying aquifer." PC 4 at 4-5, citing Tr. at 50-54; *see* Tr. at 23-24.

Responding to PRN's argument that it has failed to describe irrigation wells in the area affected by the proposed rule, Ameren states that "[t]he irrigation well closest to the Ameren property was documented on various figures, including cross-sections and flow maps, in the April 2009 closure alternatives analysis report." *Id*. at 2, citing TSD at 31-48. Ameren also emphasizes that its search of the ISGS database clearly identified six wells within a half-mile radius of Ash Pond D. PC 5 at 2, citing TSD at 200, 482-84.

Ameren states that, of the six wells within a half-mile of Ash Pond D, two are plant production wells and "the other four are irrigation wells utilized by adjacent property owners." PC 5 at 2. Ameren further notes that all six draw from the lower zone of the aquifer, which complies with Class I groundwater quality standards. Ameren Info. at 3, citing TSD at 176-330 (hydrogeologic assessment), 482-84 (well search), 494-536 (modeling). Ameren maintains that its consultant did not account for irrigation or plant wells in the modeling because those wells "are finished in the lower zone of the underlying aquifer." *Id*. Ameren states that "[t]he lower zone of the aquifer both on and off-site complies with water quality standards." *Id*. Ameren argues that, "[b]ecause the data suggests that withdrawals in the lower zone of the underlying aquifer do not impact flow in the shallow zone, there was no need to consider the plant production wells or the irrigation wells in the modeling." *Id*. at 2-3, citing Tr. at 89-91. Ameren claims that "[t]he modeling performed was consistent with modeling regularly used for landfill

settings and was found to be sufficient by the Illinois Environmental Protection Agency." PC 5 at 2, citing Tr. at 30-32.

Ameren argues that "IRR-1 is the only irrigation well that is in the vicinity of Ash Pond D." Ameren Info. at 4. Ameren refers to Mr. Cobb's testimony that, during the growing season, the direction of the groundwater flow appears to move from the east to the southeast as result of withdrawal of groundwater from IRR-1. Ameren Info. at 4, citing Cobb Test. at 8; *id*., Att. V (flow contour); TSD at 40 (same). However, Ameren maintains that groundwater flowing toward IRR-1 does not threaten it. Ameren Info. at 5. Ameren argues that "groundwater in the lower zone of the underlying aquifer meets numeric Class I groundwater quality standards and has been only minimally impacted by Ash Pond D." *Id*., citing TSD at 17-18, 201-07, 236. Ameren states that any contamination originating from Ash Pond D could affect off-site wells only by migrating at least 50 feet through the lower zone of the underlying aquifer toward the irrigation wells. Ameren Info. at 6. Ameren argues that, "[a]s contaminants migrate hydraulically down gradient from their source (*i.e.*, Ash Pond D), their concentrations tend to decline due to advection and dispersion." *Id*. Noting that the boron concentration at MW 14 is less than or equal to 1.6 mg/L 90 percent of the time and most often below 0.8 mg/L, Ameren argues that "any boron contamination from Ash Pond D that is entering the irrigation well is expected to be below 1.6 mg/L. . . ." *Id*. Ameren further argues that "boron concentrations will likely be further reduced by capping Ash Pond D and utilizing the groundwater collection trench." *Id*., citing Cobb Test. at 12.

Agency Response. The Agency emphasizes its testimony that Ameren's TSD sufficiently supports the proposal, including "information sufficient to determine that any contaminant concentrations from Ash Pond D in the irrigation wells to the south of the Hutsonville facility will remain below the applicable numeric groundwater quality standards and are likely to diminish with the installation and operation of the proposed remedy." Agency Info. at 1-2, citing Tr. at 50-54 (Cobb testimony). As noted above, in its response to the Board's January 7, 2010 order, the Agency provided a detailed explanation of the technical basis for its conclusions." *Id*. at 2.

The Agency cites Mr. Cobb's pre-filed testimony regarding the site's hydrogeology and the effect of the off-site irrigation wells on upper and lower zones of the underlying aquifer south of Ash Pond D. That testimony recommended that "the upper and lower aquifers should be considered one hydrogeologic unit, especially in the southeast corner," where MW-14 reveals contamination. Cobb Test. at 6-7, citing TSD at 51 (Box Whisker Plots for boron and sulfate). The testimony stated that potentiometric surface maps also show that "[t]he deep alluvial aquifer is hydraulically connected to the fine-grained alluvium in some areas of the site." Cobb Test. at 7, citing TSD at 40 (flow contour), 214 (comparing nested wells MW-7 and MW-7D). Mr. Cobb also testified that contamination at deep well MW-14 also reflects this hydraulic connection. Cobb Test. at 7; *see* TSD at 51-52.

The Agency notes that the TSD includes "a *time series* of potentiometric surface maps at the Hutsonville facility for both the upper and lower zones of the underlying aquifer. . . ." Agency Info. at 8 (emphasis in original), citing TSD as 33-48. The Agency states that these maps reflect seasonal changes including any off-site pumping. Agency Info. at 8. The Agency

argues that this October 2, 2007 map "shows that Ash Pond D, which is recharging the water table of the upper zone of the aquifer, is now up-gradient of MW-14 and IRR-1 and is in a position to recharge the LAI and ZOC of IRR-1 in the lower zone of the aquifer." *Id*. at 9; *see id*., Att. 3. The Agency further argues that MW-14 screened in the lower zone of the aquifer, "is down-gradient of Ash Pond D during the transient condition just described, and more importantly for the Board's concerns, it is up-gradient from the influence of IRR-1, the closest irrigation well." Agency Info. at 9, citing *id*., Att. 3, TSD at 40.

The Agency notes Mr. Cobb's testimony that box whisker plots usefully and concisely summarize "the distribution of data from a data set" and allow comparison of different monitoring wells at the Station. Agency Info. at 9-10, citing Tr. at 50-51, 53-54. The Agency notes that the plot for MW-14 indicates that the boron concentration is at or below 1.6 mg/L 90 percent of the time, and the median concentration is approximately 0.8 mg/L. Agency Info. at 10; *see id*., Att.4, TSD at 51. The Agency concludes that "the worst-case scenario for modeling contaminant transport would start with a concentration of 1.6 mg/L of boron. However, a more statistically accurate and representative starting place would be a concentration of 0.8 mg/L of boron." Agency Info. at 10.

The Agency claims that "Ash Pond D is not a continuous source of contamination to the lower zone of the underlying aquifer because of the transient nature of the groundwater flow direction due to the off-site influence of IRR-1 and any other pumping wells sufficiently close to influence groundwater movement during a limited growing season." *Id*. The Agency argues that the intermittent nature diminishes "concentrations of contaminants in groundwater as it migrates from Ash Pond D and down-gradient from MW-14." *Id*. The Agency concludes that, "[t]herefore, even using the worst cases scenario of 1.6 mg/L (versus the more likely starting concentration of 0.8 mg/L or lower), the concentration of boron (or other contaminants from Ash Pond D) in groundwater will be reduced via the process of hydrodynamic dispersion as the plume moves down-gradient toward IRR-1." *Id*.

In addition, the Agency relied upon a USEPA contaminant transport model "to predict the concentration of 1.6 mg/L of boron as it moves down-gradient from MW-14 toward off-site irrigation wells." Agency Info. at 13. The Agency states that it ran the model "under extremely conservative conditions for a ten year period assuming *steady state* conditions and a *constant source* of contamination to the *lower zone* of the aquifer. *Id*. (emphasis in original); *see id*., Att. 5 (model inputs), Att. 6 (dissolved boron transport along plume center line), Att. 7 (dispersion in x, y, z directions). The Agency argues that, even beginning with a worst-cases scenario, modeling shows "that concentrations will drop off rapidly from the concentration assumed at MW-14" as groundwater migrates toward IRR-1. *Id*. at 12.

The Agency argues that at no point in this migration will the boron concentration "equal or exceed the numeric groundwater quality standard for boron of 2.0 mg/L." Agency Info. at 13. The Agency states that this standard is based upon irrigation, as boron can be toxic to certain sensitive plants including citrus and other fruit and nut crops. *Id*. at 14 (citations omitted). The Agency describes corn and wheat as "semi-tolerant" crops. *Id*. (citation omitted). The Agency characterizes the soils south of the Station as appropriate for the 2.0 mg/L boron standard for irrigation water even for sensitive crops. *Id*. at 14-15 (citations omitted).

The Agency concludes on the basis of modeling that boron will undergo "a slight decrease in concentration over the 50 feet from MW-14 to IRR-1, but at no time does the predicted boron concentration increase." Agency Info. at 16. The Agency argues that, "[a]t the next closest irrigation well one-half mile away, the boron concentration, if groundwater could flow that direction, would be less than 0.6 mg/L." *Id*. The Agency further argues that, "[u]nder the more likely scenario of boron concentration of 0.8 mg/L at MW-14, concentrations would be reduced even further by hydrodynamic dispersion even if steady-state conditions and a continuous source of contamination are assumed." *Id*. The Agency claims that adoption of the joint proposal would provide additional reduction of boron concentrations. *Id*. The Agency attributes this projected reduction to three factors of the joint proposal: capping Ash Pond D, decreasing recharge to the lower zone of the aquifer with the discontinuation of pumping from irrigation wells, and reducing "the groundwater source area due to the effects of the groundwater collection trench." *Id*.

Board Discussion and Conclusion. Based on a review of the record in this proceeding, including the Agency's and Ameren's responses to its request for additional information on the issue of groundwater impacts, the Board finds that the contaminant concentrations attributable to Ash Pond D are projected to remain below applicable groundwater quality standards at off-site irrigation wells on property adjacent to the Station. Further, the Board is also persuaded by the existing record that implementation of the joint proposal is expected to reduce those concentrations over time.

The Board notes that PRN's primary concern with regard to groundwater is the potential impact of Ash Pond D on irrigation wells owned by adjacent landowners. PC 3 at 2. First, PRN argues that Ameren has not described the area affected by the proposed closure requirements in sufficient detail to consider the irrigation wells. As noted above, the Board found that Ameren's proposal includes adequate information concerning the irrigation wells in the vicinity of Ash Pond D. Regarding PRN's assertions that impact on the irrigation wells cannot be adequately assessed without groundwater quality data specifically sampled from the irrigation wells, the Board agrees with the Agency's analysis that hydrogeologic information demonstrates that the irrigation wells will not be impacted by the closure of Ash Pond D under the joint proposal.

Specifically, the Board notes that the site geologic data indicate that the underlying aquifer has two distinct zones, which are separated by a confining layer. Although hydraulically connected in some areas, the confining layer restricts vertical migration of groundwater between the upper migration zone and the deep alluvial aquifer. The Board notes that the information in the well logs supplied by Ameren indicates that the irrigation wells of concern are all screened in the deep alluvial aquifer. Further, the well location maps show that the nearest irrigation well with respect to Ash Pond D is IRR-1, which is approximately 50 feet south of Ameren's property boundary. TSD at 33. As explained in great detail by the Agency, irrigation well IRR-1 is downgradient (with respect to groundwater flow) of monitoring well MW-14 during the irrigation season. Also, like the irrigation wells, the monitoring well MW-14 is screened in the lower zone of the underlying aquifer. Since the monitoring well MW-14 is down gradient of Ash Pond D and upgradient of IRR-1, the Board finds that it is appropriate to use the groundwater quality data from MW-14 to evaluate the ash pond's impact on the irrigation wells.

Next, the Board notes that Ameren's submitted groundwater monitoring data for both the upper migration zone and the deep alluvial aquifer is presented in the form of "box and whisker plots." TSD at 49-50. The groundwater data for the deep aquifer indicate that, except for manganese, the concentrations of monitored constituents (boron, sulfate and TDS) were below the Class I groundwater standards. As noted by Ameren, the elevated concentrations of manganese are consistent throughout the deep alluvial aquifer and are attributable to natural geochemical conditions. TSD at 426-28. Regarding MW-14, the groundwater monitoring data indicate a boron concentration of 1.6 mg/L, which is below the Class I groundwater standard of 2.0 mg/L The Board notes that boron is given consideration because it is the most mobile contaminant of concern. Further, as explained by the Agency, although the box and whisker plot for MW-14 indicates that boron concentration is at or below 1.6 mg/L 90 percent of the time, the more likely concentration on a statistical basis would be 0.8 mg/L. Agency Info. at 10. However, the Board agrees with the Agency that using a boron concentration of 1.6 mg/L as a worst-case scenario is appropriate for evaluating potential impacts of Ash Pond D on the irrigation wells.

As noted by the Agency, the concentration of boron decreases as the groundwater moves down gradient from MW-14 towards the irrigation well IRR-1 due to the phenomenon of hydrodynamic dispersion. The Board notes that the results of the Agency's predictive modeling based on conservative assumptions show that concentrations will drop off rapidly from the concentration assumed (1.6 mg/L) at MW-14. Agency Info. at 13. Even under the worst case scenario of boron concentrations of 1.6 mg/L at MW-14, the model results show a slight decrease in concentration over the 50 feet from MW-14 to IRR-1, and at no time does the predicted boron concentration increase. *Id.* at 16. Also, the Board agrees with the Agency that, with the adoption of the proposed closure standards, the concentrations of boron will be further reduced as a result of the capping of Ash Pond D and the installation of the groundwater trench. The Board notes that, while the impact analysis focused on boron because of its mobility, the outcome for other contaminants of concern will be similar to boron.

Finally, regarding PRN's concerns about using groundwater to irrigate crops, the Board notes that the Class I and Class II groundwater quality standards of 2.0 mg/L for boron is based on irrigation. As noted by the Agency, the sensitive crops are primarily citrus and other fruit and nut crops and do not include corn, soy beans and wheat. Agency Info. at 14. Further, the Agency's review indicates that the soils south of the Hutsonville facility are appropriate even for sensitive crops under the current standard of 2.0 mg/L for boron concentrations in irrigation water.

In light of the above, the Board finds that the joint proponents have adequately evaluated the potential impacts of Ash Pond D on off-site groundwater, including the irrigation wells on the adjacent land south of the Station. Based on this evaluation, the Board finds that closure of Ash Pond D under the proposed regulations will be protective of the irrigation wells screened in the deep alluvial aquifer. The Board thus finds that the impact on off-site immigration wells provides no basis to deny the joint proposal and proceeds below to address its projected impact upon surface waters including the Wabash River.

Impact on Surface Waters

Ameren Testimony. In a question pre-filed for the hearing, PRN asked,

> [s]ince Ash Pond D is as close as 100 feet to the Wabash River, and the impoundment is unlined, have you determined how much loading of coal ash pollutants (sulfates, dissolved salts, boron, metals, etc.) may be leaching into the river itself? Have these background concentrations been considered when considering the addition of the water from the groundwater collection trench collection system to the Outfall serving Pond B under the NPDES permit? PRN Questions at 1 (¶2).

Ameren responded in the affirmative, stating that "[l]oading calculations for various constituents have been calculated" and reported in the TSD. Ameren Resp. at 2; *see* TSD at 398-492 (appendices to risk assessment); *see also* Tr. at 22, 86-87. The ecological risk assessment determined "whether exposure to constituents in groundwater discharging to the Wabash River posed a risk to ecological receptors." TSD at 372 (§6.0 Conclusions). The assessment states that "[s]urface water concentrations were estimated from the maximum detected groundwater concentrations in the deep alluvial aquifer and upper migration zone." *Id*. The assessment further states that these estimated concentrations "were well below the screening levels[,] indicating that groundwater discharging into the Wabash River is unlikely to pose a risk to aquatic receptors in the river in the vicinity of the Station" *Id*.

PRN Comments. PRN argues that, because proposed Section 840.122 allows direction of groundwater from a collection trench either to a permitted outfall or through another option approved by the Agency in a closure and post-closure plan, it is "ambiguous" and does not satisfy the Board's procedural rules regarding a proposal for site-specific rules. PC 3 at 3; *see* 35 Ill. Adm. Code 102.210(d); Joint Prop. at 18. PRN adds that "neither the closure plan nor the post-closure plan are open for public notice and comment. . . ." PC 3 at 3.

PRN argues that discharge from a groundwater collection trench into surface waters "poses an unnecessary risk to fish and wildlife populations in the river" and that the joint proposal fails to recognize this risk. PC 3 at 3. PRN refers to sources addressing the potential impact of discharges to water from coal ash impoundments. *Id*. (citations omitted). PRN claims that "[a] thorough assessment of the final plans for the contaminated groundwater must be conducted and evaluated prior to adoption of this regulation by the Illinois Pollution Control Board." *Id*. PRN argues that "[n]either the closure plan nor the existing NPDES permit . . . address potential impacts to fish and wildlife from the discharge of the contaminated groundwater." *Id*.

PRN states that both federal and state antidegradation provisions "require identification of increased pollutant loadings as well as a demonstration that any such discharges will be fully protective of existing uses." PC 3 at 5, citing 40 C.F.R. 131.12; 35 Ill. Adm. Code 302.105(c). PRN argues that, because the joint proposal does not fully identify the point of discharge to the water of the State, "it is impossible to determine what the existing uses are or whether those uses

will be protected by the proposed discharges." PC 3 at 5. PRN claims that the joint proposal seeks "an end run around antidegradation requirements." *Id*.

PRN also states that federal regulations prohibit "a new discharge of pollutants to impaired water bodies where the discharge would cause or contribute to a violation of water quality standards." PC 3 at 5, citing 40 C.F.R. 122.4(i). PRN argues that Ameren could conceivably seek to discharge contaminated groundwater from the collection trench directly to the Wabash River. PC 3 at 5. PRN further argues that, because the collected groundwater would contain various contaminants including mercury, discharging it "to the Wabash River would be contributing additional petroleum to a river that is already impaired by mercury, PCBs, and fecal coliform." *Id*. PRN claims that additional loadings of contaminants such as mercury to an impaired body of water could cause a violation of water quality standards and federal law. PRN argues that the Board should not adopt the joint proposal "without further study and assurances that the diverted waste stream will not cause or contribute to the impairments in the Wabash River of other surface waterways." *Id*.

Ameren Comments. Ameren reiterated that the daily loading rate for boron did not significantly increase the boron concentration in the river even when Ash Pond D was in use. PC 4 at 6; *see* TSD at 390. Ameren also restated that dewatering Ash Pond D reduced the daily loading rate for boron by 85 percent. PC 4 at 6; *see* TSD at 506, 535. Ameren also stressed that "USEPA's STORET database for the closest downstream monitoring station, one mile south of Ash Pond D, indicates boron concentrations lower than the median concentrations in the upper migration zone upgradient of Ash Pond D." PC 4 at 6; *see* TSD at 607-08. Ameren also notes that it conducted a risk assessment to evaluate environmental risks of its closure option. PC 4 at 6; *see* TSD at 332-492 (risk assessment); *see also* Tr. at 86-97 (inquiring about surface water impacts). Ameren states that "[t]he assessment concludes that the closure plan and associated activities will be protective of human health and the environment." PC 4 at 6; *see* TSD at 371.

In additional post-hearing comment, Ameren strenuously disputes PRN's claim that the joint proposal constitutes "an end run around anti-degradation requirements." PC 5 at 3; *see* PC 3 at 5. Ameren states that it "will seek a modification to its existing NPDES permit to discharge the groundwater collected in the proposed groundwater collection trench." PC 5 at 3. Ameren argues that that it discussed this modification at hearing and that it is reflected in the joint proposal. PC 5 at 3; *see* Tr. at 96-100, Joint Prop. at 22 (proposed Section 840.132 Modification of Existing Permits). Ameren states that "the modification of an NPDES permit results in the re-opening of the permit allowing for public participation and for the Illinois Environmental Protection Agency to perform appropriate anti-degradation analysis at that time." PC 5 at 3; *see* Tr. at 98-100.

Additional PRN Comments. PRN states that adoption of the joint proposal constitutes "approval not only of the proposed design and use of a groundwater collection trench and pumping operation but also of Section 840.122 which states '[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure or post-closure plan.'" PC 6 at 2; *see* Joint Prop. at 17 (proposed Section 840.122). PRN argues that the proposal does not identify the waters into which contaminated groundwater will be

discharged and fails to allow a proper antidegradation analysis. PC 6 at 2. PRN claims that, by the time the NPDES permit modification process requires an antidegradation analysis, "the analysis of available alternatives will be biased (if not precluded entirely) by construction and capital investments made toward Ameren's choice of groundwater collection trench, pump station, and ultimately, outfall." *Id*. PRN argues that the "analysis will only be meaningful now, before costly capital investments have been made in to the project." *Id*. at 1. PRN further argues that, without a timely assessment, "the proposed rule represents an incomplete plan for discharge and a piecemeal approach to permitting that undermines state antidegradation law and erodes water quality." *Id*. at 2; *see* 35 Ill. Adm. Code 302.105.

Agency Response to Request for More Information. In its response to the Board's January 7, 2010 order, the Agency noted that the Board has addressed PRN's post-hearing comments by requesting generally additional information "assessing the environmental impacts of the discharge of contaminated groundwater to the Wabash River." Agency Info. at 1; *see id*. at 17. The Agency further noted that the Board directed Ameren to provide "an environmental assessment of a discharge to the Wabash 'that would be helpful in evaluating the alternative options for the management of contaminated groundwater. . . .'" *Id*., citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 4 (Jan. 7, 2010).

The Agency states that the Board's direction responds to "PRN's comment that the joint proposal fails to meet the requirements of 35 Ill. Adm. Code 102.210(d) because it does not provide an antidegradation analysis and resolve once and for all the ultimate destination of the contaminated groundwater." Agency Info. at 17. The Agency attributes to PRN the view "that the contaminated groundwater management issues must be resolved in this proceeding." *Id*. The Agency emphasizes its position that "[t]he joint proposal is protective as proposed because all the available options for management of contaminated groundwater are regulated by existing and well-settled laws subject to Agency administration." Agency Info. at 2. The Agency nonetheless states that it "wishes to provide its perspective regarding assessments and evaluation *in this proceeding* of alternatives for the management of contaminated groundwater from the proposed collection trench." Agency Info. at 2 (emphasis in original).

The Agency disagrees with what it describes as PRN's "rigid interpretation of Section 102.210(d)" that issues such as assessing environmental impacts and evaluating discharge alternatives must always be resolved in site-specific rulemakings. Agency Info. at 18; *see* 35 Ill. Adm. Code 102.210(d). The Agency argues that the Act and the Board's regulations authorize it to review applications and issue permits. Agency Info. at 18, citing 415 ILCS 5/4(g), 39(a), 39(b); 35 Ill. Adm. Code 309 (Permits). The Agency acknowledges that "[t]here undoubtedly are situations when it would be essential in a site-specific rulemaking for the Board to require a level of finality similar to that advocated by PRN." Agency Info. at 18. However, the Agency argues that "[t]here are also situations when it is appropriate to defer the resolution of unresolved matters to existing procedures outside the site-specific rule that have been developed for the purpose of revolving those matters." *Id*. The Agency claims that this case "represents a particularly striking example of when deference to established procedures is warranted." *Id*. The Agency opines that "a comprehensive assessment of environmental impacts to the Wabash River from discharges of contaminated groundwater at the Hutsonville facility and a final

determination of the groundwater management option are premature, unnecessary, and not required in this proceeding." *Id*. at 23.

The Agency argues that the joint proposal recognizes the existence of numerous options for the management of contaminated groundwater. Agency Info. at 19. The Agency states that those options include, but are not limited to, the following:

> 1) [d]ischarge to the Wabash by Ameren at the Hutsonville facility through an existing outfall; 2) discharge to the Wabash by Ameren at the Hutsonville facility through an new outfall; 3) discharge by Ameren to a publicly-owned treatment works (POTW) or other waste treatment facility; 4) discharge by Ameren or another entity to another stream with greater assimilative capacity; 5) deep well injection; 5) [sic] use as process water; and 6) land application. *Id*.

The Agency argues that "[s]ome of the options do not involve discharge to the Wabash River by Ameren, some do not involve discharge to the Wabash River, and some do not involve discharge to the waters of the state." *Id*. The Agency further argues that some of these options would not require an NPDES permit or the antidegradation assessment upon which PRN insists. *Id*. The Agency states that each of the option is regulated in some fashion under the Act and the Board's regulations. *Id*. at 18. The Agency elaborates that "[t]here is no unregulated scenario under which Ameren could manage the contaminated groundwater as it pleases without restriction. *Id*. at 18-19. The Agency concludes that "[e]valuating options that might not come to pass would be premature and a waste of resources." *Id*. at 19.

The Agency supports its position by reviewing the development of the joint proposal. The Agency notes that Ameren's original proposal provided only one alternative for managing contaminated groundwater: "direction to Ash Pond B for discharge to the Wabash as authorized in the Hutsonville station's NPDES permit." Agency Info. at 19, citing SR at 19-20; Orig. Prop. at 9 (proposed Section 840.120). After reviewing the original proposal, the Agency determined that

> 1) [o]utcomes of application for NPDES permits or permit modifications could not be prejudged in this proceeding because a federally-delegated, independent regulatory structure exists for making that determination; 2) it was possible that any such application would be rejected; and 3) a proposal with one uncertain method for management of the contaminated groundwater was unacceptable. Agency Info. at 19-20.

The Agency argues that, if it denied an application for a permit or permit modification and the Board upheld the denial, then Ameren would have been unable to implement the closure plan. *Id*. at 20. The Agency claims that, in the joint proposal, "[t]he closure plan and post-closure plan mechanisms with administrative review and approval authority exercised by the Agency provide Ameren the opportunity to select a legally available management option while insuring that all applicable legal steps are followed for approval and implementation of that option." *Id*. The Agency, without objection by Ameren, proposed one clarifying amendment to proposed Section 840.122 in order "to make even clearer that these decisions will not be left unaddressed

but are merely being deferred to other appropriate mechanisms." *Id*. In summarizing proposed Section 840.122 below, the Board accepted this amendment and incorporated it into its order below. *Infra* at 90-91.

The Agency states that Ameren's original proposal has been amended "to recognize that other options may be available for management of contaminated groundwater." Agency Info. at 21. The Agency acknowledges that Ameren may select its original plan and seeks a permit modification to discharge to the Wabash River from an existing outfall. *Id*. In that event, the Agency argues that "[t]he NPDES application review procedures and antidegradation assessment procedures set forth in the Board's rules have been developed to make precisely the evaluations PRN has argued must take place in this proceeding, and they are better suited to this task." *Id*. The Agency emphasizes that these procedures include public notice and comment (*id*., citing 35 Ill. Adm. Code 309.109), notice to governmental agencies (Agency Info. at 21, citing 35 Ill. Adm. Code 309.114), opportunity for a public hearing (Agency Info. at 21, citing 35 Ill. Adm. Code 309.115), and reopening the comment period after hearing if the draft permit undergoes significant modification after the initial comment period or hearing (Agency Info. at 21, citing 35 Ill. Adm. Code 309.120). In light of requirements such as these, "[t]he Agency recommends that the Board trust in the procedures its has established for resolution of these matters. . . ." Agency Info. at 23. In addition, the Agency notes that the Act confers to the third parties the right to appeal final Agency determinations to the Board. Agency Info. at 21, citing 415 ILCS 5/40(e) (2008). The Agency states that these procedures comply with federal requirements regarding NPDES permitting. Agency Info. at 21. The Agency emphasizes that "[a]s a state administrator of a delegated federal program, the Agency must take care to conduct reviews in accordance with the federally approved procedures, standards and requirements including an antidegradation assessment." *Id*.

The Agency notes PRN's assertion that adoption of the joint proposal might bias the results of the NPDES/antidegradation review or even preclude it if Ameren opts to discharge to the Wabash River. Agency Info. at 21-22, citing PC 6 at 1, 2. The Agency notes that the joint proposal allows Ameren "180 days after the effective date of the rule to complete its engineering and design activities, submit its closure plan and post-closure care plan to the Agency for review, and, if necessary, submit an application for the NPDES permit or permit modification and/or state operating permits." Agency Info. at 22, citing Joint Prop. at 20, 22-23, 24 (proposed Sections 840.128(a); 840.132; 840.134(a), (b); 840,138(a)). The Agency further notes that it "then has 90 days for review and approval or rejection of the closure and post-closure care plans." Agency Info. at 22, citing Joint Prop. at 30-31 (proposed Section 840.148(a)). The Agency also states that, if it approves the plans, then "Ameren has eighteen months to implement the construction phase of the approve closure plan 'unless the Agency approves an alternative timeline.'" Agency Info. at 22, citing Joint Prop. at 23 (proposed Section 840.134(b)). The Agency argues that, if Ameren fails to obtain a deadline extension "and its expenditures get too far ahead of the permit process," Ameren will bear the financial risk of doing so. Agency Info. at 22.

The Agency notes that the joint proposal added the phrase "unless the Agency approves an alternative timeline." Agency Info. at 22. The Agency accounts for this addition by stating that it expects review of the NPDES permit application, including the antidegradation

assessment, to take "twelve months or more." *Id*. The Agency argues that, if approval remains uncertain, "Ameren thus has the option of requesting additional time for the construction phase rather than making costly construction and capital investments." *Id*. The Agency argues that it will be able to evaluate a request for an extension of this nature "because it will have the best information available on the progress of the permit application(s)." *Id*. at 22-23. The Agency argues that it "disagrees with PRN's assessment on both bias and preclusion." *Id*. at 22.

Ameren Response to Request for More Information. Ameren notes that the Board "requested additional information on the environmental impacts of the potential discharge of groundwater into the Wabash River." Ameren Info. at 7. Ameren notes that its proposal does not require discharging groundwater from the collection trench in to the river and does not seek the Board's approval of such a discharge. *Id*. Citing Section 840.122, Ameren argues that the joint proposal allows groundwater from the trench to be managed according to an NPDES permit "or another option as approved by the Agency in the closure plan or post closure plan." *Id*.; *see* Joint Prop. at 17. Ameren emphasizes that discharging groundwater from the collection trench as part of closing Ash Pond D requires "(1) the Agency to approve plans for the groundwater discharge system, including a plan for operation and maintenance, in the closure plan; and (2) Ameren to construct the groundwater discharge system according to a construction quality assurance program." Ameren Info. at 7.

Ameren notes PRN's position "that the joint proposal is insufficient because Ameren has allegedly failed to adequately characterize the potential discharge to the Wabash River." Ameren Info. at 8, citing PC 3, PC 6. Specifically, Ameren attributed to PRN the view that the joint proposal does not satisfy the Board's regulations because it fails to describe the entire affected area. Ameren Info. at 8, citing PC 3 at 2; *see* 35 Ill. Adm. Code 102.210(d). Ameren cites the Board's request for "an assessment of the environmental impact of discharging contaminated groundwater into the Wabash River." Ameren Info. at 8, citing Ameren Ash Pond Closure Rules (Hutsonville Power Station) Proposed 35 Ill. Adm. Code 840.101 through 840.144, R09-21, slip op. at 4 (Jan. 7, 2010).

Ameren argues that the TSD includes such an assessment. Ameren Info. at 8. Ameren emphasizes that that Agency through NPDES permitting has "determined that a discharge limit of 10 mg/L of boron into the Wabash River is protective of the environment." *Id*., citing *id*., Exh. 1 (permit reapplication). Ameren reports that it "performed a mixing calculation to determine whether a discharge from the existing ash pond system that includes groundwater collected from the groundwater collection trench has the potential to cause an exceedance of the facility's NPDES effluent limit." *Id*. at 8. Ameren states that including the groundwater in the existing discharge "will likely result in an average discharge of 2.0 mg/L of boron." *Id*., citing TSD at 610. Ameren claims that such a discharge is protective of the environment. *See* Ameren Info. at 8.

Ameren states that it "performed additional calculations to demonstrate that the potential discharge of groundwater from the collection trench into the Wabash River will not adversely impact human health or the environment and that the overall impact of the proposed closure scenario will benefit the environment by reducing impacts from Ash Pond D." Ameren Info. at 8-9. Ameren first relied upon information from the TSD to calculate "the increase in boron

loading under worst case conditions" of the estimated maximum value of boron in groundwater and low flow river conditions. *Id*. at 9, citing TSD at 430, 610. Employing a mixing zone of 25% under water quality standards (Ameren Info. at 9-10, citing 35 Ill. Adm. Code 302.102(b)(8)), Ameren estimated "the additional amount of boron in-stream at the edge of the mixing zone under worst case conditions will be 0.02 mg/L. . . ." Ameren Info. at 9.

To depict more typical conditions and provide a comparison, Ameren "also calculated the additional amount of boron in-stream following discharge under average river conditions and estimated maximum boron concentrations." Ameren Info. at 10; *see id*., Exh. 2 (Wabash River flow data). Ameren characterizes this as "a very conservative approach" because it relies on estimated maximum rather than estimated average boron concentration in the groundwater. *Id*. at 10. Ameren's calculation estimated "the increase in boron at the edge of the mixing zone . . . will be 0.002 mg/L. *Id*. at 10. Ameren argues that [t]his level is considered negligible (as this concentration is at or below common method detection limits for boron in groundwater). *Id*.

Ameren states that the general use surface water quality standard for boron is 1.0 mg/L. Ameren Info. at 10, citing 35 Ill. Adm. Code 302.208(g). Ameren argues that "[t]he worst cases scenario would result in a 0.02 mg/L increase in boron concentration which would increase the 'ambient' boron concentration to 0.091 mg/L." Ameren Info. at 10-11; *see id*. at 11 n.6 (describing determination of average concentration). Ameren further argues that, "[u]nder average flow conditions, the increase in boron concentration would be difficult to distinguish from the normal variability in the ambient river concentration." *Id*. at 11. In addition, Ameren states that the Agency is currently reviewing whether to relax the boron water quality standard. *Id*.; *see id*., Exh. 3 (Draft Water Quality Standards Updates).

Ameren argues that "[t]he magnitude of the expected change in boron concentration in the Outfall 002 discharge is very minor compared to both the historic and current ash pond discharge concentrations as well as the ash pond outfall effluent limitations contained in Ameren's NPDES permit." Ameren Info. at 11. Ameren notes that the TSD relied on data from a 2003 NPDES permit renewal to conclude that "including groundwater from the collection trench in the existing discharge will likely result in an average discharge of 2.0 mg/L of boron in the Outfall 002 discharge." *Id*., citing TSD at 609. Ameren argues, however, that more recent data reveal that "the discharge from Outfall 002 has a much lower average boron concentration of 0.69 mg/L, and a greater average flow of 3,870,000 gal/day." Ameren Info. at 11; *see id*., Exh 4 (concentration and flow rate). Relying on these figures and the estimated average boron concentration and flow from the collection trench, and assuming mixing of the two flows, Ameren determined that expected boron concentration in the Outfall 002 discharge would be 0.95 mg/L. *Id.* at 12; *see id*., Exh 5 (discharge calculations). While Ameren acknowledges that this estimated concentration is an increase of 0.26 mg/L from the current concentration, "[b]oth Ameren's environmental assessment in the TSD and the updated estimate are increases over the existing boron concentration that are well within the NPDES permit's 10 mg/L effluent limitation." *Id*. at 12; *see* TSD at 332-492.

Ameren states that the groundwater collection trench intends to collect groundwater now migrating to the southeast and transfer it to the Wabash River "in order to prevent offsite migration of leachate in this direction." Ameren Info. at 12. Ameren projects that, after

removing Ash Pond D from service but before executing closure plans, leachate flowing from Ash Pond D directly to the Wabash River will contain approximately 25 lbs/day of boron. *Id*., citing TSD at 535. After dewatering and installation of a cap and cover, however, Ameren projects that leachate flowing directly from Ash Pond D to the river will contain approximately 5 lbs/day. Ameren Info. at 12-13, citing TSD at 535. Ameren further projects that, if groundwater from the collection trench is discharged through Outfall 002, "this discharge will result in an additional 10 lbs/day of boron." Ameren Info. at 13; *see id*. n.10 (calculation). Ameren argues that, despite this estimated load from the collection trench, there is a projected overall reduction of 10 lbs/day boron associated with the closure of Pond D." *Id*. at 13, 14. Amern further argues that, "[w]hile the discharge of groundwater to the Wabash River will result in an increase in the quantity of water and may increase the amount of boron discharged pursuant to Ameren's NPDES permit, the joint proposal will result in a net decrease in boron loading to the river." *Id*. at 12. Ameren concludes that "the overall impact of closure will not degrade water quality in the Wabash River." *Id*. at 13.

Ameren states that the Act provides the Agency authority to "restore, protect and enhance the quality of the environment.'' Ameren Info. at 13 (citations omitted). Ameren argues that "the joint proposal requires the Agency to authorize any additional discharge to the Wabash River or any alternative groundwater management option" as protective of human health and the environment. *Id*. In this case, Ameren notes that the Agency joins it in maintaining that "the proposed closure scenario, including the option of discharging groundwater from the collection trench to the Wabash River *via* Outfall 002 will result in a reduction of existing contamination." *Id*. at 14, citing PC 2 at 4. Ameren states that "[t]he proposed collection trench will simply intercept groundwater currently migrating offsite and redirect that water to Pond B, which ultimately discharges through Outfall 002 to the Wabash River." Ameren Info. at 14. Ameren further states that implementation of the joint proposal "will reduce boron loading to the Wabash River by approximately 10 lbs/day. *Id*. at 13, 14. Based on this projected reduction, Ameren claims that no further environmental assessment is warranted: "the joint proposal, including implementing the option discharge of groundwater to the Wabash River, will result in net loading reductions and an ultimate benefit to human health and the environment." *Id*. at 14.

Board Discussion and Conclusion. The Board is not persuaded by PRN's position that Ameren and the Agency must in this proceeding specifically identify a point of discharge and conduct an antidegradation assessment. The Board notes that adoption of the joint proposal may *allow* Ameren after Agency review and permitting to discharge to the waters of the state but does not *require* it to do so. Proposed Section 840.122 allows the owner or operator of the Station to address contaminated groundwater either through a permitted outfall or "another option as approved by the Agency in the closure plan or post-closure care plan." Joint Prop. at 17. Ameren acknowledges that proposing a discharge to the Wabash River would require it to seek a modification of its current NPDES permit. As stressed by the Agency in its response to the request for more information, the modification process would include an antidegradation assessment and meaningful opportunities for public review, comment, participation, and appeal of Agency determinations. Consequently, the Board concurs that it is not in this proceeding necessary for the joint proposal either to identify a groundwater management strategy or to undertake an assessment of the environmental impacts of any potential strategies. The Board

finds that this issue provides no basis to deny the joint proposal and proceeds to examine the issue of consistency with the requirements of federal law.

Requirements of Federal Law

PRN Comments

PRN argued that the joint proposal "must demonstrate that the Board may grant the requested relief consistent with federal law governing the subject of the proposal." PC 3 at 5, citing 35 Ill. Adm. Code 102.210(e). PRN claims that, although the joint proposal seeks to allow the discharge of contaminated groundwater into the waters of the state, "[b]oth state and federal antidegradation laws requires identification of increased pollutant loadings as well as a demonstration that any such discharges will be fully protective of existing uses." PC 3 at 5, citing 40 C.F.R. 131.12, 35 Ill. Adm. 302.105(c). PRN argues that, because the joint proposal does not locate the discharge of the contaminated groundwater, it is "attempting an end run around antidegradation requirements." PC 3 at 5. PRN further argues that, "[w]ithout prior identification of the point of discharge to waters of the state, it is impossible to determine what the existing uses are or whether those uses will be protected by the proposed discharges." *Id*. PRN claims that the Board cannot adopt the proposed site-specific rule until proponents" can show the full extent of those impacts by demonstrating where the discharges will occur and by providing a scientifically supported assurance that existing uses will be protected despite the increase in pollutant loading." *Id*.

In addition, PRN argues that federal law "prohibits a new discharge of pollutants to impaired water bodies where the discharge would cause or contribute to a violation of water quality standards." PC 3 at 5, citing 40 C.F.R. 122.4(i). PRN claims that the Wabash River "is already impaired by mercury, PCBs, and fecal coliform." PC 3 at 5. PRN again notes that Section 840.122 of the joint proposal provides that "[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure plan." PC 3 at 5, citing Joint Prop. at 17. PRN argues that Ameren might either direct contaminated groundwater to Ash Pond B, which has a permitted discharge to the Wabash River, or discharge it directly to the river. PC 3 at 5. PRN claims that the contaminated groundwater "would contain pollutants such as arsenic, barium, cadmium, chromium, lead, mercury, and selenium" that would contribute additional pollution to an impaired river. *Id*. PRN further claims that addition loadings "will place additional strains on an already impaired water body that could cause a violation of water quality standards." *Id*. PRN asserts that "[t]he requested relief should not be granted without further study and assurances that the diverted waste stream will not cause or contribute to the impairments in the Wabash River or other surface waterways." *Id*. PRN concludes that, "[b]y granting the site-specific standard requested without further evidence of the impact on water quality, the Board would be setting the stage for a possible violation of federal law." *Id*.

PRN also states that USEPA has drafted a proposal addressing disposal of coal combustion wastes in surface impoundments. PC 3 at 5. When PRN filed its post-hearing comment on October 30, 2009, it expected USEPA to publicly release its draft rule in mid-

December. *Id*. PRN argues that, with publication of the rule foreseeable, it "seems prudent" for the Board to postpone any decision on the joint proposal until it can review USEPA's proposal. *Id*.; *see* PC 6 at 2. In this regard, the Board notes that, on June 21, 2010, USEPA proposed two alternative regulations under the Resource Conservation and Recovery Act (RCRA) to address risks from disposal of coal combustion residuals generated from combustion of coal at electric utilities and independent power producers. Notice of the proposed alternatives set a September 20, 2010 deadline for comments. *See* 75 Fed. Reg. 35127-35264 (June 21, 2010).

Ameren Comments

Ameren addresses PRN's suggestion that Ameren "is attempting an end run around anti-degradation requirements." PC 5 at 3; *see* PC 3 at 5. Ameren argues that "[t]hat statement could not be further from the truth." PC 5 at 3. Ameren states that, "as discussed at the hearing and as set forth in the proposed rule, Ameren will seek a modification to its existing NPDES permit to discharge the groundwater collected in the proposed groundwater collection trench." *Id*. Ameren further states that, "[a]s PRN, the Illinois Environmental Protection Agency and the Board are all well aware, the modification of an NPDES permit results in the re-opening of the permit allowing for public participation and for the Illinois Environmental Protection Agency to perform appropriate anti-degradation analysis at that time." *Id*.

Additional PRN Comments

PRN seeks to clarify its October 30, 2009 statement that, "[i]n failing to fully identify where the contaminated groundwater will ultimately be discharged, Petitioners are attempting an end run around antidegradation requirements." PC 6 at 1, *see* PC 3 at 5. PRN argues that antidegradation regulations "protect existing uses of all waters in the State of Illinois, maintain the quality of waters with quality that is better than water quality standards, and prevent unnecessary deterioration of waters of the State." PC 6 at 1, citing 35 Ill. Adm. Code 302.105. PRN claims that adoption of the joint proposal would constitute approval of "the proposed design and use of a groundwater collection trench and pumping operation. . . ." PC 6 at 2. PRN also claims that adoption approves the language of proposed Section 840.122, which provides that "[g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure plan." *Id*., *see* Joint Prop. at 17.

PRN argues that adoption of the joint proposal will result in a discharge of pollutants "without the scrutiny of alternatives and impacts afforded by a proper antidegradation analysis." PC 6 at 2. PRN further argues that "[t]he proposal does not even identify the waters that could be receiving the contaminated groundwater, let alone analyze whether those waters are fit to receive increased pollution." *Id*. PRN claims that "[a]uthorizing ash pond closure rules now without fully analyzing available alternatives may have the practical effect of precluding appropriate alternatives during a future NPDES permitting process." *Id*. at 1. PRN fears that, if that analysis is not performed now, it will not be meaningful because it "will be biased (if not precluded entirely) by construction and capital investments made toward Ameren's choice of groundwater collection trench, pump station, and ultimately, outfall." *Id*. at 2. PRN argues that "[a]n antidegradation analysis will only be meaningful if conducted now, before costly capital

investments have been made into the project." *Id*. at 1. PRN concludes that, in the absence of a complete assessment, "the proposed rule represents an incomplete plan for discharge and a piecemeal approach to permitting that undermines state antidegradation law and erodes water quality." *Id*.

Board Discussion and Conclusion

A discussed in the preceding subsection, the joint proposal may *allow* the owner or operator of the Station after Agency review and permitting to discharge to the waters of the state but will not *require* it to do so. As the Agency in reviewing closure and post-closure care plans will not necessarily approve such a discharge, the Board is not persuaded by PRN's argument that adoption of the joint proposal is "setting the stage for a possible violation of federal law." In the event that Ameren seeks and the Agency approves a plan involving a discharge, the process of modifying Ameren's NPDES permit will include meaningful public participation and appropriate antidegradation analysis.

The Board notes USEPA's recent issuance of "co-proposals" for regulation of coal combustion residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). *See* 75 Fed. Reg. 35127-35264 (June 21, 2010). In addressing why it proceeded with co-proposals, USEPA stated that

> there are differing views regarding the meaning of [US]EPA's information and what course of action [US]EPA should take. In part, the differing views are fueled by the complex data, analyses, legislation, implications of available options, possible unintended consequences, and a decision process, all of which pose considerations that could justify [US]EPA selecting a RCRA subtitle C approach or a RCRA subtitle D approach.
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> Given the inherently discretionary nature of the decision, the complexities of the scientific analyses, and the controversy of the issue, [US]EPA wants to ensure that the ultimate decision is based on the best available data, and is taken with the fullest possible extent of public input. . . . [T]here are a number of issues on which additional or more recent information would be useful in allowing the Agency to reach a final decision. In the absence of this information, [US]EPA has not yet reached a conclusion as to how to strike the appropriate balance among these eight [RCRA Section 8002(n) study] factors and so is presenting two proposals for federal regulation of CCRs. *Id*. at 35132.

In light of these statements by USEPA, the Board can only conclude that a significant amount of time -- perhaps many years -- may pass before USEPA adopts regulations governing sites such as the Station. While the Board recognizes PRN's implicit argument that it should not adopt rules that may become inconsistent with federal standards, the Board notes the joint proposal seeks to address this issue. Proposed Section 840.152 provides in its entirety that

> Nothing in this Subpart A shall be construed to be less stringent than or inconsistent with the provisions of the federal Resource Conservation and

> Recovery Act of 1976 (P.L. 94-580), as amended, or regulations adopted thereunder. To the extent that any rules adopted in this Subpart A are less stringent than or inconsistent with any such laws applicable to the closure of Ash Pond D, such laws will prevail. Joint Prop. at 35-36.

In their joint statement, Ameren and the Agency state that this proposed language clarifies "that RCRA does not govern the closure of Ash Pond D, but that in the event future federal regulations are deemed to govern the closure of Ash Pond D, and such future requirements are more stringent than, or inconsistent with, the proposed rule, RCRA would govern." Joint Statement at 9. Accordingly, the Board finds that the requirements of federal law provide no basis to deny the joint proposal and proceeds to address a request for a temporary moratorium on specified requests for site-specific rules.

Temporary Moratorium on Additional Site-Specific Rules for Closure of Coal Combustion Waste Surface Impoundments

Agency Request

In his pre-filed testimony, Mr. Nightingale on behalf of the Agency requests that the Board "consider initiating a temporary moratorium on future site-specific rules for the closure of surface impoundments containing coal combustion waste." Nightingale Test. at 4. As a basis for this request, he first notes that USEPA intends to issue "a set of draft regulations for the management of coal combustion waste by the end of the 2009 calendar year." *Id*. He argues that a moratorium provides regulated entities an opportunity to review the substance of USEPA's proposal. *Id*. He further argues that "[w]aiting will prevent industry, the Agency, and the Illinois Pollution Control Board from wasting scarce and valuable resources on developing regulations that may be superseded in the near future." *Id*. He also claims that, upon adoption of USEPA regulations, "any industry obtaining a site-specific rule could end up expending substantial money and resources only to find they are subject to additional and/or different closure requirements for those units." *Id*.

Second, he notes that the Agency may potentially become involved in a large number of these proceedings. Nightingale Test. at 4, citing *id*., Att. 1 (listing coal combustion waste surface impoundments in Illinois); *see* Tr. at 44. He argues that, "at this time and in the foreseeable future the Agency does not have the resources to deal with the potentially 70 additional requests for site-specific rulemakings for the other surface impoundments containing coal combustion waste." Nightingale Test. at 4; *see* Tr. at 47. He characterized these rulemakings as labor-intensive and noted "reduced agency staff and the potential for additional reductions." Tr. at 47; *see* Nightingale Test. at 5. He argued that it would be a "difficult issue" for the Agency to deal with as many as five of these site-specific rules over the next two years. Nightingale Test. at 4; *see* Tr. at 34-36 (projecting closure of four Ameren facilities); SR at 4 (same). He argues that, if the Board does not grant a temporary moratorium, the Agency may "find itself in a position where it will be unable to have adequate time and/or resources to review the proposals and provide necessary comments." Nightingale Test. at 5.

Mr. Nightingale states that "[t]he Agency acknowledges there is limited legal authority in the Act for a temporary moratorium." Nightingale Test. at 5. He argues that Section 28(a) of the Act may allow the Board to schedule a hearing on a site-specific rulemaking proposal "no sooner than six months after the hearing on a preceding proposal." *Id*., citing 415 ILCS 5/28(a) (2008). He also notes that the Board may believe that it has inherent authority to control its own docket by allowing more than six months to pass between hearings on proposals of this nature. Nightingale Test. at 5.

Mr. Nightingale claims, however, that the policy reasons in favor of a temporary moratorium are "compelling." Nightingale Test. at 5. He states that the Agency's Bureau of Land has relied in this proceeding on additional resources provided by its Bureau of Water, but he characterized this assistance "as a stop-gap measure since similar limitations also affect that Bureau." *Id*. Looking forward, he argues that "[d]iverting already limited resources to site-specific rules more than once or twice per year would substantially detract from the Bureau of Land's additional responsibilities. More than three to four site-specific rules per year probably would paralyze both the Agency and the Board from a resource standpoint and even at this rate would take over fifteen years to work through the currently existing impoundments." *Id*.

More generally, Mr. Nightingale indicates that the Bureau of Land is now considering how to address closure of surface impoundments. Nightingale Test. at 5. He argues that the proposal and adoption of federal regulations will place the Agency "in a better position to determine how to proceed." *Id*. at 6. He states that, once USEPA makes it position clear, the Agency will be able to "make a well informed decision on how to proceed." *Id*. In the event either that USEPA does not adopt regulations or that adopted regulations do not apply to the closure of surface impoundment, the Agency believes "that pursuing a general rule for the remaining surface impoundments would be a more efficient approach than to deal with each site on a site-specific basis." *Id*. Mr. Nightingale claims, however, that "proposing a general rule is also a time and resource consuming endeavor, and faced with the current staffing conditions, along with the potential for additional staff reduction, the Agency is very concerned with taking on such a daunting task." *Id*. He concludes by stating the Agency's position "that a temporary moratorium is the most prudent approach to take at this time." *Id*.

In a question pre-filed for hearing directed to Mr. Nightingale, PRN noted the Agency's request for temporary moratorium on additional site-specific rules addressing closure of coal combustion waste surface impoundments. PRN Questions at 3 (¶14); *see* Nightingale Test. at 4-6. PRN asked "why, given the fact that new federal rules regarding the management of coal combustion wastes are likely forthcoming, the Agency is not requesting that Ameren's Hutsonville Pond D activities also be placed on hold?" PRN Questions at 3 (¶14).

Responding, the Agency states that "[t]he reason the Agency has not requested that Ameren's proposal be included within a moratorium is that Ameren filed its proposal with the Board and it was accepted for hearing before the Agency clarified its own position on the matter." Agency Resp. at 3. The Agency adds that is position stems from "its difficulties in finding the resources to assemble a workgroup to respond to Ameren's proposal." *Id*.

The Agency states that, since Ameren took Ash Pond D out of service in 2000 and began pursuing closure, disagreements between Ameren and the Agency about the proper approach for closure have cause "significant delays." Agency Resp. at 3. The Agency further states that, after the Board dismissed Ameren's petition for an adjusted standard, "Ameren moved very quickly to prepare and file its proposal in this proceeding. . . ." *Id*; *see* Petition of Ameren Energy Generating Company for Adjusted Standard from 35 Ill. Adm. Code Parts 811, 814, and 815 (Hutsonville Power Station), AS 09-1, slip op. at 1, 11 (Mar. 5, 2009). The Agency indicates that, "[d]uring this short interval, the Agency did not fully consider the implications of the site-specific approach as complicated by the number of similar sites needing closure, the uncertain impacts of state budget/resource issues, and the additional uncertainty of the outcome of the federal review of CCW management." Agency Resp. at 4. The Agency states that it did not determine to request a temporary moratorium "until well after the [Ameren] proposal had been filed with the Board and accepted." *Id*. The Agency acknowledges that, with respect to future requests for site-specific rulemaking, the legal grounds for a moratorium are "uncertain." *Id*. The Agency argues that "[r]equesting that a moratorium apply so that a previously docketed proceeding would be delayed indefinitely or dismissed would raise additional legal issues of retroactivity and was never seriously considered by the Agency." *Id*.

PRN Comment

In its post-hearing comments filed October 30, 2009, PRN stated that USEPA had prepared a draft rule on surface impoundments and was expected to release it to the public in mid-December. PC 3 at 5. PRN argues that, because publication of the rule was expected in six weeks, "it seem prudent that the IPCB should at least delay a decision regarding Ameren's request until the proposed [US]EPA requirements can be reviewed." *Id*.

Ameren Response

Ameren also responded to PRN's question why the Agency is not requesting that Ameren's Hutsonville Pond D activities also be placed on hold? PRN Questions at 3 (¶14). Ameren stated that "the right to seek a site-specific rule is set forth in the Illinois Environmental Protection Act and as such, a moratorium can only be imposed through legislative action and not through a Board order." *Id*. Ameren opposes the request as "inappropriate" and argues that a request for a moratorium can only be considered and granted by the Illinois General Assembly. *Id*. Ameren notes that Mr. Nightingale's testimony identifies 25 Ameren impoundments that may generate requests for site-specific rules. *Id.*, *see* Nightingale Test., Att. 1. Ameren clarifies that "[i]n reality and in the near short-term, only a handful of Ameren facilities have impoundments that have [been] or will be taken out of service and would be subject to site-specific closure similar to Ash Pond D." Ameren Resp. at 7.

Ameren notes the Agency's request that the Board consider instituting a "temporary moratorium on further site-specific rules for the closure of surface impoundments containing coal combustion wastes." PC 4 at 8; *see* Nightingale Test. at 4-6. Ameren further notes that the Agency cites only Section 28(a) of the Act as authority for its request. PC 4 at 8; citing 415 ILCS 5/28(a) (2008). Disputing the Agency's reliance on that provision, Ameren argues that "Section 28(a) allows any person to present a written proposal for the adoption, amendment, or

repeal of the Board's regulations." PC 4 at 8; *see* 415 ILCS 5/28(a) (2008). Ameren further argues that Section 28(a) "does not grant the Board the authority to issue a moratorium on the right to seek a site-specific rule under Section 27 and 28 of the Act." PC 4 at 8, citing 415 ILCS 5/27, 28 (2008).

Ameren cites Article XI of the Illinois Constitution: "[t]he public policy of the State and the duty of each person is to provide and maintain a healthful environment for the benefit of this and future generations. The General Assembly shall provide by law for the implementation and enforcement of public policy." PC 4 at 8, citing Ill. Const. 1970, art. XI, § 2. Ameren argues that "[t]he Illinois General Assembly implemented this public policy through the Illinois Environmental Protection Act," which created the Board. PC 4 at 9; *see* 415 ILCS 5/5(a) (2008). Ameren further argues that Illinois limits the authority of an administrative agency: [i]f an entity is a creature of statute, 'any power or authority claimed by it must find its source within the provision of its enabling statute." PC 4 at 9, citing Granite City Div. of Natl. Steel Co. v. PCB, 155 Ill.2d 149, 171 (1993).

Ameren claims that Sections 27 and 28 of the Act establish a right to request a site-specific rule but do "not allow the Board to grant a rulemaking moratorium." PC 4 at 9, citing 415 ILC 5/27, 28 (2008). Ameren argues that allowing the Board such authority "is contrary to the Illinois Constitution and plain language of the statute and would grant the Board legislative authority that is reserved for the Illinois General Assembly." PC 4 at 9. Ameren further argues that granting Ameren's request "would turn the law of administrative delegation on its head." *Id*. Ameren claims that a moratorium of the kind requested by Ameren "can only be imposed through legislative action, not through a Board order." *Id*. Ameren also argues that "[p]ostponing the proper closure of such impoundments during a moratorium of undetermined length could potentially allow harm to human health or the environment in direct contravention of the Act and the Illinois Constitution." *Id*. Ameren concludes that it "opposes the Agency's request." *Id*.

Responding to the Agency's arguments, Ameren first notes that "the anticipated federal proposal reference by the Agency is only expected to be a *draft* proposal, which could take several years to finalize." PC 4 at 9. Ameren argues that, until USEPA adopts rules, "no one knows how such material will be characterized or whether such characterization and rules will be applicable to the closure of ash ponds similar to Ash Pond D." *Id*.

Ameren also discounts that Agency's apparent expectation that it will potentially become involved in a large number of these site-specific rulemaking proceedings. PC 4 at 9; *see* Nightingale Test. at 4; *id*., Att. 1 (listing coal combustion waste surface impoundments); *see also* Tr. at 44. Ameren claims that the Agency acknowledged that it has not determined the number of impoundment that will need to be closed in the next five years. PC 4 at 9, citing Tr. at 46. Ameren addresses Mr. Nightingale's suggestion that Ameren impoundments may generate as many as 25 of these proceedings. PC 4 at 9; *see* Nightingale Test., Att. 1, Tr. at 44. Specifically, Ameren states that "many of the impoundments referenced by Mr. Nightingale are under construction, not used to manage coal combustion waste or are expected to remain in active service for quite some time (in some cases for at least another 10 years)." PC 4 at 10. Ameren states that, "[a]s the Agency is aware, Ameren has two facilities with impoundments covered by

State Operating Permits that are scheduled to expire and as such will need to undergo closure similar to Ash Pond D." *Id*., citing Tr. at 43. Ameren states that, without a specific regulatory mechanism or other means for closing impoundments, it "has no other option but to seek site-specific relief so it may properly cap and close these types of impoundments." PC 4 at 10. Ameren emphasizes its belief that "final closure of impoundments when they are no longer permitted as water treatment devices is both prudent and environmentally responsible." *Id*.

Board Discussion and Conclusion

The Board readily acknowledges the Agency's concern that it may lack the resources to consider a large number of requests for site-specific rules in a short period of time. However, the Board cannot confidently conclude that it possesses the legal authority to institute even a temporary moratorium as requested by the Agency. Furthermore, as noted above, many years may pass before adoption of federal regulations addressing sites such as the Station. Accordingly, the Board declines to impose a temporary moratorium on additional site-specific rules for closure of coal combustion waste surface impoundments.

Technical Feasibility and Economic Reasonableness of Alternatives

In a letter dated June 30, 2009, the Board requested that DCEO conduct an economic impact study of the rulemaking proposal in this docket. *See* 415 ILCS 5/27(b) (2008). DCEO has not responded to this request. Although the hearing officer during the hearing sought testimony on the Board's request to DCEO, no participant offered such testimony. Tr. at 110-11.

The TSD analyzed closure alternatives and concluded that "the proposed alternative is economically reasonable and technically feasible for Ameren to implement at Hutsonville Power Station." Joint Statement at 2, citing TSD at 10-174 (closure alternatives). Although the Agency acknowledges that is has not independently analyzed these alternatives, it states that "it has no reason to believe this proposal is economically unreasonable and agrees the approach proposed here is technically feasible." Joint Statement at 2.

During the hearing, PRN asked whether Ameren had considered "pumping contaminated groundwater as a corrective action to further pull the plume back?" Tr. at 82. Mr. Bollinger responded that Ameren had considered that option "in a prior evaluation of alternatives." *Id*. He expressed the belief that "the drain interceptor trench is more effective technology for the circumstances here." *Id*. at 82-83. He elaborated that, "as one goes eastward, to try and use a pumping mechanism would be challenging in that particularly when you get in the deeper zone, the aquifer is -- would take a considerable amount of pumping to actually draw down because it's a highly permeable aquifer on the eastern end. . . ." *Id*. at 83.

In its post-hearing comments, PRN argued that Ameren did not consider treatment of contaminated groundwater from the proposed collection trench. PC 3 at 4, PC 6 at 2. PRN claims that USEPA has indentified and analyzed technologies for treating ash transport wastestreams. *Id*. PRN further claims that, with one exception, "each of these treatment technologies is currently in use at several power generating stations and serve[s] to reduce the amount of pollution entering the environment." *Id*. PRN argues that this use demonstrates that

these treatment options are economically reasonable and technically feasible. *Id*., citing United States Environmental Protection Agency, Steam Electric Power Generating, Point Source Category, EPA 821-R-09-008 (2009). PRN argues that Ameren must consider these alternatives in order to meet its burden. PC 3 at 4.

Board Discussion and Conclusion

As noted above (*see supra* at 16-33), Ameren evaluated several closure alternatives to meet the closure objectives of preventing off-site migration of contaminated groundwater, minimizing infiltration of precipitation through the ash pond, and protecting human health and environment. These alternatives addressed the management of impacted groundwater, ash removal and on- or off-site treatment and disposal, and placement of final cover. Regarding groundwater management, Ameren evaluated "no action" with groundwater monitoring, placement of a low permeability vertical barrier, and a groundwater collection trench. TSD at 22, 73. Ameren found the installation of groundwater trench to be technically feasible and economically reasonable to address the impacted groundwater. The other alternatives were found to be technically infeasible to achieve the objectives of Ash Pond D closure. The Board agrees with Ameren's conclusions, as "no action" and a vertical barrier may not prevent the off-site migration of contaminated groundwater.

With regard to ash removal and disposal, Ameren asserts that removing the entire volume of waste and disposing the ash off-site or in a newly constructed on-site landfill are not feasible options because of the exorbitant costs associated with those options. Ameren estimated the excavation and off-site disposal cost to be approximately $34 million. TSD at 73. For on-site disposal, in addition to waste excavation cost, Ameren notes that there would be a very high capital cost of reconstructing the landfill. Ameren contends that the ash removal options are economically unreasonable. *Id.* Also, Ameren states that the ash removal options pose technical concerns regarding dewatering and storage of the waste. The Agency also expressed concerns regarding implications of excavation of ash in a steady state condition in terms of geochemistry and equilibrium with the site hydrogeologic conditions. Tr. at 66-76. In light of the issues highlighted by Ameren and the Agency, the Board agrees that excavation and disposal of ash from Ash Pond D, whether on-site or off-site, is not a viable option.

Finally, with regard to the final cover alternatives, the Board finds that the proposed final cover consisting of a geomembrane with a 3-foot thick protective soil layer to be technically feasible and economically reasonable. The Board notes that the proposed final cover is similar to those required for landfills under the Board's landfill regulations at 35 Ill. Adm. Code 811.314. As noted by Ameren, the effectiveness of the geomembrane to minimize infiltration and leachate generation is comparable to the other options considered by Ameren, including compacted clay and pozzolonic fly ash. Regarding the cost of the proposed closure alternative, Ameren expects that "capital costs associated with the selected closure scenario could range from $3 to $4 million dollars, excluding engineering design." SR at 21, citing TSD at 73-74; *see* TSD at 27, Bollinger Test. at 15. Ameren has also estimated that its "[a]nnual operating and maintenance costs associated with the trench and final cover system are expected to be around $50,000." SR at 21, citing TSD at 73-74; *see* TSD at 27, Bollinger Test. at 15. In its analysis of economic and budgetary effects submitted with its original proposal, Ameren indicated that its costs as owner

of the Station were "undetermined," but it projected capital and operating costs consistent with these figures.

Regarding PRN's position that treatment of contaminated groundwater collected from the groundwater trench should considered in this rulemaking, the Board notes the proposed rules require Ameren to discharge groundwater collected in the groundwater trench in accordance with its NPDES permit or an option approved by the Agency. *See* Joint Prop. at 17 (proposed Section 840.122). As discussed earlier with regard to antidegradation analysis, the Board expects any treatment issues concerning groundwater from the collection trench to be fully addressed during the Agency's permitting process.

On the basis of the record before it, the Board concludes that Ameren has undertaken an appropriate review of closure alternatives. *See supra* at 16-33 (Closure Options). The record supports the conclusion that the joint proposal is economically reasonable and technically feasible. Accordingly, the Board proceeds below to adopt the joint proposal without significant substantive amendment for first-notice publication in the *Illinois Register*. In the following section of the opinion, the Board provides a section-by-section summary of that proposal.

SECTION-BY-SECTION SUMMARY OF BOARD'S FIRST-NOTICE PROPOSAL

PRN asked in a question pre-filed for hearing why Ameren proposed to add its site-specific rule as a new subpart j and not as an addition to the existing subchapter i. PRN Questions at 1 (¶1). PRN noted that subchapter i addresses alternative standards for coal combustion power generating facilities waste landfills in Part 816. *Id*. Ameren responded that placing its proposed rule in "a separate subpart within the Solid Waste Regulations is consistent with the direction" of the Board in its March 5, 2009 order. Ameren Resp. at 1. During the hearing, PRN characterized this response as "complete and acceptable." Tr. at 22.

In the following subsection of its opinion, the Board on a section-by-section basis summarizes the joint proposal and the issues and questions generated by it.

Section 840.100: Purpose

As originally proposed by Ameren, this Section provides in its entirety that "[t]his Subpart [A] provides for the closure of Ash Pond D at the Hutsonville Power Station, 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois" Orig. Prop. at 2. Ameren states that this proposed language intends "to identify that Subpart A specifically addresses the closure of Ash Pond D. . . ." SR at 24. In his pre-filed testimony, Mr. Buscher stated that "[t]he purpose Section of Ameren's proposed rule was not changed" by the Agency's subsequent proposal. Buscher Test. at 2; *see* Agency Prop. at 2, Joint Prop. at 2.

Section 840.102: Applicability

As originally proposed by Ameren, this Section provided in its entirety that "[t]his Subpart [A] exclusively applies to the closure of Ash Pond D, located at the Hutsonville Power Station, and particularly, no other Part of Subtitle G applies to the closure of Ash Pond D." Orig.

Prop. at 2; *see* 35 Ill. Adm. Code 700.101-888.140 (Subpart G). Ameren states that this proposed language

> sets forth the entirety of the requirements that apply to the closure of Ash Pond D, including the site-specific groundwater quality standards applicable to the site and the portion of the neighboring property where groundwater has been impacted by Ash Pond D. No other provisions of the Board's rules would apply to Ash Pond D and its closure upon adoption of this proposed site-specific rule. SR at 24-25.

In his pre-filed testimony, Mr. Buscher stated that, in Ameren's proposed language,

> the term 'closure' is used somewhat ambiguously to refer at times to the entire set of procedures and requirements set forth in Subpart A and at other times to refer to the planning and construction stage preceding the post-closure care period in which the structures and devices put in place during the closure period combine to become the operational corrective action activities. Buscher Test. at 2.

Accordingly, he stated that the Agency proposed to add the phrase "and post-closure care" in order to clarify the definition "by maintaining the distinction between closure and post-closure care, both of which are required by this [proposed] Subpart." *Id*., *see* Agency Prop. at 2.

Mr. Buscher also addressed the final portion of Ameren's proposed applicability language. He stated that the Agency proposed to strike "the language excluding the closure of Ash Pond D from all other requirements under Subtitle G because the Agency simply was unwilling at this point to accept on its face such a broad assertion." Buscher Test. at 2. He elaborated that "Subpart G covers a range of issues, and the nature and extent of future modifications to Subpart G is uncertain." *Id*.; *see* Agency Prop. at 2. The subsequent joint proposal incorporated these amendments offered by Mr. Buscher. *See* Joint Prop. at 2. As proposed by Ameren and the Agency, Section 840.102 would provide in its entirety that "[t]his Subpart exclusively applies to the closure and post-closure care of Ash Pond D, located at the Hutsonville Power Station."

Mr. Buscher's testimony reflects a reluctance on the part of the Agency to exclude Ash Pond D from other authorities that may now or in the future apply to it. Consistent with this reluctance, the Board proposes one additional change to this proposed section. The language that "[t]his Subpart exclusively applies" may be interpreted to provide that Ash Pond D is subject to no other regulatory requirements. To clarify that the proposal would apply to no other site, the Board proposes that Section 840.102 provide in its entirety as follows: "[t]his Subpart applies exclusively to the closure and post-closure care of Ash Pond D, located at the Hutsonville Power Station."

Section 840.104: Definitions

Proposed Section 840.104 states that, unless otherwise specified, the Act's definitions apply to Subpart A. Orig. Prop. at 2; *see generally id*. (proposing single Subpart A to 35 Ill.

Adm. Code 840). Ameren stated that "[t]his Section sets forth the definitions applicable to Subpart A." SR at 25. The Board separately addresses the proposed definitions in the following subsections.

"**Agency".** Ameren states that, "[f]or purposes of clarity and consistency with other Board rules, the definition of "Agency," the Illinois Environmental Protection Agency, was included in the definitions." SR at 25; *see* Orig. Prop. at 2, Agency Prop. at 2, Joint Prop. at 2; *see also, e.g.*, 35 Ill. Adm. Code 301.215 (defining "Agency" identically in water pollution regulations).

"Aquifer". Ameren states that "[t]he definition of "aquifer" was taken from Section 3(b) of the Illinois Groundwater Protection Act." SR at 25, citing 415 ILCS 55/3(b) (2008). In its entirety, the proposed definition states that "'[a]quifer' means saturated (with groundwater) soils and geologic materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients." Orig. Prop. at 2, Agency Prop. at 2, Joint Prop. at 2.

"**Ash Pond D".** Ameren states that "[t]he definition of 'Ash Pond D' was derived from the designation used by Ameren and referenced in various permits issued by the Agency to describe the surface impoundment at the Hutsonville Power Station that is subject to the proposed rule." SR at 25. In its entirety, the proposed definition states that "'Ash Pond D' means the surface impoundment designated as Ash Pond D, located at the Hutsonville Power Station, 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois." Orig. Prop. at 2, Agency Prop. at 2, Joint Prop. at 2-3.

"**Board".** Ameren states that, "[f]or purposes of clarity and consistency with other Board rules, the definition of 'Board,' the Illinois Pollution Control Board, was included in the definitions." SR at 25; *see* Orig. Prop. at 2, Agency Prop. at 2, Joint Prop. at 3; *see also, e.g.*, 35 Ill. Adm. Code 301.235 (defining "Board" identically in water pollution regulations).

"**Contaminant".** In his pre-filed testimony, Mr. Buscher stated that, "because the term is used repeatedly throughout Subpart A," the Agency proposed to add a definition of "contaminant" to Ameren's proposal. Buscher Test. at 3. In its entirety, the proposed definition provides that "'[c]ontaminant' means any solid, liquid or gaseous matter, any odor, or any form of energy, from whatever source." Agency Prop. at 3, Joint Prop. at 3. Mr. Buscher stated that the proposed definition is drawn from the Act. *Id*., citing 415 ILCS 5/3.165 (2008) (defining "contaminant" identically). The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**Hutsonville Power Station" or "Hutsonville site".** In its original proposal, Ameren stated that, "for purposes of clarity," it included a definition of the term "Hutsonville Power Station." SR at 25. Specifically, Ameren defined that term as "the electric generating station located at 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois." Orig. Prop. at 3. In its proposal, the Agency sought to provide that Ameren's proposed definition also applied to the term "Hutsonville site." Agency. Prop. at 3. The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**Lower zone of underlying aquifer".** In their joint statement, Ameren and the Agency state that they agree to strike Ameren's original designations of "Zone A" and "Zone B" and to use this term proposed by the Agency "with respect to applicable groundwater standards that will apply both on-site and off-site as set forth in [proposed] Section 840.116." Joint Statement at 4. Ameren and the Agency state that "[t]he Agency's approach provides a more straightforward framework for determining compliance obligations and relies largely on standards and requirements previously promulgated by the Board in 35 Ill. Adm. Code 620." *Id*. In its entirety, the definition provides that "'[l]ower zone of underlying aquifer' means the sands and gravels beneath the fine-grained surficial alluvium within the Wabash River bedrock valley." Joint. Prop. at 3.

"**Off-site".** In his pre-filed testimony, Mr. Buscher stated that, "to identify property that is, or is not, part of the Hutsonville Power Station," the Agency proposed to add a definition of "off-site." Buscher Test. at 3. He further stated that the concept appears in a number of proposed sections and is "used as a basis for the Agency's proposed groundwater quality standards for the site and demonstrations of compliance." *Id*., citing Agency Prop. at 7-10 (proposed Section 810.114 Groundwater Monitoring Program). In its entirety, the proposed definition provides that "'[o]ff-site' means any property that is not part of the Hutsonville Power Station." Agency Prop. at 3. The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**On-site".** In his pre-filed testimony, Mr. Buscher stated that, "to identify property that is, or is not, part of the Hutsonville Power Station," the Agency proposed to add a definition of "on-site." Buscher Test. at 3. He further stated that the concept appears in a number of proposed sections and is "used as a basis for the Agency's proposed groundwater quality standards for the site and demonstrations of compliance." *Id*., citing Agency Prop. at 7-10 (proposed Section 810.114 Groundwater Monitoring Program). In its entirety, the proposed definition provides that "'[o]n-site' means the same or geographically contiguous property constituting the Hutsonville Power Station." Agency Prop. at 3. The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**Operator".** In its original proposal, Ameren stated that it offered this definition in order to "describe the persons responsible for various requirements of the proposed rule and clarify that they are the owner or operator of Ash Pond D only." SR at 25. In its entirety, the proposed definition provides that "'[o]perator' means the person responsible for the operation of Ash Pond D." Orig. Prop. at 3, Agency Prop. at 3, Joint Prop. at 3.

"**Owner".** In its original proposal, Ameren stated that it offered this definition in order to "describe the persons responsible for various requirements of the proposed rule and clarify that they are the owner or operator of Ash Pond D only." SR at 25. In its entirety, the proposed definition provides that "'[o]wner' means the person who owns Ash Pond D." Orig. Prop. at 3, Agency Prop. at 3, Joint Prop. at 3.

"**Person".** In his pre-filed testimony, Mr. Buscher stated that, "because the term is used in other definitions," the Agency sought to define "person." Buscher Test. at 3. In its entirety,

the definition provides that "'person' is any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent or assigns." Agency Prop. at 3. Mr. Buscher stated that the proposed definition is drawn from the Act. *Id*., citing 415 ILCS 5/3.315 (2008) (defining "person" identically). The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**Professional engineer".** In its original proposal, Ameren sought to add a definition of "professional engineer." SR at 25. In its entirety, the definition provides that "'[p]rofessional engineer' means a person who has registered and obtained a seal pursuant to the Professional Engineering Practice Act of 1989." Orig. Prop. at 3, Agency Prop. at 3, Joint Prop. at 3. Ameren states that this definition is based upon that statute. SR at 25, citing 225 ILCS 325 (2008).

"**Professional Geologist".** In its original proposal, Ameren sought to add a definition of "professional geologist." SR at 25. In its entirety, the definition provides that "'[p]rofessional geologist' means a person licensed under the laws of the State of Illinois to practice as a professional geologist." Orig. Prop. at 3, Agency Prop. at 3, Joint Prop. at 3. Ameren states that this definition is based upon Section 58.2 of the Act. SR at 25, citing 415 ILCS 5/58.2 (2008) (defining "licensed professional geologist" under Site Remediation Program).

"**Site".** In its proposal, the Agency sought to add a definition of "site." Agency Prop. at 3. In its entirety, the proposed definition provides that "'[s]ite' means any location, place, tract of land, and facilities, including but not limited to buildings and improvements used for purposes subject to regulation or control by this act or regulations thereunder." *Id*. This definition is based upon Section 3.460 of the Act. *See* 415 ILCS 5/3.460 (2008) (defining "site" identically). The subsequent joint proposal did not amend the Agency's proposed definition. *See* Joint Prop. at 3.

"**Statistically significant".** In their joint statement, Ameren and the Agency state that they seek to define this term because it "is used in several sections of the [proposed] site-specific rule." Joint Statement at 4. In its entirety, the definition provides that "'[s]tatistically significant' means the application of a Mann-Kendall analysis performed at 95 percent confidence to determine whether consecutive groundwater sampling data showing greater or lesser concentrations of constituents is statistically significant." Joint Prop. at 3-4.

"**Upper zone of underlying aquifer".** In their joint statement, Ameren and the Agency state that they agree to strike Ameren's original designation of "Zone A" and "Zone B" and to use this term proposed by the Agency "with respect to applicable groundwater standards that will apply both on-site and off-site as set forth in [proposed] Section 840.116." Joint Statement at 4. Ameren and the Agency state that "[t]he Agency's approach provides a more straightforward framework for determining compliance obligations and relies largely on standards and requirements previously promulgated by the Board in 35 Ill. Adm. Code 620." *Id*. In its entirety, the proposed definition provides that "'[u]pper zone of underlying aquifer' means surficial sands and sandstones overlying shale west of the Wabash River bedrock valley, and sand lenses within the surficial fine-grained alluvium." Joint. Prop. at 4.

Section 840.106: Abbreviations and Acronyms

In its original proposal, Ameren states that this language identifies five abbreviations and acronyms used in the proposed Subpart A. SR at 26; *see* Orig. Prop. at 4. In his pre-filed testimony, Mr. Buscher proposed to add the acronym "GMZ," representing "groundwater management zone" and based upon provisions of the Board's current groundwater quality standards. Buscher Test. at 4, citing 35 Ill. Adm. Code 620.250; *see* Agency Prop. at 4. The subsequent joint proposal incorporated the Agency's additional acronym. *See* Joint Prop. at 4-5.

Section 840.108: Incorporations by Reference

In its proposal, the Agency sought to add incorporations by reference to Ameren's original proposal in proposed Section 840.108 and then to renumber subsequent sections. *See* Agency Prop. at 4-5. Specifically, the Agency proposed in subsection (a) to incorporate seven sets of materials from the National Technical Information Service and a single set of materials from the United States Geological Survey (USGS). *Id*. The Agency also proposed in subsection (b) that "[t]his Section incorporates no later edition or amendments." *Id*. at 5. The subsequent joint proposal includes the language offered by the Agency. *See* Joint Prop. at 5-6.

Section 840.110: Hydrogeologic Site Investigation

In its original proposal, Ameren obligated the owner or operator of Ash Pond D to "design and implement a hydrogeologic site investigation of Ash Pond D to develop information" for three specific uses. Orig. Prop. at 4; *see* SR at 26. Specifically, proposed subsection (a) provides that the required investigation shall be used "[t]o provide information to define hydrogeology and to assess the groundwater impacts associated with Ash Pond D." Orig. Prop. at 4; *see* SR at 26. Proposed subsection (b) requires the investigation to be used "[t]o provide information to perform a model to assess the groundwater impacts associated with closure of Ash Pond D." Orig. Prop. at 4; *see* SR at 26. Finally, proposed subsection (c) requires it to be used "[t]o provide information to establish a groundwater monitoring system." Orig. Prop. at 4; *see* SR at 26.

Ameren's proposal also provided that "[i]nformation from any hydrogeologic site investigation performed since 1999 may be used to satisfy the requirements of this Section." Orig. Prop. at 4; *see* SR at 26. Ameren states that it "performed such an investigation in 1999. The information that Ameren collected at that time continues to be valid; therefore, the rule provides that Ameren may use that data rather than conducting a new hydrogeologic site investigation." SR at 26. Ameren further states that its proposal includes this requirement "for purposes of completeness." *Id*.

In his pre-filed testimony, Mr. Dunaway sought to amend Ameren's proposal with three changes he described as "interrelated." Dunaway Test. at 3. First, he noted that Ameren's original language did not provide for prior Agency review of the hydrogeologic site investigation. *Id*. He proposed that the investigation "be reviewed and approved by the Agency as part of the closure plan." *Id*. at 2; *see* Agency Prop. at 5. Claiming that Ameren's original

proposal would render the Agency merely a "passive recipient of plans, reports, and related modifications," he characterized such prior Agency review as "essential." Dunaway Test. at 3. He claimed that "the better approach in the case of the closure of a coal ash impoundment with off-site groundwater contamination is for the Agency to be involved in an administrative oversight capacity during the design, construction and implementation of closure and post-closure activities that are likely to continue over several years." *Id*. He continued by arguing that "[t]his is consistent with the Agency's obligation to assure compliance with the Act and rules adopted under the Act." *Id*.; *see also* Agency Prop. at 28-33 (proposing Agency review, approval, and modification of closure and post-closure plans in additional Sections 840.148 and 840.150), Buscher Test. at 7-10 (addressing proposed Sections 840.148 and 840.150).

Second, Mr. Dunaway sought to strike "Ameren's proposed language to allow the use of any hydrogeologic site assessment performed since 1999." Dunaway Test. at 3; *see* Agency Prop. at 5-6. He stated that, "[w]hile the Agency is not opposed to the use of hydrogeologic data gathered since 1999, the Agency should be able to review and approve the appropriateness of the data's inclusion in a current assessment." Dunaway Test. at 3. He argued that Ameren's original language would allow data to satisfy this requirement even if it no longer remained valid. *Id*.

Third, Mr. Dunaway "proposed language intended to focus the hydrogeologic assessment on the nature and extent of contaminants originating from Ash Pond D." Dunaway Test. at 3; *see* Agency Prop. at 5-6.

Ultimately, the joint proposal reflected these Agency amendments by offering the following language:

> [t]he owner or operator of Ash Pond D must design and implement a hydrogeologic site investigation to determine the nature and extent of contamination originating from Ash Pond D and to develop hydrogeologic information for the uses set forth below. If approved in the closure plan, any information from any hydrogeologic site investigation performed since 1999 may be used to satisfy the requirements of this Section. Joint Prop. at 6

The joint proposal then lists three uses of the investigation with only grammatical changes in the language originally proposed by Ameren. *Id*.; *see* Orig. Prop. at 4.

Section 840.112: Groundwater Monitoring System

In its original proposal, Ameren obligated the owner or operator of Ash Pond D "to design and install a groundwater monitoring system that is sufficient to evaluate post-closure groundwater quality and trends." SR at 26; *see* Orig. Prop. at 4-5 (proposed Section 840.110). Ameren states that, after conducting a hydrogeologic site investigation in 1999, it designed and installed such a system. SR at 26; *see generally* TSD at 542-45 (Technical Memorandum addressing Preliminary Groundwater Monitoring Plan). Ameren further states that it "proposes to continue using components of that system pursuant to this [proposed] rule" and offers language regarding that system "[f]or purposes of completeness." SR at 26-27.

Ameren's proposed subsection (a) provides specific "[s]tandards for monitoring well construction and design." Orig. Prop. at 4. As originally proposed, subsection (a)(2) provided in its entirety that "[w]ells must be screened to allow sampling only at the desired interval." Orig. Prop. at 5. In its subsequent proposal, the Agency amended Ameren's language to provide that "[w]ells must be screened to allow sampling only at the specified ~~desired~~ interval." Agency Prop. at 6. The joint proposal maintained this revision. Joint Prop. at 7. At the hearing, Mr. Cobb indicated that, although the Agency would review these intervals as elements of monitoring system, the Agency has received data of good quality from Ameren's wells. Tr. at 106. He stated that this proposed revision intends primarily to allow the Agency flexibility to address matters that cannot be addressed by those data. *Id*.

As proposed by Ameren, subsection (b) establishes specific "[s]tandards for the location of monitoring points," and proposed subsection (c) addresses "sample collection and analysis." *Id.* at 4-5. Ameren states that '[t]he proposed standards are consistent with protocols and practices utilized by the Company in submitting monitoring data to the Agency as part of its ongoing compliance obligations with respect to the Station's Water Pollution Control and NPDES [National Pollutant Discharge Elimination System] permits." SR at 27.

In his pre-filed testimony, Mr. Dunaway proposed substantive amendments to Ameren's original proposal. First, he offered "[a] requirement for Agency review and approval of the planning for the groundwater monitoring system," which Ameren had not included. Dunaway Test. at 4. He stated that "[t]his change is proposed to assure that the groundwater monitoring system will be capable of providing the Agency with data adequate to perform its oversight duties." *Id*.; *see* Agency Prop. at 6. Mr. Dunaway states that "[t]o expedite the review and approval process, the Agency has proposed to incorporate the design of the groundwater monitoring system as part of the closure plan rather than making it a separate submittal." Dunaway Test. at 4.

Second, the Agency proposed a new subsection (b) addressing the number, installation, and depth of monitoring wells. Dunaway Test. at 4. Mr. Dunaway states that this language is based on the Agency's belief that "the monitoring system's functionality should not be limited by including only the existing monitoring system." *Id*. The proposed new subsection intends to allow "the option of expanding the monitoring system that currently exists at appropriate locations, if required, to demonstrate compliance with applicable groundwater standards under this [proposed] rule." *Id*.; *see* Agency Prop. at 6-7. The Agency states that it does not seek to eliminate wells operating since 1999 but intends to ensure that the system collects data necessary for demonstrating compliance without generating unnecessary costs. Dunaway Test. at 4.

Third, the Agency proposes to strike Ameren's proposed subsection (c) addressing sample collection and analysis. Dunaway Test. at 4; *see* Orig. Prop. at 5, Agency Prop. at 7. Noting that Ameren's original proposal addressed sample collection and analysis in this subsection (c), the Agency expresses the view that "discussion of the Groundwater Monitoring System should be limited to monitoring well characteristics, such as the number of wells, construction details and placement." Dunaway Test. at 4-5. Mr. Dunaway states that the Agency has addressed the issues of sample collection, preservation, and analysis in a separate section of its own proposal. *Id*. at 5; *see* Agency Prop. at 7-10 (proposed Section 840.114

Groundwater Monitoring Program). The Agency sought to replace Ameren's original subsection with language requiring that "[t]he groundwater monitoring system approved in the closure plan must include a maintenance plan." Agency Prop. at 7. During the hearing, the Agency anticipated that that this maintenance plan would be submitted with the closure plan. Tr. at 106. In its post-hearing comment, the Agency proposed to amend Section 840.130(f) to require a maintenance plan as an element of a closure plan. PC 2 at 2, citing Tr. at 106-07.

The joint proposal generally reflects the substantive amendments proposed by the Agency. *See* Joint Prop. at 6-8, Agency Prop. at 6-7.

Section 840.114: Groundwater Monitoring Program

In its original proposal, Ameren required the owner or operator of Ash Pond D "to develop a groundwater monitoring program, the frequency of monitoring, and the constituents to be monitored at each well installed. . . ." SR at 27; *see* Orig. Prop. at 5-7. In its opening paragraph, the proposed section provided among other requirements that "[t]he owner or operator must begin the groundwater monitoring program upon completion of the final cover installation." Orig. Prop. at 5.

Ameren's proposed subsection (a) specifically provided that the owner or operator of Pond D must monitor each well on a quarterly basis for five years after closure for the following constituents: boron, iron, manganese, pH, sulfate, and TDS [total dissolved solids]. Orig. Prop. at 5. Ameren states that it "chose to monitor for the specified constituents set forth in subsection (a) of this Section because they are consistent with parameters required in the Station's NPDES Permit. . . ." SR at 27. Ameren added that "boron and sulfate are indicator parameters of coal ash leachate and are very mobile." *Id*. Proposed subsection (a) also obligates the owner or operator to monitor for specific conductance, groundwater elevation, and monitoring well depth. Orig. Prop. at 5-6.

In addition, proposed subsection (a) addressed frequency of monitoring beyond the first five years after closure. *See* Orig. Prop. at 6. Specifically, the owner or operator may reduce the frequency to semi-annual upon determining that each of three conditions have been met: "that monitoring effectiveness will not be compromised by the reduced frequency;" that quarterly data have provided sufficient characterization of the groundwater; and that concentrations of monitored constituents "show no statistically significant increasing trends that can be attributed to Pond D." *Id*. Ameren argued that "[t]he monitoring frequency is similar to that prescribed in the Board's Landfill Regulations and will provide sufficient data to monitor the effectiveness of the proposed closure activities." SR at 27, citing 35 Ill. Adm. Code 811.319.

Ameren's proposed subsection (b) provided that the owner or operator of Pond D must monitor each well on an annual basis until monitoring is discontinued under subsection (a) for the following inorganic constituents: antimony, barium, beryllium, cadmium, chloride, chromium, cobalt, copper, cyanide, fluoride, lead, mercury, nickel, nitrate as N, selenium, silver, thallium, and zinc. Orig. Prop. at 7. Ameren states that, as a result of discussions with the Agency, it included monitoring for these additional inorganic constituents "to properly monitor the effectiveness of the proposed closure activities." SR at 27.

Finally, Ameren's proposed subsection (c) provided in its entirety that "[e]lements of the Groundwater Monitoring Program may be modified upon agreement with the Agency, so long as the modification is in accordance with the provisions of this Subpart." Orig. Prop. at 7

In his pre-filed testimony, Mr. Dunaway proposed amending Ameren's original language to an extent he characterized as "significant." Dunaway Test. at 5. First, the Agency proposed to include the groundwater monitoring program in the closure plan, "just as it did with the hydrogeologic assessment and the groundwater monitoring system." *Id*.; *see* Agency Prop. at 7. The Agency argues that including the program in the closure plan will ensure that the program is consistent with various regulatory requirements. Dunaway Test. at 5. The Agency states its "intent that once the closure plan has been approved, and the groundwater monitoring system installed as agreed, the monitoring plan will be implemented even if the rest of the closure construction activities have not been completed." *Id*. The Agency states that it has amended the opening paragraph and subsection (a) to reflect these positions. *Id*; *see* Agency Prop. at 7.

The Agency also proposes to require quarterly monitoring for all contaminants listed in Section 620.410(a) and (d) of the Board's groundwater quality standards for Class I groundwater, except for radium 226 and radium 228. Dunaway Test. at 5, citing 35 Ill. Adm. Code 620.410(a) (inorganic chemicals), 620.410(d) (pH). In its pre-filed questions, PRN asked why the Agency's proposal excluded these two constituents. PRN Questions at 6 (¶ 11). In its pre-filed response, the Agency stated that USGS research found that "radium and other radioactive elements in coal ash are not significantly elevated above concentrations that occur in materials found naturally in the environment. The USGS also found that dissolved concentrations of these radioactive elements are below levels of health concern. Therefore, inclusion of Radium 226 and Radium 228 is not warranted." Agency Resp. at 1; *see id*., Att. 1 (Radioactive Elements in Coal and Fly Ash: Abundance, Forms, and Environmental Significance). Responding to a question at hearing, Mr. Bollinger addressed monitoring for organic chemicals by indicating that Ameren has "no reason to suspect that there would be organic contaminants present in pond D." Tr. at 107. In addition, Mr. Cobb indicated that Agency is not aware of issues involving organic contaminants in the Wabash River. *Id*.

The Agency acknowledges that both Ameren and the Agency have proposed to require monitoring for the same contaminants. Dunaway Test. at 5; *see* Agency Prop. at 7-8, Orig. Prop. at 5-7. However, the Agency notes that Ameren's proposed Section 840.112(b) had proposed annual monitoring for specific inorganic constituents. Dunaway Test. at 5; *see* Orig. Prop. at 7. The Agency states that monitoring all contaminants on the same quarterly schedule effectively eliminates Ameren's proposed Section 840.112(b). Dunaway Test. at 5; *see* Orig. Prop. at 7, Agency Prop. at 7, 9-10.

The Agency acknowledges that Ameren's proposed Section 840.112(a) listed suitable parameters for indicating ash impacts on groundwater. Dunaway Test. at 5; *see* Orig. Prop. at 5. Specifically, that provision required monitoring for boron, iron, manganese, pH, sulfate, and TDS. Orig. Prop. at 5. The Agency cites boron in particular as "an excellent contaminant for impact assessment" because it "is abundant in coal ash" and is "mobile in groundwater." Dunaway Test. at 5. However, the Agency argues that there is "no dispute that an impact exists"

and that contaminants "other than the indicator contaminants could have impacted groundwater." *Id*. at 5, 6. The Agency supports its own proposed monitoring program by stating that a "full assessment of contaminants that may be present in groundwater is needed to adequately characterize and protect the resource." *Id*. at 6.

The Agency also proposes to allow Ameren to discontinue monitoring any contaminant other than six indicator contaminants (boron, iron, manganese, sulfate, TDS, and pH) after one year if the concentration of the contaminant has been below the detection limit in downgradient wells for four consecutive quarters or is not statistically greater than background concentration detected in upgradient wells for four consecutive quarters. Dunaway Test. at 6; Agency Prop. at 7. The Agency states it proposes a minimum of four quarters of monitoring "to account for seasonal variation in groundwater quality." Dunaway Test. at 6. The Agency indicates that Ameren may use the first annual report filed under proposed Section 840.144 to suggest eliminating monitoring contaminants with concentrations below detection limits. *Id*., *see* Agency Prop. at 24-25 (proposed Section 840.144 Recordkeeping and Reporting Requirements). The Agency states that, after one year of monitoring, Ameren will be required to monitor only indicator contaminants, contaminants that are impacting groundwater, and those that have the potential to do so. Dunaway Test. at 6.

The Agency notes that Ameren's original subsection (a)(1) provided conditions under which Ameren after five years might reduce its monitoring frequency to semi-annual. Dunaway Test. at 7; *see* Orig. Prop. at 6. The Agency reorganized this provision as subsection (b). Agency Prop. at 8. The Agency also added language reflecting its proposal to require "review and approval before implementation [of] or modification to the post-closure care plan." Dunaway Test. at 7.

The Agency also notes that Ameren's original subsection (a)(2) provided conditions under which Ameren might reduce its monitoring frequency to annual "[b]eginning fifteen years after closure, or five years after reducing the monitoring frequency to semi-annual. . . ." Orig. Prop. at 6; *see* Dunaway Test. at 7. The Agency reorganized this provision as subsection (c). Agency Prop. at 8. The Agency again added language reflecting its proposal to require review and approval before implementation [of] or modification to the post-closure care plan." Dunaway Test. at 7. In addition, the Agency proposes to limit the option of conducting annual monitoring after 15 years by requiring that Ameren meet conditions listed in the Agency's proposed subsection (b). *Id*., *see* Agency Prop. at 8. In support of this amendment, the Agency expresses its belief

> that the low permeability cover and the extraction trench proposed by Ameren will allow Ameren to successfully achieve the applicable groundwater standards at the Hutsonville site. However, if for some unforeseen reason Ash Pond D continues to cause statistically significant increases in groundwater contamination, in spite of implementation of the closure plan, quarterly or semi-annual monitoring pursuant to [proposed] Section 840.118, should continue as long as required to assure the protection of the off-site water resource. Dunaway Test. at 7.

The Agency also proposed to add a subsection (d). Dunaway Test. at 6; *see* Agency Prop. at 9. That proposed subsection provides in its entirety that "[s]ampling and analysis data from groundwater monitoring and decisions to drop any constituent from the monitoring program must be reported to the Agency no later than 30 days after the sampling and analysis have been completed as provided in Section 840.144(a) of this Part." Agency Prop. at 9. The Agency states that this provision will "ensure that sampling and analysis data are provided to the Agency in a timely manner consistent with Ameren's proposed Section 840.142(a)." Dunaway Test. at 6; *see* Orig. Prop. at 15-16 (proposed Section 840.142 Recordkeeping and Reporting Requirements).

The Agency also proposed to add a subsection (e). Dunaway Test. at 7; Agency Prop. at 9. The Agency argues that Ameren's original proposal included "only general guidelines for appropriate sample collection and analytical procedures." Dunaway Test. at 7. The Agency states that it seeks to provide more specific direction by proposing language based on the Board's groundwater quality standards. *Id*., citing 35 Ill. Adm. Code 620.510 (Monitoring and Analytical Requirements); *see* Agency Prop. at 9 (listing methods and procedures for monitoring and analysis). The Agency states that its proposal lists methods and procedures that it seeks to incorporate by reference. Dunaway Test. at 7; *see* Agency Prop. at 4-5 (proposed Section 840.108).

Finally, the Agency also sought to add to Ameren's proposal a subsection (f) requiring a quality assurance program as an element of the monitoring program. Dunaway Test. 7; *see* Agency Prop. at 9. Although the Agency acknowledges that Ameren's original proposal included such a requirement, the Agency sought to include it in this section, "as the Agency believes a quality assurance program for sample collection, preservation and analysis more directly relates to the Groundwater Monitoring Plan." Dunaway Test. at 7-8.

The joint proposal generally reflects the substantive amendments proposed by the Agency and summarized in the preceding paragraphs. *See* Joint Prop. at 8-11, Agency Prop. at 7-11. In their joint proposal, however, Ameren and the Agency state that they add language to this proposed Section 840.114 in order "to clarify that the groundwater monitoring program for closure and post-closure of Ash Pond D ends once compliance is achieved at the property boundary." Joint Statement at 4, citing Joint Prop. at 12-17 (proposed Section 840.118 Demonstration of Compliance); *see* Joint Prop. at 8. Ameren and the Agency state that "[t]he rule is drafted so that monitoring frequency may be gradually reduced over time unless there is a statistically significant increasing trend *that is attributable to Ash Pond D*. Attribution of statistically significant trends to Ash Pond D is a concept that carries over to the compliance determinations under [proposed] Section 840.118." Joint Statement at 4-5 (emphasis in original); *see* Joint Prop. at 8-9. The Joint Statement also notes that "[r]eporting requirements generally have been moved to [proposed] Section 840.144." Joint Statement at 5; *see* Joint Prop. at 9.

The Board notes that Section 840.114(a) of the joint proposal refers to "a concentration that is not statistically greater than the concentration detected in the upgradient wells. . . ." Joint Prop. at 8. The Board further notes that the joint statement emphasizes statistical significance as it pertains both to monitoring and compliance determinations. Joint Statement at 4. Because

"statistically significant" is a term defined in the joint proposal, the Board employs it in subsection (a) for clarification and consistency. *See* Joint Prop. at 3-4 (definition).

Section 840.116: Groundwater Quality Standards

In its original proposal, Ameren noted that the operation of Ash Pond D has impacted groundwater and sought in a section entitled "Compliance Zones" to divide the impacted area into two sections. SR at 28. The first, Zone A, Ameren "defined as the upper migration zone underlying Pond D." *Id*.; *see* Orig. Prop. at 2 (definition in proposed Section 840.104). The second, Zone B, Ameren defined as "the upper migration zone located east of Pond D, extending 500 feet south onto the adjacent landowner's property, and running to the Wabash River." SR at 28; *see* Orig. Prop. at 2-3 (definition in proposed Section 840.104).

Ameren stated that, because of the recognized groundwater impacts, "compliance with Class I groundwater quality standards is not feasible and is not consistent with Board regulations pertaining to other pre-existing fill operations." SR at 28, citing 35 Ill. Adm. Code 811.320 (waste disposal). Ameren proposed "that concentrations of parameters as monitored are authorized and no groundwater quality standards shall apply within Zones A and B." SR at 28; *see* Orig. Prop. at 7; *see also* Cobb Test. at 3. Ameren also proposed that "the results of annual trend analysis will be used to determine compliance within Zone B." Orig. Prop. at 7; SR at 28; *see* Orig. Prop. at 8 (requiring annual trend analysis).

In his pre-filed testimony, Mr. Cobb states that, under its original proposal, Ameren could achieve compliance at the downgradient boundaries of Zone B by meeting Class I groundwater quality standards with no increasing trend attributable to Ash Pond D. Cobb Test. at 3, citing Orig. Prop. at 6 (proposed Section 840.112(a)(3)). He indicates that, with compliance at such a point, "corrective action would be complete, and no groundwater quality standards would apply within Zones A and B . . . regardless of future occurrences or sources of contamination." Cobb Test. at 3-4. The Agency considers the Board's existing regulations for a groundwater management zone (GMZ) as a suitable approach for the Hutsonville site. *Id*. at 4, citing 35 Ill. Adm. Code 620. Off-site, the Agency favors greater consistency with the Board's groundwater quality standards including nondegradation, "unless an off-site GMZ can be established. . . ." Cobb Test. at 4, citing 35 Ill. Adm. Code 620. Mr. Cobb views off-site compliance as "complicated," as the lower migration zone in the proposed Zone B has experienced contaminations at concentrations below numerical Class I groundwater quality standards but above Class I nondegradation standards. Cobb Test. at 4, citing 35 Ill. Adm. Code 620.401, 620.410, 620.Subpart C. He also notes that "the lower migration zone is a source of water for irrigation of crops while boron, one of the indicator contaminants, is known to be phyto-toxic at 2 milligrams per liter." Cobb Test. at 4. Consequently, in its Section 840.116 the Agency proposes "[g]roundwater quality standards for both on-site and off-site contamination that more consistently reflect the existing Board standards." *Id*. The Agency also proposes replacing Ameren's proposed Zones A and B with "the downgradient boundaries of the Hutsonville site as the compliance point for both on-site and off-site contamination." *Id*.

Specifically, in subsection (a), the Agency "proposes, because of the existing contamination, that the groundwater quality standards that apply on-site during closure and post-

closure activities should be the existing concentrations as determined by groundwater monitoring for the contaminants that exceed the applicable Class I numeric groundwater quality standards." Cobb Test. at 5, citing 35 Ill. Adm. Code 620.420; *see* Agency Prop. at 10. The Agency recommends relying upon such existing concentrations, as confirmed through groundwater monitoring, "to prevent causing or allowing any further degradation to occur. . . ." Cobb Test. at 5, citing 415 ILCS 5/12(a) (2008). The Agency further proposes that, "[a]fter the completion of closure and post-closure, the on-site standard would be the monitored concentrations if the monitored concentrations are above the Class I numerical standards and if three conditions" are satisfied:

1) To the extent practicable, the exceedance has been minimized and beneficial use, as appropriate for the class of groundwater, has been returned;

2) Any threat to public health or the environment has been minimized; and

3) An institutional control prohibiting potable uses of groundwater is placed on the Hutsonville site in accordance with the Uniform Environmental Covenants Act (765 ILCS 122).. Cobb Test. at 5, citing Agency Prop. at 10 (proposed Sections 840.116(a)(1) - (a)(3)).

Mr. Cobb's pre-filed testimony argues that these three conditions are similar to those that must be met in order to close a GMZ where corrective action does not attain full compliance. Cobb Test. at 5, citing 35 Ill. Adm. Code 620.450(a)(4); *see* Tr. at 70, 75-76.

In subsection (b), the Agency proposes that the Class I numerical and nondegradation standards apply off-site at all times. Cobb Test. at 5, citing 35 Ill. Adm. Code 620.401, 620.410, 620.Subpart C; *see* Agency Prop. at 11, Tr. at 70. Mr. Cobb's pre-filed testimony states that the Agency "is not persuaded that the Hutsonville site should be treated as a special case for off-site groundwater contamination, especially considering this rule may become a template for the closure of a significant number of other ash impoundments." Cobb Test. at 5. The Agency proposal provides "that the numerical standards for returning to compliance under this rule would be applicable only in the upper migration zone (in which numerical standards already have been exceeded) while the nondegradation standard would apply only in the lower migration zone (in which the nondegradation standard already has been exceeded)." Cobb Test. at 5; *see* Agency Prop. at 11. The Agency states that it has not applied the nondegradation standard in the upper migration zone off-site in order to be consistent with Board regulations addressing the applicability of preventive notification and response activities. Cobb. Test. at 5-6, citing 35 Ill. Adm. Code 620.302(c). The Agency notes that Ameren's modeling shows that its proposed closure plan should achieve off-site compliance within approximately 25 years. Cobb Test. at 6, citing TSD at 534 (Figure 17D).

Mr. Cobb's pre-filed testimony states that "[t]he issue of whether the upper and lower aquifers . . . should be considered to be one hydrologic unit is closely related to the Agency's proposal of separate groundwater quality standards for the off-site upper and lower migration

zones and its proposed application of the nondegradation standards in the lower migration zone." Cobb Test. at 6; *see* Agency Prop. at 11. While noting that Ameren describes the upper and lower aquifers as separate units, the Agency cites the record to conclude that the two have hydraulic connection. Cobb Test. at 6-7, citing R. at 40, 51-52, 214. Based on this connection, the Agency claims that "the uppermost aquifer must include the deep alluvial aquifer in relation to evaluating off-site impacts to the south and southeast of Ash Pond D." Cobb Test. at 7. Mr. Cobb's pre-filed testimony acknowledges, however, that "[t]his issue is not critical on-site." *Id*.

The Agency notes Ameren's indication that "it considers contaminant concentration in the lower part of the aquifer to be insignificant because the levels found did not exceed the numerical standards." Cobb Test. at 8, citing R. at 18 (Hydrogeology and Groundwater Quality). The Agency suggests that contamination in the lower zone may be "attributable to the radial gradient produced by mounding in Ash Pond D and seasonal pumping in the off-site irrigation well, which appears to eventually change the direction of the groundwater flow to southeast." Cobb Test. at 8, citing R. at 40. Also, noting that the "the irrigation well is screened in the lower zone of the aquifer," the Agency suggests that there may be "less impact to the lower part of the aquifer than to the upper part because of the transient nature of the cone of depression, produced by the seasonal use of the off-site irrigation well." Cobb Test. at 8.

Mr. Cobb's pre-filed testimony stresses the Agency's position that nondegradation requirements "apply to off-site groundwater downgradient of Ash Pond D in the lower cone of the unconsolidated aquifer." Cobb Test, at 8, citing 415 ILCS 5/12(a), (d), 35 Ill. Adm. Code 620.401, 620.Subpart C. Specifically, he reviews various authorities to argue that these provisions prohibit "causing, threatening or allowing contamination of potable resource groundwater above what is not removed by ordinary treatment processes in a private drinking water system well." Cobb Test. at 9-11, citing Cent. Illinois Pub. Serv. Co. v. PCB, 116 Ill.2d 397, 409-10; Water Quality Standard for Intrastate Waters (SWB-14), R71-20; Water Quality Standards Revisions, R71-14. Mr. Cobb elaborates that "contaminants in off-site groundwater must not cause, threaten or allow contamination above existing concentrations," which "would constitute continuing degradation off-site." Cobb Test. at 12. He expresses the Agency's belief, however, that decreasing contaminant concentrations in the upper zone "will at least not increase the concentration in the lower zone of the aquifer and probably will decrease it as shown in Ameren's modeling." *Id*, citing R. at 534.

In subsection (b), the Agency also proposes an alternative to strict compliance with numerical and antidegradation standards: establishing an off-site GMZ with written permission from affected property owner(s). Cobb Test. at 6, citing 35 Ill. Adm. Code 620.250; *see* Agency Prop. at 11. Mr. Cobb's pre-filed testimony argues that this alternative "offers more flexibility because groundwater quality standards for the GMZ are as set forth in Section 620.450(a) for a variety of circumstances including the inability to achieve the numerical standards using the approved corrective action methods -- in this case, the final cover system, groundwater collection trench and groundwater discharge system." Cobb Test. at 6. Mr. Cobb's pre-filed testimony also states that "the Agency has always required the written permission of affected property owners for the establishment of off-site GMZs, so the details of the GMZ off-site alternative would have to be worked out at a later time." *Id*.; *but see* 35 Ill. Adm. Code 620.250.

In their joint statement, Ameren and the Agency concur that, "[w]ith respect to on-site conditions, the applicable groundwater quality standards shall be the numerical value established through the monitoring program and related requirements." Joint Statement at 5; *see* Joint Prop. at 11. In the proposed Section 840.116(a), the joint proposal seeks to clarify by adding the term "on-site" and describing groundwater standards as "numeric." Joint Prop. at 11.

The joint proposal also modifies subsection (a)(3) addressing institutional controls "to acknowledge that instruments other than the uniform environmental covenant may be available by the time the corrective action is completed." Joint Statement at 6. In the event that on-site contamination levels continue to exceed Class I numeric standards, the revised subsection allows an institutional control placed on the site through "an alternative instrument authorized for environmental uses under Illinois law and approved by the Agency." Joint Prop. at 11. In addition, the joint statement notes that "Ameren has on-site wells drawing both potable and process water from the lower zone of the underlying aquifer." Joint Statement at 6. The joint proposal further amends subsection (a)(3) by providing that "[e]xisting potable uses of groundwater may be preserved as long as such uses remain fit for human consumption in accordance with accepted water supply principles." Joint Prop. at 11, citing 415 ILCS 5/3.340 (defining "potable"). The joint statement indicates that "[i]nstitutional controls are not required for non-potable wells." Joint Statement at 6.

In their joint statement, Ameren and the Agency concur "that for the Ash Pond D site-specific rule and with respect to off-site groundwater quality, numeric Class I Groundwater Quality Standards will apply within the upper zone of the underlying aquifer and non-degradation standards will apply within the lower zone of the underlying aquifer." Joint Statement at 5. The joint statement also refers to the alternative of establishing an off-site GMZ. *Id*., citing 35 Ill. Adm. Code 620.450(a)(4). The joint proposal amends subsection (b) "to calrify that Ameren may propose and the Agency may approve a groundwater management zone not only in the closure and post-closure care plans, but also in subsequent modification of those plans." Joint Statement at 6; *see* Joint Prop. at 12.

Section 840.118: Demonstration of Compliance

In its original proposal, Ameren recognized that operating Ash Pond D had affected groundwater and relied upon "a trend analysis to ensure that the closure strategy is effectively reducing the level of constituents over time." SR at 28. First, Ameren's proposed subsection (a) provided in its entirety that "[t]he owner or operator of Ash Pond D must establish and identify in the closure plan and post-closure care plan no fewer than three downgradient monitoring wells located within Zone B for determining groundwater quality." Orig. Prop. at 7-8; *see* SR at 28. Ameren stated that, "[b]y identifying these wells in the closure and post closure care plans, the plans can be updated when necessary to account for new or replacement wells that will be used for monitoring and evaluating groundwater quality." SR at 29.

Ameren's proposed subsection (b) required that, for each of the downgradient monitoring wells situated in Zone B, the owner or operator of Ash Pond D must perform an annual trend analysis "for all constituents monitored in accordance with Section 840.112(a) . . . and for all constituents monitored in accordance with Section 840.112(b) that are above Class 1groundwater

quality standards. . . ." Orig. Prop. at 8; *see* SR at 29. If the results of this analysis reveal an increasing trend, subsection (b) also requires further analysis "to determine whether the increasing trend is statistically significant." Orig. Prop. at 8.

Ameren's proposed subsection (c) provided that, if that further analysis reveals a statistically significant increasing trend, then the owner or operator of Ash Pond D must conduct an investigation to determine its cause. SR at 29; *see* Orig. Prop. at 8. Subsection (c) further provided that, "[i]f the statistically significant increasing trend occurs during post-closure care, such investigation must include more frequent inspection of the surface of the cover system and evaluation of the effectiveness of the groundwater collection trench. . . ." Orig. Prop. at 8.

Ameren's proposed subsection (c)(1) provided that, if the investigation of the statistically significant increasing trend attributes it to cause other than Ash Pond D, then "the owner or operator of Ash Pond D must notify the Agency in writing, stating the cause of the increasing trend and providing the rationale used in such a determination." Orig. Prop. at 8; *see* SR at 29. Proposed subsection (c)(2) provided that, "[i]f the investigation determines that the increasing trend is a result of Ash Pond D and monitoring frequency has been reduced" to semi-annual or annual sampling, then the owner or operator must return to quarterly sampling. SR at 29; *see* Orig. Prop. at 8. The subsection further provided that, "[a]fter four consecutive quarterly samples show no statistically significant increasing trend, sampling frequency may return to either semi-annual or annual," whichever was conducted before returning to quarterly sampling. SR at 29; *see* Orig. Prop. at 8.

Ameren's proposed subsection (d) provided that, "[i]f a statistically significant increasing trend attributable to Ash Pond D continues over a period of two or more consecutive years, the owner or operator must perform additional investigations to determine the extent of the impact and the effectiveness of the closure activities." SR at 29; *see* Orig. Prop. at 8-9. Ameren indicates that such an "investigation may include more frequent inspections of the surface of the cover system, more frequent sampling of the monitoring wells, installation of additional wells, or one-time sampling of groundwater at other points." SR at 29; *see* Orig. Prop. at 9. Proposed subsection (e) provided that, based on the results of these additional investigations, "the owner or operator of Ash Pond D must take action to mitigate exceedances occurring at the outer edge of Zone B." Orig. Prop. at 9; *see* SR at 29.

Finally, Ameren's proposed subsection (e) required the owner or operator of Ash Pond D to file an annual report with the Agency. Orig. Prop. at 9. Specifically, the report was required to include results of trend analysis, discussion of any statistically significant increasing trends within Zone B, and notice regarding any superseding cause. *Id*.

In his pre-filed testimony on behalf of the Agency, Mr. Cobb summarizes Ameren's proposal for demonstrating compliance: "compliance will be achieved and groundwater monitoring discontinued when 'no statistically significant increasing trend that can be attributed to Pond D is detected in the concentration of any such constituent at the downgradient monitoring wells inside Zone B for three consecutive years after changing to an annual monitoring frequency' and 'all concentrations of constituents monitored in accordance with Section 840.112 are at or below Class 1 groundwater quality standards for a period of five

years." Cobb Test. at 13; *see* Orig. Prop. at 7-8. Mr. Cobb indicates that an approach similar to a GMZ may be appropriate for the site "but that off-site compliance should be more consistent with the Board's groundwater quality standards at Part 620 including the nondegradation standard unless an off-site GMZ can be established. . . ." Cobb Test. at 4; *see* 35 Ill. Adm. Code 620. Characterizing compliance with off-site standards as complicated, the Agency proposed to establish compliance points for both on-site and off-site contaminations and "appropriate methods of demonstrating compliance with the proposed standards at the proposed compliance points." Cobb Test. at 4; *see id*. at 13.

Specifically, the Agency first proposed to amend Ameren's proposal by eliminating the designations of Zones A and B and providing that the "property boundary downgradient of Ash Pond D is the applicable vertical plane of compliance for both on-site and off-site groundwater quality standards." Cobb Test. at 14; *see* Agency Prop. at 11-12. Mr. Cobb's pre-filed testimony noted that, "[e]ven though there are two sets of off-site standards in one aquifer for the upper and lower migration zones, nested wells can be used to monitor simultaneously at the upper and lower levels." Cobb Test. at 14. Mr. Cobb opined that Ameren's proposed final cover and groundwater collection trench appear to be "the appropriate remedy to decrease off-site contamination in the upper part of the aquifer, and to also subsequently prevent increases in concentrations in the lower zone of the aquifer off-site." *Id*.

The Agency proposed in its subsection (a)(1) that on-site compliance "will be achieved when monitoring at the downgradient boundaries of the Hutsonville site after a change to annual monitoring frequency shows no statistically significant increasing trend for four consecutive years." Cobb Test. at 13; *see* Agency Prop. at 11-12. Based on its proposed monitoring frequencies, the Agency noted that Ameren could attain on-site compliance no sooner than fourteen years after beginning monitoring. Cobb Test. at 13; *see* Agency Prop. at 7-8 (monitoring frequency).

The Agency addressed off-site compliance in its proposed subsection (a)(2). The Agency stated that its proposal required "a demonstration of off-site compliance by monitoring at the downgradient boundaries of the Hutsonville site for two conditions: 1) A statistically significant decreasing trend for four consecutive years after changing to an annual monitoring frequency, and 2) compliance with the upper and lower migration zone groundwater quality standards. . . ." Cobb Test. at 13-14; *see* Agency Prop. at 12; *see also id*. at 11 (off-site groundwater quality standards).

The Agency addressed demonstrating compliance in its proposed section (b). Subsection (b)(1) provided that on-site compliance "will be demonstrated using an annual trend analysis for each monitoring well at the downgradient boundaries of the Hutsonville site and each constituent that is above the Class 1 numerical standards of Section 620.410." Cobb Test. at 14; *see* Agency Prop. at 12-13; *see also* 35 Ill. Adm. Code 620.410. Mr. Cobb stated that "[a] trend is established with a minimum of four consecutive samples, and the absence of an increasing trend after changing to annual monitoring will demonstrate compliance. . . ." Cobb Test. at 14. Subsection (b)(2) addressed off-site compliance by requiring a trend analysis and monitoring data demonstrating compliance with the proposed groundwater quality standards. Agency Prop. at 13; *see* Cobb Test. at 14. Mr. Cobb's pre-filed testimony stressed that the Agency's proposed

Section 840.116(b) "would enable Ameren and the Agency to develop alternative groundwater quality standards, compliance points and demonstration requirements as provided in 35 Ill. Adm. Code 620 and to the extent appropriate at this site." Cobb. Test. at 14-15; *see* Agency Prop. at 11 (allowing establishment of off-site GMZ).

The Agency modified Ameren's proposed subsection (c) specifically to address compliance with nondegradation standards during periods of closure and post-closure care. Agency Prop. at 14-15. Mr. Cobb's pre-filed testimony stated that this amended subsection relied on trend analyses. Cobb Test. at 15. He further testified that "[i]n effect, an increasing trend will indicate further degradation of the groundwater quality that will require additional investigation" and may require mitigating action. Cobb Test. at 15; *see* Agency Prop. at 14-15. Finally, the Agency also modified Ameren's proposed subsection (d) to require that annual reports to the Agency must also address "actions taken to mitigate increasing trends." *Id*. at 15; *see* Cobb. Test. at 15.

In their joint statement, Ameren and the Agency emphasize that "Ameren must demonstrate off-site compliance at the down-gradient property boundaries of the Hutsonville site with numeric Class 1 Groundwater Quality standards in the upper zone of the underlying aquifer and non-degradation standards in the lower zone of the underlying aquifer." Joint Statement at 6; *see* Joint Prop. at 12 (proposed Section 840.116(b)). The joint proposal amends subsections (a)(2)(A)(i) and (a)(2)(A)(ii) to account for the separate groundwater quality standards "and the ability to demonstrate that there is either no increasing trend or a decreasing trend, as applicable." *Id*. at 7; *see* Joint Prop. at 13. Noting that operation of Ash Pond D has affected groundwater quality in the lower zone at the downgradient property boundary, the joint statement indicates that Ameren will demonstrate compliance with the nondegradation standard when "there is no statistically significant increasing trend attributable to Ash Pond D and the actual concentration are at or below the concentrations reflected in the sampling data provided in the TSD." *Id*. at 6-7 (citing monitoring well 14); *see* Joint Prop. at 13; *see also* Tr. at 71-74, 79-80, 84-85.

In addition, the joint proposal amends subsection (b) by removing redundant language and by simply referring to other sections "for the applicable groundwater quality standards, list of constituents to monitor, and monitoring frequency." Joint Statement at 7; *see* Joint Prop. at 14-15. The joint proposal also amends subsection (c) to clarify "that the duty to investigate, notify the Agency, or take action to mitigate depends on the determination of a *statistically significant* increasing trend. . . ." Joint Statement at 7 (emphasis in original); *see* Joint Prop. at 15-16. Finally, the joint proposal struck the subsection (d) proposed by Ameren and amended by the Agency. Joint Prop. at 16-17; *see* Joint Statement at 7. The joint proposal incorporated those reporting requirements into the proposed Section 840.144. Joint Statement at 7; *see* Joint Prop. at 16-17, 26-28.

Section 840.120: Groundwater Collection Trench

In filing its original proposal, Ameren stated that it "has determined that it is appropriate to construct and operate a groundwater collection trench to address the impacts on groundwater

emanating from Ash Pond D." SR at 30. As originally proposed by Ameren, this section provided in its entirety that

> [t]he owner or operator of Ash Pond D must design, install, and, consistent with wastewater discharge permit conditions, operate a groundwater collection trench along the south property boundary of the Hutsonville Power Station to prevent migration of groundwater impacted by Ash Pond D south of the property boundary. Upon completion of the post-closure care certification required by Section 840.140 of this Subpart, the owner or operator of Ash Pond D may discontinue operation of the groundwater collection trench. Orig. Prop. at 9.

Ameren elaborated that "[t]his trench will route groundwater collected to Ash Pond B, where it will be managed pursuant to Section 840.120 and discharged through the NPDES-permitted outfall from that pond." SR at 30.

In his pre-filed testimony on behalf of the Agency, Mr. Buscher elaborated upon Ameren's description of the proposed trench: "[t]he groundwater collection trench system is the engineered barrier which will be designed to prohibit contaminated groundwater from moving off site and to capture contaminated groundwater which has already migrated offsite." Buscher Test. at 4. He also described the manner in which the Agency proposed to amend Ameren's original proposal. First, the Agency sought to add to this section language requiring that "[p]lans for the groundwater collection trench including, but not limited to, a plan for operation and maintenance, must be approved by the Agency in the closure plan." Agency Prop. at 15; *see* Buscher Test. at 4. Second, the Agency sought to amend this section by providing that "[t]he groundwater collection trench must be constructed according to a construction quality assurance program that meets the requirements of Section 840.146 of this Part." Agency Prop. at 15; *see* Buscher Test. at 4; *see also id*. at 25-28 (proposing new section 840.146 addressing construction quality assurance). Finally, the Agency also proposed that "Ameren may discontinue operation of the groundwater collection trench when the post-closure care certification . . . has been approved by the Agency." Buscher Test. at 4; *see* Agency Prop. at 15; *see also id*. at 23-24 (addressing post-closure certification in Section 840.142).

In their joint statement, Ameren and the Agency proposed to amend this section by providing that the owner or operator of Ash Pond D may discontinue operation of the trench "[o]nce compliance with the groundwater quality standards as set forth in Section 840.116 has been achieved in accordance with Section 840.118(a)." Joint Prop. at 17. The joint proposal also seeks to add to this section the following provisions:

> [u]pon discontinuing operation of the groundwater collection trench, the owner or operator must perform four quarterly sampling of the groundwater system monitoring wells as identified in the post-closure care plan, or modification thereof, to ensure compliance with the applicable groundwater quality standards as set forth in Section 840.116. Results of the four quarterly sampling must be included in the post-closure report documentation. If compliance is not confirmed, operation of the groundwater collection trench and discharge must be resumed. *Id*., *see* Joint Statement at 7-8.

In the course of the hearing, the Board noted that this section of the joint proposal addressed requirements for the groundwater collection trench in a single lengthy paragraph. *See* Tr. at 107-08. The Board asked whether the section would be more comprehensible if separated into subsections. *Id*. at 108. In its post-hearing comments, the Agency stated that it had consulted with Ameren about this question and that they had agreed to reorganize this section into subsections. PC 2 at 2-3 (proposing reorganization). In its post-hearing comments, Ameren proposed the same reorganization. PC 4 at 10-11. Having reviewed this proposed reorganization, the Board concludes that it improves the comprehensibility of these provisions and adopts the participants' proposal in the order below.

Section 840.122: Groundwater Discharge System

Ameren's original Section 840.120 provided in its entirety that

> [g]roundwater collected in the groundwater collection trench must be directed to Ash Pond B at the Hutsonville Power Station consistent with wastewater discharge permit conditions. Groundwater collected must be routed through the outfall from Ash Pond B as authorized by the Hutsonville Power Station's NPDES permit in compliance with applicable water quality standards for the Wabash River. Orig. Prop. at 9; *see* SR at 30.

Ameren noted that routing the collected groundwater in this manner "may require Ameren to amend its current NPDES permit." SR at 30. Ameren further noted that "segments of the Wabash River are impaired for PCBs and mercury but not for any of the constituents Ameren expects to discharge as a result of the management of groundwater via the groundwater collection trench and Ash Pond B's permitted NPDES-permitted outfall." *Id*. (referring to Agency listing of impaired waters).

In his pre-filed testimony on behalf of the Agency, Mr. Buscher claimed that Ameren will have to modify its current NPDES permit in order to discharge water from the groundwater collection trench and implement its proposed rule. Buscher Test. at 4-5. He stated, however, that "issuance of a NPDES permit is completely independent of this rule and is governed by the statutory rules pertaining to the NPDES permit process." *Id*. at 5.

In his pre-filed testimony, Mr. Buscher suggested that Ameren's original language was too restrictive in directing water from the collection trench specifically through Ash Pond B. *See* Buscher Test. at 4. He further stated that, in order to provide Ameren with other options for its discharge point, its amended proposal "requires Ameren to obtain the required NPDES permits to discharge water from the collection trench to the Wabash River and does not specify how the discharge is to be routed to the river or otherwise managed." *Id*. at 5. Mr. Buscher claimed that, "[w]hile the Agency has no objections to Ameren's preference to discharge through Ash Pond B, Ameren may need to utilize an alternate discharge point if there are problems with permitting the discharge through Ash Pond B." *Id*. at 4-5. Accordingly, the Agency's revised Section 820.122 provides in its entirety that

> [g]roundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure care plan. Plans for the groundwater discharge system including, but not limited to, a plan for operation and maintenance, must be approved by the Agency in the closure plan. The groundwater collection trench must be constructed according to a construction quality assurance program that meet the requirements of Section 840.146 of this Part. Agency. Prop. at 16.

The joint proposal incorporated the Agency's proposed language without significant change. *See* Joint Prop. at 17.

During the hearing, the Board noted that this section of the joint proposal addressed requirements for the groundwater discharge system in a single lengthy paragraph. *See* Tr. at 108. The Board asked whether the section would be more comprehensible if separated into subsections. *Id*. In its post-hearing comments, the Agency stated that it had consulted with Ameren about this question and that they had agreed to reorganize this section into three subsections. PC 2 at 2-4 (proposing specific reorganization). In its post-hearing comments, Ameren proposed the same reorganization. PC 4 at 10-11. Having reviewed this proposed reorganization, the Board concludes that it improves the comprehensibility of these provisions and adopts the participants' proposal in the order below.

In its response to the Board's January 7, 2010 order, the Agency argued that "[t]he joint proposal is protective as proposed because all the available options for management of contaminated groundwater are regulated by existing and well-settled law subject to Agency administration." Agency Info. at 2. However, the Agency proposed one clarifying amendment "to make even clearer that these decisions will not be left unaddressed but are merely being deferred to other appropriate procedures." *Id*. at 20. Specifically, the Agency suggests adding the underlined language below to this proposed section:

> Groundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure plan <u>in accordance with applicable law, including, without limitation, permit requirements</u>. Plans for the groundwater discharge system including, but not limited to, a plan for operation and maintenance, must be approved by the Agency in the closure plan. The groundwater discharge system must be constructed according to a construction quality assurance program that meets the requirements of Section 840.146 of this Subpart. *Id*.

The Agency states that "Ameren counsel has informed the Agency that Ameren does not object to the proposed amendment." *Id*. at 2, 20. The Board finds that this amendment would clarify implementation of the proposed regulations and incorporates the amendment into its order below with one modification. The Board replaces the phrase "without limitation" with the phrase "but not limited to" in order to provide greater clarity and be consistent with other Board regulations.

Section 840.124: Final Slope and Stabilization

In a subsequent section of its original proposal, Ameren required installation of a final cover over Ash Pond D. Orig. Prop. at 10-12 (proposing Section 840.124); *see* SR at 30-31. In this section, originally proposed as Section 840.122, Ameren required in subsections (a) and (b) "that all final slopes on that cover be designed and constructed to that they minimize erosion, support vegetation, and drain runoff." SR at 30; *see* Orig. Prop. at 10-11. In subsection (c), Ameren proposed that "Ash Pond D must meet the stability criteria of 35 Ill. Adm. Code 811.304" before installation of the final cover. Orig. Prop. at 11; SR at 30-31; *see* 35 Ill. Adm. Code 811.304 (Foundation and Mass Stability Analysis).

Proposed subsection (c) also originally provided that the owner or operator may use coal combustion waste (CCW) generated at the Hutsonville Power Station to establish the final grade and slope. SR at 31; *see* Orig. Prop. at 10. Ameren's original proposal elaborated that "[a]ny coal combustion waste used to establish the final grade and slope is considered coal combustion byproduct, and its use does not require any independent approval pursuant to 415 ILCS 5/3.135." Orig. Prop. at 10 (proposed Section 840.122); *see* SR at 31; *see also* 415 ILCS 5/3.135 (2008) (defining "coal combustion by-product" and providing for beneficial use determinations).

In his pre-filed testimony on behalf of the Agency, Mr. Liebman stated that "Section 840.124 describes how the final slopes of the coal combustion wastes should be contoured before final cover is applied to them and allows additional coal combustion waste, generated at the Hutsonville Power Station, to be used to help create the desired contours." Liebman Test. at 2. The Agency's proposal removed from subsection (c) language addressing the use of coal combustion waste in establishing the final grade and slope. Agency Prop. at 16; *see* Liebman Test. at 2. The Agency proposed to address that issue in a new subsection (d), which placed restrictions on use of that waste:

1) The earthen berms surrounding Pond D must be regraded to eliminate any freeboard between the top of the berm and the adjacent surface of the coal combustion waste;

2) Additional coal combustion waste only may be placed directly on top of coal combustion waste that is already in place;

3) The maximum final slope must be no greater than three (3) percent;

4) Any additional coal combustion waste used to establish the final grade and slope is considered coal combustion by-product, and its use does not require any independent approval pursuant to Section 3.135 of the Act (415 ILCS 5/3.135). Agency Prop at 16-17; *see* Liebman Test. at 2.

Mr. Liebman's pre-filed testimony states that "[t]he coal combustion waste in Pond D has contaminated the groundwater and restricting the placement of additional coal combustion waste in Pond D will help limit the potential for further groundwater contamination." Liebman Test. at 2. During the hearing, Mr. Liebman testified that, in developing and reviewing these proposed

regulations, the Agency had only considered the beneficial re-use of CCW at this site in "the final grading and sloping of the ash impoundment before the cap is placed on top." Tr. at 103.

In its question pre-filed for the hearing, PRN noted that Act provides that coal combustion by-product (CCB) "shall not exceed Class 1 Groundwater Standards for metals when tested utilizing test method ASTM D3987-85. The sample or samples tested shall be representative of the CCB being considered for use." PRN Questions at 2-3 (Question 12), *see* 415 ILCS 5/3.135(a-5)(B) (2008) (defining CCB). PRN first asked why the proposed Section 840.124 didn't refer to this requirement. PRN Questions at 3. PRN also asked why the proposed use of additional CCB would not require independent approval. *Id*., citing Agency Prop. at 16-17 (proposed Section 840.124(d). The Agency responded to the two questions by claiming that the Act allows CCB

> to be used beneficially without meeting the metals standards established in Section 3.135(a-5)(B), if the applicant demonstrates to the Agency that three criteria will be met: 1) The use of the CCW will not cause, threaten or allow the discharge of any contaminant into the environment; 2) the use will otherwise protect human health and safety and the environment; and 3) the use constitutes a legitimate use of the CCW as a raw material that is an effective substitute for an analogous raw material." Agency Resp. at 1-2, citing 415 ILCS 5/3.135(b) (2008).

Answering a question at hearing, Mr. Liebman elaborated upon the Agency's response by explaining how an applicant meets the statutory criteria. He stated that the first of these criteria "will substantially be met by a combination of the final cover system and the groundwater trench." Tr. at 102. He suggested that the Agency continue examining this criterion when it reviews and approves any closure and post-closure care plans submitted by Ameren. *Id*. at 102-03. Addressing the second criterion, Mr. Liebman testified that "we think through the development of these proposed regulations and then Ameren's drafting the closure and post-closure care plan, our review of it and approval and their implementation of it will satisfy this criteria." *Id*. at 103. Regarding the third criterion, he stated that CCW is a legitimate and effective substitute for such raw material as clean soil or granular material such as sand or gravel. *Id*.

The Agency stated that it concurs with Ameren's general approach of making a beneficial use determination on a site-specific basis in this rulemaking. See Agency Resp. at 2; citing Orig. Prop. at 10 (proposed Section 840.122(c)), Agency Prop. at 16-17 (proposed Section 840.124(d)(4)). The Agency claims that CCW is "an effective substitute for other fill material" in creating the slope for the final cover system. Agency Resp. at 2. First, the Agency argues that the slope is subject to stability criteria in the Board's regulations. *Id*., citing 35 Ill. Adm. Code 811.304 (Foundation and Mass Stability Analysis). Second, the Agency argues that

> [t]he use will not result in discharge of contaminants to the environment and will otherwise protect human health and safety because the material will be used in an engineered application in which it will be placed above the water table and

> beneath the final cover system consisting of a geosynthetic membrane and at least three feet of soil material." Agency Resp. at 2.

The Agency claims that "[t]his exceeds the standard for CCB used as structural fill." *Id*., citing 415 ILCS 5/3.135(a)(8) (2008). The Agency also argues that "[o]nce construction is complete, vegetation must be established to stabilize the soil layer." Agency Resp. at 2. Finally, the Agency argues that the final cover system must follow inspection and maintenance requirements. *Id*.; *see* Agency Prop. at 21-22 (proposed Section 840.136). The Agency concludes that "the three statutory criteria will be satisfied" and that this approach substantially complies with the Act's requirements. Agency Resp. at 2; *see* 415 ILCS 5/3.135(b) (2008).

In their joint proposal, Ameren and the Agency incorporated the Agency's proposal but "set the maximum final grade and slope at five percent" instead of three percent. Joint Statement at 8; *see* Joint Prop. at 18. The joint statement indicates that "[a] five percent slope is consistent with prior Agency approvals with respect to the movement of ash for such purposes." Joint Statement at 8. The joint statement elaborates that, "[i]f coal combustion waste is not used to establish the final grade and slope, then the slope only has to be designed to support vegetation, minimize erosion, drain runoff away from the cover and to prevent ponding." *Id*.; *see* Joint Prop. at 18. It also emphasizes that, "[u]nder all circumstances, Ameren will perform a stabilization analysis as part of its closure engineering and design activities." Joint Statement at 8; *see* Joint Prop. at 18.

The Board notes that proposed Section 840.124(d)(2) provides in its entirety that "[a]dditional coal combustion waste only may be placed directly on top of coal combustion waste that is already in place." Joint Prop. at 18. The Board also notes Mr. Liebman's testimony on limiting the placement of CCW in order to limit the risk of further groundwater contamination. Liebman Test. at 2. In light of this testimony, the Board understands subsection (d) to limit the surface on which CCW may be placed and not to limit the material such as clean soil that may be used to establish the final grade and slope over Ash Pond D. Accordingly, the Baord will modify this language to provide that "[a]dditional coal combustion waste may be placed only directly on top of coal combustion waste that is already in place."

Section 840.126: Final Cover System

In its original proposal, Ameren provided that "[t]he owner or operator of Ash Pond D must design and install a final cover system for Ash Pond D. The final cover system must consist of a low permeability layer and a final protective layer." Orig. Prop. at 10.

Ameren first proposed standards for a low permeability layer. Orig. Prop. at 10. Ameren stated that it had "considered a variety of cap alternatives such as compacted clays and pozzolonic materials but selected the geosynthetic membrane as it readily complies with existing landfill performance criteria, is commercially available and technologically known to the Company, and represents an economically viable alternative." SR at 31. Ameren further stated that "[s]uch a cover is consistent with those required by the Board's Landfill Regulations and will adequately minimize infiltration." *Id*. Specifically, Ameren's proposed subsection (a) provided that the low permeability layer must consist of a geosynthetic membrane and be

constructed according to these standards: "must have a minimum thickness of 40 mil (0.04 inches) and a hydraulic conductivity of 1 x 10^{-7} centimeters per second or less" and "must be placed over a prepared base free from sharp objects and other materials that may cause damage." Orig. Prop. at 10.

Ameren's proposed subsection (b) addressed standards for a final protective layer. Orig. Prop. at 10-11. Specifically, "[t]he final protective layer must cover all of the low permeability layer and be at least three feet thick or the thickness necessary to protect the low permeability layer from freezing and to minimize root penetration into the low permeability layer." SR at 31; *see* Orig. Prop. at 10-11 (proposed subsections (b)(1) - (3)). Ameren's proposed subsection (b)(4) requires that "[t]he final protective layer must be placed as soon as possible after placement of the geosynthetic membrane." Orig. Prop. at 11; *see* SR at 31. In addition, its proposed subsection (b)(5) provides that "[t]he final protective layer must be covered with vegetation to minimize wind and water erosion." Orig. Prop. at 11; *see* SR at 31.

In addition, Ameren's proposed subsection (c) required that "[t]he final cover system must be constructed according to a construction quality assurance program" meeting various requirements. Orig. Prop. at 11. First, subsection (c)(1) provides that "[t]he operator must designate a construction quality assurance ("CQA") officer." *Id*. In subsection (c)(2), Ameren proposed that,

> [a]t the end of each week of construction of the final cover system until construction is complete, a summary report must be either prepared by the CQA officer or under the supervision of the CQA officer. The report must include descriptions of the weather, locations where construction occurred during the previous week, material used, results of testing, inspection reports, and procedures used to perform the inspection. *Id*.

Ameren also proposes to require that the CQA officer certify these reports. *Id*. Specifically, Ameren's proposed subsection (c)(3) provides that

> [t]he CQA officer must exercise judgment to certify the following:
>
> A) That the bedding material contains no undesirable objects;
>
> B) That the closure plan has been followed;
>
> C) That the anchor trench and backfill are constructed to prevent damage to the geosynthetic membrane;
>
> D) That all tears, rips, punctures, and other damage are repaired; and
>
> E) That all geosynthetic membrane seams are properly constructed and tested in accordance with manufacturer's specifications. *Id*. at 11-12.

In his pre-filed testimony on behalf of the Agency, Mr. Liebman noted that subsection (a)(1) of Ameren's original proposal addressed specifications for the thickness and conductivity of the geosynthetic membrane forming the low permeability layer of the final cover system. Liebman Test. at 2; *see* Orig Prop. at 10. Mr. Liebman argues that,

> [a]s proposed by Ameren, the hydraulic conductivity specification is essentially meaningless. Virtually all geosynthetic membranes have hydraulic conductivities several orders of magnitude lower than 1×10^{-7} centimeters/second and the amount of water that will pass through a geosynthetic membrane is determined, almost entirely, by the number of holes in it and its placement. Liebman Test. at 2.

The Agency proposed to modify subsection (a)(1) to make the "low permeability layer equivalent to that of a solid waste landfill subject to Part 811." *Id*.; *see* 35 Ill. Adm. Code 811. Specifically, the Agency sought to require that "[t]he geosynthetic membrane must have a minimum thickness of 40 mil (0.04 inches) and, in terms of hydraulic flux, be equivalent or superior to a three (3) foot layer of soil with a hydraulic conductivity of 1×10^{-7} centimeters per second." Agency Prop. at 17. At hearing, Mr. Liebman agreed that this 40 mil thickness is typical of and common for the minimum requirements for geosynthetic cover systems at landfills or surface impoundments. Tr. at 108.

Mr. Liebman's pre-filed testimony also notes that Ameren's original proposal "requires the final cover system to be constructed according to a construction quality assurance (CQA) program." Liebman Test. at 2-3; *see* Orig. Prop. at 11-12. He adds that "[t]he Agency is recommending the addition of an entire section (840.146), prescribing a more robust CQA program. . . ." Liebman Test. at 3; *see infra* at 107-08 (summarizing proposed Section 840.146). Accordingly, the Agency's proposal "deletes mention of the CQA officer's responsibilities specific to the final cover system and simply references the CQA program required by 840.146." Liebman Test. at 3; *see* Agency Prop. at 17-18.

In their joint proposal, Ameren and the Agency incorporated the Agency's proposed language for this section without significantly amending it. *See* Joint Prop. at 18-20; Agency Prop. at 17-18.

Section 840.128: Closure Plan

In its original proposal, Ameren provided language regarding a plan to close Ash Pond D. Ameren's proposed subsection (a) provided in its entirety that, "[w]ithin 180 days after the effective date of this rule, the owner or operator of Ash Pond D must prepare and submit to the Agency a closure plan." Orig. Prop. at 12; *see* SR at 32. Proposed subsection (b) provided in its entirety that "[t]he owner or operator of Ash Pond D must maintain the closure plan onsite or at a location specified in the closure plan." Orig. Prop. at 12; *see* SR at 32.

In his pre-filed testimony on behalf of the Agency, Mr. Liebman stated that the Agency proposed to amend this section only to clarify "that submission of the plan to the Agency is for the purpose of review and approval. . . ." Liebman Test. at 3; *see* Agency Prop. at 18.

In their joint proposal, Ameren and the Agency incorporated the Agency's language without amendment. *See* Joint. Prop. at 20.

Section 840.130: Contents of Closure Plan

In its original proposal, Ameren specified the information required to be included in the closure plan. Subsection (a) required that the plan include a site map identifying "all pertinent features and buildings at the Hutsonville Power Station." Orig. Prop. at 12; *see* SR at 32. Specifically, the map must identify the following:

1) All of the surface impoundments located at the site;

2) All existing and proposed groundwater collection trenches associated with the operation or closure of Ash Pond D;

3) All existing and proposed groundwater monitoring wells; and

4) Diagrams depicting Zone A and Zone B. Orig. Prop. at 12; *see* SR at 32.

Subsection (b) required that the closure plan include a description of Ash Pond D including all of the following information:

1) A description of the contents of Ash Pond D;

2) The estimated volume of material contained in Ash Pond D; and

3) An analysis of the structural integrity of Ash Pond D. Orig. Prop. at 12; *see* SR at 32.

Subsection (c) required that the closure plan include "a description of the closure activities planned and already performed." SR at 32; *see* Orig. Prop. at 12-13. Subsection (d) required a description of the hydrogeologic site investigation addressed in Ameren's proposed Section 840.108. Orig. Prop. at 13; *see supra* at 75-76 (summarizing proposed Section 840.110). Subsection (e) required a description of the groundwater trend analysis addressed in Ameren's proposed Section 840.116. Orig. Prop. at 13; *see supra* at 85-88 (summarizing proposed Section 840.118). Subsection (f) required a description of the groundwater monitoring system addressed in Ameren's proposed Section 840.110. Orig. Prop. at 13; *see supra* at 76-78 (summarizing proposed Section 840.112). Subsection (g) required a description of the groundwater monitoring program addressed in Ameren's proposed Section 840.112. Orig. Prop. at 13; *see supra* at 78-82 (summarizing proposed Section 840.114). Subsection (h) required "identification of the monitoring wells where trend analysis is being performed, which would be one or more of the groundwater monitoring wells included under subsections (f) and (g)." SR at 32; *see* Orig. Prop. at 13. Subsection (i) required a description of the final cover system addressed in Ameren's proposed Section 840.124. Orig. Prop. at 13; *see supra* at 92-94 (summarizing proposed Section

840.126). Finally, subsection (j) requires "[e]stimates of the amount of time to complete closure, the cost of closure, and the cost of post-closure care." Orig. Prop. at 13; *see* SR at 32.

In his pre-filed testimony on behalf of the Agency, Mr. Liebman notes that Ameren's proposal in this section "describes the information and documents that must be contained in the closure plan for Pond D." Liebman Test. at 3. On a subsection-by-subsection basis, he describes the Agency's proposed amendments to Ameren's language. *See id*. at 3-4. He argues that these amendments "will result in a better, more detailed closure plan that covers all the steps integral to closing Pond D: creation of the final waste slopes, installation of the final cover system, establishment of a groundwater monitoring program, and implementation of groundwater corrective action, including construction of the necessary structures and installation of necessary devices." *Id*. at 5.

First, the Agency proposes to add to the introductory language a requirement that the closure plan must contain, "at a minimum," the listed information or documents. Agency Prop. at 19. The Agency proposes in subsection (a)(4) to delete the requirement that the site map must depict Zone A and Zone B. Liebman Test. at 3; *see* Agency Prop. at 19. Mr. Liebman argues that this deletion is consistent with the Agency's proposal to eliminate those terms. Liebman Test. at 3; *see* Cobb Test. at 4, 14, Buscher Test. at 3; *see also supra* at 82-88 (summarizing proposed Sections 840.116 and 840.118).

The Agency proposes to amend subsection (d) so that the closure plan must include both the description and results of the required hydrogeologic site investigation. Agency Prop. at 19. In subsection (f) addressing the required groundwater monitoring system, the Agency proposes to replace the term "description" with "plans, specifications, and drawings." *Id*.; *see* Liebman Test. at 3. Mr. Liebman argues that this replacement clarifies "the type of information needed to accurately depict the groundwater monitoring program." Liebman Test. at 3. During the hearing, the Board noted" that the joint proposal overlooks the inclusion of the groundwater monitoring system maintenance plan required by Section 840.112(d)" in this Section. PC 2 at 2; see Tr. at 106, Joint Prop. at 8 (proposed Section 840.112(d)). In its post-hearing comments, the Agency proposed to amend subsection (f) of the joint proposal to provide in its entirety that the closure plan must include "[p]lans, specifications and drawings for the groundwater monitoring system required by Section 840.112 of this Subpart, including, but not limited to, a description of the maintenance plan required by Section 840.112(d)." PC 2 at 2. Having reviewed this proposed language, the Board concludes that it clarifies this provision and adopts the Agency's proposed revision in the order below.

In subsection (g) addressing the required groundwater monitoring program, the Agency proposes to add language providing that the description of the program must include, but not be limited to, "a description of the quality assurance program for sample collection, preservation and analysis." Agency Prop. at 19-20; *see* Liebman Test. at 4. Mr. Liebman argues that this addition is consistent with language originally proposed by Ameren and contained in Section 840.114(f) of the Agency's proposal. Liebman Test. at 4.

The Agency proposes to add a new subsection (i) providing in its entirety that the closure plan must include "[p]lans, specifications and drawings for the groundwater collection trench

and discharge system set forth in Section 840.120 and 840.122." Agency Prop. at 20; *see* Liebman Test. at 4; *see also supra* at 88-90 (summarizing proposed Sections 840.120 and 840.122). The Agency also proposes to add a new subsection (j) providing in its entirety that the closure plan must include "[p]lans, specifications and drawings or the final slope design and construction and demonstration of compliance with the stability criteria required in Section 840.124." Agency Prop. at 20; *see* Liebman Test. at 4; *see also supra* at 92-94 (summarizing proposed Section 840.124). With the proposed addition of these two subsections, the Agency sought to re-designate Ameren's proposed subsection (i) as subsection (k). Agency Prop. at 20. In that re-designated subsection requiring the closure plan to address the final cover system, the Agency proposes to replace the term "description" with "plans, specifications, and drawings." *Id*.; *see* Liebman Test. at 4. Mr. Liebman argues that this replacement clarifies "the type of information needed to accurately depict the groundwater monitoring program." Liebman Test. at 4. The Agency also sought to re-designate Ameren's proposed subsection (j) as subsection (l). Agency Prop. at 20. In that re-designated subsection requiring the closure plan to address the estimated amount of time to complete steps and the cost to do so, the Agency proposes to add the phrase "including an estimate of the time required for hydrostatic equilibrium of groundwater beneath Ash Pond D." *Id*.; *see* Liebman Test. at 4.

The Agency also seeks to add four additional new subsections. Proposed subsection (m) provides in its entirety that the closure plan must contain "[a] proposal for a groundwater management zone as set forth in Section 840.116(b) of this Part, if applicable, and including, but not limited to, plans, specifications and drawings for any structures or devices that must be constructed." Agency Prop. at 20; *see* Liebman Test. at 4; *see also supra* at 82-85 (summarizing proposed Section 840.116). Proposed subsection (n) requires a "[d]escription of the Construction Quality Assurance program required by Section 840.146 of this Part, including, but not limited to, the sampling programs required by Section 840.146(b)(7) of this Part." Agency Prop. at 20; *see* Liebman Test. at 4; *see also infra* at 107-08 (summarizing proposed Section 840.146). Proposed subsection (o) requires a "[d]escription of actions proposed to mitigate increasing trends in accordance with Section 840.118(c) of this Part, if applicable, including, but not limited to, plans, specifications, and drawings for any structures or devices that must be constructed." Agency Prop. at 20; *see* Liebman Test. at 5; *see also supra* at 85-88 (summarizing Section 840.118). Finally, proposed subsection (p) requires "[t]he signature and seal of the professional engineer supervising the preparation of the closure plan." Agency Prop. at 20; *see* Liebman Test. at 5.

In their joint proposal, Ameren and the Agency incorporated the Agency's language with one substantive amendment. Ameren and the Agency proposed to amend subsection (o) to provide that the closure plan must include a "[d]escription of actions proposed to mitigate statistically significant increasing trends. . . ." Joint Prop. at 22. The joint statement indicates that this revision intends "to ensure that the duty to mitigate depends on the determination of a *statistically significant* increasing trend as required by Section 840.118." Joint Statement at 8 (emphasis in original).

In its post-hearing comments, the Agency noted the Board's observation during the hearing that the joint proposal does not require the closure plan to include the groundwater monitoring system maintenance plan. PC 2 at 2, citing Tr. at 106-07. The Agency stated that it

"agrees this correction is needed." PC 2 at 2. The Agency suggested that Section 840.130(f) should be amended to provide that the closure plan include "[p]lans, specification and drawings for the groundwater monitoring system required by Section 840.112 of this Subpart, including, but not limited to, a description of the maintenance plan required by Section 840.112(d)." PC 2 at 2. The Board incorporates this suggested language into its order below.

Section 840.132: Modification of Existing Permits

In its original proposal, Ameren provided language regarding modification of its existing permits. Its proposed Section 840.120 provided in its entirety that "[t]he owner or operator of Ash Pond D must timely submit to the Agency an application to revise any state operating permit or NPDES permit issued by the Agency as required by Section 840.118 of this Subpart." Orig. Prop. at 13; *see supra* at 90-91 (summarizing proposed Section 840.122 addressing groundwater discharge).

Ameren supported this provision by stating that "[t]he proposed rule requires that groundwater collected in the groundwater collection trench be routed to Ash Pond B for treatment and disposal." SR at 33; *see* Orig. Prop. at 9 (proposed Section 840.120). Ameren states that, in 2005, it filed an application to renew the NPDES for Ash Pond B. SR at 33. Ameren further states that, "at the time that Ameren applied for renewal of the NPDES permit, it did not know that groundwater collected in the groundwater collection trench for Ash Pond D would be routed to Ash Pond B for treatment and disposal." *Id*. Ameren committed to amend its application for the NPDES permit for Ash Pond B "within 180 days of the effective date of this rule." *Id*.; *but see* Orig. Prop. at 13 (requiring "timely" submission).

In his pre-filed testimony on behalf of the Agency, Mr. Buscher noted that the Agency's amended proposal requires Ameren to apply to revise any state operating permit or NPDES permit, as required by the Agency's amended Sections 840.120 and 840.122. Buscher Test. at 5; Agency Prop. at 20-21; *see supra* at 88-91 (summarizing proposed Sections 840.120, 840.122). He added that the Agency proposed to require that "[t]his application must be submitted to the Agency within six (6) months of the effective date of this site-specific rule." Buscher Test. at 5; Agency Prop. at 20; *see* Tr. at 97.

Mr. Buscher argued that "[i]t is important to understand the issuance of a NPDES permit is completely independent of this rule and is governed by the statutory rules pertaining to the permit process. The permit modification will require a public notice. A public hearing may be requested which could lengthen the time required to obtain a permit." Buscher Test. at 5; *see* Tr. at 97, 99-100.

In their joint proposal, Ameren and the Agency revised this section to provide in its entirety that "[w]ithin 180 days of the effective date of this Subpart A, the owner or operator of Ash Pond D must timely submit to the Agency an application to revise any state operating permit or NPDES permit issued by the Agency as required by Section 840.120 and 840.122 of this Subpart, if necessary." Joint Prop. at 22.

Section 840.134: Completion of Closure, Closure Report, and Certification of Completion of Closure

In its original proposal, Ameren provided language addressing closure. Specifically, Ameren's Section 840.132 provided in its entirety that,

> [n]o later than 90 days after completion of all closure activities required by this Subpart, the owner or operator of Ash Pond D must prepare and submit to the Agency a closure report. The report must include certification by a professional engineer that Ash Pond D has been closed in accordance with the closure plan required by Section 840.126 of this Subpart and include all CQA reports required by Section 840.124(c)(2). Orig. Prop. at 13; *see* SR at 33.

In his pre-filed testimony on behalf of the Agency, Mr. Liebman noted that Ameren's proposed Section 840.132 addressed closure requirements. *See* Liebman Test. at 5. The Agency recommended three significant revisions to Ameren's original proposal. *See id.* at 5-6; Agency Prop. at 21. First, the Agency added a subsection (a) requiring that "[t]he owner or operator must complete closure of Ash Pond D within eighteen months after the Agency's approval of the closure plan." Agency Prop. at 21; Liebman Test. at 5. Mr. Liebman argues that this 18-month deadline "should provide sufficient time for Ameren to complete closure." Liebman Test. at 5. He further argues that "[c]ompleting closure, with the installation of the final cover system and implementation of groundwater corrective action, will be beneficial to the environment and a deadline will help ensure that closure is completed in a timely manner." *Id*.

Second, in the original language re-designated as subsection (b), the Agency revised Ameren's original proposal to provide that Agency must approve the closure plan and closure report. Agency Prop. at 21; *see* Liebman Test. at 5. Third, the Agency also proposed a revision specifying "the type of documentation that must be provided with the closure report." Liebman Test. at 5. Specifically, that documentation must included, but is not limited to

1) Engineering and hydrogeology reports including, but not limited to, monitoring well completion reports and boring logs, all CQA reports, certifications, and designations of CQA officers-in-absentia required by Section 840.146 of this Part;

2) Photographs;

3) A written summary of closure requirements and activities as set forth in the closure plan and this Subpart A;

4) Any other information relied upon by the professional engineer in making the closure certification; and

5) The signature and seal of the professional engineer supervising the implementation of the closure plan, the preparation of the closure report,

> and making the certification of completion of closure. Agency Prop. at 21; *see* Liebman Test. at 5-6.

Mr. Liebman argues that these revisions "will help ensure that the closure activities are expeditiously carried out, in accordance with the closure plan, and that this conformance is adequately documented." *Id*. at 6.

In their joint proposal, Ameren and the Agency proposed to insert a new subsection (a) providing in its entirety that "[t]he owner or operator must complete engineering and design activities for the closure of Ash Pond D within 180 days after the effective date of this rule." Joint Prop. at 22-23; *see* Joint Statement at 8. The joint proposal then re-designates subsection (a) as subsection (b) and revises it to provide in its entirety that "[t]he owner or operator must complete closure of Ash Pond D within 18 months after the Agency's approval of the closure plan, unless the Agency approves an alternative timeline." Joint. Prop. at 23. The joint statement claims that these revisions "allow flexibility in the timeline subject to Agency approval." Joint Statement at 8. Finally, Ameren and the Agency also revise the re-designated subsection (c) to specify that the closure report include "[p]hotographs of the final cover system and groundwater collection trench and any other photographs relied upon to document construction activities." Joint Prop. at 23.

Section 840.136: Post-Closure Maintenance of Cover System

In its original proposal, Ameren required the owner or operator of Ash Pond D to perform maintenance of the cover system. SR at 33; *see* Orig. Prop. at 13-14. Subsection (a) provided in its entirety that, "[a]fter closure and until completion of the post-closure care report, the owner or operator of Ash Pond D must conduct annual inspections of the cover system." Orig. Prop. at 14; *see* SR at 33. Subsection (b) provided in its entirety that "[t]he owner or operator of Ash Pond D must fill all rills, gullies, and crevices six inches or deeper identified during the inspection. Areas identified as particularly susceptible to erosion must be recontoured." Orig. Prop. at 14; *see* SR at 33. Subsection (c) provided in its entirety that "[t]he owner or operator of Ash Pond D must repair all eroded and scoured drainage channels identified during inspections and replace lining material, if necessary." Orig. Prop. at 14; *see* SR at 33. Subsection (d) provided in its entirety that "[t]he owner or operator of Ash Pond D must fill and recontour all holes and depressions created by settling so as to prevent standing water." Orig. Prop. at 14; *see* SR at 33. Subsection (e) provided in its entirety that "[t]he owner or operator of Ash Pond D must revegetate all areas in excess of 10 square feet, cumulative, with failed or eroded vegetation that had previously been vegetated." Orig. Prop. at 14; *see* SR at 33. Finally, subsection (f) provided in its entirety that "[t]he owner or operator of Ash Pond D must repair all tears, rips, punctures, and other damage to the geosynthetic membrane, if necessary." Orig. Prop. at 14; *see* SR at 33.

In his pre-filed testimony on behalf of the Agency, Mr. Liebman proposed a number of revisions to Ameren's original proposal. He claims that these revisions "will result in better, more frequent final cover inspection and in a better maintained and more functional final cover system." Liebman Test. at 7. First, he stated that the Agency revised the introductory sentence to specify "that the final cover system must be maintained, beginning immediately after its

construction, and continuing until certification of completion of post-closure care is approved by the Agency." *Id*. at 6; *see* Agency Prop. at 21. Second, the Agency modified subsection (a) to require that inspection of the final cover system occur "at the same time, and in the same frequency, that samples are collected for routine groundwater monitoring." Liebman Test. at 6; *see* Agency Prop. at 22. Third, the Agency deleted the phrase "identified during the inspection" from subsection (b) in order to indicate "a continuing obligation" to fill specified rills, gullies, and crevices. Liebman Test. at 6; *see* Agency Prop. at 22.

Fourth, the Agency deleted the phrase "identified during inspections" from subsection (c) in order to indicate "a continuing obligation" to repair scoured and eroded drainage channels. Liebman Test. at 6; *see* Agency Prop. at 22. Fifth, the Agency deleted the phrase "that had previously been vegetated" from subsection (e) in order "to maintain consistency with Section 840.126(b)(5)." Liebman Test. at 6; *see* Agency Prop. at 22; *see also id*. at 17 (Section 840.126(b)(5)). Sixth, the Agency deleted the phrase "if necessary" from subsection (f) to indicate that specified repairs to the geosynthetic membrane "generally will be necessary." Liebman Test. at 6; *see* Agency Prop. at 22. Seventh, the Agency added a new subsection (g) providing in its entirety that "[t]he owner or operator must prevent the growth of woody species on the protective cover." Agency Prop. at 22; *see* Liebman Test. at 6

In their joint proposal, Ameren and the Agency adopted the Agency's revisions without substantial amendment. *See* Joint Prop. at 23-24.

Section 840.138: Post-Closure Care Plan

In its original proposal, Ameren provided language in Section 840.136 addressing a post-closure care plan. Orig. Prop. at 14. Subsection (a) provided in its entirety that "[t]he owner or operator of Ash Pond D must prepare and submit to the Agency a post-closure care plan." *Id*.; *see* SR at 34. Subsection (b) provided in its entirety that "[t]he owner or operator of Ash Pond D must maintain the post-closure care plan onsite or at a location specified in the post-closure care plan." Orig. Prop. at 14; *see* SR at 34.

In his pre-filed testimony on behalf of the Agency, Mr. Buscher stated that the Agency revised subsection (a) to require "Ameren to prepare and submit a post-closure care plan within 180 days after the effective date of this site-specific rule." Buscher Test. at 5; *see* Agency Prop. at 22.

In their joint proposal, Ameren and the Agency further amended subsection (a) to provide in its entirety that "[w]ithin 180 days after the effective date of this Subpart A, the owner or operator of Ash Pond D must prepare and submit to the Agency a post-closure care plan for review and approval." Joint Prop. at 24.

Section 840.140: Contents of Post-Closure Care Plan

In its original proposal, Ameren listed the required contents of a post-closure care plan. Orig. Prop. at 14-15; *see* SR at 34. Subsection (a) provided that the plan must include a description of required post-closure care activities. Orig. Prop. at 14; *see* SR at 34; *see also*

supra at 102-03 (summarizing proposed Section 840.136). Subsection (b) required that the plan include a description of the required groundwater monitoring system. Orig. Prop. at 15; *see* SR at 34; *see also supra* at 76-78 (summarizing proposed Section 840.112). Subsection (c) provided that the plan must include a description of the required groundwater monitoring program. Orig. Prop. at 15; *see* SR at 34; *see also supra* at 78-82 (summarizing Section 840.114). Subsection (d) required that the plan include an identification of the location of the required monitoring wells used for trend analyses. Orig. Prop. at 15; *see* SR at 34; *see also supra* at 85-88 (summarizing Section 840.118). Finally, subsection (e) provided that the plan must include a copy of the required certification of closure. Orig. Prop. at 15; *see* SR at 34; *see also supra* at 100-02 (summarizing Section 840.134).

In his pre-filed testimony on behalf of the Agency, Mr. Buscher stated that the Agency sought to add "more detail to Ameren's post-closure care plan." Buscher Test. at 5. First, the Agency revised the introduction to provide that the plan must, at a minimum, include the specified elements. Agency Prop. at 22. Second, the Agency proposed to amend subsection (b) to require that the plan include "a description of the maintenance plan for the groundwater monitoring system." Agency Prop. at 23; *see* Buscher Test. at 5-6. Third, the Agency revised subsection (e) to require that the plan include a description of the required plan for operation and maintenance of the groundwater collection trench and discharge system. Agency Prop. at 23; Buscher Test. at 6.

The Agency also proposes to add four new subsections. Subsection (f) provides that the plan include a description of the required groundwater trend analysis. Agency Prop. at 23; Buscher Test. at 6; *see supra* at 85-88 (summarizing proposed Section 840.118). Subsection (g) requires that the plan include, if applicable, a proposal for a GMZ. Agency Prop. at 23; Buscher Test. at 6; *see supra* at 82-85 (summarizing proposed Section 840.116(b)). Subsection (h) provides that the plan include, if applicable, a "[d]escription of action proposed to mitigate increasing trends . . . and the operation and maintenance of any structures or devices." Agency Prop. at 23; Buscher Test. at 6; *see supra* at 85-88 (summarizing proposed Section 840.118(c)). Finally, subsection (i) requires that the plan include "[t]he signature and seal of the professional engineer supervising the preparation of the post-closure care plan." Agency Prop. at 23; *see* Buscher Test. at 6.

In their joint proposal, Ameren and the Agency revised the introduction to require that both the post-closure care plan and any modification to it must both include the specified elements. Joint Prop, at 24. Ameren and the Agency also proposed to amend subsection (h) to require that the plan include, if applicable, a description of actions proposed to mitigate statistically significant increasing trends and the operation and maintenance of any structures or devices. *Id*. at 25. The joint proposal otherwise reflects the Agency's revisions without substantive amendment. *See id*. at 24-25.

Section 840.142: Post-Closure Report and Certification of Completion of Post-Closure Care Plan

In its original proposal, Ameren addressed the completion of post-closure care in proposed Section 840.140, which provided in its entirety that

> [t]he owner or operator of Ash Pond D must prepare and submit to the Agency a Post-Closure Report within 60 days after satisfying the requirements of Section 840.134 and 840.112(a) of this Subpart. The Post-Closure Report must include a certification by a professional engineer or professional geologist that the requirements of Section 840.134 and Section 840.112(a)(3) of this Subpart have been met. Orig. Prop. at 15; *see* SR at 34.

In his pre-filed testimony on behalf of the Agency, Mr. Buscher addresses the Agency's revisions to Ameren's language. First, the Agency added language requiring that "[p]ost-closure care must continue until a demonstration of compliance with the groundwater quality standards as set forth in Section 840.116 has been approved by the Agency." Agency Prop. at 23; *see* Buscher Test. at 6; *supra* at 82-85 (summarizing proposed Section 840.116). Second, the Agency amended Ameren's original proposal to require that the owner or operator must submit a post-closure report to the Agency "within 60 days after satisfying the requirements of the approved post-closure care plan and achieving the applicable groundwater quality standards as set forth in the plan and Sections 840.116 through 840.118 of this Part." Agency Prop. at 23; *see* Buscher Test. at 6; *infra* at 82-88 (summarizing proposed Sections 840.116 and 840.118). Third, the Agency proposed to revise Ameren's proposed language regarding required certification of the post-closure report. *See* Agency Prop. at 23-24. Although this revision struck language allowing a professional geologist to certify the report, the Agency proposed language providing that "[a] professional geologist may supervise post-closure care activities as appropriate under the Professional Geologist Licensing Act (225 ILCS 745)." Agency Prop. at 24; *see* 225 ILCS 745/1 *et seq*. (2008).

The Agency also proposed language requiring that the post-closure report

"must contain supporting documentation including, but not limited to:

a) Engineering and hydrogeology reports including, but not limited to, documentation of compliance with the groundwater quality standards of this Subpart A;

b) Photographs;

c) A written summary of post-closure care requirements and activities as set forth in the post-closure care plan and this Subpart A and their completion;

d) Any other information relied upon by the professional engineer and professional geologist supervising the implementation of the post-closure care plan, and the signature and seal of the professional engineer supervising preparation of the post-closure report and making the certification of completion of the post-closure care plan. Agency Prop. at 24; *see* Buscher Test. at 6-7.

In their joint proposal, Ameren and the Agency proposed revisions to the Agency's language. First, the joint proposal adds language providing that the post-closure report must be submitted to the Agency "for review and approval." Joint. Prop. at 25. Second, the joint proposal amended subsection (a) to require that engineering and hydrogeology reports include "results of the four quarterly sampling performed under Section 840.120 of this Subpart." *Id*. at 26. Third, the joint proposal also revised subsection (b) to specify that the report include photographs "of the final cover system and groundwater collection trench and any other photographs relied upon to document construction activities." *Id*.

Section 840.144: Recordkeeping and Reporting Requirements

In its original proposal, Ameren addressed recordkeeping in subsection (a) by requiring "[t]he owner or operator of Ash Pond D to file groundwater monitoring data electronically with the Agency no later than 30 days after the end of the sampling period. . . ." Orig. Prop. at 15; *see* SR at 34. In subsection (b), Ameren required the owner or operator to file "an annual report with the Agency no later than January 31 of each year during the closure and post-closure periods." SR at 34-35; *see* Orig. Prop. at 15. Subsection (b) also required the filing of these annual reports "until the owner or operator of Ash Pond D has complied with the requirements of Section 840.140." SR at 35; *see* Orig. Prop. at 15; *supra* at103-04 (summarizing proposed Section 840.140).

In subsection (c), Ameren required that

[a]ll annual reports must contain the following information:

1) Trend analysis of all groundwater monitoring data generated by the groundwater monitoring program required by Section 840.112 of this Subpart during the preceding year;

2) The completed closure or post-closure activities performed during the preceding year; and

3) A summary of all modifications made to the closure plan or post-closure care plan during the preceding year and copies of the updated closure and post-closure plans reflecting any such modifications. Orig. Prop. at 16; *see* SR at 35.

Ameren's proposed subsection (d) provided in its entirety that "[t]he owner or operator of Ash Pond D must maintain on-site or at a location specified in the closure or post-closure care plan all monitoring data and trend analysis data for 10 years following generation of the data." Orig. Prop. at 16; *see* SR at 35. Proposed subsection (e) provided in its entirety that "[t]he owner or operator of Ash Pond D must maintain the closure plan until the end of the post-closure care period." Orig. Prop. at 16; *see* SR at 35. Ameren's proposed subsection (f) provided in its entirety that "[t]he owner or operator of Ash Pond D must maintain the post-closure care plan for 10 years following the certification of the Post Closure Report as required by Section 840.142." Orig. Prop. at 16; *see* SR at 35. Finally, proposed subsection (g) provided the Agency mailing

address to which reports must be submitted and allows electronic submission "as authorized and directed by the Agency." Orig. Prop. at 16; *see* SR at 35.

In his pre-filed testimony on behalf of the Agency, Mr. Buscher proposed to combine Ameren's subsections (a) and (b) "because they appear to overlap." Buscher Test. at 7; *see* Agency Prop. at 24. He states that

> [t]he Agency's amended subsection (a) requires the owner or operator to file an annual report with the Agency no later than January 31 of each year during the closure of Ash Pond D and for the entire post-closure care period. It also requires the owner or operator to submit groundwater sampling and analysis data no later than 30 days after the sampling and analysis have been completed, consistent with Ameren's original proposal. Buscher Test. at 7; *see* Agency Prop. at 24.

In the subsection re-designated from (c)(1) to (b)(1), the Agency "requires reporting increasing trends, actions taken to mitigate increasing trends, and required notices as referenced in the amended Section 840.118(d)" in the annual report. Buscher Test. at 7; *see* Agency Prop. at 24-25; *supra* at 85-88 (summarizing proposed Section 840.118). The Agency also proposed to strike "Ameren's original subsection (c)(3) requiring Ameren to provide annual summaries of all modifications to the closure and post-closure care plans . . . because the Agency's proposal provides review and approval authority to the Agency for such changes." Buscher Test. at 7; *see* Agency Prop. at 25. Finally, in the subsection re-designated from (g) to (f), the Agency provided "updated Agency contact information for reporting purposes." Buscher Test. at 7; *see* Agency Prop. at 25.

In their joint proposal, Ameren and the Agency proposed additional changes to Section 840.144. First, the joint proposal amends subsection (a) to include "decisions to remove constituents from the monitoring program" to the information that must be submitted to the Agency within 30 days after completing sampling and analysis. Joint Prop. at 26-27. The joint proposal also amends subsection (b)(1) by clarifying that the annual report must include trend analyses "required by Section 840.118(b)." *Id*. at 27 The joint proposal further amends subsection (b)(1) by striking the reference to "any additional data or information required by Section 840.118(d) of this Part" as information that the annual report must contain. *Id*. at 27.

The joint proposal also adds two new subsections. Proposed new subsection (b)(2) requires that the annual report include "[a] copy of any notice to the Agency pursuant to Section 840.118(c)(1)(A)." Joint Prop. at 27; *see supra* at 85-88 (summarizing Section 840.118). Proposed new subsection (b)(3) requires that the annual report include "[a] discussion of any statistically significant increasing trends and actions taken to mitigate such trends in accordance with Section 840.118(c)(3)." Joint Prop. at 27; *see supra* at 85-88 (summarizing Section 840.118). Finally, the joint proposal amended subsection (f) to provide for submission of plans and notification to the Agency in addition to submission of reports and notifications. Joint Prop. at 27.

Section 840.146: Construction Quality Assurance Program

In his pre-filed testimony, Mr. Liebman stated that the Agency recommended adding this section, "which expands on the construction quality assurance (CQA) program proposed by Ameren in its section concerning the final cover system." Liebman Test. at 7; *see* Agency Prop. at 25-28; Orig. Prop. at 11-12 (CQA Program). Mr. Liebman further stated that this section "is modeled on 35 Ill. Adm. Code, Part 811, Subpart E, which outlines the minimum requirements for the CQA programs used in constructing solid waste landfills." Liebman Test. at 7; *see* 35 Ill. Adm. Code 811.501 - 811.509. He argues that, "[j]ust as the quality of solid waste landfills benefits from being constructed under comprehensive CQA programs, the quality of the Pond D waste disposal unit will benefit from being constructed under the CQA program required by Section 840.146." Liebman Test. at 7.

Mr. Liebman specifies that the Agency's proposed CQA program "addresses installation of the groundwater collection trench and discharge system, compaction of the subgrade and foundation for the final cover system and construction of the surface water control structures." Liebman Test. at 7; *see* Agency Prop. at 25-26 (proposed subsection (a)). Proposed subsection (b) establishes various requirements that the CQA program must meet. Agency Prop. at 26-28. Proposed subsection (b)(1) requires designation of an Illinois licensed professional engineer as CQA officer, and proposed subsections (b)(2) and (b)(3) require filing a weekly summary report certified by the CQA officer addressing specific matters. *Id*. at 26-27. Subsection (b)(4) and (b)(5) provide for the CQA officer's supervision of inspections and various closure activities. *Id*. at 27. Subsection (b)(6) addresses the possible absence of the CQA officer, and subsection (b)(7) provides for implementation of a sampling program as part of the CQA plan for construction activities. *Id*. at 27-28.

In their joint proposal, Ameren and the Agency adopted the Agency's language in Section 840.146 regarding a CQA program without amendment.

The Board notes that the joint proposal does not provide for the maintenance, reporting, or filing with the Agency of certified weekly summary reports required by subsection (b)(2). As the Board's other waste disposal regulations generally address this issue (*see, e.g.*, 35 Ill. Adm. Code 809.501(g), 811.505(d)), the Board adds to the end of the proposed subsection (b)(2) the following requirement: "[t]he owner or operator of the Hutsonville Power Station shall retain all weekly summary reports certified by the CQA officer until the completion of the post-closure care period and must make those reports available at reasonable times for inspection and photocopying by the Agency." The Board invites comment from the participants on the addition of this language.

Section 840.148: Review, Approval and Modification of Closure Plan and Post-Closure Care Plan

In his pre-filed testimony on behalf of the Agency, Mr. Buscher notes that Ameren's original proposal did not include a provision for prior Agency review, approval, and modification of the closure and post-closure plans and various other documents and reports. Buscher Test. at 7. He argued that, without ability to review and approve such information, the Agency's only authority "would be to rely on enforcement for any violations after they occur."

Id. at 8. He also expressed the "concern that Ameren's proposal might not be sufficiently prescriptive in some circumstances to support effective enforcement." *Id*.

The Agency thus proposed this new section "to provide for the review, approval and modification of closure and post-closure care plans." Buscher Test. at 7. Mr. Buscher's testimony argues that "the better approach in the case of the closure of a coal ash impoundment with off-site groundwater contamination is for the Agency to be involved in an administrative oversight capacity during the design, construction and implementation of closure and post-closure care activities that are likely to continue over several years." *Id*. at 8. He further argues that this authority "is consistent with the Agency's obligation to assure compliance with the Act and rules adopted thereunder." *Id*.

Specifically, the Agency's proposed subsection (a) "requires the closure plan, post-closure care plan and any modification to these plans to be prepared and submitted to the Agency for review and approval." Buscher Test. at 8; Agency Prop. at 28. Subsection (a) further provides that "[t]he Agency will have 90 days from the receipt of a plan or proposed modification to conduct a review and make a final determination to approve or disapprove a plan or modification or to approve a plan or modification with conditions." Agency Prop. at 28; *see* Buscher Test. at 8. Subsection (a) also includes a provision under which an owner or operator may waive the Agency's 90-day decision deadline. Agency Prop. at 28; Buscher Test. at 8.

Proposed subsection (b) provides in its entirety that

> [a] proposed modification to a closure plan or post-closure care plan must include the reason for the modification, all the information and supporting documentation that will be changed from or will supplement the information provided in the original or most recently approved plan, and the signature and seal of the professional engineer supervising the preparation of the proposed modification. Agency Prop. at 28-29; *see* Buscher Test. at 8.

Proposed subsections (c) and (d) propose "standards for review of a closure plan, post-closure plan or a modification of either plan." Buscher Test. at 8; *see* Agency Prop. at 28-29. Under proposed subsection (e), "[t]he Agency must notify the owner or operator in writing of its final determination on the plan or proposed modification once the plan has been reviewed." Buscher Test. at 9; *see* Agency Prop. at 30. The subsection also provides that,

> [i]f the Agency disapproves a plan or modification or approves a plan or modification with conditions, the written notification must contain the following information, as applicable:
>
> 1) An explanation of the specific type of information or documentation, of any, that the Agency deems the owner or operator did not provide;

2) A list of the provisions of the Act, this Subpart A, or other applicable regulations that may be violated if the plan or modification is approved as submitted;

3) A statement of the specific reasons why the Act, this Subpart A, or other applicable regulations may be violated if the plan or modification is approved as submitted; and

4) A statement of the reasons for conditions if conditions are required. Agency Prop. at 20; *see* Buscher Test. at 9.

Finally, proposed subsection (f) allows the owner or operator to file an appeal with the Board under Section 40 of the Act "[i]f the Agency disapproves a plan or modification, approves a plan or modification with conditions, or fails to issue a final determination within the applicable review period." Agency Prop. at 30; *see* 415 ILCS 5/40 (2008).

In their joint proposal, Ameren and the Agency revised this section with the intent "to facilitate timely closure by allowing the owner or operator to appeal to the Board in the event the Agency fails to issue a final determination within the applicable review period." Joint Statement at 8. Specifically, revised subsection (f) provides in pertinent part that "[a]ppeals to the Board are subject to review under Section 40 of the Act." Joint Prop. at 33; *see* 415 ILCS 5/40 (2008). Ameren and the Agency argue that "[t]his approach is consistent with provisions for review of plans and reports in the Underground Storage Tank Rules and the Site Remediation Program." *Id*. at 8-9, citing 35 Ill. Adm. Code 732.306(a)(4)(B), 732.503(f), 734.450(a)(4)(B), 734.505(f), 740.505(h); *see* Joint Prop. at 33. In all other respects, the joint proposal adopts the Agency's Section 840.148 without substantive amendment.

Section 840.150: Review and Approval of Closure Report and Certification of Completion of Closure, Post-Closure Report and Certification of Completion of Post-Closure Care Plan

In his pre-filed testimony on behalf of the Agency, Mr. Buscher states that this proposed section, like proposed Section 840.148, is based on "the Agency's belief that administrative oversight is appropriate for this site as it proceeds through the closure process." Buscher Test. at 9. Accordingly, proposed subsection (a) "requires a closure report and post-closure report prepared and submitted to the Agency . . . to be reviewed and approved by the Agency prior to the completion of closure or post-closure care." *Id*.; *see* Agency Prop. at 31. Subsection (b) provides that "[s]ubmission and review requirements and deadlines, notification requirements, and rights of appeal shall be the same as those set forth in Section 840.148. . . ." Agency Prop. at 31; *see* Buscher Test. at 9-10. Subsection (c) and (d) establish standards for review of closure and post-closure reports, and each subsection lists nine criteria. Agency Prop. at 31-33; *see* Buscher Test. at 10.

In their joint proposal, Ameren and the Agency revise subsection (b) to provide that "[s]ubmission, review, and approval procedures and deadlines, notification requirements, and rights of appeal shall be the same as those set forth in Section 840.148. . . ." Joint Prop. at 33. Otherwise, the joint proposal adopts the Agency's language without substantive amendment.

Section 840.152: Resource Conservation and Recovery Act

The Agency's proposal included a new Section 840.152, which provided in its entirety that

> [n]othing in this Subpart A shall be construed to be less stringent than or inconsistent with the provisions of the federal Resource Conservation and Recovery Act of 1976 (P.L. 94-480), as amended, or regulations adopted thereunder. Any rules adopted in this Subpart A that are less stringent than or inconsistent with such federal laws applicable to Ash Pond D or state laws adopted to obtain federal delegation, authorization or approval of a state program, administered pursuant to such federal laws are void by operation of law. Agency Prop. at 33.

In his pre-filed testimony on behalf of the Agency, Mr. Nightingale states that USEPA is reviewing the management of coal combustion waste (CCW) and is considering promulgation of comprehensive federal rules under Subtitle C or D of RCRA. Nightingale Test. at 2. He argues that this proposed section addressees the possibility of this promulgation. Specifically, he notes that

> [t]he Board has adopted, and the Agency administers, waste management rules in our delegated program under Subtitle C and approved program under Subtitle D." He acknowledges that "it is unclear at this point whether federal rules proposed and adopted for CCW will address closure of CCW impoundments, and, if so, whether those rules will be applicable to Ash Pond D once it begins closure pursuant to proposed Subpart A. . . ." *Id*. at 3.

He states that, in order '[t]o maintain these delegated and approved programs, statutes and rules adopted in Illinois are required to be at least as stringent as, and not inconsistent with, those adopted at the federal level." *Id*.

Mr. Nightingale argues that the Agency's proposed Section 840.152 guides interpretation of Subpart A "to maintain consistency with any RCRA requirements applicable to Ash Pond D. Nightingale Test. at 2; *see* Agency Prop. at 33. He further argues that, "[i]f consistency could not be accomplished through interpretation, or, if rules clearly were less stringent than RCRA requirements applicable to Ash Pond D, then those rules would be void by operation of law." Nightingale Test. at 2; *see* Agency Prop. at 33. He claims that "[t]his would apply for any state laws adopted to obtain or maintain federal delegation, authorization or approval of a state program based on RCRA or implementing regulations." Nightingale Test. at 2.

Mr. Nightingale argues that the Agency's proposed language reflects current provisions of the Act intended "to create or maintain consistency with federal requirements under RCRA." Nightingale Test. at 3, citing 415 ILCS 5/3.485, 3.500, 22.4(a), (b), (d), 35(a), 39(d), 39.2(i) (2008). He claims that the Act states "the legislature's intent that federal approval for such program be secured and maintained." Nightingale Test. at 3, citing 415 ILCS 5/20(a)(5) - (a)(8),

(a)(11) - (a)(14) (2008). Noting the resources necessary to amend Subpart A in the event that a conflict with federal rules arises, "the Agency urges the Board to consider adoption of proposed Section 840.152." Nightingale Test. at 4.

In their joint statement, Ameren and the Agency stress that the substance of any federal CCW regulations is not now known and that it is unclear whether those rules would apply retroactively. Joint Statement at 9. They argue that, while the proposed Section 840.152 may ultimately be unnecessary, its inclusion "would not be disruptive to the operation of the rules." *Id*. Although they acknowledged that federal CCW regulations may require amending Subpart A, they claim that the proposed Section 840.152 allow the Agency to argue "that it is unnecessary to amend potentially inconsistent rules prior to submitting an application to the USEPA for delegation, authorization or approval of state" CCW regulations. *Id*.

The joint proposal amended proposed Section 840.152 to provide in its entirety that

> [n]othing in this Subpart A shall be construed to be less stringent than or inconsistent with the provisions of the federal Resource Conservation and Recovery Act of 1976 (P.L. 94-480), as amended, or regulations adopted thereunder. To the extent that any rules adopted in this Subpart A are less stringent than or inconsistent with any such laws applicable to the closure of Ash Pond D, such law will prevail. Joint Prop. at 35-36.

In their joint statement, Ameren and the Agency state that this revision clarifies "that RCRA does not govern the closure of Ash Pond D, but that in the event future federal regulations are deemed to govern the closure of Ash Pond D, and such future requirements are more stringent than, or inconsistent with, the proposed rule, RCRA would govern." Joint Statement at 9. They characterize the revised section as "a 'conflict of laws' provision providing guidance to the Board or the courts in the event an action concerning Ash Pond D comes before them in which a potential conflict with federal law is at issue." *Id*.

In a question pre-filed for hearing directed to Mr. Nightingale, PRN asked, "[i]f USEPA redetermines coal combustion waste to be 'hazardous' in nature per RCRA, would subchapter c, Part 724 regulations governing standards for hazardous waste treatment, storage and disposal facilities be sufficient to govern the closure of Ameren's Hutsonville Pond D?" PRN Questions at 3 (¶15). The Agency responded that it has no knowledge that USEPA is considering such a redetermination and argues that the action "suggested by the question is beyond the scope of this proceeding." Agency Resp. at 4. The Agency states that it expects USEPA to publish its proposal in the *Federal Register*, at which time it "will very likely perform an evaluation of the proposal" and offer comment upon it. *Id*.

In its response, Ameren notes that "this question appears to be directed to the Agency." Ameren Resp. at 8. Ameren nonetheless responds that, "[u]ntil USEPA proposed and enacts rules governing coal combustion waste, we do not know how such material will be characterized or whether such characterization and rules will be applicable to ash ponds similar to Ash Pond D." *Id*. Stating that adoption of such rules could take years, Ameren expresses the belief "that

final closure of impoundments when they are no longer permitted as water treatment devices is both prudent and environmentally responsible." *Id*.

In its March 9, 2010 response to the Board's January 7, 2010 order, the Agency states that this proposed section includes a typographical error. Agency Info. at 23. The Agency indicates that "[t]he public law referenced for the Resource Conservation and Recovery Act of 1976 should be P.L. 94-580 instead of 94-480." *Id*. The Agency requests correction (*id.*), and the Board amend the statutory reference in its order below.

CONCLUSION

The Board today concludes to submit the joint proposal without significant substantive amendments to first notice publication in the *Illinois Register*. In its order below, the Board directs the Clerk to cause publication of the Board's proposal, which commences a 45-day public comment period.

ORDER

The Board directs the Clerk to cause first-notice publication of the following proposed amendments to the Board's regulations in the *Illinois Register*. Proposed additions are underlined, and proposed deletions appear stricken.

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE G: WASTE DISPOSAL
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER j: COAL COMBUSTION WASTE SURFACE IMPOUNDMENTS

PART 840
SITE-SPECIFIC CLOSURES OF COAL COMBUSTION WASTE SURFACE IMPOUNDMENTS

SUBPART A: CLOSURE OF ASH POND D, HUTSONVILLE POWER STATION

Section
840.100 Purpose
840.102 Applicability
840.104 Definitions
840.106 Abbreviations and Acronyms
840.108 Incorporations by Reference
840.110 Hydrogeologic Site Investigation
840.112 Groundwater Monitoring System
840.114 Groundwater Monitoring Program
840.116 Groundwater Quality Standards
840.118 Demonstration of Compliance
840.120 Groundwater Collection Trench

AUTHORITY: Implementing Section 22 of the Environmental Protection Act (415 ILCS 5/22) and Section 8 of the Illinois Groundwater Protection Act (415 ILCS 55/8), and authorized by Sections 22, 27, and 28 of the Environmental Protection Act (415 ILCS 5/22, 27, and 28) and Section 8 of the Illinois Groundwater Protection Act (415 ILCS 55/8).

SOURCE: Adopted in R09-21 at 35 Ill. Reg. _____, effective ___ .

SUBPART A: CLOSURE OF ASH POND D, HUTSONVILLE POWER STATION

Section 840.100 Purpose

This Subpart provides for the closure of Ash Pond D located at the Hutsonville Power Station, 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.102 Applicability

This Subpart applies exclusively to the closure and post-closure care of Ash Pond D, located at the Hutsonville Power Station.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.104 Definitions

Unless otherwise specified, the definitions of the Environmental Protection Act (“Act") [415 ILCS 5] apply to this Subpart. The following definitions also apply:

"Agency" means the Illinois Environmental Protection Agency.

"Aquifer" means saturated (with groundwater) soils and geologic materials which are sufficiently permeable to readily yield economically useful quantities of water to wells, springs, or streams under ordinary hydraulic gradients. [415 ILCS 55/3(b)]

"Ash Pond D” means the surface impoundment designated as Ash Pond D, located at the Hutsonville Power Station, 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois.

"Board" means the Illinois Pollution Control Board.

"Contaminant" means any solid, liquid or gaseous matter, any odor, or any form of energy, from whatever source. [415 ILCS 5/3.165]

"Hutsonville Power Station" or "Hutsonville site" means the electric generating station located at 15142 East 1900 Avenue, Hutsonville, Crawford County, Illinois.

"Lower zone of underlying aquifer" means the sands and gravels beneath the fine-grained surficial alluvium within the Wabash River bedrock valley.

"Off-site" means any property that is not part of the Hutsonville Power Station.

"On-site" means the same or geographically contiguous property constituting the Hutsonville Power Station.

"Operator" means the person responsible for the operation of Ash Pond D.

"Owner" means the person who owns Ash Pond D.

"Person" is any individual, partnership, co-partnership, firm, company, limited liability company, corporation, association, joint stock company, trust, estate, political subdivision, state agency, or any other legal entity, or their legal representative, agent or assigns. [415 ILCS 5/3.315]

"Professional engineer" means a person who has registered and obtained a seal pursuant to the Professional Engineering Practice Act of 1989. [225 ILCS 325]

"Professional geologist" means a person licensed under the laws of the State of Illinois to practice as a professional geologist. [415 ILCS 5/57.2]

"Site" means any location, place, tract of land and facilities, including but not limited to, buildings, and improvements used for purposes subject to regulation or control by this act or regulations thereunder. [415 ILCS 5/3.460]

"Statistically significant" means the application of a Mann-Kendall analysis performed at 95 percent confidence to determine whether consecutive groundwater sampling data showing greater or lesser concentrations of constituents is statistically significant.

"Upper zone of underlying aquifer" means surficial sands and sandstones overlying shale west of the Wabash River bedrock valley, and sand lenses within the surficial fine grained alluvium.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.106 Abbreviations and Acronyms

Agency	Illinois Environmental Protection Agency
CQA	Construction Quality Assurance
GMZ	Groundwater Management Zone
Mg\L	milligrams per liter
NPDES	National Pollution Discharge Elimination System
TDS	total dissolved solids

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.108 Incorporations by Reference

a) The Board incorporates the following material by reference:

NTIS. National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 605-6000.

"Methods for Chemical Analysis of Water and Wastes," March 1983, Doc. No. PB84-128677. EPA 600/4-79-020 (available on-line at http://nepis.epa.gov/).

"Methods for the Determination of Inorganic Substances in Environmental Samples," August 1993, Doc. No. PB94-120821 (referred to as "USEPA Environmental Inorganic Methods"). EPA 600/R-93-100 (available online at http://nepis.epa.gov/).

"Methods for the Determination of Metals in Environmental Samples," June 1991, Doc. No. PB91-231498. EPA 600/4-91-010 (available on-line at http://nepis.epa.gov/).

"Methods for the Determination of Metals in Environmental Samples - Supplement I," May 1994, Doc. No. PB95-125472. EPA 600/4-94-111 (available on-line at http://nepis.epa.gov/).

"Methods for the Determination of Organic and Inorganic Compounds in Drinking Water: Volume I," EPA 815-R-00-014 (August 2000) (available on-line at http://nepis.epa.govl/).

"Practical Guide for Ground-Water Sampling," EPA Publication No. EPA/600/2-85/104 (September 1985), Doc. No. PB 86-137304

"Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," USEPA Publication No. SW-846, as amended by Updates I, II, IIA, IIB, III, IIIA, and IIIB (Doc. No. 955-001-00000-1), (available on-line at http://www.epa.gov/epaoswer/hazwaste/test/main.htm).

USGS. United States Geological Survey, 1961 Stout St., Denver, CO 80294 (303) 844-4169.

"Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground-Water Samples for Selected Unstable Constituents," Book I, Chapter D2 (1976).

b) This Section incorporates no later editions or amendments.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.110 Hydrogeologic Site Investigation

The owner or operator of Ash Pond D must design and implement a hydrogeologic site investigation to determine the nature and extent of contamination originating from Ash Pond D and to develop hydrogeologic information for the uses set forth below. If approved in the closure plan, any information from any hydrogeologic site investigation performed since 1999 may be used to satisfy the requirements of this Section. The uses of the hydrogeologic site investigation shall include, but not be limited to:

a) Providing information to define hydrogeology and to assess the groundwater impacts associated with Ash Pond D;

b) Providing information to perform a model to assess the groundwater impacts associated with closure of Ash Pond D; and

c) Providing information to establish a groundwater monitoring system.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.112 Groundwater Monitoring System

The owner or operator of Ash Pond D must design and install a groundwater monitoring system that enables it to monitor groundwater to evaluate post-closure groundwater quality and trends and to demonstrate compliance with the applicable groundwater quality standards at designated compliance points as set forth in Sections 840.116 and 840.118 of this Subpart. If approved in the closure plan, any groundwater monitoring well in operation since 1999 that complies with the requirements set forth in this Section may be used in satisfying the requirements of this Section.

a) Standards for monitoring well design and construction.

1) All monitoring wells must be cased in a manner that maintains the integrity of the bore holes.

2) Wells must be screened to allow sampling only at the specified interval.

3) All wells must be covered with vented caps, unless located in flood-prone areas, and equipped with devices to protect against tampering and damage.

b) The groundwater monitoring system must consist of a sufficient number of wells, installed at appropriate locations and depths to yield groundwater samples to:

1) Represent the quality of background water that has not been affected by contamination from Ash Pond D;

2) Represent the quality of groundwater at the compliance point or points; and

3) Determine compliance with Sections 840.116 and 840.118 of this Subpart.

c) Monitoring wells must be located in statigraphic horizons that could serve as contaminant pathways.

d) The groundwater monitoring system approved in the closure plan must include a maintenance plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.114 Groundwater Monitoring Program

The owner or operator of Ash Pond D must develop a groundwater monitoring program that enables it to monitor groundwater to evaluate post-closure groundwater quality both on-site and off-site to demonstrate compliance with Sections 840.116 and 840.118 of this Subpart. The owner or operator must begin the groundwater monitoring program upon completion of the installation of the groundwater monitoring system in accordance with Section 840.112 and the

approved closure plan. The groundwater monitoring program must comply with following requirements:

a) The owner or operator of Ash Pond D must monitor each well included in the groundwater monitoring system pursuant to Section 840.112 on a quarterly basis for the constituents identified in 35 Ill. Adm. Code 620.410(a) and (d) except radium-226 and radium-228. Any constituent that is not detectable in the down-gradient wells for four consecutive quarters or has a concentration that does not differ to a statistically significant degree from the concentration detected in the up-gradient wells for four consecutive quarters may be removed from the monitoring program in both the up-gradient and down-gradient wells with the exception of boron, iron, manganese, pH, sulfate, and TDS. The owner or operator must also monitor for the following: specific conductance, groundwater elevation, and monitoring well depth.

b) Five years after approval of the closure plan, the owner or operator of Ash Pond D may request modification of the post-closure care plan to reduce the frequency of groundwater monitoring to semi-annual sampling by demonstrating all of the following:

1) That monitoring effectiveness will not be compromised by the reduced frequency of monitoring;

2) That sufficient data has been collected to characterize groundwater; and

3) That concentrations of constituents monitored pursuant to subsection (a) of this Section at the down-gradient boundaries of the Hutsonville site show no statistically significant increasing trends that can be attributed to Ash Pond D.

c) If concentrations of constituents monitored pursuant to subsection (a) of this Section at the down-gradient boundaries of the Hutsonville site show no statistically significant increasing trends that can be attributed to Ash Pond D for the five years after reducing the monitoring frequency to semi-annual, the owner or operator of Ash Pond D may request modification of the post-closure care plan to reduce monitoring frequency to annual sampling by demonstrating all of the factors set forth in subsections (b)(1) through (b)(3) of this Section.

d) The owner or operator of Ash Pond D may discontinue groundwater monitoring upon Agency approval of the certified post-closure care report as required by Section 840.142.

e) Sampling and analysis data from groundwater monitoring and decisions to remove any constituent from the monitoring program must be reported to the Agency as provided in Section 840.144(a) of this Subpart.

f) Representative samples from the groundwater monitoring system must be collected and analyzed in accordance with the procedures for groundwater monitoring and analysis set forth in the following documents as incorporated by reference at Section 840.108 of this Subpart or other procedures approved by the Agency in the closure plan or post-closure care plan:

1) "Methods for Chemical Analysis of Water and Wastes";

2) "Methods for the Determination of Inorganic Substances in Environmental Samples";

3) "Methods for the Determination of Metals in Environmental Samples";

4) "Methods for the Determination of Metals in Environmental Samples - Supplement I";

5) "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water";

6) "Practical Guide for Ground-Water Sampling";

7) "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846), as amended by Updates I, II, IIA, IIB, III, IIIA, and IIIB;

8) "Techniques of Water Resources Investigations of the United States Geological Survey, Guidelines for Collection and Field Analysis of Ground-Water Samples for Selected Unstable Constituents."

g) The owner or operator of Ash Pond D must establish a groundwater monitoring quality assurance program for sample collection, preservation and analysis.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.116 Groundwater Quality Standards

a) On-site, prior to the completion of the post-closure care period, the applicable groundwater quality standards at the Hutsonville site for concentrations of contaminants from Ash Pond D are the concentrations as determined by groundwater monitoring, if such concentrations exceed the numeric standards for Class I: Potable Resource Groundwater set forth in 35 Ill. Adm. Code 620.410. After completion of the post-closure care period, the on-site concentrations of contaminants from Ash Pond D as determined by groundwater monitoring, if such concentrations exceed the numeric standards for Class I: Potable Resource Groundwater set forth in 35 Ill. Adm. Code 620.410, are the applicable groundwater standards at the Hutsonville site if:

1) To the extent practicable, the exceedence has been minimized and beneficial use, as appropriate for the class of groundwater, has been returned on-site;

2) Any threat to human health or the environment on-site has been minimized; and

3) An institutional control prohibiting potable uses of groundwater is placed on the Hutsonville site in accordance with the Uniform Environmental Covenants Act (765 ILCS 122) or an alternative instrument authorized for environmental uses under Illinois law and approved by the Agency. Existing potable uses of groundwater may be preserved as long as such uses remain fit for human consumption in accordance with accepted water supply principles.

b) Off-site, the applicable groundwater quality standards are the numeric standards for Class I: Potable Resource Groundwater set forth in 35 Ill. Adm. Code 620.410 in the upper zone of the underlying aquifer and the nondegradation standard of 35 Ill. Adm. Code 620.Subpart C in the lower zone of the underlying aquifer, unless a groundwater management zone (GMZ) has been established as provided in 35 Ill. Adm. Code 620.250 with the written permission of the affected owner(s) for off-site property or properties with groundwater contamination from Ash Pond D so that monitoring wells may be installed and such other corrective actions designed and implemented as necessary to achieve compliance with 35 Ill. Adm. Code 620.

1) A GMZ for off-site properties with groundwater contamination from Ash Pond D and any related design and construction activities must be proposed and approved in the closure plan or post-closure care plan or any modification thereof, as appropriate.

2) Groundwater quality standards for an off-site GMZ are set forth at 35 Ill. Adm. Code 620.450(a)(4).

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.118 Demonstration of Compliance

a) Compliance with the on-site and off-site groundwater quality standards set forth in Sections 840.116(a) and (b) of this Subpart:

1) Compliance with on-site groundwater quality standards will be achieved when no statistically significant increasing trend that can be attributed to Ash Pond D is detected in the concentrations of all constituents monitored in accordance with Section 840.114 of this Part at the down-gradient boundaries of the Hutsonville site for four consecutive years after

changing to an annual monitoring frequency pursuant to Section 840.114(c) of this Subpart.

2) Compliance with off-site groundwater quality standards:

A) Compliance with off-site groundwater quality standards set forth in Section 840.116(b) of this Part will be achieved when:

i) A statistically significant decreasing trend in concentrations of constituents monitored in accordance with Section 840.114 of this Subpart in the upper zone of the underlying aquifer at the down-gradient boundaries of the Hutsonville site is detected in the concentrations of all constituents monitored for a period of four consecutive years after changing to an annual monitoring frequency pursuant to Section 840.114(c) of this Subpart;

ii) No statistically significant increasing trend that can be attributed to Ash Pond D is detected in concentrations of constituents monitored in accordance with Section 840.114 of this Subpart in the lower zone of the underlying aquifer at the down-gradient boundaries of the Hutsonville site for four consecutive years after changing to an annual monitoring frequency pursuant to Section 840.114(c) of this Subpart; and

iii) All concentrations of constituents monitored in accordance with Section 840.114 of this Subpart are at or below the applicable groundwater quality standards as provided in Section 840.116(b) of this Subpart at the down-gradient boundaries of the Hutsonville site.

B) If a groundwater management zone for off-site properties with groundwater contamination from Ash Pond D is established as provided in Section 840.116(b) of this Subpart, the compliance points will be determined as set forth in the GMZ approved in the closure plan or post-closure care plan, as appropriate.

b) For purposes of demonstrating compliance:

1) The owner or operator of Ash Pond D must perform an annual trend analysis for each monitoring well located at the down-gradient boundaries of the Hutsonville site for all constituents monitored in accordance with Section 840.114 of this Subpart, based on a minimum of four consecutive samples, by applying Sen's Estimate of Slope.

2) If a groundwater management zone for off-site properties with groundwater contamination from Ash Pond D is established as provided in Section 840.116(b) of this Subpart, the demonstration of compliance will be determined as set forth in the GMZ approved in the closure plan or post-closure care plan, as appropriate.

c) Compliance with nondegradation standards during closure and post-closure care periods:

1) If the results of sampling and analysis show an increasing trend at any monitoring well located at the down-gradient boundaries of the Hutsonville site, a Mann-Kendall analysis must be performed at 95 percent confidence to determine whether the increasing trend is statistically significant. The owner or operator of Ash Pond D must investigate the cause of a statistically significant increasing trend as determined under subsection (b) of this Section. If the statistically significant increasing trend occurs during post-closure care, such investigation must include more frequent inspection of the surface of the cover system and evaluation of background concentrations and the effectiveness of the groundwater collection trench required by Section 840.120 of this Subpart.

A) If an investigation performed in accordance with subsection (c)(1) of this Section attributes a statistically significant increasing trend to a superseding cause, the owner or operator of Ash Pond D must notify the Agency in writing, stating the cause of the increasing trend and providing the rationale used in such a determination.

B) If there is no superseding cause for the statistically significant increasing trend and sampling frequency has been reduced pursuant to Sections 840.114(b) or (c) of this Subpart to semiannual or annual sampling, the owner or operator must return to a quarterly sampling schedule. After four consecutive quarterly samples show no statistically significant increasing trend, the frequency of groundwater monitoring may be returned to either semi-annual or annual, whichever frequency was utilized prior to the return to quarterly sampling.

C) For purposes of this subsection (c)(1), notifications concerning statistically significant increasing trends and revisions of the sampling frequency must be reported to the Agency in writing within 30 days after making the determinations as provided in Section 840.144(f) of this Subpart.

2) If a statistically significant increasing trend is observed to continue over a period of two or more consecutive years and there are no superseding causes for the trend, the owner or operator must perform the following:

A) A hydrogeologic investigation; and

B) Additional site investigation, if necessary.

3) Based on the outcome of the activities required by subsection (c)(2) of this Section, the owner or operator of Ash Pond D must take action to mitigate statistically significant increasing trends that are causing, threatening or allowing exceedences of off-site groundwater quality standards as set forth in Section 840.116(b). Such actions must be proposed as a modification to the post-closure care plan within 180 days after completion of the activities required by subsection (c)(2) of this Section.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.120 Groundwater Collection Trench

a) The owner or operator of Ash Pond D must design, install, and, consistent with any applicable wastewater discharge permit conditions, operate a groundwater collection trench along the south property boundary of the Hutsonville Power Station to prevent migration of groundwater impacted by Ash Pond D south of the property boundary.

b) Plans for the groundwater collection trench including, but not limited to, a plan for operation and maintenance, must be approved by the Agency in the closure plan.

c) The groundwater collection trench must be constructed according to a construction quality assurance program that meets the requirements of Section 840.146 of this Subpart.

d) Once compliance with the groundwater quality standards as set forth in Section 840.116 has been achieved in accordance with Section 840.118(a), the owner or operator of Ash Pond D may discontinue operation of the groundwater collection trench.

1) Upon discontinuing operation of the groundwater collection trench, the owner or operator must perform four quarterly sampling of the groundwater monitoring system wells as identified in the post-closure care plan, or modification thereof, to ensure compliance with the applicable groundwater quality standards set forth in Section 840.116.

2) Results of the four quarterly sampling must be included in the post-closure report documentation. If compliance is not confirmed, operation of the groundwater collection trench and discharge system must be resumed.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.122 Groundwater Discharge System

a) Groundwater collected in the groundwater collection trench must be directed to an outfall for which the Hutsonville Power Station has NPDES authorization or to another option as approved by the Agency in the closure plan or post-closure care plan in accordance with applicable law, including but not limited to, permit requirements.

b) The groundwater discharge system must be constructed according to a construction quality assurance program that meets the requirements of Section 840.146 of this Subpart.

c) Plans for the groundwater discharge system including, but not limited to, a plan for operation and maintenance, must be approved by the Agency in the closure plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.124 Final Slope and Stabilization

a) All final slopes must be designed and constructed to a grade capable of supporting vegetation and minimizing erosion.

b) All slopes must be designed to drain runoff away from the cover and to prevent ponding.

c) Ash Pond D must meet the stability criteria of 35 Ill. Adm. Code 811.304.

d) The owner or operator may use coal combustion waste generated at the site in establishing the final grade and slope as provided below:

1) The earthen berms surrounding Ash Pond D must be regraded to eliminate any freeboard between the top of the berm and the adjacent surface of the coal combustion waste;

2) Additional coal combustion waste may be placed only directly on top of coal combustion waste that is already in place;

3) The maximum final slope must be no greater than five (5) percent;

4) Any additional coal combustion waste used to establish the final grade and slope is considered coal combustion by-product, and its use does not require any independent approval pursuant to Section 3.135 of the Act (415 ILCS 5/3.135).

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.126 Final Cover System

The owner or operator of Ash Pond D must design and install a final cover system for Ash Pond D. The final cover system must consist of a low permeability layer and a final protective layer.

a) Standards for the low permeability layer. The low permeability layer must be designed to minimize surface infiltration and must consist of a geosynthetic membrane cover and be constructed in accordance with the following standards:

1) The geosynthetic membrane must have a minimum thickness of 40 mil (0.04 inches) and, in terms of hydraulic flux, be equivalent or superior to a three (3) foot layer of soil with a hydraulic conductivity of $I \times 10^{-7}$ centimeters per second.

2) The geosynthetic membrane must be placed over a prepared base free from sharp objects and other materials that may cause damage.

b) Standards for the final protective layer.

1) The final protective layer must cover the entire geosynthetic membrane.

2) The final protective layer must be at least three feet thick and must be sufficient to protect the geosynthetic membrane from freezing and minimize root penetration of the geosynthetic membrane.

3) The final protective layer must consist of soil material capable of supporting vegetation.

4) The final protective layer must be placed as soon as possible after placement of the geosynthetic membrane.

5) The final protective layer must be covered with vegetation to minimize wind and water erosion.

c) Construction Quality Assurance Program. The final cover system must be constructed according to a construction quality assurance program that meets the requirements of Section 840.146 of this Subpart.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.128 Closure Plan

a) Within 180 days after the effective date of this rule, the owner or operator of Ash Pond D must prepare and submit to the Agency a closure plan for review and approval.

b) The owner or operator of Ash Pond D must maintain the closure plan onsite or at a location specified in the closure plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.130 Contents of Closure Plan

The closure plan must contain, at a minimum, the following information or documents:

a) Site map. The site map must identify all pertinent features and buildings at the Hutsonville Power Station and must clearly identify the following:

1) All of the surface impoundments located at the site;

2) All existing and proposed groundwater collection trenches associated with the operation or closure of Ash Pond D; and

3) All existing and proposed groundwater monitoring wells.

b) Description of Ash Pond D. The description of Ash Pond D must include all of the following information:

1) A description of the contents of Ash Pond D;

2) The estimated volume of material contained in Ash Pond D; and

3) An analysis of the structural integrity of Ash Pond D.

c) Description of the closure activities to be performed in accordance with this Subpart and any additional activities performed by the owner or operator to close Ash Pond D, including any dewatering.

d) Description and results of the hydrogeologic site investigation required by Section 840.110 of this Subpart.

e) Description of the groundwater trend analysis methods as required by Section 840.118 of this Subpart.

f) Plans, specifications and drawings for the groundwater monitoring system required by Section 840.112 of this Subpart, including, but not limited to, a description of the maintenance plan required by Section 840.112(d).

g) Description of the groundwater monitoring program required by Section 840.114 of this Subpart including, but not limited to, a description of the quality assurance program for sample collection, preservation and analysis.

h) Identification of the location of the monitoring wells used for trend analyses required by Section 840.118 of this Subpart.

i) Plans, specifications and drawings for the groundwater collection trench and discharge system set forth in Sections 840.120 and 840.122.

j) Plans, specifications and drawings for the final slope design and construction and demonstration of compliance with the stability criteria required in Section 840.124.

k) Plans, specifications and drawings for the final cover system required by Section 840.126 of this Subpart.

l) Estimates of the amount of time to complete closure, including an estimate of the time required for hydrostatic equilibrium of groundwater beneath Ash Pond D, the cost of closure, and the cost of post-closure care.

m) A proposal for a groundwater management zone as set forth in Section 840.116(b) of this Subpart, if applicable, and including, but not limited to, plans, specifications and drawings for any structures or devices that must be constructed.

n) Description of the Construction Quality Assurance program required by Section 840.146 of this Subpart including, but not limited to, the sampling programs required by Section 840.146(b)(7) of this Subpart.

o) Description of actions proposed to mitigate statistically significant increasing trends in accordance with Section 840.118(c) of this Subpart, if applicable, including, but not limited to, plans, specifications, and drawings for any structures or devices that must be constructed.

p) The signature and seal of the professional engineer supervising the preparation of the closure plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.132 Modification of Existing Permits

Within 180 days of the effective date of this Subpart A, the owner or operator of Ash Pond D must timely submit to the Agency an application to revise any state operating permit or NPDES permit issued by the Agency as required by Sections 840.120 and 840.122 of this Subpart, if necessary.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.134 Completion of Closure, Closure Report and Certification of Completion of Closure

a) The owner or operator must complete engineering and design activities for the closure of Ash Pond D within 180 days after the effective date of this rule.

b) The owner or operator must complete closure of Ash Pond D within 18 months after the Agency's approval of the closure plan, unless the Agency approves an alternative timeline.

c) No later than 90 days after the completion of all closure activities required by this Subpart and approved in the closure plan, the owner or operator of Ash Pond D must prepare and submit to the Agency a closure report for review and approval. The report must include certification by a professional engineer that Ash Pond D has been closed in accordance with the approved closure plan required by Section 840.128 of this Part and the requirements of this Subpart. The report also must contain supporting documentation including, but not limited to:

1) Engineering and hydrogeology reports including, but not limited to, monitoring well completion reports and boring logs, all CQA reports, certifications, and designations of CQA officers-in-absentia required by Section 840.146 of this Subpart;

2) Photographs of the final cover system and groundwater collection trench and any other photographs relied upon to document construction activities;

3) A written summary of closure requirements and activities as set forth in the closure plan and this Subpart A;

4) Any other information relied upon by the professional engineer in making the closure certification; and

5) The signature and seal of the professional engineer supervising the implementation of the closure plan, the preparation of the closure report, and making the certification of completion of closure.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.136 Post Closure Maintenance of Cover System

The owner or operator of Ash Pond D must maintain the surface of the cover system beginning immediately after construction until approval of the post-closure report by the Agency.

a) After closure, and until completion ofthe post-closure report, the owner or operator of Ash Pond D must conduct inspections of the cover system at the same time and frequency as the groundwater monitoring sampling schedule set forth in Section 840.114 of this subpart.

b) The owner or operator of Ash Pond D must fill all rills, gullies, and crevices six inches or deeper. Areas identified as particularly susceptible to erosion must be recontoured.

c) The owner or operator of Ash Pond D must repair all eroded and scoured drainage channels and replace lining material, if necessary.

d) The owner or operator of Ash Pond D must fill and recontour all holes and depressions created by settling so as to prevent standing water.

e) The owner or operator of Ash Pond D must revegetate all areas in excess of 100 square feet, cumulative, with failed or eroded vegetation.

f) The owner or operator of Ash Pond D must repair all tears, rips, punctures, and other damage to the geosynthetic membrane.

g) The owner or operator must prevent the growth of woody species on the protective cover.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.138 Post Closure Care Plan

a) Within 180 days after the effective date of this Subpart A, the owner or operator of Ash Pond D must prepare and submit to the Agency a post-closure care plan for review and approval.

b) The owner or operator must maintain the post-closure care plan onsite or at a location specified in the post-closure care plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.140 Contents of Post-Closure Care Plan

The post-closure care plan, or modification thereof, must include, at a minimum, the following elements:

a) Description of the post-closure care activities required by Section 840.136 of this Subpart;

b) Description of the groundwater monitoring system required by Section 840.112 of the Subpart and a description of the maintenance plan for the groundwater monitoring system;

c) Description of the groundwater monitoring program required by Section 840.114 of this Subpart;

d) Identification of the location of the monitoring wells used for trend analyses required by Section 840.118 of this Subpart;

e) Description of the operation and maintenance that will be required for the groundwater collection trench and discharge system required by Sections 840.120 and 840.122 of this Subpart;

f) Description of the groundwater trend analysis methods as required by Section 840.118 of this Subpart;

g) A proposal for a groundwater management zone as set forth in Section 840.116(b) of this Part, if applicable;

h) Description of actions proposed to mitigate statistically significant increasing trends in accordance with Section 840.118(c) of this Subpart, if applicable, and the operation and maintenance of any structures or devices; and

i) The signature and seal of the professional engineer supervising the preparation of the post-closure care plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.142 Post-Closure Report and Certification of Completion of Post-Closure Care Plan

Post-closure care must continue until a demonstration of compliance with the groundwater quality standards as set forth in Section 840.116 has been approved by the Agency. The owner or operator of Ash Pond D must prepare and submit to the Agency for review and approval a post-closure report within 60 days after satisfying the requirements of the approved post-closure care plan and achieving the applicable groundwater quality standards as set forth in the plan and Sections 840.116 through 840.118 of this Part. The post-closure report must include a certification(s) by a professional engineer that the standards and requirements set forth in this Subpart A and approved in the post-closure care plan have been met. A professional geologist may supervise post-closure care activities as appropriate under the Professional Geologist

Licensing Act (225 ILCS 745). The report also must contain supporting documentation including, but not limited to:

a) Engineering and hydrogeology reports including, but not limited to, documentation of compliance with the groundwater quality standards of this Subpart A and results of the four quarterly sampling performed under Section 840.120 of this Subpart;

b) Photographs of the final cover system and groundwater collection trench and any other photographs relied upon to document construction activities;

c) A written summary of post-closure care requirements and activities as set forth in the post-closure care plan and this Subpart A and their completion;

d) Any other information relied upon by the professional engineer or professional geologist, as appropriate for the activity, in making the post-closure care certification(s); and

e) The signature and seal of the professional engineer and professional geologist supervising the implementation of the post-closure care plan, and the signature and seal of the professional engineer supervising preparation of the post-closure report and making the certification of completion of the post-closure care plan.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.144 Recordkeeping and Reporting Requirements

a) The owner or operator of Ash Pond D must file an annual report with the Agency no later than January 31 of each year during the closure of Ash Pond D and for the entire post-closure care period. Once the requirements of Section 840.142 of this Subpart have been met, annual reports are no longer required. The owner or operator must submit groundwater sampling and analysis data and decisions to remove constituents from the monitoring program no later than 30 days after the sampling and analysis have been completed.

b) All annual reports must contain the following information:

1) Trend analyses required by Section 840.118(b) of all groundwater monitoring data generated by the groundwater monitoring program required by Section 840.114 of this Subpart;

2) A copy of any notice submitted to the Agency pursuant to Section 840.118(c)(1)(A);

3) A discussion of any statistically significant increasing trends and actions taken to mitigate such trends in accordance with Section 840.118(c)(3); and

4) The completed closure or post-closure activities performed during the preceding year.

c) The owner or operator of Ash Pond D must maintain onsite or at a location specified in the closure or post-closure care plan all monitoring data and trend analysis data for 10 years following generation of the data.

d) The owner or operator of Ash Pond D must maintain the closure plan until the end of the post-closure care period.

e) The owner or operator of Ash Pond D must maintain the post-closure care plan for 10 years following the certification of the post-closure report as required by Section 840.142.

f) All reports, plans, modifications and notifications required under this Subpart to be submitted to the Agency must be submitted in writing to the Bureau of Water, Division of PubIic Water Supplies, Attn: Hydrogeology and Compliance Unit, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276 or electronically as authorized and directed by the Agency.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.146 Construction Quality Assurance Program

a) The following components must be constructed according to a construction quality assurance program:

1) Installation of the groundwater collection trench and discharge system required by Sections 840.120 and 840.122 of this Part;

2) Compaction of the final cover system subgrade and foundation to design parameters;

3) Application of final cover, including installation of the geomembrane; and

4) Construction of ponds, ditches, lagoons and berms.

b) The construction quality assurance program must meet the following requirements:

1) The operator must designate a construction quality assurance (CQA) officer who is an Illinois licensed professional engineer (LPE).

2) At the end of each week of construction of the final cover system until construction is complete, a summary report must be either prepared by the CQA officer or under the supervision of the CQA officer. The report must include descriptions of the weather, locations where construction occurred during the previous week, materials used, results of testing, inspection reports, and procedures used to perform the inspections. The CQA officer must certify the report. The owner or operator of the Hutsonville Power Station shall retain all weekly summary reports certified by the CQA officer until the completion of the post-closure care period and must make those reports available at reasonable times for inspection and photocopying by the Agency.

3) The CQA officer must exercise judgment to certify the following:

A) That the bedding material contains no undesirable objects;

B) That the closure plan has been followed;

C) That the anchor trench and backfill are constructed to prevent damage to the geosynthetic membrane;

D) That all tears, rips, punctures, and other damage are repaired;

E) That all geosynthetic membrane seams are properly constructed and tested in accordance with manufacturer's specifications;

F) That the groundwater trench is constructed to intersect the water table;

G) That the groundwater trench is properly constructed to slope towards extraction points, and the extraction equipment is properly designed and installed;

H) That an appropriate operations and maintenance plan for the trench and extraction and discharge equipment is provided;

I) That proper filter material consisting of uniform granular fill, to avoid clogging, is used in construction; and

J) That the filter material as placed must possess structural strength adequate to support the maximum loads imposed by the overlying materials and equipment used at the facility.

4) The CQA officer must supervise and be responsible for all inspections, testing and other activities required to be implemented as part of the CQA program under this Section.

5). The CQA officer must be present to provide supervision and assume responsibility for performing all inspections of the following activities:

A) Compaction of the subgrade and foundation to design parameters;

B) Application of final cover, including installation of the geomembrane;

C) Installation of the groundwater collection trench and discharge system required by Sections 840.120 and 840.122 of this Subpart; and

D) Construction of ponds, ditches, lagoons and berms.

6) If the CQA officer is unable to be present to perform, as required by subsection (b)(5) of this Section, the CQA officer must provide, in writing, the reasons for his or her absence, a designation of a person who must exercise professional judgment in carrying out the duties of the CQA officer-in-absentia, and a signed statement that the CQA officer assumes full responsibility for all inspections performed and reports prepared by the designated CQA officer-in-absentia during the absence of the CQA.

7) The sampling program must be implemented as part of the CQA plan for all construction activities in order to ensure, at a minimum, that construction materials and operations meet design specifications.

A) The sampling program must be designed prior to construction.

B) The sampling program must be based upon statistical sampling techniques and must establish and specify criteria for acceptance or rejection of materials and operations.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.148 Review, Approval, and Modification of Closure Plan and Post-Closure Care Plan

The closure plan and post-closure care plan prepared and submitted to the Agency in accordance with Sections 840.128 and 840.138 of this Subpart, and any modifications to those plans, must be reviewed and approved by the Agency prior to implementation.

a) A closure plan satisfying the requirements of Section 840.130 of this Subpart, a post-closure care plan satisfying the requirements of Section 840.140 of this Subpart, and any modifications to approved plans must be submitted to the Agency for review and approval prior to implementation. The Agency will have 90 days from the receipt of a plan or proposed modification to conduct a review and make a final determination to approve or disapprove a plan or modification or to approve a plan or modification with conditions.

1) The Agency's record of the date of receipt of a plan or proposed modification to a plan will be deemed conclusive unless a contrary date is proved by a dated, signed receipt from the Agency or certified or registered mail.

2) Submission of an amended plan or amended modification to a plan restarts the time for review.

3) The owner or operator may waive the Agency's decision deadline upon a request from the Agency or at the owner's or operator's discretion.

b) A proposed modification to a closure plan or post-closure care plan must include the reason for the modification, all the information and supporting documentation that will be changed from or will supplement the information provided in the original or most recently approved plan, and the signature and seal of the professional engineer supervising the preparation of the proposed modification.

c) When reviewing a closure plan or modification, the Agency must consider:

1) Whether the plan or modification contains, at a minimum, all the elements required pursuant to Section 840.130 of this Subpart and has been accompanied by the information and supporting documentation necessary to evaluate the compliance of the proposed plan relative to the standards and requirements of this Subpart A;

2) Whether the activities, structures and devices proposed are in accordance with the applicable standards and requirements of this Subpart A and are otherwise consistent with generally accepted engineering practices and principles of hydrogeology, accepted groundwater modeling practices, appropriate statistical analyses, and appropriate sampling techniques and analytical methods;

3) The likelihood that the plan or modification will result in the containment of the ash and associated contaminants and the attainment of the applicable groundwater quality standards as set forth in Sections 840.116 and 840.118 of this Subpart;

4) Whether the plan or modification contains the required professional signatures and seals.

d) When reviewing a post-closure care plan or proposed modification, the Agency must consider:

1) Whether the plan or modification contains, at a minimum, all the elements required pursuant to Section 840.140 of this Subpart and has been accompanied by the information and supporting documentation necessary to evaluate the compliance of the proposed plan relative to the standards and requirements of this Subpart A;

2) Whether the activities, structures and devices proposed will be completed, operated and maintained in accordance with the applicable standards and requirements of this Subpart A and are otherwise consistent with generally accepted engineering practices and principles of hydrogeology, accepted groundwater modeling practices, appropriate statistical analyses, and appropriate sampling techniques and analytical methods;

3) The management of risk relative to any remaining contamination, including, but not limited to, provisions for the use of long-term restrictions on the use of groundwater as a potable water supply, if appropriate;

4) Whether the plan or modification contains the required professional signatures and seals.

e) Upon completion of the review, the Agency must notify the owner or operator in writing of its final determination on the plan or proposed modification. The notification must be made by certified or registered mail post-marked with a date stamp and with return receipt requested. The Agency's final determination will be deemed to have taken place on the post-marked date that the notice is mailed. If the Agency disapproves a plan or modification or approves a plan or modification with conditions, the written notification must contain the following information, as applicable:

1) An explanation of the specific type of information or documentation, if any, that the Agency deems the owner or operator did not provide;

2) A list of the provisions of the Act, this Subpart A, or other applicable regulations that may be violated if the plan or modification is approved as submitted;

3) A statement of the specific reasons why the Act, this Subpart A, or other applicable regulations may be violated if the plan or modification is approved as submitted; and

4) A statement of the reasons for conditions if conditions are required.

f) If the Agency disapproves a plan or modification, approves a plan or modification with conditions, or fails to issue a final determination within the applicable review period, the owner or operator may, within 35 days after receipt of the final determination or expiration of the review period, file an appeal with the Board. Appeals to the Board are subject to review under Section 40 of the Act (415 ILCS 5/40).

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.150 Review and Approval of Closure Report and Certification of Completion of Closure, Post-Closure Report and Certification of Completion of Post-Closure Care Plan

The closure report and post-closure report prepared and submitted to the Agency in accordance with Sections 840.134 and 840.142 of this Subpart must be reviewed and approved by the Agency prior to the completion of closure or post-closure care.

a) A closure report satisfying the requirements of Section 840.134 of this Subpart and a post-closure report satisfying the requirements of Section 840.142 of this Subpart must be submitted to the Agency for review and approval. Closure and post-closure activities will not be deemed complete until the reports are approved by the Agency.

b) Submission, review, and approval procedures and deadlines, notification requirements, and rights of appeal shall be the same as those set forth in Section 840.148 of this Subpart for closure plans and post-closure care plans.

c) When reviewing a closure report and certification of completion of closure, the Agency must consider whether the documentation demonstrates that the activities, structures and devices approved in the closure plan have been completed in accordance with this Subpart A and the approved closure plan including, but not limited to:

1) The performance of the hydrogeologic site investigation required by Section 840.110 of this Subpart;

2) The installation of the groundwater monitoring system required by Section 840.112 of this Subpart;

3) The installation of the groundwater collection trench and discharge system or alternative as approved by the Agency as required by Sections 840.120 and 840.122;

4) The construction of the final slope and compliance with the stability criteria as required by Section 840.124 of this Subpart;

5) The installation of the final cover system as required by Section 840.126 of this Subpart;

6) Compliance with the Construction Quality Assurance requirements of Section 840.146 of this Subpart;

7) The establishment of a groundwater management zone in accordance with Section 840.116(b), if applicable;

8) The implementation of actions to mitigate increasing trends as required by Section 840.118(c) of this Subpart, if applicable; and

9) The presence of professional signatures and seals as required by Section 840.134.

d) When reviewing a post-closure report and certification of completion of post-closure care plan, the Agency must consider whether the documentation demonstrates that the activities, structures and devices approved in the post-closure care plan have been completed, operated and maintained in accordance with this Subpart A and the approved post-closure care plan including, but not limited to:

1) The post-closure maintenance of the cover system as required by Section 840.136;

2) The maintenance of the groundwater monitoring system in accordance with Section 840.112(d);

3) The implementation of the groundwater monitoring program as required by Section 840.114 of this Subpart;

4) The operation and maintenance of the groundwater collection trench and discharge system, or alternative approved by the Agency, as required by Sections 840.120 and 840.122;

5) The performance of the groundwater trend analysis as required by Section 840.118 of this Subpart;

6) The implementation of actions to mitigate increasing trends as required by Section 840.118(c) of this Subpart, if applicable;

7) Compliance with the requirements of the groundwater management zone as established pursuant to Section 840.116(b), if applicable;

8) Compliance with the groundwater quality standards set forth in Sections 840.116(a) and 840.116(b) as demonstrated in accordance with Section 840.118; and

9) The presence of professional signatures and seals as required by Section 840.140.

(Source: Added at 35 Ill. Reg. ___, effective_____)

Section 840.152 Resource Conservation and Recovery Act

Nothing in this Subpart A shall be construed to be less stringent than or inconsistent with the provisions of the federal Resource Conservation and Recovery Act of 1976 (P.L. 94-580), as amended, or regulations adopted thereunder. To the extent that any rules adopted in this Subpart A are less stringent than or inconsistent with any such laws applicable to the closure of Ash Pond D, such laws will prevail.

(Source: Added at 35 Ill. Reg. ___, effective_____)

IT IS SO ORDERED.

I, John T. Therriault, Assistant Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on October 7, 2010, by a vote of 5-0.

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John T. Therriault, Assistant Clerk
Illinois Pollution Control Board