BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

SIERRA CLUB, PRAIRIE RIVERS NETWORK, and NATIONAL ASSOCIATION FOR THE ADVANCEMENT OF COLORED PEOPLE,	)	
Complainants,	)	**PCB 18-11** **(Enforcement – Water)**
v.	)	
CITY OF SPRINGFIELD, OFFICE OF PUBLIC UTILITIES d/b/a CITY WATER, LIGHT and POWER,	)	
Respondent.	)	

NOTICE OF FILING

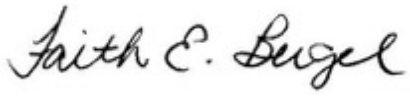
To: Don Brown, Clerk
Illinois Pollution Control Board
100 W. Randolph Street, Suite 11-500
Chicago, IL 60601
don.brown@illinois.gov

And Attached Service List

PLASE TAKE NOTICE that I have filed electronically with the Office of the Clerk of the Illinois Pollution Control Board the following Complainants' Amended Response to Respondent's Motion for Partial Summary Judgment, a copy of which is hereby served upon you.

Dated: February 13, 2020

Respectfully submitted,



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Attorney for Sierra Club

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COMPLAINANTS' AMENDED RESPONSE TO RESPONDENT'S MOTION FOR PARTIAL SUMMARY JUDGMENT

I. Argument

Respondent's Motion for Partial Summary Judgment ("Motion") is flawed in numerous ways. Most problematically, the Motion represents a perpetuation of Respondent's faulty view of this case and the relevant Illinois state laws and regulations. Notably, Respondent's Motion neglects to address the core issue of liability, which is consistent with Respondent's forthright acknowledgment throughout this case that its use of unlined impoundments for storage and disposal of coal ash has caused exceedances of state groundwater standards. Instead, Respondent uses its motion to re-litigate legal questions that the Board has already rejected when Respondent filed a Motion to Dismiss in this proceeding, thereby ignoring the Board's previous ruling. In so doing, it has misconstrued not only the First Amended Complaint but also the interplay between this case and current and forthcoming coal ash laws and regulations. Respondent has done so while offering virtually no citations to undisputed facts to support its claims.

II. Recent Legal and Regulatory Developments in Illinois and the Federal Rules Do Not Supersede Remedies Available to Complainants in This Case.

One of Respondent's main arguments centers on the idea that this case should not proceed to remedy phase or hearings because the process at that phase should be governed by either state or federal rules. Resp't Mot. for Partial Summ. J. at 10-13 (Jan. 29, 2020) ("Resp't Mot."). The Federal CCR rules, Senate Bill 9, and the IEPA's draft state rules do not obviate the need for the remedy phase or hearings in this action because (a) rulemakings generally do not supersede enforcement actions already underway, but rather are inherently different processes with distinct aims; (b) there are numerous mechanisms to ensure that any remedy or relief granted in this case will not conflict with whatever the final rules may require; and (c) IEPA's

draft rules have not yet even been proposed to the Board, will not be finalized for more than a year, and are still being actively debated, such that their final requirements are still uncertain.

In general, rulemakings do not supersede enforcement actions. Rulemakings are forward-looking, and in the case of the federal and state coal ash rulemakings, regulate future use of surface impoundments. Enforcement actions, including this action before the Board, are backward looking, addressing violations that have already occurred. Indeed, the Board has noted this very point the last time it was faced with the question of whether the Agency's previous coal ash rulemaking (R14-10) should supersede an enforcement action involving claims similar to the present case—coal ash violations of the groundwater standards. *Sierra Club v. Midwest Generation ("MWGen"),* PCB 13-15, 2014 WL 1630316, at *13 (IPCB Apr. 17, 2014) ("The Board notes that rulemakings and enforcement actions are entirely distinct proceedings with different aims. Rulemakings are forward-looking and impose future obligations, while enforcement actions concern alleged past or ongoing violations and the proper remedies to redress proven violations."). Further, IEPA's Draft Rule is clear that it does not displace enforcement actions. Under IEPA's Draft Rule, exceedances of groundwater quality standards could still subject an owner/operator to an enforcement action. "[F]ailure to comply with the Act or regulations promulgated under the Act shall be grounds for enforcement action as provided in the Act." IEPA, Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments, Draft Rule § 845.210(f) (Dec. 2019) ("IEPA Draft Rule") (provided as Attachment 1).

The Federal CCR rule and pending state rulemaking likewise do not pose a risk of inconsistencies between any relief awarded here and the requirements of those rules. There are numerous mechanisms built into both rules and the current board process to avoid such

inconsistencies among the different outcomes. Neither IEPA's Draft Rule nor the Federal CCR Rule mandate specific corrective action measures, and therefore pose no direct conflict with any relief the Board may order in this case. First, the state rulemaking is simply a codification of a process to be used (similar to the current CCA process) and does not mandate any specific outcomes. IEPA's Draft Rule instead provides for a plan for monitoring groundwater contamination at the sites (which CWLP is already doing), as well as an "assessment of corrective measures" and a "selection of remedy" should groundwater contamination be found. *See, e.g.*, IEPA Draft Rule § 845.650 (requiring a groundwater monitoring program), § 845.710(b) ("Before selecting a closure method, the owner or operator of each CCR surface impoundment must complete a closure alternatives analysis."); § 845.660 (describing the process of assessing various corrective measures and selection of a remedy). Similarly, the Federal Rule does not mandate outcomes but also codifies a process that also includes groundwater monitoring, a corrective measures assessment for contamination, and selection of a remedy. *See, e.g.*, 40 C.F.R. § 257.96 (providing for an assessment of corrective measures), § 257.97 ("Based on the results of the corrective measures assessment conducted under § 257.96, the owner or operator must, as soon as feasible, select a remedy . . ."). Again, the Board noted this point in *Sierra Club v. Midwest Generation*.

> There is nothing in either rulemaking proposal that would prevent the Board from ordering tailored remedial measures if complainants establish the violations alleged in this action. Thus, regardless of the end result of the federal and state rulemakings, neither can be expected to obviate this proceeding or render any aspect of it moot.

Sierra Club v. MWGen, PCB 13-15, 2014 WL 1630316, at *13.

Further, the requirements of the state coal ash rules when finalized are still uncertain and it will probably be more than a year before the rules take effect. Those rules have been shared

publicly only in draft form from IEPA, and have not yet even been proposed before the Board. As a result, those rules are not part of a formal rulemaking. Rules are rarely adopted in precisely the same form as they were initially drafted, and with the complexities of coal ash regulation and the high level of public attention focused on the issue, it is expected that changes will be made to IEPA's draft rules between now and the Board's adoption of coal ash rules in final form. Further, the finalization of those rules is more than a year away. The Coal Ash Pollution Prevention Act does not require the final rules to be adopted until March of 2021, more than a year from now. 415 ILCS 5/22.59(g). In the meantime, CWLP's coal ash ponds are causing groundwater contamination now, an environmental harm that can and should be curtailed before March of 2021.

Respondent's claims as to participation in the State's coal ash rulemaking before this Board in 2013-14 are inaccurate and also don't alter the legal effect of these prior rulemakings on this proceeding. Referring to the previous coal ash rulemaking in Illinois, R14-10, Respondent states that "[b]oth parties to this matter were participants in that proceeding until the Record closed in March of 2017." Resp't Mot. at 5 (citing *In re Coal Combustion Waste Ash Ponds and Surface Impoundments at Power Generating Facilities*, R14-10 (Oct. 28, 2013)). But in so stating, Respondent ignores the fact that there are three Complainants (not one) and four interested parties to this proceeding (not two). Further, only two of the three Complainants were interested parties to the previous coal ash rulemaking.[1] Respondent appears to have disregarded the NAACP because the NAACP was not a participant in the previous coal ash rulemaking. Complainants, thus, dispute Respondent's claims as to the overlap of participants in this proceeding compared to R14-10.

[1] *See In re Coal Combustion Waste Ash Ponds and Surface Impoundments at Power Generating Facilities*, R14-10, Service List, *available at* https://pcb.illinois.gov/Cases/GetCaseDetailsById?caseId=14705 (last visited Feb. 7, 2020).

Finally, Complainants note that the Board has already addressed the question of whether the Federal CCR rule obviates the need for this proceeding. *Sierra Club v. Springfield*, PCB 18-11, 2017 WL 6757572, at *6 (IPCB Dec. 21, 2017). At that time, CWLP argued that the proceeding was premature and a frivolous abuse of the Board's limited resources in light of the Federal CCR rule. *Id.* [2] The Board has already held in this very proceeding that

> CWLP does not . . . identify any provision of the Act, Board rules, or other laws that supports [its] claims. Nor does CWLP argue that the complaint asks the Board to enforce any federal regulations or make any determinations on matters preempted by federal law or otherwise outside of the Board's authority.

Id. Furthermore, in *Sierra Club v. Midwest Generation*, the Board has indicated that a prospective rulemaking should not form the basis of a stay of an enforcement proceeding. "The Board finds that staying this proceeding pending the outcome of the rulemakings would unnecessarily delay resolution of this action." *Sierra Club v. MWGen*, PCB 13-15, 2014 WL 1630316, at *14. That was merely a stay of proceedings as opposed to a summary judgment decision that would be dispositive of the whole question of remedy. If the early stages of a rulemaking, and the speculative outcomes of such a rulemaking, should not form the basis of a stay of proceedings, they surely should not from the basis of a grant of summary judgment. "[N]either the state nor federal proposed rulemaking would obviate this proceeding, and the Board sees no reason to hold up this proceeding pending the conclusion of rulemaking proceedings that, whenever completed, cannot be expected to moot this case." *Id.* Similarly, in the present case, neither the State nor Federal Rules bar this enforcement action. Thus, there is no reason for the Board to grant summary judgment to CWLP when federal and state rules do not moot this case.

[2] Ironically, it is CWLP that is causing the Board a duplicative waste of resources by raising this question a second time when the Board has already addressed this question earlier in this proceeding.

Respondent's citation to Midwest Generation's petition for an adjusted standard and the Board's grant of a stay in that case based upon the Public Act 101-171, the Coal Ash Pollution Prevention Act, Resp't Mot. at 10-11, is inapposite because that proceeding is not analogous to this case. Enforcement actions and adjusted standard proceedings are not "similar cases," as Respondent Claims. *Id.* at 10. Rather, adjusted standard proceedings are those proceedings where

> [a]fter adopting a regulation of general applicability, the Board may grant, in a subsequent adjudicatory determination, an adjusted standard for persons who can justify such an adjustment consistent with subsection (a) of Section 27 of this Act. In granting such adjusted standards, the Board may impose such conditions as may be necessary to accomplish the purposes of this Act.

415 ILCS 5/28.1. Enforcement actions are "proceedings before the Board concerning complaints alleging violations of the Act, regulations, and orders of the Board under Section 31 of the Act." 35 Ill. Admin. Code § 103.100(a). Further, "[e]nforcement proceedings may be initiated by any person against any person allegedly violating the Act, any rule or regulation adopted under the Act, any permit or term or condition of a permit, or any Board order." 35 Ill. Admin. Code § 103.106 (emphasis omitted). As such, enforcement actions are adversarial in nature while adjusted standards are not necessarily. Also, enforcement actions present more of a concern regarding delay than adjusted standards, since violations are being adjudicated and may be ongoing. Finally, in adjusted standard proceedings like *In re Midwest Generation* in which the party seeking the stay is also the petitioner seeking the adjusted standard, there is virtually no concern regarding delay. AS 19-1, slip op. at 1 (Oct. 3, 2019). For these reasons, *In re Midwest Generation* is not at all analogous to the present case and the grant of a stay based on the State Rulemaking is irrelevant. *Id.*

III. Complainants' Requested Remedies Fall Within the Range of Relief for Which the Board Has Statutory Authority.

Respondent also spends much of its brief arguing that the relief Complainants seek is beyond the Board's statutory authority. Resp't Mot. at 3-4. Respondent is incorrect: Complainants do not seek an injunction as Respondent argues, and as a result, Respondent's cases regarding injunctions are completely distinguishable from the present case. Also, the relief that Complainants seek is well within the Board's statutory authority and completely consistent with the Act.

Addressing the first argument first: Respondent argues that the remedy "Complainants seek is for this Board to issue a mandatory injunction ordering and directing the manner and means by which such closure should occur." Resp't Mot. at 1. But Complainants have not asked for an injunction: they seek a cease and desist order, together with other appropriate remedies within the Board's authority. Complainants' First Am. Compl. at 16 (Apr. 19, 2019). In the request for relief, Complainants have asked that the Board conclude that there are violations of the Act, impose penalties, issue an order, and grant such other relief as the Board deems just and proper. *Id.* More specifically, Complainants request that the Board order Respondent to: "i. Cease and desist from causing or threatening to cause water pollution, ii. Modify its coal ash and coal combustion waste disposal and storage practices so as to avoid future groundwater contamination, [and] iii. Remediate the contaminated groundwater so that it meets applicable Illinois Groundwater Quality Standards (GQSs)." *Id.* The case law cited by Respondent doesn't govern because at issue in those cases was (1) whether the Board had the authority to enforce a State court order or (2) the complaint's verbatim request for an injunction from the Board. *Janson* v. *Ill. Pollution Control Bd.*, 69 Ill. App. 3d 324, 328, 387 N.E.2d 404, 408 (1979); *Clean*

the Uniform Co.-Highland v. Aramark Uniform & *Career Apparel, Inc.*, PCB 03-21, 2002 WL 31545663, at *1-2 (IPCB Nov. 7, 2002).

In *Janson*, the Court was addressing the question of priority of jurisdiction of two separate cases. 69 Ill. App. 3d at 328. One case was before the Board and the second case in state court "was essentially one involving the contempt power of the circuit court to enforce the court approved stipulation." *Id.* The court examined the question of whether the second case should have been brought before the Board. "The Pollution Control Board has no authority to adjudicate the issue of petitioner's violation of the stipulation approved by the circuit court action. The Board has no authority to issue or enforce injunctive relief as requested in the circuit court or to punish for civil contempt." *Id.* Thus, the Court's statements regarding the PCB's authority to issue injunctive relief were focused on injunctive relief related to a violation of a stipulation from a prior court action. This is wholly unrelated to the Board's authority to fashion an appropriate remedy in a final order in the present enforcement action.

Similarly, the second case cited by Respondent, *Clean the Uniform v. Aramark*, is also completely distinguishable. PCB 03-21, 2002 WL 31545663, at *1-2. In that case, the Complainant was literally seeking injunctive relief. *Id*. at *2. "[T]he complaint seeks both cost recovery and 'injunctive' relief. Comp. at 1. The Board is not authorized to grant injunctive relief (415 ILCS 5/43 (2000)) and that portion of the complaint is stricken." *Id.* Again, the facts in *Clean the Uniform* are distinguishable from the present case because the complaint literally sought injunctive relief, which the Board is not authorized to grant. In the present case, Complainants do not seek injunctive relief but a cease and desist from violations of the Illinois Environmental Protection Act (the "Act") and regulations and other appropriate remedies. Neither of the holdings in *Janson* or *Clean the Uniform* applies to the present case, and

Respondent's claim that Complainants are seeking injunctive relief that the Board cannot grant is false.

Second, Respondent argues that "[w]hile the Board may order a Respondent to cease and desist from violations of the Act, the Board authority does not extend to the imposition of the relief requested by Complainants to order modification of coal ash practice or to order a plan of remediation of contaminated groundwater." Resp't Mot. at 3-4. Respondent, again, is incorrect. The Complaint seeks (1) a cease and desist from causing water pollution; (2) a modification of CWLP's coal ash storage and disposal practices in order to stop causing groundwater exceedances; and (3) remediation of groundwater contamination. Complainants' First Am. Compl. at 16. This relief is within the Board's statutory authority and completely consistent with the Act. Section 33(a) gives the Board the authority to "issue and enter such final order" it deems "appropriate under the circumstances." 415 ILCS 5/33(a). The Board "order may include a direction to cease and desist from violations of this Act, [and] any rule or regulation adopted under this Act." 415 ILCS 5/33(b). This grant of authority gives the Board "wide discretion in fashioning a remedy." *Sierra Club v. MWGen,* PCB 13-15, 2014 WL 1630316, at *15 (quoting *Roti v. LTD Commodities*, 355 Ill. App. 3d 1039, 1053, 823 N.E.2d 636, 647 (2005); *see also Discovery S. Grp., Ltd. v. Pollution Control Bd.*, 275 Ill. App. 3d 547, 557-61, 656 N.E.2d 51, 58-61 (1995) (upholding Board decision requiring outdoor amphitheater to conduct sound monitoring and meet sound level restrictions tailored to theater)); *see also Finley v. IFCO ICS-Chicago, Inc.*, PCB 02-208, 2002 WL 1876193, at *9 (IPCB Aug. 8, 2002) (holding that Board's authority is not limited to just cease and desist order, but other relief as the Board deems appropriate and penalties).

The *Roti* case provides a good example of the Board's "wide discretion in fashioning a remedy." *Roti*, 355 Ill. App. 3d at 1053. In *Roti*, the court held that the remedies ordered by the Board—ceasing nighttime operations and disconnecting the back-up beeper on a tractor, or, alternatively, building a noise wall—were permissible. *Id*. at 1053-54. Similarly, in the present case, should the Board determine that closure of the ash ponds is an appropriate remedy and orders the "means and manner through which CWLP proceeds with" closure (Resp't Mot. at 1), it would be similar to the Board remedies in *Roti* and within the Board's statutory authority.

Another case providing a strong analogy to the present case is *People v. Jersey Sanitation*. PCB 97-2, 2005 WL 1496953, at *3 (IPCB June 16, 2005). In *Jersey Sanitation*, the Board pointed out that "Section 33(a) of the Act gives the Board broad discretion in matters of remedy by authorizing it to enter 'such final order . . . as it shall deem appropriate under the circumstances.'" *Id.* at *3. The Board ordered Jersey Sanitation to comply with requirements in its existing permit and also to conduct groundwater sampling and an assessment plan. "In an enforcement proceeding the Board may order the submission of a program or order further hearings to develop one." *Id.* (citing Currie, David, *Enforcement Under the Illinois Pollution Law*, Nw. U. L. Rev., Vol. 70, No. 3 (1976); citing *EPA v. Champaign*, PCB 71-51C (Sept. 16, 1971) ("requiring respondent to report regarding the condition of the water body and steps taken to mitigate pollution and to report on a program for the policing and improving the water quality of the water body"); *rev'd in part on other grounds, City of Champaign v. Envtl. Prot. Agency*, 12 Ill. App. 3d 720; 299 N.E.2d 28 (1973)). "[O]rdering Jersey Sanitation to complete groundwater monitoring as provided in its permit is not outside of the Board's authority because is an exercise of the Board's power to order compliance." *Jersey Sanitation*, PCB 97-2, 2005 WL 1496953, at *4. The alternatives analysis that Complainant's expert Mark Hutson

recommended,[3] falls within the scope of the "submission of a program" that the Board held was a permissible part of the remedy in *Jersey Sanitation*. PCB 97-2, 2005 WL 1496953, at *3.

Respondent's factual claim that "Complainants purport to dictate the means and manner through which CWLP proceeds with its stated intent to close its unlined ash ponds," (Resp't Mot. at 1) is also unsupported by the facts. Respondent also claims that the "City has committed publicly for some time that it plans to close its unlined ash ponds." *Id.* at 11. First, there are no citations to the record to support these statements. A summary judgment motion must be supported with adequate citations to the record. *Brickyard Disposal & Recycling, Inc. v. Ill. Envtl. Prot. Agency*, PCB 16-66, 2016 WL 6901282, at *4 (IPCB Nov. 17, 2016). Second, the Complaint does not seek closure in its request for relief. Complainants' First Am. Compl. at 16. Third, while Mr. Hutson identifies closure as an option in his discussion of a range of remedies, he does not advocate for any specific remedy. Supplemental Expert Report of Mark A. Hutson, PG at 23-30 (Mar. 26, 2019) ("Hutson Suppl. Expert Report") (provided as Attachment 2). Instead, he recommends that the selection of a remedy should be conducted through a process that provides a "detailed analysis of alternatives . . . to evaluate the range of options and make a final selection." Hutson Rebuttal at 11 (quoted in Resp't Mot. at 3, 12). Consequently, Respondent's claim that Complainants seek to dictate the means and manner through which CWLP closes its ash ponds is disputed. Contrary to Respondent's claim, this is a genuine issue of material fact. 35 Ill. Admin. Code §§ 101.516(a), 101.202; *Brickyard Disposal & Recycling, Inc., v. Ill. Envtl. Prot. Agency*, PCB 16-66, 2016 WL 5373592, at *3 (IPCB Sept. 16, 2016); *City of Quincy v. Ill. Envtl. Prot. Agency*, PCB 08-86, 2010 WL 2547531 (IPCB June 17, 2010).

Respondent also argues that the need for further fact finding on remedy and statements by Complainants' expert indicate that dispositive motions and proceedings to hearings are

[3] *See* Rebuttal Report of Mark A. Hutson, PG at 11 (June 27, 2019) ("Hutson Rebuttal").

premature in this matter. Resp't Mot. at 3, 12 ("[N]either [Complainants' Expert] nor the Complainants are in a position to recommend any specific remedy without further fact finding."). Again, Respondent is incorrect. The Board has found fact finding as part of a remedy to be appropriate and permissible part of the relief in a Board Order. Specifically, "[i]n an enforcement proceeding the Board may order . . . further hearings to develop [a program]." *Jersey Sanitation*, PCB 97-2, 2005 WL 1496953, at *3 (citing Currie, David, *Enforcement Under the Illinois Pollution Law*, Nw. U. L. Rev., Vol. 70, No. 3 (1976); citing *EPA v. Champaign*, PCB 71-51C ("requiring respondent to report regarding the condition of the water body and steps taken to mitigate pollution and to report on a program for the policing and improving the water quality of the water body"); *rev'd in part on other grounds, City of Champaign*, 12 Ill. App. 3d 720). Hutson Rebuttal at 11. As indicated by the Board's holdings in *Jersey Sanitation* and *EPA v. Champaign*, it is within the Board's authority to order the alternatives analysis that Complainants' expert recommends and hearings to select a remedy in the present case. Complainants' summary judgment motion on liability and any subsequent hearings to either develop a remedy or identify a remedy are not premature.

IV. The Board Would Not Be Engaged in an Improper Rulemaking If It Ordered Complainants' Requested Relief.

Respondent also argues that the Board would be improperly engaged in a rulemaking if it identified a procedure to close CWLP's ash ponds because the IEPA has been directed to propose rules to close ash impoundments. Resp't Mot. at 4. Respondent argues that "the Board is without statutory authority to proceed with rulemaking without the advice of the EPA." *Id.* (emphasis omitted). But just because the IEPA has been directed by the legislature to develop rules to close ash impoundments does not mean that the Board would be engaged in a rulemaking if it identified a procedure for closing ponds at CWLP. The distinction between a

rulemaking and an adjudicatory action is not based on subject matter but on whether the agency is making a statement of general applicability. The Illinois Administrative Procedure Act ("APA") defines the term "rule" in part as an "agency statement of general applicability that implements, applies, interprets, or prescribes law or policy . . . " 5 ILCS 100/1-70. On the other hand, an agency is not engaged in a rulemaking when it conducts an "adjudicatory proceeding" making a determination as to "individual legal rights, duties, or privileges." 5 ILCS 100/1-30. In *Discovery South Group*, the Court held that the Board's final order requiring three years of monitoring and company compliance with existing noise regulations was within "the Board's power to order compliance ." 275 Ill. App. 3d at 560. The court relied on the APA definition of rule when it concluded that if the remedy imposed by the PCB is "not a new standard of general applicability" then the PCB was not engaged in a rulemaking. *Id.* Similarly, any remedy imposed on CWLP in the present case will not be a standard of general applicability that gets applied to CWLP ash ponds and ash ponds not owned by CWLP alike. Instead, in determining a remedy in this case, the Board will be making a determination as to CWLP's individual legal rights and duties. As a result, this proceeding does not qualify as a rulemaking.

V. Respondent Did Not Bear Its Burden of Production on Its Summary Judgment Motion.

Finally, Complainants note that Respondent has not met its burden of production to point to uncontested evidence supporting its arguments. Virtually the only piece of evidence from the record that Respondent cites is Complainants' Expert Mark Hutson's Rebuttal report. Resp't Mot. at 3, 12. Respondent does not, however, cite Mr. Hutson's Rebuttal Report for the purpose of identifying undisputed material facts but instead for the purpose of arguing that Complainants have not adequately identified a remedy and, therefore, proceeding in the case would be

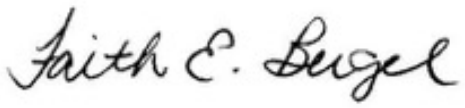
premature.[4] The Board does not bear the burden of combing the record looking for evidence that supports Respondent's naked allegations. "Where a movant 'has not cited to any specific pages of the record in support of its contentions[,] [t]he Board will not search the record in order to support a movant's contentions.'" *Brickyard*, PCB 16-66, 2016 WL 5373592, at *3 (quoting *Concerned Citizens of Williamson Cnty. v. Bill Kibler Dev. Corp.*, PCB 92-204 (Apr. 8, 1993)). Further, as stated supra, Mr. Hutson identified a whole range of remedies in his Supplemental Report and recommended a process by which a remedy can be selected. Hutson Suppl. Expert Report at 23-30. Remedies identified in Mr. Hutson's report include: discontinuing disposal in the ponds, eliminating wet handling of ash, leachate and groundwater collection and treatment, installation of physical barriers, retrofitting the impoundments, capping in place, excavation and beneficial reuse of ash in the ponds, and excavation and disposal of ash. *Id.* Complainants have thus identified a range of numerous remedies and appropriately recommend a Board process for selecting one of those remedies. Consequently, Respondent has failed to identify uncontested evidence supporting its arguments and, thus, failed to meet its burden of production on summary judgment.

VI. Conclusion

Therefore, for the reasons listed above, Complainants respectfully request that the Board deny Respondent's Motion and allow this case to proceed forward accordingly.

[4] Complainants dispute these latter assertions, as discussed supra.

Dated: February 13, 2020
Respectfully submitted,



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CERTIFICATE OF SERVICE

I, Faith E. Bugel, an attorney, certify that I have served electronically upon the Clerk and by email upon the individuals named on the attached Service List a true and correct copy of the **NOTICE OF FILING** and **COMPLAINANTS' AMENDED RESPONSE TO RESPONDENT'S MOTION FOR PARTIAL SUMMARY JUDGMENT**, a 204 page document, before 5 p.m. Central Time on February 13, 2020 to the email addresses of the parties on the attached Service List.

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PCB 18-11

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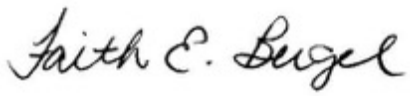
Respectfully submitted,



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ATTACHMENT 1

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

PART 845
STANDARDS FOR THE DISPOSAL OF COAL COMBUSTION RESIDUALS IN SURFACE IMPOUNDMENTS

SUBPART A: GENERAL PROVISIONS

SUBPART B: PERMITTING

SUBPART C: LOCATION RESTRICTIONS

SUBPART D: DESIGN CRITERIA

SUBPART E: OPERATING CRITERIA

SUBPART F: GROUNDWATER MONITORING AND CORRECTIVE ACTION

SUBPART G: CLOSURE AND POST-CLOSURE CARE

SUBPART H: RECORDKEEPING

SUBPART I: FINANCIAL ASSURANCE

AUTHORITY: Implementing Sections 22.59 and 22 of the Environmental Protection Act [415 ILCS 5/12 and 22] and authorized by Sections 27, and 28 of the Environmental Protection Act [415 ILCS 5/ 27, and 28].

SOURCE: Adopted in R__-__ at __ Ill. Reg._____, effective _____.

SUBPART A: GENERAL PROVISIONS

Section 845.100 Scope and Purpose

a) This Part establishes criteria for the purpose of determining which CCR surface impoundments do not pose a reasonable probability of adverse effects on health or the environment. CCR surface impoundments failing to satisfy any of the requirements of this Part are considered open dumps, which are prohibited.

b) This Part applies to owners and operators of new and existing surface impoundments, including any lateral expansions of CCR surface impoundments that dispose or otherwise engage in solid waste management of CCR generated from the combustion of coal at electric utilities and independent power producers. Unless otherwise provided in this Part, these requirements also apply to CCR surface impoundments located off-site of the electric utility or independent power producer.

c) This Part also applies to inactive CCR surface impoundments at active and inactive electric utilities or independent power producers, regardless of the fuel currently used at the facility to produce electricity.

d) Except as provided in Section 845.170, inactive CCR surface impoundments are subject to all the requirements of this Part applicable to existing CCR surface impoundments.

e) This Part does not apply to wastes, including fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated at facilities that are not part of an electric utility or independent power producer, such as manufacturing facilities, universities, and hospitals. This Part also does not apply to fly ash, bottom ash, boiler slag, and flue gas desulfurization materials, generated primarily from the combustion of fuels (including other fossil fuels) other than coal, for the purpose of generating electricity unless the fuel burned consists of more than fifty percent (50%) coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal.

f) This Part does not apply to practices that meet the definition of a beneficial use of CCR.

g) This Part does not apply to CCR placement at active or abandoned underground or surface coal mines.

h) This Part does not apply to landfills that receive CCR.

Section 845.110 Applicability of Other Regulations

a) Compliance with the requirements of this Part does not affect the need for the owner or operator of a CCR surface impoundment or lateral expansion of a CCR surface impoundment, to comply with all other applicable federal, state, tribal, or local laws or other requirements.

b) Any CCR surface impoundment or lateral expansion of a CCR surface impoundment continues to be subject to the following requirements:

1) Floodplains:

A) Facilities or practices in floodplains shall not restrict the flow of the base flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste, so as to pose a hazard to human life, wildlife, or land or water resources.

B) As used in this subsection:

i) Base flood means a flood that has a 1 percent or greater chance of recurring in any year or a flood of a magnitude equaled or exceeded once in 100 years on average over a significantly long period.

ii) Floodplain means the lowland and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands, which are inundated by the base flood.

iii) Washout means the carrying away of solid waste by waters of the base flood.

2) Illinois Endangered Species Protection Act, 520 ILCS 10.

3) Surface Water

A) A facility shall not cause a discharge of pollutants into waters of the United States that is in violation of the requirements of the National Pollutant Discharge Elimination System (NPDES) under section 402 of the Clean Water Act, as amended, Section 12(f) of the Act, or 35 Ill. Adm. Code Subtitle C.

B) A facility shall not cause a discharge of dredged material or fill material to waters of the United States that is in violation of the requirements under section 404 of the Clean Water Act, as amended.

C) A facility or practice shall not cause non-point source pollution of waters of the United States that violates applicable legal requirements implementing an areawide or Statewide water quality management plan that has been approved by USEPA under section 208 of the Clean Water Act, as amended.

D) Definitions of the terms Discharge of dredged material, Point source, Pollutant, and Waters of the United States can be found in the Clean Water Act, as amended, 33 U.S.C. 1251 et seq., and implementing regulations, specifically 33 CFR part 323 (42 FR 37122, July 19, 1977).

4) Rivers, Lakes and Streams Act, 615 ILCS 5/23 and 23(a) and implementing regulations in 17 Ill. Adm. Code 3702.

Section 845.120 Definitions

Except as stated in this Section, or unless a different meaning of a word or term is clear from the context, the definition of words or terms in this Part will be the same as that applied to the same words or terms in the Environmental Protection Act (Act):

"Act" means the Illinois Environmental Protection Act [415 ILCS 5].

"Active facility" or "active electric utilities" or "independent power producers" means any facility subject to the requirements of this Part that is in operation on or after October 19, 2015. An electric utility or independent power producer is in operation if it is generating electricity that is provided to electric power transmission systems or to electric power distribution systems on or after October 19, 2015. An off-site CCR surface impoundment is in operation if it is accepting or managing CCR on or after October 19, 2015.

"Active life" or "in operation" means the period of operation beginning with the initial placement of CCR in the CCR surface impoundment and ending at completion of closure activities in accordance with Subpart G.

"Agency" means the Illinois Environmental Protection Agency.

"Aquifer" means a geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of groundwater to wells or springs.

"Area-capacity curves" means graphic curves which readily show the reservoir water surface area, in acres, at different elevations from the bottom of the reservoir to the maximum water surface, and the capacity or volume, in acre-feet, of the water contained in the reservoir at various elevations.

"Areas susceptible to mass movement" means those areas of influence (i.e., areas characterized as having an active or substantial possibility of mass movement) where, because of natural or human-induced events, the movement of earthen material at, beneath, or adjacent to the CCR surface impoundment may result in the downslope transport of soil and rock material by means of gravitational influence. Areas of mass movement include, but are not limited to, landslides, avalanches, debris slides and flows, soil fluctuation, block sliding, and rock fall.

"Beneficial use of CCR" means CCR that meets the definition of coal combustion by product in the Act and the definition of "beneficial use of CCR" pursuant to 40 C.F.R. 257.53.

"Board" means Illinois Pollution Control Board.

"Certified Laboratory" means any laboratory certified under Section 4(o) of the Act, or certified by USEPA for the specific parameters to be examined.

"Closed" means placement of CCR in a CCR surface impoundment has ceased, and the owner or operator has completed closure of the CCR surface impoundment and has initiated post-closure care in accordance with Subpart G.

"Coal combustion residuals" or "CCR" means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

"CCR fugitive dust" means solid airborne particulate matter that contains or is derived from CCR, emitted from any source other than a stack or chimney.

"CCR storage pile" means any temporary accumulation of solid, non-flowing CCR placed on the land that is designed and managed to control releases of CCR to the environment. CCR contained in an enclosed structure is not a CCR storage pile. Examples of control measures to control releases from CCR storage piles include: periodic wetting, application of surfactants, tarps or wind barriers to suppress dust; tarps or berms for preventing contact with precipitation and controlling run-on/runoff; and impervious storage pads or geomembrane liners for soil and groundwater protection.

"CCR surface impoundment" or "impoundment" means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR.

"Dike" means an embankment, berm, or ridge of either natural or man-made materials used to prevent the movement of liquids, sludges, solids, or other materials.

"Displacement" means the relative movement of any two sides of a fault measured in any direction.

"Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste as defined in section 1004(27) of the Resource Conservation and Recovery Act into or on any land or water or into any well so that such solid waste, or constituent thereof, may enter the environment or be emitted into the air or discharged into any waters, including groundwaters. For purposes of this Part, disposal does not include the beneficial use of CCR.

"Downstream toe" means the junction of the downstream slope or face of the CCR surface impoundment with the ground surface.

"Enclosed structure" means:

(1) A completely enclosed, self-supporting structure that is designed and constructed of manmade materials of sufficient strength and thickness to support itself, the CCR, and any personnel and heavy equipment that operate within the structure, and to prevent failure due to settlement, compression, or uplift; climatic conditions; and the stresses of daily operation, including the movement of heavy

equipment within the structure and contact of such equipment with containment walls;

(2) Has containment walls that are designed to be sufficiently durable to withstand any movement of personnel, CCR, and handling equipment within the structure;

(3) Is designed and operated to ensure containment and prevent fugitive dust emissions from openings, such as doors, windows and vents, and the tracking of CCR from the structure by personnel or equipment.

"Existing CCR surface impoundment" means a CCR surface impoundment in which CCR is placed both before and after October 19, 2015, or for which construction commenced prior to October 19, 2015 and in which CCR is placed on or after October 19, 2015. A CCR surface impoundment has commenced construction if the owner or operator has obtained the federal, state, and local approvals or permits necessary to begin physical construction and a continuous on-site, physical construction program had begun prior to October 19, 2015.

"Facility" means all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, disposing, or otherwise conducting solid waste management of CCR. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations of them).

"Factor of safety" or "Safety factor" means the ratio of the forces tending to resist the failure of a structure to the forces tending to cause such failure as determined by accepted engineering practice.

"Fault" means a fracture or a zone of fractures in any material along which strata on one side have been displaced with respect to that on the other side.

"Flood hydrograph" means a graph showing, for a given point on a stream, the discharge, height, or other characteristic of a flood as a function of time.

"Free liquids" means liquids that readily separate from the solid portion of a waste under ambient temperature and pressure.

"Groundwater" means water below the land surface in a zone of saturation.

"Hazard potential classification" means the possible adverse incremental consequences that result from the release of water or stored contents due to failure of the diked CCR surface impoundment or mis-operation of the diked CCR surface impoundment or its appurtenances. The hazardous potential classifications include Class 1 and Class 2, which mean:

Class 1 CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.

Class 2 CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.

"Height" means the vertical measurement from the downstream toe of the CCR surface impoundment at its lowest point to the lowest elevation of the crest of the CCR surface impoundment, not including spillways.

"Holocene" means the most recent epoch of the Quaternary period, extending from the end of the Pleistocene Epoch, at 11,700 years before present, to present.

"Hydraulic conductivity" means the rate at which water can move through a permeable medium (i.e., the coefficient of permeability).

"Inactive CCR surface impoundment" means a CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015. Inactive CCR surface impoundments may be located at an active facility or inactive facility.

"Inactive Closed CCR surface impoundment" means an inactive CCR surface impoundment that completed closure before October 19, 2015 with an Agency-approved closure plan.

"Inactive facility" or "inactive electric utilities or independent power producers" means any facility that is not in operation on or after October 19, 2015.

"Incised CCR surface impoundment" means a CCR surface impoundment which is constructed by excavating entirely below the natural ground surface, holds an accumulation of CCR entirely below the adjacent natural ground surface, and does not consist of any constructed diked portion.

"Inflow design flood" means the flood hydrograph that is used in the design or modification of the CCR surface impoundments and its appurtenant works.

"In operation" means the same as "active life."

"Karst terrain" means an area where karst topography, with its characteristic erosional surface and subterranean features, is developed as the result of dissolution of limestone, dolomite, or other soluble rock. Characteristic physiographic features present in karst terranes include, but are not limited to, dolines, collapse shafts (sinkholes), sinking streams, caves, seeps, large springs, and blind valleys.

"Lateral expansion" means a horizontal or vertical expansion of the waste boundaries of an existing CCR surface impoundment made after October 19, 2015.

"Liquefaction factor of safety" means the factor of safety (safety factor) determined using analysis under liquefaction conditions.

"Lithified earth material" means all rock, including all naturally occurring and naturally formed aggregates or masses of minerals or small particles of older rock that formed by crystallization of magma or by induration of loose sediments. This term does not include man-made materials, such as fill, concrete, and asphalt, or unconsolidated earth materials, soil, or regolith lying at or near the earth surface.

"Maximum horizontal acceleration in lithified earth material" means the maximum expected horizontal acceleration at the ground surface as depicted on a seismic hazard map, with a 98% or greater probability that the acceleration will not be exceeded in 50 years, or the maximum expected horizontal acceleration based on a site-specific seismic risk assessment.

"New CCR surface impoundment" means a CCR surface impoundment or lateral expansion of an existing or new CCR surface impoundment that first receives CCR or commences construction after October 19, 2015. A new CCR surface impoundment has commenced construction if the owner or operator has obtained the federal, state, and local approvals or permits necessary to begin physical construction and a continuous on-site, physical construction program had begun after October 19, 2015.

"Operator" means the person(s) responsible for the overall operation of a CCR surface impoundment.

"Outermost damage zone of a fault" means the volume of deformed wall rocks around a fault surface that results from the initiation, propagation, interaction and build-up of slip along faults.

"Owner" means the person(s) who owns a CCR surface impoundment or part of a CCR surface impoundment.

"Poor foundation conditions" means those areas where features exist which indicate that a natural or human-induced event may result in inadequate foundation support for the structural components of an existing or new CCR surface impoundment. For example, failure to maintain static and seismic factors of safety as required in Section 845.460 would cause a poor foundation condition.

"Probable maximum flood" means the flood that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the drainage basin.

"Qualified person" means a person or persons trained to recognize specific appearances of structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR surface impoundment by visual observation and, if applicable, to monitor instrumentation.

"Qualified professional engineer" means an individual who is licensed under the Professional Engineer Act of 1989, 225 ILCS 32, to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to complete the engineering analyses and make the specific technical certifications required under this Part.

"Recognized and generally accepted engineering practices" means engineering maintenance or operation activities based on established codes, widely accepted standards, published technical reports, or a practice widely recommended throughout the industry. Such practices generally detail approved ways to perform specific engineering, inspection, or mechanical integrity activities.

"Retrofit" means to remove all CCR and contaminated soils and sediments from the CCR surface impoundment, and to ensure the surface impoundment complies with the requirements in Section 845.410.

"Run-off" means any rainwater, leachate, or other liquid that drains over land from any part of a CCR surface impoundment or lateral expansion of a CCR surface impoundment.

"Run-on" means any rainwater, leachate, or other liquid that drains over land onto any part of a CCR surface impoundment or lateral expansion of a CCR surface impoundment.

"Sand and gravel pit" or "quarry" means an excavation for the extraction of aggregate, minerals or metals. The term sand and gravel pit and/or quarry does not include subsurface or surface coal mines.

"Seismic factor of safety" means the factor of safety (safety factor) determined using analysis under earthquake conditions using the peak ground acceleration for a seismic event with a 2% probability of exceedance in 50 years, equivalent to a return period of approximately 2,500 years, based on the U.S. Geological Survey (USGS) seismic hazard maps for seismic events with this return period for the region where the CCR surface impoundment is located.

"Seismic impact zone" means an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 50 years.

"Slope protection" means engineered or non-engineered measures installed on the upstream or downstream slope of the CCR surface impoundment to protect the slope against wave action or erosion, including but not limited to rock riprap, wooden pile,

concrete revetments, vegetated wave berms, concrete facing, gabions, geotextiles, or fascines.

"Solid waste management" or "management" means the systematic administration of the activities which provide for the collection, source separation, storage, transportation, processing, treatment, or disposal of solid waste.

"Static factor of safety" means the factor of safety (safety factor) determined using analysis under the long-term, maximum storage pool loading condition, the maximum surcharge pool loading condition, and under the end-of-construction loading condition.

"Structural components" means liners, leachate collection and removal systems, final covers, run-on and run-off systems, inflow design flood control systems, and any other component used in the construction and operation of the CCR surface impoundment that is necessary to ensure the integrity of the surface impoundment and that the contents of the surface impoundment are not released into the environment.

"Temporary accumulation" means an accumulation on the land that is neither permanent nor indefinite. To demonstrate that the accumulation on the land is temporary, all CCR must be removed from the pile at the site. The entity engaged in the activity must have a record in place, such as a contract, purchase order, facility operation and maintenance, or fugitive dust control plan, documenting that all of the CCR in the pile will be completely removed according to a specific timeline.

"Unstable area" means a location that is susceptible to natural or human-induced events or forces capable of impairing the integrity, including structural components of some or all of the CCR surface impoundment that are responsible for preventing releases from such surface impoundment. Unstable areas can include poor foundation conditions, areas susceptible to mass movements, and karst terrains.

"Uppermost aquifer" means the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary. Upper limit is measured at a point nearest to the natural ground surface to which the aquifer rises during the wet season.

"Waste boundary" means a vertical surface located at the hydraulically downgradient limit of the CCR surface impoundment. The vertical surface extends down into the uppermost aquifer.

"Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Section 845.130 Surface Impoundment Identification

The owner or operator of a CCR surface impoundment must place on or immediately adjacent to the CCR surface impoundment a permanent identification marker at least six feet high showing the identification number of the CCR surface impoundment assigned by the Agency, the name associated with the CCR surface impoundment and the name of the owner or operator of the CCR surface impoundment. The owner or operator must maintain the marker until completion of closure by removal or completion of post-closure care, as applicable.

Section 845.140 Right of Inspection

The owner or operator of a CCR surface impoundment must allow the Agency and its duly authorized representatives to perform inspections in accordance with its authority under the Act, including but not limited to:

a) entering at reasonable times the facility where CCR surface impoundments are located or where any activity is to be conducted pursuant to a permit issued under this Part;

b) having access to and copying at reasonable times any records required to be kept under the terms and conditions of a permit or this Part;

c) inspecting at reasonable times, including during any hours of operation:

1) equipment constructed or operated under a permit issued under this Part;

2) equipment or monitoring methodology; or

3) equipment required to be kept, used, operated, calibrated and maintained under a permit issued under this Part;

d) obtaining and removing at reasonable times samples of any raw or finished water, discharge or emission of pollutants;

e) entering at reasonable times to use any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring or recording any raw or finished water, activity, discharge or emission authorized by a permit.

Section 845.150 Incorporations by Reference

a) The Board incorporates the following material by reference:

Association For the Advancement of Cost Engineering (AACE)

"Cost Estimate Classification System—As Applied in Engineering, Procurement, and Construction for the Process Industries" TCM Framework: 7.3 – Cost Estimating and Budgeting. February 2, 2005, AACE

International Recommended Practice No. 18R-97. (available on line at https://www.costengineering.eu/Downloads/articles/AACE_CLASSIFICATIONSYSTEM.pdf).

"NIOSH Pocket Guide to Chemical Hazards", September 2007, Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2005-149 (accessible online and available by download from https://www.cdc.gov/niosh/docs/2005-149/pdfs/2005-149.pdf).

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

"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 online at http://www.epa.gov/epaoswer/hazwaste/test/main.htm).

b) This Section incorporates no later editions or amendments.

Section 845.160 Severability

If any provision of this Part or its application to any person or under any circumstances is adjudged invalid, such adjudication shall not affect the validity of this Part as a whole or of any portion not adjudged invalid.

Section 845.170 Inactive Closed CCR Surface Impoundments

a) Only the following provisions of this Part apply to inactive closed CCR surface impoundments:

1) all of Subpart A: General Provisions

2) the following Sections of Subpart B: Permitting

A) Section 845.200;

B) Section 845.210;

C) Section 845.220(a), (c), (f)(1);

D) Section 845.230(c) and (d)(4);

E) Section 845.250;

F) Section 845.270;

G) Section 845.280;

H) Section 845.290;

3) the following Section of Subpart G: Section 845.780(b), (d) and (e); and

4) all of Subpart I: Financial Assurance.

b) When a prior release from an inactive closed CCR surface impoundment has caused an exceedance of the groundwater quality standards, and the owner or operator has not completed remediation of the release before completing closure, the owner or operator must initiate or continue corrective action under an operating permit issued pursuant to this Part.

c) When a release from an inactive closed CCR surface impoundment causes an exceedance of the groundwater quality standards in 35 Ill. Adm. Code Part 620, and the Agency has not concurred with an alternative source demonstration, the owner or operator of an inactive closed CCR surface impoundment must initiate an assessment of corrective measures that prevents further releases, remediates any releases, and restores the affected area. The owner or operator of the inactive closed CCR surface impoundment shall develop a corrective action plan and obtain a construction permit consistent with subsection (a)(2) of this Section before preforming any corrective action to remediate any releases and to restore the affected area, including, but not limited to the final cover system, groundwater monitoring system, groundwater collection trench, extraction wells, slurry walls, or any construction related to corrective action.

SUBPART B: PERMITTING

Section 845.200 Permit Requirements and Standards of Issuance

a) Permit Requirements

1) No person shall construct, install or modify a CCR surface impoundment or related treatment or mitigation facilities without a construction permit issued by the Agency pursuant to this Part.

2) Except as provided in Section 845.230(d), no person shall operate a CCR surface impoundment without an operating permit issued by the Agency pursuant to this Part. For the purposes of this Part, a CCR surface impoundment commences operation upon initial receipt of CCR.

3) No person shall perform corrective action at a CCR surface impoundment without obtaining a construction permit for corrective action and modifying the facility's operating permit, or modifying the facility's

operating permit when the approved corrective action does not require the modification of the CCR surface impoundment or the installation or modification of related treatment or mitigation facilities.

4) Except as provided in Section 22.59(e) of the Act, no person shall close a CCR surface impoundment without obtaining a construction permit for closure issued by the Agency pursuant to this Part.

5) A CCR surface impoundment must maintain an operating permit until:

A) the completion of post-closure care when the CCR surface impoundment is closed with a final cover system; or

B) the completion of closure when the CCR surface impoundment is closed by removal.

6) The Agency may issue a joint construction and operating permit.

b) Standards for Issuance

1) Except as provided in subsection (b)(2), the Agency shall not issue any construction or operating permit required by this Part unless the applicant submits adequate proof that the CCR surface impoundment will be constructed, modified or operated so as not to cause a violation of the Act or Board rules.

2) The existence of a violation of the Act, Board regulation, or Agency regulation will not prevent the issuance of a construction permit if:

A) the applicant has been granted a variance or an adjusted standard from the regulation by the Board;

B) the permit application is for construction or installation of equipment to alleviate or correct a violation; or

C) the permit application is for construction or installation of equipment necessary to restore, protect or enhance the environment.

3) *In granting permits, the Agency shall impose conditions as may be necessary to accomplish the purpose of the Act and as are not inconsistent with this Part.* [415 ILCS 5/39(a)]

4) *In making its determinations on permit applications under this* Part, *the Agency may consider prior adjudications of noncompliance with this Act*

by the applicant that involved a release of a contaminant into the environment. [415 ILCS 5/39(a)]

Section 845.210 General Provisions

a) All permit applications shall be made on such forms as are prescribed by the Agency and shall be mailed or delivered to the address designated by the Agency on the forms. The Agency shall provide a dated, signed receipt upon request. The Agency's record of the date of filing shall be deemed conclusive unless a contrary date is proved by a dated, signed receipt.

b) Required Signatures of Owners or Operators

1) All permit applications shall contain the name, address, email address and telephone number of the operator, or duly authorized agent, and the property owner to whom all inquiries and correspondence shall be addressed.

2) All permit applications shall be signed by the owner, operator or a duly authorized agent of the operator.

3) An application submitted by a corporation shall be signed by a principal executive officer of at least the level of vice president, or his or her duly authorized representative, if such representative is responsible for the overall operation of the facility described in the application form. In the case of a partnership or a sole proprietorship, the application shall be signed by a general partner or the proprietor, respectively. In the case of a publicly owned facility, the application shall be signed by either the principal executive officer, ranking elected official, or other duly authorized employee.

c) Legal Description. All permit applications shall contain a legal description of the facility boundary and the boundaries of all units included in the facility.

d) Previous Assessments, Investigations, Plans and Programs

1) The Agency may approve the use of any hydrogeologic site investigation or characterization, groundwater monitoring well or system, or groundwater monitoring plan completed prior to the effective date of these rules to satisfy the requirements of this Part.

2) For existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed location restriction demonstration required by Section 845.300 (Placement Above The Uppermost Aquifer), Section 845.310 (Wetlands), Section 845.320 (Fault Areas), Section 845.330 (Seismic Impact Zones), and Section

845.340 (Unstable Areas) provided that the previously completed assessments meet the applicable requirements of those Sections.

3) For existing CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a previously completed assessment to serve as the initial assessment required by Section 845.440 (Hazard Potential Classification Assessment), Section 845.450 (Structural Stability Assessment) and Section 845.460 (Safety Factor Assessment) provided that the previously completed assessment:

A) was not completed more the five years ago; and

B) meets the applicable requirements of those Sections.

4) For inactive closed CCR surface impoundments, the owner or operator of the CCR surface impoundment may use a post-closure care plan previously approved by the Agency.

e) The Agency shall mail all notices of final action by certified mail, post marked with a date stamp and with return receipt requested. Final action shall be deemed to have taken place on the post marked date that such notice is mailed.

f) Violation of any permit condition or failure to comply with the Act or regulations promulgated under the Act shall be grounds for enforcement action as provided in the Act, including revocation of a permit.

g) Issuance of a permit under this Part does not relieve the applicant of the obligation to obtain other permits required by law.

h) The owner or operator shall place in the facility's operating record all permit applications submitted to the Agency and all permits issued under this Part, as required by Section 845.800(d)(1).

Section 845.220 Construction Permits

a) All construction permit applications must contain the following information and documents.

1) Design and Construction Plans

A) Identifying information

i) The name and address of the person(s) owning or operating the CCR surface impoundment;

ii) The name associated with the CCR surface impoundment; and

iii) The identification number of the CCR surface impoundment if one has been assigned by the Agency.

B) A statement of the purpose for which the CCR surface impoundment is being used, how long the CCR surface impoundment has been in operation, and the types of CCR that have been placed in the CCR surface impoundment.

C) The name and size in acres of the watershed within which the CCR surface impoundment is located.

D) A description of the physical and engineering properties of the foundation and abutment materials on which the CCR surface impoundment is constructed.

E) A statement of the type, size, range, and physical and engineering properties of the materials used in constructing each zone or stage of the CCR surface impoundment; the method of site preparation and construction of each zone of the CCR surface impoundment; and the approximate dates of construction of each successive stage of construction of the CCR surface impoundment.

F) At a scale that details engineering structures and appurtenances relevant to the design, construction, operation, and maintenance of the CCR surface impoundment, detailed dimensional drawings of the CCR surface impoundment, including a plan view and cross sections of the length and width of the CCR surface impoundment, showing all zones, foundation improvements, drainage provisions, spillways, diversion ditches, outlets, instrument locations, and slope protection, in addition to the normal operating pool surface elevation and the maximum pool surface elevation following peak discharge from the inflow design flood, the expected maximum depth of CCR within the CCR surface impoundment, and any identifiable natural or manmade features that could adversely affect operation of the CCR surface impoundment due to malfunction or mis-operation.

G) A description of the type, purpose, and location of existing instrumentation.

H) Area-capacity curves for the CCR surface impoundment.

I) A description of each spillway and diversion design features and capacities and calculations used in their determination.

J) The construction specifications and provisions for surveillance, maintenance, and repair of the CCR surface impoundment.

K) Any record or knowledge of structural instability of the CCR surface impoundment.

2) Narrative Description of the Facility. The permit application shall contain a written description of the facility with supporting documentation describing the procedures and plans that will be used at the facility to comply with the requirements of this Part. Such descriptions shall include, but not be limited to, the following information:

A) The types of CCR expected in the CCR surface impoundment, including a chemical analysis of each type of expected CCR;

B) An estimate of the maximum capacity of each surface impoundment in gallons or cubic yards;

C) The rate at which CCR and non-CCR waste streams currently enter the CCR surface impoundment in gallons per day and dry tons;

D) The estimated length of time the CCR surface impoundment will receive CCR and non-CCR waste streams; and

E) An on-site transportation plan that includes all existing and planned roads in the facility that will be used during the operation of the CCR surface impoundment.

3) Site Location Map. All permit applications shall contain a site location map on the most recent United States Geological Survey (USGS) quadrangle of the area from the 7 ½ minute series (topographic), or on such other map whose scale clearly shows the following information:

A) the facility boundaries and all adjacent property, extending at least 1000 meters (3280 feet) beyond the boundary of the facility;

B) all surface waters;

C) the prevailing wind direction;

D) the limits of all 100-year floodplains;

E) all natural areas designated as a Dedicated Illinois Nature Preserve pursuant to the Illinois Natural Areas Preservation Act (525 ILCS 30/1 et seq.);

F) all historic and archaeological sites designated by the National Historic Preservation Act (16 U.S.C. 470 et seq.) and the Illinois Historic Sites Advisory Council Act (20 ILCS 3410/1 et seq.); and

G) all areas identified as critical habitat pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and the Illinois Endangered Species Protection Act (520 ILCS 10/1 et seq.).

4) Site Plan Map. The application shall contain maps, including cross sectional maps of the site boundaries, showing the location of the facility. The following information shall be shown:

A) the entire facility, including any proposed and all existing CCR surface impoundment locations;

B) the boundaries, both above and below ground level, of the facility and all CCR surface impoundments or landfills containing CCR included in the facility;

C) all existing and proposed groundwater monitoring wells; and

D) all main service corridors, transportation routes, and access roads to the facility.

5) A narrative description of the proposed construction of or modification to a CCR surface impoundment and any projected changes in the volume or nature of the CCR or non-CCR waste streams.

6) Plans and specifications fully describing the design, nature, function and interrelationship of each individual component of the facility or source.

7) A new groundwater monitoring program or any modification to an existing groundwater monitoring program that includes but is not limited to the following information:

A) a hydrogeologic site investigation meeting the requirements of Section 845.620, if applicable;

B) design and construction plans of a groundwater monitoring system meeting the requirements of Section 845.630; and

C) a proposed groundwater sampling and analysis program that includes selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by Sections 845.640 and 845.650.

8) The signature and seal of a qualified professional engineer.

9) Certification that the owner or operator of the CCR surface impoundment completed the public notification and public meeting required pursuant to Section 845.240, a summary of the issues raised by the public, and a list of interested persons in attendance who would like to be added to the Agency's listserv for the facility.

b) New Construction. In addition to the requirements in subsection (a), all construction permit applications to build a new CCR surface impoundment, lateral expansion of a CCR surface impoundment, or retrofit an existing CCR surface impoundment must also contain the following information and documents:

1) Plans and specifications that demonstrate the proposed CCR surface impoundment will not be:

A) placed less than five feet above the uppermost aquifer pursuant to Section 845.300;

B) located in wetlands pursuant to Section 845.310;

C) located in fault areas pursuant to Section 845.320;

D) located in a seismic impact zone pursuant to Section 845.330; and

E) located in an unstable area pursuant to Section 845.340.

2) Plans and specifications that demonstrate the proposed CCR surface impoundment will meet the following design criteria:

A) the CCR surface impoundment will have a liner meeting the liner requirements in Section 845.400(b) or (c);

B) the CCR surface impoundment will have a leachate collection system meeting the requirements of Section 845.420; and

C) the CCR surface impoundment, if not incised, will be constructed with slope protection, as required by Section 845.430.

3) CCR fugitive dust control plan, as specified in Section 845.500(b).

4) Preliminary written closure plan, as specified in Section 845.720(a).

5) Initial written post-closure care plan, as specified in Section 845.780(d).

c) Corrective Action Construction. In addition to the requirements in subsection (a), all construction permit applications which include any corrective action performed pursuant to Subpart F must also contain the following information and documents:

1) Corrective Action plan, as specified in Section 845.670

2) Groundwater modeling, including:

A) the results of groundwater contaminant transport modeling and calculations showing how the corrective action will achieve compliance with the applicable groundwater standards;

B) description of the fate and transport of contaminants with the selected corrective action over time;

C) capture zone modeling, if applicable; and

D) provide the Agency any necessary licenses and software needed to review and access both the model and the data contained within the model.

3) Corrective action groundwater monitoring program, including identification of revisions to the groundwater monitoring system for corrective action; and

4) Any interim measures necessary to reduce the contaminants leaching from the CCR surface impoundment, and/or potential exposures to human or ecological receptors, including an analysis of the factors specified in Section 845.680(a)(3).

d) Closure Construction. In addition to the requirements in subsection (a), all construction permit applications for closure of the CCR surface impoundment pursuant to Subpart G must contain the following information and documents:

1) Closure prioritization category pursuant to Section 845.700(g), if applicable;

2) Final closure plan, as specified in Section 845.720(b), which includes the closure alternatives analysis required by Section 845.710.

3) Groundwater modeling, including

A) the results of groundwater contaminant transport modeling and calculations showing how the closure will achieve compliance with the applicable groundwater standards;

B) description of the fate and transport of contaminants with the selected closure over time;

C) capture zone modeling, if applicable; and

D) provide the Agency any necessary licenses and software needed to review and access both the model and the data contained within the model.

4) Proposed schedule to complete closure; and

5) Post-closure care plan as specified in Section 845.780(d), if applicable.

e) A single construction permit application may be submitted for new construction, corrective action, and closure if the construction is related to the same multi-phased project. The permit application for a project with multiple phases must contain all information required by subsections (a), (b), (c) and (d), as applicable.

f) Duration of Construction Permits

1) For any construction permit which is not for the closure or retrofit of the CCR unit, the construction permit shall be issued for fixed terms not to exceed 3 years.

2) For any construction permit for the closure or retrofit of a CCR unit, the construction permit shall be issued for an initial fixed term expiring within the timeframe approved by the Agency in the construction permit or five years, whichever is less. The Agency may renew a construction permit for closure or retrofit in two year increments pursuant to Section 845.760(b).

Section 845.230 Operating Permits

The operating permit applications as specified in this Section must contain the following information and documents:

a) Initial operating permit for a new CCR surface impoundments and any lateral expansion of a CCR surface impoundment.

1) A demonstration that the CCR surface impoundment as built meets the location standards in the following sections:

A) Section 845.300 (Placement Above the Uppermost Aquifer);

B) Section 845.310 (Wetlands);

C) Section 845.320 (Fault Areas);

D) Section 845.330 (Seismic Impact Zones); and

E) Section 845.340 (Unstable Areas);

2) Certification from a qualified professional engineer that the composite liner or if applicable, the alternative composite liner has been constructed in accordance with the requirements of this Section 845.400(b) or (c);

3) Certification from a qualified professional engineer that the leachate collection system has been constructed in accordance with the requirements of Section 845.420, if applicable;

4) Evidence that the permanent markers required by Section 845.130 have been installed;

5) Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in Section 845.430;

6) Initial hazard potential classification assessment certification, required by Section 845.440(a)(2);

7) Initial Emergency Action Plan certification, required by Section 845.520(d);

8) Initial structural stability assessment certification, required by Section 845.450(c);

9) Initial safety factor assessment certification, required by Section 845.460(b);

10) Fugitive dust control plan certification, as required by Section 845.500(b)(7);

11) Initial inflow design flood control system plan certification, as required by Section 845.510(c)(3);

12) Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well as required by Section 840.650(b);

13) Preliminary written closure plan, as specified in Section 845.720(a);

14) Initial written post-closure care plan, as specified in Section 845.780(d), if applicable;

15) An analysis of the chemical parameters found within the CCR to be placed in the CCR surface impoundment; and

16) An analysis of the chemical parameters of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment.

b) Renewal Operating Permit

1) Documentation that the CCR surface impoundment, if not incised, is being operated and maintained with one of the forms of slope protection specified in Section 845.430;

2) Emergency Action Plan certification if the plan was amended, as required by Section 845.520;

3) Fugitive dust control plan certification if the plan was amended, as required by Section 845.500(b)(7);

4) Any significant changes to the design and construction plans compiled under subsection (d)(2)(A) of this Section or Section 845.220(a)(1);

5) A statement that the groundwater monitoring has been conducted pursuant to an Agency approved groundwater monitoring program;

6) Written preliminary closure plan, if amended, as specified in Section 845.720(a); and

7) Written post-closure care plan, if amended, as specified in Section 845.780(d).

c) Post-Closure Care Operating Permit

The owner or operator of a CCR surface impoundment conducting post-closure care pursuant to Section 845.780 must maintain an operating permit until the completion of post-closure care. Any changes to the post-closure care plan, groundwater monitoring system, groundwater sampling and analysis program, and

groundwater monitoring program must be submitted to the Agency in an operating permit application.

d) Initial Operating Permit for Existing, Inactive and Inactive Closed CCR Surface Impoundments

1) The owner or operator of an existing, inactive or inactive closed CCR surface impoundment who has not completed post-closure care must submit an initial operating permit application to the Agency by September 30, 2021;

2) The initial operating permit application for existing CCR surface impoundments that have not completed an Agency approved closure prior to July 30, 2021, must contain the following information and documents on forms prescribed by the Agency:

A) The history of construction specified in Section 845.220(a)(1);

B) An analysis of the chemical parameters found within the CCR to be placed in the CCR surface impoundment;

C) An analysis of the chemical parameters of all waste streams, chemical additives and sorbent materials entering or contained in the CCR surface impoundment;

D) A demonstration that the CCR surface impoundment as built meets the location standards in the following sections:

i) Section 845.300 (Placement Above the Uppermost Aquifer);

ii) Section 845.310 (Wetlands);

iii) Section 845.320 (Fault Areas);

iv) Section 845.330 (Seismic Impact Zones); and

v) Section 845.340 (Unstable Areas);

D) Evidence that the permanent markers required by Section 845.130 have been installed;

E) Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in Section 845.430;

F) Initial Emergency Action Plan certification, required by Section 845.520(d);

G) Fugitive dust control plan certification, as required by Section 845.500(b)(7);

H) Proposed groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well as required by Section 840.650(b);

I) Preliminary written closure plan, as specified in Section 845.720(a);

J) Initial written post-closure care plan, as specified in Section 845.780(d), if applicable;

K) A certification as specified in Section 845.400(h), or a statement that the CCR surface impoundment does not have a liner that meets the requirements of Section 845.400(b) or (c); and

L) History of known exceedances of the groundwater protection standards in Section 845.600, and any corrective action taken to remediate the groundwater.

3) The initial operating permit application for existing CCR surface impoundments that has completed an Agency approved closure prior to July 30, 2021, but is not an inactive closed CCR surface impoundment, must contain the following information and documents on forms prescribed by the Agency:

A) The history of construction specified in Section 845.220(a)(1);

B) Evidence that the permanent markers required by Section 845.130 have been installed;

C) Documentation that the CCR surface impoundment, if not incised, will be operated and maintained with one of the forms of slope protection specified in Section 845.430;

D) Emergency Action Plan certification, required by Section 845.520(d);

E) Groundwater monitoring program that includes a minimum of eight independent samples for each background and downgradient well as required by Section 845.650(b);

F) Written post-closure care plan, as specified in Section 845.780(d), if applicable;

G) History of known exceedances of the groundwater protection standards in Section 845.600, and any corrective action plan taken to remediate the groundwater.

4) The initial operating permit application for inactive closed CCR surface impoundments must contain the following information:

A) Evidence that the permanent markers required by Section 845.130 have been installed;

B) Groundwater monitoring program;

C) Written post-closure care plan, as specified in Section 845.780(d); and

D) History of known exceedances of the groundwater quality standards in 35 Ill. Adm. Code 620, whether the owner or operator has obtained a groundwater management zone, and any corrective action taken to remediate the groundwater.

e) Operating permits shall be issued for fixed terms not to exceed five years.

Section 845.240 Pre-Application Public Notification and Public Meeting

a) At least 30 days before the submission of a construction permit application, the owner or operator of the CCR surface impoundment must hold at least two public meetings to discuss the proposed construction, where at least one meeting is held after 5:00 p.m. in the evening. Any public meeting held under this Section must be located at a venue that is accessible to persons with disabilities, and the owner or operator must provide reasonable accommodations upon request.

b) The owner or operator must prepare and circulate a notice explaining the proposed construction project and any related activities and the time and place of the public meeting. The owner or operator of the CCR surface impoundment must:

1) mail or hand-deliver the notice to the Agency and all residents within a one-mile radius from the site boundary;

2) post the notice on all of the owner or operator's social media outlets; and

3) post the notice in conspicuous locations throughout villages, towns, or cities within 10 miles of the site, or use appropriate broadcast media (such as radio or television).

c) When a proposed construction project or any related activity is located in an area with a significant proportion of non-English speaking residents, the notification must be circulated in both English and the appropriate non-English language.

d) The owner or operator of the CCR surface impoundment must prepare documentation recording the public meeting and place the documentation in the facility's operating record, as required by Section 845.800(d)(2).

e) At least 14 days prior to a public meeting, the owner or operator of the CCR surface impoundment must post on the owner or operator's publicly accessible internet site all documentation relied upon in making the tentative construction permit application determination.

f) At the public meeting, the owner or operator of the CCR surface impoundment must outline the decision-making process for the construction permit application, including, where applicable, the corrective action alternatives and the closure alternatives considered.

Section 845.250 Tentative Determination and Draft Permit

Following the receipt of a complete application for a construction permit, operating permit or a joint construction and operating permit, the Agency shall prepare a tentative determination.

a) The tentative determination shall include at least the following:

1) A statement regarding whether the permit is to be issued or denied; and

2) If the determination is to issue the permit, a draft permit and a brief description of any conditions contained therein.

b) Upon tentative determination to issue or deny the permit:

1) If the determination is to issue the permit, the Agency shall notify the applicant in writing of the content of the tentative determination and draft permit and of its intent to circulate public notice of issuance in accordance with Section 845.260;

2) If the determination is to deny the permit, the Agency shall notify the applicant in writing of the tentative determination and of its intent to circulate public notice of denial, in accordance with Section 845.260. In the case of denial, notice to the applicant shall include a statement of the reasons for denial, as required by Section 39(a) of the Act.

c) The documents supporting the Agency's tentative decision to issue or deny a permit shall be made part of the Agency's record.

Section 845.260 Draft Permit Public Notice and Participation

a) The Agency shall post a notification that it has received a permit application on the Agency's webpage and shall email the notice to the Agency's listserv for the applicant's facility.

b) Public Notice of Draft Permit

1) Not earlier than 15 days following the Agency's notification to the applicant of its tentative decision pursuant to Section 845.250 to issue or deny the permit application, the Agency shall circulate public notice of the completed application for the permit in a manner designed to inform interested and potentially interested persons of the construction, modification, operation or closure of a CCR surface impoundment and of the proposed determination to issue or deny the permit.

2) The contents of public notice of completed applications for permits shall include at least the following:

A) Name, address, and telephone number of the Agency;

B) Name and address of the applicant;

C) Brief description of the applicant's activities or operations which result in the construction, operation, modification or closure of a CCR surface impoundment;

D) A statement of the tentative determination to issue or deny the permit;

E) A brief description of the procedures for the formulation of final determinations, including the procedures for submitting comments and expiration date of the comment period; and

F) Address and telephone number of Agency premises at which interested persons may obtain further information, request a copy of the permit application and related documents.

3) Procedures for the circulation of public notice required pursuant to this Section shall include at least the following concurrent actions:

A) Posting on the Agency's webpage and all of the Agency's social media outlets;

B) Mailing the notice to the clerk of the nearest city, town or village requesting further posting in conspicuous locations throughout the city, town or village;

C) Requiring the applicant to post the notice near the entrance to the applicant's premises; and

D) Emailing the notice to the Agency's listserv for the facility.

c) Public Comment Period

1) The Agency shall accept written comments from interested persons on the draft permit determination for 30 days following the circulation of the public notice pursuant to subsection (b).

2) All comments shall be submitted to the Agency and to the applicant.

3) All written comments submitted during the 30-day comment period shall be retained by the Agency and considered in the formulation of its final determination with respect to the permit application.

4) The period for comment may be extended at the discretion of the Agency.

5) The Agency shall consider all comments received.

d) Public Hearing

1) The Agency may hold a public hearing on the issuance or denial of a draft permit whenever the Agency determines that there exists a significant degree of public interest in the proposed permit.

2) Within the 30-day public comment period, any person, including the applicant, may submit to the Agency a request for a public hearing which must include the reasons why a hearing is warranted.

3) Hearings held pursuant to this Section shall be held in the geographical area in which the CCR surface impoundment is located. When determining the hearing location, consideration shall be given to facilitating attendance of interested or affected persons and organizations and to accessibility of hearing sites to public transportation.

e) Notice of Public Hearing

1) The Agency shall issue notice of a public hearing not less than 30 days prior to the date of such hearing pursuant to the procedures for the circulation of public notice in subsection (b)(3).

2) The contents of the public notice for the public hearing shall include at least the following:

A) Name, address, and telephone number of the Agency;

B) Name and address of each applicant whose application will be considered at the hearing;

C) Brief description of the applicant's activities or operations which result in the construction, operation, modification or closure of a CCR surface impoundment;

D) Information regarding the time and location of the hearing;

E) The purpose of the hearing;

F) A concise statement of the issues to be considered at the hearing;

G) Address and telephone number of premises at which interested persons may obtain further information, request a copy of the draft permit and related documents; and

H) A statement that the hearing will be conducted in accordance with this Section.

f) When the Agency holds a public hearing pursuant to this Section, the Agency shall prepare a responsiveness summary which includes:

1) An identification of the public participation activity conducted;

2) Description of the matter on which the public was consulted;

3) An estimate of the number of persons present at the hearing;

4) A summary of all significant comments, criticisms, and suggestions, whether written or oral, submitted at the hearing or during the time the hearing record was open;

5) The Agency's response to all significant comments, criticisms, and suggestions; and

6) A statement of Agency action, including when applicable the issuance or denial of the permit.

Section 845.270 Final Permit Determination and Appeal

a) The Agency shall not make a final permit determination until the public participation process in Section 845.260 has concluded.

b) After the consideration of any comments which may have been received, the Agency may either issue or deny the permit.

c) The Agency shall provide a notice of the issuance or denial of the permit to the applicant, to any person who provides an email address to the Agency during the public hearing, to any person who requested a public hearing, and to any person on the Agency' listserv for the facility. Such notice shall briefly indicate any significant changes which were made from terms and conditions set forth in the draft permit.

d) In the case of denial, the Agency shall inform the applicant of the reasons for denial, as required by Section 39(a) of the Act.

e) Appeal

1) If the Agency refuses to grant or grants with conditions a permit under this Part, the applicant may petition the Board to appeal the Agency's final decision pursuant to Section 40 of the Act.

2) All appeals must be filed with the Board within 35 days after the final action as specified in Section 845.210(e).

Section 845.280 Transfer, Modification and Renewal

a) No permit is transferable from one person to another except as approved by the Agency. Approval shall be granted only if a new owner or operator seeking transfer of a permit can demonstrate the ability to comply with all applicable financial requirements of Subpart I of this Part.

b) Agency Initiated Modification. The Agency may modify a permit under the following conditions:

1) Discovery of a typographical or calculation error;

2) Discovery that a determination or condition was based upon false or misleading information;

3) An order of the Board issued in an action brought pursuant to Title VIII, IX or X of the Act; or

4) Promulgation of new statutes or regulations affecting the permit.

c) The owner or operator of a CCR surface impoundment may initiate modification to its permit by submitting an application to the Agency at any time after the permit is approved and before the permit expires.

d) The Agency may make minor modifications to a permit without following the public notice procedures of Section 845.260. Minor modifications may only:

1) Correct typographical errors;

2) Require more frequent monitoring or reporting by the permittee;

3) Allow for a change in ownership or operational control of a facility where the Agency determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees has been submitted to the Agency;

4) Change the construction schedule which does not impact the scheduled date of completion; or

5) Require electronic reporting requirements.

e) An application for renewal of an operating permit shall be filed with the Agency at least 180 days prior to the expiration date of the existing permit.

Section 845.290 Construction Quality Assurance Program

a) The following must be constructed according to a Construction Quality Assurance (CQA) program:

1) the construction of a new CCR surface impoundment, or the lateral expansion of an existing CCR surface impoundment;

2) the retrofit of an existing CCR surface impoundment;

3) installation of a groundwater collection system and discharge system;

4) installation of the groundwater monitoring system; and

5) installation of the final cover system.

b) The CQA program must meet the following requirements:

1) The owner or operator of the CCR surface impoundment must designate a CQA officer who is a qualified professional engineer.

2) At the end of each week of construction until construction is complete, a summary report must be prepared either 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 review and approve the report. The owner or operator of the CCR surface impoundment shall place the weekly reports in the facility's operating record, as required by Section 845.800(d)(3).

3) The CQA officer must certify the following, when applicable:

A) the bedding material contains no undesirable objects;

B) the final closure plan or corrective action plan approved by the construction permit has been followed;

C) the anchor trench and backfill are constructed to prevent damage to a geosynthetic membrane;

D) all tears, rips, punctures, and other damage are repaired;

E) all geosynthetic membrane seams are properly constructed and tested in accordance with the manufacturer's specifications;

F) any groundwater collection system is constructed to intersect the water table;

G) any groundwater collection system is properly constructed to slope toward extraction points, and the extraction equipment is properly designed and installed;

H) appropriate operation and maintenance plans for the groundwater collection system and extraction and discharge equipment are provided;

I) proper filter material consisting of uniform granular fill, to avoid clogging, is used in construction;

J) the filter material as placed possesses structural strength adequate to support the maximum loads imposed by the overlying materials and equipment used at the facility;

K) CCR stabilization; and

L) site restoration, if any.

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, when applicable:

A) compaction of the subgrade and foundation to design parameters;

B) application of final cover, including installation of the geomembrane; and

C) installation of the groundwater collection system and discharge system.

6) If the CQA officer is unable to be present as required by subsection (b)(5) of this Section, the CQA officer must provide the following in writing:

A) the reasons for his or her absence;

B) a designation of a person who must exercise professional judgment in carrying out the duties of the CQA officer-in-absentia; and

C) 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 officer.

7) The CQA program must ensure, at a minimum, that construction materials and operations meet design specifications.

SUBPART C: LOCATION RESTICTIONS

Section 845.300 Placement Above The Uppermost Aquifer

a) Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR surface impoundment and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table).

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a) of this Section.

c) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) of this Section and submit the completed demonstration to the Agency in the facility's initial operating permit application.

d) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed pursuant to subsection (a) of this Section. Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.310 Wetlands

a) Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located in wetlands unless the owner or operator demonstrates the following:

1) Where applicable under Section 404 of the Clean Water Act, Interagency Wetlands Policy Act of 1989 (20 ILCS 830 et seq.) and Rivers, Lakes, and Streams Act (615 ILCS 5/4.9 et seq.), or other applicable state wetlands laws, a clear and objective rebuttal of the presumption that an alternative to the CCR surface impoundment is reasonably available that does not involve wetlands.

2) The construction and operation of the CCR surface impoundment will not cause or contribute to any of the following:

A) A violation of any applicable state or federal water quality standard;

B) A violation of any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act;

C) Jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of a critical habitat, protected under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) and the Illinois Endangered Species Protection Act (520 ILCS 10/1 et seq.); and

D) A violation of any requirement under the Marine Protection, Research, and Sanctuaries Act of 1972 (16 U.S.C. 1431 and 33 U.S.C. 1401) for the protection of a marine sanctuary.

3) The CCR surface impoundment will not cause or contribute to significant degradation of wetlands by addressing all of the following factors:

A) Erosion, stability, and migration potential of native wetland soils, muds and deposits used to support the CCR surface impoundment;

B) Erosion, stability, and migration potential of dredged and fill materials used to support the CCR surface impoundment;

C) The volume and chemical nature of the CCR;

D) Impacts on fish, wildlife, and other aquatic resources and their habitat from release of CCR;

E) The potential effects of catastrophic release of CCR to the wetland and the resulting impacts on the environment; and

F) Any additional factors, as necessary, to demonstrate that ecological resources in the wetland are sufficiently protected.

4) To the extent required under Section 404 of the Clean Water Act or applicable state wetlands laws, steps have been taken to attempt to achieve no net loss of wetlands (as defined by acreage and function) by first avoiding impacts to wetlands to the maximum extent reasonable as required by subsections (a)(1) through (3) of this Section, then minimizing unavoidable impacts to the maximum extent reasonable, and finally offsetting remaining unavoidable wetland impacts through all appropriate and reasonable compensatory mitigation actions (e.g., restoration of existing degraded wetlands or creation of man-made wetlands); and

5) Sufficient information is available to make a reasoned determination with respect to the demonstrations in subsections (a)(1) through (4) of this Section.

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a) of this Section.

c) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) of this Section and submit the

completed demonstration to the Agency with the facility's initial operating permit application.

d) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed pursuant to subsection (a) of this Section. Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.320 Fault Areas

a) Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR surface impoundment.

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a) of this Section.

c) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) of this Section and submit the completed demonstration to the Agency with the facility's initial operating permit application.

d) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed pursuant to subsection (a) of this Section. Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.330 Seismic Impact Zones

a) Existing and new CCR surface impoundments, and all lateral expansions of CCR surface impoundments must not be located in seismic impact zones unless the owner or operator demonstrates that all structural components including liners,

leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a) of this Section.

c) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) of this Section and submit the completed demonstration to the Agency with the facility's initial operating permit application.

d) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed pursuant to subsection (a) of this Section. Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.340 Unstable Areas

a) An existing or new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must not be located in an unstable area unless the owner or operator demonstrates that recognized and generally accepted engineering practices have been incorporated into the design of the CCR surface impoundment to ensure that the integrity of the structural components of the CCR surface impoundment will not be disrupted.

b) The owner or operator must consider all of the following factors, at a minimum, when determining whether an area is unstable:

1) On-site or local soil conditions, including but not limited to liquefaction, that may result in significant differential settling;

2) On-site or local geologic or geomorphologic features; and

3) On-site or local human-made features or events (both surface and subsurface).

c) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the demonstration meets the requirements of subsection (a) of this Section.

d) The owner or operator of an existing CCR surface impoundment must complete the demonstration required by subsection (a) of this Section and submit the completed demonstration to the Agency with the facility's initial operating permit application.

e) The owner or operator of a new CCR surface impoundment or a lateral expansion of a CCR surface impoundment must submit plans and specifications in a construction permit application that demonstrate the CCR surface impoundment will be constructed pursuant to subsection (a) of this Section. Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the CCR surface impoundment or lateral expansion was constructed in accordance with the requirements in subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.350 Failure to Meet Location Standards

a) An owner or operator of an existing CCR surface impoundment who fails to demonstrate compliance with the requirements of this Subpart is subject to the requirements of Section 845.700.

b) An owner or operator of a new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment who fails to make the demonstration showing compliance with the requirements of this Subpart is prohibited from placing CCR in the CCR surface impoundment.

SUBPART D: DESIGN CRITERIA

Section 845.400 Liner Design Criteria For Existing CCR Surface Impoundments

a) An existing CCR surface impoundment is considered to be an existing lined surface impoundment if it has been constructed with either a composite liner that meets the requirements of subsection (b) of this Section or an alternative composite liner that meets the requirements of subsection (c) of this Section.

b) Composite Liner

1) A composite liner must consist of two components; the upper component consisting of, at a minimum, a 30-mil geomembrane liner, and the lower component consisting of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second (cm/sec). The geomembrane liner components consisting of high-density polyethylene (HDPE) must be at least 60-mil. The geomembrane liner or upper liner component must be installed in direct and uniform contact with the compacted soil or lower liner component.

2) The composite liner must be:

A) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the CCR or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

B) Constructed of materials that provide appropriate shear resistance of the upper and lower component interface to prevent sliding of the upper component including on slopes;

C) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

D) Installed to cover all surrounding earth likely to be in contact with the CCR or leachate.

c) Alternative Composite Liner

1) An alternative composite liner must consist of two components; the upper component consisting of, at a minimum, a 30-mil geomembrane liner, and a lower component, that is not a geomembrane, with a liquid flow rate no greater than the liquid flow rate of two feet of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. The geomembrane liner components consisting of high density polyethylene (HDPE) must be at least 60-mil. If the lower component of the alternative liner is compacted soil, the geomembrane liner must be installed in direct and uniform contact with the compacted soil.

2) The liquid flow rate through the lower component of the alternative composite liner shall be no greater than the liquid flow rate through two feet of compacted soil with a hydraulic conductivity of 1×10^{-7} cm/sec. The hydraulic conductivity for the two feet of compacted soil used in the comparison shall be no greater than 1×10^{-7} cm/sec. The hydraulic conductivity of any alternative to the two feet of compacted soil must be determined using recognized and generally accepted methods.

3) The liquid flow rate comparison must be made using the following equation, which is derived from Darcy's Law for gravity flow through porous media.

$$Q/A = q = k ((h/t)+1)$$

Where:
Q= flow rate (cubic centimeters/second)
A= Surface are of the liner (squared centimeters)
q = flow rate per unit area (cubic centimeters/ second/squared centimeter)
k = hydraulic conductivity of the liner (centimeters /second)
h = hydraulic head above the liner (centimeters); and
t = thickness of the liner (centimeters)

4) The alternative composite liner must meet the requirements specified in subsection (b) of this Section.

d) The hydraulic conductivity of the compacted soil must be determined using recognized and generally accepted methods.

e) The owner or operator of an existing CCR surface impoundment that has not completed an Agency approved closure prior to July 30, 2021, must submit an initial operating permit application pursuant to Section 845.230 that demonstrates whether or not the CCR surface impoundment was constructed with either of the following:

1) A composite liner that meets the requirements of subsection (b); or

2) An alternative composite liner that meets the requirements of subsection (c).

f) A CCR surface impoundment is considered to be an unlined CCR surface impoundment if either:

1) The owner or operator of the CCR surface impoundment determines that the CCR surface impoundment is not constructed with a liner that meets the requirements of subsections (b) or (c) of this Section; or

2) The owner or operator of the CCR surface impoundment fails to document whether the CCR surface impoundment was constructed with a liner that meets the requirements of subsections (b) or (c) of this Section.

g) All unlined CCR surface impoundments are subject to the requirements of Section 845.700.

h) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer attesting that the CCR surface impoundment meets the requirements of subsection (a) of this Section and submit the certification to the Agency in the facility's initial operating permit application.

Section 845.410 Liner Design Criteria for New CCR Surface Impoundments and Any Lateral Expansion of a CCR Surface Impoundment

a) New CCR surface impoundments and lateral expansions of existing and new CCR surface impoundments must be designed, constructed, operated, and maintained with either a composite liner or an alternative composite liner that meets the requirements of Section 845.400(b) or (c).

b) Any liner specified in this Section must be installed to cover all surrounding earth likely to be in contact with CCR. Dikes shall not be constructed so as to damage the composite liner.

c) Prior to construction, the owner or operator must obtain certification from a qualified professional engineer that the design of the composite liner or, if applicable, the design of an alternative composite liner complies with the requirements of this Section and submit this certification to the Agency in the facility's construction permit application.

d) Upon completion of construction, the owner or operator must obtain a certification from a qualified professional engineer that the composite liner or if applicable, the alternative composite liner has been constructed in accordance with the requirements of this Section and submit this certification to the Agency in the facility's initial operating permit application.

Section 845.420 Leachate Collection and Removal System

A new CCR surface impoundment must be designed, constructed, operated and maintained with a leachate collection and removal system. The leachate collection and removal system must be designed, constructed, operated, and maintained to collect and remove leachate from the leachate collection system of the CCR surface impoundment during its active life and post-closure care period.

a) The leachate collection and removal system must:

1) be placed above the liner required by Section 845.400 or Section 845.410;

2) have placed above it a low permeability layer that has a hydraulic conductivity of no less than $1x10^{-5}$ cm/sec;

3) have a bottom slope of three percent or more towards the collection pipes;

4) be constructed of granular drainage materials with a hydraulic conductivity of 1×10^{-1} cm/sec or more and a thickness of 24 inches or more above the crown of the collection pipe; or constructed of synthetic drainage materials with a transmissivity of 6×10^{-4} m^2/sec or more;

5) be constructed of materials that are chemically resistant to CCR and any non-CCR waste managed in the CCR surface impoundment and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying waste and any waste cover materials and equipment used at the CCR surface impoundment;

6) be designed, constructed and operated with collection pipes at the base of the granular material, to prevent clogging with fines during the active life and post-closure care period;

7) have collection pipes

A) designed such that leachate is collected at a sump and is pumped or flows out of the CCR surface impoundment;

B) with slopes that allow flow from all points within the CCR surface impoundment to the sump or drain outlet; and

C) large enough to conduct periodic cleaning;

8) have a protective layer or other means of deflecting the force of CCR pumped into the CCR surface impoundment; and

9) be designed and operated to minimize clogging during the active life and post-closure care period.

b) The owner or operator must obtain certification from a qualified professional engineer that the design of the leachate collection system complies with the requirements of this Section and submit this certification to the Agency in the facility's construction permit application.

c) Upon completion, the owner or operator must obtain a certification from a qualified professional engineer that the leachate collection system has been constructed in accordance with the requirements of this Section and submit this certification to the Agency in the facility's initial operating permit application.

Section 845.430 Slope Maintenance

The slopes and pertinent surrounding areas of the CCR surface impoundment must be designed, constructed, operated, and maintained with one of the forms of slope protection specified in subsection (a) of this Section that meets all of the performance standards of subsection (b) of this Section.

a) Slope protection must consist of one of the following:

1) A vegetative cover consisting of grassy vegetation;

2) An engineered cover consisting of a single form or combination of forms of engineered slope protection measures; or

3) A combination of the forms of cover specified in subsections (a)(1) or (a)(2) of this Section.

b) Any form of cover for slope protection must meet the following performance standards:

1) The cover must be installed and maintained on the slopes and pertinent surrounding areas of the CCR surface impoundment;

2) The cover must provide protection against surface erosion, wave action, and adverse effects of rapid drawdown;

3) The cover must be maintained to allow for the observation of and access to the slopes and pertinent surrounding areas during routine and emergency events;

4) Woody vegetation must be removed from the slopes or pertinent surrounding areas. Any removal of woody vegetation with a diameter greater than 1/2 inch must be directed by a person familiar with the design and operation of the CCR surface impoundment and in consideration of the complexities of removal of a tree or a shrubbery, who must ensure the removal does not create a risk of destabilizing the CCR surface impoundment or otherwise adversely affect the stability and safety of the CCR surface impoundment or personnel undertaking the removal; and

5) The height of vegetation must not exceed 12 inches.

Section 845.440 Hazard Potential Classification Assessment

a) Hazard potential classification assessments

1) The owner or operator of the CCR surface impoundment must conduct an initial and annual hazard potential classification assessment of the CCR surface impoundment. The owner or operator must document the hazard potential classification of each CCR surface impoundment as either a Class 1 or Class 2 CCR surface impoundment. The owner or operator must also document the basis for each hazard potential classification.

2) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the initial hazard potential classification and each annual classification was conducted in accordance with the requirements of this Section.

3) Timeframe for submission of the Hazard Potential Classification Assessments and Certifications

A) The owner or operator of a new CCR surface impoundment must submit the initial hazard potential classification assessment certification with the initial operating permit application prior to the initial receipt of CCR in the surface impoundment.

B) The owner or operator of an existing CCR surface impoundment must submit the initial hazard potential classification assessment certification with its first annual inspection report required by Section 845.540(b).

C) The owner or operator of a CCR surface impoundment must submit the annual hazard potential classification assessment certification each year with the annual inspection required by Section 845.540(b).

D) The owner or operator of a CCR surface impoundment must place each hazard potential classification assessment in the facility's operating record, as required by Section 845.800(d)(4).

b) The requirements of this Section apply to all CCR surface impoundments, except for those CCR surface impoundments that are incised CCR surface impoundments. If an incised CCR surface impoundment is subsequently modified (e.g., a dike is constructed) such that the CCR surface impoundment no longer meets the definition of an incised CCR surface impoundment, the CCR surface impoundment is subject to the requirements of this Section.

Section 845.450 Structural Stability Assessment

a) The owner or operator of a CCR surface impoundment must conduct initial and annual structural stability assessments and document whether the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein. The assessment must, at a minimum, document whether the CCR surface impoundment has been designed, constructed, operated, and maintained with:

1) Stable foundations and abutments;

2) Adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown;

3) Dikes mechanically compacted to a density sufficient to withstand the range of loading conditions in the CCR surface impoundment;

4) Slope protection consistent with Section 845.430;

5) A single spillway or a combination of spillways configured as specified in subsection (a)(5)(A) of this Section. The combined capacity of all spillways must be designed, constructed, operated, and maintained to adequately manage flow during and following the peak discharge from the event specified in subsection (a)(5)(B) of this Section.

A) All spillways must be either:

i) Of non-erodible construction and designed to carry sustained flows; or

ii) Earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected.

B) The combined capacity of all spillways must adequately manage flow during and following the peak discharge from a:

i) Probable maximum flood for a Class 1 CCR surface impoundment; or

ii) 1000-year flood for a Class 2 CCR surface impoundment.

6) Hydraulic structures underlying the base of the CCR surface impoundment or passing through the dike of the CCR surface impoundment that maintain structural integrity and are free of significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the CCR surface impoundment; and

7) For CCR surface impoundments with downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream or lake, downstream slopes that maintain structural stability during low pool of the adjacent water body or sudden drawdown of the adjacent water body.

b) The annual assessment described in this Section must identify any structural stability deficiencies associated with the CCR surface impoundment in addition to recommending corrective measures. If a deficiency or a release is identified

during the periodic assessment, the owner or operator of the surface impoundment must submit to the Agency a construction permit application including documentation detailing proposed corrective measures and must obtain any necessary permits from the Agency as soon as feasible.

c) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the initial structural stability assessments and each annual assessment thereafter was conducted in accordance with the requirements of this Section.

d) Timeframe for submission of structural stability assessment

1) The owner or operator of a new CCR surface impoundment must submit the initial structural stability assessment certification with the initial operating permit application prior to the initial receipt of CCR in the surface impoundment.

2) The owner or operator of an existing CCR surface impoundment must submit the initial structural stability assessment certification with its first annual inspection report required by Section 845.540(b).

3) The owner or operator of a CCR surface impoundment must submit the annual structural stability assessment certification each year with the annual inspection required by Section 845.540(b).

4) The owner or operator of a CCR surface impoundment must place each structural stability assessment in the facility's operating record, as required by Section 845.800(d)(5).

f) The requirements of this Section apply to all CCR surface impoundments, except for those CCR surface impoundments that are incised CCR surface impoundments. If an incised CCR surface impoundment is subsequently modified (e.g., a dike is constructed) such that the CCR surface impoundment no longer meets the definition of an incised CCR surface impoundment, the CCR surface impoundment is subject to the requirements of this Section.

Section 845.460 Safety Factor Assessment

a) The owner or operator of a CCR surface impoundment must conduct an initial and annual safety factor assessments for each CCR surface impoundment and document whether the calculated factors of safety for each CCR surface impoundment achieve the minimum safety factors specified in this Section for the critical cross section of the embankment. The critical cross section is the cross section anticipated to be the most susceptible of all cross sections to structural failure based on appropriate engineering considerations, including loading

conditions. The safety factor assessments must be supported by appropriate engineering calculations.

1) For new CCR surface impoundments, the calculated static factor of safety under the end-of-construction loading condition must equal or exceed 1.30. The assessment of this loading condition is only required for the initial safety factor assessment and is not required for subsequent assessments.

2) The calculated static factor of safety under the long-term, maximum storage pool loading condition must equal or exceed 1.50.

3) The calculated static factor of safety under the maximum surcharge pool loading condition must equal or exceed 1.40.

4) The calculated seismic factor of safety must equal or exceed 1.00.

5) For dikes constructed of soils that have susceptibility to liquefaction, the calculated liquefaction factor of safety must equal or exceed 1.20.

b) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the initial safety factor assessment and each annual assessment thereafter was conducted in accordance with the requirements of this Section.

c) Timeframe for submission of the safety factor assessment

1) The owner or operator of a new CCR surface impoundment must submit the initial safety factor assessment certification with the initial operating permit application prior to the initial receipt of CCR in the surface impoundment.

2) The owner or operator of an existing CCR surface impoundment must submit the initial safety factor assessment certification with its first annual inspection report required by Section 845.540(b).

3) The owner or operator of a CCR surface impoundment must submit the annual safety factor assessment certification each year with the annual inspection required by Section 845.540(b).

4) The owner or operator of a new CCR surface impoundment must place each safety factor assessment in the facility's operating record as required by Section 845.800(d)(6).

d) Failure to document minimum safety factors.

1) For new CCR surface impoundments, until the date an owner or operator of a CCR surface impoundment documents that the calculated factors of safety achieve the minimum safety factors specified in this section, the owner or operator is prohibited from placing CCR in such CCR surface impoundment.

2) An owner or operator of the CCR surface impoundment who either fails to complete a timely safety factor assessment or fails to demonstrate minimum safety factors as required by this Section is subject to the requirements of Section 845.700.

e) The requirements of this Section apply to all CCR surface impoundments, except for those CCR surface impoundments that are incised CCR surface impoundments. If an incised CCR surface impoundment is subsequently modified (e.g., a dike is constructed) such that the CCR surface impoundment no longer meets the definition of an incised CCR surface impoundment, the CCR surface impoundment is subject to the requirements of this Section.

SUBPART E: OPERATING CRITERIA

Section 845.500 Air Criteria

a) The owner or operator of a CCR surface impoundment, or any lateral expansion of a CCR surface impoundment must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR surface impoundments, roads, and other CCR management and material handling activities.

b) CCR fugitive dust control plan. The owner or operator of the CCR surface impoundment must prepare and operate in accordance with a CCR fugitive dust control plan as specified in subsections (b)(1) through (7) of this Section. This requirement applies in addition to, not in place of, any applicable standards under the Occupational Safety and Health Act or any other State or federal law.

1) The CCR fugitive dust control plan must identify and describe the CCR fugitive dust control measures the owner or operator will use to minimize CCR from becoming airborne at the facility. The owner or operator must select, and include in the CCR fugitive dust control plan, the CCR fugitive dust control measures that are most appropriate for site conditions, along with an explanation of how the measures selected are applicable and appropriate for site conditions. Examples of control measures that may be appropriate include: locating CCR inside an enclosure or partial enclosure; operating a water spray or fogging system; reducing fall distances at material drop points; using wind barriers, compaction, or vegetative covers; establishing and enforcing reduced vehicle speed limits; paving

and sweeping roads; covering trucks transporting CCR; reducing or halting operations during high wind events; or applying a daily cover.

2) The CCR fugitive dust control plan must include procedures to log citizen complaints received by the owner or operator involving CCR fugitive dust events at the facility.

4) The CCR fugitive dust control plan must include a description of the procedures the owner or operator will follow to periodically assess the effectiveness of the control plan.

5) Amendment of the plan. The owner or operator of a CCR surface impoundment subject to the requirements of this Section may amend the written CCR fugitive dust control plan at any time provided the revised plan is submitted to the Agency. The owner or operator must amend the written plan whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR surface impoundment.

6) The owner or operator must place the initial and any amendments to the fugitive dust control plan in the facility's operating record as required by Section 845.800(d)(7).

7) The owner or operator must obtain a certification from a qualified professional engineer that the initial CCR fugitive dust control plan, or any subsequent amendment of it, meets the requirements of this Section.

c) Annual CCR fugitive dust control report. The owner or operator of a CCR surface impoundment must prepare an annual CCR fugitive dust control report that includes a description of the actions taken by the owner or operator to control CCR fugitive dust, a record of all citizen complaints, and a summary of any corrective measures taken. The annual CCR fugitive dust control report must be submitted as a part of the annual consolidated report required by Section 845.550.

Section 845.510 Hydrologic and Hydraulic Capacity Requirements for CCR Surface Impoundments

a) The owner or operator of an existing or new CCR surface impoundment or any lateral expansion of a CCR surface impoundment must design, construct, operate, and maintain an inflow design flood control system as specified in subsections (a)(1) and (2) of this Section.

1) The inflow design flood control system must adequately manage flow into the CCR surface impoundment during and following the peak discharge of the inflow design flood specified in subsection (a)(3) of this Section.

2) The inflow design flood control system must adequately manage flow from the CCR surface impoundment to collect and control the peak discharge resulting from the inflow design flood specified in subsection (a)(3) of this Section.

3) The inflow design flood, at a minimum, is:

A) For a Class 1 CCR surface impoundment, as determined under Section 845.440(a), the probable maximum flood;

B) For a Class 2 CCR surface impoundment, as determined under Section 845.440(a), the 1,000-year flood; or

C) For an incised CCR surface impoundment, the 25-year flood.

b) Discharge from the CCR surface impoundment must be handled in accordance with the surface water requirements in Section 845.110(b)(3) and 35 Ill. Adm. Code Subtitle C.

c) Inflow design flood control system plan

1) Content of the plan. The owner or operator must prepare initial and annual inflow design flood control system plans for the CCR surface impoundment. These plans must document how the inflow design flood control system has been designed and constructed to meet the requirements of this Section. Each plan must be supported by appropriate engineering calculations.

2) Amendment of the plan. The owner or operator of the CCR surface impoundment may amend the written inflow design flood control system plan at any time. The owner or operator must amend the written inflow design flood control system plan whenever there is a change in conditions that would substantially affect the written plan in effect.

3) The owner or operator must obtain a certification from a qualified professional engineer stating that the initial and periodic inflow design flood control system plans meet the requirements of this Section

4) Timeframe for plan submission

A) The owner or operator of a new CCR surface impoundment must submit to the Agency the initial inflow design flood control system plan certification with the initial operating permit application prior to the initial receipt of CCR in the surface impoundment.

B) The owner or operator of an existing CCR surface impoundment must submit the initial inflow design flood control system plan certification with its first annual inspection report required by Section 845.540(b).

C) The owner or operator of a CCR surface impoundment must submit the annual inflow design flood control system plan certification each year with the annual inspection required by Section 845.540(b).

D) The owner or operator of a new CCR surface impoundment must place each inflow design flood control system plan in the facility's operating record, as required by Section 845.800(d)(8).

Section 845.520 Emergency Action Plan

a) The owner or operator of a CCR surface impoundment must prepare and maintain a written Emergency Action Plan (EAP). The owner or operator must place the EAP and any amendment of the EAP in the facility's operating record, as required by Section 845.800(d)(9).

b) At a minimum, the EAP must:

1) Define the events or circumstances involving the CCR surface impoundment that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;

2) Define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR surface impoundment;

3) Provide contact information of emergency responders;

4) Include a map which delineates the downstream area which would be affected in the event of a CCR surface impoundment failure and a physical description of the CCR surface impoundment; and

5) Include provisions for an annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders.

c) Amendment of the plan

1) The owner or operator of a CCR surface impoundment may amend the written EAP at any time.

2) The owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect.

3) The written EAP must be evaluated, at a minimum, every five years to ensure the information required in this Section is accurate.

d) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of this Section.

e) Activation of the EAP. The EAP must be implemented once events or circumstances involving the CCR surface impoundment that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person. The owner or operator of the CCR surface impoundment must submit records documenting all activations of the EAP to the Agency and place the documentation in the facility's operating record as required by Section 845.800(d)(10).

f) The owner or operator of a CCR surface impoundment must document the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders as required by subsection (b)(5). The owner or operator of the CCR surface impoundment must place this documentation in the facility's operating record as required by Section 845.800(d)(11).

Section 845.530 Safety and Health Plan

a) The owner or operator of the CCR surface impoundment shall develop a Safety and Health Plan. The owner or operator shall conduct ongoing worker hazard analyses. The plan shall be updated as needed based on the worker hazard analyses, but at least every six months. The plan and all amendments to the plan, shall be placed in the facility's operating record as required by Section 845.800(d)(12), and on the owner or operator's publicly accessible internet site.

b) For worker exposure safety, in addition to all other applicable local, state and federal requirements, the owner or operator of the CCR surface impoundment shall, for chemical compounds found within the CCR surface impoundment, implement the recommendations in the NIOSH Pocket Guide to Chemical Hazards, incorporated by reference in Section 845.150, and applicable Occupational Safety and Health Administration regulations in Chapter 17 of Title 29 of the Code of Federal Regulations.

c) The Safety and Health Plan must include a personnel training program that meets the following minimum requirements.

1) Facility personnel must successfully complete a program of instruction that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of this Part. The facility must maintain an outline of the training program used (or to be used) at the facility and a brief description of how the training program is designed to meet actual jobs tasks.

2) At a minimum, the training program must be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including, where applicable:

A) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;

B) Communications or alarm systems;

C) Response to fires or explosions;

D) Response to potential groundwater contamination incidents;

E) Applicable Occupational Safety and Health Standards and use of personal protective equipment; and

F) Information about chemical hazards and hazardous materials on site.

3) For facility employees that have received emergency response training pursuant to the federal Occupational Safety and Health Administration (OSHA) regulations at 29 CFR 1910.120(p)(8) and (q), the facility is not required to provide separate emergency response training pursuant to this Section, provided that the overall facility OSHA emergency response training meets all the requirements of this Section.

d) Facility personnel must successfully complete the program required in subsection (c) of this Section prior to undertaking any activity to construct, operate or close a CCR surface impoundment.

e) Facility personnel must take part in an annual review of the initial training required in subsection (c) of this Section.

f) The owner or operator of the CCR surface impoundment must perform, at a minimum, the following hazard communication activities:

1) post signs at the facility identifying the hazards of CCR, including dust inhalation when handling CCR;

2) post signs at the facility identifying unstable CCR areas which may make operation of heavy equipment hazardous; and

3) post signs at the facility where the CCR surface impoundment is located identifying safety measures and necessary precautions, including the proper use of personal protective equipment.

Section 845.540 Inspection Requirements for CCR Surface Impoundments

a) Inspections by a qualified person.

1) All CCR surface impoundments and any lateral expansion of a CCR surface impoundment must be examined by a qualified person as follows:

A) At intervals not exceeding seven days and after each 25-year, 24-hour storm, inspect for the following:

i) any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR surface impoundment;

ii) deterioration, malfunctions or improper operation of overtopping control systems where present;

iii) sudden drops in the level of the CCR surface impoundment's contents;

iv) severe erosion (e.g. rills, gullies, and crevices six inches or deeper) or other signs of deterioration (e.g. failed or eroded vegetation in excess of 100 square feet or cracks) in dikes or other containment devices; and

v) any visible releases.

B) At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the CCR surface impoundment or through the dike of the CCR surface impoundment for abnormal discoloration, flow or discharge of debris or sediment;

C) At intervals not exceeding 30 days, monitor all CCR surface impoundment instrumentation; and

D) The owner or operator shall prepare a report for each inspection which includes the date of the inspection, condition of the CCR surface impoundment, any repairs made to the CCR surface impoundment and the date of the repair. The results of the inspection by a qualified person must be recorded in the facility's operating record as required by Section 845.800(d)(13).

2) CCR surface impoundments must initiate and continue the inspections required under subsection (a) of this Section until completion of post-closure care.

b) Annual inspections by a qualified professional engineer.

1) The CCR surface impoundment must be inspected on an annual basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR surface impoundment is consistent with recognized and generally accepted engineering standards. The inspection must, at a minimum, include:

A) A review of available information regarding the status and condition of the CCR surface impoundment, including, but not limited to, files available in the operating record (e.g., CCR surface impoundment design and construction information required by Sections 845.220(a)(1) and 845.230(d)(2)(A), previous structural stability assessments required under Section 845.450, the results of inspections by a qualified person, and results of previous annual inspections);

B) A visual inspection of the CCR surface impoundment to identify signs of distress or malfunction of the CCR surface impoundment and appurtenant structures;

C) A visual inspection of any hydraulic structures underlying the base of the CCR surface impoundment or passing through the dike of the CCR surface impoundment for structural integrity and continued safe and reliable operation;

D) The annual hazard potential classification certification, required by Section 845.440, if applicable;

E) The annual structural stability assessment certification, required by Section 845.450, if applicable;

F) The annual safety factor assessment certification, required by Section 845.460, if applicable; and

G) The inflow design flood control system plan certification, required by Section 845.510(c).

2) Inspection report. The qualified professional engineer must prepare a report following each inspection that addresses the following:

A) Any changes in geometry of the impounding structure since the previous annual inspection;

B) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

C) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

D) The storage capacity of the impounding structure at the time of the inspection;

E) The approximate volume of the impounded water and CCR at the time of the inspection;

F) Any appearances of an actual or potential structural weakness of the CCR surface impoundment, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR surface impoundment and appurtenant structures; and

G) Any other changes which may have affected the stability or operation of the impounding structure since the previous annual inspection.

3) By January 31 of each year, the inspection report must be completed and submitted with the annual consolidated report required by Section 845.550.

4) Frequency of inspections. The owner or operator of the CCR surface impoundment must conduct the inspection required by subsections (b)(1) and (2) of this Section on an annual basis. The deadline for conducting a subsequent inspection is based on the date of conducting the previous inspection.

5) If a deficiency or release is identified during an inspection, the owner or operator must submit to the Agency documentation detailing proposed corrective measures and obtain any necessary permits from the Agency.

6) The owner or operator of the CCR surface impoundment must submit the inspection report to the Agency.

Section 845.550 Annual Consolidated Report

a) No later than January 31 of each year, the owner or operator of the CCR surface impoundment must prepare and submit an annual consolidated report for the preceding calendar year that includes the following:

1) Annual CCR fugitive dust control report, required by Section 845.500(c);

2) Annual inspection report, required by Section 845.540(b), including

A) annual hazard potential classification certification, required by Section 845.440, if applicable;

B) annual structural stability assessment certification, required by Section 845.450, if applicable;

C) annual safety factor assessment certification, required by Section 845.460, if applicable; and

D) inflow design flood control system plan certification, required by Section 845.510(c).

3) Annual Groundwater Monitoring and Corrective Action Report, required by Section 845.610(e).

b) The owner or operator of the CCR surface impoundment must place the annual consolidated report in the facility's operating record as required by Section 845.800(d)(14).

SUBPART F: GROUNDWATER MONITORING AND CORRECTIVE ACTION

Section 845.600 Groundwater Protection Standards

a) For existing CCR surface impoundments

1) The groundwater protection standards at the waste boundary shall be:

A) Antimony: 0.006 mg/L

B) Arsenic: 0.010 mg/L

C) Barium: 2.0 mg/L

D) Beryllium: 0.004 mg/L

E) Boron: 2 mg/L

F) Cadmium: 0.005 mg/L

G) Chloride: 200 mg/L

H) Chromium: 0.1 mg/L

I) Cobalt: 0.006 mg/L

J) Fluoride: 4.0 mg/L

K) Lead: 0.0075 mg/L

L) Lithium: 0.04 mg/L

M) Mercury: 0.002 mg/L

N) Molybdenum: 0.1 mg/L

O) pH: 6.5-9.0 units

P) Selenium: 0.05 mg/L

Q) Sulfate: 400 mg/L

R) Thallium: 0.002 mg/L

S) Total Dissolved Solids: 1200 mg/L

T) Radium 226 and 228 combined: 5 pCi/L

2) For constituents with a background concentration higher than the levels identified under subsection (a)(1) of this Section, the background concentration shall be the groundwater protection standard.

b) For new CCR surface impoundments, the groundwater protection standards at the waste boundary shall be background for the constituents listed in subsection (a)(1).

c) In addition to the groundwater protection standards in subsections (a) and (b), the groundwater quality standards in 35 Ill. Adm. Code 620 apply to CCR surface impoundments. When the groundwater protection standards in subsections (a) and (b) and the groundwater quality standards in 35 Ill. Adm. Code 620 are inconsistent, the more stringent standard shall apply.

d) The owner or operator of a CCR surface impoundment may not obtain alternative groundwater quality standards in 35 Ill. Adm. Code 620.450(a)(4) for the constituents in subsections (a) and (b).

Section 845.610 General Requirements

a) All CCR surface impoundments and lateral expansions of CCR surface impoundments are subject to the groundwater monitoring and corrective action requirements under this Subpart.

b) Required submissions and Agency approvals for groundwater monitoring

1) Existing CCR surface impoundments. The owner or operator of an existing CCR surface impoundment must submit the following to the Agency in an initial operating permit application:

A) a hydrogeologic site characterization meeting the requirements of Section 845.620;

B) design and construction plans of a groundwater monitoring system meeting the requirements of Section 845.630;

C) a groundwater sampling and analysis program that includes selection of the statistical procedures to be used for evaluating groundwater monitoring data as required by Section 845.640; and

D) a monitoring program that includes a minimum of eight independent samples for each background and downgradient well as required by Section 845.650(b).

2) New CCR surface impoundments. The owner or operator of a new CCR surface impoundment and all lateral expansions of a CCR surface impoundment must submit the information required in subsection (b)(1)(A)-(C) in a construction permit application, and the information required in subsection (b)(1)(D) in an operating permit application.

3) All owners and operators of CCR surface impoundments must:

A) conduct groundwater monitoring pursuant to a monitoring program approved by the Agency under this Subpart;

B) evaluate the groundwater monitoring data for statistically significant increases over background levels for the constituents listed in Section 845.600 after each sampling event;

C) determine compliance with the groundwater protection standards in Section 845.600 after each sampling event; and

D) submit all groundwater monitoring data to the Agency and any analysis performed under subsection (b)(3)(B) and (b)(3)(C) within 60 days after completion of sampling, and place the groundwater monitoring data in the facility's operating record as required by Section 845.800(d)(15).

c) Once the groundwater monitoring system and the groundwater monitoring program have been established at the CCR surface impoundment as required by this Subpart, the owner or operator must conduct groundwater monitoring and, if necessary, corrective action throughout the active life and post-closure care period of the CCR surface impoundment.

d) In the event of a release from a CCR surface impoundment, the owner or operator must immediately take all necessary measures to control all sources of the release so as to reduce or eliminate, to the maximum extent feasible, further releases of contaminants into the environment. The owner or operator of the CCR surface impoundment must comply with all applicable requirements in Sections 845.660, 845.670, 845.680.

e) Annual Groundwater Monitoring and Corrective Action Report

1) The owner or operator of the CCR surface impoundment must prepare and submit to the Agency an annual groundwater monitoring and corrective action report as a part of the annual consolidated report required by Section 845.550.

2) For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action plan for the CCR surface impoundment, summarize key actions completed, including but not limited to the status of permit applications and Agency approvals, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

3) At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

A) A map, aerial image, or diagram showing the CCR surface impoundment, all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program for the CCR surface impoundment, and a visual delineation of any contaminant exceedances;

B) Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

C) A potentiometric surface map for each groundwater elevation sampling event required by Section 845.650(b)(2);

D) In addition to all the monitoring data obtained under this Subpart, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected;

E) A narrative discussion of any statistically significant increases over background levels for the constituents listed in Section 845.600; and

F) Other information required to be included in the annual report as specified in this Subpart.

4) A section at the beginning of the annual report must provide an overview of the current status of groundwater monitoring program and corrective action plan for the CCR surface impoundment. At a minimum, the summary must:

A) specify whether groundwater monitoring data shows a statistically significant increase over background concentrations for one or more constituents listed in Section 845.600;

B) identify those constituents having a statistically significant increase over background concentrations and the names of the monitoring wells associated with such an increase;

C) specify whether the groundwater protection standards for one or more constituents listed in Section 845.600 has been exceeded;

D) identify those constituents that exceed the groundwater protection standards in Section 845.600 and the names of the monitoring wells associated with such an increase;

E) provide the date when the assessment of corrective measures was initiated for the CCR surface impoundment;

F) provide the date when the assessment of corrective measures was completed for the CCR surface impoundment;

G) specify whether a remedy was selected pursuant to Section 845.670 during the current annual reporting period, and if so, the date of remedy selection; and

H) specify whether remedial activities were initiated or are ongoing pursuant to Section 845.780 during the current annual reporting period.

Section 845.620 Hydrogeologic Site Characterization

a) The owner or operator of the CCR surface impoundment must design and implement a hydrogeologic site characterization.

b) The hydrogeologic site characterization shall include but not be limited to the following:

1) Geologic well logs/boring logs;

2) Climatic aspects of the site, including seasonal and temporal fluctuations in groundwater flow;

3) Identification of nearby surface water bodies and drinking water intakes;

4) Identification of nearby pumping wells and associated uses of the groundwater;

5) Identification of nearby dedicated nature preserves;

6) Geologic setting;

7) Structural characteristics;

8) Geologic cross-sections;

9) Soil characteristics;

10) Identification of confining layers;

11) Identification of potential migration pathways;

12) Groundwater quality data;

13) Vertical and horizontal extent of the geologic layers to a minimum depth of 100 feet below land surface, including lithology and stratigraphy;

14) Chemical and physical properties of the geologic layers to a minimum depth of 100 feet below land surface;

15) Hydraulic characteristics of the geologic layers identified as migration pathways and geologic layers that limit migration, including:

A) water table depth;

B) hydraulic conductivities;

C) effective and total porosities;

D) direction and velocity of groundwater flow; and

E) map of the potentiometric surface;

16) groundwater classification pursuant to 35 Ill. Adm. Code 620; and

17) Any other information requested by the Agency.

Section 845.630 Groundwater Monitoring Systems

a) Performance standard. The owner or operator of a CCR surface impoundment must install a groundwater monitoring system that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield groundwater samples that:

1) Accurately represent the quality of background groundwater that has not been affected by leakage from a landfill containing CCR or CCR surface impoundment. A determination of background quality may include sampling of wells that are not hydraulically upgradient of the CCR management area where:

A) Hydrogeologic conditions do not allow the owner or operator of the CCR surface impoundment to determine what wells are hydraulically upgradient; or

B) Sampling at other wells will provide an indication of background groundwater quality that is demonstratively as representative or more representative than that provided by the upgradient wells; and

2) Accurately represent the quality of groundwater passing the waste boundary of the CCR surface impoundment. The downgradient monitoring system must be installed at the waste boundary that ensures detection of groundwater contamination. All potential contaminant pathways must be monitored.

b) The number, spacing, and depths of monitoring system wells shall be determined based upon site-specific technical information identified in the hydrogeologic site characterization conducted under Section 845.620.

c) The groundwater monitoring system must include a sufficient number of monitoring wells necessary to meet the performance standards specified in subsection (a) of this Section based on the site-specific information specified in subsection (b) of this Section. The groundwater monitoring system must contain:

1) a minimum of one upgradient and three downgradient monitoring wells; and

2) additional monitoring wells as necessary to accurately represent the quality of background groundwater that has not been affected by leakage from the CCR surface impoundment and the quality of groundwater passing the waste boundary of the CCR surface impoundment.

d) Multiunit groundwater monitoring system

1) The owner or operator of multiple CCR surface impoundments may install a multiunit groundwater monitoring system instead of separate groundwater monitoring systems for each CCR surface impoundment.

2) The multiunit groundwater monitoring system must be equally as capable of detecting monitored constituents at the waste boundary of the CCR surface impoundment as the individual groundwater monitoring system specified in subsections (a) through (c) of this Section for each CCR surface impoundment based on the following factors:

A) number, spacing, and orientation of each CCR surface impoundment;

B) hydrogeologic setting;

C) site history; and

D) engineering design of the CCR surface impoundment.

e) Monitoring wells must be properly constructed in a manner consistent with the standards of 77 Ill. Adm. Code 920.170.

1) The owner or operator must document and include in the facility's operating record the design, installation, development, and decommissioning of any monitoring wells, piezometers and other measurement, sampling, and analytical devices. The qualified professional engineer must be given access to this documentation when completing the groundwater monitoring system certification required under subsection (g) of this Section.

2) The monitoring wells, piezometers, and other measurement, sampling, and analytical devices must be operated and maintained so that they perform to the design specifications throughout the life of the monitoring program.

f) The owner or operator of a new CCR surface impoundment must submit a construction permit application containing documentation showing that the groundwater monitoring system is designed to meet the requirements of this Section. The owner or operator of all CCR surface impoundments must submit an operating permit application containing documentation showing that the groundwater monitoring system has been constructed to meet the requirements of this Section.

g) The owner or operator must obtain a certification from a qualified professional engineer stating that the groundwater monitoring system has been designed and constructed to meet the requirements of this Section. If the groundwater monitoring system includes the minimum number of monitoring wells specified in subsection (c)(1) of this Section, the certification must document the basis supporting this determination. The certification must be submitted to the Agency with the appropriate permit application.

Section 845.640 Groundwater Sampling and Analysis Requirements

a) The groundwater monitoring program must include consistent sampling and analysis procedures that are designed to ensure monitoring results that provide an accurate representation of groundwater quality at the background and downgradient wells required by Section 845.630. The owner or operator of the CCR surface impoundment must develop a sampling and analysis program that includes procedures and techniques for:

1) Sample collection;

2) Sample preservation and shipment;

3) Analytical procedures;

4) Chain of custody control; and

5) Quality assurance and quality control.

b) The groundwater monitoring program must include sampling and analytical methods that are appropriate for groundwater sampling and that accurately measure hazardous constituents and other monitoring parameters in groundwater samples. For purposes of this Subpart, the term constituent refers to both hazardous constituents and other monitoring parameters listed in Section 845.600.

c) Groundwater elevations must be measured in each well prior to purging, each time groundwater is sampled. The owner or operator of the CCR surface impoundment must determine the rate and direction of groundwater flow each time groundwater is sampled. Groundwater elevations in wells which monitor the same CCR management area must be measured within a period of time short enough to avoid temporal variations in groundwater flow which could preclude accurate determination of groundwater flow rate and direction.

d) The owner or operator of the CCR surface impoundment must establish background groundwater quality in a hydraulically upgradient or background well(s) for each of the constituents listed in Section 845.600. Background groundwater quality may be established at wells that are not located hydraulically upgradient from the CCR surface impoundment if it meets the requirements of Section 845.630(a)(1).

e) The number of samples collected when conducting monitoring (for both downgradient and background wells) must be consistent with the statistical procedures chosen under subsection (f) of this Section and the performance standards under subsection (g) of this Section. The sampling procedures shall be those specified under Section 845.650(a) through (c).

f) The owner or operator of the CCR surface impoundment must select one of the statistical methods specified in subsections (f)(1) through (5) of this Section to be used in evaluating groundwater monitoring data for each specified constituent. The statistical test chosen shall be conducted separately for each constituent in each monitoring well.

1) A parametric analysis of variance followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's mean and the background mean levels for each constituent.

2) An analysis of variance based on ranks followed by multiple comparison procedures to identify statistically significant evidence of contamination. The method must include estimation and testing of the contrasts between each compliance well's median and the background median levels for each constituent.

3) A tolerance or prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data and the level of each constituent in each compliance well is compared to the upper tolerance or prediction limit.

4) A control chart approach that gives control limits for each constituent.

5) Another statistical test method that meets the performance standards of subsection (g) of this Section.

6) The owner or operator of the CCR surface impoundment must obtain a certification from a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR surface impoundment. The certification must include a narrative description of the statistical method selected to evaluate the groundwater monitoring data. The certification must be submitted to the Agency with the appropriate permit application.

7) The owner or operator of the CCR surface impoundment must submit the following to the Agency in an operating permit application:

A) documentation of the statistical method chosen; and

B) the qualified professional engineer certification required under subsection (f)(6).

g) Any statistical method chosen under subsection (f) of this Section shall comply with the following performance standards, as appropriate, based on the statistical test method used:

1) The statistical method used to evaluate groundwater monitoring data shall be appropriate for the distribution of constituents. Normal distributions of data values shall use parametric methods. Non-normal distributions shall use non-parametric methods. If the distribution of the constituents is shown by the owner or operator of the CCR surface impoundment to be inappropriate for a normal theory test, then the data must be transformed or a distribution-free (non-parametric) theory test must be used. If the distributions for the constituents differ, more than one statistical method may be needed.

2) If an individual well comparison procedure is used to compare an individual compliance well constituent concentration with background constituent concentrations or a groundwater protection standard, the test shall be done at a Type I error level no less than 0.01 for each testing period. If a multiple comparison procedure is used, the Type I experiment wise error rate for each testing period shall be no less than 0.05; however, the Type I error of no less than 0.01 for individual well comparisons must be maintained. This performance standard does not apply to tolerance intervals, prediction intervals, or control charts.

3) If a control chart approach is used to evaluate groundwater monitoring data, the specific type of control chart and its associated parameter values shall be such that this approach is at least as effective as any other approach in this section for evaluating groundwater data. The parameter values shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

4) If a tolerance interval or a prediction interval is used to evaluate groundwater monitoring data, the levels of confidence and, for tolerance intervals, the percentage of the population that the interval must contain, shall be such that this approach is at least as effective as any other approach in this section for evaluating groundwater data. These parameters shall be determined after considering the number of samples in the background data base, the data distribution, and the range of the concentration values for each constituent of concern.

5) The statistical method must account for data below the limit of detection with one or more statistical procedures at least as effective as any other approach in this section for evaluating groundwater data. Any practical quantitation limit that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility. The practical quantitation limit must be less than the groundwater protection standards in Section 845.600.

6) If necessary, the statistical method must include procedures to control or correct for seasonal and spatial variability as well as temporal correlation in the data.

h) The owner or operator of the CCR surface impoundment must determine whether or not there is a statistically significant increase over background values for each constituent in Section 845.600.

1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the groundwater quality of each

constituent at each monitoring well designated pursuant to Section 845.630(a)(2) or (d)(1) to the background value of that constituent, according to the statistical procedures and performance standards specified under subsections (f) and (g) of this Section.

2) Within 90 days after completing sampling and analysis, the owner or operator must determine whether there has been a statistically significant increase over background for any constituent at each monitoring well.

i) The owner or operator must measure total recoverable metals concentrations in measuring groundwater quality. Measurement of total recoverable metals captures both the particulate fraction and dissolved fraction of metals in natural waters. Groundwater samples shall not be field-filtered prior to analysis.

j) All groundwater samples taken pursuant to this Subpart must be analyzed by a certified laboratory using Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, incorporated by reference in Section 845.150.

Section 845.650 Groundwater Monitoring Program

a) The owner or operator of a CCR surface impoundment must conduct groundwater monitoring consistent with this Section. At a minimum, groundwater monitoring must include groundwater monitoring for all constituents with a groundwater protection standard in Section 845.600 and calcium. The owner or operator of the CCR surface impoundment must submit a groundwater monitoring plan to the Agency with its operating permit application.

b) Monitoring Frequency

1) The monitoring frequency for all constituents with a groundwater protection standard in Section 845.600 and calcium shall be at least quarterly during the active life of the CCR surface impoundment and the post-closure care period.

A) For existing CCR surface impoundments, a minimum of eight independent samples from each background and downgradient well must be collected and analyzed for all constituents with a groundwater protection standard listed in Section 845.600(a) and calcium no later than 180 days after the effective date of this Part.

B) For new CCR surface impoundments, and all lateral expansions of CCR surface impoundments, a minimum of eight independent samples for each background well and downgradient well must be collected and analyzed for all constituents with a groundwater

protection standard listed in Section 845.600(a) and calcium during the first 180 days of sampling.

2) The groundwater elevation monitoring frequency shall be monthly.

c) The number of samples collected and analyzed for each background well and downgradient well during subsequent quarterly sampling events must be consistent with Section 845.640, and must account for any unique characteristics of the site, but must include at least one sample from each background and downgradient well.

d) If one or more constituents are detected above the groundwater protection standards in Section 845.600 in any sampling event, the owner or operator must notify the Agency which constituent exceeded the groundwater protection standard and place the notification in the facility's operating record as required by Section 845.800(d)(16). The owner or operator of the CCR surface impoundment also must:

1) Characterize the nature and extent of the release and any relevant site conditions that may affect the remedy ultimately selected. The characterization must be sufficient to support a complete and accurate assessment of the corrective measures necessary to effectively clean up all releases from the CCR surface impoundment pursuant to Section 845.660. The owner or operator of the CCR surface impoundment must submit the characterization to the Agency and place the characterization in the facility's operating record as required by Section 845.800(d)(16). Characterization of the release includes the following minimum measures:

A) Install additional monitoring wells necessary to define the contaminant plume(s);

B) Collect data on the nature and estimated quantity of material released including specific information on the constituents listed in Section 845.600 and the levels at which they are present in the material released;

C) Install at least one additional monitoring well at the facility boundary in the direction of contaminant migration and sample this well in accordance with subsection (a) and (b) of this Section; and

D) Sample all wells in accordance with subsection (a) and (b) of this Section to characterize the nature and extent of the release.

2) Notify all persons who own the land or reside on the land that directly overlies any part of the plume of contamination if contaminants have migrated off-site as indicated by sampling of wells in accordance with

subsection (d)(1) of this Section. The owner or operator must send notifications made pursuant to this subsection (d)(2) to the Agency and place the notifications in the facility's operating record as required by Section 845.800(d)(16).

3) Except as provided in subsection (d)(4), within 90 days of the detected exceedance, initiate an assessment of corrective measures as required by Section 845.660.

4) Alternative Source Demonstration. The owner or operator of a CCR surface impoundment may, within 60 days of the detected exceedance, submit a demonstration to the Agency that a source other than the CCR surface impoundment caused the contamination and the CCR surface impoundment did not contribute to the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, natural variation in groundwater quality, or a change in the potentiometric surface and groundwater flow direction. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer.

A) The Agency shall provide a written response either concurring or not concurring with the demonstration within 30 days.

B) If the Agency concurs with the demonstration, the owner or operator must continue monitoring in accordance with this Section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by Section 845.610(e), in addition to the certification by a qualified professional engineer.

C) If the Agency does not concur with the written demonstration made pursuant to subsection (d)(4) of this Section, the owner or operator of the CCR surface impoundment must initiate the assessment of corrective measures requirements under Section 845.660.

Section 845.660 Assessment of Corrective Measures

a) Unless the Agency has concurred with an alternative source demonstration made pursuant to Section 845.650(d)(4), the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore the affected area.

1) The assessment of corrective measures must be initiated within 90 days of finding that any constituent listed in Section 845.600 has been detected at

a statistically significant level exceeding the groundwater protection standards in Section 845.600, or immediately upon detection of a release from a CCR surface impoundment.

2) The assessment of corrective measures must be completed and submitted to the Agency within 90 days of initiation of assessment of corrective measures, unless the owner or operator demonstrates to the Agency the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must submit this demonstration along with a certification from a qualified professional engineer attesting that the demonstration is accurate to the Agency within 60 days of initiating an assessment of corrective measures. The Agency shall either approve or disapprove the demonstration within 30 days. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the Agency approved demonstration in the annual groundwater monitoring and corrective action report required by Section 845.610(e), in addition to the certification by a qualified professional engineer.

b) The owner or operator of the CCR surface impoundment must continue to monitor groundwater in accordance with the monitoring program as specified in Section 845.650.

c) The assessment under subsection (a) of this Section must include an analysis of the effectiveness of potential corrective measures in meeting all of the requirements and objectives of the corrective action plan as described under Section 845.670 addressing at least the following:

1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;

2) The time required to begin and complete the corrective action plan; and

3) The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the corrective action plan.

d) The owner or operator of the CCR surface impoundment must discuss the results of the corrective measures assessment at least 30 days prior to the selection of remedy in a public meeting with interested and affected parties as required by Section 845.240.

e) When the owner or operator of a CCR surface impoundment is completing closure and corrective action simultaneously, the owner or operator may combine

the requirements of this Section and Section 845.710 into one assessment of alternatives.

Section 845.670 Corrective Action Plan

a) The owner or operator must prepare a semi-annual report describing the progress in selecting a remedy and developing a corrective action plan. The semi-annual report must be submitted to the Agency and placed in the operating record as required by Section 845.800(d)(17).

b) Within 1 year of completing the assessment of corrective measures as specified in Section 845.660, and after completion of the public meeting in Section 845.660(d), the owner or operator of the CCR surface impoundment must submit a corrective action plan, which identifies the selected remedy, in a construction permit application to the Agency. This requirement applies in addition to, not in place of, any applicable standards under the Occupational Safety and Health Act or any other State or federal law.

c) The corrective action plan must meet the following requirements:

1) be based on the results of the corrective measures assessment conducted under Section 845.660;

2) identify a selected remedy, which at a minimum, meets the standards listed in subsection (d) of this Section;

3) contain the corrective action alternatives analysis specified in subsection (e); and

4) contain proposed schedules for implementation, including an analysis of the factors in subsection (f);

d) The selected remedy in the corrective action plan must:

1) Be protective of human health and the environment;

2) Attain the groundwater protection standards as specified in Section 845.600;

3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of constituents in Section 845.600 of this Part into the environment;

4) Remove from the environment as much of the contaminated material that was released from the CCR surface impoundment as is feasible, taking

into account factors such as avoiding inappropriate disturbance of sensitive ecosystems; and

5) Comply with standards for management of wastes as specified in 845.680 (d).

e) Corrective Action Alternatives Analysis. In selecting a remedy that meets the standards of subsection (d) of this Section, the owner or operator of the CCR surface impoundment shall consider the following evaluation factors:

1) The long- and short-term effectiveness and protectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on consideration of the following:

A) Magnitude of reduction of existing risks;

B) Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy;

C) The type and degree of long-term management required, including monitoring, operation, and maintenance;

D) Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminants;

E) Time until groundwater protection standards in Section 845.600 are achieved;

F) The potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, containment or changes in groundwater flow;

G) The long-term reliability of the engineering and institutional controls, including an analysis of any off-site, nearby destabilizing activities; and

H) Potential need for replacement of the remedy.

2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:

A) The extent to which containment practices will reduce further releases; and

B) The extent to which treatment technologies may be used.

3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:

A) Degree of difficulty associated with constructing the technology;

B) Expected operational reliability of the technologies;

C) Need to coordinate with and obtain necessary approvals and permits from other agencies;

D) Availability of necessary equipment and specialists; and

E) Available capacity and location of needed treatment, storage, and disposal services.

4) The degree to which community concerns are addressed by a potential remedy(s).

f) The owner or operator must specify, as part of the corrective action plan, a schedule for implementing and completing remedial activities. Such a schedule must require the completion of remedial activities within a reasonable period of time taking into consideration the factors set forth in subsections (f)(1) through (6) of this Section. The owner or operator of the CCR surface impoundment must consider the following factors in determining the schedule of remedial activities:

1) Extent and nature of contamination, as determined by the characterization required under Section 845.650(d);

2) Reasonable probabilities of remedial technologies in achieving compliance with the groundwater protection standards established under Section 845.600 and other objectives of the remedy;

3) Availability of treatment or disposal capacity for CCR managed during implementation of the remedy;

4) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;

5) Resource value of the aquifer including:

A) Current and future uses, including but not limited to potential, residential, agricultural, commercial industrial and ecological uses;

B) Proximity and withdrawal rate of users;

C) Groundwater quantity and quality;

D) The potential impact to the subsurface ecosystem, wildlife, other natural resources, crops, vegetation, and physical structures caused by exposure to CCR constituents;

E) The hydrogeologic characteristic of the facility and surrounding land; and

F) The availability of alternative water supplies; and

6) Other relevant factors.

Section 845.680 Implementation of the Corrective Action Plan

a) Within 90 days of the Agency's approval of the corrective action plan submitted under Section 845.670, the owner or operator must initiate corrective action. Based on the schedule approved by the Agency for implementation and completion of corrective action, the owner or operator must:

1) Establish and implement a corrective action groundwater monitoring program that:

A) At a minimum, meets the requirements of the monitoring program under Section 845.650;

B) Documents the effectiveness of the corrective action remedy; and

C) Demonstrates compliance with the groundwater protection standard pursuant to subsection (c) of this Section.

2) Implement the corrective action remedy approved by the Agency under Section 845.670; and

3) Take any interim measures necessary to reduce the contaminants leaching from the CCR surface impoundment, and/or potential exposures to human or ecological receptors. Interim measures must, to the greatest extent feasible, be consistent with the objectives of and contribute to the performance of any remedy that may be required pursuant to Section 845.670. The following factors must be considered by an owner or operator in determining whether interim measures are necessary:

A) Time required to develop and implement a final remedy;

B) Actual or potential exposure of nearby populations or environmental receptors to any of the constituents listed in Section 845.600 of this Part;

C) Actual or potential contamination of sensitive ecosystems or current or potential drinking water supplies;

D) Further degradation of the groundwater that may occur if remedial action is not initiated expeditiously;

E) Weather conditions that may cause any of the constituents listed in Section 845.600 of this Part to migrate or be released;

F) Potential for exposure to any of the constituents listed in Section 845.600 of this Part as a result of an accident or failure of a container or handling system; and

G) Other situations that may pose threats to human health and the environment.

b) If the Agency or an owner or operator of the CCR surface impoundment, determines, at any time, that compliance with the requirements of Section 845.670(d) is not being achieved through the remedy selected, the owner or operator must implement other methods or techniques that could feasibly achieve compliance with the requirements. These methods or techniques must receive approval by the Agency before implementation.

c) Corrective action shall be considered complete when:

1) The owner or operator of the CCR surface impoundment demonstrates compliance with the groundwater protection standards established under Section 845.600 has been achieved at all points within the plume of contamination that lie beyond the waste boundary;

2) Compliance with the groundwater protection standards has been achieved by demonstrating that concentrations of constituents listed in Section 845.600 of this Part have not been exceeded for a period of three consecutive years using the statistical procedures and performance standards in Section 845.640(f) and (g); and

3) All actions required to complete the remedy have been satisfied.

d) All CCR managed pursuant to a remedy approved by the Agency under Section 845.670, or an interim measure required under subsection (a)(3) of this Section, shall be managed in a manner that complies with this Part.

e) Upon completion of the corrective action plan, the owner or operator must submit to the Agency a corrective action completion report and certification.

1) The corrective action completion report must contain supporting documentation, including, but not limited to:

A) Any 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 845.290 of this Part;

B) A written summary of the implementation of the corrective action plan as set forth in the construction permit and this Part;

C) Groundwater monitoring data demonstrating compliance with Section 845.680(c);

D) Any remedial actions completed pursuant to Section 845.680(d);

E) Documentation showing compliance with the selected remedy requirements of Section 845.670(b); and

F) Any other information relied upon by the qualified professional engineer in making the closure certification.

2) The corrective action completion certification must include a statement from a qualified professional engineer attesting that the corrective action plan has been completed in compliance with the requirements of subsection (c) of this Section.

3) The owner or operator must place the corrective action completion report and certification in the facility's operating record as required by Section 845.800(d)(18).

SUBPART G: CLOSURE AND POST-CLOSURE CARE

Section 845.700 Required Closure or Retrofit of CCR Surface Impoundments

a) Required closure. The owner or operator of the following CCR surface impoundments must cease placing CCR or non-CCR waste streams in the CCR surface impoundment and must initiate closure of the CCR surface impoundment:

1) an existing CCR surface impoundment that has not demonstrated compliance with any of the following location restrictions:

A) uppermost aquifer location as specified in Section 845.300;

B) wetlands, as specified in Section 845.310;

C) fault areas, as specified in Section 845.320;

D) seismic impact zones, as specified in Section 845.330; or

E) unstable areas, as specified in Section 845.340.

2) The owner or operator any CCR surface impoundment that has failed to complete the initial or any subsequent annual safety factor assessment required by Section 845.460 or that has failed to document the calculated factors of safety for the CCR surface impoundment to achieve the minimum safety factors specified in Section 845.460(a)(1) through (5).

b) Required Closure or Retrofit. The owner or operator of an existing unlined CCR surface impoundment, as determined under Section 845.400(f), must cease placing CCR and non-CCR waste streams into such CCR surface impoundment and either retrofit or close the CCR unit in accordance with the requirements of Subpart G. The owner or operator of a CCR surface impoundment electing to retrofit must submit a construction permit application to retrofit pursuant to Section 845.770 according to the schedule in subsection (h);

c) Beginning on the effective date of this Part, the owner or operator of the CCR surface impoundment required to close under subsection (a) or electing to close under subsection (b) must immediately take steps to categorize the CCR surface impoundment pursuant to subsection (g) of this Section and to comply with the closure alternatives analysis requirements in Section 845.710. The owner or operator of the CCR surface impoundment must submit a construction permit application containing a final closure plan pursuant to the schedule in subsection (h) of this Section.

d) Timeframes for Closure

1) Except as provided in subsection (d)(2), the owner or operator must cease placing CCR and non-CCR waste streams in the impoundment and initiate closure within six months of failing to complete any of the demonstrations listed in subsection (a).

2) For CCR surface impoundments required to close under subsection (a)(1) or electing to close under subsection (b):

A) If, on the effective date of this Part, the owner or operator of a CCR surface impoundment has not satisfied an alternative closure requirement of 40 CFR 257.103 that allows for the continued receipt of CCR or non-CCR waste streams, the owner or operator must not place CCR or non-CCR waste streams into the CCR surface impoundment after the effective date of this Part.

B) If, on the effective date of this Part, the owner or operator of a CCR surface impoundment has demonstrated that alternative disposal capacity is infeasible under 40 CFR 257.103, the owner or operator must cease placing CCR or non-CCR waste streams into the CCR surface impoundment by the end of the initial time extension approved under 40 CFR 257.103 or once alternative capacity becomes available, whichever is sooner. In no case may the owner or operator of the CCR surface impoundment place CCR or non-CCR waste streams into the CCR surface impoundment after October 15, 2023.

C) If, on the effective date of this Part, the owner or operator of a CCR surface impoundment has demonstrated permanent cessation of coal-fired power boiler(s) by a certain date under 40 CFR 257.103, the owner or operator must:

i) for CCR surface impoundments that are 40 acres or smaller, cease operation of the coal-fired boiler and complete closure no later than October 17, 2023; or

ii) for CCR surface impoundments that are larger than 40 acres, cease operation of the coal-fired boiler and complete closure no later than October 17, 2028.

D) Failure to remain in compliance with any of the requirements of this Part will result in the automatic loss of authorization under subsection (d)(2)(B) and subsection (d)(2)(C).

E) The owner or operator of the CCR surface impoundment will not be given extensions of the timeframes for closure

e) Semi-Annual Reports. The owner or operator of a CCR surface impoundment closing under the time frames in subsection (d)(2)(B) and (d)(2)(C) shall prepare semi-annual reports consistent with the requirements in 40 CFR 257.103 until the owner or operator has initiated closure.

f) An owner or operator of a CCR surface impoundment required to close pursuant to this Section must prepare the notification required under Section 845.730(d) that the CCR surface impoundment is closing under this Section.

g) Closure Prioritization

1) The owner or operator of a CCR surface impoundment required to close under this Section must assign the CCR surface impoundment to one of the following categories. Category 1 has the highest priority for closure. Category 7 has the lowest priority category for closure.

A) Category 1 includes CCR surface impoundments that have impacted an existing potable water supply well or that have impacted groundwater quality within the setback of an existing potable water supply well.

B) Category 2 includes CCR surface impoundments that are an imminent threat to human health or the environment as determined by the Agency pursuant to subsection (g)(5).

C) Category 3 includes CCR surface impoundments located in areas of environmental justice concern as determined by the Agency pursuant to subsection (g)(6).

D) Category 4 includes inactive CCR surface impoundments that have an exceedance of the groundwater protection standards in Section 845.600.

E) Category 5 includes existing CCR surface impoundments that have exceedances of the groundwater protection standards in Section 845.600.

F) Category 6 includes inactive CCR surface impoundments that are in compliance with the groundwater protection standards in Section 845.600.

G) Category 7 includes existing CCR surface impoundments that are in compliance with the groundwater protection standards in Section 845.600.

2) If a CCR surface impoundment can be categorized in more than one category, the owner or operator of the CCR surface impoundment must assign the CCR surface impoundment the highest priority category.

3) Whenever an owner or operator of a CCR surface impoundment has more than one CCR surface impoundment that must close under this Section, the owner or operator shall close the CCR surface impoundments in order of priority.

4) If the CCR surface impoundment meets the criteria for Category 1, the owner or operator must take immediate steps to mitigate the impact to any existing potable water supply. The owner or operator of the CCR surface impoundment shall act to replace the water supply with a supply of equal or better quality and quantity within 30 days of notice that such impact has occurred.

5) The Agency may designate a CCR surface impoundment as a Category 2 surface impoundment when:

A) the CCR surface impoundment has failed to document that the calculated factors of safety for the CCR surface impoundment achieve the minimum safety factors specified in Section 845.460(a)(1) through (5);

B) the CCR surface impoundment has not demonstrated compliance with the location restrictions in Subpart C of this Part;

C) the owner or operator has been enjoined pursuant to 415 ILCS 5/43;

D) contamination exceeding the groundwater protection standards in Section 845.600 has migrated off-site; or

E) the Agency finds that an emergency condition exists creating an immediate danger to public health or welfare, or the environment.

6) For the purposes of this Part and only this Part, areas of environmental justice concern are identified as any area that meets either of the following:

A) any area within one-mile of a census block group where the number of low-income persons is twice the statewide average, where low income means the number or percent of a census block group's population in households where the household income is less than or equal to twice the federal poverty level; or

B) any area within one-mile of a census block group where the number of minority persons is twice the statewide average, where minority means the number or percent of individuals in a census block group who list their racial status as a race other than white alone or list their ethnicity as Hispanic or Latino.

h) Application Schedule

1) Category 1, Category 2, Category 3, and Category 4 CCR surface impoundment owners or operators must submit either a construction permit application containing a final closure plan or submit a construction permit application to retrofit the CCR surface impoundment in accordance with the requirements of this Part no later than January 1, 2022.

2) Category 5 CCR surface impoundment owners or operators must submit either a construction permit application containing a final closure plan or submit a construction permit application to retrofit the CCR surface impoundment in accordance with the requirements of this Part no later than July 1, 2022.

3) Category 6 and Category 7 CCR surface impoundment owners or operators must submit either a construction permit application containing a final closure plan or submit a construction permit application to retrofit the CCR surface impoundment in accordance with the requirements of this Part no later than July 1, 2023.

4) Owners or operators consolidating one or more CCR surface impoundments for closure must meet the application schedule of the highest priority CCR surface impoundment.

5) If the Agency denies a construction permit application submitted pursuant to this Section, the owner and operator must submit a revised construction permit application addressing all deficiencies identified by Agency. The revised construction permit application for closure must be submitted to the Agency within 90 days after the Agency's denial if the Agency's denial is not appealed pursuant to Section 845.270. If the Agency's denial is appealed, the owner or operator must submit a revised construction permit application for closure within 90 days after a final decision by the Illinois Pollution Control Board is rendered. The owner or operator of the CCR surface impoundment must discuss the owner or operator's proposed response to all deficiencies identified by the Agency in a public meeting with interested and affected parties held pursuant to Section 845.240.

Section 845.710 Closure Alternatives

a) Closure of a CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, must be completed either by leaving the CCR in place and installing a final cover system or through removal of the CCR and decontamination of the CCR surface impoundment, as described in Sections 845.720 through 845.760.

b) Before selecting a closure method, the owner or operator of each CCR surface impoundment must complete a closure alternatives analysis. The closure alternatives analysis must examine the following for each closure alternative:

1) the long- and short-term effectiveness and protectiveness of the closure method, including identification and analyses of the following factors:

   A) the magnitude of reduction of existing risks;

   B) the magnitude of residual risks in terms of likelihood of future releases of CCR;

   C) the type and degree of long-term management required, including monitoring, operation, and maintenance;

   D) the short-term risks that might be posed to the community or the environment during implementation of such a closure, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminants;

   E) the time until closure and post-closure care is completed;

   F) the potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, containment or changes in groundwater flow;

   G) the long-term reliability of the engineering and institutional controls, including an analysis of any off-site, nearby destabilizing activities; and

   H) potential need for future corrective action of the closure alternative.

2) the effectiveness of the closure method in controlling future releases based on analyses of the following factors:

   A) the extent to which containment practices will reduce further releases; and

   B) the extent to which treatment technologies may be used.

3) the ease or difficulty of implementing a potential closure method based on analyses of the following types of factors:

   A) degree of difficulty associated with constructing the technology;

   B) expected operational reliability of the technologies;

C) need to coordinate with and obtain necessary approvals and permits from other agencies;

D) availability of necessary equipment and specialists; and

E) available capacity and location of needed treatment, storage, and disposal services.

4) the degree to which the concerns of the residents living within communities where the CCR will be handled, transported and disposed are addressed by the closure method.

c) The owner or operator of the CCR surface impoundment must analyze complete removal of the CCR as one closure alternative in the closure alternatives analysis. The closure alternative analysis must identify whether the facility has an onsite landfill meeting the requirements of 35 Ill. Adm. Code 815, and if not, whether constructing a landfill onsite is possible. The owner and operator of the CCR surface impoundment must include any other closure method in the alternatives analysis if requested by the Agency.

d) The analysis for each alternative completed pursuant to this Section must

1) meet or exceed a class 4 estimate under the AACE Classification Standard, incorporated by reference in Section 845.150, or a comparable classification practice as provided in the AACE classification standard;

2) contain the results of groundwater contaminant transport modeling and calculations showing how the closure alternative will achieve compliance with the applicable groundwater protection standards;

3) include a description of the fate and transport of contaminants with the closure alternative over time including consideration of seasonal variations; and

4) assess impacts to waters in the state.

e) At least 30 days before submission of a construction permit application for closure, the owner or operator of the CCR surface impoundment must discuss the results of the closure alternatives analysis in a public meeting with interested and affected parties as required by Section 845.240.

f) After completion of the public meeting pursuant to subsection (e), the owner or operator of a CCR surface impoundment must select a closure method and submit a final closure plan to the Agency pursuant to Section 845.720(b). All materials

demonstrating completion of the closure alternatives analysis specified in this Section must be submitted with the final closure plan.

g) The selected closure method must meet the requirements and standards of this Part, ensure the protection of human health and the environment, and achieve compliance with the groundwater protection standards in Section 845.600.

Section 845.720 Closure Plan

a) Preliminary written closure plan

1) Content of the preliminary closure plan. The owner or operator of a new CCR surface impoundment or an existing CCR surface impoundment not required to close under Section 845.700 must prepare a preliminary written closure plan that describes the steps necessary to close the CCR surface impoundment at any point during the active life of the CCR surface impoundment consistent with recognized and generally accepted engineering practices. The preliminary written closure plan must include, at a minimum, the information specified in subsections (a)(1)(A) through (F) of this Section.

A) A narrative description of how the CCR surface impoundment will be closed in accordance with this Part.

B) If closure of the CCR surface impoundment will be accomplished through removal of CCR from the CCR surface impoundment, a description of the procedures to remove the CCR and decontaminate the CCR surface impoundment in accordance with Section 845.740.

C) If closure of the CCR surface impoundment will be accomplished by leaving CCR in place, a description of the final cover system, designed in accordance with Section 845.750, and the methods and procedures to be used to install the final cover. The closure plan must also discuss how the final cover system will achieve the performance standards specified in Section 845.750.

D) An estimate of the maximum inventory of CCR ever on-site over the active life of the CCR surface impoundment.

E) An estimate of the largest area of the CCR surface impoundment ever requiring a final cover as required by Section 845.750 of this Section at any time during the CCR surface impoundment's active life.

F) A schedule for completing all activities necessary to satisfy the closure criteria in this Section, including an estimate of the year in which all closure activities for the CCR surface impoundment will be completed. The schedule should provide sufficient information to describe the sequential steps that will be taken to close the CCR surface impoundment, including identification of major milestones such as coordinating with and obtaining necessary approvals and permits from other agencies, the dewatering and stabilization phases of CCR surface impoundment closure, or installation of the final cover system, and the estimated timeframes to complete each step or phase of CCR surface impoundment closure. When preparing the preliminary written closure plan, if the owner or operator of a CCR surface impoundment estimates that the time required to complete closure will exceed the timeframes specified in Section 845.760(a), the preliminary written closure plan must include the site-specific information, factors and considerations that would support any time extension sought under Section 845.760(b).

2) The owner or operator of the CCR surface impoundment must submit the preliminary written closure plan to the Agency with its initial operating permit application. The owner or operator of the CCR surface impoundment must submit the most recently amended preliminary closure plan to the Agency with each operating permit renewal application. The owner or operator must place preliminary and amended preliminary written closure plans in the facility's operating record as required by Section 845.800(d)(19).

3) Amendment of a preliminary written closure plan.

A) The owner or operator may amend the preliminary written closure plan at any time.

B) The owner or operator must amend the preliminary written closure plan whenever:

i) There is a change in the operation of the CCR surface impoundment that would substantially affect the written closure plan in effect; or

ii) Before closure activities have commenced, unanticipated events necessitate a revision of the written closure plan.

C) The owner or operator must amend the closure plan at least 60 days prior to a planned change in the operation of the facility or CCR surface impoundment, or no later than 60 days after an

unanticipated event requires the need to revise an existing written closure plan.

4) The owner or operator of the CCR surface impoundment must obtain a written certification from a qualified professional engineer that the initial and any amendment of the preliminary written closure plan meets the requirements of this Part.

b) Final Closure Plan

1) The owner or operator of a CCR surface impoundment must submit, as a part of a construction permit application for closure, a final closure plan to the Agency before the installation of a final cover system or removal of CCR from the surface impoundment for the purpose of closure.

2) Except as otherwise provided in Section 22.59 of the Act, the owner or operator of a CCR surface impoundment must not close a CCR surface impoundment without a construction permit issued pursuant to this Part.

3) The final closure plan must identify the proposed selected closure method, and include the information required in subsection (a)(1) of this Section and the closure alternatives analysis as specified in Section 845.710.

4) If a final written closure plan revision is necessary after closure activities have commenced for a CCR surface impoundment, the owner or operator must submit a request to modify the construction permit no later than 30 days following the triggering event.

5) The owner or operator of the CCR surface impoundment must obtain a written certification from a qualified professional engineer that the final written closure plan meets the requirements of this Part.

Section 845.730 Initiation of Closure

Initiation of closure activities. Except as provided for in this Section, the owner or operator of a CCR surface impoundment must initiate closure of the CCR surface impoundment no later than the applicable timeframes specified in either subsections (a) or (b) of this Section. For purposes of this Part, closure of the CCR surface impoundment has been initiated if the owner or operator has ceased placing waste in the CCR surface impoundment and has submitted to the Agency a construction permit application pursuant to Section 845.220(d).

a) Known Final Receipt. The owner or operator must initiate closure of the CCR surface impoundment no later than 30 days after the date on which the CCR surface impoundment either:

1) Receives the known final placement of waste, either CCR or any non-CCR waste stream; or

2) Removes the known final volume of CCR from the CCR surface impoundment for the purpose of beneficial use of CCR.

b) Temporarily Idled Units.

1) Except as provided by subsection (b)(2) of this Section, the owner or operator must initiate closure of a CCR surface impoundment that has not received CCR or any non-CCR waste stream or is no longer removing CCR for the purpose of beneficial use within two years of the last receipt of waste or within two years of the last removal of CCR material for the purpose of beneficial use.

2) Notwithstanding subsection (b)(1) of this Section, the owner or operator of the CCR surface impoundment may secure an additional two years to initiate closure of the idle surface impoundment if the Agency approves the owner or operator's written demonstration that the CCR surface impoundment will continue to accept wastes or will start removing CCR for the purpose of beneficial use. The documentation must be supported by, at a minimum, the information specified in subsections (b)(2)(A) and (B) of this Section. The owner or operator may obtain two-year extensions provided the owner or operator continues to be able to demonstrate that there is reasonable likelihood that the CCR surface impoundment will accept wastes in the foreseeable future or will remove CCR from the surface impoundment for the purpose of beneficial use. The owner or operator must place each Agency approved demonstration, if more than one time extension is sought, in the facility's operating record as required by Section 845.800(d)(20) prior to the end of any two-year period.

A) Information documenting that the CCR surface impoundment has remaining storage or disposal capacity or that the CCR surface impoundment can have CCR removed for the purpose of beneficial use; and

B) Information demonstrating that that there is a reasonable likelihood that the CCR surface impoundment will resume receiving CCR or non-CCR waste streams in the foreseeable future or that CCR can be removed for the purpose of beneficial use. The narrative must include a best estimate as to when the CCR surface impoundment will resume receiving CCR or non-CCR waste streams. The situations listed in subsections (b)(2)(B)(i) through (iv) of this Section are examples of situations that would support a determination that the CCR surface impoundment will resume

receiving CCR or non-CCR waste streams in the foreseeable future.

i) Normal plant operations include periods during which the CCR surface impoundment does not receive CCR or non-CCR waste streams, such as the alternating use of two or more CCR surface impoundments whereby at any point in time one CCR surface impoundment is receiving CCR while CCR is being removed from a second CCR surface impoundment after its dewatering.

ii) The CCR surface impoundment is dedicated to a coal-fired boiler surface impoundment that is temporarily idled (e.g., CCR is not being generated) and there is a reasonable likelihood that the coal-fired boiler will resume operations in the future.

iii) The CCR surface impoundment is dedicated to an operating coal-fired boiler (i.e., CCR is being generated); however, no CCR are being placed in the CCR surface impoundment because the CCR is being entirely diverted to beneficial uses, but there is a reasonable likelihood that the CCR surface impoundment will again be used in the foreseeable future.

iv) The CCR surface impoundment currently receives only non-CCR waste streams and those non-CCR waste streams are not generated for an extended period of time, but there is a reasonable likelihood that the CCR surface impoundment will again receive non-CCR waste streams in the future.

3) In order to obtain additional time extension(s) to initiate closure of a CCR surface impoundment beyond the two years provided by subsection (b)(1) of this Section, the owner or operator of the CCR surface impoundment must submit the demonstration required by subsection (b)(2) of this Section to the Agency for review and approval. The written documentation must include the following statement signed by the owner or operator or an authorized representative:

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS DEMONSTRATION AND ALL ATTACHED DOCUMENTS, AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I

BELIEVE THAT THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

c) The timeframes specified in subsections (a) and (b) of this Section do not apply to an owner or operator of a CCR surface impoundment closing the CCR surface impoundment as required by Section 845.700:

d) No later than the date the owner or operator initiates closure of a CCR surface impoundment, the owner or operator must prepare a notification of intent to close a CCR surface impoundment. The notification must be placed in the facility's operating record as required by Section 845.800(d)(21).

Section 845.740 Closure by Removal

a) Closure by removal of CCR. An owner or operator may elect to close a CCR surface impoundment by removing and decontaminating all areas affected by releases from the CCR surface impoundment. CCR removal and decontamination of the CCR surface impoundment are complete when constituent concentrations throughout the CCR surface impoundment and any areas affected by releases from the CCR surface impoundment have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to Section 845.600.

b) The owner or operator of a CCR surface impoundment removing CCR during closure must responsibly handle and transport the CCR consistent with this subsection.

1) Transportation

A) Manifests

i) When transporting CCR by motor vehicle, manifests must be carried as specified in 35 Ill. Adm. Code 809. For purposes of this Part, coal combustion fly ash is not exempt from the manifest requirement.

ii) When transporting CCR by any other mode or method, including but not limited to trains or barges, manifests must be carried specifying, at a minimum, the following information: the volume of the CCR; the location from which the CCR was loaded onto the mode of transportation and the date the loading took place; and the location where the CCR is being taken and the date it will be delivered.

B) The owner or operator of a CCR surface impoundment from which CCR is removed and transported off-site shall develop a CCR transportation plan, which shall include:

i) identification of the transportation method selected, including whether a combination of transportation methods will be used;

ii) the frequency, time of day, and routes of CCR transportation;

iii) any measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;

iv) measures to limit fugitive dust from any transportation of CCR;

v) installation and use of a vehicle washing station;

vi) a means of covering the CCR for any mode of CCR transportation, including conveyor belts; and

vii) a requirement that, for transport by motor vehicle, the CCR is transported by a permitted special waste hauler pursuant to 35 Ill. Adm. Code 809.201.

2) The owner or operator of a CCR surface impoundment must develop and implement on site dust controls, which must include:

A) A water spray or other commercial dust suppressant to suppress dust in CCR handling areas and haul roads; and

B) CCR must be handled to minimize airborne particulates and offsite particulate movement during any weather event or condition.

3) The owner or operator of a CCR surface impoundment must provide the following public notices:

A) signage must be posted at the property entrance warning of the hazards of CCR dust inhalation; and

B) when CCR is transported off-site, a written notice explaining the hazards of CCR dust inhalation, the transportation plan and tentative transportation schedule must be provided to units of local government through which the CCR will be transported.

4) The owner or operator of the surface impoundment must take measures to prevent contamination of surface water, groundwater, soil and sediments from the removal of CCR, including but not limited to the following:

A) CCR removed from the surface impoundment must be stored in either a lined landfill, lined CCR surface impoundment, an enclosed structure or a CCR storage pile.

B) CCR storage piles shall

i) be tarped or constructed with wind barriers to suppress dust and to limit stormwater contact with storage piles;

ii) be periodically wetted or have periodic application of dust suppressants;

iii) have an impervious storage pad or geomembrane liner that is properly sloped to allow appropriate drainage;

iv) be tarped over the edge of the storage pad where possible;

v) be constructed with fixed and mobile berms where appropriate to reduce run-on and run-off of stormwater to and from the storage pile, and minimize stormwater-CCR contact; and

vi) have a groundwater monitoring system that is consistent with the requirements of Section 845.630 and approved by the Agency.

C) The owner or operator of the CCR surface impoundment shall incorporate general housekeeping procedures such as daily cleanup of CCR, tarping of trucks, maintaining the pad and equipment, and good practices during unloading and loading.

D) The owner or operator of the CCR must minimize the amount of time the CCR is exposed to precipitation and wind.

E) The discharge of stormwater runoff which has come in contact with CCR must be covered by an individual National Pollutant Discharge Elimination System (NPDES) permit. The owner or operator shall develop and implement a Stormwater Pollution Prevention Plan (SWPPP) in addition to any other requirements of the facility's NPDES permit. Any construction permit application for closure must include a copy of the SWPPP.

c) At the end of each month where CCR is being removed from a CCR surface impoundment, the owner or operator must prepare a report that describes the weather, precipitation amounts, the amount of CCR removed from the CCR surface impoundment, the amount and location of CCR being stored on-site, the amount of CCR transported offsite, the implementation of good housekeeping procedures required by Section 845.740(b)(4)(C), the implementation of dust control measures, and documents worker safety measured implemented. The owner or operator of the CCR surface impoundment must place the monthly report in the facility's operating record as required by Section 845.800(d)(22).

Section 845.750 Closure with a Final Cover System

Closure performance standard when leaving CCR in place:

a) The owner or operator of a CCR surface impoundment must ensure that, at a minimum, the CCR surface impoundment is closed in a manner that will:

1) Control, minimize or eliminate, to the maximum extent feasible, post-closure infiltration of liquids into the waste and releases of CCR, leachate, or contaminated run-off to the ground or surface waters or to the atmosphere;

2) Preclude the probability of future impoundment of water, sediment, or slurry;

3) Include measures that provide for major slope stability to prevent the sloughing or movement of the final cover system during the closure and post-closure care period;

4) Minimize the need for further maintenance of the CCR surface impoundment; and

5) Be completed in the shortest amount of time consistent with recognized and generally accepted engineering practices.

b) Drainage and stabilization of CCR surface impoundments. The owner or operator of a CCR surface impoundment or any lateral expansion of a CCR surface impoundment must meet the requirements of subsection (b) of this Section prior to installing the final cover system required under subsection (c) of this Section.

1) Free liquids must be eliminated by removing liquid wastes or solidifying the remaining wastes and waste residues.

2) Remaining wastes must be stabilized sufficient to support the final cover system.

c) Final cover system. If a CCR surface impoundment is closed by leaving CCR in place, the owner or operator must install a final cover system that is designed to minimize infiltration and erosion, and at a minimum, meets the requirements of this subsection (c) of this Section. The final cover system must consist of a low permeability layer and a final protective layer. The design of the final cover system must be included in the preliminary and final written closure plans required by Section 845.720 and the construction permit application for closure submitted to the Agency.

1) Standards for the low permeability layer. The low permeability layer must have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a hydraulic conductivity no greater than 1×10^{-7} cm/sec, whichever is less. The low permeability layer must be constructed in accordance with the following standards in either subsections (c)(1)(A) or (c)(1)(B) of this Section, unless the owner or operator demonstrates that another low permeability layer construction technique or material provides equivalent or superior performance to the requirements of either subsections (c)(1)(A) or (c)(1)(B) of this Section and is approved by the Agency.

A) A compacted earth layer constructed in accordance with the following standards:

i) The minimum allowable thickness must be 0.91 meter (3 feet); and

ii) The layer must be compacted to achieve a hydraulic conductivity of 1×10^{-7} cm/sec or less and minimize void spaces.

B) A geomembrane constructed in accordance with the following standards:

i) 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 3 foot layer of soil with a hydraulic conductivity of 1×10^{-7} cm/sec.

ii) The geomembrane must have strength to withstand the normal stresses imposed by the waste stabilization process.

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

2) Standards for the final protective layer. The final protective layer must meet the following requirements, unless the owner or operator demonstrates that another final protective layer construction technique or material provides equivalent or superior performance to the requirements of subsection (c)(2) of this Section and is approved by the Agency.

A) Cover the entire low permeability layer;

B) Be at least 3 feet thick and must be sufficient to protect the low permeability layer from freezing and minimize root penetration of the low permeability layer;

C) Consist of soil material capable of supporting vegetation;

D) Be placed as soon as possible after placement of the low permeability layer; and

E) Be covered with vegetation to minimize wind and water erosion.

3) The disruption of the integrity of the final cover system must be minimized through a design that accommodates settling and subsidence.

4) The owner or operator of the CCR surface impoundment must obtain a written certification from a qualified professional engineer that the design of the final cover system meets the requirements of this Section.

Section 845.760 Completion of Closure Activities

a) Except as provided for in subsection (b) of this Section, the owner or operator must complete closure of existing and new CCR surface impoundments and any lateral expansion of a CCR surface impoundment, within the timeframe approved by the Agency in the final closure plan, or within five years of obtaining a construction permit for closure, whichever is less.

b) Extensions of closure timeframes.

1) The timeframes for completing closure of a CCR surface impoundment specified under subsection (a) of this Section may be extended if the owner or operator has demonstrated to the Agency that it was not feasible to complete closure of the CCR surface impoundment within the required timeframes due to factors beyond the facility's control.

2) The demonstration must include a narrative discussion explaining the basis for additional time.

3) The owner or operator must submit the demonstration to the Agency with a renewal construction permit application for closure.

4) Factors that may support such a demonstration include:

A) Complications stemming from the climate and weather, such as unusual amounts of precipitation or a significantly shortened construction season;

B) Time required to dewater a surface impoundment due to the volume of CCR contained in the CCR surface impoundment or the characteristics of the CCR in the surface impoundment;

C) The geology and terrain surrounding the CCR surface impoundment will affect the amount of material needed to close the CCR surface impoundment; or

D) Time required or delays caused by the need to coordinate with and obtain necessary approvals and permits from the Agency or other agencies.

c) Maximum time extensions.

A) CCR surface impoundments of 40 acres or smaller may extend the time to complete closure by no longer than two years.

B) CCR surface impoundments larger than 40 acres may extend the timeframe to complete closure of the CCR surface impoundment multiple times, in two-year increments. For each two-year extension sought, the owner or operator must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions may be obtained for any CCR surface impoundment.

d) In order to obtain additional time extension(s) to complete closure of a CCR surface impoundment beyond the times provided by subsection (a) of this Section, the owner or operator of the CCR surface impoundment must include with the demonstration required by subsection (b) of this Section the following statement signed by the owner or operator or an authorized representative:

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED IN THIS DEMONSTRATION AND ALL ATTACHED DOCUMENTS, AND THAT, BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THAT THE SUBMITTED INFORMATION IS TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT

PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

e) Upon completion of all closure activities required by this Part and approved in the final closure plan, the owner or operator of the CCR surface impoundment must submit to the Agency a closure report and a closure certification.

1) The closure report must contain supporting documentation, including, but not limited to:

A) 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 845.290 of this Part;

B) Photographs including time, date and location information of the photograph of the final cover system and groundwater collection system, if applicable, and any other photographs relied upon to document construction activities;

C) A written summary of closure requirements and completed activities as set forth in the closure plan and this Part; and

D) Any other information relied upon by the qualified professional engineer in making the closure certification.

2) The closure certification must include a statement from a qualified professional engineer that closure has been completed in accordance with the Agency-approved final closure plan and the requirements of this Section.

3) The owner or operator must place the closure report and certification in the facility's operating record as required by Section 845.800(d)(23).

f) Within 30 days of the Agency's approval of the closure report and closure certification submitted pursuant to subsection (e) of this Section, the owner or operator must prepare a notification of closure of the CCR surface impoundment. The notification must include the certification by a qualified professional engineer as required subsection (e)(2) of this Section. The owner or operator must place the notification in the facility's operating record as required by Section 845.800(d)(24).

g) If an owner or operator of a CCR surface impoundment has completed closure of the CCR surface impoundment before the effective date of this Part, the owner or operator must notify the Agency of the completed closure by September 30, 2021 if such notification has not previously been submitted.

h) Deed notations.

1) Except as provided by subsection (h)(4), following closure of a CCR surface impoundment, the owner or operator must record a notation on the deed to the property, or some other instrument that is normally examined during title search.

2) The notation on the deed must in perpetuity notify any potential purchaser of the property that:

A) The land has been used as a CCR surface impoundment; and

B) Its use is restricted under the post-closure care requirements as provided by Section 845.780(d)(1)(C).

3) Within 30 days of recording a notation on the deed to the property, the owner or operator must submit to the Agency a notification stating that the notation has been recorded. The owner or operator must place the notification in the facility's operating record as required by 845.800(d)(25).

4) An owner or operator that closes a CCR surface impoundment by removal in accordance with Section 845.740 is not subject to the requirements of subsections (h)(1) through (3).

Section 845.770 Retrofitting

Retrofit of a CCR surface impoundment must be completed in accordance with the requirements of this Section.

a) To retrofit an existing CCR surface impoundment, the owner or operator must:

1) First remove all CCR, including any liners, as necessary, and contaminated soils and sediments from the CCR surface impoundment; and

2) Comply with the requirements in Section 845.410 and Section 845.420.

b) A CCR surface impoundment undergoing a retrofit remains subject to all other requirements of this Part, including the requirement to conduct any necessary corrective action.

c) Written retrofit plan

1) Content of the plan. The owner or operator must prepare a written retrofit plan that describes the steps necessary to retrofit the CCR surface impoundment consistent with recognized and generally accepted engineering practices. The written retrofit plan must include, at a minimum, all of the following information:

   A) A narrative description of the specific measures that will be taken to retrofit the CCR surface impoundment in accordance with this section.

   B) A description of the procedures to remove all CCR, liners as necessary, and contaminated soils and sediments from the CCR surface impoundment.

   C) An estimate of the maximum amount of CCR and other contaminated materials that will be removed as part of the retrofit operation.

   D) An estimate of the largest area of the CCR surface impoundment that will be affected by the retrofit operation.

   E) A schedule for completing all activities necessary to satisfy the retrofit criteria in this Section, including an estimate of the year in which retrofit activities of the CCR surface impoundment will be completed.

2) The owner or operator must submit the written retrofit plan with the construction permit application and must obtain a construction permit before retrofitting a CCR surface impoundment.

3) Amendment of a written retrofit plan.

   A) The owner or operator may submit a permit modification application to amend the initial or any subsequent written retrofit plan at any time.

   B) The owner or operator must seek to amend the written retrofit plan whenever:

      i) There is a change in the operation of the CCR surface impoundment that would substantially affect the written retrofit plan in effect; or

      ii) unanticipated events necessitate a revision of the written retrofit plan either before or after retrofit activities have commenced.

C) The owner or operator must seek to amend the retrofit plan at least 60 days prior to a planned change in the operation of the facility or CCR surface impoundment, or no later than 60 days after an unanticipated event requires the revision of an existing written retrofit plan. If a written retrofit plan needs to be revised after retrofit activities have commenced for a CCR surface impoundment, the owner or operator must submit a request to modify the construction permit no later than 30 days following the triggering event.

4) The owner or operator of the CCR surface impoundment must obtain a written certification from a qualified professional engineer that the activities outlined in the written retrofit plan, including any amendment of the plan, meet the requirements of this Section.

d) No later than the date the owner or operator submits a construction permit application to the Agency to retrofit a CCR surface impoundment, the owner or operator must prepare a notification of intent to retrofit a CCR surface impoundment. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by Section 845.800(d)(26).

e) When activities related to retrofitting the CCR surface impoundment include the removal of CCR from the surface impoundment, the handling and removal of CCR must be performed in a manner consistent with the requirements in Section 845.740.

f) Deadline for completion of activities related to the retrofit of a CCR surface impoundment. Any CCR surface impoundment that is being retrofitted must complete all retrofit activities within the timeframe approved by the Agency in the retrofit plan, or within five years of obtaining a construction permit, whichever is less. The same procedures specified for the extension closure timeframes in Section 845.760(b) apply to extension of retrofit timeframes.

g) Upon completion of all retrofit activities required by this Part and approved by the Agency in a construction permit, the owner or operator of the CCR surface impoundment must submit to the Agency a retrofit completion report and certification.

1) The retrofit completion report must contain supporting documentation, including, but not limited to:

A) 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 845.290 of this Part;

B) Photographs including time, date and location information of the photograph of the liner system and leachate collection system, and any other photographs relied upon to document construction activities;

C) A written summary of retrofit requirements and completed activities as set forth in the construction permit and this Part; and

D) Any other information relied upon by the qualified professional engineer in making the closure certification.

2) The retrofit certification must include a statement from a qualified professional engineer that retrofit has been completed in accordance with the retrofit plan specified in subsection (b) of this Section and the requirements of this Part.

3) The owner or operator must place the retrofit completion report and certification in the facility's operating record as required by Section 845.800(d)(27).

h) Within 30 days of the Agency's approval of the retrofit completion report and certification submitted pursuant to subsection (f) of this Section, the owner or operator must prepare a notification of completion of retrofit activities. The notification must include the certification by a qualified professional engineer as required by subsection (f) of this Section. The owner or operator has completed the notification when it has been placed in the facility's operating record as required by Section 845.800(d)(28).

i) At any time after the initiation of a CCR surface impoundment retrofit, the owner or operator may cease the retrofit and seek to initiate closure of the CCR surface impoundment in accordance with the requirements of this Subpart G. The owner or operator of the CCR surface impoundment must obtain an approved construction permit for closure.

Section 845.780 Post-Closure Care Requirements

a) Applicability

1) Except as provided by subsection (a)(2) of this Section, this Section applies to the owners or operators of CCR surface impoundments who have completed an Agency approved closure.

2) An owner or operator of a CCR surface impoundment that elects to close a CCR surface impoundment by removing CCR as provided by Section 845.740 is not subject to the post-closure care criteria under this Section.

b) Post-closure care maintenance requirements. Following closure of the CCR surface impoundment, the owner or operator must conduct post-closure care for the CCR surface impoundment, which must consist of at least the following:

1) Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

2) If the CCR surface impoundment is subject to the design criteria under Section 845.420, maintaining the integrity and effectiveness of the leachate collection and removal system and operating the leachate collection and removal system in accordance with the requirements of Section 845.420; and

3) Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with the requirements of Subpart F.

c) Post-closure care period.

1) Except as provided by subsection (c)(2) of this Section, the owner or operator of the CCR surface impoundment must conduct post-closure care for 30 years.

2) At the end of the 30-year post-closure care period, the owner or operator of the CCR surface impoundment must continue to conduct post-closure care until the groundwater monitoring data shows the concentrations are:

A) below the groundwater protections standards in Section 845.600; and

B) not increasing for those parameters over background.

d) Written post-closure care plan

1) Content of the plan. The owner or operator of a CCR surface impoundment must prepare a written post-closure care plan that includes, at a minimum, the information specified in subsections (d)(1)(A) through (C) of this Section.

A) A description of the monitoring and maintenance activities required in subsection (b) of this Section for the CCR surface

impoundment and the frequency at which these activities will be performed;

B) The name, address, telephone number, and email address of the person or office to contact about the facility during the post-closure care period; and

C) A description of the planned uses of the property during the post-closure care period. Post-closure use of the property shall not disturb the integrity of the final cover, liner(s), or any other component of the containment system, or the function of the monitoring systems unless necessary to comply with the requirements in this Part. Any other disturbance is allowed if the owner or operator of the CCR surface impoundment demonstrates that disturbance of the final cover, liner, or other component of the containment system, including any removal of CCR, will not increase the potential threat to human health or the environment. The demonstration must be certified by a qualified professional engineer and must be submitted to the Agency.

2) Deadline to prepare the initial written post-closure care plan. The owner or operator of a CCR surface impoundment must submit to the Agency an initial written post-closure care plan consistent with the requirements specified in subsection (d)(1) of this Section with its initial operating permit application.

3) Amendment of a written post-closure care plan.

A) The owner or operator may submit an operating permit modification application to amend the initial or any subsequent written post-closure care plan developed pursuant to subsection (d)(1) of this Section at any time.

B) The owner or operator must seek to amend the written closure care plan whenever:

i) There is a change in the operation of the CCR surface impoundment that would substantially affect the written post-closure care plan in effect; or

ii) unanticipated events necessitate a revision of the written post-closure care plan, after post-closure activities have commenced.

C) The owner or operator must seek to amend the written post-closure care plan at least 60 days prior to a planned change in the operation

of the facility or CCR surface impoundment, or no later than 60 days after an unanticipated event requires the need to revise an existing written post-closure care plan. If a written post-closure care plan is revised after post-closure activities have commenced for a CCR surface impoundment, the owner or operator must submit a request to modify the operating permit no later than 30 days following the triggering event.

4) The owner or operator of the CCR surface impoundment must obtain a written certification from a qualified professional engineer that the initial and any amendment of the written post-closure care plan meets the requirements of this Section.

e) Upon the completion of the post-closure care period, the owner or operator of the CCR surface impoundment must submit a request to the Agency to terminate post-closure care. The request must include a certification by a qualified professional engineer verifying that post-closure care has been completed in accordance with the post-closure care plan specified in subsection (d) of this Section and the requirements of this Section.

f) Notification of completion of post-closure care period. Within 30 days of the Agency's approval of owner or operator's request to terminate post-closure care, the owner or operator must prepare a notification of completion of post-closure care and must place the notification in the facility's operating record as required by Section 845.800(d)(29).

SUBPART H: RECORDKEEPING

Section 845.800 Facility Operating Record

a) Each owner or operator of a CCR surface impoundment subject to the requirements of this Part must maintain files of all information required by this section in a written operating record at the facility.

b) Unless specified otherwise, each file must be retained for at least three years past the date the Agency approved the owner or operator's request to terminate post-closure care.

c) An owner or operator of more than one CCR surface impoundment subject to the provisions of this Part may comply with the requirements of this Section in one recordkeeping system provided the system identifies each file by the name and identification number of each CCR surface impoundment. The files may be maintained on microfilm, on a computer, on computer disks, on a storage system accessible by a computer, on magnetic tape disks, or on microfiche.

d) The owner or operator of a CCR surface impoundment must place the following in the facility's operating record:

1) copies of all permit applications and permits issued under this Part;

2) documentation recording the public meetings held pursuant to Section 845.240;

3) weekly CQA reports Section 845.290(b);

4) hazard potential classification assessments for CCR surface impoundments, as required by Section 845.440(a)(3)(D);

5) structural stability assessments for CCR surface impoundments, as required by Section 845.450(d)(4);

6) safety factor assessments for CCR surface impoundments, as required by Section 845.460(c)(4);

7) the CCR fugitive dust control plan and any subsequent amendment of the plan, as required by Section 845.500(b)(6),except that only the most recent fugitive dust control plan must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b) of this Section;

8) inflow design flood control system plans for CCR surface impoundments, as required by Section 845.510(c)(4)(D);

9) Emergency Action Plan, as required by Section 845.520(a), except that only the most recent EAP must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b) of this Section;

10) documentation prepared by the owner or operator recording all activations of the EAP as required Section 845.520(e);

11) documentation prepared by the owner or operator recording the annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR surface impoundment and the local emergency responders as required by Section 845.520(f);

12) Safety and Health Plan, as required by Section 845.530(a);

13) documentation recording the results of each inspection and instrumentation monitoring by a qualified person as required by Section 845.540(a)(1)(D);

14) annual consolidated report, as required by Section 845.550, which contains the following:

A) the annual CCR fugitive dust control report required by 845.500(c);

B) the annual inspection report as required by Section 845.540(b)(3); and

C) the annual groundwater monitoring and corrective action report as required by Section 845.610(e).

15) all groundwater monitoring data submitted to the Agency and any analysis performed, as required by Section 845.610(b)(3)(D);

16) within 30 days of detecting one or more monitored constituents above the groundwater protection standard, the notifications as required by Section 845.650(d);

17) the semi-annual report describing the progress in selecting and designing the remedy as required by Section 845.670(a);

18) within 30 days of completing the corrective action plan , the notification as required by Section 845.680(e);

19) the preliminary written closure plan, and any amendment of the plan, as required by Section 845.720(a), except that only the most recent closure plan must be maintained in the facility's operating record irrespective of the time requirement specified in subsection (b) of this Section;

20) the written demonstration(s), including the certification required by Section 845.730(b)(3), for a time extension for initiating closure as required by Section 845.730(b)(2);

21) the notification of intent to close a CCR surface impoundment as required by Section 845.730(d);

22) the monthly reports for closure by removal, as required by Section 845.740(c);

23) the closure report and certification, as required by Section 845.760(e)(3);

24) the notification of completion of closure of a CCR surface impoundment as required by Section 845.760(f);

25) the notification recording a notation on the deed as required by Section 845.760(h);

26) the notification of intent to initiate retrofit of a CCR surface impoundment as required by Section 845.770(d);

27) the retrofit completion report and certification, as required by Section 845.770(g)(3);

28) the notification of completion of retrofit activities as required by Section 845.770(h); and

29) the notification of completion of post-closure care period as required by Section 845.780(f).

Section 845.810 Publicly Accessible Internet Site Requirements

a) Each owner or operator of a CCR surface impoundment subject to the requirements of this Part must maintain a publicly accessible Internet site (CCR website) containing the information specified in this section. The owner or operator's website must be titled "CCR Rule Compliance Data and Information."

b) An owner or operator of more than one CCR surface impoundment subject to the provisions of this Part may comply with the requirements of this Section by using the same Internet site for multiple CCR surface impoundments provided the CCR website clearly delineates information by the name and identification number of each surface impoundment.

c) Unless otherwise required in this Section, the information required to be posted to the CCR website must be made available to the public for at least five years following the date on which the information was first posted to the CCR website.

d) Unless otherwise required in this Section, the information must be posted to the CCR website within 30 days of placing the pertinent information required by Section 845.800 in the operating record.

e) The owner or operator of a CCR surface impoundment subject to this Part must place all the information specified under Section 845.800(d) on the owner or operator's CCR website.

f) The owner or operator of a CCR surface impoundment subject to this Part must place all the information specified under Section 845.240(e) on the owner or operator's CCR website at least 14 days prior to the public meeting.

SUBPART I: FINANCIAL ASSURANCE

Section 845.900 General Provisions

a) This Subpart provides procedures by which the owner or operator of a CCR surface impoundment, subject to this Part, provides financial assurance satisfying the requirements of Section 22.59(f) of the Act.

b) The owner or operator must provide financial assurance to ensure the following:

1) completion of closure;

2) completion of post-closure care, if applicable; and

3) remediation of releases from a CCR surface impoundment.

c) The owner or operator shall maintain financial assurance equal to or greater than the current cost estimates calculated pursuant to Section 845.930 at all times, except as otherwise provided by Section 845.910.

d) Financial assurance shall be provided, as specified in Section 845.950, by a trust agreement, a surety bond guaranteeing payment, a surety bond guaranteeing payment or performance, or an irrevocable letter of credit. The owner or operator shall provide financial assurance to the Agency within the timeframe(s) set forth in Section 845.950(c).

e) This Subpart does not apply to the State of Illinois, its agencies and institutions, to any unit of local government, or to any not-for-profit electric cooperative as defined in Section 3.4 of the Electric Supplier Act [220 ILCS 30].

f) The Agency is authorized to enter into such contracts and agreements as it may deem necessary to carry out the purposes of this Subpart and of Section 22.59(f) of the Act. Neither the State, nor the Director of the Illinois Environmental Protection Agency, nor any State employee shall be liable for any damages or injuries arising out of or resulting from any action taken under this Part.

g) The Agency may sue in any court of competent jurisdiction to enforce its rights under financial instruments. The filing of an enforcement action before the Board is not a condition precedent to such an Agency action, except when this Subpart or the terms of the instrument provide otherwise.

h) The Agency shall have the authority to approve or disapprove any financial assurance mechanism posted or submitted pursuant to this Subpart.

i) The following Agency actions may be appealed to the Board as a permit denial pursuant to Section 845.270(e) and Section 22.59(f)(3) of the Act:

1) A refusal to accept financial assurance tendered by the owner or operator;

2) A refusal to release the owner or operator from the requirement to maintain financial assurance;

3) A refusal to release excess funds from a trust;

4) A refusal to approve a reduction in the penal sum of a bond; and

5) A refusal to approve a reduction in the amount of a letter of credit.

j) An owner or operator must notify the Agency by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 of the United States Code (Bankruptcy) naming any of the owners or operators as debtor, within 10 days after commencement of the proceeding.

k) An owner or operator that fulfills the requirements of Sections 845.960, 845.970, 845.980, or 845.990 by obtaining a trust fund, surety bond, or letter of credit will be deemed to be without the required financial assurance in the event of bankruptcy of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee institution to act as trustee or of the institution issuing the surety bond or letter of credit to issue such instruments. The owner or operator must establish alternative financial assurance within 60 days after such an event.

Section 845.910 Upgrading Financial Assurance

a) The owner or operator shall increase the total amount of financial assurance so as to equal or exceed the current cost estimate within 60 days after either of the following occurrences:

1) An increase in the current cost estimate; or

2) A decrease in the value of a trust fund.

b) The owner or operator of a CCR surface impoundment shall annually make adjustments for inflation if required pursuant to Sections 845.930 or 845.940.

Section 845.920 Release of Financial Institution and Owner or Operator

a) The Agency shall release a trustee, surety, or other financial institution when:

1) An owner or operator substitutes alternative financial assurance such that the total financial assurance for the CCR surface impoundment is equal to or greater than the current cost estimate, without counting the amounts to be released; or

2) The Agency releases the owner or operator from the requirements of this Subpart pursuant to subsection (b).

b) The Agency will release an owner or operator of a CCR surface impoundment from the requirements of this Subpart under the following circumstances:

1) Completed Closure. In the Agency's approval of the closure report and certification pursuant to Section 845.760, the Agency will notify the owner or operator in writing that it is no longer required by this Subpart to maintain financial assurance for closure of the CCR surface impoundment.

2) Completed Post-Closure Care. In the Agency's approval of the owner or operator's request to terminate post-closure care pursuant to Section 845.780, the Agency will notify the owner or operator in writing that it is no longer required by this Subpart to maintain financial assurance for post-closure care of the CCR surface impoundment.

3) Completed Corrective Action. In the Agency's approval of the corrective action completion report and certification pursuant to Section 845.680, the Agency will notify the owner or operator in writing that it is no longer required by this Subpart to maintain financial assurance for corrective action.

Section 845.930 Cost Estimates

a) The owner or operator shall prepare cost estimates for:

1) the total costs for closure and post-closure care;

2) preliminary corrective action costs; and

3) the total costs of the correction action plan for remediation of any releases from a CCR surface impoundment.

b) Written cost estimate for closure and post-closure

1) The owner or operator must have a detailed written estimate, in current dollars, of the cost of: closing the CCR surface impoundment in accordance with this Part and providing post-closure care on an annual basis, when required, in accordance with this Part. The cost estimate is the total cost for closure and post-closure care.

2) The cost estimate must equal the cost of final closure and post-closure care at the point in the CCR surface impoundment's active life when the extent and manner of its operation would make closure and post-closure care the most expensive.

3) The cost estimate must be based on the assumption that the Agency will contract with a third party at the appropriate prevailing wage(s), pursuant to the Prevailing Wage Act, 820 ILCS 130, if applicable, to implement the closure and post-closure care plans. A third party is a party who is neither a parent nor a subsidiary of the owner or operator.

4) The cost estimate may not be reduced by allowance for the salvage value of facility structures or equipment, for the resale value of land, for the sale of CCR or its beneficial reuse if permitted by the Agency pursuant to this Part, or for other assets associated with the facility at the time of partial or final closure.

5) The owner or operator must not incorporate a zero cost for CCR, if permitted by the Agency pursuant to this Part, that might have economic value.

6) The cost estimate must, at a minimum, include all costs for all activities necessary to close the CCR surface impoundment and provide post-closure care in accordance with all requirements of this Part.

7) The post-closure care portion of the cost estimate must, at a minimum, be based on the following elements:

A) Maintaining the integrity and effectiveness of the final cover system, including making repairs to the final cover as necessary to correct the effects of settlement, subsidence, erosion, or other events, and preventing run-on and run-off from eroding or otherwise damaging the final cover;

B) If the CCR surface impoundment is subject to the design criteria under Section 845.420, maintaining the integrity and effectiveness of the leachate collection and removal system and operating the leachate collection and removal system in accordance with the requirements of Section 845.420; and

C) Maintaining the groundwater monitoring system and monitoring the groundwater in accordance with the requirements of Subpart F.

c) Cost Estimate for Corrective Action

1) Preliminary Corrective Action Cost Estimate. An owner or operator of a CCR surface impoundment with a release that has caused an exceedance of the groundwater protection standard in Section 845.600 or groundwater quality standard in 35 Ill. Adm. Code 620, must provide a preliminary

corrective action cost estimate that is equal to 25% of the costs calculated pursuant subsection (b).

2) Corrective Action Cost Estimate. The owner or operator must provide to the Agency a detailed written estimate, in current dollars, of the cost of hiring a third party at the appropriate prevailing wage(s), pursuant to the Prevailing Wage Act, 820 ILCS 130, if applicable, to implement the approved corrective action plan in accordance with this Part. The corrective action cost estimate must account for the total costs of corrective action activities as described in the approved corrective action plan for the entire corrective action period.

3) The owner or operator must annually adjust the cost estimates in this subsection for inflation (see Section 845.940(a)) until the approved corrective action plan is completed in accordance with Subpart F.

4) The owner or operator must increase the corrective action cost estimates in this subsection and the amount of financial assurance provided if changes in the corrective action plan or CCR surface impoundment conditions increase the maximum costs of corrective action.

5) The owner or operator may reduce the amount of the corrective action cost estimate, upon Agency approval, if the cost estimate exceeds the maximum remaining costs of corrective action.

Section 845.940 Revision of Cost Estimates

a) During the active life of the CCR surface impoundment, the owner or operator shall adjust the cost estimates of closure, post-closure care, and corrective action for inflation on an annual basis. Such adjustments shall occur within 60 days prior to the anniversary date of the establishment of the financial instruments used to comply with Section 845.950. The adjustment may be made by recalculating the maximum costs of closure, post-closure care, or corrective action in current dollars, or by using an inflation factor derived from the annual Implicit Price Deflator for Gross National Product (Deflator) as published by the U.S. Department of Commerce in its Survey of Current Business (Table 1.1.9), as specified in subsections (a)(1) and (a)(2). The inflation factor is the result of dividing the latest published annual Deflator by the Deflator for the previous year.

1) The first adjustment is made by multiplying the cost estimate by the inflation factor. The result is the adjusted cost estimate.

2) Subsequent adjustments are made by multiplying the latest adjusted cost estimate by the latest inflation factor.

b) During the active life of the CCR surface impoundment, the owner or operator must revise the cost estimate no later than 30 days after the Agency has approved a request to modify the corrective action plan, closure plan or post-closure care plan, if the change in the modified plan increases the cost of corrective action, closure or post-closure care. The revised cost estimate must be adjusted for inflation, as specified in subsection (a).

c) At least 60 days prior to submitting any closure plan to the Agency, the owner or operator must revise the cost estimate if the selected closure method increases the estimated closure or post-closure care costs.

d) The owner or operator must keep the most current cost estimates in the facility's operating record during the operating life of the CCR surface impoundment.

Section 845.950 Mechanisms for Financial Assurance

a) The owner or operator of a CCR surface impoundment shall utilize any of the mechanisms listed in subsections (a)(1) through (a)(4) to provide financial assurance for closure and post-closure care, and for corrective action at a CCR surface impoundment. An owner or operator of a CCR surface impoundment shall also meet the requirements of subsections (b), (c), and (d). The mechanisms are as follows:

1) A trust fund (see Section 845.960);

2) A surety bond guaranteeing payment (see Section 845.970);

3) A surety bond guaranteeing performance (see Section 845.980); or

4) An irrevocable letter of credit (see Section 845.990).

b) The owner or operator of a CCR surface impoundment shall ensure that the language of the mechanisms listed in subsection (a), when used for providing financial assurance for closure, post-closure, and corrective action, is consistent with the forms prescribed by the Agency and satisfies the following:

1) The amount of funds assured is sufficient to cover the costs of closure, post-closure care, and corrective action; and

2) The funds will be available in a timely fashion when needed.

c) The owner or operator of a CCR surface impoundment shall provide financial assurance utilizing one or more of the mechanisms listed in subsection (a) within the following timeframes:

1) An owner or operator of an existing CCR surface impoundment shall

provide financial assurance to the Agency for closure and post-closure care within 60 days from the effective date of this Part;

2) An owner or operator of a new CCR surface impoundment shall provide financial assurance to the Agency for closure and post-closure care at least 60 days before the date of initial receipt of CCR in the CCR surface impoundment.

3) In the case of corrective action required pursuant to Subpart F, the owner or operator of the CCR surface impoundment shall provide preliminary financial assurance for corrective action no later than when the owner or operator initiates an assessment of corrective measures pursuant to Section 845.650(d)(3). The preliminary financial assurance for corrective action must be maintained until replaced with financial assurance based on the cost estimate of the corrective action. The owner or operator of the CCR surface impoundment shall provide financial assurance based on the approved corrective action plan to the Agency no later than 60 days after the Agency's approval.

d) The owner or operator shall provide continuous financial assurance coverage until the owner or operator is released from the financial assurance requirements of this Subpart pursuant to Section 845.920(b).

e) Use of Multiple Financial Assurance Mechanisms. An owner or operator may satisfy the requirements of this Subpart by establishing more than one financial mechanism per CCR surface impoundment. These mechanisms are limited to trust funds, surety bonds guaranteeing payment, and letters of credit. The mechanisms must be as specified in Sections 845.960, 845.970, and 845.990, as applicable, except that it is the combination of mechanisms, rather than the single mechanism, that must provide financial assurance for an aggregate amount at least equal to the current cost estimate for closure, post-closure care, and corrective action, except that mechanisms guaranteeing performance, rather than payment, may not be combined with other instruments. The owner or operator may use any or all of the mechanisms to provide financial assurance for corrective action, closure and post-closure care.

f) Use of a Financial Assurance Mechanism for Multiple CCR Surface Impoundments in Illinois. An owner or operator may use a financial assurance mechanism specified in this Subpart to meet the requirements of this Subpart for more than one CCR surface impoundment located in Illinois. Evidence of financial assurance submitted to the Agency must include a list showing, for each CCR surface impoundment, the identification number (see Section 845.130), name, address and the amount of funds assured by the mechanism. The amount of funds available through the mechanism must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for each CCR surface impoundment. The amount of funds available to the

Agency must be sufficient to close and provide post-closure care for all of the owner or operator's CCR surface impoundments. In directing funds available through a single mechanism for the closure and post-closure care of any single CCR surface impoundment covered by that mechanism, the Agency shall direct only that amount of funds designated for that CCR surface impoundment, unless the owner or operator agrees to the use of additional funds available under that mechanism.

Section 845.960 Trust Fund

a) An owner or operator may satisfy the requirements of this Subpart by establishing a fully funded trust fund that conforms to the requirements of this Section and submitting an original signed duplicate of the trust agreement to the Agency.

b) The trustee must be an entity that has the authority to act as a trustee and of whom either of the following is true:

1) It is an entity whose trust operations are examined by the Illinois Department of Financial and Professional Regulation pursuant to the Illinois Banking Act [205 ILCS 5]; or

2) It is an entity that complies with the Corporate Fiduciary Act [205 ILCS 620].

c) The trust agreement must be on forms prescribed by the Agency. The trust agreement must be updated within 60 days after a change in the amount of the current closure, post-closure, and corrective action cost estimates covered by the agreement.

d) The trust fund must be fully funded from the date that the trust agreement becomes effective.

e) The trustee must evaluate the trust fund annually, as of the day the trust was created or on such earlier date as may be provided in the agreement. The trustee must notify the owner or operator and the Agency of the value within 30 days after the evaluation date.

f) If the owner or operator of a CCR surface impoundment establishes a trust fund after having used one or more alternative mechanisms specified in this Subpart, the trust fund must be fully funded and established according to the specifications of this Section.

g) Release of excess funds.

1) If the value of the financial assurance is greater than the total amount of the current cost estimate, the owner or operator may submit a written

request to the Agency for a release of the amount in excess of the current cost estimate.

2) Within 60 days after receiving a request from the owner or operator for a release of funds, the Agency must instruct the trustee to release to the owner or operator such funds as the Agency specifies in writing to be in excess of the current cost estimate.

h) Reimbursement for closure, post-closure care, and corrective action expenses.

1) After initiating corrective action, closure, or post-closure care an owner or operator, or any other person authorized to perform corrective action, closure, or post-closure care, may request reimbursement for closure, post-closure care, or corrective action expenditures, by submitting itemized bills to the Agency.

2) Within 60 days after receiving the itemized bills for closure, post-closure care, or correction action activities, the Agency must determine whether the expenditures are in accordance with the closure, post-closure care, or corrective action plan. The Agency must instruct the trustee to make reimbursement in such amounts as the Agency specifies in writing as expenditures in accordance with the closure, post-closure care, or corrective action plan.

3) If the Agency determines, based on such information as is available to it, that the cost of closure and post-closure care or corrective action will be greater than the value of the trust fund, it must withhold reimbursement of such amounts as it determines are necessary to preserve the fund in order to accomplish closure and post-closure care or corrective action until it determines that the owner or operator is no longer required to maintain financial assurance for closure and post-closure care or corrective action. In the event the fund is inadequate to pay all claims, the Agency must pay claims according to the following priorities:

A) Persons with whom the Agency has contracted to perform closure, post-closure care, or corrective action activities (first priority);

B) Persons who have completed closure, post-closure care, or corrective action authorized by the Agency (second priority);

C) Persons who have completed work that furthered the closure, post-closure care, or corrective action (third priority);

D) The owner or operator and related business entities (last priority).

Section 845.970 Surety Bond Guaranteeing Payment

a) An owner or operator may satisfy the requirements of this Subpart by obtaining a surety bond which conforms to the requirements of this Section and submitting the bond to the Agency.

b) The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on federal bonds in Circular 570 of the U.S. Department of the Treasury. Circular 570 is available on the Internet from the following website: https://fiscal.treasury.gov/surety-bonds/circular-570.html

c) The surety bond must be on forms prescribed by the Agency.

d) Any payments drawn from or made under the bond will be placed in the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury.

e) Conditions:

1) The bond must guarantee that the owner or operator will:

A) Provide closure and post-closure care in accordance with the approved closure and post-closure care plans and, if the bond is a corrective action bond, provide corrective action in accordance with Subpart F; and

B) Provide alternative financial assurance, as specified in this Subpart, and obtain the Agency's written approval of the assurance provided within 90 days after receipt by both the owner or operator and the Agency of a notice from the surety that the bond will not be renewed for another term.

2) The surety will become liable on the bond obligation when, during the term of the bond, the owner or operator fails to perform as guaranteed by the bond. The owner or operator fails to perform when the owner or operator:

A) Abandons the CCR surface impoundment;

B) Is adjudicated bankrupt;

C) Fails to initiate closure of the CCR surface impoundment or post-closure care or corrective action when ordered to do so by the Board pursuant to Title VIII of the Act, or when ordered to do so by a court of competent jurisdiction;

D) Notifies the Agency that it has initiated closure or corrective

action, or initiates closure or corrective action, but fails to close the CCR surface impoundment or provide post-closure care or corrective action in accordance with the closure and post-closure care or corrective action plans;

E) For a corrective action bond, fails to implement or complete corrective action at a CCR surface impoundment in accordance with Section 845.670; or

F) Fails to provide alternative financial assurance, as specified in this Subpart, and obtain the Agency's written approval of the assurance provided within 90 days after receipt by both the owner or operator and the Agency of a notice from the surety that the bond will not be renewed for another term.

3) If the owner or operator does not establish alternative financial assurance, as specified in this Subpart, and obtain written approval of such alternative assurance from the Agency within 90 days after receipt by both the owner or operator and the Agency of a notice of nonrenewal from the surety (see subsection (g)(2)), the Agency must draw on the bond. During the last 30 days of any such notice of nonrenewal the Agency must draw on the bond if the owner or operator has failed to provide alternative financial assurance, as specified in this Section, and obtain written approval of such assurance from the Agency.

f) Penal sum:

1) The penal sum of the bond must be in an amount at least equal to the current cost estimate.

2) Whenever the current cost estimate decreases, the penal sum may be reduced to the amount of the current cost estimate following written approval by the Agency.

3) Whenever the current cost estimate increases to an amount greater than the penal sum, the owner or operator, within 90 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current cost estimate and submit evidence of that increase to the Agency or obtain other financial assurance, as specified in this Subpart, to cover the increase and submit evidence of the alternative financial assurance to the Agency.

g) Term:

1) The bond must be issued for a term of at least one year and must not be cancelable during that term.

2) The surety bond must provide that, on the current expiration date and on each successive expiration date, the term of the surety bond will be automatically extended for a period of at least one year unless, at least 120 days before the current expiration date, the surety notifies both the owner or operator and the Agency by certified mail of a decision not to renew the bond. Under the terms of the surety bond, the 120 days will begin on the date when both the owner or operator and the Agency have received the notice, as evidenced by the return receipts.

3) The Agency shall release the surety by providing written authorization for termination of the bond to the owner or operator and the surety when either of the following occurs:

A) An owner or operator substitutes alternative financial assurance, as specified in this Subpart; or

B) The Agency releases the owner or operator from the requirements of this Subpart in accordance with Section 845.920(b).

h) Cure of default and refunds:

1) The Agency shall release the surety if, after the surety becomes liable on the bond, the owner or operator or another person provides financial assurance for closure and post-closure care of the CCR surface impoundment or corrective action at a CCR surface impoundment; unless the Agency determines that the closure, post-closure care, or corrective action plan, or the amount of substituted financial assurance, is inadequate to provide closure and post-closure care or implement corrective action in compliance with this Part.

2) After closure and post-closure care have been completed in accordance with the plans and requirements of this Part or after the completion of corrective action at a CCR surface impoundment in accordance with Subpart F, the Agency shall refund any unspent money which was paid into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund by the surety, subject to appropriation of funds by the Illinois General Assembly.

Section 845.980 Surety Bond Guaranteeing Performance

a) An owner or operator may satisfy the requirements of this Subpart by obtaining a surety bond which conforms to the requirements of this Section and submitting the bond to the Agency.

b) The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on federal bonds in Circular 570 of the U.S. Department of the Treasury. Circular 570 is available on the Internet from the following website: https://fiscal.treasury.gov/surety-bonds/circular-570.html

c) The surety bond must be on forms prescribed by the Agency.

d) Any payments made under the bond will be placed in the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury.

e) Conditions:

1) The bond must guarantee that the owner or operator will:

A) Provide closure and post-closure care in accordance with the approved closure and post-closure care plans and, if the bond is a corrective action bond, provide corrective action in accordance with Subpart F; and

B) Provide alternative financial assurance, as specified in this Subpart, and obtain the Agency's written approval of the assurance provided within 90 days after receipt by both the owner or operator and the Agency of a notice from the surety that the bond will not be renewed for another term.

2) The surety will become liable on the bond obligation when, during the term of the bond, the owner or operator fails to perform as guaranteed by the bond. The owner or operator fails to perform when the owner or operator:

A) Abandons the CCR surface impoundment;

B) Is adjudicated bankrupt;

C) Fails to initiate closure of the CCR surface impoundment or post-closure care or corrective action when ordered to do so by the Board pursuant to Title VIII of the Act, or when ordered to do so by a court of competent jurisdiction;

D) Notifies the Agency that it has initiated closure or corrective action, or initiates closure or corrective action, but fails to close the CCR surface impoundment or provide post-closure care or corrective action in accordance with the closure and post-closure care or corrective action plans;

E) For a corrective action bond, fails to implement or complete corrective action at a CCR surface impoundment in accordance with Section 845.670; or

F) Fails to provide alternative financial assurance, as specified in this Subpart, and obtain the Agency's written approval of the assurance provided within 90 days after receipt by both the owner or operator and the Agency of a notice from the surety that the bond will not be renewed for another term.

3) Upon failure of the owner or operator to perform as guaranteed by the bond, the surety shall have the option of:

A) providing closure and post-closure care in accordance with the approved closure and post-closure care plans; or

B) carrying out corrective action in accordance with the corrective action plan; or

C) paying the penal sum.

f) Penal sum:

1) The penal sum of the bond must be in an amount at least equal to the current cost estimate.

2) Whenever the current cost estimate decreases, the penal sum may be reduced to the amount of the current cost estimate following written approval by the Agency.

3) Whenever the current cost estimate increases to an amount greater than the penal sum, the owner or operator, within 90 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current cost estimate and submit evidence of that increase to the Agency or obtain other financial assurance, as specified in this Subpart, and submit evidence of the alternative financial assurance to the Agency.

g) Term:

1) The bond must be issued for a term of at least one year and must not be cancelable during that term.

2) The surety bond must provide that, on the current expiration date and on each successive expiration date, the term of the surety bond will be automatically extended for a period of at least one year unless, at least 120 days before the current expiration date, the surety notifies both the owner

or operator and the Agency by certified mail of a decision not to renew the bond. Under the terms of the surety bond, the 120 days will begin on the date when both the owner or operator and the Agency have received the notice, as evidenced by the return receipts.

3) The Agency shall release the surety by providing written authorization for termination of the bond to the owner or operator and the surety when either of the following occurs:

A) An owner or operator substitutes alternative financial assurance, as specified in this Subpart; or

B) The Agency releases the owner or operator from the requirements of this Subpart in accordance with Section 845.920(b).

h) Cure of default and refunds:

1) The Agency shall release the surety if, after the surety becomes liable on the bond, the owner or operator or another person provides financial assurance for closure and post-closure care of the CCR surface impoundment or corrective action at a CCR surface impoundment; unless the Agency determines that the closure, post-closure care, or corrective action plan, or the amount of substituted financial assurance, is inadequate to provide closure and post-closure care or implement corrective action in compliance with this Part.

2) After closure and post-closure care have been completed in accordance with the plans and requirements of this Part or after the completion of corrective action at a CCR surface impoundment in accordance with Subpart F, the Agency shall refund any unspent money which was paid into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund by the surety, subject to appropriation of funds by the Illinois General Assembly.

i) The surety will not be liable for deficiencies in the performance of closure, post-closure care, or corrective action by the owner or operator after the Agency releases the owner or operator from the requirements of this Subpart.

Section 845.990 Letter of Credit

a) An owner or operator may satisfy the requirements of this Subpart by obtaining an irrevocable standby letter of credit which conforms to the requirements of this Section and submitting the letter to the Agency.

b) The issuing institution shall be an entity that has the authority to issue letters of credit and:

1) Whose letter of credit operations are regulated by the Illinois Department of Financial and Professional Regulation pursuant to the Illinois Banking Act [205 ILCS 5]; or

2) Whose deposits are insured by the Federal Deposit Insurance Corporation.

c) Forms:

1) The letter of credit must be on forms prescribed by the Agency.

2) The letter of credit must be accompanied by a letter from the owner or operator, referring to the letter of credit by number, the name and address of the issuing institution, and the effective date of the letter, and providing the following information: the name and address of the CCR surface impoundment, the identification number (see Section 845.130), and the amount of funds assured by the letter of credit for closure and post-closure care of the CCR surface impoundment, or for corrective action at the CCR surface impoundment.

d) Any amounts drawn by the Agency pursuant to the letter of credit will be deposited in the Coal Combustion Residual Surface Impoundment Financial Assurance Fund within the State Treasury.

e) Conditions on which the Agency shall draw on the letter of credit:

1) The Agency shall draw on the letter of credit if the owner or operator fails to perform closure or post-closure care in accordance with the approved closure and post-closure care plans, or fails to perform corrective action at a CCR surface impoundment in accordance with Subpart F.

2) The Agency shall draw on the letter of credit if the owner or operator:

A) Abandons the CCR surface impoundment;

B) Is adjudicated bankrupt;

C) Fails to initiate closure of the CCR surface impoundment or post-closure care or corrective action when ordered to do so by the Board pursuant to Title VIII of the Act, or when ordered to do so by a court of competent jurisdiction;

D) Notifies the Agency that it has initiated closure or corrective action, or initiates closure or corrective action, but fails to provide closure and post-closure care or corrective action in accordance with the closure and post-closure care or corrective action plans;

E) For a corrective action letter of credit, fails to implement or complete corrective action at a CCR surface impoundment in accordance with Section 845.670; or

F) Fails to provide alternative financial assurance, as specified in this Subpart, and obtain the Agency's written approval of the assurance provided within 90 days after receipt by both the owner or operator and the Agency of a notice from the issuing institution that the letter of credit will not be extended for another term.

3) If the owner or operator does not establish alternative financial assurance, as specified in this Subpart, and obtain written approval of such alternative assurance from the Agency within 90 days after receipt by both the owner or operator and the Agency of a notice of expiration from the issuing institution (see subsection (g)(2)), the Agency must draw on the letter of credit. During the last 30 days of any such notice of expiration the Agency must draw on the letter of credit if the owner or operator has failed to provide alternative financial assurance, as specified in this Section, and obtain written approval of such assurance from the Agency.

f) Amount:

1) The letter of credit must be issued in an amount at least equal to the current cost estimate.

2) Whenever the current cost estimate decreases, the amount of credit may be reduced to the amount of the current cost estimate following written approval by the Agency.

3) Whenever the current cost estimate increases to an amount greater than the amount of the credit, the owner or operator, within 90 days after the increase, must either cause the amount of the credit to be increased to an amount at least equal to the current cost estimate and submit evidence of that increase to the Agency or obtain other financial assurance, as specified in this Subpart, to cover the increase and submit evidence of the alternative financial assurance to the Agency.

g) Term:

1) The letter of credit must be issued for a term of at least one year and must be irrevocable during that term.

2) The letter of credit must provide that, on the current expiration date and on each successive expiration date, the letter of credit will be automatically extended for a period of at least one year unless, at least 120 days before

the current expiration date, the issuing institution notifies both the owner or operator and the Agency by certified mail of a decision not to extend the letter of credit for another term. Under the terms of the letter of credit, the 120 days will begin on the date when both the owner or operator and the Agency have received the notice, as evidenced by the return receipts.

3) The Agency must return the letter of credit to the issuing institution for termination when either of the following occurs:

A) An owner or operator substitutes alternative financial assurance, as specified in this Subpart; or

B) The Agency releases the owner or operator from the requirements of this Subpart in accordance with Section 845.920(b).

h) Cure of default and refunds:

1) The Agency shall release the financial institution if, after the Agency is allowed to draw on the letter of credit, the owner or operator or another person provides financial assurance for closure and post-closure care of the CCR surface impoundment or corrective action at a CCR surface impoundment; unless the Agency determines that the closure, post-closure care, or corrective action plan, or the amount of substituted financial assurance, is inadequate to provide closure and post-closure care or implement corrective action in compliance with this Part.

2) After closure and post-closure care have been completed in accordance with the plans and requirements of this Part or after the completion of corrective action at a CCR surface impoundment in accordance with Subpart F, the Agency shall refund any unspent money which was drawn and paid into the Coal Combustion Residual Surface Impoundment Financial Assurance Fund by the financial institution, subject to appropriation of funds by the Illinois General Assembly.

ATTACHMENT 2

GEO-HYDRO, INC
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SUPPLEMENTAL EXPERT REPORT OF MARK A. HUTSON, PG City Water, Light & Power Dallman Station Springfield, IL

Prepared for:
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Environmental Law Program
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Suite 1300
Oakland, CA 94612

March 26, 2019

GEO-HYDRO, INC.

TABLE OF CONTENTS

1. Introduction

City Water, Light & Power (CWLP) operates Dallman Station (Dallman), a coal-fired electric power plant on Lake Springfield, in Springfield, IL. Coal Combustion Waste (CCW) storage and disposal facilities, including Fly Ash Ponds and a Flue Gas Desulfurization Sludge (FGDS) Landfill, are located on CWLP property downstream of Lake Springfield and Spalding Dam (Figure 1). I have been asked by Sierra Club to review the available information and data and provide my expert opinions on whether the data indicate that the coal ash facilities at Dallman are impacting water quality so as to cause exceedances of water quality standards and if so, what remedial actions might be effective.

2. Qualifications

The opinions expressed in this document have been formulated based upon my formal education in geology and over 38 years of experience in the fields of geology, hydrogeology, and investigation and remediation of a wide range of contaminant impacted sites. My educational background includes a B.S. in Geology from Northern Illinois University and an M.S. in geology from the University of Illinois at Chicago. I am a registered as a Professional Geologist in the states of Illinois, Indiana, Kansas, Nebraska, North Carolina, and Wisconsin. I have been a Certified Professional Geologist by the American Institute of Professional Geologists for over 30 years. I am also active in the Colorado Groundwater Association, having served on the Board of Directors as Vice-President, President, and Past-President of the organization.

My entire professional career has been focused on regulatory, site characterization, and remediation issues related to waste handling and disposal practices and facilities. I have worked on contaminated sites in over 35 states and the Caribbean. My site characterization and remediation experience includes activities at sites located in a full range of geologic conditions, involving soil and groundwater contamination in both unconsolidated and consolidated geologic media, and a wide range of contaminants. I have served in various technical and managerial roles in conducting all aspects of site characterization and remediation including definition of the nature and extent of contamination, directing human health and ecological risk assessments, conducting feasibility studies for selection of appropriate remedies to meet remediation goals, and implementing remedial strategies. Much of my consulting activity over the past 12 years has been related to groundwater contamination and permitting issues at coal ash storage and disposal sites.

A copy of my curriculum vitae is attached as Appendix A.

3. Summary of Opinions Formed

Based upon my review of the available information I have formed the following opinions on the historic and continuing impacts to groundwater quality caused by the disposal and storage of the coal combustion wastes at the CWLP generating station.

Opinion 1: Coal Ash Stored in the Dallman Ash Pond is Contaminating Groundwater

Opinion 2: Groundwater Located Downgradient of the Dallman Ash Pond is Contaminated at Concentrations Exceeding Background and Illinois Groundwater Quality Standards

Opinion 3: CWLP Has Not Determined the Downgradient Extent of Impacts Nor Taken Identifiable Steps to Control Groundwater Contamination

Opinion 4: Opinion 4: CWLP Should Close Their Impoundments to Additional Waste Disposal and Implement Site Closure by Excavating and Removing the Waste

The background and rationale behind each of these opinions are described in this report.

4. Background

CWLP owns and operates CCW storage and disposal facilities that service Dallman including two coal ash disposal ponds, the Lakeside Ash Pond and Dallman Ash Pond, an FGDS Landfill, a clarification pond, and 3 lime ponds that have been constructed over portions of the Lakeside Ash Pond (collectively, the Coal Ash Facilities). Bottom ash, fly ash, and FGDS are all sluiced to these facilities. Available water quality data are insufficient to identify and distinguish between possible impacts from the Lakeside Ash Pond and FGDS Landfill. The Lakeside Ash Pond and FGDS Landfill are discussed in this section because those facilities do impact groundwater flow across the site. However, a monitoring system has been established that has developed data allowing identification of impacts from the Dallman Ash Pond. Groundwater impacts from the Dallman Ash Pond are therefore the primary focus of this report.

4.1 Site Setting and History

4.1.1 Site Location

The CWLP Coal Ash Facilities are located on the north side of East Lake Shore drive, and east of Interstate 55 in Springfield, Illinois. All of these facilities were constructed on the floodplain of Sugar Creek downstream of Spaulding Dam, the dam that forms Lake Springfield (Figure 1). The entirety of the coal ash ponds, lime storage ponds, FGDS Landfill, and gypsum storage areas are located within the 1% annual chance flood area[1] indicated on the current Federal Emergency Management Agency (FEMA) Flood Hazard map (Figure 2). The 1% annual chance flood, commonly referred to as the 100-year flood, is the area of the Sugar Creek floodplain that has a 1% chance of flooding during any calendar year.

The location of the CWLP waste facilities on the floodplain and within the area of inundation of Sugar Creek is problematic for at least two reasons. First, the wastes in the unlined waste disposal cells will be re-wetted from below by rising groundwater associated with even relatively minor flood events. During high water events groundwater flows from the stream into the groundwater contained in surrounding sediments causing the groundwater elevation to increase. Where the bottoms of unlined waste disposal cells are located at or below the normal water table, such as at the CWLP site, rising groundwater elevations will re-wet wastes that might not be wet under normal conditions (See Section 4.2.2). Re-wetting of disposed wastes stimulates leachate production from higher elevation wastes that might normally be located above the groundwater.

The second issue with the location of the waste disposal facilities adjacent to Sugar Creek is the increased danger of damage and/or catastrophic release of coal ash during flood events. Eric

[1] FEMA National Flood Hazard Layer Viewer

Staley stated that flooding of areas of the site where monitoring well RW-3 is located is "almost an annual event."[2] Damage to monitoring wells and erosion of berms is a continuing problem associated with even moderate storm events. Monitoring wells AP-1, AP-2, and AW-3 are known to have been damaged during high water events and replaced with new wells located near the original locations.[3] The events that damaged the monitoring system were minor flood events compared with the damage to the site that should be expected with a major flood.

Under major flood events such as the 1%-annual-chance-flood (Figure 2), erosion of the berms that currently contain the disposed coal wastes should be expected. The probability of significant berm erosion is enhanced by the location of a bedrock outcrop allocated across the stream channel from the normal Springfield Lake spillway. The bedrock outcrop forces flow in the creek to make a sharp eastward turn below the spillway. During flood conditions flow will impinge directly on the berms on the western side of the Lakeside ash ponds.

Further enhancing the chance of significant release of wastes is the possibility of floodwater flowing across the roadway which crosses Spaulding Dam and onto the CWLP property near the Lakeside lime softening ponds. Water that flows over the dam and onto the ash pond site will have considerable erosive power due to its rapid drop in elevation as it crosses the dam (Figure 2). Re-wetting of disposed waste during high water events and the potential for a catastrophic release of disposed waste during major storm events are both reasons that the current location of CWLP coal waste facilities is far sub-optimal.

4.1.2 **History of Development**

Dallman Ash Pond

The 34.5-acre Dallman Ash Pond was placed into service in approximately 1976. The berms for the Dallman Ash Pond are reportedly constructed of earthen materials to a height of approximately 27 feet.[4] The bottom of the Dallman Ash Pond was reported to be at an elevation of 527 feet above msl and was constructed on natural clayey soils with relatively low permeability.[5] However, the natural clayey soils that form the bottom of the ponds were not compacted except at locations where the berms crossed over the pre-existing Sugar Creek channel,[6] and no engineered liner was used to line the bottom of the Lakeside Ash Pond.[7] As a result, all areas within the Dallman Ash Pond are appropriately considered by CWLP consultants to be unlined.[8]

[2] Transcript of deposition of Eric Staley, p. 28
[3] Transcript of deposition of Kim Van Pelt, pp. 16-18
[4] Andrews Engineering, 2016a, p. 3
[5] Stabilize, Inc. 2010, p.2
[6] Andrews Engineering, 2016b, p. 2
[7] Andrews Engineering, 2016b, p. 3
[8] Burns and McDonnell, 2013, pp. 6-6 thru 6-7

Fly ash, bottom ash, and some water treatment sludge from generating facilities have historically been sluiced to both the Lakeside and Dallman Ash Ponds. The Lakeside power plant is no longer in operation, so only water treatment sludge is still being sluiced to ponds located on the Lakeside Ash Pond. The Dallman power plant continues to operate, so fly ash and bottom ash continue to be sluiced to the Dallman Ash Pond.[9] Settled water from both the ponds flows into the Clarification Pond before being discharged into Sugar Creek.

The normal pool level (545.5 feet) and maximum elevation (554.0 feet) in the Dallman Ash Pond reportedly provides a typical freeboard of 8.5 feet.[10] My observations of conditions at the Dallman Ash Pond during a site visit conducted on March 1, 2019 showed several conditions of concern. Of particular concern at the Dallman pond was the observed lack of any freeboard. At the time of my visit the elevation of water contained within the Dallman Pond was nearly equal to the top of berm elevation on the northwest corner of the Dallman Ash Pond. This condition makes overtopping of the Dallman Pond berms very likely during any significant precipitation event. Erosion of the berm and release of waste would be a significant concern should the berm be overtopped.

Even without overtopping of the berm, erosion of the outside of the berm on the northwest corner of the Dallman Ash Pond was observed during the site. An active seep and associated small slump of berm sediment was observed to be active during the site visit. These features showed that water is migrating through the berms and reducing their strength and resistance to erosion. Operation of the Dallman Ash pond without the normal amount of available freeboard increases the potential for overtopping the berms during a significant precipitation event and increases the water level inside the impoundment that drives the flow of water through the berm material; neither of these observations is acceptable for an operating facility.

Lakeside Ash Pond

The 44-acre Lakeside Ash Pond was constructed prior to 1958.[11] The Lakeside Ash Pond is bounded by Spaulding Dam to the south and by earthen berms on the east, north, and south. The original bottom elevation of the Lakeside Ash Pond was identified on drawings to be located at an elevation approximately 537 feet above mean sea level (msl).[12] The earthen berms were reportedly built to 18 to 20 feet above the pond bottom elevation.[13] The normal pool level (564 feet) and maximum elevation (565.0 feet) in the Lakeside Ash Pond reportedly provides a typical freeboard of 1.0 foot.[14]

[9] Stabilize, Inc. 2010, p. 2
[10] Andrews Engineering, 2016c, p. 2
[11] Andrews Engineering, 2016a, p. 3
[12] Hanson Engineers, 1988, Sheet 2 of 2
[13] Andrews Engineering, 2016a, p. 3
[14] Andrews Engineering, 2016c, p. 2

The capacity of the Lakeside Ash Pond was expanded in 1988 by constructing berms on top and inside of the existing berms, and over bottom ash fill. During this time period, interior berms were constructed on the southern portion of the Lakeside Ash Pond to create lime-softening ponds that are indicated on the Site Location and Layout Map (Figure 1). The vertical expansion berms were reportedly constructed using compacted Flue Gas Desulfurization (FGD) scrubber sludge and clay as the base berm material and a silty clay lining on the interior of the berms.[15] Use of FGD sludge in construction of the berms introduced a source of potential groundwater contaminants outside of the pond's clay lining. Bottom ash is spread liberally on top and outside slopes of the Lakeside Ash Pond berms where it is readily washed downslope, and is spread on the surface adjacent to Sugar Creek where it can readily be transported downstream during high water events.

The Lakeside Ash Pond was constructed on natural clayey soils with relatively low permeability, but the natural clayey soils that form the bottom of the ponds were not compacted,[16] and no engineered liner was used to line the bottom of the Lakeside Ash Pond.[17] As a result, all areas within the Lakeside Ash Pond are appropriately considered by consultants for CWLP to be unlined.[18]

Subsequent to construction of the original and expansion berms CWLP installed a toe drain system at the base of the expansion berm to collect leakage along the west side of the Lakeside Ash Pond. Water collected in the toe drain system is pumped to the clarification pond for disposal. This toe drain system was originally installed soon after pond expansion in 1988 and redone again in 2018.[19] Common leakage though the connection between the original and expansion berm has been attributed to a "poor design".[20]

Another area of leakage from the west side of the Lakeside Ash Pond is located at the base of the original berm, near Sugar Creek. Persistent seepage in this location caused CWLP to install a sump in the alluvial sediments along the creek to collect leakage.[21] Water collected in the sump is pumped to the ash line for discharge into the Dallman Ash pond.[22] At the time of my March 1, 2019 site visit I observed a shallow ditch dug into the alluvial sediments that directs surface water from Sugar Creek into the sump. It is unclear why clear creek water was being

[15] Burns and McDonnell, 2013, Section 6.5
[16] Andrews Engineering, 2016b, p. 2
[17] Andrews Engineering, 2016b, p. 2
[18] Burns and McDonnell, 2013, pp. 6-6 thru 6-7
[19] Transcript of deposition of Susan Corcoran, p. 37
[20] Transcript of deposition of Susan Corcoran, p. 36
[21] Transcript of deposition of Susan Corcoran, p. 37
[22] Transcript of deposition of William Antonacci, p. 33

directed into the sump,[23] but the effect of this practice will be to add water to the ash that will increase generation and migration of leachate from the impoundment.

A third area of frequent leachate seepage has been reported on the northeast side of the Lakeside Ash Pond. Leakage from the impoundment at this location is reportedly the result of "a weak spot" in the berm.[24] A shallow ditch has been constructed to collect seepage and direct that seepage into the clarification pond. No seepage was observed at this location during my March 1 site visit.

Flue Gas Desulfurization Landfill

The FGDS Landfill is located immediately east of the Dallman Ash Pond and north of the Lakeside Ash Pond and Clarification Pond. The Landfill was originally designed with three disposal cells that have since been broken into two regulated units. Unit 1 is a 10.5-acre area that encompasses the filled and closed south disposal cell.[25]

The berm that originally separated the middle and north cells has been removed. Unit 2 is a 22.3-acre area encompassing the middle and northern disposal cells. The active portion of the Landfill is currently in the northwest corner of Unit 2 (cell 3). This area has been lined with five feet of low permeability clayey soils borrowed from adjacent areas and reportedly includes leachate collection above the liner.[26] The active area receives gypsum solids that are dredged from the active lime ponds on the Lakeside Ash Pond and stored pending shipment for offsite reuse.

The middle cell of Unit 2 is undeveloped and reportedly often experiences near-saturated ground conditions.[27] The reported saturated or near-saturated soils in the undeveloped middle cell are not surprising. The original bottom elevation of the FGDS Landfill was identified on design drawings to be located at an elevation of approximately 523 feet above msl. Ground surface elevations at several of the monitoring wells and piezometers located inside Unit 2 are in the range from 522.7 to 526.7.[28] Comparison of ground surface elevations to the potentiometric surfaces shown in Appendix B indicates that much of the interior of Unit 2 lies at or below the potentiometric surface.[29]

[23] Our site visit escort, Eric Staley, indicated that he did not know the purpose of directing creek water into the sump.
[24] Transcript of deposition of Susan Corcoran, p. 43
[25] Andrews Engineering, 2017a, p. 012905
[26] Andrews Engineering, 1992
[27] Burns and McDonnell, 2013, p. 6-7
[28] Stabilize, 2010 b, Table 1
[29] The potentiometric surface represents the elevation to which groundwater rises in wells completed in confined geologic units. It is mapped (rather than a water table) since groundwater below some areas of the site is present under confined conditions.

Three "evaporation ponds" on the east side of Unit 2 collect inflowing groundwater and precipitation that accumulates in the Landfill. The impounded water is reportedly "a mixture of seepage, artesian groundwater and precipitation entering the middle portion of the Landfill also known as Cell 2 and the undeveloped remainder of Cell 3".[30] Collected water is pumped from the Landfill to the Dallman Ash Pond. [31]

4.2 Geology and Hydrogeology

There have been several phases of geologic and hydrogeology characterization of the area of the CWLP Coal Ash ponds. Many of the characterization activities were performed primarily to support development and permitting activities on the adjacent FGDS Landfill. Examples of the geologic and hydrogeologic characterizations reviewed include:

- Andrews Environmental Engineering (March, 1990) - This investigation was performed to install six monitoring wells at the facility.
- Patrick Engineering (July, 1992) - This investigation was performed to further characterize the hydrogeology of the Landfill setting. Approximately 44 soil boring and piezometers were installed.
- Patrick Engineering (June, 1993) - This investigation was performed in support of an application for a permit modification at the FGDS Landfill.
- Stabilize, Inc. (December, 2008) - This investigation installed three new monitoring wells as part of an assessment program for the FGDS Landfill.
- Stabilize (September, 2010) – This investigation described the geology, hydrogeology, and water quality in the vicinity of the ash ponds.
- Andrews Environmental Engineering (2017) – Coal Combustion Residuals Surface Impoundments, Groundwater Monitoring Program. This document review site geology and hydrogeology and describes the groundwater monitoring program at the Dallman Ash Pond.

The following sections provide summaries of the geology and hydrogeology of the CWLP Coal Ash ponds based on information developed in part by the above investigations.

4.2.1 **Geology**

Geologic materials encountered in the vicinity of the CWLP waste storage facilities are highly variable due to their location over alluvial deposits that overlie bedrock in the Sugar Creek Valley. Characterization of alluvial sediments is an extremely difficult task due to the very irregular thickness, discontinuous extent, and propensity for abrupt lithology changes that are

[30] Stabilize, 2010a, Attachment A

[31] The documentation reviewed indicated that some FGDS wells have been designated as assessment wells and others have been designated as zone of attenuation wells. I could not locate any further documentation that described an agreement to establish a groundwater management zone. I also could locate no other regulatory agreements that might clarify the status of the impacted wells located downgradient of the FGDS landfill and/or Lakeside Ash Pond. I reserve the right to identify further issues related to groundwater impacts downgradient of these facilities once their status is clarified.

all characteristics of alluvial sediments. The materials encountered at the site are described in the following sections and summarized from shallowest to deepest units in the table below.[32]

Summary of Geologic Material Properties			
Unit	**Material Types**	**Thickness**	**Hydraulic Conductivity (cm/sec)**
Upper Cohesive Deposit	Silt, Silty Clays, and Clayey Silt	2.5 to 19 feet	1.6×10^{-5} to 5.2×10^{-7}
Shallow Sand Unit	Silty to Clayey Fine Sand	1 to 3 feet	2.9×10^{-2} to 3.6×10^{-3}
Lower Cohesive Unit	Clays, Silty Clays, and Clayey Silts	0 to 22 feet	4.6×10^{-5} to 7.6×10^{-5}
Channel Fill	Highly Variable - Silty Clays to Silty Sands	Undetermined	1.1×10^{-4} to 7.1×10^{-5}
Basal Sand Unit	Silty and Clayey Fine Sand to Sand with some Gravel	0 to 12.3 feet	3.6×10^{-2} to 5.6×10^{-4}
Pennsylvanian Bedrock	Shale	Undetermined	1.3×10^{-6} to 1.8×10^{-7}

Alluvial Sediments

The CWLP Coal Ash ponds are located in and along the alluvial valley of Sugar Creek. In fact, both the Dallman Ash Pond and the FGDS Landfill were constructed within the floodplain and over the previous location of the meandering channel of Sugar Creek.[33] The creek channel was relocated to the west of the Dallman Ash Pond to allow construction of the waste storage facilities.[34]

Various alluvial units and placed fill materials overlie the Pennsylvanian Shale bedrock. As is typical of alluvial sediments, the unconsolidated sediments that overlie bedrock include various combinations of sands, gravels, silts and clays in generally fining upward sequences of highly variable thickness. The naturally occurring sediments have been described in various characterization reports[35] and grouped into the general units described below.

Upper Cohesive Deposit

The uppermost naturally occurring sediment unit generally encountered at the site is the Upper Cohesive Deposit. This unit consists of silt, silty clays and clayey silts. This unit was reported to vary in thickness from 2.5 to 19 feet.[36] The remaining thickness of this unit after site

[32] Stabilize, 2010b; Andrews Engineering, 2017b, section 2
[33] City Water, Light & Power, 1976, p. 11
[34] City Water, Light & Power, 1976, p. 11
[35] Stabilize, 2010b: Andrews Engineering, 2017b, Section 2
[36] Stabilize, 2010b, p. 9

development should be assumed to be reduced in many locations as this unit was excavated and used in facility construction.[37] Laboratory tests of samples from this unit indicate that hydraulic conductivity is relatively low with laboratory tests of vertical conductivity values ranging between 1.6×10^{-5} cm/sec and 5.2×10^{-7} cm/sec.[38] Horizontal hydraulic conductivity should be expected to be roughly an order of magnitude more conductive than the vertical laboratory test results indicate.

Shallow Sand Unit

The Shallow Sand Unit often underlies the Upper Cohesive Deposit. This unit was not encountered at all locations across the site, but where it was encountered it was found to underlie the Upper Cohesive Deposit. Where present, this unit consists of silty to clayey fine sand that varies in thickness from one to three feet. Slug tests conducted on two piezometers completed in this unit show values of 3.6×10^{-3} cm/sec and 2.9×10^{-2} cm/sec.[39]

Lower Cohesive Deposit

The Lower Cohesive unit consists of clays, silty clays, and clayey silts that range in thickness from 0 to 22 feet.[40] The average thickness is reported to be approximately 15 feet. This deposit is missing in some areas along the abandoned creek bed where it has likely been removed by erosion. The horizontal hydraulic conductivity of the Lower Cohesive Unit ranges from 4.6×10^{-5} cm/sec to 7.6×10^{-5} cm/sec.[41]

Basal Sand Unit

The Basal Sand unit is composed of silty to clayey fine sands to sand with some gravel. It generally overlies the bedrock surface and underlies the lower cohesive deposit. This unit is not present everywhere, but where present its thickness varies from 0 to 12.3 feet with a top elevation of from 491 to 513 feet above msl.[42] The Basal Sand Unit is the most conductive of any material encountered on site with measured hydraulic conductivity ranging from 3.6×10^{-2} to 5.6×10^{-4} cm/sec.[43] CWLP has appropriately identified the Basal Sand Unit as the Uppermost Aquifer on the site.[44] This is the unit that is targeted by the groundwater monitoring system.

[37] Andrews Engineering, 2016a, p. 2
[38] Andrews Engineering, 2017b, Section 2
[39] Andrews Engineering, 2017b, Section 2
[40] Stabilize, 2010b, p 10
[41] Andrews Engineering, 2017b, Section 2
[42] Stabilize, 2010b, p 11
[43] Andrews Engineering, 2017b, p. 6
[44] Andrews Engineering, 2017b, p. 6

Channel Fill

Fill materials were used during site development to increase the elevation of low areas, specifically including the former channel of Sugar Creek. Borings completed into the Channel Fill materials show that fill consists of variable cohesive and granular soils classified as ranging from silty clays to silty sands.[45] The field horizontal hydraulic conductivity of the fill materials is highly variable, ranging from 6.1 x 10^{-2} cm/sec in granular fill to 7.1 x 10^{-5} cm/sec in cohesive fill.[46] The creek fill affects site hydrogeology and transport of contaminants because in some areas granular fill materials extend down to the top of bedrock, interconnecting the Channel Fill with the Upper Sand Unit and the Basal Sand Unit.[47] This interconnection of the sand units creates a conduit for transfer of CCR contaminants to the uppermost aquifer (Basal Sand) at the CWLP site.

Bedrock

The uppermost bedrock that underlies the CWLP site is Pennsylvanian Shale. The top of the bedrock surface generally slopes from both the east and west toward the center of the Landfill area. The measured elevation varies from a low of 492 feet above msl near the center of the Landfill, to a high of approximately 554 feet above msl on a bedrock outcrop located near the southeast corner of Landfill Cell 1.[48] Two tests of the hydraulic conductivity of the upper portions of the shale returned values of 1.8 x 10^{-7} cm/sec and 1.3 x 10^{-5} cm/sec.[49] Vertical flow through the bedrock unit is not expected to be significant unless currently unidentified fracture zones were to be identified.

4.2.2 **Hydrogeology**

Potentiometric surface maps depicting the change in groundwater potential across the CWLP Waste disposal facilities during 2016 and 2017 were included in the Groundwater Monitoring Program document[50] and are provided in Figures 2 and 3, respectively. At the CWLP site, high elevation groundwater is found along the south side of the Lakeside Ash Pond near Springfield Lake and on the highland area to the east of the Lakeside Ash Pond. General groundwater flow is from south to north toward Sugar Creek with significant local aberrations in the area around the Dallman Ash Pond and FGDS Landfill.[51] Both of these maps indicate the presence of mounded groundwater beneath the Dallman Ash Pond.[52] As a result of this mounded water, groundwater flows from the Dallman Ash Pond toward the north, east, and west. Flow toward the north and west is moving water from the ash pond toward discharge areas along Sugar

[45] Andrews Engineering, 2017b, p. 4
[46] Andrews Engineering, 2017b, p. 5
[47] Andrews Engineering, 2017b, p. 4
[48] Andrews Engineering, 2017b, p. 5
[49] Stabilize, 2010b, p 12
[50] Andrews Engineering, 2017b, Appendix A
[51] See potentiometric surface maps in Figures 2 and 3.
[52] See potentiometric surface maps in Figures 2 and 3.

Creek. Eastward flow from the Dallman Ash Pond moves groundwater toward the FGDS Landfill where it contributes to the shallow saturated conditions on that site.

Descriptions of the Lakeside and Dallman Ash Ponds provided above identify the elevations of the bottom of the Lakeside and Dallman Ash Ponds to be at approximately 537 and 527 feet above msl, respectively.[53] The potentiometric surface maps in Figures 2 and 3 show the groundwater elevation in the Dallman Ash Pond to be mounded with elevations ranging from approximately 535 to 530 feet above msl. Subtracting out the elevation of the base of the Dallman Ash Pond (527 feet above msl) indicates that at least 3 to 8 feet of the waste in the Dallman Ash Pond is saturated with groundwater. However, the actual elevation of the zone of saturation within the pond is likely much greater. The potentiometric maps do not reflect the elevation of standing water held within the unlined ash ponds. Rather, the potentiometric maps only reflect groundwater elevations measured in monitoring wells locate around the perimeter of the pond.[54] In reality, nearly the entire volume of waste held in the Dallman Ash Pond is likely saturated and leaching ash-related contaminants to groundwater. Constantly saturated coal ash creates the opportunity for continuous leaching and migration of contaminants from the Dallman Ash Pond.

Similarly, the potentiometric surface maps in Figures 2 and 3 show the groundwater elevation in the Lakeside Ash Pond decreases from a high of 565 feet above msl on the southeast corner to approximately 540 feet above msl along the northern berm. Subtracting out the elevation of the base of the Lakeside Ash Pond (537 feet above msl) indicates that at least 3 to 28 feet of the waste in the Lakeside Ash Pond is saturated with groundwater. Groundwater elevations at the Lakeside Ash Pond are measured in monitoring wells located around the perimeter of the pond and do not reflect the elevation of standing water held within the ash pond. Nearly the entire volume of waste held in the impoundment is likely saturated and leaching ash-related contaminants to groundwater.

Water-soluble metals and other contaminants in the ash dissolve into the groundwater as it passes through the waste material or are transported into the groundwater by infiltrating sluice water and precipitation. Contaminant loading through these processes is responsible for the elevated concentration of ash contamination detected in groundwater monitoring wells located downgradient of the ash ponds.

Other than the CWLP waste facilities that are being discussed herein, there are no other known sources that could be contributing the CCW-related constituents to groundwater. Some drawings included in early documents indicate the presence of a sewage treatment pond located

[53] Hanson Engineers, 1988, Sheet 2 of 2; Stabilize, Inc. 2010, p. 2

[54] More accurate potentiometric surface maps could not be prepared without nearly concurrent measurements of pond water and monitoring well water elevations.

immediately east of the first cell of the FGDS Landfill. The former location of that pond to the east of the FGDS Landfill places that pond on the opposite side of the Dallman Ash Pond groundwater mound from the Dallman monitoring wells and therefore the source of contaminants in the Dallman wells cannot be attributed to that location. Even if the groundwater mound was not present, contaminants from that pond would not be expected to include high concentrations of coal ash contaminants.[55]

4.2.3 **Groundwater Monitoring Systems**

The groundwater monitoring system at the Dallman Ash Pond consists of two upgradient monitoring wells (AP-4 and AP-5) and four downgradient monitoring wells (AP-1, AP-2, AP-3 and AW-3/RW-3).[56] Upgradient wells are purposefully placed in areas that are not thought to be impacted by facility operations to provide information about naturally occurring concentrations of chemical parameters. Downgradient monitoring wells are placed hydraulically downgradient of the waste unit, between the ash pond and Sugar Creek, in order to detect changes in water chemistry caused by the Ash Pond. Unfortunately, the close proximity of the ash ponds to Sugar Creek makes the monitoring system susceptible to damage during even moderate flood events.[57] Each of the monitoring wells in the Dallman groundwater monitoring system was constructed with screened intervals set to monitor the quality of water flowing immediately above the bedrock in the Basal Sand (Uppermost Aquifer).

Monitoring of the Dallman Ash Pond was initiated in 2010 with a single analysis from each well. A regular systematic monitoring program was initiated in February 2012 and continues to the present.[58] Water from all of the tested wells is sampled and analyzed for a wide range of ash-related parameters including antimony, arsenic, barium, boron, beryllium, cadmium, calcium, chloride, cobalt, fluoride, lead, lithium, mercury, molybdenum, pH, selenium, sulfate, thallium, total dissolved solids (TDS), and radium 226 & 228.[59] Analytical results are compared to statistically derived background concentrations and relevant water quality standards to determine if groundwater quality has been significantly impacted by site operations.

4.3 Groundwater Quality Criteria

Analytical data from monitoring wells tell us nothing without a standard or benchmark against which to judge whether a result shows significant degradation of water quality from site operations. I compared these monitoring results to both applicable water quality standards and

[55] Minnesota Pollution Control Agency, 1999, Table 4
[56] Monitoring well AW-3/RW-3 serves the double purpose of being included in both the Dallman Ash Pond and FGDS groundwater monitoring systems.
[57] At the time of my March 1, 2019 site visit Eric Staley indicated that wells AP-2 and AP-3 are subject to flooding and that AP-3 had recently flooded and had not yet been repaired.
[58] CWLP Ash Pond Groundwater Laboratory Reports 2010 to present. BATES 6.6
[59] CWLP Ash Pond Groundwater Laboratory Reports 2010 to present. BATES 6.6

statistically derived background values for the CWLP site, where available. The results of these comparisons of applicable standards and background values to data from the Dallman monitoring system is described in the following sections.

4.3.1 **Groundwater Classification**

Illinois groundwater quality regulations establish a groundwater classification system and associated numeric groundwater concentration standards for each classification.[60] Class I groundwater is defined as potable resource groundwater and is generally considered to be Class I unless otherwise demonstrated.[61] Hanson Engineers performed a formal evaluation of the appropriate classification of groundwater at the FGDS Landfill[62] in support of the 1995 Significant Permit Modification Application.[63] The results of that evaluation indicate that "[a]ll groundwater in the Creek Fill, Shallow Sand Unit, Lower Cohesive deposit and the Basal Sand Unit is Class I."[64] The Basal Sand Unit between the Dallman Ash Pond and Sugar Creek is considered to be Class I groundwater.

Class I Groundwater Quality Standards for Inorganic Constituents[65]			
Parameter	Class I Water Quality Standard (mg/l)	Parameter	Class I Water Quality Standard (mg/l)
Antimony	0.006	Manganese	0.15
Arsenic	0.010	Mercury	0.002
Barium	2	Nickel	0.1
Beryllium	0.004	Nitrate as N	10.0
Boron	2.0	pH	6.5 – 9.0
Cadmium	0.005	Perchlorate	0.0049
Chloride	200.0	Selenium	0.05
Chromium	0.1	Silver	0.05
Cobalt	1.0	Sulfate	400.0
Copper	0.65	Thallium	0.002
Cyanide	0.2	TDS	1,200
Fluoride	4.0	Vanadium	0.049
Iron	5.0	Zinc	5.0
Lead	0.0075		

[60] Title 35, Part 620 Groundwater Quality, Section 620.410
[61] Hanson Engineers, 1995, p. 5 of 11
[62] Hanson Engineers, 1995
[63] Andrews Engineering, 1995
[64] Hanson Engineers, 1995, p. 11 of 11
[65] Section 620.410 Groundwater Quality Standards for Class I: Potable Resource Groundwater

4.3.2 **Background Groundwater Quality**

Six years after the initiation of groundwater sampling CWLP has established proposed background water quality values. The statistical method employed is the calculation of the 95% Upper Prediction Limit (both upper and lower for pH). This is a standard statistical test that complies with EPA guidance[66] on the statistical analysis of groundwater; it identifies the concentration limit which is then compared to one or more observations from a compliance point population.[67] In this case, the concentration limit is identified as the Proposed Background Concentrations. Proposed background values calculated by CWLP for the Dallman Ash Pond are summarized in the table below.

Proposed Background Concentrations[68]			
Parameter	Proposed Background Value (mg/l)	Parameter	Proposed Background Value (mg/l)
Antimony	0.16	Lead	0.638
Arsenic	0.0724	Lithium	0.05
Barium	5.24	Mercury	0.0008
Beryllium	0.0164	Molybdenum	0.025
Boron	0.787	pH	6.76-7.63
Cadmium	0.128	Selenium	0.0079
Calcium	176.63	Sulfate	84.5
Chloride	24.2	TDS	597.94
Chromium	0.811	Thallium	0.00556
Cobalt	0.297	Radium 226	7.1
Fluoride	0.62	Radium 228	5.1

Where laboratory analytical values exceed the calculated background value, the sample is considered to be statistically above background.

4.4 Nature and Extent of Groundwater Contamination

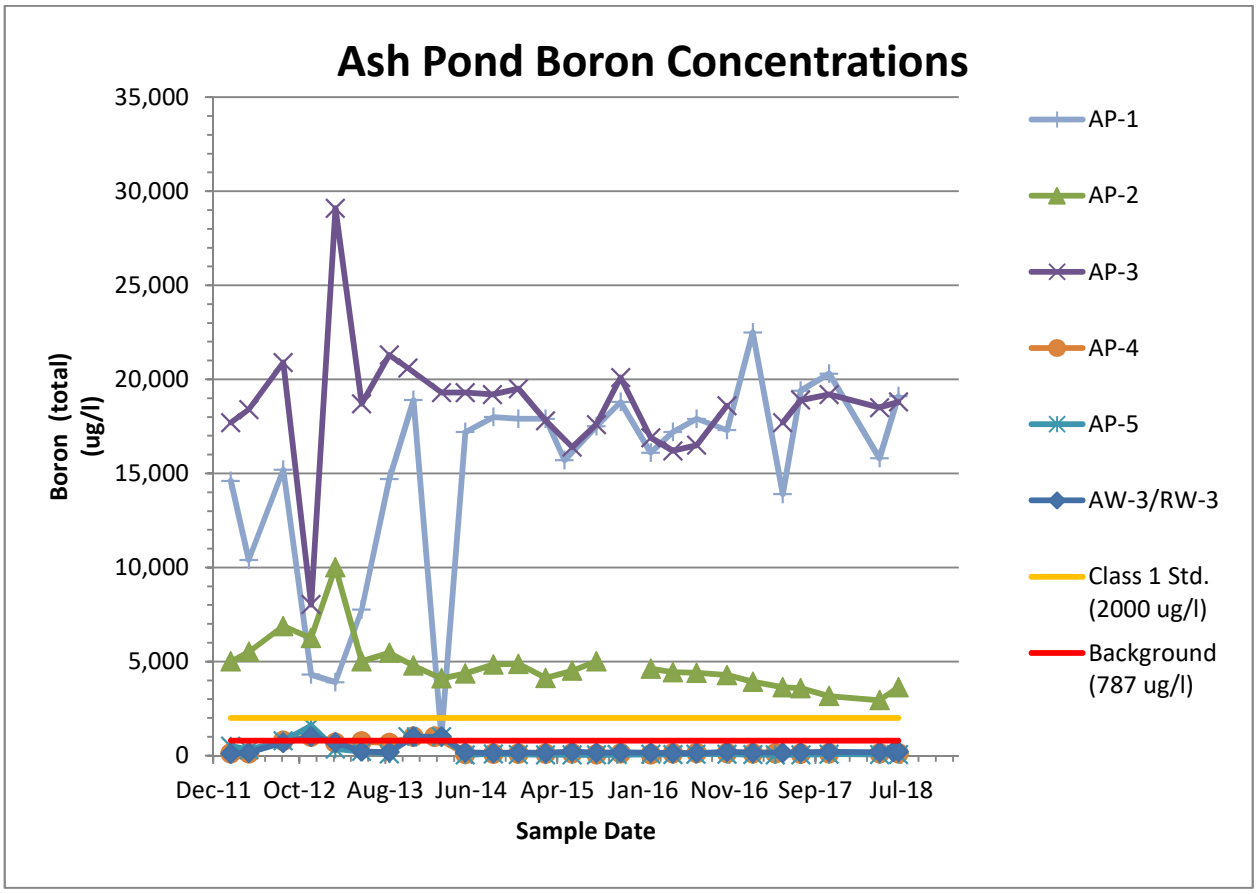
I identified constituents of concern at this site by comparing analytical results to background values, Class I Groundwater Quality Standards, or both where they have each been established. The following table identifies the wells that routinely show impacts by ash-related contaminants of concern in the Dallman Ash Pond groundwater monitoring system. Data summarized below were prepared using data taken from the reports of laboratory analyses.[69]

[66] USEPA, 2009
[67] USEPA, 2009
[68] Proposed Background Concentrations found in Andrews (2017b), Groundwater Monitoring Program
[69] Laboratory data reports used were provided during discovery at Bates 6.6 and 6.7, and obtained from the CWLP CCR Compliance web site

Parameter	Routine Detections Above Background	Routine Detections Above Class 1 Standard
Boron	AP-1, AP-2, and AP-3	AP-1, AP-2, and AP-3
Sulfate	AP-1, AP-2, and AP-3	AP-1 and AP-2
Manganese	AP-2 and AP-3	AP-2 and AP-3
Arsenic	AW-3/RW-3	AW-3/RW-3
TDS	AP-1, AP-2, and AP-3	AP-1

Time versus concentration graphs of several parameters that illustrate the magnitude of water quality impacts in Dallman Ash Pond monitoring wells are provided and discussed in the following sections.

4.4.1 **Boron Contamination**

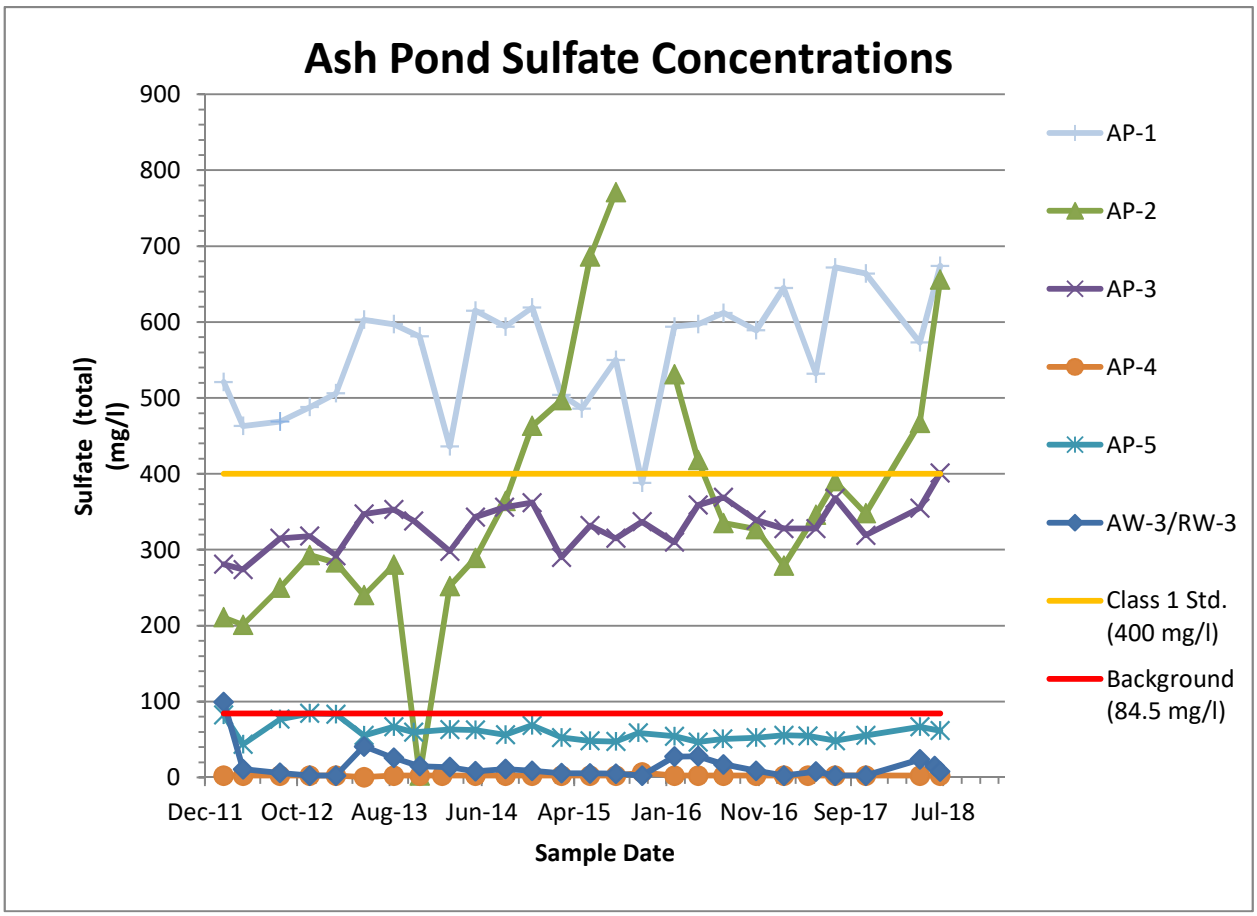


Boron is a very common coal ash constituent that is regularly found to be contaminating groundwater at ash disposal sites,[70] and the CWLP site is no exception. The above graph shows that the concentration of boron in downgradient monitoring wells AP-1, AP-2 and AP-3 is consistently above both background concentrations and Illinois Class I Groundwater Quality

[70] EPRI, 1998

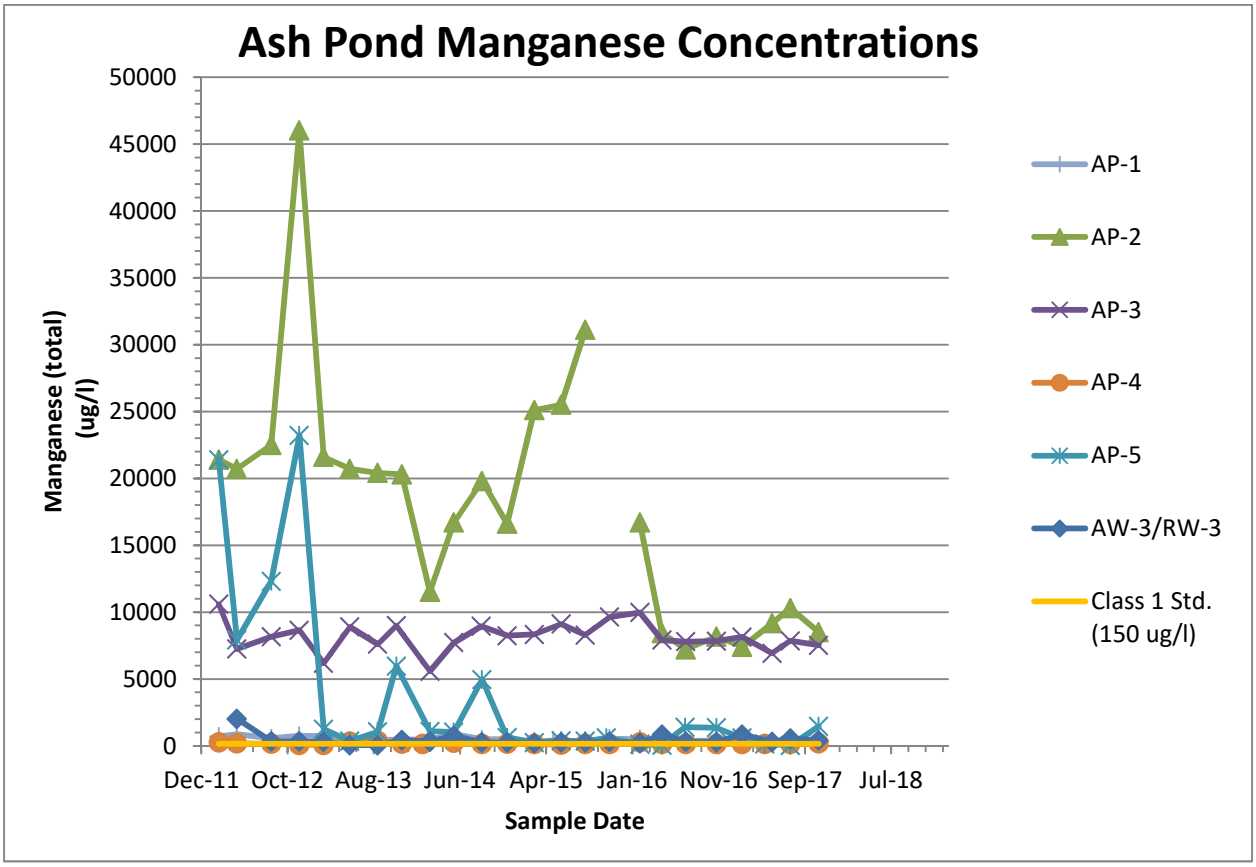
Standards. I also note that the two upgradient wells (AP-4 and AP-5) contain only small concentrations of boron compared to the downgradient wells.

4.4.2 **Sulfate Contamination**



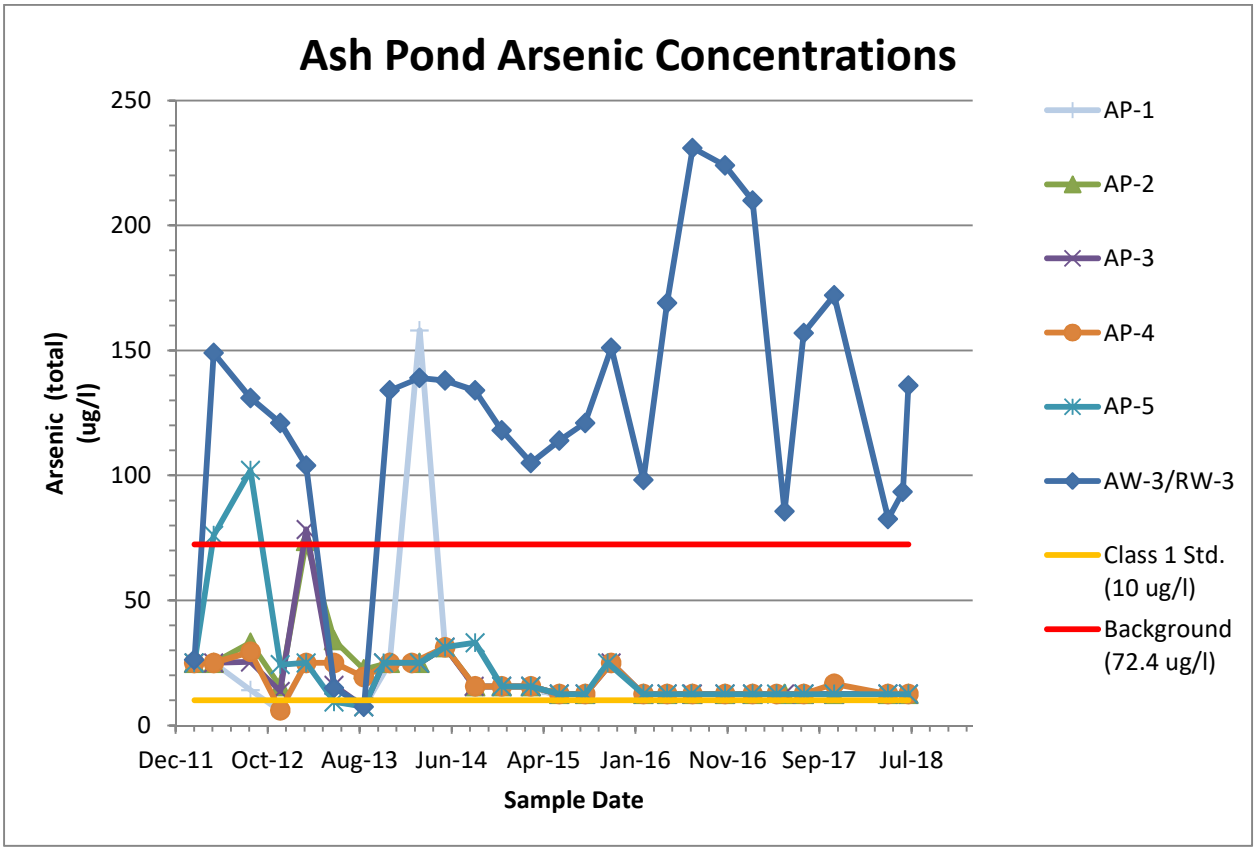
Sulfate is another very common coal ash constituent that is regularly found to be contaminating groundwater at ash disposal sites, and which also is impacting groundwater at the CWLP site. The above graph shows that the concentration of sulfate in downgradient monitoring well AP-1 is consistently above both background concentrations and Illinois Class I Groundwater Quality Standards. The concentration of sulfate in monitoring well AP-2 is variable with the most recent samples showing concentrations well above both background and the Class 1 standard. Monitoring well AP-3 shows concentrations of sulfate that are elevated well above background at concentrations and generally just below the Class 1 Standard. The two upgradient wells (AP-4 and AP-5) contain comparatively low concentrations of sulfate.

4.4.3 Manganese Contamination



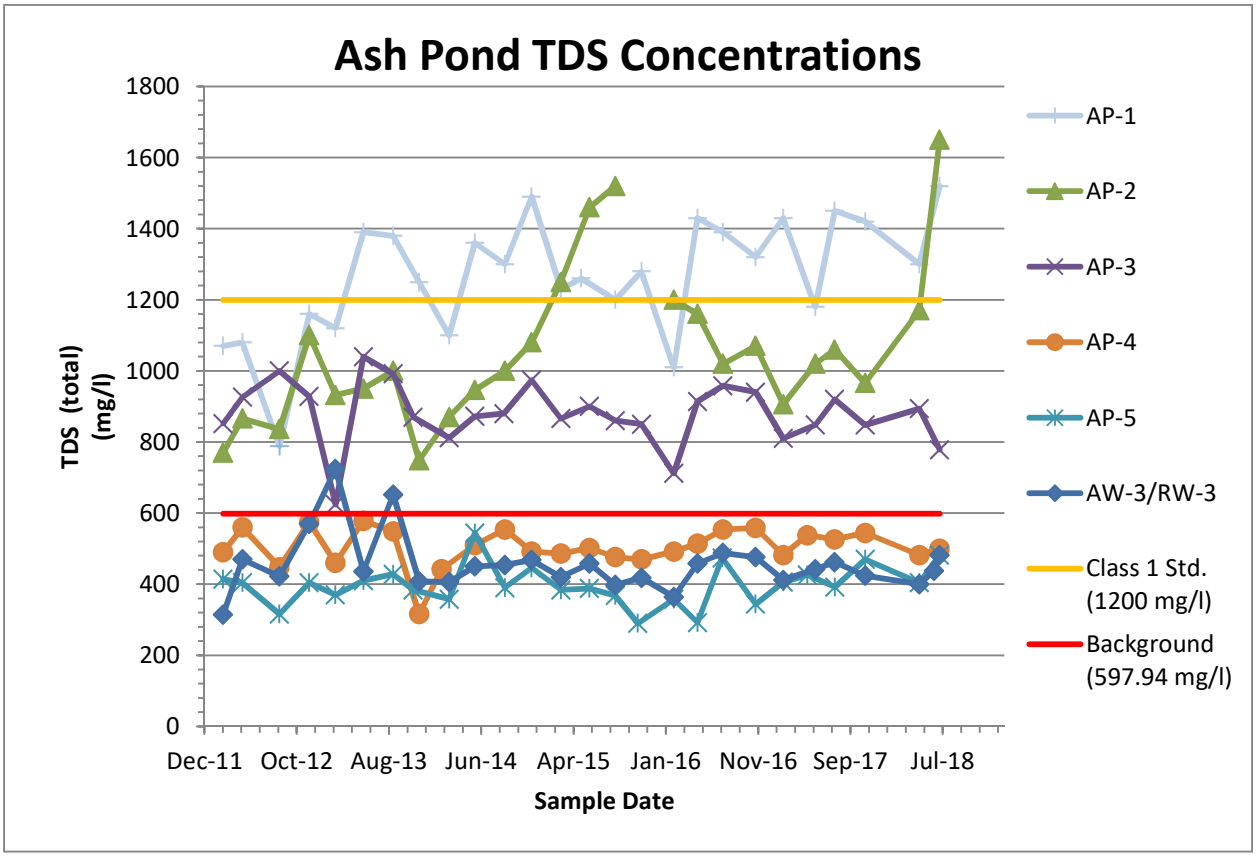
Manganese is another common ash constituent that contaminates groundwater at ash disposal sites, and also is impacting groundwater at the CWLP site. The above graph shows that the concentration of sulfate in downgradient monitoring wells AP-2 and AP-3 is consistently above the Illinois Class I Groundwater Quality Standards. A numeric background concentration for manganese has not been identified, but it is clear from the above graph that the concentrations of manganese in wells AP-2 and AP-3 are elevated over those recorded for background wells AP-4 and AP-5. The two upgradient wells AP-4 and AP-5, generally contain low concentrations of manganese with the exception of the first few analyses from well AP-5. Higher than expected concentrations observed in the first few samples in an analytical data set is something that I have occasionally observed in water quality data sets from coal ash disposal facilities. It appears that the first few samples from some wells were subject to either inadequate well development or poor sampling techniques that resulted in some higher concentrations being reported. For this reason I have not focused closely on the contaminant concentrations from the early sample events.

4.4.4 Arsenic Contamination



While a common constituent of coal ash, in my experience arsenic is a less frequently detected groundwater contaminant found downgradient of leaking coal ash facilities. The lower frequency of detection is due to the fact that arsenic is generally not as mobile as other ash contaminants that migrate from ash ponds. Arsenic was detected in downgradient monitoring wells AW-3/RW-3 in concentrations well above both background and Class I Water Quality Standards. Early detections of arsenic in well AP-5 may be the result of sampling and/or development errors similar to the manganese results described above. It is currently unclear if the high concentration of arsenic has been mobilized directly from the Dallman Ash Pond or is present in groundwater as a result of interaction of ash pond leachate with discharges from the adjacent FGDS Landfill and/or gypsum storage area. However, based on the location of wells AW-3/RW-3, it is clear that some combination of leachate from the Dallman Ash Pond and/or the FGDS Landfill is causing mobilization of arsenic that is being detected in the Dallman Ash Pond groundwater monitoring system at wells AW-3/RW-3. The two upgradient wells AP-4 and AP-5, contain low concentrations of arsenic as compared to the concentrations consistently detected in well AW-3/RW-3.

4.4.5 TDS Contamination



Total Dissolved Solids (TDS) is a very common parameter that is found, sometimes at very high concentrations, at ash disposal sites. The above graph shows that the concentration of TDS in downgradient monitoring well AP-1 is routinely above both background concentrations and the Illinois Class I Groundwater Quality Standards. The concentration of TDS in monitoring well AP-2 is variable with the most recent sample showing concentrations well above both background and the Class 1 standard. Monitoring well AP-3 shows concentrations of TDS that are elevated above background at concentrations and below the Class 1 Standard. Upgradient wells AP-4 and AP-5 contain low concentrations of TDS by comparison. These results are similar to the sulfate concentration trends that were previously described.

In summary, each of the downgradient monitoring wells is impacted with ash contaminants. Because there are no unimpacted monitoring wells located further downgradient of the Coal Ash Facilities, it is impossible to determine the full extent of the downgradient groundwater contaminant plume. Similarly, there is insufficient information to determine the lateral extent of groundwater contamination. There are no unimpacted monitoring wells capable of detecting passage of the leading edge of the contaminant plume. The lateral extent of the plume is likely to be limited to the west of the Dallman Ash Pond by the presence of local

areas of discharge to Sugar Creek. It is expected, but should be verified with additional wells, that most of the contaminants migrating from the Dallman Ash Pond will be discharged into Sugar Creek. It is however possible that some portion of the ash contaminants migrate for some undetermined distance north of the site through the alluvial sediments that fill the valley of Sugar Creek. There is no indication that anyone has investigated the extent of any downgradient migration from the site, nor that other sources are responsible for any of the identified contaminants of concern.

There is no indication that there have been any actions taken to reduce or eliminate the groundwater contamination that IEPA had indicated were violations in 2012 and 2013. CWLP continues to store coal ash in the unlined Dallman Ash Ponds, as well as the Lakeside Ash Pond. Groundwater monitoring data shows that contamination was caused by storage of coal fly ash in the unlined Dallman Ash Pond, that it was ongoing when monitoring was started, that it currently continues unabated, and the contamination shows no indication of decreasing to concentrations below background or applicable standards.

5. Potential Remedies

5.1 Remedial Goals

In order to provide some basis for discussing and comparing various remedial actions I have identified remedial action goals. These remedial action goals identified are general goals for use in comparing the ability of each remedial option to reduce current environmental impacts and protect against future environmental impacts from the CWLP coal ash impoundments. They are similar to the evaluation criteria identified by USEPA for use in remedy selection for Superfund Remedial Actions,[71] but have been modified to more directly address the relevant issues at the CWLP site. The goals used in this analysis to compare the effectiveness of remedial options include:

- Reduce the volume of leachate generation.
- Reduce releases of leachate to groundwater and surface water.
- Minimize long-term operation and maintenance requirements.
- Permanent solutions are preferable to temporary fixes.
- Eliminate the long-term risk of catastrophic release into Sugar Creek.

Implementation costs and public and/or regulatory acceptance of the various options will also play significantly into selection of the remedy.

5.2 Potential Remedial Actions

The following discussion of remedies commonly proposed to control contaminant releases at coal ash sites is intended as an overview that describes the positive and negative aspects of each remedy. In practice, many of these remedial actions are combined to fit the needs of the particular location. It should be expected that multiple actions will be required to mitigate the observed groundwater contamination and eliminate the threat of further environmental impacts.

5.2.1 **Discontinue Disposal of Waste in the Impoundments**

The first law of holes[72] describes an appropriate response to the situation at CWLP. It states that "if you find yourself in a hole, stop digging." Wastes currently in impoundments include fly ash, bottom ash, boiler slag, and lime sludge. CWLP currently has contracts to send some portion of each of these waste streams off-site for beneficial use or disposal.[73] A total of approximately 79,000 tons of fly ash and 38,000 tons of bottom ash (117,000 tons combined) are generated annually by all the generating units.[74] Of the combined 117,000 tons of waste, approximately 30,000 to 35,000 tons are shipped back to the coal mine.[75] Approximately 18,000 tons of fly ash per year is removed under

[71] USEPA, 1990, Exhibit 3
[72] Anecdote variously attributed to Will Rogers.
[73] Offsite use of these materials was discussed during the deposition of William Antonacci on January 16, 2019.
[74] Transcript of deposition of William Antonacci, p. 73
[75] Transcript of deposition of William Antonacci, p. 74

a contract with Ozinga and another 18,000 tons of bottom ash is removed for use by Harsco. [76] Contracts with Fly ash Direct and Champaign County result in removal of approximately 7,000 tons of fly ash and 2,000 tons of bottom ash, respectively. The result is that approximately 68% of the fly ash and bottom ash that is generated annually is being removed for offsite beneficial uses. CWLP should investigate other beneficial re-use or disposal options for each of these waste streams so that additional source materials are not added to existing contaminant sources.

Every day that additional waste is disposed of into the leaking CWLP ash ponds increases the contaminant source volume and extends the time duration over which, in the absence of effective remediation, the waste will continue impacting water quality. It has been nearly 9 years since the first monitoring results showing clear impacts to groundwater were generated and the volume of the contaminant source material (ash) continues to grow. Discontinuing disposal of the fly ash, bottom ash, boiler slag, and lime sludge in the impoundments will not stop releases to the environment from already placed ash, it is not a final closure remedy, and does not eliminate the threat of catastrophic release of ash during a flood event. It would, however, at least stop the growth of source material volume. Discontinuing disposal in the impoundments, at least temporarily, is also a prerequisite for implementing several other potential remedies that may be considered to remediate contamination from the current source materials.

5.2.2 **Eliminate Wet Handling of Waste**

In the event that complete elimination of ash disposal in leaking impoundments cannot be implemented under current conditions, the potential for switching plant operations from wet to dry ash handling should be evaluated.[77] CWLP is currently able to send its dry ash offsite for beneficial reuse.[78] Eliminating wet handling of ash would have the effect of facilitating additional off-site reuse of coal wastes.

While not a final closure remedy, switching operations to dry ash disposal would reduce the rate of infiltration into groundwater by eliminating discharge of sluice water into the impoundments. Eliminating discharge of sluice water would eliminate one major water input, alter the water balance of the impoundments, and should slow migration of leachate out of the impoundments. A careful study of the water balance of the impoundments would be required in order to evaluate whether eliminating sluice water would lower internal heads sufficiently to reduce contaminant discharges into downgradient water. Discontinuing wet disposal of the fly ash and bottom ash in the impoundments will not stop releases to the environment from already placed ash, is not a final closure remedy, and does not eliminate the threat of catastrophic release of ash during a major flood event.

[76] Transcript of deposition of William Antonacci, pp. 75 and 49
[77] William Antonnocci indicated during his January 16, 2019 deposition that CWLP has already done some investigation of the feasibility of converting to dry handling of coal ash, but did not know the current status.
[78] Transcript of deposition of William Antonacci, pp. 75

5.2.3 **Leachate Collection and Treatment**

Installation and operation of leachate collection systems such as sumps or wells inside the impoundments could lower the leachate head within the impoundment and reduce the flux of contaminants out of the impoundments. Collection of leachate from within an ash impoundment was utilized at the Wateree Generating Station in South Carolina as a temporary measure to reduce contaminant releases from an ash impoundment until such time excavation and removal of the accumulated waste could remove the source material[79]. Lowering the leachate head provided an additional benefit of initiating the dewatering process in preparation for excavation and removal of the ash to a secure disposal site. However, active operation and maintenance of the leachate collection and water treatment systems would be necessary for as long as leachate continues to be generated, a time period that may continue for many decades following the placement of the final wastes within the impoundment.

Furthermore, this option could be complicated by the potential need to treat collected leachate prior to discharge. Coal ash porewater often contains higher concentrations of ash constituents than are found in surface water that is discharged through the regulated outfall. This has been documented at multiple sites including the Belews Creek[80], Mayo[81], and Roxboro[82] sites in North Carolina. As a result, extraction of leachate from within the waste would be expected to contain higher concentrations of ash constituents than is currently being discharged into Sugar Creek. The expected concentration of ash constituents at the CWLP site would need to be determined in order to evaluate whether leachate treatment would be necessary prior to discharge.

Collecting leachate within the impoundments alone is not a final closure remedy and does not reduce the risk of catastrophic release of ash. It might however be used to reduce the flux of leachate from the impoundments into groundwater and result in decreased contaminant concentrations in the groundwater for as long as the system is operated. Collecting leachate within the impoundments also would likely not eliminate groundwater contamination. It could however be implemented as a component of an overall remediation strategy.

5.2.4 **Groundwater Collection and Treatment**

Installation and operation of groundwater collection wells or trenches installed through high permeability materials below or outside of the impoundments could potentially be used to capture contaminated groundwater. Applicability of this option would need to be carefully evaluated to determine the feasibility of this option given the proximity of Sugar Creek, as well as to determine the number of wells, spacing of trenches, and/or pumping rates necessary to capture contaminants released from the leaking impoundments. There is very little distance between the edge of the

[79] Personal communication from Jim Landreth at the time of November 2016 site visit.
[80] Duke Energy Carolinas, 2016a, Tables 3-2 and 3-3
[81] Duke Energy Progress, 2017a, Appendix B
[82] Duke Energy Progress, 2017b, Appendix B

impoundments and Sugar Creek in some locations[83] on the site (See Figure 1). Wells or trenches placed between the impoundments and Sugar Creek could unintentionally capture significant amounts of water from Sugar Creek rather than impacted groundwater flowing from the leaking impoundments. Active operation and maintenance of the leachate collection and water treatment systems would be necessary for as long as leachate continues to be generated and migrating from the impoundments, a time period that may continue for many decades following the last placement of waste.

In practice, it has often been difficult to intercept all of the contaminants in a plume using wells or trenches installed in alluvial sediments. The highly variable composition, orientation, and discontinuous nature of alluvial sediments can hinder the ability of wells and trenches to capture enough of the contaminated groundwater to halt plume migration. For example, both capture wells and interceptor trenches have been unsuccessfully utilized at the Colstrip[84] generating station in Montana in an effort to stop the spread of multiple contaminant plumes. The location of the facilities on the alluvial Fort Union Formation and recent alluvial sediments has limited the effectiveness of these measures.

Installation and operation of groundwater collection wells or trenches installed below or outside of the impoundments alone is not a final closure remedy and does not reduce the risk of damage or catastrophic release of ash. It might however be used to reduce the flux of contaminated groundwater that is migrating from the leaking impoundments and result in decreased contaminant concentrations in the groundwater for as long as the system is operated.

5.2.5 **Physical Barriers**

Construction of physical barriers such as low permeability walls constructed around the perimeter of the impoundments could restrict lateral flow of groundwater. As is the case for groundwater collection wells and trenches (Section 5.2.4), construction of an effective low permeability barrier in alluvial sediments can be problematic. The effectiveness of these remedies is often dependent on construction quality, the ability to obtain a positive seal between the barrier and underlying low permeability unit, and the ability of underlying low permeability unit to prevent flow beneath the barrier. Low permeability barriers were utilized at the Colstrip power station in Montana[85] and at the Wateree generating station in South Carolina[86] in an effort to stop the spread of contamination. Both of these facilities have since switched their processes to dry ash handling and the Wateree

[83] Figure 1 and observations made during a site visit conducted on March 1, 2019 indicate that the distance from the outside of the impoundment berms to Sugar Creek are on the order of a few tens of feet in the vicinity of the clarification pond and the northwest corner of the Dallman Pond.
[84] PPL Montana, 2014, Table 3-2
[85] PPL Montana, 2014, Table 3-2
[86] Personal communication from Jim Landreth at the time of November 2016 site visit

station has excavated and disposed of the ash in the impoundment that was the source of the contamination[87].

Installation of low permeability barriers alone is not a final closure remedy. Construction of a physical barrier around the perimeter of the impoundments would only be appropriate if implemented along with other remedies meant to eliminate or control the formation of leachate within the impoundments. One benefit of physical barriers is that once installed there is little to no required operation and maintenance other than routine monitoring. However, since the waste would remain in place within impoundments located adjacent to Sugar Creek, construction of below grade physical barriers would not reduce the risk of damage or catastrophic release of ash during a major flood event.

5.2.6 **Retrofit Impoundments**

In an evaluation of compliance with CCR Rule surface impoundment location restrictions[88] prepared for CWLP, Andrews Engineering concluded that;

> "unlined ponds are placed directly above and within 5 feet of the high water table for the uppermost aquifer. Either it must be demonstrated that there will not be intermittent, recurring or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer, or cessation of disposal and closure must begin."[89]

It goes on to state that "Hydraulic separation can be shown by retrofitting the ponds. A composite liner consisting of a two-foot (minimum) low hydraulic conductivity ($< 1.0 \times 10^{-7}$ cm/sec) clayey material overlain by a minimum 30 mil geomembrane (or equivalent) will be adequate to demonstrate hydraulic separation."[90]

Retrofitting the impoundments at the CWLP site to the specifications identified by Andrews would require that the waste that is currently located in the impoundments be removed so that a new composite liner system could be constructed. Low hydraulic conductivity clay soils would then be trucked to the impoundment, spread and compacted. Following placement of the low conductivity base material a synthetic liner system would be installed. Alternative handling plans for newly generated wastes would be necessary while construction takes place. Once completed, the retrofitted impoundments could again be utilized for waste disposal. The newly retrofitted impoundments would however remain potentially susceptible to damage or catastrophic release of wastes during flood events.

Retrofitting the existing unlined impoundments could be effective at controlling groundwater contamination, at least for the immediate future. While even new liner systems leak to some extent,

[87] Ash impoundments at the Colstrip Units 3&4 Effluent Holding Ponds are located well above the floodplain of local streams making flood-related damage or releases highly improbable.
[88] Andrews Engineering, 2018, p. 3
[89] Andrews Engineering, 2018, p. 3
[90] Andrews Engineering, 2018, p. 3

the flux of contaminants out of the impoundment would be expected to be significantly reduced. A composite liner system should contain ash leachate inside the impoundment as long as the amount of leachate contained within the liner is controlled.

Retrofitting the impoundments may meet the CCR location restrictions but would commit CWLP to additional costs associated with long term operation and maintenance as well as eventual closure of these facilities,[91] including at least 30 years of post-closure monitoring if waste remains in place and the impoundment would remain susceptible to damage or catastrophic release of waste into Sugar Creek during a major flood.

The lined impoundment would have already incurred the costs of removing existing wastes once in preparation for retrofitting the impoundments with a liner system. If the waste is to be removed from the current leaking impoundments, future waste disposal should be relocated to a properly sited and constructed disposal facility, or wet ash handling should be eliminated so that most waste can readily be beneficially used.

5.2.7 **Cap in Place**

A commonly utilized method of reducing impacts to groundwater at coal ash sites is to close the impoundments by capping the waste in place. The combination of elimination of sluice water entering the impoundment and installation of a cap system over the waste would reduce leachate head and slow migration release of contaminants to groundwater. However, this remedial option is effective only as long as there is separation between the bottom of the waste and the water table. This is exactly the point of the federal CCR rule location restriction discussed above. Waste placed too close to groundwater, such as in the CWLP impoundments, will be rewetted from below during high water events even though the cap may be functioning as planned. In the case of the CWLP impoundments "unlined ponds are placed directly above and within 5 feet of the high water table for the uppermost aquifer."[92] Rewetting of the waste during high water events will cause renewed leachate generation and continued release of contaminants to the groundwater.

Capping the Dallman and Lakeside impoundments could be effective if combined with installation of a liner system to provide separation from the groundwater and to comply with CCR Rule location restrictions.[93] Removal of the existing wastes to facilitate lining in the current location on the floodplain would continue the unit's susceptibility to flooding.

5.2.8 **Excavation and Beneficial Reuse**

Excavation and beneficial reuse of the waste stored in the Dallman impoundment is a final closure option that should be carefully evaluated when the site is closed. Beneficial reuse of some of the coal

[91] Impoundment closure could consist of either again removing all of the waste contained in the impoundments or installing a composite cap system over the wastes.
[92] Andrews Engineering, 2018, Evaluation of CCR Location Restrictions
[93] See Section 5.2.6

combustion wastes that are currently being produced and disposed in the CWLP impoundments has occurred in the past and continues to occur. In fact, William Antonacci indicated in his recent deposition that most of the ash contained in the Dallman Ash Pond was taken for beneficial use in rebuilding a highway interchange as recently as 2008 or 2009.[94] While it is unclear if an appropriate use for all of the waste stored in the CWLP impoundments could readily be found, it is clear that beneficial reuse opportunities are occasionally available and that additional opportunities would be available if ash was handled dry.

Benefits of excavation and beneficial reuse include: elimination of the source of groundwater and surface water contaminants from the floodplain, elimination of the risk of a catastrophic release to the environment, elimination of at least 30 years of site monitoring and maintenance costs, elimination potential liabilities of disposing of waste in another disposal facility. For all of these reasons, I recommend the option excavation and beneficial reuse for the CWLP impoundments.

5.2.9 **Excavation and Disposal**

Disposal of excavated ash in a new or existing Landfill capable of minimizing contact between ash and water, and containing ash contaminants would: eliminate the source of groundwater and surface water contaminants from the floodplain, eliminate the risk of a catastrophic release to the environment, and elimination of at least 30 years of site monitoring and maintenance costs.

This option would remove the source of groundwater contamination from the current location but depending on its final disposition, has the potential to create environmental liabilities at its new location. Waste removed from the current leaking impoundments should be removed to a properly sited and constructed disposal facility

5.2.10 **Comparison of Potential Remedies to Remedial Goals**

A summary of each of the above potential remedies compared to the previously identified remedial goals is provided in Table 1. This summary shows that the remedial alternatives that best protect the environment are those that include removal of the waste from the Sugar Creek floodplain and then either utilization of the waste for a beneficial use or disposal of the waste in a secure off-site location.

A combination of retrofitting the impoundments with a composite liner system, leachate collection and treatment, and eventually capping the waste in place would allow the impoundments to continue operation and likely reduce the impact of ash disposal on groundwater, at least until the next major flood event. However, implementation of this group of alternatives would require that the existing wastes be removed from the impoundments in order for the composite liner system to be installed. If

[94] See page 47 of transcript of William Antonacci deposition dated January 16, 2016.

the waste is to be removed from the current leaking impoundments, future waste disposal should be relocated to a properly cited and constructed Landfill.

Closing the impoundments by capping them in place would slow the release of contaminants into the groundwater. However, waste located at or below the water table would continue to release contaminants, especially after high water events re-saturate the waste. The closed impoundments would also be susceptible to damage or release of wastes during flood.

Other remedial options may reduce contaminant concentrations to some extent for as long as one or more systems are operated and maintained. The overarching problem with this site would however remain. The CWLP impoundments were constructed in a location that is very poorly suited to waste disposal facilities. If the CWLP impoundments were located away from Sugar Creek and above the normal water table there would likely be more alternatives that could be effective at containing the waste and controlling the release of contaminants into the environment. However, the CWLP ash is currently contained in:

- impoundments that have been described by CWLP personnel as poorly designed and constructed impoundments,
- impoundments known to be releasing ash-related contaminants to groundwater in concentrations well above Illinois Class I Groundwater Quality Standards,
- Impoundments with bottoms located at or below the water table, and
- Impoundments located on the Sugar Creek floodplain and completely within the zone of inundation during the 100-year flood.

For these reasons I see no responsible choice other than to recommend that the impoundments be closed to additional waste disposal and that the existing wastes be excavated and either beneficially reused or disposed in a properly sited and constructed disposal facility.

Table 1
Summary of Example Remediation Effectiveness

	Reduce Leachate Generation	Reduce Releases to Groundwater and Surface Water	Permanent Solution Rather than Temporary Fix	Minimize Long-Term Operation and Maintenance	Eliminate Long-Term Risk of Catastrophic Release	Comments
Stop Further Disposal of Ash	**Effective**	**Effective**	**Not Effective**	**Not Effective**	**Not Effective**	Eliminating new disposal of ash in the impoundments restricts growth of the total volume of the contaminant source material and is a prerequisite for implementing many other remedial options.
Eliminate Wet Handling of Ash	**Effective**	**Effective**	**Not Effective**	**Not Effective**	**Not Effective**	Dry ash disposal may reduce the rate of infiltration into groundwater by eliminating discharge of sluice water into the impoundments.
Leachate Collection and Treatment	**Not Effective**	**Effective**	**Not Effective**	**Not Effective**	**Not Effective**	Continuous operation and maintenance required to control leachate levels.
Groundwater Collection and Treatment	**Not Effective**	**Effective**	**Not Effective**	**Not Effective**	**Not Effective**	Requires continuous operation and maintenance of system.
Physical Barriers	**Not Effective**	**Effective**	**Partially Effective**	**Effective**	**Not Effective**	Effectiveness is often dependent on construction quality and underlying materials. Only effective as long as the volume of leachate inside the containment is controlled.
Retrofit Impoundments	**Not Effective**	**Effective**	**Not Effective**	**Not Effective**	**Not Effective**	The flux of contaminants out of the impoundment would be expected to be significantly reduced as long as the amount of leachate contained within the liner is controlled. Requires that all waste in an impoundment be removed to install liner system.
Cap in Place	**Effective**	**Effective**	**Partially Effective**	**Partially Effective**	**Not Effective**	Caps are subject to deterioration and leakage over time. Waste will still be in place and capable of generating leachate when the cap begins to leak. Not completely effective if waste is in contact with groundwater as is the case at CWLP.
Excavation and Beneficial Reuse	**Effective**	**Effective**	**Effective**	**Effective**	**Effective**	This is a permanent remedy that has the added benefit of not creating or adding to another disposal site.
Excavation and Disposal	**Effective**	**Effective**	**Effective**	**Effective**	**Effective**	This is a permanent remedy that fills all remediation goals but that creates or adds to another disposal site..

6. Opinions Formed

6.1 Opinion 1: Coal Ash Stored in the Dallman Ash Pond is Contaminating Groundwater

The discussion provided above shows that coal ash in the Dallman Ash Pond is the source of contaminants detected in downgradient groundwater wells. The contaminants were transferred from ash to groundwater via the unlined pond, which was made worse by the fact that at least some portion of the waste is saturated with water. Groundwater, sluice water, and precipitation that migrate through the waste dissolve water-soluble contaminants in the ash, which are then transferred to and subsequently detected in downgradient groundwater. Groundwater monitoring data collected regularly since 2012 show that downgradient concentrations of boron, sulfate, manganese, TDS, and to a lesser extent arsenic are detected in much higher concentrations in downgradient wells than in background wells.

6.2 Opinion 2: Groundwater Located Downgradient of the Dallman Ash Ponds is Contaminated at Concentrations Exceeding Background and Illinois Groundwater Quality Standards

The uppermost aquifer at the site, the Basal Sand Layer, has been identified as Class 1 groundwater on the basis its depth and hydraulic conductivity above 10^{-4} cm/sec. The discussion provided above shows that the coal ash contamination caused by the Dallman Ash Pond exceeds both Illinois Class I Groundwater Quality Standards and locally derived background values.

6.3 Opinion 3: CWLP Has Not Determined the Downgradient Extent of Impacts Nor Taken Identifiable Steps to Control Groundwater Contamination

Groundwater monitoring data collected regularly since 2012 show that groundwater downgradient of the Dallman Ash Pond is contaminated above background by the ash basin with boron, sulfate, manganese, TDS, and to a lesser extent arsenic. The extent of groundwater impacts outside of the ash pond has not been identified. It is likely that the extent of contamination is limited in areas west of the Dallman Ash Pond since groundwater will likely discharge, along with its dissolved contaminants, into Sugar Creek. It is however possible that some portion of the ash contaminants migrate downgradient of the site to the north through the alluvial sediments. There is no indication that the extent of any downgradient migration from the site has been investigated. The available documentation indicates that although IEPA at one time intended to enforce compliance with groundwater

quality standards,[95] no such enforcement has occurred and groundwater contamination downgradient of the Dallman Ash Pond continues unabated as of this date.

6.4 Opinion 4: CWLP Should Close Their Impoundments to Additional Waste Disposal and Implement Site Closure by Excavating and Removing the Waste

The CWLP impoundments were constructed in a location that is very poorly suited to waste disposal facilities. If the CWLP impoundments were located away from Sugar Creek and above the normal water table there would likely be more alternatives that could be effective at containing the waste and controlling the release of contaminants into the environment. However, the CWLP ash is currently contained in:

- impoundments that have been described by CWLP personnel as poorly designed and constructed impoundments,
- impoundments known to be releasing ash-related contaminants to groundwater in concentrations well above Illinois Class I Groundwater Quality Standards,
- impoundments with bottoms located at or below the water table, and
- impoundments located on the Sugar Creek floodplain and completely within the zone of inundation during the 100-year flood.

For these reasons I see no responsible choice other than to recommend that the impoundments be closed to additional waste disposal and that the existing wastes be excavated and either beneficially reused or disposed in a properly sited and constructed disposal facility.

[95] IEPA ,2014

7. Compensation

My hourly rate in reviewing documentation, preparing this report and for any necessary depositions and testimony is $140 per hour.

8. Concluding Remarks

This report sets forth my opinions and the information upon which I relied in forming those opinions. I reserve the right to supplement this report and/or my opinions as new or additional information is brought to light in the future.

Mark A. Hutson, P.G.
Illinois Licensed Professional Geologist No. 196.001465

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Figures

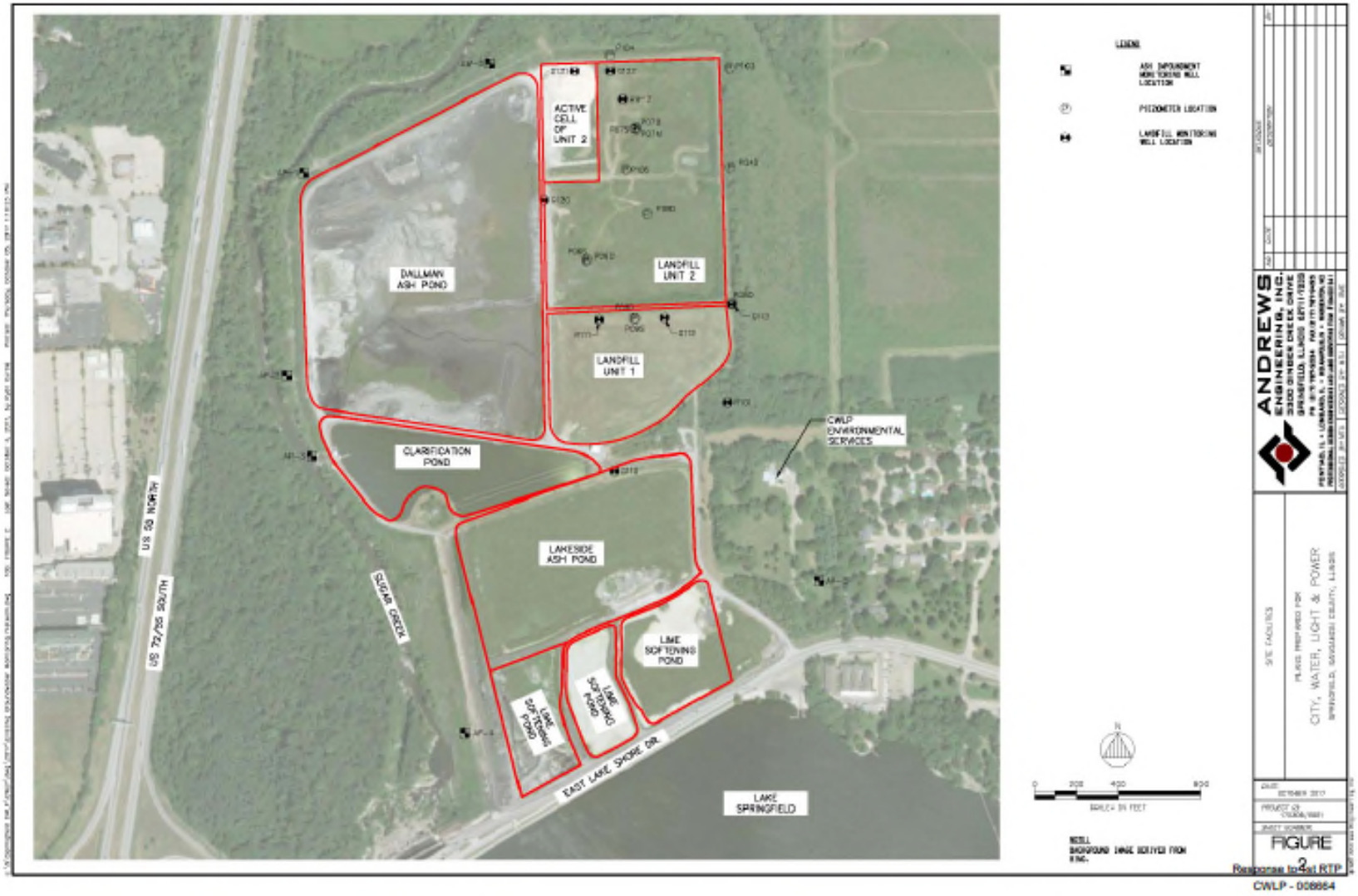

Figure 1
Site Location and Layout

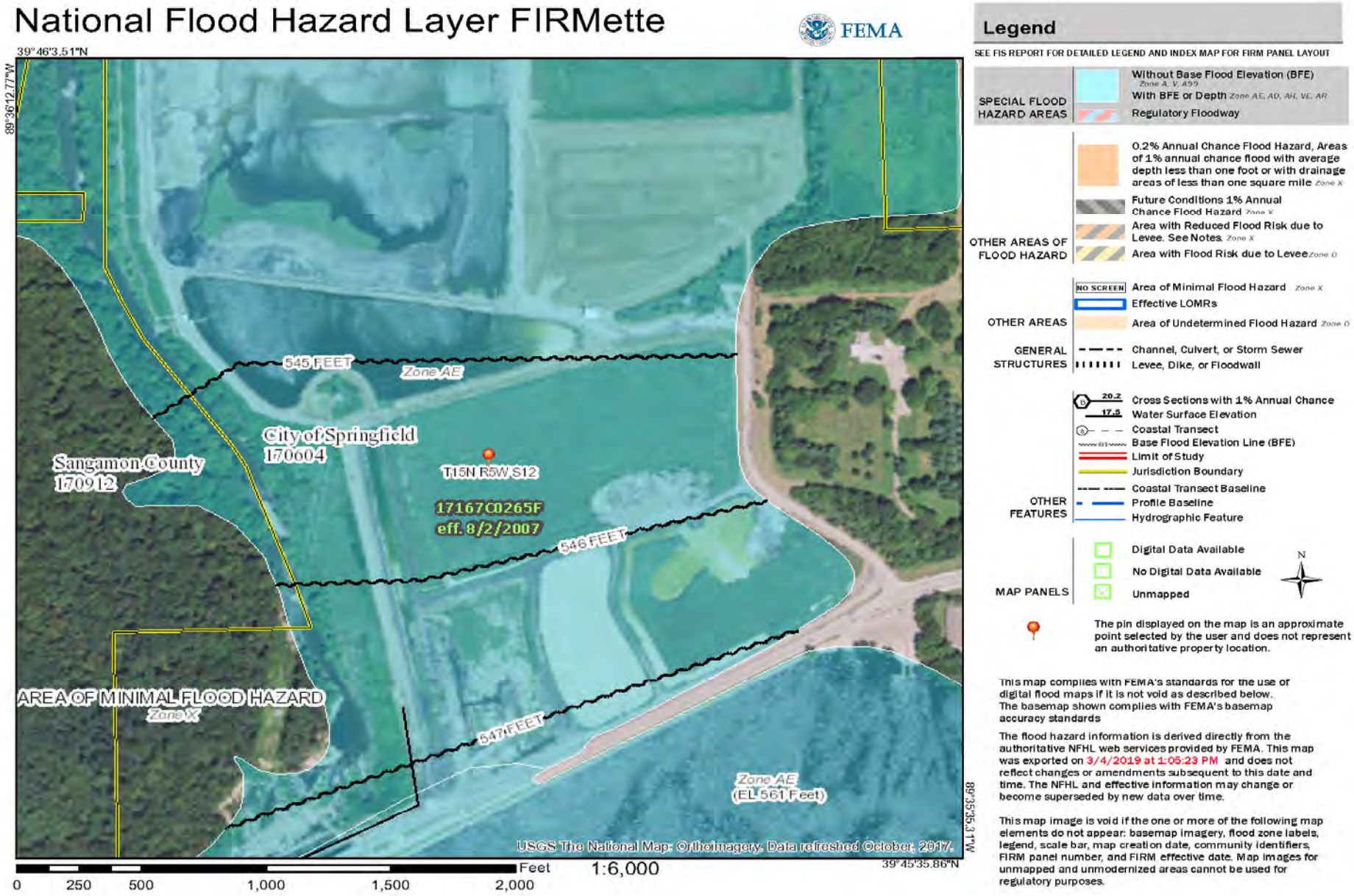

Figure 2
FEMA 1% Annual Chance Flood Map

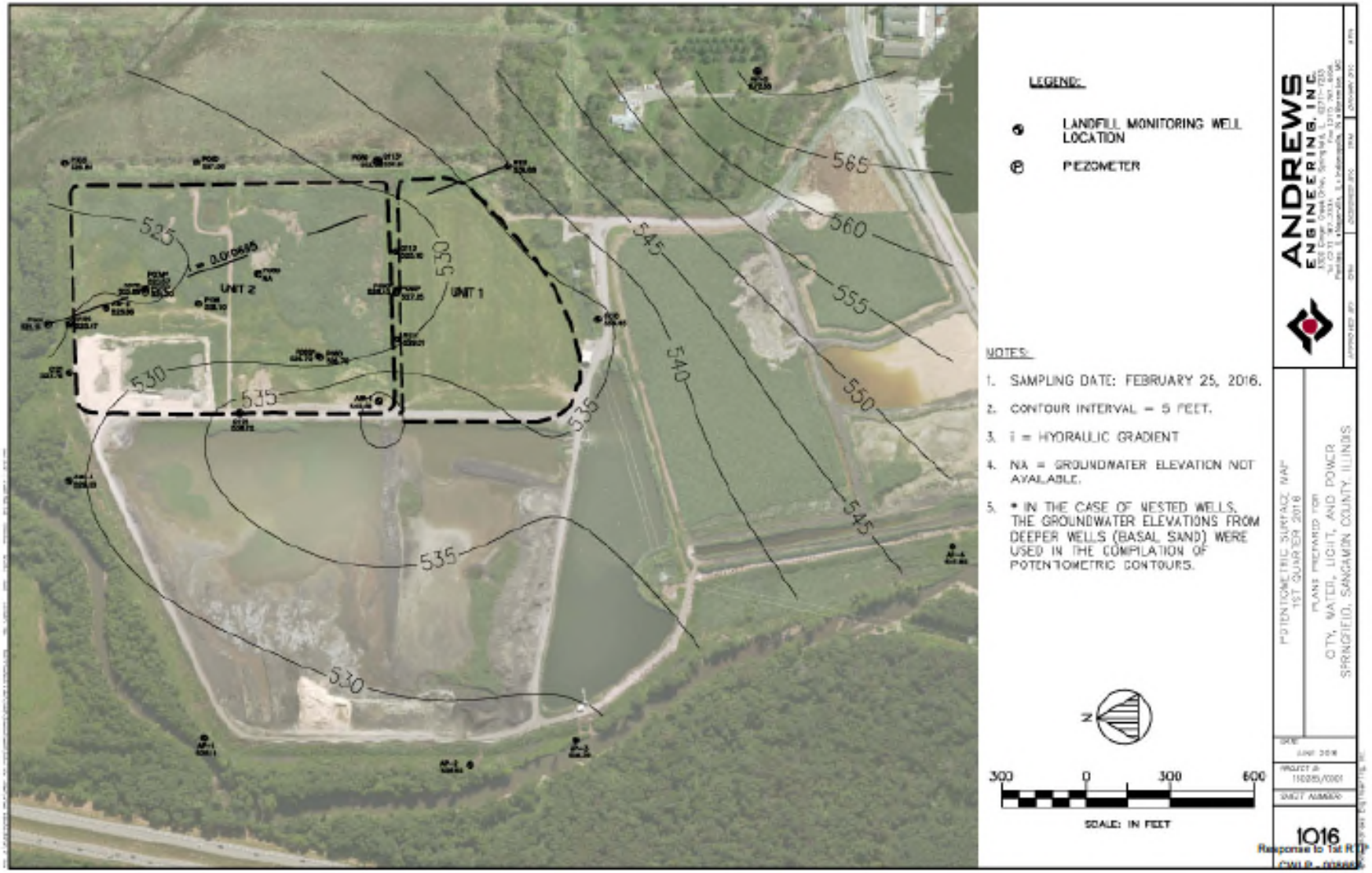

Figure 3
1st Quarter 2016 Potentiometric Surface Map

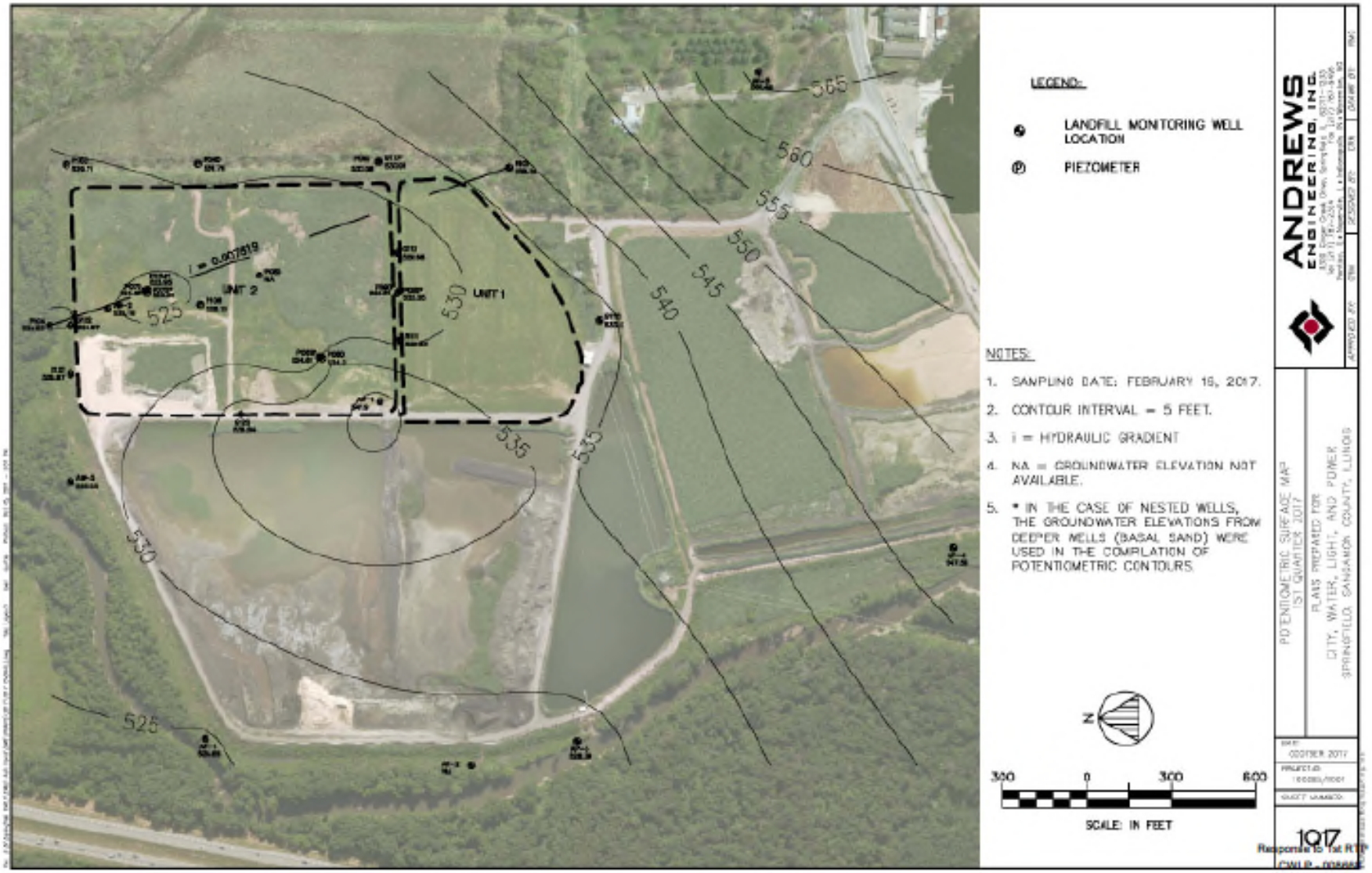

Figure 4
1st Quarter 2017 Potentiometric Surface Map

Appendix A
Curriculum Vitae

Mark A. Hutson, P.G.

Summary of Qualifications

Over 38 years professional experience performing and managing site characterization, RI/FS's, RFI's, and soil and/or groundwater remediation projects. Management experience includes all aspects of projects for industrial, governmental, and non-profit clients. I have provided technical review, comments, and oversight on preparation of numerous permit applications and a wide array of projects.

Professional Experience

Geo-Hydro, Inc., 2006-Present, Principal/Senior Scientist
Weston Solutions, Inc., 2002-2006, Senior Project Manager/Business Line Operations Manager
Ellis Environmental Group, LLC, 2001-2002, Senior Project Manager
Foothill Engineering Consultants, 1997-2001, Senior Project Manager
Burns & McDonnell Waste Consultants, Inc., 1996-1997, Senior Project Manager
Hydro-Search, Inc., 1990-1996, Senior Project Manager/Operations Manager
Roy F. Weston, Inc., 1984-1990, Senior Geologist/ Project Manager
University of Illinois at Chicago, 1982-1984, Teaching Assistant
Ecology and Environment, Inc., 1980-1982, Hydrogeologist
Illinois Environmental Protection Agency, 1978-1980, Environmental Protection Specialist

Professional Registrations, Memberships, and Affiliation

Professional Geologist - Wisconsin (No. 889), Illinois (196.001465), Indiana (No. 754), Kansas (No. 709), Nebraska (No. G-0329), North Carolina (No. 2513)

American Institute of Professional Geologists - Certified Professional Geologist (No. 7302)

Colorado Ground Water Association - (Past-President 2015-2016), President 2014-2015, Vice President 2013-2014, Education Committee Chair, 2011-2018)

Education

M.S., Geology, University of Illinois at Chicago, 1989
B.S., Geology, Northern Illinois University, 1978
Graduate Studies in Business, Northern Illinois University, 1979-81
Various courses on computer software and geographic information systems

Select Project Experience

Technical Oversight and Consulting

- Consultant tasked with reviewing and summarizing water quality data from 66 Coal Combustion Residual sites to gain insight into the nature and magnitude of the documented impacts that CCR units have on groundwater quality. Results were submitted to EPA by my client during the public comment period on proposed revisions to the 2015 Coal Combustion Residual Rules.

- Consultant tasked with reviewing and providing my Expert Opinions on EPA's proposed revisions to the 2015 Coal Combustion Residual rules. Opinions were submitted to EPA by my client during the public comment period.

- Consultant tasked with reviewing and providing comments on Site Assessment Plans, Comprehensive Site Assessments, and Corrective Action Plans for coal ash impoundments at the Mayo, Roxboro, and Belews Creek Generating Stations in North Carolina. Coal ash impoundments at each of these sites were constructed in stream valleys and resulted in burying perennial streams below sluiced ash.

- Consultant for the Western Environmental Law Center initially tasked with reviewing and providing comments on the mine permit application for the Bull Mountains Mine, Montana. I was subsequently asked to provide testimony about concerns over inadequate evaluation of potential impacts to springs and seeps as well as water supplies on surrounding properties.

- Consultant tasked with reviewing closure plan information and monitoring reports from the Santee Cooper Grainger Generating Station ash pond closure. The site is located near Conway, SC. Documents were reviewed to evaluate the effectiveness of the proposed closure plan and comments were provided to counsel for use in negotiations with the company.

- Technical Consultant tasked with reviewing and preparing comments on the Draft Environmental Impact Statement for the Four Corners Power Plant and Navajo Mine Energy Project in New Mexico. Reviewed documentation from Office of Surface Mining Reclamation and Enforcement sources and prepared comments covering the effects of current and previous mining and coal ash disposal practices and identifying proposed activities likely to adversely impact environmental quality.

- Consultant providing support to counsel by reviewing and providing comments on Groundwater Assessment Work Plans and Drinking Water Supply Well and Receptor Surveys at 14 coal ash disposal facilities located in the southeast. The document reviews were conducted in order to evaluate the appropriateness of proposed characterization, make recommendations to improve characterization, and identify any sites that showed a particularly high risk to off-site receptors.

- Consultant tasked with reviewing and preparing comments on the 2012 reports covering the Plant Area, Stage One and Stage Two Evaporation Ponds Area, and Units 3 & 4 Evaporation Holding Ponds Area of the Colstrip Steam Electric Station located at Colstrip, MT. Reviewed documents and prepared comments and talking points that were submitted subsequently submitted to regulators.

- Consultant on the Pines Groundwater Plume Site through a USEPA Technical Assistance Program grant from PRPs to local citizens' group. The Pines site is a coal combustion waste landfill with significant spread of contaminants. Provide assistance to the citizens through grant to provide assessment and feedback on site work products as they are developed and implemented, explain the remediation processes and activities to the citizens, and serve as technical liaison between citizens and remediation team.

- Technical Consultant tasked by with reviewing a variety of documents and monitoring data from the Rosebud Mine located near Colstrip, MT. Document and data reviews included groundwater monitoring data, MPDES permits and discharge monitoring reports, and permit renewal documents. In each case, documentation and data were reviewed and comments were prepared and submitted to counsel.

- Technical Consultant providing support at the Massachusetts Military Reservation (MMR) on Cape Cod, MA. Under contract to the Corps of Engineers, provided third-party technical support services for the Selectmen of four towns surrounding MMR from 1998 thru 2011. The project involved oversight of impact area characterization and remediation activities including UXO location and disposal, and characterization of explosive impacted soil and groundwater, volatile organics, and perchlorate. Provided technical review of remediation data as well as comments and advice to the Selectmen on technical issues.

- Environmental Consultant to the City of Afton, MN to review and provide comments on an application to develop a coal combustion waste landfill on the site of a former sand and gravel mining operation. On behalf of the City of Afton, GHI reviewed the available materials, identified data gaps and potential concerns, and submitted detailed comments on the plan. Major concerns included the susceptibility of the local water supply to contamination from the facility, the unacceptable geologic characteristics of the site for construction of a waste disposal facility, poor characterization of wastes to be placed in the facility, improper modeling of the site conducted in support of the EIS, and the location of many potential receptors downgradient of the facility.

- Project Manager and Consultant tasked with reviewing and providing technical comments on the Faulkner, Westland and Brandywine coal combustion waste disposal facilities in rural Maryland. Provided comments on the adequacy of characterization of the nature and extent of contaminants released from these facilities. Subsequently supported the legal team in negotiating the details of necessary actions to be taken during closure of these facilities to protect human health and the environment.

- Consultant tasked with reviewing and preparing comments on a permit amendment application for the Savage Mine located in eastern Montana. Comments submitted to counsel primarily concerned the adequacy of the site characterization, the hydrologic balance and probable hydrologic consequences of proposed application.

- Project Manager and Consultant on the review and preparation of technical comments on an application by a major utility to develop an unlined coal combustion waste (CCW) disposal facility in western Kansas. Major issues included the leachability of CCW in the landfill environment, inadequacy of the proposed groundwater monitoring plan and the lack of necessary groundwater protection systems in the design. Comments were provided to counsel for inclusion in the public review process.

- Environmental Consultant tasked with reviewing and preparing comments on a permit application for a proposed lignite mine located near South Heart, North Dakota. Comments submitted to counsel included identification of inadequacies in the site characterization, the monitoring plan, the Probable Hydrologic Consequences, and the evaluation of potential alluvial valley floors. Comments were submitted to counsel.

- Project Manager and Consultant for Robinson Township and Environmental Integrity Project on a review of a permit application submitted to the State of Pennsylvania to mine coal refuse, generate electricity and dispose of coal combustion waste at the location of a large coal refuse pile. Services included permit application review and preparation of comments. Review identified deficiencies in the characterization of geologic materials, groundwater, surface water, and the hydrologic balance provided in the permit application.

- Geologist on a geologic and hydrogeologic assessment of a proposed regional landfill in Kendall County, Il. Research documented problems with the geologic and hydrogeologic characterization, including karst features in the area that had not been noted or anticipated in the permit application materials.

Site Characterization and Remediation

- Lead author on a Groundwater Impact Assessment at a coal combustion waste disposal facility in Illinois. This project was conducted to assist an electric generating station investigate the nature and extent of

contaminants that had been released to the groundwater and to investigate remedial options necessary to minimize future releases. Results of this study are currently being implemented by the company and are projected to adequately contain contamination and avoid exposures to surrounding residents.

- PCP Contaminated Soil Remediation, Beaver Wood Products, Columbia Falls, MT, Project Manager. Manager of a project to investigate, excavate and bio-remediate PCP impacted soils at a former pole treatment site. Soil treatment was conducted via an on-site Land Treatment Unit (LTU). At the time of project completion over 20,000 cubic yards of impacted soil had been excavated, treated, and returned to the site. Responsible for project planning and execution, budget and schedule tracking, and cost control.

- Project Manager of a project to remediate and remove an oil interceptor pond containing PCB-contaminated sediment at a generating facility in North Dakota. Oily sludge in the pond contained PCB's in sufficient concentrations to require special handling and disposal. Responsible for all aspects of the project including evaluating remedial action alternatives, preparing construction plans, representing the client with regulatory agencies, and implementation of the approved site closure. Fly ash was added as a stabilizing agent to stabilize the sediment within the pond. Stabilized and characterized sediment was shipped to a permitted TSCA facility for disposal.

- Remediation of hydrocarbon contaminated soils at natural gas collection and pumping Stations, KN Energy, Project Manager. The project consisted of identification of areas of visually impacted soils, excavation of soils to visually clean, screening soils with field instrumentation, collecting verification samples for laboratory analysis, directing contaminated soil excavation, and replacing excavated soil with clean backfill. Impacted soil was transported to pre-existing landfarm areas for treatment by the client.

- Project Manager and Principal Investigator on a mixed waste treatability study performed for Kerr-McGee Corporation to investigate methods of making radiologically impacted hydrocarbon sludge acceptable for disposal without increasing the total volume. The project included characterization of the physical, chemical, and radiologic composition of the available waste materials, and evaluating the feasibility of combining wastes to produce an acceptable material. Pilot scale testing was conducted on the most promising materials to identify the proportions necessary to produce an optimum mixture.

- Project Manager on a groundwater remedial design project at a Phillips Petroleum facility in Beatrice, Nebraska. Project tasks included a general site characterization, geophysical surveys, soil borings and chemical analysis, pump testing, and design of ground water remediation system. Remedial technologies selected utilized air stripping and carbon absorption.

- Project Geologist involved in the installation of a petroleum hydrocarbon recovery system at the Hess Oil refinery on St. Croix US Virgin Islands. Activities included daily coordination with refinery personnel and drilling contractors, logging and installing recovery wells, and performing recovery tests on completed installations.

- Project Manager of a program to investigate, design and construct ground water remediation systems at three Chevron facilities in Puerto Rico. Project included ground water characterization, pump testing and conceptual and detailed designs of remediation systems. Systems were constructed, operated for a period of approximately 2 years and have now been removed.

- Prepared Detailed Plans and Specifications for construction and operation of a land treatment unit to remove hydrocarbon and volatile organics from soil in North Dakota, Project Manager. Managed a team of people involved in preparation of a complete design and specifications package for construction and operation of a land treatment unit to treat soils impacted with petroleum hydrocarbon and chlorinated solvents. This project was completed on schedule, has been built and was successfully completed.

- Project Manager and author of a revised and updated Site Decommissioning Plan for the Kerr-McGee facility in Cushing, OK. Plan preparation included summarizing site conditions, establishing clean-up criteria, specifying remedial actions for each of 16 radioactive materials areas (RMAs) including measurement and sorting of materials, and planning final survey procedures. The scope of the

remediation was negotiated with Nuclear Regulatory Commission headquarters and regional personnel as the document was being drafted to attempt to minimize the time for subsequent review and approval.

- Project Manager of a multi-million dollar U.S. Army program to identify and properly abandon wells located on Rocky Mountain Arsenal (RMA) that could possibly be conduits for downward migration of contamination. This work was conducted in accordance with an Administrative Order ceasing remedial activities at RMA. Over 350 wells were identified and abandoned under this program.

- Project Manager on the characterization of Bombing Target 5 for the Pueblo of Laguna, NM. Portions of the Laguna Pueblo were used during WWII as a bombing practice area. The project consisted of preparation of detailed UXO planning documents, surface clearance of the area around the target, and excavation of the target to a depth of 5-feet below the surface. Material found to potentially present and explosive hazard were collected on-site and detonated on-site at the end of the project. The Pueblo of Laguna and the Corps of Engineers approved all procedures and field activities.

- Multi-phase AFCEE Soil And Groundwater Investigation And Monitoring Program at the Former Bergstrom Air Force Base in Austin, Texas, Project Manager. Investigation areas included an oil-water separator at an engine test facility, a former maintenance facility, and the base landfills. Soils were contaminated with heavy metals including lead and solvents. Contaminated soils were excavated and disposed at an off-site facility. Closure reports for all three areas were submitted and approved by TNRCC.

- Project Manager on a contract to the Department of Energy to perform a surface clearance for UXO at three former bombing targets at the Tonopah Test Site in Nevada. Materials encountered included practice bombs and rockets that had been fired several decades ago. UXO technicians inspected each piece of material for potential explosive hazards. Materials that potentially contained explosive hazards were blown-in-place by Tonopah personnel. Scrap material was secured on-site and disposed appropriately at the end of the project.

- Project Manager for the investigation of subsurface contamination at several high priority solid waste management units at Rocky Flats Plant. Work included identification and characterization of surface and subsurface soil contamination, source characterization, and evaluation of ground water quality and movement.

- Project Manager under contract to Rockwell International to develop usable and defensible background geochemical data sets for various media at the Rocky Flats Plant. The occurrence of low-level radioactive material contamination from many years of plant operations, surrounding land uses, and atomic test fallout necessitated an extensive program to develop data and apply statistical analysis to describe background conditions. Additional statistical testing was performed to identify investigative results that showed results above defensible background values.

- Project Manager on a multi-phase soil and groundwater investigation and monitoring program at the former Bergstrom Air Force Base in Austin, Texas. Investigation areas included an oil-water separator at an engine test facility, a former maintenance facility, and the base landfills. Closure reports for all three areas are currently being prepared.

- Project Manager on a geophysical survey program at the Rocky Flats Plant designed to identify sources of chemical and radiological contamination at high priority solid waste management units. Surveys included electromagnetic, magnetic, and electrical resistivity methods used in conjunction with aerial photographs to identify possible source areas.

- Project Manager on a contract for USEPA Region 5 to plan and execute an investigation of the Federal Marine Terminals site near Detroit, Michigan. The investigation included a detailed review of historical aerial photographs, geophysical surveys of potential burial sites, soil sampling, monitoring well construction and sampling, and preparation of a site investigation report. Documentation and depositions

on findings were provided to Region 5 enforcement.

- Project Geologist on a preliminary investigation of possible JP-4 impacts to soil and groundwater from the fueling system at Forbes Field Air National Guard base in Topeka, KS. The investigation included drilling through runway and ramp areas, around fuel storage facilities, and evaluation of possible migration pathways.

- Project Geologist on a project to use electromagnetic geophysical techniques to trace the lateral migration of shallow, high TDS groundwater plumes associated with three DOE uranium mill tailings sites located in different parts of the western U.S. Results of these surveys showed that electromagnetics was useful for tracing the plumes and allowed a minimal number of subsequent monitoring wells to be installed to quantify leading edge impacts.

Remedial Investigations/Feasibility Studies

- Project Manager for the Remedial Investigation at a former Atlas Missile site located near Holton, Kansas, Responsible for completion of a site investigation and risk assessment for the Kansas City District. Direct push soil sampling, sonic drilling and well installation, and indoor air, surface water, sediment, and groundwater sampling have been conducted in and around the former facility to determine the level and extent of contamination that may be present. An ecological and human health risk assessment was conducted to evaluate the potential health risks associated with the site.

- Project Manager on a Remedial Investigation and Focused Feasibility Study of JP-4 contaminated soils at the Fire Protection Training Area at Minot Air Force Base. Performed under contract to the U.S. Corp of Engineers, this project utilized Laser Induced Fluorescence, an innovative investigation technique, to characterize the extent of subsurface contamination. The Focused Feasibility Study examined eight potential remedial actions and was successful in gaining State acceptance of on-site land treatment as the chosen remedial alternative.

- Project Manager for the Remedial Investigation/Feasibility Study (RI/FS) of the Landfill Solids and Gases Operable Units at the Lowry Landfill CERCLA site. This project involves the characterization and assessment of the extent of potential contamination within the unsaturated solid and gaseous phases of the materials at this high profile site. Responsible for coordinating the activities of up to 30 project staff assigned to multiple concurrent tasks. Responsibilities also included extensive coordination and interaction with multiple clients and PRP groups as well as the Colorado Department of Health and Environment and USEPA Region 8 personnel.

- Technical Advisor under contract to EPA Region V on the Remedial Investigation at the Marion Bragg Landfill CERCLA site. Provided technical assistance to the project team related to investigation techniques to be used in characterizing the landfill and surrounding areas, including evaluating and providing remedies to difficult well installation encountered during the remedial investigation.

- Project Manager on a Feasibility Study/Risk Assessment program at a former Rocketdyne fuel test facility located near Spanish Springs, NV. This program included performing a risk assessment on an impacted groundwater plume, performing a feasibility study to evaluate appropriate remedial options, and performing treatability studies on two alternatives to verify and quantify effectiveness and estimate costs.

- Project Geologist and Site Manager on contract to USEPA Region V on the Remedial Investigation of the Skinner Landfill CERCLA site located near Cincinnati, OH. Prepared planning documents including the Sampling and Analysis Plan, Quality Assurance Project Plan, and Health and Safety Plan. Managed implementation of the remedial investigation that included geophysical surveys, aquatic biology surveys, well installation, and soil and groundwater sampling.

Publications and Presentations

Hutson, M.A., " Oil Interceptor Pond Closure, Sediment, PCB's and Groundwater on a Budget", presented at the 2005 Air Force Environmental Symposium, Louisville, KY, March 2005.

Holliway, K.D., Witt, M.E., and M.A. Hutson, "Abandoned Well Closure Program at a Hazardous Waste Facility, Rocky Mountain Arsenal, Denver, Colorado" Hazardous Materials Control, vol. 5, no.1, January 1992.

Karnauskas, R.J., Deigan, G.J., Schoenberger, R.J., and M. A. Hutson, "Closure of Lead Contaminated Glass Manufacturing Waste Lagoons" Proceedings of HAZMACON 87, April 1987.

Hutson, M.A., and R. J. Karnauskas, "Groundwater Contamination Study, Forbes Field Air National Guard Based, Shawnee County Kansas, Defense Technical Information Center, 1985.

Testimony and Depositions Given

Denver, CO, 2017, Montana Board of Environmental Review, Cause No. BER 2016-07 SM, Appeal Amendment Application AM3, Signal Peak Energy LLC's Bull Mountain Mine No. 1, Permit No. C1993017. Deposition concerning opinions expressed in permit application comments.

Chapel Hill, NC, 2017, Roanoke River Basin Association vs. Duke Energy Progress, LLC, United States District Court for the Middle District of North Carolina, Civil Action Nos. 1:16-cv-607 and 1:17-cv-0042. Deposition concerning opinions expressed in Expert Report.

Chapel Hill, NC, February 2017, State of North Carolina, ex rel, North Carolina Department of Environmental Quality, et. al. v. Duke Energy Progress, LLC., Civil Action No. 13-CVS-11032 and 13-CVS-14461. Deposition concerning opinions expressed in Expert Report.

Chapel Hill, NC, July 2016, State of North Carolina, ex rel, North Carolina Department of Environmental Quality, et. al. v. Duke Energy Progress, LLC., Civil Action No. 13-CVS-11032 and 13-CVS-14461. Deposition concerning opinions expressed in Expert Report.

Denver, CO, 2015, Montana Environmental Information Center et. al. v. Montana Department of Environmental Quality, et. al., 16th Jud. Dist. No. DV 12-42. Deposition concerning opinions expressed in Expert Report.

Denver, CO, 2015, City of Loves Park, IL vs. Browning Ferris Industries. Deposition on behalf of Browning Ferris Industries regarding meetings held and documents produced during employment at the Illinois Environmental Protection Agency.

Chicago, IL, 1982, United States Environmental Protection Agency vs. Federal Marine Terminals. Deposition on behalf of USEPA regarding findings of site investigation at a Federal Marine Terminals site in Detroit, Mi.

Dixon, IL, 1980, Illinois Environmental Protection Agency vs. Lee County Landfill, Testified in state court on behalf of the IEPA regarding violations of state environmental laws at the Lee County landfill.