BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the Matter of:	)	
	)	
SIERRA CLUB, ENVIRONMENTAL LAW AND POLICY CENTER, PRAIRIE RIVERS NETWORK, and CITIZENS AGAINST RUINING THE ENVIRONMENT	)	
	)	PCB No-2013-015
Complainants,	)	(Enforcement – Water)
	)	
v.	)	
	)	
MIDWEST GENERATION, LLC,	)	
	)	
Respondents	)	

NOTICE OF FILING

PLEASE TAKE NOTICE that I have filed today with the Illinois Pollution Control Board the attached **COMPLAINANTS' MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS AND TESTIMONY** and **COMPLAINANTS' MEMORANDUM IN SUPPORT OF THEIR MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS TESTIMONY**, copies of which are attached hereto and herewith served upon you.

Respectfully submitted,

Faith E. Bugel

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Dated: February 26, 2018

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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SIERRA CLUB, ENVIRONMENTAL LAW AND POLICY CENTER, PRAIRIE RIVERS NETWORK, and CITIZENS AGAINST RUINING THE ENVIRONMENT	)	
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MIDWEST GENERATION, LLC,	)	
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Respondents	)	

COMPLAINANTS' MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS AND TESTIMONY

Pursuant to 35 Ill. Adm. Code 101.500 and 101.502, Complainants Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment ("Complainants") respectfully request that the Hearing Officer enter an order striking the portions of the reports and demonstrative exhibits produced by Respondent's expert, John Seymour, that describe his analysis of the "matching percentages" between leachate and groundwater (hereinafter "matching analysis"). The relevant sections include Tables 5-4 and 5-5 of the *Expert Report of John Seymour, P.E.* ("Expert Report"); all references thereto in the Expert Report, including Section 5.5.2; the *Supplement to the Expert Report of John Seymour, P.E.* ("Supplement") in its entirety; portions of the demonstrative exhibit introduced as Ex. 901; and all testimony on the matching analysis.

Seymour's matching analysis violates rule 702 of the Illinois Rules of Evidence because it is based on methods that have not gained general acceptance, and because the analysis is

inherently unreliable, and will therefore undermine the fact-finder's ability to understanding the evidence in this case. In support of its Motion, Complainants submit a Memorandum in Support of this Motion and state as follows:

1) On November 2, 2015, pursuant to the discovery schedule established and modified by the Hearing Officer, Respondents submitted an expert report by John Seymour ("Expert Report," Exhibit 903). In the Expert Report, Seymour purports to "match" the concentrations of various constituents in coal ash leachate and in groundwater, and to calculate "matching percentages." (Ex. 903, pp. 5, 6, 42-43, 49, 51, 52, and Tables 5-4 and 5-5).

2) On February 29, 2016, Respondents submitted a supplement to the Expert Report ("Supplemental Report," Exhibit 904), which was intended to "replace[] the original §5.5.2 in its entirety, including Tables 5-4 and 5-5." Ex. 904, p. 1.

3) Seymour testified in this matter on February 1 and 2, 2018. During his testimony, Seymour referred to a demonstrative exhibit that Respondent Midwest Generation entered as Exhibit 901. Exhibit 901 includes new versions of Table 5-4 and 5-5, using more recent data but generated using the same methods used to generate earlier versions of these tables.

4) The methods that Seymour uses to "match" constituents are inherently unreliable for two basic reasons. First, as largely conceded by Seymour in his testimony, his methods draw inaccurate conclusions from the presence of non-coal ash constituents in groundwater. Second, again as largely conceded by Seymour in his testimony, his methods make inappropriate comparisons between two sets of data to draw inaccurate conclusions that the data do not support.

5) Furthermore, again as largely conceded by Seymour in his testimony, his methods are unique, have never been used before, and have not gained acceptance in his field.

6) Since Seymour's methods are inherently unreliable, the conclusions he draws from the methods are unsupported, and both his methods and his conclusions will undermine the fact-finder's ability to understand and interpret the evidence presented in this case. This renders the evidence inadmissible under Illinois Evidence Rule 702, which establishes the *Frye* test for the admission of scientific evidence. The purpose of the *Frye* test "is to exclude new or novel scientific evidence that undeservedly creates a perception of certainty when the basis for the evidence or opinion is actually invalid." *In re Det. of New*, 2014 IL 116306, ¶ 26, 21 N.E.3d 406, 411-12 (2014) (internal citations omitted). According to Rule 702, "[w]here an expert witness testifies to an opinion based on a new or novel scientific methodology or principle, the proponent of the opinion has the burden of showing the methodology or scientific principle on which the opinion is based is sufficiently established to have gained general acceptance in the particular field in which it belongs." Ill. Rules of Evid. 702. Here, the methodology has never been used before, much less "gained general acceptance," and again, it is inherently flawed and unreliable.

7) WHEREFORE, Complainants respectfully request that the hearing officer enter an order striking Expert Report section 5.5.2 and Tables 5-4 and 5-5; all references to Tables 5-4 and 5-5 in the Expert Report; all references to Seymour's "matching" analysis in the Expert Report; the "Supplemental Report" in its entirety; Pages *37, *46, *47, *61, *62, *75, *76, *89, and *90 of Ex. 901;[1] and all testimony on Seymour's matching analysis, which includes PCB 13-15 Hearing Transcript, Feb. 1, pages 281:4-284:4, and PCB 13-15 Hearing Transcript, Feb. 2, pages 15:4-20:17, 69:4-70:8, 92:11-93:2, 118:18-119:18, 231:2-280:22.

[1] These page numbers reflect the pages of the pdf document as filed by Respondent Midwest Generation on January 30, 2018. Some of these pages also have page numbers in the lower left corner; these page numbers are not the same as the corresponding page of the pdf document. To be clear, Complainants are referring to pages titled "Comparison with Groundwater" (pdf page *37, also labelled as page number 12); and all pages titled "[Site name] – Updated Table 5-4" or "[Site name] – Updated Table 5-5."

Respectfully submitted,

/s/Faith E. Bugel

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Attorneys for ELPC, Sierra Club and Prairie Rivers Network

Dated: February 26, 2018

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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COMPLAINANTS' MEMORANDUM IN SUPPORT OF THEIR MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS TESTIMONY

Complainants Sierra Club, Environmental Law and Policy Center, Prairie Rivers Network, and Citizens Against Ruining the Environment ("Complainants") submit this Memorandum in Support of their Motion to Strike Portions of Respondent Expert's Report and Testimony.

I. FACTUAL BACKGROUND

On November 2, 2015, pursuant to the discovery schedule established and modified by the Hearing Officer, Respondents submitted an expert report by John Seymour ("Expert Report," Exhibit 903, attached in excerpted form as Attachment A). In the Expert Report, Seymour purports to "match" the concentrations of various constituents in coal ash leachate and in groundwater, and to calculate "matching percentages." (Attachment A, pp. 5, 6, 42-43, 49, 51, 52, and Tables 5-4 and 5-5). On February 29, 2016, Respondents submitted a supplement to the

Expert Report ("Supplemental Report," Exhibit 904, attached as Attachment B), which was intended to "replace[] the original §5.5.2 in its entirety, including Tables 5-4 and 5-5." Attachment B, p. 1.

Seymour testified in this matter on February 1 and 2, 2018. Excerpts of PCB 13-15 Hearing Transcript, Feb. 2 are attached hereto as Attachment C. During his testimony, Seymour referred to a demonstrative exhibit that Respondent Midwest Generation entered as Exhibit 901 (attached in excerpted form as Attachment D). Exhibit 901 included updated versions of Tables 5-4 and 5-5, generated using the same methodology as the Tables 5-4 and 5-5 found in Seymour's Supplemental Report, but with groundwater data from a different period of time. Attachment C, pp. 15:4-18:5 and 232:1-233:5.

To summarize, Seymour's initial Expert Report, his Supplemental Report, and demonstrative Exhibit 901 contain three versions of a set of tables identified as Tables 5-4 and 5-5.[2] Each of these tables, in turn, refer back to either Table 5-1 or Table 5-2 of Seymour's initial Expert Report (Attachment A), which provide the leach test data that Seymour used for his analysis.

II. LEGAL BACKGROUND

The admissibility of expert opinions is governed by Illinois Evidence Rule 702:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise. Where an expert witness testifies to an opinion based on a new or novel scientific methodology or principle, the proponent of the opinion has the burden of showing the methodology or scientific principle on which the opinion is based is

[2] Each Table 5-4 or 5-5 is in fact a series of sub-tables, one for each of the four sites at issue in this proceeding.

> sufficiently established to have gained general acceptance in the particular field in which it belongs.

Ill. Rules of Evid. 702. Rule 702 establishes the Frye standard for the admission of scientific evidence:

> Illinois law is unequivocal: the exclusive test for the admission of expert testimony is governed by the standard first expressed in *Frye v. United States,* 293 F. 1013 (D.C.Cir.1923). *Miller,* 173 Ill.2d at 187–88, 219 Ill.Dec. 43, 670 N.E.2d 721; *People v. Thomas,* 137 Ill.2d 500, 517, 148 Ill.Dec. 751, 561 N.E.2d 57 (1990); *Eyler,* 133 Ill.2d at 211–12, 139 Ill.Dec. 756, 549 N.E.2d 268; *People v. Zayas,* 131 Ill.2d 284, 293, 137 Ill.Dec. 568, 546 N.E.2d 513 (1989); *People v. Jordan,* 103 Ill.2d 192, 208, 82 Ill.Dec. 925, 469 N.E.2d 569 (1984); *People v. Baynes,* 88 Ill.2d 225, 241, 58 Ill.Dec. 819, 430 N.E.2d 1070 (1981). The *Frye* standard, commonly called the "general acceptance" test, dictates that scientific evidence is only admissible at trial if the methodology or scientific principle upon which the opinion is based is "sufficiently established to have gained general acceptance in the particular field in which it belongs." *Frye,* 293 F. at 1014.

Donaldson v. Cent. Illinois Pub. Serv. Co., 199 Ill. 2d 63, 76-77, 767 N.E.2d 314, 323-324 (2002) *abrogated on other grounds by In re Commitment of Simons*, 213 Ill. 2d 523, 821 N.E.2d 1184 (2004). Although decisions about the admissibility of scientific evidence are sometimes made after a "*Frye* hearing," the "trial court can render a decision utilizing *Frye* without actually holding a *Frye* hearing." *Donaldson v. Cent. Illinois Pub. Serv. Co.*, 313 Ill. App. 3d 1061, 1075, 730 N.E.2d 68, 78 (2000), *aff'd*, 199 Ill. 2d 63, 767 N.E.2d 314 (2002).

Reliability is an important piece of the *Frye* inquiry because it informs the extent to which a method has been established or accepted in the scientific community. Although Illinois does not apply a "Frye plus reliability" standard (*Donaldson, 199 Ill. 2d 80-81*), "a principle or technique is not generally accepted in the scientific community if it is by nature unreliable." *Id.* at 81. Put another way, "[g]eneral acceptance and reliability are not two separate questions. The determination of the reliability of an expert's methodology is naturally subsumed by the inquiry into its general acceptance in the scientific community." *In re Commitment of Field*, 349 Ill. App. 3d 830, 836, 813 N.E.2d 319, 325 (2004).

The Illinois Supreme Court recently described the purpose of Rule 702 as follows:

> The purpose of the *Frye* test is to exclude new or novel scientific evidence that undeservedly creates a perception of certainty when the basis for the evidence or opinion is actually invalid. Imposition of the test serves to prevent the jury from simply adopting the judgment of an expert because of the natural inclination of the jury to equate science with truth and, therefore, accord undue significance to any evidence labeled scientific.

In re Det. of New, 2014 IL 116306, ¶ 26, 21 N.E.3d 406, 411-12 (2014) (internal citations omitted). Here, Seymour's "matching" methodology is invalid, unreliable, "undeservedly creates a perception of certainty" (*id.*), and is not generally accepted. Seymour himself concedes that there are errors in his approach and his results, and that his methodology is not generally accepted, having been used for the first time in this proceeding. The methodology therefore plainly violates Rule 702 and must be excluded.

III. DISCUSSION

In the Expert Report, the Supplemental Report, and his testimony, Seymour attempts to evaluate whether groundwater reflects coal ash contamination by "matching" constituents found in groundwater to constituents found in the results of leach tests performed on coal ash. Attachment A, pp. 42-43; Attachment B, p. 1. Seymour approaches his "matching" analysis as follows:

> Conceptually, if all the constituents detected in groundwater samples from a monitoring well match the constituents detected in leachate from ash currently stored in ponds, and if the constituents not detected in groundwater match the constituents not detected in leachate from ash currently stored in ponds, then it would be probable that leachate from ash currently stored in ponds is impacting groundwater.

Attachment B, p. 1. Seymour quantifies the degree of matching by calculating, for each monitoring well, the "Percentage of Observed Constituents that are Not Consistent with Indicators of Leachate from Ash Currently Stored in Impoundments." *See, e.g.*, Attachment B,

Table 5-4. In other words, Seymour calculates a percentage of "mismatches." Any "mismatch" in Seymour's analysis counts against a conclusion that coal ash has contaminated the groundwater:

> BY MR. RUSS: Q. And to simplify a little, mismatches in your approach count against the possibility that groundwater has been contaminated by coal ash; is that right?
>
> MR. SEYMOUR: A. Yes, in the increase in the likelihood that it's not from the ash in the pond.

Attachment C, p. 235:8-13. The Tables 5-4 and 5-5 in Seymour's Supplemental Report and Exhibit 901 show mismatch percentages ranging from 0% to 75%. In other words, to take the inverse percentages, they show matching percentages for each well that range from 25% to 100%. Due to errors in Seymour's approach, these percentages are in error. In fact, as described in more detail below, Seymour's primary analysis, if done correctly, would show a 100% match between coal ash leachate and groundwater quality data for every monitoring well at all four sites.

Seymour's methods violate Rule 702 because they are novel, deviate significantly from standard practice, and are not used, much less generally accepted, in his field. As described in detail below, Seymour's methods are also inherently flawed and unreliable, in at least two ways. First, as Seymour largely concedes, his methods draw inappropriate conclusions from the presence of non-coal ash constituents in groundwater. Second, again as largely conceded by Seymour, his methods produce inaccurate results that skew his conclusions. The result is that Seymour's methods and conclusions are likely to "instill a false confidence," *Donaldson,* 199 Ill. 2d 86 (internal citations omitted). Allowing Seymour's analysis and conclusions to remain in the record would clearly not "assist the trier of fact to understand the evidence or to determine a fact in issue," (Ill. Rules of Evid. 702), and would in fact undermine the fact-finder's role.

A. SEYMOUR'S METHODS ARE UNRELIABLE AND BIASED

Seymour uses two sets of data to represent the content of coal ash leachate. The first is a set of leach test measurements collected by Midwest Generation from bottom ash at the Powerton, Waukegan, and Will County plants ("MWG leach test data"). Attachment A, Table 5-1; Attachment B, Table 5-5). The second is a set of leach test measurements collected by the Electric Power Research Institute (EPRI) for subbituminous or lignite coal ash in impoundments ("EPRI leach test data"). Attachment A, Table 5-2; Attachment B, Table 5-4. According to Seymour, the analysis using MWG leach test data – the Table 5-5 analysis – was his primary analysis, and the analysis using EPRI leach test data – the Table 5-4 analysis – was a "backup" analysis. Attachment C, pp. 18:17-19:16. In his Supplemental Report, Seymour compared each set of leach test data to Midwest Generation's groundwater monitoring results for 2014. Attachment B, p. 1. In his testimony, Seymour compared each set of leach test data to groundwater monitoring results from 2016-2017, with the same methodology that he used in his Supplemental Report. Attachment C, pp. 17:20-18:15 and 232:1-233:5.

As discussed in detail below, Seymour's two matching analyses, one using MWG leach test data (Table 5-5) and the other using EPRI leach test data (Table 5-4), are each associated with unique methodological flaws that lead to inaccurate results and conclusions, and are therefore unreliable.

1) SEYMOUR'S HANDLING OF NON-INDICATOR CONSTITUENTS PRODUCES CRITICAL ERRORS IN HIS ANALYSIS

Seymour identified coal ash "indicators" as anything that was detected in coal ash leach tests. Attachment A, p. 42 and Tables 5-1 through 5-3. Everything else could be described as "non-indicators." According to Seymour's description of his approach, the presence of a non-

indicator in groundwater counts as a "mismatch," and counts against the possibility of contamination:

> BY MR. RUSS: Q. Okay. For purposes of this table [Attachment B, Table 5-4], you counted the presence of non-indicator[s] as evidence against the possibility of contamination, isn't that right?
>
> MR. SEYMOUR: A. Yes.

Attachment C, page 241:1-5. *See also* Attachment B, p. 1. This approach introduces an inappropriate assumption – that contaminated groundwater should look exactly like leachate – which ignores all other potential sources of non-indicators. Even naturally occurring constituents would count against the possibility of coal ash contamination. This is plainly irrational, and a critical flaw in Seymour's methodology, as Seymour concedes in his testimony:

> BY MR. RUSS: Q. A non-indicator, something that's not – a constituent that's not an indicator of coal ash, the presence or absence of that chemical in groundwater shouldn't have any bearing on your conclusion about the presence or absence of coal ash; is that right?
>
> MR. SEYMOUR: A. That's kind of complicated. I'm sorry, Mr. Russ. One more time. I'll try to concentrate very carefully.
>
> Q. What you said about benzene, I believe, is that it shouldn't have any – it shouldn't be in the analysis?
>
> A. It would not be in the analysis.
>
> Q. And why is that?
>
> A. It's not an indicator of coal ash.
>
> Q. Okay. Right. And that's what I'm asking. So something that's not an indicator of coal ash shouldn't have any bearing on your determination of whether or not there's coal ash in groundwater?
>
> A. I would think – yes, I think that would be correct.

Attachment C, pp. 237:6-238:4. In short, Seymour concedes that non-indicators should not be included in his analysis, and yet his analysis repeatedly uses non-indicators to discount the possibility of coal ash contamination. During his testimony, Seymour admitted that his approach was flawed in this regard:

> BY MR. RUSS: Q. Okay. For purposes of this table [Attachment B, Table 5-4], you counted the presence of non-indicator[s] as evidence against the possibility of contamination, isn't that right?
>
> MR. SEYMOUR: A. Yes.
>
> Q. And I believe you just said you shouldn't do that?
>
> A. You're right.

Attachment C, p. 241:1-8. This flaw in Seymour's approach critically undermines his conclusions. Taking as an example Table 5-5 of Attachment B, which showed Seymour's primary matching analysis, all of the "mismatches" in this table are the result of non-indicators being detected in groundwater, as indicated by the blue shading in that Table.[3] Again, upon looking at this table, Seymour admitted his error:

> BY MR. RUSS: Q. So all of these blue cells, though, are non-indicators that were found in groundwater and you counted that against the possibility of contamination; isn't that right?
>
> MR. SEYMOUR: A. Well, because it wasn't found in the leachate, but it was found in the groundwater, so it did not match. It's not consistent.
>
> Q. Right. But I believe you said earlier if you find a non-indicator in groundwater, you shouldn't contribute that to your analysis; is that right?
>
> A. I understand, yes.
>
> Q. So there's a series of errors in this table?

[3] "Blue shading indicates that a constituent that is not an indicator of leachate from ash stored in the impoundments was detected during at least one quarterly groundwater event in 2014" (Attachment B, Table 5-5, p. 5).

> A. Mr. Russ, I – I would agree that it looks that way. I – as I said, I am a little bit confused. I have to kind of go back to the whole discussion in the report. It may take a while.

Attachment C, p. 243:4-24. The same observations apply equally to the versions of Table 5-5 found in Exhibit 901 (Attachment D), where all of the mismatches are the result of non-indicators being detected in groundwater. Since all of the "mismatches" in Table 5-5 are in error, there are in fact no mismatches at all. In fact, the coal ash indicators identified by Seymour – barium, boron and sulfate – were found in all wells at all four Midwest Generation sites at issue in this case; after correcting the errors admitted by Seymour, this leads to a 100% match, as Seymour concedes:

> BY MR. RUSS: Q. So the three indicators that you have in this table were found in all of the wells at the Waukegan site?
>
> MR. SEYMOUR: A. Yes.
>
> Q. So if we take the non-indicators out, that would be a 100 percent match, wouldn't it?
>
> A. Yes. In fact they did – in the analysis, the new percent is correct. But again, I have to go back and refresh my memory.

Attachment C, p. 245:14-21. The same is true for all four sites in all versions of Table 5-5. In short, despite the fact that <u>all three</u> coal ash indicators selected by Seymour – barium, boron, and sulfate – were detected <u>in every single well</u> at the four sites, Seymour's analysis leads him to conclude that the groundwater is not affected by coal ash. This is of course an absurd conclusion, and as Seymour concedes, it is the product of a critical flaw in his analytical approach. In this situation, Seymour's methods "undeservedly create[] a perception of certainty when the basis for the evidence or opinion is actually invalid." *In re Det. of New*, 2014 IL 116306, ¶ 26 (internal citations omitted).

2) SEYMOUR'S ANALYSIS OF ONSITE LEACH TEST DATA PRODUCES UNRELIABLE RESULTS AND BIASES HIS CONCLUSIONS

An additional flaw in Seymour's methodology is that he compares sources of data that are not amenable to comparison. Seymour analyzes the extent to which pollutants are detected, but the datasets being compared have very different sensitivities, as indicated by their detection limits. As described in more detail below, this produces results that are not only unreliable, but biased against the possibility of coal ash contamination.

Seymour's primary analysis uses leach test methods that are much less sensitive than the groundwater test. For example, the arsenic results for MWG leachate were all reported as "<0.05" mg/L. Attachment A, Table 5-1.[4] In this case, as Seymour admits, the true concentration of arsenic in leachate could be anything up to 0.049 mg/L. Attachment C, pp. 247:23-248:15. Midwest Generation's groundwater monitoring for 2014, by comparison, could detect arsenic concentrations down to a detection limit of 0.001 mg/L. Exhibit 268P, NRG Energy, Annual and Quarterly Groundwater Monitoring Results, Fourth Quarter 2014, Waukegan Generating Station, Ash Impoundments, Table 2 (Jan. 22, 2015), excerpt attached as Attachment E. Here, there is a wide range of arsenic concentrations – anything between 0.001 and 0.05 mg/L – that would be detected by one method (the groundwater test) and not the other (the leach test). In this situation, as explained below, the two tests would produce results that appear inconsistent even if the two samples were identical.

If arsenic is detected in groundwater at a concentration less than 0.05 mg/L, Seymour's approach counts it as a "mismatch" (because it was not detected in leachate), and counts it against the possibility of groundwater contamination. However, the data do not support this

[4] At the hearing, Seymour added an additional, slightly more sensitive leach test result, which shows arsenic in leachate at "<0.01" mg/L. Ex. 901, slide 8. This is not a material change for purposes of this motion; the four other leachate samples used by Seymour all had "<0.05" mg/L, or up to 0.049 mg/L.

interpretation. For example, arsenic in Waukegan well MW-02 ranged between 0.0062 mg/L and 0.0095 mg/L in 2014. Attachment E, Table 2. This is perfectly consistent with groundwater having the same amount of arsenic as pure, undiluted leachate (which has anywhere between zero and 0.05 mg/L of arsenic), but due to differences in the sensitivity of the tests, it is not possible to say whether the leach test data and the groundwater data are a "match" or a "mismatch;" the answer is unknown. Yet Seymour concludes, without any factual support, that the data are a "mismatch." Attachment B, Table 5-5, p. 3.[5]

Again, Seymour effectively concedes that this approach could produce inaccurate results:

> BY MR. RUSS: Q. So the question I'm asking is since the leachate [and] the groundwater could have the same concentration of arsenic given these numbers, you can't really say for sure [] that it's a mismatch; is that right?
>
> MR. SEYMOUR: A. Well, if you don't have the data, you can't say it's a match either.
>
> Q. Right. You can't say that it's a match and you can't say that it's a mismatch. I would call it unknown; is that fair?
>
> A. Okay.
>
> Q. Yet you coded it as a mismatch, I believe and…
>
> A. Yes, I understand that. And as mentioned, I think I'm confused. I have to go back and look at it.
>
> Q. So is that potentially an error in your table?
>
> A. It's possible it's an error, yes. I have to look at it. I am confused.

Attachment C, pp. 252:8-253:3. Seymour's approach takes something that he concedes is "unknown," and treats it as a "known" mismatch, in effect making an assumption that supports his preferred conclusion. Again, the leach test data and the groundwater data could be a perfect

[5] "Blue shading indicates that a constituent that is not an indicator of leachate from ash stored in the impoundments was detected during at least one quarterly groundwater event in 2014" Attachment B, Table 5-5, p. 5.

match, with the exact same arsenic concentration, and Seymour's approach would reach the opposite conclusion.

In general, as Seymour concedes, his approach could produce a false "mismatch" whenever the two tests being compared have different sensitivities:

> BY MR. RUSS: Q. Okay. To generalize beyond arsenic, this kind of – this kind of phenomenon, when you detect a constituent in groundwater, but not a leach test, even if groundwater and the leachate [have] the same concentration, it's possible [when]ever the groundwater test is, it's more sensitive than the leach test; isn't that right?
>
> MR. SEYMOUR: A. That's – yes, it could be.
>
> Q. Do you know how many of the results in your Table 5-5 might be affected by that circumstance?
>
> A. I would have to add them, but you know that it would be quite a few.
>
> Q. Okay. Thanks.
>
> A. Presuming, in fact, I'm – I'm a little confused. If it's correct, there would be errors in the table.

Attachment C, pp. 256:12-257:5. In fact, the same error illustrated above is repeated for multiple constituents at each site.[6] For example, the MWG leach test could not detect selenium below 0.05 mg/L, Attachment A, Table 5-1, but the groundwater test could detect concentrations as low as 0.0025 mg/L. Attachment E, Table 2. Anything between those two concentrations would only be detected by one method, and not by the other, giving the appearance of a mismatch even if the samples were identical.

In short, Seymour's methods frequently assume "mismatches," and count these mismatches against the possibility of contamination, when the data do not support such a

[6] Arsenic, copper, lead, manganese, nickel, and selenium all had lower detection limits in groundwater than in MWG leach tests, making them all susceptible to the flaw in Seymour's methodology (Attachment A, Table 5-1, Attachment E, Table 2).

conclusion. This renders his approach unreliable and biased toward finding no contamination, and creates "false confidence" and a "misleading sense of scientific infallibility." *Donaldson,* 199 Ill. 2d 86 (internal citations omitted).

3) SEYMOUR'S ANALYSIS OF EPRI LEACH TEST DATA PRODUCES UNRELIABLE RESULTS AND BIASES HIS CONCLUSIONS

Seymour's methods produce the inverse error with respect to his "backup" analysis of EPRI leachate data. In this case, the EPRI leach test was much more sensitive than the test that Midwest Generation used to analyze groundwater. For example, the EPRI leach test was able to detect antimony concentrations as low as 0.00024 mg/L (Attachment A, Table 5-2), while the 2014 groundwater monitoring could not detect antimony at concentrations below 0.003 mg/L – a difference of more than an order of magnitude. Attachment E, Table 2. As a result, there is a wide range of antimony concentrations – anything between 0.00024 and 0.003 mg/L – that would be detected by one method (the EPRI leach test) and not the other (the groundwater test).

Seymour observes that antimony was detected in EPRI leach test data, but not in any groundwater monitoring data, and concludes that the two datasets do not match. This can be seen, for example, in Table 5-4 of Attachment B, where the antimony cells are all shaded green.[7] Antimony is one of the constituents that Seymour includes in his tally of "constituents that are not consistent with indicators of leachate." *Id*. In short, Seymour concludes, for each well at the four sites, that antimony is a "mismatch," and he counts that against the possibility that coal ash has contaminated the groundwater.

[7] Green shading in Seymour's tables indicates that "a constituent that is an indicator of leachate from ash stored in the impoundments was not detected during quarterly groundwater monitoring in 2014." Attachment B, Table 5-4.

Again, Seymour's approach fails because the data do not support his results or his conclusions. Continuing with the example of the Waukegan site, the groundwater results are all reported as "ND," or "not detected." This does not mean that there is no antimony in these wells. It only means that the concentration of antimony was less than the detection limit. In this case, the detection limit was 0.003 mg/L, so the groundwater had something between zero and 0.003 mg/L of antimony. This is perfectly consistent with the range of antimony concentrations found in the EPRI leach test data – 0.00024 to 0.00062 mg/L. Given these concentrations, it is inaccurate and misleading to say that the leach test data and the groundwater data do not match. Even if the groundwater were pure, undiluted leachate with the maximum concentration of antimony (0.00062 mg/L), the antimony would not be detected by the groundwater test. In short, Seymour assumes that there is a "mismatch" without any factual support.

This flaw is made clear in Seymour's testimony, where he concedes that leachate and groundwater could have the same concentration of antimony – a situation that should be a "match" – and his analysis would nonetheless describe it as a "mismatch." Attachment C, pp. 265:16-267:4 (Seymour agreeing that 0.6 micrograms of antimony per liter would be detected in the EPRI leach test, but not in the Midwest Generation groundwater test). Again, the leachate and the groundwater could be a perfect match, with the exact same concentration of antimony, and Seymour's methods would find a "mismatch."

The same error illustrated above is repeated for several constituents at each site.[8] For example, the EPRI leach test could detect chromium concentrations as low as 0.00066 mg/L

[8] Antimony, chromium, cobalt, lead, manganese, mercury, nickel, selenium, and zinc all had detection limits and minimum concentrations in the EPRI leach test data that were lower than the detection limits in groundwater, making them all susceptible to the flaw in Seymour's methodology. Attachment A, Table 5-2, and Attachment E, Table 2.

(Attachment A, Table 5-2), but Midwest Generation's groundwater monitoring could not detect concentrations lower than 0.005 mg/L (Attachment E, Table 2). The EPRI leach test data could detect mercury concentrations as low as 0.0000054 mg/L (Attachment A, Table 5-2), but Midwest Generation's groundwater monitoring could not detect concentrations lower than 0.0002 mg/L. These are just two additional examples of a pervasive flaw in Seymour's approach.

Again, Seymour's methods frequently assume "mismatches," and count these mismatches against the possibility of contamination, when the data do not support such a conclusion. Seymour's methodology is therefore inherently unreliable in a way that biases his conclusions; this "undeservedly creates a perception of certainty when the basis for the evidence or opinion is actually invalid." *In re Det. of New*, 2014 IL 116306, ¶ 26 (internal citations omitted). As a result, Seymour's matching analysis and all discussions of his matching analysis should be excluded from expert testimony.

II. SEYMOUR'S METHODS ARE NOT ACCEPTED IN HIS FIELD

Given the multiple flaws in Seymour's methodology, it is not surprising that no one in his field, to his knowledge, has ever used this kind of "matching analysis" before, including Seymour himself:

> BY MR. RUSS: Q. Have you ever used this particular quantitative method?
>
> MR. SEYMOUR: A. Again, this is a method that looks at the numbers and accumulates a percentage and presents a percentage. I have not used that presentation before.
>
> . . .
>
> BY MR. RUSS: Q. Are you aware if anyone else using this particular quantitative method before?
>
> MS. NIJMAN: Vague.
>
> HEARING OFFICER HALLORAN: He can answer if he is able.

> A. I mean, it implies a very broad understanding of what all the industry does. So I think it's a little bit – I would answer no, but I think it's – there's a lot of ideas out there and I don't know if I could know.
>
> . . .
>
> BY MR. RUSS: Q. Are you aware of anyone – are you – has this particular quantitative method ever been published in any journal or academic publication?
>
> A. It's a similar question that you asked before, if I knew of anybody who had done it. There's lots of publications. I've not read all the publications. So I don't know if I – even if I say I don't know, that doesn't mean it hasn't been used.
>
> Q. Are you aware of any?
>
> A. As I said, I don't know. But it's a little unfair because there's lots of journals and I've not read all the journals.

Attachment C, pp. 278:11-280:17. Midwest Generation, as the proponent of the evidence in question, has the burden of showing that the methodology is "sufficiently established to have gained general acceptance in the particular field in which it belongs." Ill. Rules of Evid. 702. In this case, there is no plausible way that Midwest Generation could meet its burden, because its expert has already admitted that he is unaware of anyone (including himself) using this method before. The fact that his inherently unreliable and biased methodology is novel, untested, and not generally accepted in his field makes it inadmissible under Rule 702.

III. CONCLUSION

Seymour's "matching" analysis must be excluded from evidence because it would frustrate the purpose of expert testimony. His methodology is inherently flawed and unreliable, as he himself acknowledges. Far from "assist[ing] the trier of fact to understand the evidence" (Ill. Rules of Evid. 702), Seymour's methodology, and the results he obtains using that methodology, could only serve to confuse the fact-finder by presenting a false sense of certainty.

Moreover, Seymour's methodology is not merely unreliable, it is also inherently biased against the possibility of contamination. In this case, his results and conclusions would almost certainly mislead the fact-finder.

Using his flawed methodology, Seymour concluded that "there are substantial and widespread mismatches between the characteristics of recent groundwater analyzed near the ash ponds and the characteristics of leachate from ash currently stored in the ash basins." Attachment B, p. 3. The data do not even remotely support this conclusion. In fact, the record shows that Seymour's matching analysis, if done correctly, would have found a 100% match between coal ash leachate and groundwater quality at all four sites at issue here. The stark contrast between what Seymour should have found and his stated conclusions underscores the fact that his methodology is not just unreliable, but systematically inaccurate and biased against an honest interpretation of the data.

Furthermore, as far as Seymour is aware, this is the first time anyone has ever approached groundwater data with this methodology. Rule 702 plainly prohibits the use of novel and untested methods in expert testimony. Where Rule 702 states that "the proponent of the opinion has the burden of showing the methodology or scientific principle on which the opinion is based is sufficiently established," in this case the methodology has not been established at all.

For the aforementioned reasons, we urge the Hearing Officer to strike Expert Report section 5.5.2 and Tables 5-4 and 5-5; all references to Tables 5-4 and 5-5 in the Expert Report; all references to Seymour's "matching" analysis in the Expert Report; the "Supplemental Report" in its entirety; Pages *37, *46, *47, *61, *62, *75, *76, *89, and *90 of Ex. 901;[9] and all

[9] These page numbers reflect the pages of the pdf document as filed by Respondent Midwest Generation on January 30, 2018. Some of these pages also have page numbers in the lower left corner; these page numbers are not the same as the corresponding page of the pdf document. To be clear, Complainants are

testimony on Seymour's matching analysis, which includes PCB 13-15 Hearing Transcript, Feb. 1, pages 281:4-284:4, and PCB 13-15 Hearing Transcript, Feb. 2, pages 15:4-20:17, 69:4-70:8, 92:11-93:2, 118:18-119:18, 231:2-280:22.

Respectfully submitted,

_/s/ Abel Russ_____

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referring to pages titled "Comparison with Groundwater" (pdf page *37, also labelled as page number 12); and all pages titled "[Site name] – Updated Table 5-4" or "[Site name] – Updated Table 5-5."

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Dated: February 26, 2018

CERTIFICATE OF SERVICE

I hereby certify that the foregoing **NOTICE OF FILING**, **COMPLAINANTS' MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS AND TESTIMONY**, and **COMPLAINANTS' MEMORANDUM IN SUPPORT OF THEIR MOTION TO STRIKE PORTIONS OF RESPONDENT EXPERT'S REPORTS TESTIMONY** were served electronically to all parties of record listed below, on February 26, 2018.

Respectfully submitted,

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