December 9, 2019

Ms. Alysa Hopkins
Indiana Department of Environmental Management
Office of Land Quality
Solid Waste Permits Section
100 N. Senate Ave., IGCN, Rm. 1154
Indianapolis, IN 46204-2251
AHopkins@idem.IN.gov

RE: Comments on Proposed Closure and Post-Closure Applications for the Ash Pond System located at NIPSCO's Michigan City Generating Station

Dear Ms. Hopkins:

The undersigned are writing to comment on the Closure Application submitted in December 2018 for the coal ash impoundments at the Michigan City Generating Station (MCGS). We appreciate the opportunity to weigh in with IDEM regarding coal ash disposal in Indiana, and we request that you address the important concerns expressed in this letter.

The Michigan City Generating Station sits on the shore of Lake Michigan, an area rich in ecological and economic significance. Lake Michigan is the second largest of the Great Lakes by volume and provides drinking water to millions of people. It provides habitat for a wide variety of wildlife including 134 species of fish.[1] Indiana's 47 miles of shoreline on Lake Michigan include the Indiana Dunes State and National Parks, which host more than 3 million visitors each year and bring more than $400 million in economic benefit to northern Indiana.[2] The lake and its tributaries also provide important commercial and recreational value to local communities, including its host community, Michigan City. Therefore protection of the Lake and its tributaries, as well as the groundwater that discharges into these water bodies, is essential.

Extensive fill with coal ash

The ground at the Michigan City Generating Station (MCGS) is loaded with coal ash due to decades of using ash as fill. A steel sheet pile wall was built around the lake-side and creek-side property boundaries, and a mix of coal ash and sand was filled in behind the sheet pile. The extent of the fill is

[1] National Oceanographic and Atmospheric Administration, Lake Michigan Food Web. https://www.glerl.noaa.gov/pubs/brochures/foodweb/LMfoodweb.pdf

[2] Indiana Dunes Tourism (Aug. 7, 2019). Testimony for the Indiana Legislature's Agriculture and Natural Resources Interim Committee.

documented in the RCRA Facility Investigation wherein Appendix D, the Waterfront Facilities Inspection[3] lists 1,350 linear feet of sheet pile along Trail Creek and 2,500 feet of sheet pile shore protection along Lake Michigan. The "Site Geology" section of the RCRA report states:

> *One purpose of the sheet pile walls was to facilitate the creation of "made land", which resulted from filling behind the structures with CCR produced at the generating station*[4]

The result of filling behind these long sections of sheet pile is a massive collection of CCR. The fill thickness in the Power Generation Area of the MCGS site

> *varies from approximately 6 to 19 ft below ground surface (bgs) in the northern portion of the Site near SWMU12 (Sargent & Lundy borings). The fill materials consist of black ash, cinders, and fly ash comingled with sand*.[5]

The CCR Management Area of MCGS covers the western two-thirds of the property:

> *Fill is present beneath the current ash ponds from approximately ground surface to at least 40 ft. bgs near the East Primary Fly Ash Settling Basin (Boring BH-7, Golder 2012) and near the Final Pond (BH-8, Golder 2012). The fill material includes a mixture of fly ash, boiler slag, and sand*.[6]

The extent of the fill is also documented in the following cross sections found in the RCRA Facility Investigation (Figure 1).[7] The brown color represents fill.

[3] Marine Solutions, Inc (July 12, 2018).Waterfront Facilities Inspections and Assessments. In Appendix D of the RCRA Facility Investigation Report, Michigan City Generating Station, pdf page 368.
[4]Golder Associates, Inc (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. p. 9 (pdf page 20).
[5]Ibid p. 10 (pdf page 21).
[6]Ibid p. 10 (pdf page 21).
[7] Ibid, pdf pages 138-139.

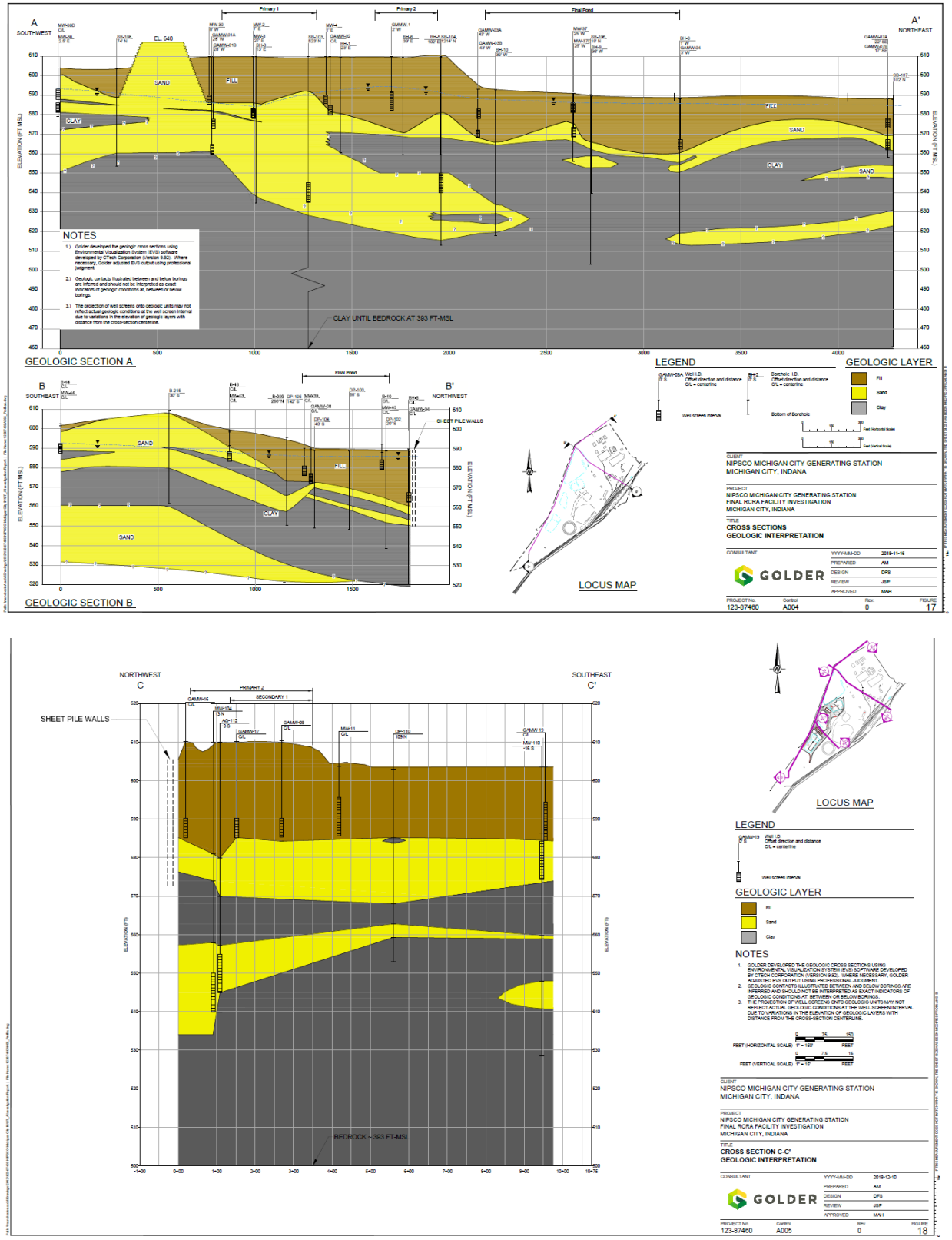

Figure 1. NIPSCO Michigan City Generating Station, Cross Sections, Geologic Interpretation. From Figure 17 of the 2018 RCRA Investigation Report. See footnote 7.

As figure 1 illustrates in cross section A-A', the fill is 10 to 30 feet thick along nearly the entire lakeshore edge of the property and at A', it is nearly 20 feet thick on the bank of Trail Creek. This means 10 to 30 feet of coal ash fill sit up against the sheet pile, and the sheet pile is the only thing keeping the ash from spilling into Lake Michigan and Trail Creek.

The Closure Application also documents the extensive fill on the site.

> *A layer of fill material approximately 14 feet in thickness beneath the Boiler Slag Pond and thickening from east to west to at least 40 feet in thickness beneath Primary Settling Pond No. 2.*[8]

Coal ash fill complicates closure of impoundments

The extensive presence of coal ash in fill at MCGS complicates closure of the coal ash impoundments at the site. First, CCR in fill will interfere with closure of the impoundments by removal of CCR. Under the CCR Rule, the criterion for closure by removal is the following:

> *CCR removal and decontamination of the CCR unit are complete when constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed . . .*[9]

In order for constituent concentrations to be removed from the unit, as required, excavation of the unit will have to continue until it reaches soil or rock untainted by coal ash. Given the 14 feet of mixed CCR fill or more under the Michigan City ash ponds, the excavation will have to extend to the bottom of the fill in order to reach untainted soil or rock. The Closure Application does not address how excavation is going to proceed once it gets into the CCR fill below the ash ponds.

In a similar way, CCR in fill will interfere with closure removal verification. The Closure Application states that the surface impoundments will be closed by removal of the CCR, the impoundment liners (which are blast furnace slag), and an additional foot of underlying soil.[10] Following excavation of those materials, the plan says that removal of CCR will be confirmed by visual inspection.

> *Upon completion of the excavation of the CCR material, blast furnace slag liner, and an additional one foot of material from the surface impoundments area, visual observations will be conducted to evaluate removal of physical CCR materials*.[11]

However, since CCR fill extends to 14 feet or more beneath the impoundments, the excavation of one additional foot below the impoundment liner will be excavation of fill material containing CCR. Visual

[8] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, p. 22 (pdf page 33.)
[9] 40 C.F.R.§ 257.102(c).
[10] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, p. 11 (pdf page 22).
[11] Ibid, p. 16 (pdf page 27).

observation after removal of that additional foot will reveal more CCR and will not be able to confirm "*removal of physical CCR materials*." The visual observations will be that CCR is still present. The Closure Application does not address this problem. IDEM requested additional information about the confirmation of removal in February 2019, but the request simply asked for survey confirmation and photographs.[12] The NIPSCO response was that survey confirmation and photographs would be used to confirm the excavation limits.[13] Neither the IDEM request, nor the NIPSCO answer dealt with the fact that the excavation would be digging into fill containing CCR.

Another complication the CCR fill brings to the impoundment closure at MCGS is the potential for continued contamination of the groundwater after closure. Closure by removal is only considered complete, according to the federal rule, when "*. . . groundwater monitoring concentrations do not exceed the groundwater protection standard . . .*"[14] However, the CCR present in the fill at MCGS is as likely to leach contaminants into the groundwater as the CCR in the impoundments. In fact, the fill may be more likely to contaminate the groundwater, since there is more of it and since cross sections submitted in the Addendum to the Closure Application (Figure 2) show that a good portion of the fill is below the water table.[15] Where the CCR fill is below the water table, it is continuously saturated.

The only comment we found in the Closure Application about groundwater contamination from the CCR fill is a vague one:

> *Minor concentrations of CCR materials may be present upon completion of closure by removal activities. Measures will be incorporated into the groundwater corrective action process to address residual concentrations of CCR constituents of concern.*[16]

[12] Indiana Dept of Environmental Management (April 9, 2019). Request for Additional Information, Michigan City Generating Station. VFC document # 82746466.
[13] NIPSCO (June 5, 2019) Response to request for additional information. VFC document # 82791433.
[14] 40 C.F.R.§ 257.102(c).
[15] Wood Environment and Infrastructure Solutions, Inc. (Feb 28, 2019). Supplemental Addendum Monitoring Well Network, Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Michigan City Generating Station. Pdf pages 14-15. VFC document # 82709758.
[16] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, p. 11 (pdf page 22)

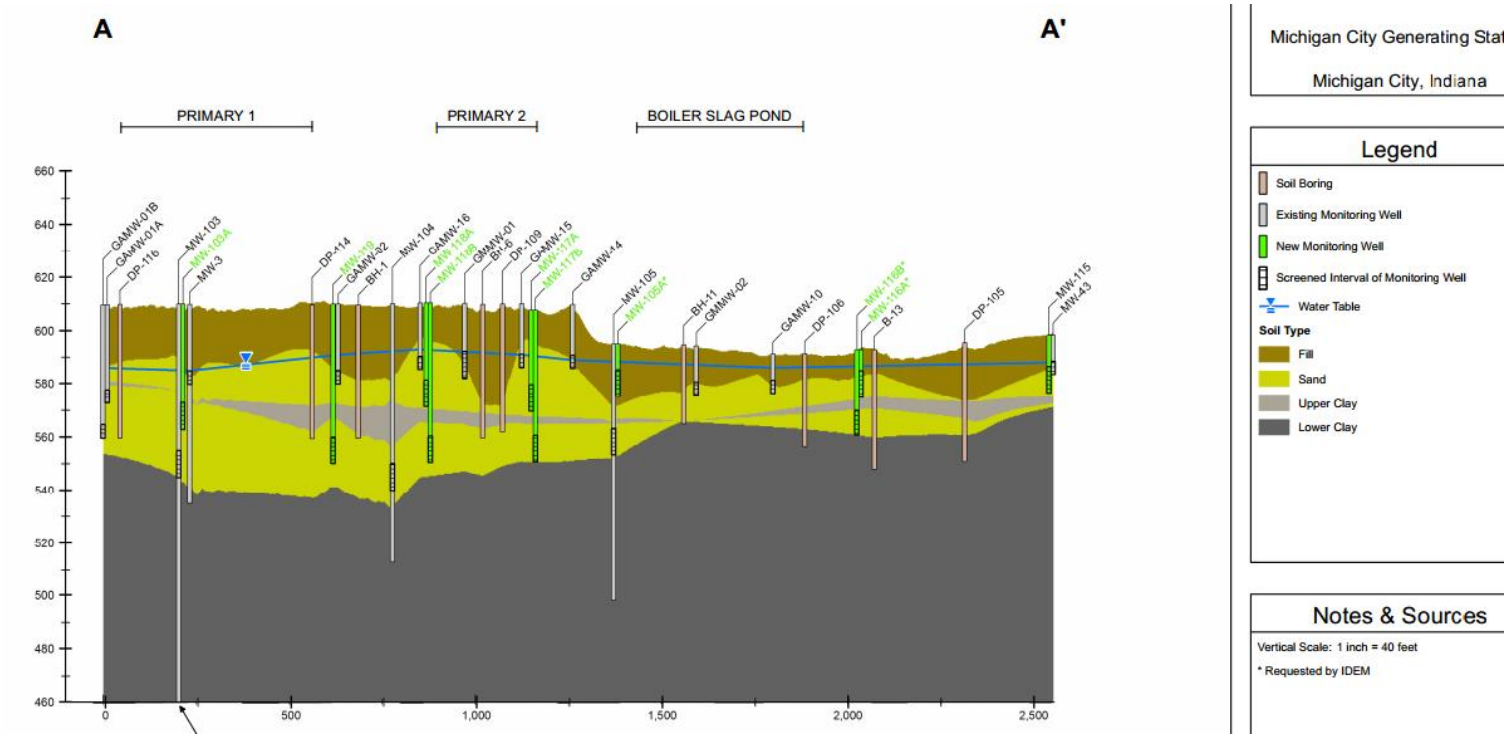

Figure 2. Cross section showing fill and water table. From the Michigan City Closure Addendum, Feb 2019.

We take issue with use of the word "minor" since the volume of CCR present in the fill probably exceeds the volume present in the impoundments. According to the Closure Application, the five impoundments addressed will have a total of approximately 170,600 cubic yards excavated.[17] Given that the MCGS site is 123 acres[18] and the cross sections show fill occupying more than half the site to a depth of at least 10 feet, then a very conservative estimate is that there are at least 950,000 cubic yards of fill.[19] If CCR makes up 20% or more of the fill (190,000 cubic yards), then the amount of CCR in the fill exceeds the amount in the impoundments. Therefore, the CCR fill is likely to have a significant contribution to groundwater contamination at MCGS.

As cited above, the Closure Application vaguely defers action on groundwater contamination by CCR fill until the site reaches the corrective action stage of the CCR Rule. At a minimum, the closure plans should include an investigation of the extent of groundwater contamination by the fill and the risk that the contamination will continue after excavation of the ash ponds.

[17] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, p. 15 (pdf page 26)
[18] Ibid, p. 2 (pdf page13)
[19] 61 acres x 4840 yards^2/acre x 3.3 yards deep = 974,292 cubic yards

Michigan City coal ash fill is in the floodplain

According to the Indiana Department of Natural Resources floodplain maps, a significant portion of ash ponds and ash fill at the Michigan City Generating Station are in the floodplain of Lake Michigan and Trail Creek (Figures 3 and 4).[20] With the proposed Closure Application, the coal ash fill and any impoundments that are not excavated will continue to reside in the floodplain.

Leaving coal ash in the floodplain creates a risk of an ash spill into Lake Michigan and Trail Creek. The risk is likely higher than expressed by the current 100-year floodplain map since the map is based on historical data. Current climate projections are that there will be a 6 – 8 percent increase in annual precipitation in Indiana by 2050 relative to recent decades and an increased frequency of extreme precipitation events[21]. The flood maps do not account for those projections. The projected changes in precipitation will increase the frequency and extent of flooding. During a flood, the sheet pile and rip rap that currently protect the lake and the creek could fail causing a coal ash spill.

A coal ash spill at MCGS would damage the aquatic ecosystems of Trail Creek and Lake Michigan, including portions of the lake that are part of the Indiana Dunes National Park which is immediately adjacent to the NIPSCO property. Previous coal ash spills have caused fish kills and long-lasting impacts.

IF the coal ash fill is left in place at MCGS, there will need to be future maintenance to deal with water damage to the bulkheads and shoreline protection at MCGS in order to try to prevent a coal ash spill. The sheet pile in the bulkhead and shoreline protection will eventually need replacement given the ongoing corrosion documented in the 2018 inspection.[22] Maintenance will still be needed beyond the 30-year post-closure period, as well. In fact, given the enduring nature of coal ash, it would be needed indefinitely, if coal ash is left in the floodplain. Depending on corroding sheet pile walls to contain CCR located on the shore of Lake Michigan is a temporary measure that will not permanently contain the waste and protect the adjacent national lakeshore.

[20] Flood Rate Insurance Map (FIRM) accessed at maps.indiana.edu

[21] Widhalm, M, *et. al.* (2018). Indiana's Past and Future Climate: A Report from the Indiana Climate Change Impacts Assessment. Purdue Climate Change Research Center, Purdue University. https://ag.purdue.edu/indianaclimate/indiana-climate-report

[22] Marine Solutions, Inc. (July 12, 2018). Waterfront facilities inspections and assessments. Accessed in Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 366

Figure 3. MCGS relative to Lake Michigan to the northwest and Trail Creek to the northeast.[23]

Figure 4. 100-year floodplain at the NIPSCO Michigan City Generating Station obtained from FEMA Flood Rate Insurance Maps, accessed at maps.Indiana.edu.

[23] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, pdf page 50

Inappropriate background wells

In the Closure Application, NIPSCO listed wells GAMW-05, GAMW-12, and GAMW-18 as "*background*". This is not in keeping with the requirements under the CCR Rule. The Rule requires that background wells

> *(1) Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit.*[24]

The Indiana requirements for impoundment closure also emphasize the need to measure background in groundwater that is not impacted by the waste material.

> *A minimum of four background samples must be taken in the vicinity of the impoundment, but from an area that is uncontaminated and undisturbed by facility activities.*[25]

Concentrations of constituents in the designated background wells at MCGS (GAMW-05, GAMW-12, and GAMW-18) confirm that they are impacted by CCR.[26] They have elevated concentrations of boron, sulfate, lithium and molybdenum, which are typical coal ash contaminants. Although the reports show some elevated concentrations in these wells, the full extent of their contamination is not in the reports because Golder and Associates removed some of these wells' sampling data. The Groundwater Monitoring and Corrective Action Reports for 2017 and 2018 list multiple results removed from the data set for wells GAMW-05, GAMW-12, and GAMW-18 for the following reason: *inconsistent with concentrations detected in other background monitoring wells*.[27] This is an unjustified manipulation of the data. The data removed for this reason should be replaced and revised groundwater reports issued.

The three designated background wells may be showing elevated concentrations because they were drilled in areas with large amounts of CCR fill. The well log for GAMW-05 shows it was drilled through 8 feet of slag, and the log for GAMW-12 was drilled through 2 feet of fly ash and 9 feet of slag.[28] A boring log for GAMW-18 was not found in the Closure Application. CCR used as fill can be a source of leaching contaminants into groundwater and may be impacting these designated "*background*" wells.

---

[24] 40 C.F.R.§ 257.91(a)(1).

[25] Indiana Department of Environmental Management, Office of Land Quality.(Jan 15, 2013). Surface Impoundment Closure Guidance.

[26] 2018 Annual Groundwater Monitoring and Corrective Action Report for NIPSCO Michigan City Generating Station. https://www.nipsco.com/our-company/about-us/our-environment/ccr-rule-compliance#Michigan

[27] Golder and Associates (Jan 2018) CCR Management Unit Referred to as Michigan City Boiler Slag Pond, 2017 Annual Groundwater Monitoring and Corrective Action Report. Golder and Associates (Jan 2019) CCR Management Unit Referred to as Michigan City, 2018 Annual Groundwater Monitoring and Corrective Action Report - Boiler Slag Pond, NIPSCO Michigan City Generating Station.

[28] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, pdf pages 95 and 101.

The three wells designated "*background*" at Michigan City could also be affected by leakage from a CCR unit. They are located close to the Boiler Slag Pond and Primary Settling Pond No.2. The general direction of groundwater flow at that location was estimated to be to the north away from wells GAMW-05, GAMW-12, and GAMW-18.[29] However, when the ash ponds contained water, they created localized "groundwater mounding," i.e. an area where groundwater moves outward in all directions. The monitoring wells located on the south side of the ponds could have been affected by that mounding.

After receiving the Michigan City Closure Application, the Indiana Department of Environmental Management notified NIPSCO that:

> *The background monitoring locations need to provide ground water quality samples that represent historical conditions unaffected by a CCR unit or facility activities that may contribute constituents of concern against which background comparisons occur.*[30]

NIPSCO responded with an Addendum to the Closure Application that proposes new background wells. The Addendum states that:

> *The 12 new monitoring wells will be installed and developed within 90 days of NIPSCO's placing a notification of completion of closure of the CCR surface impoundments in the operating record per 40 CFR 257.100(c)(3)*.[31]

Installing the new background wells *after* completion of closure is inadequate. The CCR Rule requires that appropriate background wells be part of the groundwater monitoring network, not just part of the post-closure monitoring. As part of the network, the background wells are crucial for establishing Groundwater Protective Standards (GPS) that are used in determining the need for corrective measures. We agree with IDEM that the original background wells were inappropriate, but NIPSCO's proposed timing for new wells violates both state and federal law. New background wells are needed in order to comply with the requirements of the federal CCR Rule, as well as Indiana regulations.

As with the original background wells, the proposed locations for the new background wells are also problematic because most are in areas of heavy CCR fill. The cross sections in the Supplemental Addendum show fill depths of 6 to 20 feet in the proposed locations of MW-110, MW-113, and MW-115[32]. Groundwater at these locations is likely affected by CCR, so they will not fulfill IDEM's requirement that background wells be *unaffected by a CCR unit or facility activities*.

There are monitoring wells at Michigan City that appear to be more appropriate for use as background. The RCRA Facility Investigation Report filed in December 2018 shows wells MW-108 and MW-109, which

[29] Wood Environment & Infrastructure Solutions, Inc. (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, pdf page 53

[30] Email Jan 25, 2019, from Marty Harmless at IDEM to mokin@nisource.com. VFC document # 82740322

[31] Wood Environment & Infrastructure Solutions, Inc (Feb 28, 2019). Supplemental Addendum Monitoring Well Network (VFC document # 82709758), pdf page 9.

[32] Ibid., pdf pages 14-15.

are located away from CCR disposal units,[33] and the Closure Application shows they are in areas of only minimal CCR fill.[34] The borehole log on the Closure Application shows only one foot of fly ash in MW-108.[35]The log for MW-109 shows a narrow band of fly ash.[36] Groundwater monitoring confirms that the groundwater at these wells is essentially unaffected by coal ash. It has constituent concentrations more consistent with groundwater that has not been impacted by coal ash. MW-108 and MW-109 do not have the elevations of boron, sulfate, arsenic, thallium, and lithium seen in the monitoring wells that are impacted by coal ash at this site. Neither does MW-36 on the far east side of the property. We suggest that MW-108, MW-109, and MW-36 be considered for background wells.

	MW-108	MW-109	MW-36
Arsenic (ug/L)	1.1	2.3	1.0
Boron (ug/L)	90	160	0.11
Lithium (ug/L)	4.4	4.9	0.0061J
Sulfate (ug/L)	21	74	89

Table 1. Groundwater data from Table 6-7, RCRA Facility Investigation Report, Michigan City Generating Station, 2018, pdf page 250, and Table 12 on pdf page 100

The GWPS and SSLs should be recalculated using appropriate background wells

Once appropriate background wells, unaffected by coal ash, have been established at MCGS, the results from those wells should be used to calculate new Groundwater Protection Standards (GWPS) and the Statistically Significant Levels (SSLs) in accordance with 40 C.F.R.§§ 257.95(h) and 257.93(h). The GWPS are used to analyze groundwater monitoring data at coal ash disposal sites and determine when coal ash is contaminating groundwater. Using GWPS that are based on groundwater affected by coal ash will reduce detection of groundwater contamination. The contaminated groundwater will be compared to a GWPS that itself reflects contaminated groundwater, and when they are statistically similar it will appear that the monitored samples are not contaminated. That will reduce the need for corrective action. Only by using new GWPS based on appropriate background groundwater will the actual groundwater contamination be detected.

The CCR Rule requires investigating the extent of the plume

Under § 257.95(g), the owner or operator must "*characterize the nature and extent of the release*" including *"(i)install additional monitoring wells necessary to define the contaminant plume(s)*." This is included in the Closure Application, which states that if there is evidence of groundwater contamination,

[33]Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 223
[34] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Soil Boring Profile, pdf page 117.
[35] Ibid, pdf page 191.
[36] Ibid, pdf page 193.

such evidence will "*trigger additional response activities, including a delineation of the nature and extent of the noted SSLs.*"[37] Since one SSL has been reported[38] and others are likely when appropriate background wells are used, plans to delineate the extent of the groundwater plume at MCGS should be forthcoming.

There is evidence that contaminated groundwater is moving into Lake Michigan and Trail Creek

There is evidence that the contaminated groundwater at the Michigan City Generating Station is leaking into Lake Michigan and Trail Creek. The evidence includes: (a) the groundwater flow direction; (b) the groundwater flow velocity; (c) the history of the sheet pile construction; and (d) the most recent sheet pile inspection.

The groundwater at MCGS is flowing toward Lake Michigan and Trail Creek (Figure 5). The water table maps included in the Closure Application and RCRA Facility Investigation Report indicate flow toward Lake Michigan to the north and west and toward Trail Creek to the northeast.[39,40] The Closure Application includes a calculation that the horizontal flow of groundwater at MCGS is approximately 230 feet per year.

> *"Based upon site-specific data, average horizontal groundwater flow velocity was calculated at approximately 230 feet/year"*[41].

[37] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application pdf page 38.
[38] Michigan City Generating Station SSL Boiler Slag Pond Notification 6-12-19, posted at https://www.nipsco.com/our-company/about-us/our-environment/ccr-rule-compliance#Michigan
[39] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, pdf page 53.
[40] Golder Associates, Inc (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 126.
[41] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, pdf page 34.

Figure 5. August 2008 Groundwater Surface Map, from the MCGS RCRA Investigation Report, pg 126

The groundwater flow meets the sheet pile along the majority of the site boundary, but the sheet pile was never designed or constructed to form a water-tight barrier against groundwater flow. The fact that gradients measured in on-site monitoring wells indicate flow toward the sheet pile walls confirms that groundwater is migrating and transporting CCR contaminants toward discharge areas into Lake Michigan and Trail Creek.

The sheet pile at MCGS has been documented to be leaking. Appendix D of the RCRA Investigation Report is the *Waterfront Facilities Investigations and Assessments,*[42] which is a report on the 2018 inspection of the MCGS sheet pile, above and below water. The inspection documented leakage through the sheet pile bulkhead along Trail Creek and the Shore Protection along Lake Michigan.

[42] Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 366.

> *The bulkhead is in Fair condition. .. surfaces below water typically exhibit minor to moderate corrosion over 100 percent of the surface area consisting of scaling up to ¼-inch thick and pitting up to 1/16-inch deep. Water seepage is evident through the interlocks.*[43]
>
> *The shore protection is in Satisfactory Condition. The steel sheet pile bulkheads exhibited minor to moderate corrosion with evidence of water seepage between the interlocks on the inner bulkhead.*[44]

The RCRA Facility Investigation also acknowledges the leak through the sheet pile:

> *Although the sheet-pile is present around the downgradient perimeter of the Site, the underlying clay is not always shallow enough in all locations to allow the sheet pile to key into the clay, possibly allowing groundwater to flow beneath the sheet pile adjacent to Lake Michigan (e.g., near GAMW-01A/01B, and MW-30). Water table elevation maps created based on both recent and historical data suggest areas where leakage beneath or through the sheet pile may be occurring.*[45]

The groundwater at MCGS has elevated levels of arsenic, lithium, sulfate, and thallium.[46] Leakage of the contaminated groundwater into Lake Michigan could affect the near-shore aquatic life, including aquatic life within the Indiana Dunes National Park which borders MCGS and extends into the Lake.

However, the Closure Application currently lays out no plans for stopping the leak. Coal ash closure at the Michigan City Generating Station should fully assess and then eliminate leaks of contaminated groundwater into Lake Michigan and Trail Creek, and it should eliminate the potential of any future leakage.

Elimination of the leakage of contaminated groundwater into Lake Michigan and Trail Creek is required by both federal and state law. The off-site migration of contaminated groundwater from a waste site is a violation of RCRA. Indiana coal ash regulation states

> *final disposal of solid waste in the impoundment at the end of the operation of the impoundment is subject to approval by the commissioner, based on the requirements for coal combustion residuals impoundments in 40 CFR 257.50 through 40 CFR.107 and on other management practices that are protective of human health and the environment*[47].

To be protective of human health and the environment, closure at Michigan City must stop off-site movement of contaminated groundwater including its movement into Lake Michigan and Trail Creek.

---

[43] Ibid, pdf page 371.
[44] Ibid, pdf page 372.
[45] Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 3.
[46] 2018 Annual Groundwater Monitoring and Corrective Action Report for NIPSCO Michigan City Generating Station. https://www.nipsco.com/our-company/about-us/our-environment/ccr-rule-compliance#Michigan
[47] 329 IAC 10-9-1(c).

There are public drinking water intakes of surface water in the vicinity of the Michigan City Generating Station that could be affected,[48] and there are people who catch and eat fish from Trail Creek[49].

Testing for impact to Trail Creek

Not only is there documented leakage of contaminated groundwater into Trail Creek, but there is also evidence that the coal ash fill itself is being released into the creek. The Waterfront Facilities Investigations and Assessments makes it clear that the fill behind the sheet-pile bulkhead is being lost into the creek:

> *The bulkhead is leaning outward and/or out of plumb at sta. 3+95, 5+20 to 6+00 and 12+00 to 13+50. This indicates potential issues with the tiebacks and anchoring systems in these areas, however, this was unable to be confirmed as the anchoring systems are buried in earth behind the bulkhead. Additionally,* ***the backfill is washed out to varying degrees*** *between sta. 6+10 to 13+50[50] (emphasis added).*

Trail Creek has been receiving contaminated groundwater and coal ash fill for an indeterminate time and has likely been receiving it for decades. The coal ash fill has been present behind the sheet wall since before 1970, as documented in the RCRA Investigation:

> *The Site setting (i.e., on the Lake Michigan shoreline) and its development and expansion by NIPSCO and predecessor companies included the installation of sheet pile barriers along water side property boundaries to the east (Trail Creek) and north (Lake Michigan). Available records indicate the earliest of these barriers were constructed in the 1930s. . . . One purpose of the sheet pile walls was to facilitate the creation of "made land", which resulted from filling behind the structures with CCR produced at the generating station and/or excavated materials from the creation of ash ponds in the early 1970s.[51]*

Coal ash contains arsenic, mercury and selenium[52] which, when released into an aquatic environment, bioaccumulate in fish. Mercury in water has long been documented to accumulate in fish, as described in an EPA fact sheet:

> *Once released into the environment, inorganic mercury is converted to organic mercury (methylmercury) which is the primary form that accumulates in fish and shellfish.*

[48] Indiana Finance Authority (Oct 2015). Utility Planning in Indiana. Map of Indiana surface water intakes on pdf page 27.
[49] Personal communication with Michigan City residents.
[50] Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 371
[51] Ibid, pdf page 20
[52] Electric Power Research Institute (2006). Coal Ash: Characteristics, Management and Environmental Issues.

> *Methylmercury biomagnifies up the food chain as it is passed from a lower food chain level to a subsequently higher food chain level. . .*[53]

More recent studies have begun to document the bioaccumulation of arsenic in freshwater fish. The following quote is from a 2007 study of fish from two arsenic-contaminated ponds which were compared to a pond with an arsenic concentration more than an order of magnitude lower:

> *The study shows for the first time a clear effect of water arsenic concentrations on natural fish tissue arsenic concentrations, and is the first report of a freshwater fish species attaining arsenic concentrations comparable with those found in marine fish species. Furthermore, the high concentrations of toxic inorganic arsenic (predominantly arsenate) in the muscle tissue of the edible fish C. striata have human health implications*[54]

Since Michigan City Generating Station has been releasing coal ash fill and contaminated groundwater into Trail Creek, likely for several decades, we are requesting an assessment of off-site release of waste materials. The water and sediments of Trail Creek should be tested and the release of ash and contaminated groundwater thoroughly investigated. Since people in the area consume fish from Trail Creek, we are also requesting an evaluation of fish tissue in Trail Creek, both existing data from Indiana fish tissue monitoring and testing for other bioaccumulative contaminants from coal ash in fish tissue.

Investigation of soil contaminated by off-site spread of coal ash

Over the long history of burning coal at the Michigan City Generating Station, there have been releases of coal ash that have settled on the surrounding community. This occurred in part because NIPSCO resisted use of certain air pollution controls until a major consent decree with EPA in 2011.[55] From time to time, there have also been malfunctions that released ash, like the July 2018 release that coated the nearby community with ash.[56] A prison and some of the Michigan City parks are close enough to the generating station to be affected.

Coal ash carries an array of hazardous heavy metals[57]. Where it contaminates soil it can pose an human exposure risk, as has been determined in the Town of Pines, Indiana.

> *. . .fly ash was used as landscaping fill in and around the Town of Pines, and some fill areas have concentrations of constituents that present an unacceptable exposure risk to human health.* [58]

---

[53] US Environmental Protection Agency (2001). Fact Sheet: Mercury Update: Impact on Fish Advisories. EAP-823-F-01-011

[54] Jankong, P et. al. (2007) Arsenic accumulation and speciation in freshwater fish living in arsenic-contaminated water. *Env Chem,*4,DOI: 10.1071/EN06084

[55] United States District Court for the Northern District of Indiana (2011). Consent Decree in United States of American and State of Indiana vs. Northern Indiana Public Service Company.

[56] Smith, K. (July 6, 2018). NIPSCO ash falls in park as fireworks fly. In *Michigan City News Dispatch*

[57] Electric Power Research Institute (2009). Coal Ash: Characteristics, management and environmental issues.

[58] US EPA (Sept 2016) Town of Pines Superfund Site: Record of Decision, pdf page 11

Therefore, we are requesting an investigation of whether soil in Michigan City has been contaminated by coal ash, particularly in the nearby prison and parks. We also request that the investigation assess whether ash was used as fill in Michigan City. Such an investigation would be in keeping with Indiana coal ash regulation 327 IAC 10-9-1 which states:

> *For a coal combustion residuals impoundment subject to 40 CFR 257, Subpart D, final disposal of solid waste in the impoundment at the end of the operation of the impoundment is subject to approval by the commissioner, based on the requirements for coal combustion residuals impoundments in 40 CFR 257.50* through 40 CFR 257.107* **and on other management practices that are protective of human health and the environment.*** (emphasis added)

MCGS berms contain CCR and should also be removed

The Conceptual Closure Plan for the Boiler Slag Pond posted on NIPSCO's CCR website[59] indicates that the berms surrounding the pond will be pushed into the ponds after the coal ash is excavated.

> *After final receipt of CCR and dewatering activities are complete, CCR will be removed from the Unit. The above grade portion of the impoundment berms will then be graded inward to reduce interior slopes . . .*[60]

The more complete Closure Application submitted to IDEM does not include grading the berms inward.[61] The description of the ponds and their excavation runs from pdf page 19 to 26. The only mention of the berms is on pdf page 26,

> The interior berms, (i.e., *the berm between the Secondary Settling Pond No.1 and the Primary Settling Pond No.2) and the berm between Secondary Settling Pond No.2 and Boiler Slag pond will remain in place*.

The berms should neither be graded into the excavated ponds nor left standing since they contain CCR. In the RCRA Facility Investigation Report the description of how the impoundments were built includes the statement "*NIPSCO constructed these four basins in the early 1970s . . . A sand/gravel/CCR materials berm surrounds each basin.*"[62] Since they contain CCR, the berms should be removed from the site and taken to the landfill with the rest of the coal ash.

The provision of the federal rule that applies to closure of coal ash impoundments by removal, § 257.102(c), requires removal of CCR and decontamination of the unit. If CCR is left behind in a CCR-

[59] https://www.nipsco.com/our-company/about-us/our-environment/ccr-rule-compliance#Michigan

[60] Haley and Aldrick, Inc. (Feb 7, 2019). CCR Conceptual Closure Plan - Version #2, Northern Indiana Public Service Co. Michigan City Generating Station - Boiler Slag Pond.

[61] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Virtual File Cabinet document #82667727.

[62] Golder Associates (Dec 2018). RCRA Facility Investigation Report, Michigan City Generating Station. pdf page 28.

containing berm, the CCR will not have been completely removed, and the unit will not have been decontaminated.

Dust control during closure

During closure there will be excavation and transportation of ash as well as backfilling that could raise significant dust. Particles in coal ash can be as small as 1 micron,[63] small enough that people can inhale them deep into the alveoli of their lungs. Fine particulate matter at that size has been well documented to exacerbate both respiratory and cardiovascular diseases.[64] Given the proximity of MCGS to residential and commercial neighborhoods and the proximity of the proposed receiving landfill at NIPSCO's Schahfer Generating Station to private residences, control of dust during closure and transportation is vital.

NIPSCO has not yet described the specific measures that will be taken for dust control during coal ash closure. The Closure Application states that dust control will be a priority and that the contractor doing the excavation of the impoundments will be responsible for dust control and writing a dust control plan.[65] In its request for additional information (RAI) in April 2019, IDEM noted the absence of the dust control plan and required that it be submittal before excavation begins.[66] NIPSCO's response to the RAI reiterated that they would place this responsibility on the contractor and said they would share the control plan with IDEM.[67] In reference to closure activities, NIPSCO's CCR Fugitive Dust Control Plan says only

> *Increased transportation activities related to the closures of CCR surface impoundments will be monitored for potential need for increased road watering and/or additional fugitive dust control methods, including but not limited to, the possible use of chemical dust suppression agents.*[68]

We appreciate NIPSCO's stated commitment to dust control during closure. We hope to see a plan detailing specific dust control measures soon. These essential safety measures must not be left solely in the hands of a contractor, but must be scrutinized by IDEM and the public to guarantee their adequacy to protect public health.

[63] Electric Power Research Institute (2009). Coal Ash: Characteristics, management and environmental issues.
[64] Romieu, I. Hernandez-Avila, M. and Holguin, F. (2011). Outdoor Air Pollution. Chapter 6 in Occupational and Environmental Health, Levy, B, Wegman, D, Baron, S, and Sokas, R editors.
[65] Wood Environment & Infrastructure Solutions, Inc (2018). Surface Impoundment Closures (CCR Final Rule and RCRA Regulated) Closure Application, Virtual File Cabinet document #82667727. , pdf page 26
[66] Indiana Dept of Environmental Management (April 9, 2019). Request for Additional Information, Michigan City Generating Station. VFC document # 82746466.
[67] NIPSCO (June 5, 2019). Response to request for additional information. VFC document # 82791433
[68] NIPSCO (Aug 2019). CCR Fugitive Dust Control Plan in support of 40 CFR Part 257. https://www.nipsco.com/our-company/about-us/our-environment/ccr-rule-compliance#Michigan

Summary of problems with MCGS coal ash closure

Based on our review of numerous documents related to the coal ash at the Michigan City Generating Station (MCGS) including the Closure Application, RCRA Facility Investigation Report, groundwater monitoring reports, and others, we have found significant problems with the proposed coal ash closure at MCGS. In the preceding pages we have documented those problems. In summary, the problems are:

- The monitoring wells listed as 'background' for CCR Rule purposes (GAMW-5, GAMW-12, and GAMW-18) are contaminated by coal ash and inappropriate for use as background wells.
- Replacement background wells proposed by NIPSCO (MW-110, MW-113, and MW-115) are inappropriate because they are also in areas with extensive CCR fill.
- Calculation of Groundwater Protection Standards (GWPS) and the Statistically Significant Levels (SSLs) was based on inappropriate background wells
- There is evidence that groundwater contaminated by coal ash is moving from MCGS into Lake Michigan and Trail Creek.
- The extensive coal ash fill on the MCGS site:
    - exceeds the volume of coal ash in the impoundments;
    - interferes with closure of the ash impoundments by removal;
    - interferes with removal verification;
    - is extensively present below the water table
    - is a massive reservoir of ash which will continue to contaminate groundwater after impoundment excavation; and
    - resides in the floodplain of Lake Michigan and Trail Creek creating a risk of spill.
- The contaminated groundwater and coal ash fill leaking into Lake Michigan and Trail Creek and the spill risk pose risks to human health and the environment.
- Coal ash has been released into the air from MCGS and settled on the surrounding community

Recommendations

We urge IDEM to require that NIPSCO take the following measures to address these problems:

- Establish appropriate background wells. Potential background wells unaffected by coal ash are already available at MCGS (MW-36, MW-108, and MW-109).
- Groundwater Protection Standards and Statistically Significant Levels (SSLs) should be recalculated using appropriate background wells that are unaffected by coal ash.
- Characterize the plume of contaminated groundwater fully, including investigation of off-site migration.
- Remove all of the coal ash from the Michigan City Generating Station and take it to a lined landfill out of the floodplain. This removal should include the ash in all of the current and former impoundments and their berms and the coal ash fill.

- Investigate off-site release of coal ash into Trail Creek and into the surrounding community with testing of creek water, creek sediment, and soil.
- Investigate coal ash impact on fish in Trail Creek.

We realize that excavation of the coal ash fill will be an extensive and lengthy undertaking. We understand that buildings and other power station infrastructure were built on top of some of the fill. However, there appears to be no environmentally-sound alternative. The fill includes massive amounts of coal ash separated from Lake Michigan and Trail Creek only by sheet pile. The sheet pile is showing signs of deterioration and is leaking contaminated groundwater and ash into the lake and creek. We have come to the conclusion that removal of the fill is the only solution that will correct the groundwater contamination, stop the leakage into Lake Michigan and Trail Creek, and eliminate the spill risk from storing coal ash in the floodplain. The health, welfare and environment of the Michigan City community and the Indiana Dunes State and National Parks depends upon full and effective cleanup of the MCGS site.

We sincerely appreciate the opportunity to comment on NIPSCO's closure plans for the coal ash at the Michigan City Generating Station. We hope you will take our comments under serious consideration as you determine next steps. We would like to request a meeting with IDEM staff to discuss the coal ash closure at Michigan City. Please contact Indra Frank at ifrank@hecweb.org or 317-981-3207 to arrange a meeting and for any follow up questions.

Sincerely,

Indra Frank
Director of Environmental Health and Water Policy
Hoosier Environmental Council

Tim Maloney
Senior Policy Director
Hoosier Environmental Council

Bowden Quinn
Chapter Director
Hoosier Chapter
Sierra Club

John Blair
Executive Director
Valley Watch

Natalie Johnson
Executive Director

Save the Dunes

Kerwin Olson
Executive Director
Citizens Action Coalition

Jason Flickner
Director
Lower Ohio River Waterkeeper

Linda Hanson and Barb Schilling
Co-presidents
League of Women Voters of Indiana

Jo Ann Engquist
President
League of Women Voters of La Porte County

Patty Slamkowski
President
League of Women Voters of Porter County

Barb Schilling
President
League of Women Voters of Calumet Area

Lisa Evans
Senior Counsel
Earthjustice

Thom Cmar
Deputy Managing Attorney, Coal Program
Earthjustice

Jeffrey Hammons
Staff Attorney
Environmental Law & Policy Center

Colin Deverell
Midwest Program Manager
National Parks Conservation Association