

July 10, 2018

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Sent via electronic mail

RE: Comments on Tanners Creek Plant Fly Ash Pond Closure & Post-Closure Plan

Dear Mr. Hale,

The undersigned organizations are submitting the following comments on the Tanners Creek Fly Ash Pond Closure & Post-Closure Plan at the former Indiana and Michigan Power Tanners Creek Generating Station ("Closure Plan").

The Tanners Creek coal ash ponds are located in a high risk and vulnerable location

For decades, coal combustion residuals (coal ash) and other waste materials were dumped in two surface impoundments (ponds) and a fill area located in the Ohio River floodplain, within several hundred feet of the Ohio River. Only one of the ponds has a liner.¹

The ponds are located directly above, or in some cases sitting within, the shallow sand and gravel groundwater system that adjoins the river. According to the Tanners Creek Closure Plan, groundwater elevations observed in existing monitoring wells have reached elevations above the bottom level of the coal ash (458 feet) in the Fly Ash pond.²

The unconsolidated aquifer map for Dearborn County describes the Ohio River Outwash Aquifer System that lies just below the Ohio River valley as having "...large amounts of outwash sand and gravel..", and states, "These outwash and alluvial deposits form the most prolific aquifer system in the county."³

Although not subject to this closure plan, the coal ash at the nearby Main Ash pond and Old Ash Area is sitting in groundwater. The 2015 Indiana & Michigan Power Company Tanners Creek Plant Fly Ash Pond and Main Ash Pond Closure Plan, prepared by TRC Environmental Corporation, stated, "Groundwater conditions within the Old Ash Area are similar to the MAP suggestive of a shallow groundwater level perched within the CCR deposits above the sand and gravel aquifer."⁴

Groundwater contamination is present underneath the lagoons

The Closure Plan does not provide a description of water quality underneath or near the Fly Ash pond. The most recent sampling nearby the Fly Ash pond is the groundwater monitoring occurring at the site's restricted waste landfill, as required by the landfill permit. There are eight monitoring wells for the landfill.⁵ The Fall 2017 monitoring results include an arsenic concentration at one well (MW-7) of 17.1 ug/l, which is above the MCL for

arsenic of 10 ug/l.⁶ Two other wells have boron concentrations of 1180 ug/l (MW-3) and 1420 ug/l (MW-2).⁷ These levels are below the health advisory level for boron, but high enough to suggest they are a result of coal ash contamination.

Table 1 in these comments lists the highest concentrations found for four contaminants.^{8,9}

Table 1. RWS Landfill Groundwater Sampling Results		
Contaminant	Maximum concentration found in sampling events (mg/l)	U.S. EPA Drinking Water Standard (MCL), Secondary MCL, or Health Advisory Standard (HAS) (mg/l)
Boron	1.53	3 (HAS)
Arsenic	.017	.01 (MCL)
Manganese	2.58	.05 (SMCL)
Total dissolved solids	592	500 (SMCL)

The Groundwater Monitoring Plan in the Fly Ash Pond Closure Plan includes “corrective actions triggering parameters” for eight contaminants. If these triggering parameters were applied to the groundwater sampling results from the RWS landfill, the arsenic concentration trigger of .006 mg/l has been exceeded four times in the last two sampling events.^{10,11}

The Closure Plan proposes to use two of the RWS landfill monitoring wells as “upgradient” wells, even though these wells are considered downgradient wells in the landfill’s monitoring well network.¹² One of these existing wells (MW-2) intended to do double duty has exhibited high boron concentrations as noted above.

Since the wells labeled ‘upgradient’ in the Closure Plan are likely affected by coal ash contained in the landfill, Main Ash Pond or Old Ash Area, they must not be used to establish background groundwater concentrations. Tanners Creek must be required to find appropriate wells for measuring the true background concentrations in the local groundwater, wells that are not impacted by coal ash.

Because of the segmented closure planning process for the Tanners Creek coal ash ponds, the public, the affected communities, and the Indiana Department of Environmental Management have an incomplete picture of the groundwater contamination risks at the site and to the nearby public water supply wells

In 2015, Indiana & Michigan Power Company submitted a proposed Tanners Creek Plant Closure Plan for the site’s Fly Ash Pond and Main Ash Pond, including the Old Ash Area. This was a logical planning approach, given that the ash ponds were all part of the power plant’s ash disposal system, that the ash ponds share common site conditions, and that the ash ponds are all situated above the same shallow sand and gravel aquifer. The new site owners, Tanners Creek Development LLC, have chosen to proceed with separate closure plans for the two ash ponds, including groundwater monitoring networks that considered separately provide only a limited, partial assessment of the groundwater conditions, groundwater quality, and hydrology of the site. This outcome serves to inappropriately limit the state’s and the public’s consideration of whether the proposed closure-in-place approach will or will not threaten the drinking water supply for virtually every community in this area.

Tanners Creek has not adequately assessed groundwater quality at the site, whether contamination exists underneath the Fly Ash pond, and whether any present or future contamination may threaten nearby public supply water wells or contaminate the Ohio River

The Closure Plan cites past groundwater data demonstrating that the normal flow of groundwater underneath the Tanners Creek site is to the northwest, directly toward water supply wells utilized by the City of Aurora, Lawrenceburg Municipal Utilities, Greendale, LMS Conservancy, LCD Conservancy, MGPI Distillery, Proximo Spirits, and South Dearborn RSD.^{13,14} Given this groundwater flow direction, any contamination arising from the unlined Main Ash Pond and Old Ash Area, the RWS landfill, and the Fly Ash pond, will be combined and pulled toward the water supply wells due to the cone of depression these high capacity wells are creating.¹⁵

While the normal groundwater flow is to the northwest, the Spring 2018 groundwater monitoring results at the RWS landfill also reinforce that the shallow sand and gravel aquifer underneath the site is hydrologically connected to the Ohio River, and that high water flows in the river can reverse the flow direction of the aquifer.¹⁶ This monitoring event revealed a changed potentiometric condition as a result of an Ohio River flood event, with groundwater elevations up to 7 feet higher than the elevations observed in October 2017, and with the general groundwater flow reversing to the southeast and southwest. In this sampling event, one of the landfill's "upgradient" wells recorded a high arsenic concentration of 17 ug/l.¹⁷

The Closure Plan does not provide any groundwater sampling results from the existing monitoring wells at the site, either from the RWS landfill, or any monitoring wells located closer to the Main Ash Pond and Old Ash Area. The only available sampling results must be obtained from records for the nearby RWS landfill to the south of the Fly Ash Pond.

Without adequate groundwater monitoring, both at the ash ponds, landfill, and in the surrounding vicinity, the question of whether any contamination underneath the Tanners Creek ash ponds is migrating to nearby drinking water wells will remain unanswered. It is not sufficient that the water utilities conduct sampling at their own wells; by the time they detect a problem, it may be too late to protect the safety of the water produced by their wells.

The Fly Ash Closure Plan states that "Specifically, all permanent drainage controls are to be sized for the 25-year 24-hour design storm event;"¹⁸ There are two concerns with this statement. One is that with climate change, Indiana is experiencing increasing frequency of violent storms, so the current records on what constitutes a 25 year-24 hour storm may not be accurate going forward. Second, because of the enduring nature of coal ash, these structures need to contain the ash indefinitely, not just for the next 25 years. Use of a stronger standard than the 25 year-24 hour should be required.

Closure in place will not prevent continued contamination

There is no demonstration or references to case studies in the closure plan that dewatering and capping the lined Fly Ash Pond or the unlined Main Ash Pond will prevent groundwater contamination. Given that groundwater elevations may exceed the bottom elevation of the ash in the Fly Ash Pond (458 feet), as demonstrated in the Spring 2018 flood event where the groundwater reached an elevation of 461 feet, it is likely that groundwater will continue to remain a threat to re-saturate the coal ash left in place at the Fly Ash Pond, in the event the bottom liner fails, or to continue to saturate the ash at the unlined Main Ash Pond.

The record at a number of other disposal sites indicates that unlined disposal facilities will continue to contaminate groundwater even after the site is no longer in use and has been covered. Two discontinued coal ash disposal sites in Tennessee and Georgia continued to discharge high levels of boron and strontium to adjacent surface waters, according to a report published in *Environmental Science & Technology*. The authors conclude, "These examples show that the closure or disuse of coal ash impoundments does not necessarily eliminate leaking of the CCR-impacted pond water to the surrounding environment."¹⁹

Disposing of, or leaving, coal ash in the floodplain is also risky because Indiana rivers are susceptible to significant shifts in their courses over time. In 2013 the US Geological Survey published a report on channel migration rates for 38 of the largest streams in Indiana²⁰ that shows that rivers in west-central and east-central Indiana have had significant channel migration in recent years, particularly the lower Wabash River and lower White River which had among the highest migration rates. The lower Wabash and lower White River are home to coal ash disposal units at six major power plants. Where coal ash is disposed of adjacent to rivers, channel migration could erode into the ash over time causing release of the ash into the river. The image below illustrates channel migration. It is from the cover of the USGS report, and shows migration of the White River near Centerton, IN. The blue arrows point to utility poles.



Tanners Creek has failed to consider the cost of corrective action when evaluating cost of closure in place

The Closure Plan includes estimated costs, but it does not estimate the costs of corrective action for any groundwater contamination at the Tanners Creek site. Sites that have groundwater contaminated with coal ash are required to take corrective action under IDEM's Surface Impoundment Closure guidance.

As described above, if the ash is left in place, and leaching of coal ash contaminants occurs due to a failure of the Fly Ash Pond liner or due to flood damage of the pond's cover or dikes, corrective action to halt and remediate the contamination will be required. Not only will Tanners Creek have to take corrective action, but that corrective action could last for decades into the future.

Notwithstanding the exclusion in 329 IAC 10-3-1, for many years IDEM has implemented a well-established policy²¹ that the qualifying language of the exclusion requiring closure of surface impoundments to be subject "to approval by the commissioner" requires the commissioner's approval to be based on compliance with the closure requirements of 329 IAC 10-30 and 329 IAC 10-31, Restricted Waste Sites Type I and Type II and Nonmunicipal Solid Waste Landfills; Closure Requirements and Post-Closure Requirements. This requirement states at 10-31-2 that leachate must be controlled for 30 years after closure. And at 329 IAC 10-31-5 and 10-31-6, the regulation further states that even after the 30-year post-closure period the owner "shall be responsible for correcting and controlling any nuisance conditions occurring at the facility", and "shall be responsible for eliminating any threat to human health or the environment."

According to *Power Engineering*,

Potential corrective actions, such as a pump and treat system or in situ technology, have significant unknown and critically important costs. As utilities are considering future closure options, the possibility of groundwater impacts should be taken into account for those impoundments that will remain active after October 19, 2015. For these impoundments, clean closure could be more cost effective in the long run than a cap-in-place option, which has the potential for years of corrective action.²²

The cost of decades of groundwater corrective action could make a significant difference in the total closure and post-closure cost for the Tanners Creek Fly Ash Pond. If that cost is taken into account, is closure in place still the most cost-effective approach? This is a question well worth consideration. If the ash is placed into dry, lined storage or recycled into concrete, rather than being left in place, any leaching will be prevented or stopped, and there may be no need for groundwater corrective action. Preventing leaching is the most protective course for the groundwater, the public supply water wells, and the Ohio River, and it may also be the most cost-effective approach in the long run.

Tanners Creek failed to consider alternatives to closure in place

The Fly Ash Pond Closure Plan does not include an analysis of alternatives. It describes the proposal to cap the ash in place but makes no mention of what the other options might be nor does it give the reason that cap-in-place was chosen. Tanners Creek has not justified its selection of cap-in-place nor adequately accounted for how their closure plan will eliminate threats to human health and the environment in the future.

The most protective storage of coal ash is in a dry landfill on high ground with a composite liner and leachate collection and treatment. This would eliminate the need for long-term groundwater corrective action, and placement on high ground would reduce the risk of flood damage to the site's ash ponds. This alternative should be evaluated for the Tanners Creek coal ash ponds.

Removal of ash to dry, lined storage is occurring in other states

Excavation of coal ash impoundments is happening in other states for protection of groundwater and rivers. In North Carolina by court order or settlement, Duke Energy will be excavating ash from 8 of 14 coal ash sites at

Riverbend, Asheville, Sutton, Dan River, Cape Fear, Lee, Weatherspoon, and Buck generating stations. Ash from those sites will go either to dry, lined disposal sites or be recycled for concrete²³.

In South Carolina, Santee Cooper, South Carolina Electric and Gas, and Duke Energy have agreed to remove all coal ash from all unlined, water-front impoundments.²⁴ Excavation at the Wateree plant has already decreased the arsenic in the underlying groundwater.²⁵ In Florida, Gulf Power is excavating coal ash at the Scholz Generating Plant.²⁶

The proposed Tanners Creek Closure Plan violates Indiana regulation

The selection of cap-in-place is inconsistent with Indiana regulation at 329 IAC 10-30-1, which, as discussed above, IDEM looks to – pursuant to the IDEM Surface Impoundment Closure Guidance – in determining whether a closure plan is protective of human health and the environment. 329 IAC 10-30-1 states:

“Sec. 1. Owners or operators of restricted waste sites type I and Type II and nonmunicipal solid waste landfills shall close the facilities in a manner that:

- (1) minimizes the need for further maintenance;
- (2) controls post-closure escape of waste, waste constituents, leachate, contaminated precipitation, or waste decomposition products to the ground or surface waters or the atmosphere;”

With no groundwater sampling results available for groundwater beneath the Fly Ash pond or at its perimeter (except those from the nearby RWS landfill), it is unknown whether the Fly Ash Pond is causing contamination. The Fly Ash pond has a 20-mil thick PVC bottom liner.

Cap-in-place also is also inconsistent with the regulation in that it will not minimize the need for further maintenance. The Fly Ash pond sits in the 100-year floodplain of the Ohio River, though the embankments around them are high enough to be above the estimated 100-year flood level. When the river goes into flood stage, assuming it does so after the cap is complete over the ash, it will erode and damage the berms and cap and saturate the ash. If the ash were landfilled on high ground, it would lower or eliminate the risk of flood damage and reduce future maintenance.

The Closure Plan is also inconsistent with IDEM’s Surface Impoundment Closure Guidance because it does not contain a provision for financial assurance, required by 329 IAC 10-39.

Protection of Human Health and the Environment

The closure of all surface impoundments in Indiana cannot be undertaken unless and until approved by IDEM’s commissioner, and his approval is contingent on a showing that the proposed closure “is based on management practices that are protective of human health and the environment.” 329 IAC 10-3-1(9). As explained in detail herein, the Closure Plan proposed by Tanners Creek Development for the Tanners Creek Fly Ash Pond does not protect either human health or the environment because it would allow toxic coal ash constituents to pollute Indiana’s precious groundwater and the Ohio River in perpetuity. Under that standard alone, the Closure Plan must be rejected.

The Department of Environmental Management failed to post notice of the proposed closure plan on its CCR webpage or its Public Notices webpage.

Despite the agency's commitment that "Public notices related to IDEM's review of CCR impoundment closure plans, including public comment periods and final decisions are available on the IDEM Public Notices site,"²⁷ the strong public interest in this site as indicated by the extensive local media coverage, and the substantial crowd that attended a community meeting scheduled by the site owners, the Tanners Creek Redevelopment Surface Impoundment Closure Fact Sheet with the notice of a public comment period was not posted to these agency web pages.

Conclusion and recommendations

Based on the foregoing information and analysis, the undersigned recommend:

1. IDEM reject Tanners Creek Fly Ash Pond closure plan since it contains incomplete information, inaccurate analysis and unsupported conclusions and leaves a dangerous and toxic waste in place to threaten groundwater and the Ohio River into the future.
2. IDEM reject Tanners Creek Closure Plan because it violates state law pertaining to closure of toxic waste impoundments.
3. Tanners Creek be required to conduct a full cost-benefit analysis of alternatives to ensure that the most prudent and cost-effective approach is selected for cleaning up its coal ash.
4. Tanners Creek keep the public fully informed through meetings and other mechanisms so that residents and elected officials of the affected communities have complete, up to date information about the results of groundwater monitoring and how drinking water and the Ohio River are being protected.

Sincerely,

Hoosier Environmental Council
Hoosier Chapter Sierra Club
Citizens Action Coalition
Lower Ohio River Water Keepers

Cc: Rebecca Holwerda, Policy Director for Energy and Environment, Office of the Governor
Bruno Pigott, Commissioner, IDEM
Peggy Dorsey, Assistant Commissioner, OLQ
Rebecca Joniskan, Section Chief, OLQ

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- ¹ S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018
- ² S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018
- ³ Unconsolidated Aquifer Systems of Dearborn County, Indiana, Indiana Department of Natural Resources Division of Water, June 2006
- ⁴ Indiana & Michigan Power Company, Tanners Creek Plant Closure Plan, prepared by TRC Environmental Corporation, February 2015
- ⁵ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill, Tanners Creek Development, LLC, EnviroAnalytics Group, June 2018
- ⁶ Fall 2017 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill, Tanners Creek Development, LLC
- ⁷ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ⁸ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ⁹ Fall 2017 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill, Tanners Creek Development, LLC
- ¹⁰ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ¹¹ Fall 2017 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ¹² S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018
- ¹³ S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018, page 2 of Groundwater Monitoring Plan
- ¹⁴ Email from Andrew Lyons, Superintendent, Lawrenceburg Municipal Utilities, to IDEM, June 6, 2018
- ¹⁵ S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018
- ¹⁶ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ¹⁷ Spring 2018 Semi-Annual Groundwater Monitoring Report, Tanners Creek Plant Type I Landfill
- ¹⁸ S&ME, Closure Plan, Rev. 2, Tanners Creek Fly Ash Pond, Revised June 26, 2018
- ¹⁹ Harkness, Jennifer S., Sulkin, Barry, and Vengosh, Avner, Evidence for Coal Ash Ponds Leaking in the Southeastern United States, Environmental Science & Technology, May 2016
- ²⁰ US Geological Survey, Recent (circa 1998 to 2011) Channel-Migration Rates of Selected Streams in Indiana, Report 2013-5168
- ²¹ Indiana Department of Environmental Management, Office of Land Quality, Surface Impoundment Closure Guidance, Updated 01-15-2013
- ²² Yoder, S & Andrascsek, R (Dec 2, 2015). The Real Cost of the CCR Rule. www.power-eng.com/articles/print/volume-119/issue-11/departments/energy-matters/the-real-cost-of-the-ccr-rule.html
- ²³ Southern Environmental Law Center (Nov 23, 2016). Press Release. www.southernenvironment.org/news-and-press/press-releases/conservation-groups-reach-settlement-with-Duke-energy-on-sutton-coal-ash
- ²⁴ Reaves, A. (May 3, 2016). South Carolina Leads Southeast in Coal Ash Cleanup. <http://blog.cleanenergy.org/2016/05/03/south-carolina-leads-southeast-in-coal-ash-cleanup-nc-and-tn-taking-action/>
- ²⁵ Southern Environmental Law Center (Nov 23, 2016). Press Release. <https://www.southernenvironment.org/news-and-press/press-releases/south-carolina-groundwater-contamination-plummets-after-coal-ash-removal>
- ²⁶ Ammann, P. (June 24, 2015). Gulf Power settles federal lawsuit, agrees to move toxic coal ash from Apalachicola River. <http://floridapolitics.com/archives/185594-gulf-power-settles-federal-lawsuit-agrees-to-move-toxic-coal-ash-from-apalachicola-river>
- ²⁷ <https://www.in.gov/idem/landquality/2503.htm>, accessed July 9, 2018