

TOXIC TRASH EXPOSED

*Coal Ash Pollution
in Michigan*



November 2013



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Executive Summary

Water defines, and is central to, Michigan's economy. Major tourism, agriculture, and fishing industries depend on the health of rivers, lakes, and streams. The Great Lakes contain over 20% of the world's usable fresh surface water.¹ Unfortunately unmitigated coal ash pollution is a major threat to the health of the state's water and economy.

More than 1.7 million tons of coal ash, the toxic byproduct produced by coal-fired power plants, is generated every year in Michigan. Managing and storing this amount of waste safely is a challenge and presents health and environmental risks to Michigan's communities. A lack of federal protections, weak state regulations, outdated and unregulated storage areas, and historic coal ash contamination sites threaten the state's "Pure Michigan" heritage and the Great Lakes.

There are twenty-nine known coal ash sites in Michigan. Nineteen are within five miles of a Great Lake or a bay of a Great Lake, with several sitting directly adjacent to a bay. Three sites are within twenty miles of the Great Lakes. *Every single coal ash impoundment or landfill sits on or near one of the state's lakes, rivers, streams, and wetlands.*

The Twenty-nine known coal ash sites in the state include several different types of sites:

- Nine open Type III Low Hazardous Industrial Waste landfills and surface impoundments, which are licensed by the state's Office of Waste Management and Radiological Protection division (solid waste) at the Michigan Department of Environmental Quality (MDEQ.)
- Five fully, or partially closed, Type III Low Hazardous Waste Landfills and surface impoundments.
- Nine "contained waste" coal ash storage ponds that are completely unregulated by the state's solid waste authority, unless they meet the state's definition of a dam.²
- There are a total of 20 open ponds spread across these nine sites.^{3 4}
- Six historic coal ash storage areas classified by MDEQ as "Part 201" Brownfield contaminated sites.

Of the fourteen sites that were regulated by the state at some point as Type III coal ash storage areas, twelve are either known to be contaminated or considered "likely contaminated." MDEQ has reported eight sites as contaminated to the U.S. Environmental Protection Agency (EPA). Clean Water Fund's research found four additional "likely" contaminated sites. That's nearly 86% of the regulated storage sites. There are an additional six known historic contamination sites that have been identified by the state as Part 201 Brownfield sites. Unfortunately, because of a lack of data, it is unknown whether numerous unregulated "contained waste" storage ponds are also contaminating the state's water.

In addition to the threats posed by leaking coal ash storage sites, there are other serious problems created by coal ash pollution. Several of the Brownfield sites include areas where coal

ash was historically disposed of in unlined pits or trenches as construction fill, which is allowed under “beneficial reuse” provisions of Michigan law. Disposing of coal ash in this manner exposes the surrounding community to contamination during storm events. Moreover, the majority of power plants in the state are allowed to discharge toxic pollution directly into the state’s water without limiting harmful pollutants like mercury and lead.

The state is not living up to the promise of “Pure Michigan.” The Governor’s 2014–2015 Executive Budget provides the “Pure Michigan” tourism campaign with \$29 million⁵ from the state’s general fund allocations. In contrast, the Michigan Department of Environmental Quality (MDEQ) is only allocated \$28.1 million which must cover all of the department’s work including oversight of solid waste and cleaning-up programs.⁶ This limited funding for environmental regulation puts Michigan’s water at risk.

The state can and must do more to protect public health and water quality by overseeing handling and disposal of coal ash and clean-up contaminated and leaking coal ash sites. Weak state regulations are compounded by the absence of strong U.S. Environmental Protection Agency (EPA) rules addressing the long-term disposal of coal ash and water pollution from power plant coal ash ponds. EPA risk assessments have long shown that the dangers of coal ash pollution and the risks to human health and the environment are real. These assessments show the need for strong regulations to prevent water and air pollution and to protect public health. *However, in practice, coal ash is less regulated than household trash.*

Coal ash contamination is preventable. Yet, without minimum federal standards to control this toxic waste, coal ash will continue to be managed through a patchwork of weak state standards. This situation has allowed the water, air and land in at least 37 states to be poisoned, including Michigan.⁷

Overview: The Dangers of Coal Ash

Coal ash is the general term for fly ash, bottom ash, coal slag, coal combustion waste, and coal combustion residues. It also refers to Flue Gas Desulphurization (FGD) byproducts commonly called “scrubber sludge.” FGD is the process used to remove sulfur dioxide from power plant smokestacks, which leaves behind a concentrated toxic sludge. As facilities install new scrubbers to comply with federal air pollution regulations, the concentration of toxic chemicals and heavy metals in coal ash will increase.⁸

The toxic substances commonly found in coal ash, including mercury, lead, vanadium, selenium, and arsenic, are known to pollute water and air and pose public health risks. For example, a person who drinks water polluted with arsenic has a cancer rate as high as one in



Monroe Power Plant, Monroe, Michigan.

fifty.⁹ Lead, mercury, and other heavy metals in coal ash may cause developmental disabilities in fetuses and children.¹⁰ Coal ash may harm wildlife, too; for example, selenium can cause mutations in fish.¹¹ These toxic elements can migrate from disposal sites and pollute the environment. Dry coal ash can blow away as “fugitive dust” and wet coal ash can percolate through soil and pollute drinking water. Coal ash also can mix with stormwater and drain directly into Michigan’s waterways.

Compounding these risks is the sheer amount of waste produced by coal-fired power plants. *The Environmental Protection Agency (EPA) estimates that U.S. power plants produce 140 million tons of coal ash annually* — more toxic waste than any other industry.¹² Yet there are no federal regulations to ensure communities and wildlife are protected from this toxic waste and most state regulations are nonexistent or weak. This means that *the majority of coal ash is disposed of in unlined landfills or wet impoundments (often called ash ponds) while the rest is used as construction fill or recycled in some other form.*

Many disposal sites lack adequate safeguards such as protective liners or groundwater monitoring and many of the impoundments are nothing more than earthen dams. This leaves nearby communities and wildlife at risk from potential large scale disasters, like the massive Tennessee Valley Authority (TVA) coal ash spill in Tennessee in 2008 that dumped more than one billion gallons of coal ash into the Emory and Clinch Rivers, destroyed three homes and damaged dozens more.¹³ This spill was caused when an unstable coal ash impoundment (or wet pond) failed.

In response to the TVA disaster, on June 21, 2010, EPA proposed a rule to regulate coal ash disposal under the Resource Conservation and Recovery Act (RCRA.) Nearly 450,000 people submitted comments in support of EPA’s proposal, including Clean Water Action members and supporters who traveled to Chicago, IL to provide in-person comments to the EPA in support of a strong coal ash rule. However, more than three years later, a rule has yet to be finalized by the EPA.

EPA’s proposed rule has been under constant attack by some members of Congress. Legislation has been introduced multiple times to limit federal standards and enforcement by the EPA. The U.S. Congressional Research Service has three times found these proposed bills to be inadequate to protect human health and the environment from the dangers of coal ash.¹⁴

“...[G]iven the potential gaps in existing state programs to regulate [Coal Combustion Residuals (CCRs)] CCRs, a program that would continue to allow states flexibility to regulate CCR disposal as they deem necessary would not necessarily fill those gaps — potentially allowing waste management practices identified by EPA as those posing a risk to human health to continue.”

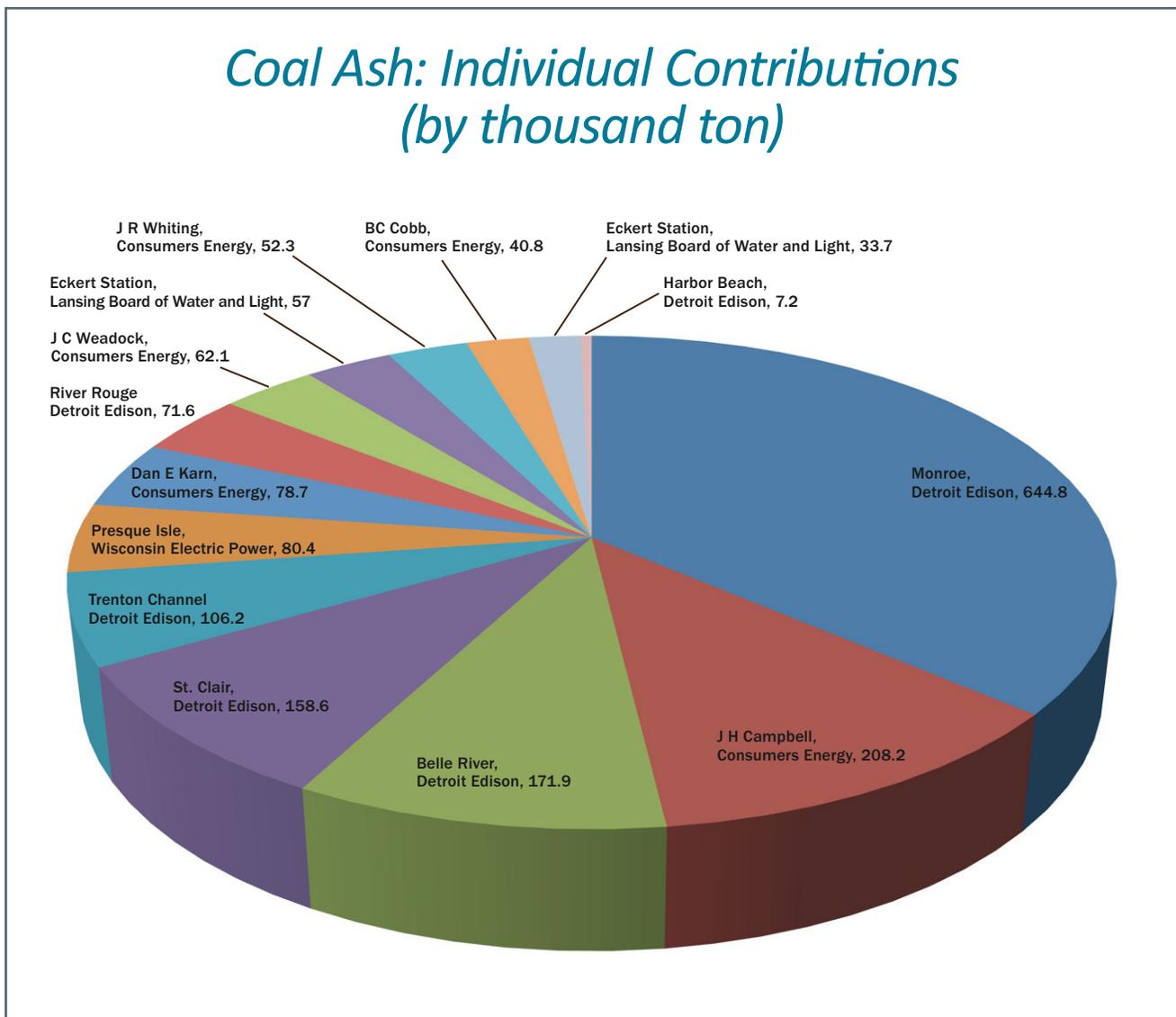
— Excerpt from March 2013 Congressional Research Service Report ¹⁵

In addition to not adequately protecting water or health, these proposed bills fail to address how to manage existing coal ash disposal sites such as leaking landfills and unregulated “contained waste” storage ponds. These proposals to block federal oversight coupled with a lack of deadlines for states to set standards means there could be no improvements on the safety of coal ash storage sites. Instead of allowing EPA to set science and health based standards, the proposed legislation would continue to rely on the weak patchwork of ineffective state laws that provide few safeguards to protect communities from harmful coal ash pollution.

Coal-fired Electric Power Plants in Michigan

Electric generation in Michigan is highly dependent on coal. More than 54% of the state's electricity comes from coal fired power plants.¹⁶ For example, Detroit Edison generates approximately 80% of its electricity from coal.¹⁷

Currently, there are 23 coal-fired power plants operating¹⁸ in Michigan. Combined, the plants produce over 14,816 Megawatts (MW) of electricity annually and create millions of tons of pollution, including coal ash and toxic water pollution. Small plants are exempt from national reporting requirements and the state does not collect that type of data, so the exact amount of coal ash produced annually in Michigan cannot be determined. However, according to the U.S. Energy Information Administration, over 1.7 million tons of ash is generated annually by the 14 largest coal-fired power plants in the state.¹⁹ *For more information: See Table 1: Coal Fired Power Plant Pollution in Appendix H.*



Coal Ash Management in Michigan

Toxic coal ash dumps are scattered across the state's two peninsulas. All of these sites are located on or very near lakes, rivers, streams, or wetlands. Under Michigan law and MDEQ regulations coal ash can be disposed of in a variety of ways including:

- Used as construction fill.
- Disposed of in municipal landfills.
- Disposed of in low-hazardous industrial waste landfills and surface impoundments.
- Stored in "contained waste" piles and surface impoundments (ponds).

Beneficial Reuse Under Michigan Law

Under current state law, coal ash is exempt from solid waste requirements if it meets certain specifications for "reuse."²⁰ However, that includes allowing it to be used as fill in road or construction projects, creating the potential for contaminants to seep and enter ground or surface water.

There are two types of reuse: *Encapsulated* and *Unencapsulated*. Encapsulated reuse chemically binds ash with another substance, like concrete. In theory, encapsulating coal ash will keep it from migrating into soil, surface, and ground water. There is still a need to test encapsulated uses over time for radiation levels and toxic leaching, but in general this practice is thought to be less harmful than unencapsulated uses.

Unencapsulated reuse of coal ash, like construction fill or road base or agricultural applications are not considered to be "beneficial" by EPA. Over one quarter of the known coal ash damage cases cited by the EPA in its 2010 proposed rule were caused by unencapsulated coal ash reuse. For example, in Pines, Indiana, drinking water wells were contaminated by arsenic and other harmful substances because coal ash was used as fill under new roads and construction sites around the city.²¹

Despite the risks to public health and the environment from unencapsulated coal ash reuse, it is allowed under Michigan state law if it meets certain specifications.²² These requirements — disposal depths must be greater than four feet from the seasonal water table and ash must be covered with impermeable substances (though that can be waived by the MDEQ) — seem protective, but in practice there are no real safeguards for human health from leaching contaminants. For example, there are no requirements that fill areas be lined, that leachate be drained and collected, or that nearby ground or surface water be monitored for contamination.

The State's Office of Regulatory Reinvention and certain lawmakers want to expand the unencapsulated reuse of coal ash, and other harmful industrial waste products like cement kiln dust. These proposals would allow the unencapsulated coal ash to be used in road shoulders covered with permeable gravel or applied to agricultural fields. Such uses are dangerous and should be avoided. Instead of weakening protections, Michigan should move forward with regulations that only permit encapsulated coal ash reuse while beginning a long term study of such methods for safety.

Michigan Department of Environmental Quality Regulations on Disposal of Coal Ash

In addition to reuse, Michigan allows coal ash to be disposed of in dry landfills or wet storage ponds, most of which are unlined or lined only with clay. These permanent disposal facilities are called "Type III Low Hazardous Industrial Landfills"²³ and are licensed under the state's solid

waste program. However, many of these permanent disposal sites were “grandfathered in” so requirements for solid waste landfills don’t apply.²⁴ These sites have no synthetic liners,²⁵ liquid waste seepage, or leachate collection.²⁶ Current Michigan regulations allow low permeability soil,²⁷ clay, and other natural liners to be used for even new Type III landfills.²⁸

“Contained waste” piles of coal ash are typically ponds that are unregulated by the state,²⁹ unless dam safety requirements apply. Under Michigan rules, the “storage of solid waste in a pile shall not constitute disposal if the pile has a containment system that is designed, installed, and operated to prevent any migration of accumulated liquids out of the system to the soil, groundwater, or surface water at any time during the use of the system.”³⁰ Certain specifications must be met for waste pile containment, such as ensuring the pressure of the liquid waste can be endured. This has allowed waste ponds to exist at most, if not all, of the state’s power plants without state oversight, though several plants have associated solid waste landfills that are regulated or sought regulation for an impoundment.

In Michigan, coal ash may also be disposed of in municipal landfills³¹ designed for household trash. Municipal solid waste landfills are required to install liners and systems to collect leachate to minimize water pollution and to monitor nearby water quality. Unfortunately these requirements are designed for household trash, not the contaminants in coal ash waste. Due to inadequate record-keeping the state does not know how much coal ash is being disposed of in solid waste landfills or whether this ash is polluting water near landfill sites.

Coal Ash Sites in Michigan

In Michigan, there are twenty-nine known coal ash sites; twenty three are impoundments or ponds and six are “Part 201” Brownfields. The majority of these sites are within a short distance of the Great Lakes and all of the sites are located on or very near bays, rivers, or wetlands. Many sites are bordered by water and some are near stormwater drains that channel runoff into streams, rivers, and other surface water.

The twenty-three coal ash storage sites in Michigan include three different types of sites: regulated Type III landfills, both open and closed; regulated Type III surface impoundments, or ponds, both open and closed; and lastly, unregulated “contained waste” storage sites.

Licensed Solid Waste Facilities

Open Type III Coal Ash sites

Type III Low Hazardous landfills are monitored by the state’s Office of Waste Management & Radiological Protection and must in theory meet solid waste disposal requirements. However many of these sites are exempted from requirements, such as waivers for ongoing water quality testing and discontinuation of all testing for certain contaminants.

There are nine open Type III sites in the state, used primarily for coal ash storage: DE Karn in Essexville, JC Weadock in Essexville, JH Campbell in West Olive, JR Whiting in Erie, Monroe Power Plant in Monroe, Presque Isle Power Plant in Marquette, Range Road landfill in China Township, Sibley Quarry in Trenton, and Zeeland Township in Zeeland. The Campbell, Whiting, and Presque Isle sites include some retired landfills but are still actively accepting waste. [For more information, see Table 2: Open Licensed Coal Ash Type III Waste Areas in Appendix H.](#)

Closed Type III Coal Ash Sites

There are five Type III coal ash sites that were formerly licensed to accept solid waste but are now closed. All of these sites are known to be contaminated by the state.³²

The five closed Type III sites are: BC Cobb, Muskegon; Muskegon County Landfill, Muskegon; North Lansing Landfill, Lansing; Pine Hill Landfill, Marquette; and Warden Station, L'anse. Most of these sites were regulated as landfills rather than wet ash storage ponds. The BC Cobb plant's Regulated Type III landfill was closed but the site still accepts waste in their 10 unregulated "contained waste" storage ponds. *For more information: See Table 3: Closed Licensed Coal Ash Type III Waste Areas in Appendix H.*



St. Clair Power Plant, St. Clair Michigan

"Contained Waste" Storage Sites

As discussed earlier, contained storage areas are unregulated by the state. However, EPA required utilities to submit information on these storage ponds after the Tennessee coal ash spill, so information exists on the number of ponds, whether they are lined, and what waste they receive.

Clean Water Fund's analysis of these reports shows that there are at least 46 open primary (e.g., a bottom ash basin) and non-primary (e.g., an overflow pond) ash storage ponds and at least three retired ash ponds in Michigan.³³ However, a large number of those ponds are at Licensed Type III coal ash storage areas that also have landfills or the surface impoundment itself is licensed under the solid waste rules. Many of these sites were reported to the EPA as "lined" but only have natural clay lining. *For more information, see Table 4: Unregulated "Contained Waste" Storage Ponds in Appendix H.*

Part 201 Brownfield Sites

Clean Water Fund's research³⁴ identified several sites that were used to store coal ash prior to the creation of the state landfill rules. Due to the fact that these sites were never regulated storage areas, and because contamination is present, they are considered to be "Part 201" or Brownfield sites.

At least six known Part 201 Brownfield sites³⁵ have been identified by the state: Comfort Street Site, Lansing, Former Consumers Energy site, Kalamazoo, GenCo "Historic Coal Ash Dump," Marquette, MLK/Grand River Street Site, Lansing, Michigan State University, East Lansing, Wolverine Advanced Power Plant, Eveline. *For specifics on these sites, see Appendix B.*

Cleanup and management of Brownfields is the responsibility of MDEQ's Remediation and Redevelopment division. One of the goals of the Brownfield program is to create incentives³⁶ for clean-up of property. Unfortunately, with one exception, none of these historic coal ash sites have been remediated.

One of the issues is that the Part 201 program simply requires a "Due Care" standard from owners of contaminated sites. "Due Care" only requires operators keep contamination on site



Eckert Station, Lansing

from worsening and: “[prevent] unacceptable exposure to hazardous substances, mitigate fire and explosion hazards due to hazardous substances, and allow for the intended use of the facility in a manner that protects the public health and safety.”³⁷ There is also a requirement to notify the state of activities and to take “reasonable precautions.” Due to the shortcomings of the “Due Care” provisions in the state’s Brownfield program, many of these sites continue to leak contaminants into our water.

Beyond the weak “Due Care” provisions, there are other components of the Part 201 program that weaken its effectiveness. For example, some contaminated sites are allowed to comply with the law by using Groundwater/Surface Water Interface

(GSI) and mixing zone criteria.³⁸ The GSI takes into account the path water takes when it vents from ground to surface water and, when mixing-zone criteria are used, water is tested at that point where the ground and surface water mix. In this case the pollution is diluted and different standards are set rather than the generic GSI standards.³⁹ This method is a sub-optimal way to test for contamination.

Another weakness in Michigan’s Brownfield program is the use of site-specific criteria.⁴⁰ Instead of across-the-board standards for water quality, the state allows facilities to judge compliance based on individual site characteristics such as “background levels” that account for high levels of historic pollution. Instead of setting a “floor” for contamination, the minimum requirements are only the level of pollution that surrounds a certain site.

While there is one exception (the Wolverine Advanced Power Plant on Lake Charlevoix is being redeveloped into a marina and condominiums), the state has failed to clean up these Brownfields. All of the known coal ash Brownfield sites are located right near or on the water. The GenCo site in Marquette is leaking directly into Lake Superior and the Comfort Street and MLK/Grand River sites in Lansing are located on the Grand River. The Former Consumers Energy site is near the banks of the Kalamazoo River. The Michigan State University site has coal ash located less than a mile from the Red Cedar River and also near lakes and wetlands.

These contaminated sites pose a real threat to Michigan’s water. It is unclear how many additional sites are leaking toxic pollutants into the state’s land and water because not all coal ash Brownfields are documented. Until these Brownfield sites are adequately cleaned up, they will continue to pollute Michigan’s lakes, streams, and rivers with toxic pollution.

Coal Ash Contamination in Michigan

In addition to Brownfield sites, licensed Type III toxic coal ash dumps have also contaminated Michigan’s ground and surface water. Clean Water Fund’s analysis of water quality data indicates that there are additional sites in the state that are “likely contaminated” under national thresholds for harm to human health.⁴¹ Since contained waste piles are not regulated by the state, water quality data is not available and it is impossible to know if these sites are contaminating our water.

Clean-up Rules for Licensed Coal Ash Storage Areas

Remediation of coal ash sites previously licensed by the state as Type III coal ash storage areas falls under “Part 115” of Michigan’s Natural Resources and Environmental Protection Act (NREPA) and is overseen by MDEQ’s Office of Waste Management and Radiological Protection. Many of the clean-up standards for the Part 115 program allow for the use of criteria as set by the Part 201 Brownfield program, like GSI mixing zone criteria and site specific criteria. Part 115 requires pollution from a formerly licensed site be addressed either through removal of hazardous substances from an aquifer or through natural processes (e.g. time and dilution).⁴²

Even though weaknesses in state regulations allow lenient water quality criteria and don’t require clean-up of all sites, some coal ash sites have been closed in whole or in part because of demonstrated contamination. Under MDEQ rules, licensed solid waste facilities that do not comply with performance standards,⁴³ including not meeting applicable water quality standards⁴⁴ and/or site specific and mixing zone criteria must enter into negotiations to address the pollution. This usually ends in a Response (or Remedial) Action Plan (RAP) which could include fines and Consent Agreements where closure of all or part of the site is required. RAPs⁴⁵ are also required to contain specific water quality monitoring requirements. [See Appendix D for more on RAPs for known contaminated sites.](#)

Known Damage Cases

In its comments to the EPA regarding the proposed coal ash rule, Michigan provided an overview of eight known damage cases from Licensed Type III coal ash storage areas.⁴⁶ These sites are: BC Cobb in Muskegon, the JH Campbell site in West Olive, the Muskegon County landfill in Muskegon, the North Lansing landfill in Lansing, the Pine Hill landfill in Marquette, the Presque Isle plant site in Marquette, the Range Road landfill in China Township, and Warden Station in L’anse. [See Appendix C for background information on these sites, including nearby water sources and evidence of contamination.](#)

Some of the closed landfills are being remediated. Consumers Energy plans to turn the BC Cobb landfill into a soccer and outdoor recreation complex. Though the state closed the regulated landfill at the plant, Consumers Energy still maintains unregulated “contained waste” ponds at the Cobb site.

Other known contaminated sites include the Presque Isle Power Plant landfill in Marquette and the Range Road landfill in China Township. Two of the three sections of the Presque Isle landfill were closed by the state, while one remains open to accept waste. The Range Road landfill still accepts waste from Detroit Edison’s St. Claire and Belle River plants in the portions of the landfill that are lined by clay versus the sandy areas, which were closed in the 1990s. However, Clean Water Fund’s analysis of water quality data from the Range Road site indicates the presence of high levels of dangerous contaminants like boron, manganese, and sulfate.

At most disposal sites, it appears that utilities do not test for all groundwater contaminants of concern such as hexavalent chromium, which is highly carcinogenic and a rising cause of drinking water contamination across the country.⁴⁷ The difference in the number of monitoring wells between sites is also troubling — some sites, like Cobb, have three wells while there are forty wells at the nearby Campbell plant. Both are owned by Consumers Energy.

Addressing the ongoing pollution from these closed sites to protect public health and water quality in Michigan should be a priority.

Suspected Contamination Sites

Both the DE Karn site and JC Weadock sites were identified as “proven damage cases” in the 2010 Environmental Integrity Project and Earthjustice report, *“Out of Control: Mounting Damages from Coal Ash Waste Sites.”* However, the state disputes this finding.⁴⁸ It claims the water quality monitoring results do not prove a statistically significant increase in contamination over baseline levels. Yet Clean Water Fund’s analysis found that thresholds for arsenic, boron, sulfate, and chromium thresholds were exceeded at the Karn site. At the neighboring Weadock site, arsenic, boron and sulfate thresholds were met or exceeded EPA Maximum Contaminant Levels (MCLs). Compounding matters, these two landfills are adjacent to Saginaw Bay on Lake Huron. It is likely that these two Consumers Energy coal ash sites pose a threat to the surrounding communities’ water.



DE Karn - J.C. Weadock Generating Complex, along the Saginaw Bay shoreline

Very little water monitoring has been conducted at other disposal sites, and where monitoring has been done, contamination has been found. Data reveal that the one monitoring well at the Monroe surface impoundment has exceeded MCL thresholds for arsenic and sulfate; this site is next to Plum Creek, which flows into the River Raisin. All that separates the site from Lake Erie is a 200-acre peninsula. In addition, EPA has rated the Monroe plant’s impoundment a “significant hazard” that could pose grave environmental harm if there was a breach of the impoundment’s 35-foot earthen walls.⁴⁹

The bottom line: Coal ash disposal is poisoning Michigan’s water. Out of the 14 sites that are or were regulated by the state as Type III coal ash storage areas, 12 (86%) are either known to be contaminated or are “likely contaminated”. Based on Clean Water Fund’s analysis of state monitoring data, there are another four “likely contaminated” sites. Contamination from unregulated impoundments is unknown due to the lack of data, but is likely based on the lack of safeguards in place such as protective liners.

Data Gaps

Lack of water monitoring data prevented an analysis of potential contamination at two landfills, JR Whiting and Zeeland.

A clear data gap at the federal level is that some plants are known to have coal ash contamination even though they don’t report this information to the EPA on their unregulated “contained waste areas.” For example, the TB Simon plant at Michigan State University is built on historic coal ash contamination and much of the surrounding area of campus is a coal ash Brownfield site.

In addition to lack of water monitoring data, the threat posed by unregulated “contained waste piles” highlight insufficiencies of the Michigan program. There are nine total sites where

there are only unregulated “contained waste” ponds. These unregulated coal ash storage sites are: Belle River/St. Clair, Erickson Station (except dam safety), Harbor Beach (retired), J.B. Sims, James DeYoung, River Rouge, Shiras, and Trenton Channel. *Because these sites are not regulated, we have no information on whether or not they have contaminated ground or surface water in the surrounding communities.*

Some of the plants with unregulated ponds are especially concerning, such as the Trenton Channel plant in Southeast Michigan. The Trenton ponds are near the banks of the Detroit River, which flows into Lake Erie. Reported equipment failures in 2013 caused fly ash to rain down on neighborhoods surrounding the plant.⁵⁰



Coal Ash Sludge in Tennessee.

Impoundment Structural Integrity and Dam Safety

In the wake of the TVA coal ash disaster in 2008, it is impossible to ignore the problem of structural instability of coal ash impoundments. Storage ponds across Michigan and the country threaten water quality because they are made of earthen dams that could rupture and dump coal ash slurry directly into neighboring water bodies when improperly drained or poorly maintained and monitored. Even though the potential for environmental harm is high, only a few surface impoundments in the state have been assessed by EPA for structural integrity: the Erickson site in Lansing, the Karn/Weadock site in Essexville, the Monroe impoundment in Monroe, and the Whiting plant in Erie.⁵¹ *See Appendix G for more details.*

EPA’s impoundment integrity assessments found that two impoundments, Monroe and Whiting, potentially pose a “significant hazard” to Michigan’s natural resources and local property values. Both of these sites pose a direct threat to Lake Erie if the impoundment walls breach. The Erickson plant was not given a final determination because the site is being excavated while a new surface impoundment is built in a smaller area of the existing site.

The data submitted to the EPA demonstrate that these coal ash dams pose real threats to water quality and public health. Even worse, without data on unregulated ponds, it’s difficult to determine whether progress has been made by the owners to address impoundment structural issues.

The Clean Water Act and Power Plant Water Pollution

Another source of toxic water pollution is the wastewater from coal ash storage ponds and FGD scrubber sludge from power plants. This wastewater comes from wet coal ash handling practices that sluice ash out of boilers and transport ash in a slurry to storage ponds. Once the ash solids settle to the bottom of the pond, water is siphoned off and discharged into a stream, lake, river or bay. Coal plants receive permits to pollute under “Part 31,” the section

of Michigan's rules that cover state implementation of the federal Clean Water Act's National Pollution Discharge Elimination System (NPDES) program.

Power plants are responsible for more than half of the nation's toxic water pollution yet most are not required to limit the amount of heavy metals and other toxic pollutants that they discharge into surface water. In fact, federal standards to control power plant water pollution haven't been updated in more than 30 years. In June 2013, EPA proposed new standards that, if finalized in their strongest form, would drastically reduce toxic water pollution from power plants.

Not only do most power plants not limit the amount of metals such as arsenic, mercury, and lead they discharge, most plants do not even monitor their wastewater discharges for these pollutants. Under EPA reporting requirements, some toxic pollution from power plants is tracked in the Toxic Release Inventory. *Michigan's toxic release inventory data for surface water pollution is included in Appendix H, Table 1. Information on plants with NPDES permits is in Appendix H, Table 5.*

Some of these power plants even discharge toxic wastewater directly into rivers, lakes or streams that are known to be "impaired" because of a pollutant associated with wastewater discharges. *For more information, see Appendix H, Table 5 for a list of power plants that discharge coal ash wastewater.*



Policy Recommendations

A strong federal coal ash disposal rule is essential for protecting public health and water quality from toxic coal ash. A patchwork of weak state regulations has not solved the coal ash disposal problem. Though EPA proposed a coal ash rule over three years ago, a final rule has still not been issued.

Clean Water Fund recommends the following policy changes:

- Phase-out unsafe structural disposal of coal ash as construction and road fill and ensure “beneficial reuse” exemptions apply only to encapsulated coal ash recycling.
- Require storage of all coal ash (including legacy coal ash) in lined landfills that have, at a minimum: composite liners or synthetic membranes; leachate collection systems; and require standardized water quality monitoring for all contaminants of concern.
- Ban new construction of “contained waste” storage ponds and assess structural safety of all existing impoundments and ponds.
- Clean-up all leaking coal ash sites with at least active remediation when excavation is infeasible.
- Control fugitive coal ash dust at all sites, including excavation of historic coal ash sites and Type II municipal landfills.
- Ensure water quality testing results are easily available to the public.
- Increase funding for MDEQ, including providing adequate resources for enforcement actions on leaking Brownfield coal ash sites.

The long-term solution to coal ash pollution in Michigan is a transition to cleaner sources of electricity including wind and solar while investing in more energy efficiency. These bigger investments in energy efficiency and renewables will allow dirty coal plants to retire, leading to a reduction in the amount of coal ash produced. Communities must begin to develop Sustainable Community Energy Plans to transition to a clean energy future and to replace aging coal plants’ electricity, jobs, and tax revenue. Remediation of existing coal ash pollution at sites across the state is also a vital component of any plan.

The owners of the James DeYoung plant in Holland near Lake Macatawa have discussed the possibility of retiring coal units at the plant as part of community energy planning conversations, though there has not been a solid commitment to retire the plant. However, the specific details of what would be done to clean up the unregulated “contained waste” pond were not outlined during the community energy planning discussions.

Conclusion

Coal ash disposal sites across the state are leaking harmful contaminants such as arsenic, lead, mercury and selenium into Michigan's ground and surface water.

The findings of Clean Water Fund's research are alarming. There are twenty-nine known coal ash storage areas in Michigan, both regulated and unregulated. *Every single site sits on or near one of Michigan's many lakes, rivers, streams, and wetlands.* Twelve of the fourteen sites that were regulated by the state at some point as Type III coal ash storage areas are either known to be contaminated or considered to be "likely contaminated." There are also at least six known Part 201 Brownfield sites that were primarily used as coal ash storage.

Dam safety is also an issue when it comes to coal ash storage. The ecological devastation after the TVA coal ash disaster and the collapse of a Wisconsin plant's historic coal ash storage area, which dumped ash into Lake Michigan in 2011,⁵² highlight the potential risks when dams are not properly regulated. Two dams in Michigan, one at Detroit Edison's Monroe plant and the other at Consumer Energy's JR Whiting plant are considered by the EPA to pose a "Significant Hazard" to the environment and surrounding communities.

Additional problems include outdated federal regulations that allow coal plants to discharge toxic wastewater into streams, rivers, lakes and bays. These discharges account for more than half of the nation's toxic water pollution.

Compounding the pollution problems are gaps in the data about contamination. This lack of available information about potential additional contamination is troubling. For example, there is an unknown amount of pollution leaking from the nine sites with "contained waste piles." These piles are actually multiple coal ash surface impoundments, or ponds, on each site and are completely unregulated by the state's solid waste division. There is also an unknown amount of pollution leaking from road and construction projects in which coal ash was reused as fill.

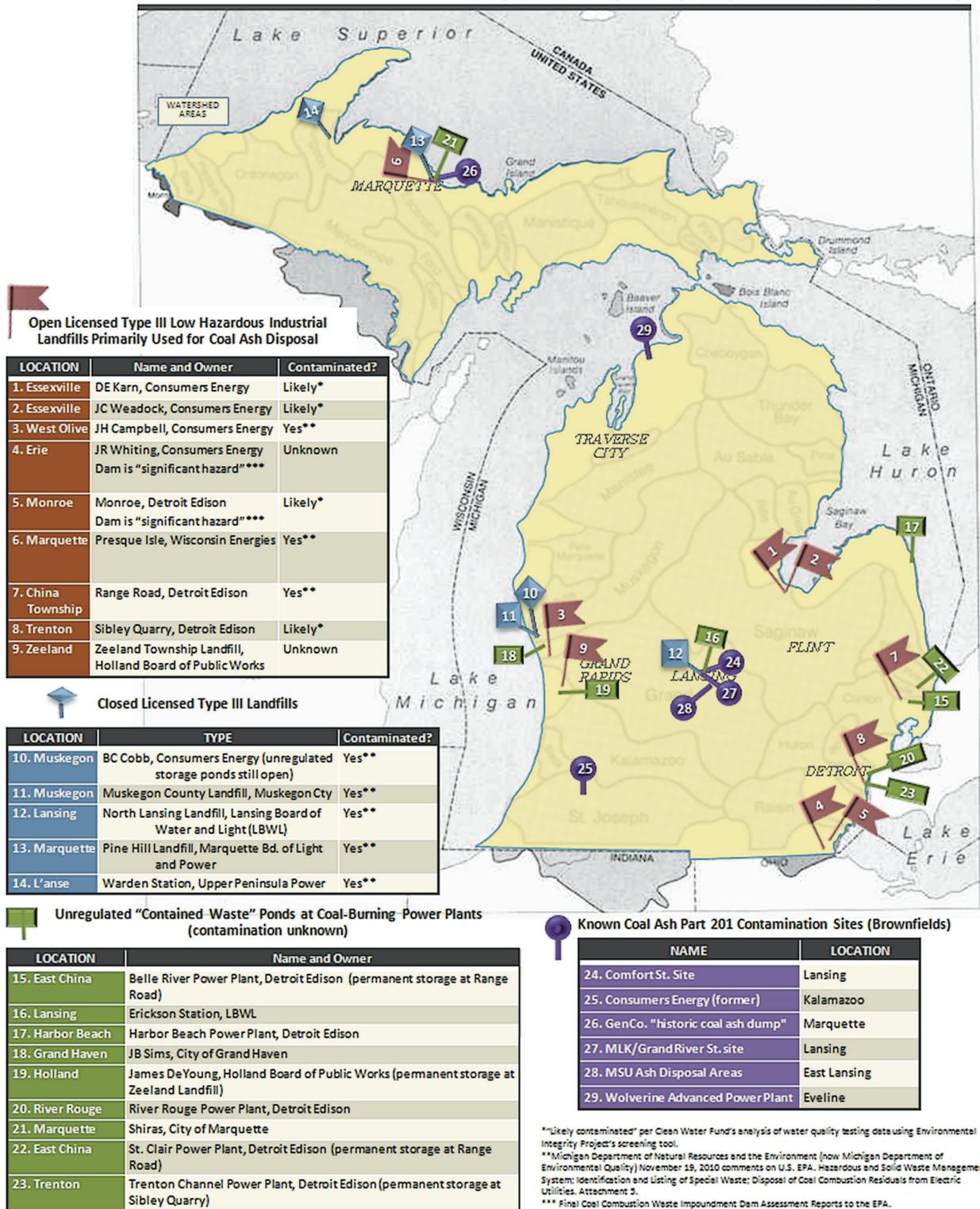
Despite loopholes and exemptions in state law that make data collection difficult, what little information that is available clearly shows a majority of the sites are currently or likely contaminating Michigan's ground and surface water. It's clear the state is not properly protecting Michigan's lakes, rivers, and streams and is not fulfilling the promise of "Pure Michigan".

While EPA is finalizing minimum regulations for coal ash and limits to water pollution from coal plants, Michigan has an opportunity to do more to protect citizen's health and the health of the state's water by ending unsafe handling and disposal of coal ash and clean-up of leaking coal ash sites. To facilitate this process, Michigan should commit to providing better public information on coal ash storage sites and require enforcement by the MDEQ of known coal ash contamination sites. Utilities also need to work with communities to transition to a clean energy future by retiring coal plants, remediating polluted coal ash sites, and creating new investments in Michigan-made renewable energy technologies.

"Pure Michigan" must be more than an empty promise. It's time for the state to protect water by cleaning-up toxic coal ash trash dumps and transitioning to a clean energy future.

APPENDIX A

Map of Coal Ash Storage Sites in Michigan



APPENDIX B

Known Part 201 Coal Ash Sites

A Brownfield listed by the state as a “Part 201 Facility” means that contamination is present at the site.

Comfort Street Site, Lansing

Background: The site is owned by the Lansing Board of Water and Light (LBWL) and accepted ash from 1964 until 1978.⁵³ The total size of the parcel is listed as 51 acres, with ash stored in a 30-acre plot. However, some documents refer to the site as 65 or 80 acres for the coal ash storage area alone. The site is adjacent to the Grand River and is sloped toward the river and stormwater drains directly into it. The LBWL is currently undergoing mitigation including excavation of coal ash and disposal in a licensed Type II lined municipal landfill with leachate collection and other protections. The project is estimated to continue through 2013. It appears that some elements of “Due Care” requirements may not be currently met, such as “reasonable precautions” since the area is frequented by neighbors despite the no trespassing signs.

Proven contamination: The City of Lansing considered purchasing the land for use as a park and discovered the coal ash disposal area in 2002. Testing confirmed state Part 201 standards were exceeded, thereby classifying the area as a “facility.”

Constituents of concern: Aluminum, arsenic, boron, chromium, iron, lithium, magnesium, manganese, molybdenum, nickel, lead, selenium, strontium, sulfate, and zinc.

Type of contamination: Soil samples showed that arsenic exceeded the state’s standard for direct contact with skin. Boron, cadmium, chromium, nickel, selenium, strontium, and zinc are all above MDEQ Groundwater Surface Water Interface Criteria.

Nearby water: Bordered by the Grand River in addition to a pond and wetlands on site.

Other issues: Former owners of the site contracted with the military to create munitions, and buried drums were discovered, which potentially contributed to contamination on the site; Nearby Ashland Chemical, a federal contamination site, has also polluted the groundwater; There is some soil erosion into the river and NPDES permit was issued for construction runoff during ash excavation; The Comfort site feasibility study proposed deed restrictions to restrict new water wells in the area, but it is not clear whether such restrictions are currently in place; The proposal also identified the need for a large fence to be built to control access. Currently neighbors are known to trespass in the wooded area

and already use it as parkland though there are dermal contact and inhalation hazards.

**Groundwater sampling was done.*

Former Consumers Energy site, Kalamazoo

Background: Site of the former Consumers Energy manufactured gas plant includes an eight acre fly ash disposal area that is twenty to thirty feet deep.⁵⁴ The area is now owned by the city of Kalamazoo, and is exempt from “Due Care” obligations.

Proven contamination: In tests, arsenic⁵⁵ exceeded background levels.

Nearby water: Adjacent to the Kalamazoo River.

Other issues: In addition to coal ash metals, other contaminants like PCBs exist on the site; a company located next door to the site decommissioned leaking storage tanks and potentially added contamination to the site.

**No groundwater testing has occurred, but was suggested as part of remediation.*

GenCo “Historic Coal Ash Dump,” Marquette

Background: The approximately twenty-two acre site received ash from the Presque Isle plant from 1967–1977.⁵⁶ The landfill was closed and covered with soil and vegetation. The site is now owned by Cleveland-Cliffs.

Constituents of concern: Boron, sodium, sulfate, and manganese. Also present in the groundwater plume are chloride, arsenic, lithium, and selenium.

Proven contamination: Cleveland-Cliffs submitted documents in 2002 to MDEQ showing a groundwater plume to have migrated into neighboring properties, one of which is owned by Middle Island Point Campers Association.⁵⁷ Boron, sulfate, sodium, manganese, and ammonia have been found in Turtle Lake and exceed generic clean-up levels by 14 times.⁵⁸ Levels of boron in the groundwater plume reached 17.2 mg/L — grossly exceeding the state’s drinking water clean-up standard for boron of .5 mg/L).

Nearby water: Lake Superior is 4,000 feet away from the site. Turtle Lake and its marshes are directly next to the ash storage area. Compeau Creek and the Dead River are also near the site.

Other issues: MDEQ memos reveal many inadequacies of testing protocol including filtering metal samples, thereby reducing concentrations. The company

APPENDIX B

Known Part 201 Coal Ash Sites (cont.)

requested mixing zone criteria in 2006 for contaminated groundwater venting into Lake Superior, however a Remedial Action Plan must first be submitted before mixing zone criteria can be granted.

**Groundwater testing has been done.*

MLK/Grand River Street Site, Lansing

Background: In 1998, during construction of the Lansing Avenue Pump Station, a resident notified the city that soil from the construction site was being deposited on private property on the banks of the Grand River. Investigation of this complaint led to the discovery that the site was a historic coal ash dump site. The ash was never excavated — it was covered with soil and seeded and the owner was counseled to put a deed restriction on the property in place. No further action is apparent.

Nearby water: The Grand River.

Other issues: The site also received erosion permit and floodplain permit.

**Groundwater testing has not been done.*

Michigan State University (MSU), East Lansing

Background: The TB Simon power plant is the largest on-campus coal plant in the nation. Historically, coal ash from the plant was used as construction fill on the south side of MSU's campus. During construction of a railroad underpass in 2007, around 120,124 cubic yards of contaminated coal ash and soil from a 5.5 acre site was taken to a licensed municipal landfill. However, during additional phases of construction, approximately 92,782 cubic yards of coal ash was simply relocated to another location on MSU's campus. The new coal ash disposal area (Jolly Road site) was a site of prior contamination from improper chemical disposal and was already determined to be a "Part 201 facility." Under the Brownfield law, it is allowable to transfer contaminated soils on the same facility⁵⁹ as long as notice is provided to any new owner should the property change hands in the future (unless a Remedial Action Plan is in file for the site.)⁶⁰ Due Care standards must still be met, however, including requirements to keep pollution at the site from worsening and using "reasonable precautions" since the Jolly Road site appears to be used as a MSU Police Gun Range and Canine Training Facility. The excavated coal ash and contaminated soil was used to create sound barrier berms and was seeded. Not all of the coal ash was excavated from the Farm Lane site. The infrastructure surrounding the power plant prohibited the coal ash from being delineated or excavated. Coal

ash was also accidentally deposited directly next to the Inland Lakes (Duck Pond) area on campus and was later excavated.

Constituents of concern: Arsenic, boron, chromium (total), lithium, mercury, selenium, and silver.

Proven contamination: After initial testing, MSU had soil samples verified and Strata, the company hired to interpret the data, determined that, though contamination levels exceeded Generic Residential Clean-up Criteria, site-specific criteria should be used to determine exceedances. Their background sampling data showed existing high levels of heavy metals and other constituents of concern.

Nearby water: Red Cedar River is less than a mile from the Farm Lane site.

Other issues: It is unknown whether the addition of coal ash to the existing Jolly Road site worsened the pollution coming from the facility. Water quality monitoring at the Jolly Road site only tested for Volatile Organic Chemicals — not for heavy metals or any other of the contaminants of concern.

**Soil testing only for Farm Lane area and limited water quality data from Jolly Road site.⁶¹*

Wolverine Advanced Power Plant, Eveline

Background: This 23 acre Brownfield site was used for coal ash disposal from 1953–1996.⁶² Remediation activities have been ongoing since 2001. Ash was removed from former storage ponds; contaminated soils were removed as well. Both were deposited offsite. The site is now proposed to become a Condominium project and marina.⁶³

Constituents of concern: Arsenic contamination of groundwater. Vanadium and selenium also exceeded state groundwater standards.

Proven contamination: A restrictive covenant for groundwater was filed because of post-remediation exceedances of Drinking Water Criteria for arsenic. No new groundwater wells or drinking of onsite water will be allowed.

Nearby water: Lake Charlevoix and Porter Creek.

Other issues: Former coal storage areas, underground storage tanks and other infrastructure are present and contribute to site contamination; High mercury levels in groundwater were blamed on upgradient sources; Selenium levels in soil were high, but the soil was excavated offsite;

**Groundwater monitoring has been done, but planned to be discontinued one year after closure of site.*

APPENDIX C

Environmental Integrity Project (EIP) Screening Tool Protocol

Environmental Integrity Project's groundwater screening tool is an interactive spreadsheet that profiles arsenic, boron, manganese, sulfates, antimony, cadmium, chloride, chromium, cobalt, lead, molybdenum, and selenium. Contaminant thresholds are similar to EPA MCL's and groundwater standards. This tool enables users to quickly assess if a site is "probably not contaminated" because of sufficient data and no evidence of contamination; "unknown" because of insufficient data; "possibly contaminated" because of insufficient data with some evidence of contamination; or "likely contaminated" because of sufficient data and evidence of contamination.

- **PROBABLY NOT CONTAMINATED:** Arsenic, boron, manganese, and sulfate are all monitored and there are no recent exceedances.
- **UNKNOWN:** Arsenic, boron, manganese, and sulfate are all not monitored but there are no current exceedances of any contaminants.
- **POSSIBLY CONTAMINATED:** Any exceedance of arsenic, boron, manganese, sulfate, antimony, cadmium, chloride, chromium (total), chromium (hex), cobalt, lead, molybdenum, and selenium.
- **LIKELY CONTAMINATED:** Any of the following combinations of exceedances:
 - arsenic + manganese + any
 - boron + any
 - sulfate + manganese
 - sulfate + arsenic

APPENDIX D

*Dossiers For Known Type III Damage Cases***BC Cobb landfill, Muskegon**

Background: Received ash in surface impoundment from 1970–1982. The BC Cobb Plant is located in the southwest portion of the site beyond the right of way of Highway M-120, which borders the site on the west. Directly east of the site are the CSX Railroad right of way and the now closed City of Muskegon Landfill. The landfill has a dike of bottom ash built along the channel of the river and nearby marshes. After the site was closed by the state, it was covered with sand, vegetated and is now a wildlife area. Consumers Energy is seeking to turn it into a soccer field and recreation area and plans to cover it with a membrane liner (citing the exemption in state law for use of coal ash as construction fill.)

Constituents of concern: Boron and lithium.

Proven contamination: On-site exceedances for boron and lithium.

Type of contamination: Groundwater but not drinking water. *RAP says boron, lithium, manganese, sulfate, and ammonia exceed drinking water criteria.

Nearby water: Directly south of the North Branch of the Muskegon River. Marshes and Veterans Memorial Park Pond.

Proof: Proposed Consent Order. Remedial Investigation, Feasibility Study and Remedial Action Plan (RAP). Slurry wall and impermeable cap planned. Restriction on new drinking water wells.

Other issues: Bank erosion; Boron and/or lithium have been found in surface water but road and dike built from coal ash could be source of surface water contamination.

JH Campbell ponds and landfills, West Olive

Background: Received ash as surface impoundment from 1962–1998. This site consists of several “cells” the last of which were closed in 2012.

Constituents of concern: Antimony, boron, lithium, and selenium.

Proven contamination: On-site exceedances for antimony, boron, lithium, and selenium.

Type of contamination: Groundwater and surface water but not drinking water. Release into Pigeon River.

Nearby water: Lake Michigan one mile west and Pigeon River approximately 3000-3,400 feet away.

Proof: RAP (Cells 1-7); RAP (Cells A-K impoundment, South of cells 1-7); restrictive deed covenant. Groundwater extraction (can be suspended if criteria are met), mixing zone criteria: boron, lithium, selenium.

Other issues: Leaking leachate collection; tear in liner; coal ash stockpiled outside of ponds for future reuse; overspray of leachate for dust suppression; brine that is high in boron and selenium is still applied to road; Sluice water was thought to be source of contamination and coal ash still disposed of in an area that has a double synthetic liner.

Muskegon County landfill, Muskegon

Background: Received ash from 1980-2001. The site only has a soil and clay bottom, no liner.

Constituents of concern: Boron and manganese. Also lithium, sulfate, selenium, potassium and total dissolved solids (TDS.)

Proven contamination: On-site exceedances for boron and manganese.

Type of contamination: Groundwater but not drinking water.

Nearby water: Black Creek (and Muskegon/Newaygo Drain).

Proof: Feasibility Study and RAP (since 1998) required groundwater interceptor trench, rapid infiltration and treatment.

Other issues: Wastewater irrigation spray fields and treated wastewater storage lagoon; Complex groundwater system because of adjacent Type II landfill also adds to inability to determine groundwater impact from coal ash landfill.

North Lansing landfill, Lansing

Background: Received ash from 1980-1997. It is a former gravel quarry pit with high groundwater table.

Constituents of concern: Lithium and selenium.

Proven contamination: Off-site exceedances for lithium. Also boron and sulfate.

Type of contamination: Groundwater.

Nearby water: Grand River (5,000 feet away). Wetlands 1,000 feet away at Bancroft Park and Groesbeck golf course.

Proof: Consent Order agreed to and Remedial investigation done. Slurry wall installed and gradient control as part of required source control as well as extraction pumping.

Other issues: Extraction pump failures in 2012; Site is directly adjacent to Motor Wheel Superfund Site and corresponding plume of groundwater contamination; Builder’s Concrete has pond for stormwater and truck wash runoff.

APPENDIX D

*Dossiers For Known Type III Damage Cases (cont.)***Pine Hill landfill, Marquette**

Background: Received ash from 1985–1995. Located in a valley with shallow groundwater.

Constituents of concern: Boron, lithium, and sodium.

Proven contamination: On-site exceedances for boron and lithium.

Type of contamination: Groundwater.

Nearby water: Wetlands, Morgan Creek, manmade ponds.

Proof: RAP (1998) restrictive covenant blocking new water wells or use of drinking water within aquifer or any aquifer within .5 miles of the site, closed and covered in 1993-95. Groundwater discharges to Morgan Creek so GSI applies.

Other issues: Post-closure monitoring plan is only for ten years.

Presque Isle landfill, Marquette

Background: Received ash from 1979-1993. Landfill #1 was combined from three ten-acre cells (A, B, and C, which were all filled and capped). Landfill #2 is comprised of a 1st cell and 2nd cell, both of which have liners and leachate collection. Landfill #3 is open.

Constituents of concern: Boron, lithium, and sodium (from RAP: boron, molybdenum, and sulfate).

Proven contamination: On-site exceedances for boron and lithium.

Type of contamination: Groundwater.

Nearby water: Compeau Creek.

Proof: RAP (1998) for landfill #1, which is closed and capped with synthetic cover; also has surface water management systems in place. Restrictive covenant in place to restrict installation of water supply wells.

Other issues: RAP monitoring suspended in 2009 but some water testing occurs for open, regulated landfill.

Range Road landfill, China Township

Background: Received ash from before 1950 to present from St. Clair, Belle River, Harbor Beach, and the retired Marysville power plants. Entire landfill is 514 acres of which 191 acres currently hold ash. In 1995, it was found and that a side of landfill was sandy and leaking into ground and surface water. Areas A, C, D1 and D2 are in process of closure (53 acres). Area B and B1

closed (111 acres). One landfill remains open. Unlined but has clay under most of site. Area closed in 1995 did not have a clay under layer.

Constituents of concern: Boron, iron, lithium, and manganese.

Proven contamination: Off-site exceedances for boron, lithium, and manganese.

Type of contamination: Ground and surface water but not drinking water.

Nearby water: One mile from St. Clair River, south of Pine River (French Drain, Layle Robbins Drain — now closed as part of Remedial Action Plan).

Proof: Offsite Remedial Action ('08) required slurry wall and conveyance trench to detention pond. Additional improvements have been necessary to handle stormwater flow, including increased ditching, pumping station and a larger detention pond.

Other issues: Area F (54 acres) still open and Area E& G (221 acres) are not yet open but have been identified for expansion purposes. Detention pond discharges w/ Belle River's NPDES permit.

Warden Station landfill, L'anse

Background: Received ash from 1974-1993. The site is 18.4 acres with no liner. It is owned by Upper Peninsula Power Co. (UPPCO). Stormwater discharge into streams and leachate percolation has caused plume of contamination in local groundwater, a source for the stream.

Constituents of concern: Boron and lithium.

Proven contamination: On-site exceedances for boron and lithium.

Type of contamination: Groundwater and surface water, but not drinking water.

Nearby water: Three-quarters of a mile from Keweenaw Bay on Lake Superior, streams, and ponds. Stream vents directly into Keweenaw Bay.

Proof: Consent order ('93) — remediation investigation suggested no active groundwater extraction. Ash redistribution and removal, grading, and capping w/ synthetic membrane, surface water drainage.

Other issues: Wet municipal solid waste was present underneath the ash.

APPENDIX E

Dossiers for “Likely Contaminated” Coal Ash Sites

DE Karn landfill and impoundments, Essexville

Background: Received ash since 1940’s. Both the DE Karn site and JC Weadock sites are unlined surface impoundments. The sites are authorized “to discharge to the unusable aquifer directly under the solid waste even though it vents almost immediately to the Saginaw River and Saginaw Bay.”⁶⁴ A slurry wall was to be installed at the Karn impoundment but is no longer proposed due to slope instability of the site.⁶⁵ A closure plan has been proposed which includes covering a portion of the site with synthetic materials and gravel. The site also has a NPDES permit for its wastewater discharges.

Constituents of concern: Arsenic (540 ppb) and boron (21,000 ppb) GSI mixing zone criteria and load-based criteria for phosphorus (1,000 ppb for .07 lbs/day loads into Saginaw River and .16 lbs/day for Saginaw Bay). Criteria for low-level mercury (.013 ppb) but no mixing zone criteria allowed. Phosphorus loading appears to be exceeded but Consumers Energy argues it is from sources outside of the landfill, such as agricultural runoff.

Proven contamination: None. The site is within compliance, except for “spikes.”

Nearby water: Directly next to Saginaw River and Saginaw Bay on Lake Huron.

Other issues: Received violation notice on July 1, 2010 for inadequate water quality monitoring.

2012 Screening tool data: Site has eight monitoring wells. Screening tool thresholds exceeded for several constituents tested: arsenic, boron, sulfate, and chromium (total) but thresholds not exceeded for: molybdenum and selenium, which were also tested. Not tested: manganese, antimony, cadmium, chloride, chromium (hex), cobalt, and lead (because this was 1st Quarter monitoring it was for a limited set of parameters, which are tested on semi-annual bases — 2nd and 4th quarters).

Determination: LIKELY CONTAMINATED (B, D)

Monroe

Background: Licensed Type III surface impoundment. It is 400 acres and was constructed in the mid-1970s. The site has a clay liner, so the company says they need only one monitoring well where there is a sand seam. There is a requirement for the site to have alternate vegetative cover. Sluice water for the site is drawn from Lake Erie.

See Appendix F for more information.

Constituents of concern: “Detected concentrations of

arsenic and chromium in groundwater slightly exceeded their control limits during the second 2011 semi-annual event. These exceedances are likely false positives.” (Company plans to do additional testing to show the well is “out of control.”)⁶⁶ Annual impoundment and embankment inspection and mitigation reports are also done for this structure.

Constituents of concern: Arsenic and sulfate.

Nearby water: Adjacent to the impoundment is a 200-acre peninsula into Lake Erie. Plum Creek borders the site and LaPlaisance Creek is within 2000 feet. Plum Creek deltas with Raisin River.

Other issues: In 1999, the Department said hexavalent chromium was present in the ash basin but the Company disagrees.⁶⁷ High tritium has been found in the groundwater but company says due to nuclear tests and historical presence of tritium in Lake Erie.

2012 Screening tool data: One monitoring well.

Screening tool thresholds exceeded for: arsenic and sulfate, but not boron, manganese, antimony, cadmium, chloride, chromium (total), lead, molybdenum, and selenium which were also tested. Not tested: chromium (hex) and cobalt.

Determination: LIKELY CONTAMINATED (D)

Sibley Quarry

Background: No information.

Constituents of concern: Boron, sulfate, chloride, and selenium.

2012 Screening tool data: Two monitoring wells.

Screening tool thresholds exceeded for: boron, sulfate, chloride, and selenium but not arsenic, cadmium, chromium (total), and lead which were also tested. Not tested: manganese, antimony, chromium (hex), cobalt, and molybdenum.

Determination: LIKELY CONTAMINATED (B, D)

JC Weadock pond and landfill, Essexville

Background: See DE Karn site.

Constituents of concern: Arsenic, boron and sulfate.

2012 Screening tool data: Ten monitoring wells.

Screening tool thresholds exceeded for several constituents tested: arsenic, boron and sulfate but thresholds not exceeded for: antimony, chromium (total), lead, molybdenum and selenium which were also tested. Not tested: manganese, cadmium, chloride, chromium (hex), and cobalt.

Determination: LIKELY CONTAMINATED (B, D)

APPENDIX F

*Sites Where Contamination Is Disputed or Unknown***JR Whiting ponds and landfills, Erie**

Background: Licensed Type III Surface impoundments accepting ash since 1950. 152 acres (six ponds, three active.) The JR Whiting site was identified as damage case of contamination in a 2010 Environmental Integrity Project and Earthjustice report. In the 1980's the U.S. Fish and Wildlife Service conducted a peer-reviewed study that found aquatic life in Lake Erie was harmed by discharges of selenium, arsenic and heavy metals from a leaking coal ash pond.⁶⁸ However, the characterization as a "proven damage case" is disputed by the state⁶⁹ because of compliance with state regulations and potential lack of evidence that aquatic species impacts were not caused by ash disposal. The walls of the surface impoundment ponds and dikes are made of coal ash materials. Three of the ponds received "Significant Hazard Potential" ratings from the EPA for Dam Safety assessment (see Dam Safety and Structural Integrity Section.) Groundwater monitoring did not test for many constituents but it has been discontinued for the site.

Constituents of Concern: No screening tool thresholds were met.

Nearby water: Maumee Bay of Lake Erie, LaPointe Drain, wetlands.

Other issues: Water quality monitoring was discontinued in 2009.

2009 screening tool data (most recent): Six monitoring wells. Screening tool thresholds were not met or exceeded for any constituents tested: arsenic, antimony, cadmium, chromium (total). Not tested: boron, manganese, sulfate, chloride, chromium (total), chromium (hex), cobalt, lead, and molybdenum.

Determination: CONTAMINATION UNKNOWN

Zeeland

Background: 40 acre licensed Type III landfill. Accepting waste since 1992. Clay liner only but does have leachate collection.

Constituents of concern: Screening tool thresholds were not met for any constituents.

Nearby water: Macatawa River.

2012 Screening tool data: Two monitoring wells. Screening tool thresholds not met for any contaminants tested: manganese, sulfate, and chloride. Not tested: arsenic, boron, antimony, cadmium, chromium (total), chromium (hex), cobalt.

Determination: CONTAMINATION UNKNOWN

APPENDIX G

Details on Dam Structural Integrity

DE Karn

Dam Safety Background: 174 acres in size, the DE Karn's embankment walls are approximately 17 feet tall.⁷⁰ 21.7 million gallons per day of wastewater is discharged into Saginaw Bay from this surface impoundment. A closure plan is in place that did not include a slurry wall because of slope instability. The area is unlined except for clay.

Level of concern: "Low Hazard" potential designation; the impoundment was characterized as in "satisfactory" condition.

Erickson

Dam Safety Background: The Erickson pond is a 33 acre unregulated "contained waste pile" that has been regulated under the state's "Part 315" Dam Safety section of MDEQ.⁷¹ The Erickson pond was assessed during EPA's study of surface impoundments. The ash storage area is being dewatered and the ash is excavated to a Type II landfill offsite. The embankments are 17 feet high. According to the Dam Safety Assessment, the Lansing Board of Water and Light plans to build a smaller impoundment (around 5 acres) within the footprint of the existing pond which they believe would mitigate existing issues of lack of flood and stability studies.

Level of concern: *Status in flux.* Conditions are such that it would usually be considered Low-Risk (no probable loss of human life), and damage would mostly be on the Erickson Station Property. In addition, the pond is having water removed and ash excavated to a lined municipal landfill. A smaller impoundment is being built. Because of the changes at the site, the EPA asked that no official rating be placed on the site.

Nearby water: Site is on the banks of the Grand River and very near the Red Cedar River.

Other issues: Community fishing area in a water storage pond that is right next to the ash water recycling system. Some leaking found at the ash discharge pipe that has since been fixed. Vegetation was also removed.

J.C. Weadock

Dam Safety Background: 292 acres in size,⁷² the JC Weadock embankment walls are approximately 15 feet tall.⁷³ 21.7 million gallons per day of water is discharged from the site into Saginaw Bay. The area is unlined except for clay.

Level of concern: "Low hazard" potential designation. Overall, the impoundment was characterized as in "satisfactory" condition.

Monroe

Dam Safety Background: The surface impoundment was constructed in 1971⁷⁴ and it is still in operation. It is approximately 400 acres and comprised of clay dikes. The site has only a clay liner. The height of the embankment walls are 35–44 feet above ground and the surface of the impoundment is ten feet below ground. (The bottom ash stormwater pond is not considered a dam because it does not have embankments taller than 6 feet. Material entering basin is ten parts water, one part ash and ten million gallons of water/day is sluiced off the top, though it is expected the water resides in the basin approximately one year before it is discharged. Facility has a NPDES permit for water pollution siphoned off the pond and discharged into Lake Erie and the Raisin River. Only a 200-acre peninsula separates the site from Lake Erie.

Level of concern: The fly ash basin is characterized as "**Significant Hazard Potential.**"⁷⁵ The significant designation is due to nearby homes, Interstate I-75, and power disruption. The condition of the site is considered to be "satisfactory." Noticeable seepage and heavy vegetation on some embankments.

Proof: Detroit Edison has been performing "embankment mitigation plan" for sloughing in the embankments since the 1990s.

Other issues: There are areas where ash is stockpiled outside of the ponds for transport. The large trees growing in the embankment help protect the smaller walls from erosion, especially from wave action of Lake Erie.

JR Whiting

Dam Safety Background: Ponds 1 and 2 Active; 3, 4 and 5 Inactive — final closure in progress; Pond 6, Active.

Level of concern: Ponds 1, 2 and 6 all rated as "Significant Hazard Potential". (Ratings are Less than Low, Low, Significant, and High). Ponds 3, 4, and 5 not applicable because water is no longer being added to those ponds, only dry ash and they are in the process of being covered. However, overall Ponds 1–6 were ranked in "Fair" condition.

APPENDIX G

Details on Dam Structural Integrity (cont.)

- **Ponds 1 and 2:** 15 feet, 50 feet high walls. The raised embankments and dikes are themselves made with coal ash constituents. There are noticeable wet areas, animal burrows, and heavy vegetation growing out of embankments including mature trees. No stability analysis has been done by the company.
- **Pond 6:** Proximity to Lake Erie, a marina, and a Luna Pier residential area, mean significant environmental damage could be done. There have been slope failures in the past that required stability reinforcements. In addition to animal burrows, there is evidence of poor drainage, including scarping. There is also potential for overtopping in a flood situation. There are nearby farm tiles that drain near one side of the embankment and leave standing ponds of water. “Significant Environmental Damage” could be done if the dam ruptures.

APPENDIX H: TABLES 1-5

Table 1: Coal-Fired Power Plants Pollution in Michigan

| Plant Name and Location | MW | Owner | Ash (thousand tons/yr) | Ponds and landfills (primary and non-primary coal ash only) | Toxic Surface Water Pollution* (annual in lbs.) |
|----------------------------------|-----------|-------------------------------------|-----------------------------------|--|--|
| BC Cobb, Muskegon | 519.6 | Consumers Energy | 40.8 | 10 ponds (+1 retired pond). Ponds are open as unregulated temporary storage. 1 pond is a closed Type III site. | 0 |
| Belle River, East China Township | 1664.4 | Detroit Edison | 171.9 | 4 ponds (permanent storage at Range Road) | 7,058 (zinc, arsenic, lead, barium, nickel, chromium, vanadium, manganese, copper, mercury) |
| Dan E. Karn, Essexville | 1946.3 | Consumers Energy | 78.7 | 1 pond, 1 landfill | 7245.22 (mercury, mopper, barium) |
| Eckert Station, Lansing | 375 | Lansing Board of Water and Light | 57 | UNREPORTED to EPA: Silos and ??? | 3,825.99 (mercury, barium, manganese) |
| Endicott Station, Litchfield | 55 | Michigan South Central Power Agency | No data | UNREPORTED to EPA: Silos and ??? | UNREPORTED to EPA |
| Erickson Station, Lansing | 154.7 | Lansing Board of Water and Light | 33.7 | 2 ponds | 111.49 (barium) |
| Escanaba, Escanaba | 40.9 | Upper Peninsula Power Co. | No data | 0 | 0 |
| Harbor Beach, Harbor Beach | 125 | Detroit Edison | 7.2 | 3 ponds | 0 |
| J.B. Sims, Grand Haven | 75 | City of Grand Haven | No data | 2 ponds (+1 retired pond) | 0.584 lbs. of mercury |
| J.C. Weadock, Essexville | 331.2 | Consumers Energy | 62.1 | 1 pond, 1 landfill | 7,245.22 [combined with Karn's] (mercury, copper, barium) |
| J.H. Campbell, West Olive | 1,588.70 | Consumers Energy | 208.2 | 5 ponds (+1 retired pond), 7 landfills | 4315 (copper, manganese vanadium, ammonia, barium) |
| J.R. Whiting, Erie | ??? | Consumers Energy | 52.3 | 6 ponds (+2 retired landfills) | 1884.47 (barium, manganese, mercury, vanadium) |

*Source: Toxic Release Inventory (TRI) 2011 data.

Table 1: Coal-Fired Power Plants Pollution in Michigan (cont.)

| Plant Name and Location | MW | Owner | Ash (thousand tons/yr) | Ponds and landfills (primary and non-primary coal ash only) | Toxic Surface Water Pollution* (annual in lbs.) |
|---------------------------------------|------------------|-------------------------------|--|--|--|
| James DeYoung, Holland | 62.8 | City of Holland | No Data | 1 pond (permanent storage at Zeeland) | 72.351 (lead, mercury) |
| Monroe, Monroe | 3293.1 | Detroit Edison | 644.8 | 2 ponds | 28,962.9 (selenium, mercury, copper, ammonia, arsenic, zinc, lead, barium, nickel, beryllium, cobalt, vanadium, manganese, chromium) |
| Presque Isle, Marquette | 624.7 | Wisconsin Electric Power Co. | 80.4 | 1 pond, 1 landfill (+2 retired landfills) | 919.2 (lead, manganese, barium, copper) |
| River Rouge, River Rouge | 944 | Detroit Edison | 71.6 | 1 pond (permanent storage at Sible Quarry) | 212.8 (copper, lead, barium) |
| Shiras, Marquette | 77.5 | City of Marquette | No Data | 1 pond | 0 |
| St. Clair East China | 1928.6 | Detroit Edison | 158.6 | 4 ponds (permanent storage at Range Road) | 4,740.21 (nickel, lead, barium, mercury, manganese, chromium, copper, zinc, vanadium, arsenic) |
| T.B. Simon, East Lansing | 61 | Michigan State University | No data | UNREPORTED to EPA: silos and ???? | UNREPORTED to EPA |
| TES Filer City Station, Filer City | 70 | TES Filer City Station | No Data | UNREPORTED to EPA: silos and ???? | 156.06 (lead, barium, zinc) |
| Trenton Channel, Trenton | 775.5 | Detroit Edison | 106.2 | 2 ponds (permanent storage at Sibley Quarry) | 3,988.01 (chromium, vanadium, nickel, barium, manganese, zinc) |
| White Pine Electric Power, White Pine | 60 | White Pine Electric power | No Data | UNREPORTED to EPA: silos and ???? | 0 |
| Wyandotte, Wyandotte | 73 | Wyandotte Municipal Serv Comm | No Data | UNREPORTED to EPA: silos and ???? | 4.6 (lead) |
| TOTALS | 14,816 MW | | 1,773,500 tons (1773.5 thousand tons) | | 63,496.265 lbs. |

*Source: Toxic Release Inventory (TRI) 2011 data.

Table 2: Open Licensed Coal Ash Type III Waste Areas

| Landfill Name and Location | Number of Landfills | Size | Lined (including clay) | Wet or Dry Handling Process | Leachate Collection | Number of Ponds |
|-------------------------------------|---|------------------------------------|--|--|---|-------------------------------|
| Dan E. Karn, Essexville | 1 (surface impoundment w. NPDES permit) | 174 acres | NO | Being dewatered and closed; DRY ash now added. | NO | 1 pond |
| J.C. Weadock, Essexville | 1 (surface impoundment w. NPDES permit) | 292 acres | NO | Being dewatered and closed; DRY ash now added. | NO | 1 pond |
| J.H. Campbell, West Olive | 7 | 138 acres | YES, double synthetic | DRY | YES | 5 ponds (plus 1 retired) |
| J.R. Whiting, Erie | 2 retired; no groundwater monitoring | 152 acres | clay | Being dewatered and closed; DRY ash now added. | NO | 6 ponds (3 active, 3 retired) |
| Monroe Power Plant, Monroe | 0 | 400 acres | One pond is lined | Wet ash | NO | 2 ponds |
| Presque Isle Power Plant, Marquette | 1 (plus 2 retired) | 30 acres retired | Open Landfill (#3) is lined and one retired, but pond and closed landfill are unlined. | Unknown | YES for open and 1 closed, but not for 1 closed landfill. | 1 pond |
| Range Road, China Township | 1 | 54 open (191 acres total with ash) | YES | Unknown | YES | |
| Sibley Quarry, Trenton | 1 | Unknown | YES, ponds are lined but not landfill. | Unknown | NO | |
| Zeeland Twp. Landfill, Zeeland | 1 | 40 | NO, clay only | Unknown | YES | |

Table 3: Closed Licensed Coal Ash Type III Waste Areas

| Landfill Name and Location | Size | Lined | Leachate Collection | Number of Landfills | Number of Ponds |
|------------------------------------|--------------------------|-------|----------------------|---------------------|--|
| B.C. Cobb, Muskegon | 68 acres (area 4 and 4A) | NO | Not submitted to EPA | 1 retired | 10 (plus 1 retired). Ponds open as unregulated "temporary storage" |
| Muskegon County Landfill, Muskegon | 55 acres | NO | YES, remedial | 1 | 0 |
| North Lansing Landfill, Lansing | Unknown | NO | YES, remedial | 1 | 0 |
| Pine Hill Landfill, Marquette | Unknown | NO | NO | 1 | 0 |
| Warden Station, L'Anse | 18.4 acres | NO | YES, remedial | 1 | 0 |

Table 4: Unregulated "Contained Waste" Storage Ponds

| Power Plant Name and Location | Lined (including clay) | Leachate Collection | Number of Ponds |
|--|-----------------------------|---------------------|--|
| Belle River Power Plant, East China | YES | NO | 4 (permanent storage at Range Road) |
| Erickson Station, Lansing | YES | NO | 2 |
| Harbor Beach Power Plant, Harbor Beach | NO | NO | 3 |
| J.B. Sims, Grand Haven | YES (closed pond not lined) | NO | 2 (plus one retired) |
| James DeYoung, Holland | NO | NO | 1 (permanent storage at Zeeland) |
| River Rouge Power Plant, River Rouge | YES | NO | 1 (permanent storage at Sibley Quarry) |
| Shiras, Marquette | NO | NO | 1 |
| St. Clair Power Plant, East China | YES | NO | 4 (permanent Storage at Range Road) |
| Trenton Channel Power Plant, Trenton | Half of the ponds are lined | NO | 2 (permanent storage at Sibley Quarry) |

Table 5: Power Plants' NPDES Permits and Michigan's Impaired Waters

| Power Plant Name and Location | Impaired Waters | Cause for Impairment | Notes |
|----------------------------------|--|----------------------|--|
| BC Cobb, Muskegon | Muskegon River, Ruddiman Creek, Green Creek, Fourmile Creek, Ryerson Creek. | Mercury | Does not limit pollutants. |
| Belle River, East China Township | Belle River and tributaries, Webster Drain | | Near drinking water intake. |
| Dan E. Karn, Essexville | Saginaw Bay | | Permit expired in 2011. |
| Eckert Station, Lansing | Grand River and Silver Creek | Mercury | Does not limit pollutants. Permit expired in 2012. |
| Endicott Station, Litchfield | | | <i>No known issues.</i> |
| Erickson Station, Lansing | Grand River and Carrier Creek | Mercury | Does not limit pollutants. Permit expired in 2012. |
| Harbor Beach, Harbor Beach | | | Does not limit pollutants. |
| J.B. Sims, Grand Haven | Grand River Grand Haven Boaters Park Beach, Black Creek, Grand River Lloyd Bayou. | Mercury | Does not limit pollutants. |
| J.C. Weadock, Essexville | | | Permit expired in 2011. |
| J.H. Campbell, West Olive | | | Does not limit pollutants. Permit expired in 2011. |
| J.R. Whiting, Erie | | | Permit expired in 2012. |
| James DeYoung, Holland | | | Does not limit pollutants. Permit expired in 2011. |
| J.R. Whiting, Erie | | | Does not limit pollutants. Permit expired in 2011. |
| Monroe, Monroe | River Raisin, Barnaby Drain, Brost Drain, Brown Drain, Burdeau Drain, Karm Drain, Mason Run, Middle Branch Willow Run, Moore Drain, Sietz Drain. | Mercury | |
| Presque Isle, Marquette | | | Does not limit pollutants. Permit expired in 2012. |
| River Rouge, River Rouge | Rouge River | Mercury | Near drinking water intake. Does not limit pollutants. Permit expired in 2012. |

Table 5: Power Plants' NPDES Permits and Michigan's Impaired Waters (cont.)

| Power Plant Name and Location | Impaired Waters | Cause for Impairment | Notes |
|---------------------------------------|------------------------|-----------------------------|---|
| Shiras, Marquette | | | Does not limit pollutants. Permit expired in 2012. |
| St. Clair, East China | St. Clair River | | Near drinking water intake. |
| TES Filer City Station, Filer City | | | Does not limit pollutants. |
| Trenton Channel, Trenton | | | Permit expired in 2012. |
| Wyandotte, Wyandotte | | | Permit expired in 2012. |

Endnotes

- 1 See U.S Environmental Protection Agency (EPA) Great Lakes website: <http://www.epa.gov/greatlakes/basicinfo.html>.
- 2 Even though these ponds are unregulated by the solid waste department, many of these storage ponds are permitted to discharge wastewater into MI's rivers, lakes and bays under the Clean Water Act.
- 3 Environmental Integrity Project (EIP) EPA FOIA output, June 26, 2010. (EIP FOIA output).
- 4 An additional 16 unregulated "contained waste" ponds are located at sites that also have regulated Type III landfills. Those sites are analyzed in this report only as regulated storage areas.
- 5 <http://www.crainsdetroit.com/article/20130615/NEWS01/130619876/#>
- 6 "Moving Michigan Forward – Continuing Our Comeback: Executive Budget Recommendation for Fiscal Years 2014 and 2015. See: michigan.gov/documents/reinvent/Governors_FY_2014_budget_recommendation_FINAL_410798_7.pdf.
- 7 Earthjustice. In Harm's Way: Coal Ash Contaminated Sites. Available at: <http://earthjustice.org/features/campaigns/in-harm-s-way-coal-ash-contaminated-sites>. - Updated December 2012.
- 8 U.S. Congressional Research Service. "Managing Coal Combustion Waste (CCW); Issues with Disposal and Use." 7-5700, January 12, 2010. Luther, L.
- 9 U.S. EPA. Hazardous and Solid Waste Management System; Identification and Listing of Special Waste; Disposal of Coal Combustion Residuals from Electric Utilities. Proposed Rule, June 21, 2010. Federal Register, Vol. 75, No. 118, page 35145.
- 10 Agency for Toxic Substances and Disease Registry (ATSDR) ToxFAQs. <http://www.atsdr.cdc.gov/substances/indexAZ.asp>
- 11 Proposed Rule, at 35171.
- 12 U.S. Environmental Agency. 2010. Hazardous and Solid Waste Management Systems; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, 75 Fed. Reg. 35128, June 21, 2010.
- 13 Evans, L., Becher, M and Lee, B. State of Failure: How States Fail to Protect Our Health and Drinking Water from Toxic Coal Ash. August 2011. Earthjustice. Available at: <http://earthjustice.org/sites/default/files/StateofFailure.pdf>
- 14 "Analysis of Recent Proposals to Amend the Resource Conservation and Recovery Act (RCRA) to Create a Coal Combustion Residuals Permit Program", March 19, 2013 (March 2013 CRS Report) and "H.R. 2273 and S. 3512: Analysis of Proposals to Create a Coal Combustion Residuals Permit Program Under RCRA", December 5, 2012 (Dec. 2012 CRS Report).
- 15 March 2013 CRS Report at 45.
- 16 Energy Information Administration state data, see: <http://www.eia.gov/state/?sid=MI> (last accessed 4/25/13)
- 17 See: <http://www.dteenergy.com/dteEnergyCompany/environment/generation/generation.html>
- 18 The Marysville and SD Warren plants have been decommissioned. However, this report does not address whether the coal ash at these sites has been remediated.
- 19 Data compiled from Energy Information Administration, "Power Plant Operations Report," (Form EIA-923), October 25, 2011.
- 20 MCL 324.11506
- 21 See: "Not in My Lifetime" report.
- 22 R 299.4113
- 23 For locations see Google map (Type III) open locations: http://www.michigan.gov/documents/deq/MI_Part115_Actives_343663_7.kml?rand=6611
- 24 R 299.4301 R 299.4302 Appendix B
- 25 Unless lateral expansion of existing landfill. See R 299.4307(1) Appendix B.
- 26 Leachate collection systems R 299.4308 exempt some natural soil "lined" Type III landfills. See Appendix B.
- 27 Soil must have a maximum demonstrated hydraulic conductivity of 1.0 X 10⁻⁷ cm/sec, R 299.4307
- 28 R 299.4307 Appendix B.
- 29 R 299.4130

Endnotes (cont.)

- 30 R 299.4130
- 31 R 299.4311 Appendix B.
- 32 Michigan Department of Natural Resources and the Environment (now Michigan Department of Environmental Quality), November 19, 2010 comments on U.S. EPA Hazardous and Solid Management System; Identification and Listing of Special Waste: Disposal of Coal Combustion Residuals from Electric Utilities. Attachment 5.
- 33 EIP EPA FOIA output, June 26, 2010.
- 34 The state's database of contaminated brownfield sites ceased to be populated in 2010 and the MDEQ is in the process of developing a "facilities inventory." Clean Water Fund called MDEQ District Offices and spoke with District Supervisors for the Office of Remediation and Redevelopment for lists of known brownfield sites in order to submit Freedom of Information Act (FOIA) requests.
- 35 There are several additional brownfields that have known coal ash pollution, but it is only a part of the total contamination at those sites. According to communications with the state, those sites are: Union Carbide (Sault St. Marie); Kincheloe Air Force Base (Kinross Township); KI Sawyer Air Force Base (Marquette); Burcham Park Landfill (East Lansing); and Port of Monroe Landfill (Monroe.)
- 36 See http://www.michigan.gov/documents/deq/deq-rrd-March2011GuideToRRDDraft_348114_7.pdf
- 37 MCL 324.20107a
- 38 R 299.5716
- 39 But, changes to this are imminent as Governor Snyder signed into law Public Act 190 of 1012 that changed Michigan Brownfield law and will allow companies to be seen as complying with the law even if GSI mixing zone standards are not met, if "impracticable" or only water impacts are "de minimis."
- 40 R 299.4318
- 41 Environmental Integrity Project's groundwater screening tool is an interactive spreadsheet that profiles arsenic, boron, manganese, sulfates, antimony, cadmium, chloride, chromium, cobalt, lead, molybdenum, and selenium. Contaminant thresholds are similar to EPA MCL's and groundwater standards. For more information on the EIP screening tool, see Appendix C.
- 42 R 299.5705 (6)
- 43 R 299.4306
- 44 R 299.4318
- 45 R 299.4319
- 46 Michigan Department of Natural Resources and the Environment (now Michigan Department of Environmental Quality) November 19, 2010 comments on U.S. EPA. Hazardous and Solid Waste Management System; Identification and Listing of Special Waste; Disposal of Coal Combustion Residuals from Electric Utilities. Attachment 5
- 47 <http://water.epa.gov/drink/info/chromium/guidance.cfm>
- 48 MDEQ Comments to EPA (Docket ID EPA-HQ-RCRA 2009-0640) in response to solicitation from EPA regarding alleged damage cases (MDEQ Damage Case Response) November 15, 2011. http://www.astswmo.org/Files/Policies_and_Publications/Cross-program/Coal_Combustion_Residuals/2011.11-NODA_Comments/Michigan_NODA_Comments.pdf
- 49 <http://www.epa.gov/osw/nonhaz/industrial/special/fossil/surveys2/dte-monroe-final.pdf>
- 50 <http://trenton-grosseile.patch.com/articles/coal-ash-covers-trenton-advocates-speak-out>
- 51 <http://www.epa.gov/osw/nonhaz/industrial/special/fossil/surveys2>
- 52 http://www.mlive.com/environment/index.ssf/2011/11/wisconsin_dnr_coal-ash_spill_n.html
- 53 Remedial Investigation and Feasibility Study, LBWL, Vicinity of Comfort and Sunset Streets, January 2007.
- 54 Work Plan to Implement Continued Interim Remedial Investigation Activities, Consumers Energy, Former Kalamazoo MGP site, March 25, 2003.

Endnotes (cont.)

- 55 Report on the Phase II Environmental Site Assessment, Former Consumers Power Site, Kalamazoo, Michigan, April 18, 1997.
- 56 North Jackson Company May 5, 2006 memo to Cliffs Michigan Mining Company (Cleveland Cliffs Iron Company (CCIC)).
- 57 Genco 2001 Plume Delineation Report
- 58 August 1, 2006 memo from Chris Austin, MDEQ Geologist to Steve Harrington, Project Manager MDEQ Gwinn District office.
- 59 It is important to note that the definition of “on-site” says movement of soil to “contiguous” or “adjacent” parcels owned by the same entity. The MSU site is separated by a road, farmland, etc. It is not clear if that meets the definition of “adjacent.”
- 60 MCL 324.20120c
- 61 Awaiting additional water quality testing data from MSU from historic water monitoring wells near the TB Simon power plant.
- 62 Remedial Action Plan Closure Report for Former Advance Steam Plant, February 15, 2007.
- 63 May 15, 2012 letter to MDEQ from Barron & Engstrom, PLC. on behalf of Sommerset Pointe Development, LLC.
- 64 DE Karn Solid Waste Facility Compliance Monitoring Report, 1st Quarter, April 30, 2012,
- 65 See Consumers Energy’s December 20, 2011 letter “Transmittal of Deliverables Pursuant to Special License Condition 20.C and 20.D of the DE Karn 1 & 2 Land Disposal Areas License No. 9234; Waste Data System Number 392503” citing “The Report on Updated Slope Stability Analysis for DE Karn Ash Disposal Facility (Sept. 29, 2010 by NTH Consultants).
- 66 Second 2011 Semi-Annual Monitoring Event, January 26, 2012
- 67 Groundwater-monitoring Plan for the Monroe Ash Basin, (Updated June 18, 1999.)
- 68 http://www.environmentalintegrity.org/news_reports/documents/INHARMSWAY_FINAL.pdf
- 69 MDEQ Damage Case Response
- 70 Final Report Round 7 Dam Assessment, Consumers Energy DE Karn Plant 1 & 2 Disposal Area, June 30, 2011.
- 71 Final Report Round 10 Dam Assessment Report, Lansing Board of Water and Light Erickson Station Ash Pond, August 17, 2012.
- 72 Final Coal Combustion Waste Impoundment Round 7 Dam Assessment Report, Consumers Energy JC Weadock site, April 2011.
- 73 Final Report Round 7 Dam Assessment, Consumers Energy DE Karn Plant 1 & 2 Disposal Area, June 30, 2011.
- 74 Final Report Round 7 Dam Assessment, DTE Energy Monroe Power Plant, June 2, 2011.
- 75 U.S. EPA Dam Safety Assessment of CCW Impoundments, J.R. Whiting, O’Brien & Gere, June 27, 2011.