Toxic Impact: The Regulation of Coal Ash and the Influence of Big Money on Small Communities

Patricia Helman
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It is increasingly said that civilization, Western civilization at least, stands in need of a new ethic . . . setting out people’s relations to the natural environment, in Leopold’s words “an ethic dealing with man’s relation to land and to the animals and plants which grow upon it.”

PROLOGUE

Imagine a seemingly perfect, picturesque, family development complete with community events, pools, playgrounds, and shopping. Imagine also a coal and gas burning power plant which stands just three miles away. While easy to see, it is rarely looked at—the elephant in the room that no one wants to talk about. To some, it may seem obvious that residing in such close proximity to a power plant would undoubtedly have adverse health effects; but to most, a lack of warning means that it must be safe.

Over time, a child develops a persistent cough; a friend and neighbor both develop unusual tumors. Then, the unthinkable occurs, a 16-month-old baby girl is diagnosed with a rare brain cancer, succumbing to it just days later. She lived just three miles away from the power plant. Questions begin to arise regarding the smoke-breathing concrete and steel monolith on the horizon.

A search for answers uncovers that the power plant utilizes an unlined landfill and leaking surface impoundments. The power plant, by storing wet coal ash, poses a danger to surrounding groundwater and surface water. The discovery of the extensive list of toxic metals contained within coal ash is jarring: arsenic, lead, mercury, cadmium, chromium, and other cancer causing agents. Finally, and perhaps most alarming, the discovery that coal ash and its toxic hazards are not...
federally regulated, bringing to light the true nature of the regulations and the influence the power industry has on the nation.

I. IN THE BEGINNING

These concerns became harsh reality for many on December 22, 2008, when, while most of the town of Harriman, Tennessee slept soundly in their beds, calamity struck, changing their lives forever. A 40-acre dam holding toxic coal ash collapsed, inundating residents’ homes with one billion gallons of toxic coal ash, encasing “300 acres with thick, toxic sludge.” Residents described the toxic coal ash not as a thin coating, but as “boulders” as large as a house. Homes were damaged and destroyed, the surrounding rivers contaminated, effectively devastating the community. The United States Environmental Protection Agency (EPA) conducted testing of the water after the spill and “found toxic heavy metals including arsenic, which . . . measured at 149 times the allowable standard for drinking water.”

The failed dam belonged to an unlined forty-acre pond at the Tennessee Valley Authority (TVA) Kingston Fossil Plant in Harriman, Tennessee. The pond was used as a permanent storage site for toxic coal ash, reaching an elevation level of 820 feet. Investigatory reports identified several reasons for the spill, including the high elevation level of the coal ash, the continued use of the dam, and the policies and practices of TVA management that allowed deteriorating conditions to advance. The toxic spill in Harriman was the largest of its kind in United States history, leading to federal recognition that regulation of toxic coal ash was required to prevent future destruction to humanity and the environment.

5. Id.
6. See generally id.
9. Id.
10. Id.
12. Gottlieb et al., supra note 8, at v.
13. Id.
14. Id.
16. Id. at 999.
17. Id.
The dam that collapsed in Harriman was built in 1955,\textsuperscript{20} when regulations over the power industry were largely non-existent.\textsuperscript{21} Power plants similar to Kingston have been operating for decades and still store and dispose of coal ash within structures that were built without adequate safeguards and which are deteriorating.\textsuperscript{22} Risk of another spill similar to that of Kingston is high, as evidenced by the Dan River spill in 2014, where 39,000 tons of toxic coal ash spilled into the Dan River in Eden, North Carolina.\textsuperscript{23} More recently, it was revealed during trial that 27 billion gallons of toxic coal ash spilled into the Cumberland River from the Gallatin Fossil Plant (also managed by TVA) in Nashville, Tennessee, over an eight-year period, and that toxic metals continue to leach into the river.\textsuperscript{24}

Risk of a massive breach looms over communities such as Shippingport, Pennsylvania, where the largest coal ash pond in the country is located.\textsuperscript{25} Little Blue Run, an unlined 1,700-acre pond located at the Bruce Mansfield power plant, which closed at the end of 2016,\textsuperscript{26} is the subject of ongoing litigation due to its toxic leakage and negative health effects on the surrounding community.\textsuperscript{27} Residents of Shippingport were at one time told they could swim and play in the lake of toxic coal ash.\textsuperscript{28} A picture was painted of a seemingly pristine lake—the true hazards of its contents remained unspoken.\textsuperscript{29} The lack of information regarding the toxic hazards of coal ash is not uncommon and is equally as damaging as the failure to regulate the disposal and storage methods of coal ash.\textsuperscript{30}

\textsuperscript{22} Final Rule, supra note 18, at 21326.
\textsuperscript{28} Warrick, supra note 25.
\textsuperscript{29} Id.
\textsuperscript{30} See generally Final Rule, supra note 18, at 21302.
This comment addresses the need for enforceable regulations and practical solutions related to the disposal and storage of coal ash, specifically in relation to the final rule implemented by the EPA, *Hazardous and Solid Waste Management Systems: Disposal of Coal Combustion Residuals from Electric Utilities.* Part II of this comment will discuss coal ash and its toxic and hazardous chemical components; Part III will address the history and final implementation of the final rule; Part IV will address the impact the rule will have on the environment and humanity; and Part V will provide a practical, plausible, and easily attainable solution based on lead paint as a historical model.

II. COAL ASH

A. What is Coal Ash?

Coal ash is the waste byproduct produced through the burning or combustion of coal to generate power. Coal is used as a heat source within power plants to convert water into steam which in turn drives a generator that produces electricity. The coal is first pulverized into a fine powder and then released into the air of a combustion chamber where it catches fire. The airborne residual is known as fly ash. The fly ash either exits via the smoke stacks (leading to brownish-green smoke permeating the sky) or is caught in a pollution control device known as a scrubber. The coal residuals that fall to the bottom of the combustion chamber are known as bottom ash and boiler slag. Flue gas desulfurization materials are the final form of coal ash. The residuals are “produced through a process used to reduce sulfur dioxide (SO₂) emissions from the exhaust gas system.” Collectively, fly ash, bottom ash, boiler slag, and flue gas desulfurization materials are coal combustion residuals, commonly referred to as coal ash.

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31. See generally id.
32. Gottlieb et al., *supra* note 8, at vii.
34. *Id.*
37. *Id.*
38. *Id.* A scrubber is a pollution control device utilized to capture fly ash before it becomes airborne escaping through the smoke stack. See *The Clean Coal Technology Program*, U.S. DEPT. OF ENERGY, https://fossil.energy.gov/education/energylessons/coal/coal_cct2.html (last updated Feb. 12, 2013).
39. 2010 Proposal, *supra* note 18, at 35130 (defining boiler slag as “molten bottom ash collected at the base of . . . furnaces”).
40. *Id.*
41. *Id.*
42. *Id.*
43. Gottlieb et al., *supra* note 8, at vii.
B. What Happens to Coal Ash?

Once burned, coal ash is either: (1) deposited in dry landfills;\(^44\) (2) deposited in surface impoundments (also known as wet ash ponds) where it is mixed with water;\(^45\) (3) discharged into nearby waterways under the plant’s water discharge permit;\(^46\) or (4) reused through recycling methods.\(^47\) Wet ash ponds pose the greatest risk to human health and the environment due to the combining of coal ash with water and the absence of composite liners within the ponds “to prevent leaking and leaching.”\(^48\)

According to EPA findings, “because of the mobility of metals and the large size of typical disposal units, metals (especially arsenic) have leached at levels of concern from unlined landfills and surface impoundments.”\(^49\) Many power companies, including TVA, and even those located immediately adjacent to residential communities, use wet ash ponds without liners.\(^50\)

The EPA evaluated the disposal facilities at coal-burning power plants and found that in 2012 over 470 coal-burning power plants “burned over 800 million tons of coal, generating approximately 110 million tons of [coal ash],” of which approximately 60 percent were disposed in 735 surface impoundments and 310 landfills.\(^51\) Of the 735 wet ash ponds, the EPA designated 318 as having a “high or significant hazardous rating,”\(^52\) thereby categorizing these locations as having a greater potential for loss of human life and environmental damage in the event of catastrophic failure.\(^53\)

The EPA confirmed a total of 157 damage cases—the greatest number in history—in which mismanagement of coal ash has caused damage to human health and the environment.\(^54\) Additionally, the EPA found that the older the wet ash pond, the greater likelihood of leaking.\(^55\) Out of the 735 wet ash ponds accounted for, approximately 56 were older than 50 years of age, 195 exceeded 40 years of age, and 340 were between 26 and 40 years of age.\(^56\) Unlined wet ash ponds typically operate for twenty years before leaking or leaching occurs.\(^57\)

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\(^{44}\) See 2010 Proposal, supra note 18, at 35130 (describing a landfill as a disposal facility where coal ash is placed, such as “piles, sand and gravel pits, quarries, and/or large scale fill operations”).

\(^{45}\) Id. (describing a surface impoundment as a large hole dug into the ground, or already existing in the ground, containing liquid that will be mixed with the coal ash).


\(^{47}\) Gottlieb et al., supra note 8, at 7; see also 2010 Proposal, supra note 18, at 35129–30 (describing the reuse of coal ash as “beneficial use” considered to provide a functional and useful benefit of the waste by replacing alternative materials and natural resources that may have been previously used).

\(^{48}\) Gottlieb et al., supra note 8, at 7.

\(^{49}\) 2010 Proposal, supra note 18, at 35137.


\(^{51}\) Final Rule, supra note 18, at 21303 (describing landfills as averaging over 120 acres in size with an average depth of over 40 feet, and surface impoundments averaging over 50 acres in size with an average depth of 20 feet).

\(^{52}\) Id. at 21327.

\(^{53}\) Id.

\(^{54}\) Id. at 21325.

\(^{55}\) Id. at 21327.

\(^{56}\) Id.

\(^{57}\) Final Rule, supra note 18 at 21326–27.
C. Coal Ash, a Hazardous Waste

The EPA defines a hazardous waste as “a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment.”\(^{58}\) Characteristics of a hazardous waste include “ignitability, corrosivity, reactivity or toxicity.”\(^{59}\) Coal ash commonly contains some of the world’s deadliest toxic metals, including “arsenic, lead, mercury, cadmium, chromium and selenium . . . [as well as] aluminum, antimony, beryllium, boron, chlorine, cobalt, manganese, molybdenum, nickel, thallium, vanadium, zinc, and uranium and thorium.”\(^{60}\) Each toxic metal poses its own individual health risks, but when exposed to multiple contaminants at one time (as would occur with exposure to coal ash) the grave risk to the health of humans and other species compounds exponentially.\(^{62}\) For humans and other species, all major organ systems are potentially affected, resulting in possible death.\(^{63}\)

In 2015, the Agency for Toxic Substances and Disease Registry (ATSDR) updated a biennial report identifying 785 toxic metals found at Superfund spill sites throughout the United States.\(^{64}\) The toxic metals were ranked in order of those posing “the most significant potential threat to human health due to their known or suspected toxicity and potential for human exposure.”\(^{65}\) Arsenic, lead, and mercury, the primary toxic metals found in coal ash,\(^{66}\) were named as the top three most commonly occurring toxic metals, with the highest rankings of toxicity.\(^{67}\)

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62. Gottlieb et al., supra note 8, at 4.  
65. ATSDR Priority List of Hazardous Substances, supra note 60.  
66. Gottlieb et al., supra note 8, at v–vi.  
67. ATSDR Priority List of Hazardous Substances, supra note 60; ATSDR Summary Data of Hazardous Substances, supra note 64; Barbara Gottlieb, Selling our Health Down the River, SoundCloud, 6:19 (June 17, 2015) (Discussing the hazardous impact of coal ash on the environment, Barbara Gottlieb described the discharge of toxic metals from power plants at “over 80,000 pounds of arsenic each year” and over “67,000 pounds of lead and mercury each year.”).
Arsenic, considered a human carcinogen, is one of the most common and deadliest toxic metals found within coal ash. Exposure to arsenic can result from contaminated drinking water, contaminated soil where children play, and by absorption through the skin in areas where a coal ash spill is present or through coal ash dust. At low levels, exposure to arsenic can result in nausea, vomiting, cardiovascular effects, and damage to the nervous system. Chronic exposure, even at low levels, and exposure to high levels of arsenic can result in multiple forms of cancer—some of which may not develop for years after exposure—and death. In children, harm is further expounded by the added potential to cause neurological effects, resulting in decreased IQ scores and “increased mortality.”

Lead, another common and deadly toxic metal found in coal ash, was identified by the ATSDR as the most commonly occurring toxic metal, and has been found at 1,274 spill sites identified on the National Priority List. This neurotoxin has been considered so hazardous that when purchasing or leasing a house, disclosure is required as to whether lead paint potentially exists in the home, and warnings are required regarding the hazards of lead. Exposure to lead in children could quickly result in “swelling of the brain, kidney disease, effects on the hemoglobin and possible death.”

Mercury, also considered a human carcinogen, is extremely toxic to the developing fetus and children. When mercury leaches into soil or water from coal ash, it converts into an organic form which can be absorbed by smaller organisms which are then eaten by larger organisms, such as fish. Bioaccumulation results in a high concentration of methylmercury within the fish, thus becoming a major pathway for human exposure. Additional methods of exposure include breathing...
contaminated air,\textsuperscript{85} as well as consuming contaminated food\textsuperscript{86} and water.\textsuperscript{87} Harmful effects of exposure to the fetus include “brain damage, mental retardation, incoordination, blindness, seizures, and inability to speak.”\textsuperscript{88} Children exposed to mercury “may develop problems of their nervous and digestive systems, and kidney damage.”\textsuperscript{89}

Coal ash ponds provide two additional injurious methods of exposure to fish and wildlife: direct exposure to the ponds’ toxic waters\textsuperscript{90} and exposure via leaking and leaching.\textsuperscript{91} Fish and wildlife become poisoned from exposure to toxic metals, such as selenium, arsenic, and mercury.\textsuperscript{92} The result is severe physical deformities, damage to reproductive development resulting in the elimination of entire species, and death.\textsuperscript{93}

In communities immediately adjacent to power plants using unlined wet ash ponds, where drinking water is derived from wells, the EPA has determined that residents of that community have “as much as a 1 in 50 chance of getting cancer from drinking water contaminated by arsenic, one of the most common and dangerous pollutants in coal ash.”\textsuperscript{94} Repeated low level exposure over an extended period of time can ultimately have the same effect as “a one-time high level of exposure,” where the results of cancer may not be seen for years following exposure.\textsuperscript{95} The EPA, through its own admissions, has defined coal ash as a toxic, hazardous waste,\textsuperscript{96} the management of which should be regulated as such due to the inherent risk, and enforced at a national level.

III. THE HISTORY OF THE TOXIC COAL ASH DISPOSAL REGULATIONS

A. Solid Waste Disposal Act

The regulation of coal ash has been hotly contested for decades.\textsuperscript{97} The first step towards regulating these toxic metals was in 1965 through the implementation of the

\begin{footnotesize}
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\item \textsuperscript{85} Toxic Substances Portal—Mercury, supra note 81.
\item \textsuperscript{86} Id.
\item \textsuperscript{87} Id.
\item \textsuperscript{88} Id.
\item \textsuperscript{89} Id.
\item \textsuperscript{90} Lemley et al., supra note 63; Gottlieb et al., supra note 8, at 8.
\item \textsuperscript{91} Id.
\item \textsuperscript{92} Lemley et al., supra note 63, at 8596.
\item \textsuperscript{93} Id.
\item \textsuperscript{95} Id. at 1.
\item \textsuperscript{97} Sue Sturgis, Big Energy vs. Coal Ash Regulation, GRIST (May 27, 2010), http://grist.org/article/power-politics/full/.
\end{itemize}
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Solid Waste Disposal Act (SWDA).\textsuperscript{98} This was the first federal regulation of its kind, designed to improve waste disposal technology.\textsuperscript{99} The purpose of SWDA “was to protect human health and the environment, to reduce wastes, and to limit the generation of hazardous waste.”\textsuperscript{100} As the EPA was not yet formed, the regulations provided states with minimum safety regulations for local landfills in an effort to control solid waste.\textsuperscript{101} After the EPA was formed in 1970, it became clear that stricter standards were needed to regulate solid waste disposal,\textsuperscript{102} which lead to a major expansion of the SWDA through Congress’s passage of the Resource Conservation and Recovery Act (RCRA).\textsuperscript{103}

\textbf{B. Pre-2015 Resource Recovery and Conservation Act}

RCRA is the backbone of solid and hazardous waste regulations, which sets forth federal guidelines on disposal of solid waste\textsuperscript{104} and implements EPA enforcement authority of hazardous waste.\textsuperscript{105} Upon promulgation, the goals of RCRA were to “[e]nsure that wastes are managed in a manner that protects human health and the environment; [r]educe or eliminate, as expeditiously as possible, the amount of waste generated, including hazardous waste; and [c]onserve energy and natural resources through waste recycling and recovery.”\textsuperscript{106} The “National Policy”\textsuperscript{107} under RCRA further expanded upon these goals, and stated that “wherever feasible, the generation of hazardous waste . . . be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment.”\textsuperscript{108} Two subchapters of RCRA have led to the greatest contention over the past thirty years.\textsuperscript{109} The first is Subchapter III, “Hazardous Waste Management,”\textsuperscript{110} commonly referred to as Subtitle C, regulating the management and disposal of hazardous waste.\textsuperscript{111} The second is Subchapter IV, “State or Regional Solid Waste Plans,”\textsuperscript{112} commonly referred to as Subtitle D, regulating the disposal of solid waste deemed non-hazardous.\textsuperscript{113} As written in 1976, the purpose of Subtitle C and D were clear,\textsuperscript{114} but

\begin{thebibliography}{99}
\bibitem{99} Id.
\bibitem{100} Id.
\bibitem{101} 25 Years of RCRA: Building on Our Past to Protect Our Future, EPA 1 (Apr. 2002), https://nepis.epa.gov/Exe/ZyPDF.cgi/10000MAO.PDF?Dockey=10000MAO.PDF.
\bibitem{102} Id.
\bibitem{103} Id. at 1–2.
\bibitem{104} Solid Waste Management on Tribal Lands, supra note 97.
\bibitem{105} Id.
\bibitem{106} Id. at 2.
\bibitem{107} 42 U.S.C. § 6902(b) (1976).
\bibitem{108} Id.
\bibitem{111} 2010 Proposal, supra note 18, at 35135.
\bibitem{113} 2010 Proposal, supra note 18, at 35136.
\bibitem{114} 42 U.S.C. § 6901(b) (2006) (containing the same language as the 1976 version of the statute).
\end{thebibliography}
as the years went on, money and corporate interests corroded their effectiveness. Subtitle D will be addressed first.

i. Subtitle D

Subtitle D differed greatly from its counterpart, Subtitle C. The purpose of this subtitle is to regulate solid waste that did not fall within the definition of a hazardous waste and which was not identified by the EPA as a hazardous waste. In sum, Subtitle D regulates the disposal of household garbage. Where Subtitle C provides stringent requirements on the management of hazardous waste through a “cradle-to-grave approach,” Subtitle D manages only the disposal of solid waste. While these differences are significant, the glaring difference is that the EPA does not have any authority to enforce the provisions of Subtitle D. Non-compliance with the guidelines set forth in Subtitle D can therefore only be enforced through citizen suit. For this reason, combined with the broad requirements of Subtitle D, logic concludes that management of any hazardous waste should not fall under purview of Subtitle D.

ii. Subtitle C

Under Subtitle C, the EPA is “authorized to enforce standards applicable to hazardous waste generators and transporters, and to owners and operators of hazardous waste treatment, storage, and disposal facilities . . . sometimes referred to as ‘cradle-to-grave’ management.” Therefore, all wastes deemed hazardous by the EPA are regulated by the strict standards of Subtitle C at the federal level. At the time of enactment, hazardous wastes were not yet identified. No later than eighteen months following promulgation, the EPA provided Congress the criteria required to identify hazardous wastes and a list of hazardous wastes to be regulated under Subtitle C. When making these determinations, the EPA was required to consider “toxicity, persistence, and degradability in nature, potential for...
accumulation in tissue, and other related factors such as flammability, corrosiveness, and other hazardous characteristics.”

In 1978, the EPA presented Congress with the required report establishing criteria for hazardous waste and identifying hazardous waste to be regulated under Subtitle C. Coal ash was identified as a potential hazardous waste. The EPA, expressing concern that it did not have enough information on the effects of coal ash, while at the same time recognizing that it was a hazardous waste, proposed regulation under a “limited subset of Subtitle C standards” called “special waste standards.” This proposal was met with fierce opposition by supporters of the coal industry, leading to a bill placed before Congress in 1980 known as the Bevill Amendment.

C. Coal Industry, Welcome to the Show—The Bevill Amendment

The Bevill Amendment was sponsored by Representative Thomas Bevill of Alabama, the chair of the House Energy Development and Water Appropriations Subcommittee, who opposed identifying coal ash as hazardous waste and regulating it under strict requirements of Subtitle C. During the Congressional debate, Bevill argued that “it would be unreasonable for EPA to impose costly and burdensome regulatory requirements without knowing if a problem really exists, and if it does, the true nature of that problem.” The Bevill Amendment was drafted in Alabama, a state that obtained most of its power from coal.

Under the Amendment, the EPA was required to conduct an extensive study and provide a detailed report by October 21, 1982, on the “adverse effects on human health and the environment” of the disposal and use of coal ash. Pending those findings, certain hazardous waste products, including coal ash, were exempt from Subtitle C, thus placing them within the mandates of Subtitle D, the regulation of household garbage. Cost and inconvenience to the power industry were the determining factors leading to the passage of the Bevill Amendment. A big win

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127. Id.
129. Id. at 59021.
130. LUTHER, supra note 95, at 4.
131. Id. at 6.
132. Id. at 4.
133. Id.
134. Sue Sturgis, supra note 96, at 2.
139. LUTHER, supra note 95, at 4.
for the power industry and its associates, the Bevill Amendment was seen as a major loss for residents, the natural world, and future generations. Thus, the EPA’s first attempt to regulate coal ash as hazardous waste was thwarted by profit margins and politics.

The deadline of October 21, 1982 came and went without any report provided. Finally, in 1998 and 1999 the EPA provided two reports, both of which claimed damage to human health and the environment did not warrant lifting the Bevill Amendment to regulate coal ash as hazardous waste. In 2000 however, there was a drastic shift in the EPA’s stance when the EPA was inundated with thousands of comments, some of which brought to light damage cases the EPA had not previously identified. The result was a new report proposing, for a second time, that coal ash be regulated under Subtitle C as a hazardous waste.

[Coal ash] waste[] could pose risks to human health and the environment if not properly managed, and [that] there is sufficient evidence that adequate controls may not be in place—for example, while most states can now require newer units to include liners and groundwater monitoring, 62% of existing utility surface impoundments do not have groundwater monitoring.

The proposal collided with other interests when it was introduced to Congress. The debate did not focus on human or environmental health, but on cost. The EPA estimated costs to the power industry to be an additional $1 billion per plant per year, while the power industry estimated costs to be an additional $13 billion per plant per year. Due to political and industry-driven considerations, the EPA backed away from the proposed regulations and claimed it would consider regulating coal ash as a non-hazardous waste. Those regulations however, did not come until it was too late.

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140. See generally Sturgis, supra note 96 (discussing how the coal industry avoided the imposition of costly and burdensome regulatory requirements, while evidence was “mounting that coal ash posed a growing threat to environmental and human health”).
141. Id.
143. Id.
144. Id.
145. Id.
147. Id. at 32,216.
149. Id.
150. Id.
151. Id.
In 2007, just one year before the Kingston TVA spill, the EPA prepared a study, *Human and Ecological Risk Assessment of Coal Combustion Wastes*, describing inherent risks in the disposal of coal ash.\(^{152}\) Within this study, the EPA found that state management of coal ash disposal sites were insufficient,\(^{153}\) coal ash disposal sites were not monitored by the states,\(^{154}\) and most states did not require liners.\(^{155}\) Additionally, the study identified the existence of state programs that permitted disposal methods of coal ash which directly threatened drinking water supplies from underground aquifers.\(^{156}\) Yet these findings were not enough for the EPA to propose regulations on the storage and disposal of coal ash.\(^{157}\) It took a catastrophic disaster in Harriman, Tennessee,\(^{158}\) shocking the nation with the horror of coal ash and the risks imposed on the communities, for the federal government to finally stir.\(^{159}\)

**D. 2010, The Proposal**

As a direct result of the 2008 TVA spill,\(^{160}\) in 2010, the EPA proposed regulations for the disposal and storage of coal ash.\(^{161}\) The proposal provided two main options to regulate coal ash and requested public comments before a final determination was made.\(^{162}\) The first option proposed regulation of coal ash (disposed of through landfills or surface impoundments) through Subtitle C of RCRA,\(^{163}\) thereby reversing its previous determinations to regulate coal ash as a non-hazardous waste and lifting the Bevill exemption.\(^{164}\) By falling under the mandates of Subtitle C, federal enforcement would be required, as well as state adoption and implementation.\(^{165}\) This was the EPA’s third attempt to regulate coal ash as hazardous waste.\(^{166}\)

The second option proposed regulation of coal ash through Subtitle D of RCRA, drafted for the regulation of non-hazardous waste.\(^{167}\) Consistent with the provisions of Subtitle D, these guidelines would be self-regulating,\(^{168}\) providing citizens and states the opportunity to bring suit for failure to comply,\(^{169}\) but prohibiting the federal

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\(^{153}\) *Id.*

\(^{154}\) *Id.*

\(^{155}\) *Id.*

\(^{156}\) *Id.; see also Sturgis, supra note 96.*

\(^{157}\) *See Sturgis, supra note 96.*

\(^{158}\) *Id.; see also 2010 Proposal, supra note 18, at 35132.*

\(^{159}\) *See Sturgis, supra note 96.*

\(^{160}\) *See 2010 Proposal, supra note 18, at 35132, 35150.*

\(^{161}\) *Id. at 35150.*

\(^{162}\) *Id.*

\(^{163}\) *Id. at 35133.*

\(^{164}\) *Id.*

\(^{165}\) *Id. at 35135–36.*

\(^{166}\) *See generally Sturgis, supra note 96 (discussing the three attempts made to regulate coal ash in 1978, 2000, and 2010).*

\(^{167}\) *2010 Proposal, supra note 18, at 35136.*

\(^{168}\) *Id.*

\(^{169}\) *Id.*
government from enforcement due to the Bevill exemption. The EPA justified regulation under Subtitle D by claiming that while certain safeguards (such as lining ponds) must be in place to protect against hazardous effects of coal ash, the safeguards did not need to be as stringent as those required under Subtitle C. The EPA would not go as far as defining coal ash as non-hazardous, yet proposed it could be regulated as such.

Over 400,000 comments and submissions came pouring in from communities, the power industry, and environmentalists as to preferred methods of regulation. Environmentalists and members of concerned communities relied on the proven toxic hazards of coal ash and the weight of historical events to support regulation under Subtitle C. The power industry however took a firm stance in affirming its belief in profit over people and the continued regulation of coal ash under Subtitle D, stating that the Subtitle C compliance costs “cannot be justified.”

E. 2014, The Final Rule

On December 19, 2014, the EPA published the final rule regulating coal ash, a proven hazardous waste, under the self-regulating standards of Subtitle D. Within the Summary of the Rule, the EPA acknowledged that “the risks posed to human health and the environment by certain . . . [coal ash] management units warrant regulatory controls.” The rule requires the closure, or retrofitting, of any existing unlined surface impoundments that are contaminating groundwater above a regulated limit and the closure of landfills and surface impoundments that cannot meet structural integrity requirements, as well as maintaining a publicly available website containing compliance information. The rule limits regulation to active power facilities and specifically excludes inactive surface impoundments at closed facilities, which could continue to store coal ash with the potential of contaminating groundwater with toxic metals.

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170. Id.
171. Id.
172. Id.
174. Final Rule, supra note 18, at 21302.
176. Final Rule, supra note 18, at 21302 (As a Subtitle D regulation, the guidelines are not federally enforceable, with regulations only being enforceable through state and citizen suit.). The Final Rule was pre-published on December 19, 2014, prior to publication in the Federal Registrar on April 17, 2015.
177. Id.
178. Id.
179. Id. at 21340.
On October 6, 2016, the rule was further amended to extend the deadline for compliance of closing surface impoundment locations. The closure of these locations is required due to potential risks imposed through inadequate surface impoundment structures. The extension of the deadline therefore grossly increases the risk of exposure to toxic, carcinogenic metals, potentially having catastrophic effects to nearby residents and the environment.

IV. THE NET EFFECT

A. Failure to Comply Results in Toxic Impacts on Communities and Environment

Despite the fact that coal ash is “regulated” under Subtitle D, it is a hazardous waste due to the toxic metals that comprise coal ash. Improper storage and disposal of coal ash resulting from lack of enforcement have had, and will continue to have, detrimental and deadly impacts on neighboring communities.

Following the Kingston TVA spill, the toxic coal ash was transferred from Tennessee to a small, low-income, minority town in Uniontown, Alabama. The coal ash was placed into a landfill, uncapped, and resulted in severely hazardous health effects to the community. Residents of the community and environmental advocates have described the potential impacts of the massive coal ash landfill as causing coal dust storms in windy conditions; coal ash to seep down the sides of the “mountain” in the rain; paint to peel off houses and cars; animals to become ill and die; and residents to experience grave health effects.

In 2014, just prior to EPA’s final rule, a massive coal ash spill occurred in Eden, North Carolina from a retired Duke Energy plant, resulting in “canyons and ridges of industrial waste the size of 20 football fields, buried right by the river where people fish and swim and get their drinking water.” As much as 39,000 tons of coal ash and 27 million gallons of toxic pond water were released into the Dan

182. Id.
183. See id. The lack of regulation of closed facilities, continuing to store coal ash, warrants a related, but entirely separate writing and legal analysis.
184. See Physicians for Social Responsibility, supra note 60; see also ATSDR, The Priority List of Hazardous Substances, supra note 60.
188. Foster, supra note 185.
189. The Spill at Dan River, supra note 23.
River. The spill traveled as far as seventy miles downstream into Virginia’s neighboring riverbeds. A damage assessment conducted by the Dan River Natural Resource Trustee Council determined that “concentrations of the hazardous substances associated with coal ash in Dan River sediments were sufficient to cause injury” to wildlife and other species exposed to the coal ash. Both arsenic and selenium were identified amongst the toxic metals at levels of concern. It is unclear at this point as to the long term effects that this toxic, hazardous exposure will have on the North Carolina community.

Litigation has been ongoing in communities such as Shippingport, Pennsylvania, which are exposed to toxic leakage and negative health effects from the largest coal ash pond in the country, Little Blue Run, an unlined 1,700 acre coal ash pond. Built as a coal ash disposal site for Bruce Mansfield power plant, the residents of Shippingport were at one time told that the “lake” would be a boon to the area, a family destination where they could swim and play. Tests have now confirmed that coal ash has penetrated hundreds of yards of rock and soil, contaminated the local groundwater, and occasionally spills from the surrounding hillsides into residents’ backyards. Local wells tested positive for arsenic. While this pond was closed at the end of 2016, the community and environment continue to suffer from its hazardous impact.

Almost ten years after the Kingston spill, TVA facilities continue to contaminate rivers and drinking water of neighboring communities due to improper disposal and management of coal ash, this time at the Gallatin Fossil Plant located just south of Nashville, Tennessee. This plant, similar to the Kingston Plant, is surrounded by

191. Id. at 19, 32.
194. Pennsylvania DEP, supra note 27; see also MORNING JOURNAL, supra note 27.
195. Warrick, supra note 25; Peach, supra note 193.
196. Warrick, supra note 25.
197. Id.
199. Warrick, supra note 25.
200. Id.
201. Id.
202. Id.
203. See MORNING JOURNAL, supra note 27; EARTHJUSTICE, supra note 198.
residential homes, with children and families who drink the water, swim in pools, and play in the soil. The Southern Environmental Law Center (SELC) filed suit against TVA as a result of this contamination.

During trial, which concluded on February 3, 2017, the TVA acknowledged that contamination began as early as the 1970’s. The mixture of water with coal ash leaked “through the porous bottom of the ash ponds at a rate of 6,000 gallons a minute. The total volume of coal ash wastewater lost [from 1970 to 1978] . . . was 27 billion gallons.” SELC experts visited the site just prior to trial and testified that “they encountered coal ash sludge on the banks of the Cumberland River that was at times waist deep.” As a result of this toxic leaching, the Cumberland River is likely, as of the date trial concluded, polluted with “arsenic, cadmium, selenium and other toxic agents harmful to both humans and wildlife.”

B. Political Upheaval—Compliance Unlikely

“Please allow me to introduce myself
I’m a man of wealth and taste
I’ve been around for a long, long year
Stolen many a man’s soul and faith”
-Sympathy for the Devil, The Rolling Stones

Using the EPA’s own definition of hazardous waste, coal ash disposal and storage should fall under federal enforcement and be regulated under Subtitle C. The exclusion of coal ash from Subtitle C, combined with the lack of federal enforcement, could have devastating effects on those communities endangered due to the risks of leakage and exposure. Applying Subtitle C to coal ash would restore value to both humanity and the earth. While this rule provides a small step towards protecting the health of the community and the environment, compliance is unlikely due to its self-regulating nature, and the unraveling of environmental regulations by the federal government.

On January 20, 2017, within hours of Donald Trump taking office, all reference to climate change and the impact of mankind on the environment were removed from the White House website and replaced with an aggressive plan to access the nation’s
shale, oil, and gas reserves, and revive the coal industry.\textsuperscript{212} This plan is coming to fruition at an alarming rate as evidenced through significant rollbacks and elimination of essential environmental regulations,\textsuperscript{213} including the decision to remove the United States from the Paris Climate Change Agreement,\textsuperscript{214} sending shockwaves across the globe.\textsuperscript{215} The elimination and rollback of regulations meant to protect mankind and the environment align with President Trump’s redirection of the EPA,\textsuperscript{216} to overhaul and dismantle any environmental regulations that the Administration deems overly burdensome (i.e. costly) for the power industry and corporations.\textsuperscript{217}

On May 12, 2017, the Utility Solid Waste Activities Group (USWAG) petitioned the EPA to reconsider and significantly rollback requirements within the Final


Taking its lead from the President’s Executive Orders, the justification for reconsideration was (what the USWAG considers) the unnecessary cost of compliance to close or retrofit coal ash ponds leaking and contaminating the environment. Thus, adding to the ever growing list of potential environmental rollbacks, the already insufficient regulations related to the storage and disposal of coal ash.

Based on the recent regulatory changes, it is becoming clear that the current Administration cannot be relied upon to be a steward for the health of the environment and humanity. It is the power of the people, acting through the elected members of Congress, which must act to create regulations protecting the citizens of the states to which they represent. It is the realization of the toxic hazards of coal ash that must move Congress to enact federal regulations that are enforceable and protect against the improper storage and disposal of coal ash.

Federal regulations however must go one step further. Too many Americans have unknowingly turned a blind eye towards the potential hazards of the power plant looming over their backyard, learning only too late of the toxic substances slowly leaking into their ground water and surface water. Education and disclosure of the toxic hazards of coal ash are essential to ensure communities are protected from the hazards surrounding them. In 1992, Congress recognized that education and disclosure were the key to prevention of the detrimental and deadly effects exposure to lead paint was having on millions of children throughout the country. The history and regulation of lead paint can be learned from and utilized to find a solution for those unknowing communities.

224. Id.
V. THE PRACTICAL SOLUTION

A. Lead Paint, a Historical Model

Lead, a primary toxic metal within coal ash, has its own lamented history as a public health hazard. As a standalone risk, lead-based paint in particular was deemed dangerous enough to compel Congress to come together in order to protect the health of humanity through the passage of legislation banning the usage of lead paint and requiring disclosure of the health hazards associated with lead. Such history and bi-partisan efforts can contribute to a viable solution for coal ash.

In the early part of the nineteenth century, paint manufacturing was limited to druggists within local communities, who had easy access to minerals and dyes. With the rise of transportation, came the rise of the corporate lead industry in the United States, making it the largest lead producing nation in the world. In 1906, National Lead began its fifty year campaign to promote white lead with promises of health, prosperity, and purity. As a result, by the early 1920’s the use of lead paint reached its peak in the United States, due to claims by the lead industry that lead paint, easily washable and durable, provided better protections from germs than that of wallpaper and glue. The white “cleanliness” of the paint drew consumers through advertisements of the famed Dutch Boy, claiming “lead helps guard your health.”

As the United States was ramping up its use of lead-based paint, many countries were prohibiting its use due to the severe, and rising, cases of lead poisoning. In 1921, the White Lead Convention was organized by the International Labour Conference, leading to the prohibition of lead paint in several countries. The United States however did not join in this prohibition; the interests of the Lead Industries Association took priority over the health of humanity, not unlike the influence the coal industry and its lobbyists have on the federal government.

226. Gottlieb et al., supra note 8, at 1, 3.
227. Id. at 3.
228. Id.
231. MARKOWITZ et al., supra note 230, at 36.
232. Id. at 38.
233. Id. at 68; see also Why was Lead Paint Ever Popular, H2 ENVTL., http://www.h2environmental.com/lead-paint-ever-popular/ (last visited June 1, 2017).
234. MARKOWITZ et al., supra note 230, at 83.
236. Id.
237. Id.
238. Id.
239. Id.
240. Id.
Refusal by the United States to join in the ratification of the White Lead Convention would go on to have detrimental and deadly effects on the United States’ population over a span of decades.\textsuperscript{242} As a direct result, “pediatric lead poisoning became an epidemic, whose shocking magnitude was not understood until the late 1960s or early 1970s.”\textsuperscript{243}

For a large part of the twentieth century, lead poisoning in children was blamed on consumption of lead based paint chips from toys and furniture as well as consumption of peeling and flaking paint from poorly maintained homes.\textsuperscript{244} The blame was placed on parents,\textsuperscript{245} and the solution was to better educate parents to prevent children from consuming lead contaminated paint.\textsuperscript{246} This resulted in the ban of interior lead paint in Baltimore in 1951\textsuperscript{247} and, in 1955, the adoption of a voluntary national standard by the paint industry and the American Academy of Pediatrics, to prohibit the use of interior lead paint.\textsuperscript{248} Then, in 1974, a new theory emerged, more damaging than before: lead poisoning in children caused by consuming everyday household dust contaminated with lead, through acts as innocent as children licking their hands.\textsuperscript{249} A seemingly harmless act was discovered to result in severe lead poisoning.\textsuperscript{250}

The injuries caused from exposure to lead are debilitating and deadly.\textsuperscript{251} According to the Center for Disease Control (CDC), elevated blood lead levels in children can result in “learning disabilities, behavioral problems, mental retardation, and at extremely high levels, seizures, coma, and death.”\textsuperscript{252} Acceptable blood lead levels in children, once not to exceed 80 micrograms per deciliter,\textsuperscript{253} are now deemed high risk if exceeding 5 micrograms per deciliter.\textsuperscript{254} In 1992, as many as three million children were afflicted with lead poisoning.\textsuperscript{255}

Following decades of illness, disease, and death from lead poisoning, Congress recognized the deadly impact that exposure to lead could have on children and that a solution was required at the national level.\textsuperscript{256} The Residential Lead-Based Paint

\begin{footnotes}
\item \textsuperscript{242} Hernberg, supra note 235, at 249.
\item \textsuperscript{243} Id.
\item \textsuperscript{244} Id.
\item \textsuperscript{246} Hernberg, supra note 235, at 249.
\item \textsuperscript{247} Id.
\item \textsuperscript{248} Id.
\item \textsuperscript{249} Id.
\item \textsuperscript{250} Id.
\item \textsuperscript{252} Id.
\item \textsuperscript{253} MARKOWTIZ et al., supra note 230, at 110.
\item \textsuperscript{254} CDC, \textit{What Do Parents Need to Know to Protect Their Children?}, https://www.cdc.gov/nceh/lead/acclpp/blood_lead_levels.htm (last updated Jan. 30, 2017).
\item \textsuperscript{255} 42 U.S.C. § 4851 (1992).
\item \textsuperscript{256} Id.
\end{footnotes}
Hazard Reduction Act of 1992 was passed to rectify the uphill battle of lead poisoning caused by years of failure to act.\textsuperscript{257} The goals of the Act were clear: to prevent childhood lead poisoning;\textsuperscript{258} to eliminate the hazards related to lead;\textsuperscript{259} and “to educate the public concerning the hazards and sources of lead-based paint poisoning and steps to reduce and eliminate such hazards.”\textsuperscript{260} In order to facilitate these goals, Congress mandated the U.S. Department of Housing and Urban Development (HUD) and the EPA to develop regulations requiring disclosure of lead-based paint hazards and disclosure of information known of lead-based paint prior to the sale or lease of residential housing built prior to 1978.\textsuperscript{261}

Pursuant to these regulations, sellers and landlords must provide buyers and lessees a pamphlet, approved by the EPA, describing how to identify and control lead-based paint hazards;\textsuperscript{262} disclose all known information regarding lead-based paint hazards within the home;\textsuperscript{263} provide a Lead Warning Statement attached to the contract confirming compliance with lead notification requirements;\textsuperscript{264} and ensure a 10-day period for buyers to conduct a lead inspection of the home.\textsuperscript{265} In a society where cost to the industry is the driving factor,\textsuperscript{266} this solution—disclosure to families choosing whether they will reside within homes that could potentially be contaminated with lead, whose children could suffer grave and deadly effects from that lead\textsuperscript{267}—was of zero cost to the industry.\textsuperscript{268}

\textbf{B. Written Disclosure, No Cost to the Industry}

Similar to Congress’s goals when enacting the Residential Lead-Based Paint Hazard Reduction Act, written disclosure can be the catalyst to educate citizens of the hazards that could occur through exposure to toxic coal ash. The disclosures could be modeled after the already accepted lead paint disclosures and include relevant information regarding the health risks of living near a coal-burning power plant. At a minimum, the disclosures should include: (1) an explanation that the residence is located within a certain proximity to a coal-burning power plant; (2) a definition of coal ash and a comprehensive list of the toxic metals commonly found in coal ash; (3) the harmful effects that exposure to coal ash can have on the health of the individual as well as the environment; and (4) a clear explanation of how exposure to coal ash could occur.

\textsuperscript{257} Id.
\textsuperscript{259} Id.
\textsuperscript{260} Id.
\textsuperscript{262} Id.
\textsuperscript{263} Id.
\textsuperscript{264} Id.
\textsuperscript{265} Id.
\textsuperscript{267} See generally, The Lead Disclosure Rule, supra note 260.
\textsuperscript{268} EPA and HUD Move to Protect Children from Lead-Based Paint Poisoning: Disclosure of Lead-Based Paint Hazards in Housing, EPA & DEPT. OF HOUSING AND URBAN DEV. https://www.epa.gov/sites/production/files/documents/fs-disc1.pdf.
Without due diligence, purchasers and lessees may not be aware that the home they are considering is within blocks of a coal-burning power plant. While they may see the smoke stacks, the understanding of what those smoke stacks are, or what they mean, may not seem like a necessary consideration. Elected officials have a responsibility to ensure the protection of their citizens, and that responsibility must come before the protection of power plants. Requiring disclosure of hazards of toxic coal ash is part of that responsibility.

Requiring written disclosure however does not protect those citizens who already reside within those residential communities close to the power plants. While there are many options for public notice, at a minimum, power plants should be required to display conspicuous signage along the perimeter of the power plant, providing a warning that coal ash is a hazardous waste, a list of the common toxic metals within coal ash, and a general statement regarding the health effects related to exposure of coal ash. This does not resolve the improper storage of coal ash, but it does provide a warning to the surrounding community of the true health hazards of residing near a coal-burning power plant. While the coal industry may object to such disclosures, the out-of-pocket expense is negligible—simply that of a sign.

VI. CONCLUSION

Federal regulation of the disposal and storage of coal ash as a hazardous waste, and disclosure of its toxic hazards to the surrounding community, must be required in order to protect the country and environment on a larger scale. Regulation as a non-hazardous waste is not due to its lack of “ignitability, corrosivity, reactivity or toxicity,”269 but merely a result of the cost and “inconvenience” to the power industry.270 Raised awareness regarding the dangers of coal ash through explicit disclosure is an essential, easily attainable, and cost efficient solution. A similar approach raised awareness of, and greatly reduced, the detrimental effects of lead paint, providing a viable, cost efficient, and easily attainable solution to disclose the dangers of coal ash.271

As of March 11, 2018, the EPA’s mission remains “to protect human health and the environment.”272 However, under newly-elected President Trump’s Administration, it is likely coal ash will continue to be regulated as a non-hazardous waste.273 Just as cities, states, and members of Congress are banding together to fight against the removal of the United States from the Paris Climate Agreement,274 just

270. See generally Sturgis, supra note 96 (discussing how the coal industry avoided the imposition of costly and burdensome regulatory requirements, while evidence was “mounting that coal ash posed a growing threat to environmental and human health”).  
271. See generally The Lead Disclosure Rule, supra note 260.  
274. See Keneally & Jacobo, supra note 214; Bill Chappel, Bloomberg Promises $15 Million To Help Make Up For U.S. Withdrawal From Climate Deal, NPR (June 2, 2017, 1:58 PM), http://www.npr.org/sections/thetwo-
as Congress implemented stringent regulations due to the inherent harm caused by lead paint, 275 those same movements must compel Congress to fight to protect communities from the dangers of coal ash.