

TESTIMONY OF  
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BEFORE THE  
SUBCOMMITTEE ON ENERGY AND MINERAL RESOURCES,  
COMMITTEE ON NATURAL RESOURCES,  
U.S. HOUSE OF REPRESENTATIVES  
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Chairman Costa and Members of the Subcommittee, thank you for holding this hearing to consider the federal government's role in addressing the health and environmental risks of coal combustion waste. When mismanaged, coal combustion waste damages aquatic ecosystems, poisons drinking water and threatens the health of Americans nationwide. One of the dangers posed by coal combustion waste is disposal in coal mines, a practice that threatens the already heavily impacted communities and natural resources of our nation's coal mining regions.

I am Lisa Evans, an attorney for Earthjustice, a national non-profit, public interest law firm founded in 1971 as the Sierra Club Legal Defense Fund. Earthjustice represents, without charge, hundreds of public interest clients in order to reduce water and air pollution, prevent toxic contamination, safeguard public lands, and preserve endangered species. My area of expertise is hazardous and solid waste law. I have worked previously as an Assistant Regional Counsel for the Environmental Protection Agency enforcing federal hazardous waste law and providing oversight of state programs. I appreciate the opportunity to testify this morning.

The question before this subcommittee, how the federal government should address the risks of coal combustion waste, has a straightforward answer. Simply stated, the U.S. Environmental Protection Agency (EPA) must do what it committed to do in its final *Regulatory Determination on Wastes from the Combustion of Fossil Fuels*, published 8 years ago.<sup>1</sup> In that determination, mandated by Congress in 1980, EPA concluded that federal standards for the disposal of coal combustion waste under the Resource Conservation and Recovery Act (RCRA) and/or the Surface Mining Control and Reclamation Act (SMCRA) are required to protect health and the environment. EPA's commitment to set minimum federal disposal standards extended to coal ash disposed in landfills, lagoons and mines. Yet eight years later, and 25 years after Congress required this determination, EPA's commitment remains an entirely empty promise.

The failure to fulfill this commitment is wholly unjustified, particularly in light of the substantial research that has already been completed by both EPA and the National Academies of Science (NAS). Preceding EPA's 2000 determination, EPA complied (albeit 16 years late) with a congressional mandate under RCRA to study the risks posed by coal combustion waste, solicit public comment, hold a public hearing, and publish a Report to Congress.<sup>2</sup> As a result, there is a robust record documenting the risks posed by coal ash and the damage that has occurred throughout the country as a result of its mismanagement. Further supplementing the record, EPA published in August 2007 a

Notice of Data Availability that included additional documentation of the risks posed by coal combustion waste including a draft *Human Health and Ecological Risk Assessment* and a *Coal Combustion Waste Damage Case Assessment*. Lastly, EPA's Office of Research and Development has published a series of documents detailing the increasing toxicity of coal combustion waste, including *Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control*.

Secondly, in 2004, Representative Nick Rahall introduced legislation requiring the NAS to study the impact of coal ash placement in mines and to recommend what federal action, if any, should be taken to control this burgeoning practice. In March 2006, the NAS published a report, *Managing Coal Combustion Residues in Mines*, that concluded unequivocally that enforceable federal standards be established to protect ecological and human health. The NAS recommended that EPA and the U.S. Office of Surface Mining (OSM) work together to promulgate federal standards under RCRA, SMCRA or a combination of both statutes.

It is now two years since the publication of the NAS report, 8 years after EPA's final regulatory determination, and 28 years since Congress first asked EPA to study the question. While the federal agencies have failed to act, the need to resolve this question has become increasingly urgent. When one considers the escalating number of sites polluted by coal combustion waste, the documented increase in the toxicity of coal ash, the increase in U.S. coal use, the accompanying increase in the volume of waste, and the trends in mismanagement, the path is clear. Flying blind without federal rules that ensure safe disposal of the largest industrial waste in the country is nothing if not foolish, dangerous, and contrary to statutory mandates and clear Congressional intent.

EPA and OSM are fiddling while ash from burning coal poisons our water and sickens our communities. Inadequate state laws offer scant protection. Federal environmental statutes dictate that EPA and OSM must do what they promised to do and what they have been directed to do -- promulgate enforceable minimum federal standards to protect health and the environment nationwide from the risks posed by mismanagement of coal combustion waste.

## **The Nature of the Threat from Coal Combustion Waste**

### *1. The Volume of Waste is Immense*

Burning coal produces over 129 million tons *each year* of coal combustion waste in the U.S. This is the equivalent of a train of boxcars stretching from Washington, D.C. to Melbourne, Australia.<sup>3</sup> Coal combustion waste (CCW) is largely made up of ash and other unburned materials that remain after coal is burned in a power plant to generate electricity. These industrial wastes include the particles captured by pollution control devices installed to prevent air emissions of particulate matter (soot) and other gaseous pollutants from the smokestack. In addition to burning coal, some power plants mix coal with other fuels and wastes, including a wide range of toxic or otherwise hazardous

chemicals, such as the residue from shredded cars (a potential source of PCBs), oil combustion waste (often high in vanadium), railroad ties, plastics, tire-derived fuel and other materials.<sup>4</sup>

As demand for electricity increases and regulations to reduce air emissions from power plants are enforced, the amount of CCW is expected to increase. By 2015, the quantity of CCW generated per year is estimated to exceed 170 million tons. (See Figure 1) In addition, the Energy Information Administration (EIA)'s *2007 Annual Energy Outlook* indicates that electricity production from coal is projected to increase almost 25 percent by 2020 and 64% by 2030.<sup>5</sup> Production of CCW will increase proportionally.

CCW is significantly different from coal itself. As coal is burned, its volume is reduced by two thirds to four fifths, concentrating metals and other minerals that remain in the ash. Elements such as chlorine, zinc, copper, arsenic, selenium, mercury, and numerous other dangerously toxic contaminants are found in much higher concentrations on a per volume basis in the ash compared to the coal. These wastes are poisonous and can cause cancer or damage the nervous systems and other organs, especially in children. The thousands of tons of chemicals disposed of in CCW each year dwarf other industrial waste streams. (See Figure 2) Table 1 below indicates some of the contaminants commonly found in CCW and their human health effects.

**Table 1: Human Health Effects of Coal Combustion Waste Pollutants**

Aluminum	Lung disease, developmental problems
Antimony	Eye irritation, heart damage, lung problems
Arsenic	Multiple types of cancer, darkening of skin, hand warts
Barium	Gastrointestinal problems, muscle weakness, heart problems
Beryllium	Lung cancer, pneumonia, respiratory problems
Boron	Reproductive problems, gastrointestinal illness
Cadmium	Lung disease, kidney disease, cancer
Chromium	Cancer, ulcers and other stomach problems
Chlorine	Respiratory distress
Cobalt	Lung/heart/liver/kidney problems, dermatitis
Lead	Decreases in IQ, nervous system, developmental and behavioral problems
Manganese	Nervous system, muscle problems, mental problems
Mercury	Cognitive deficits, developmental delays, behavioral problems
Molybdenum	Mineral imbalance, anemia, developmental problems
Nickel	Cancer, lung problems, allergic reactions
Selenium	Birth defects, impaired bone growth in children
Thallium	Birth defects, nervous system/reproductive problems
Vanadium	Birth defects, lung/throat/eye problems
Zinc	Gastrointestinal effects, reproductive problems

Source: ATSDR ToxFAQs, available at [www.atsdr.cdc.gov/toxfaq.html](http://www.atsdr.cdc.gov/toxfaq.html)

## 2. Better Air Pollution Controls Make CCW More Toxic

CCW is becoming increasingly toxic. As air pollution control regulations are implemented under the Clean Air Act, more particulates and metals are captured in the ash instead of being emitted from the smokestack. In a 2006 report on CCW, EPA found that when activated carbon injection was added to a coal-fired boiler to capture mercury, the resulting waste leached selenium and arsenic at levels sufficient to classify the waste as “hazardous” under RCRA.<sup>6</sup> Specifically, EPA found that arsenic leached (dissolved) from the CCW at levels as high as 100 times its maximum contaminant level (MCL) for drinking water, and selenium leached at levels up to 200 times its MCL.<sup>7</sup>

In a follow-up study that is currently underway by EPA’s Office of Research and Development, EPA tested the leaching characteristics of CCW from a power plant employing both mercury controls and a wet scrubber for sulfur dioxide control. EPA found that CCW from a plant with a wet scrubber leached numerous additional toxic metals at levels significantly higher than their MCLs.<sup>8</sup> EPA found that the CCW leached arsenic, thallium, boron, and barium above RCRA’s hazardous waste threshold (100 times the MCL). The CCW also leached levels of antimony, cadmium, chromium, lead, mercury, molybdenum and selenium in quantities sufficient to contaminate drinking water and harm aquatic life.

EPA’s own analyses of how CCW behaves in unlined disposal sites predict that some metals will migrate and contaminate nearby groundwater to conditions extremely dangerous to people. In 2007, EPA published a draft *Human Health and Ecological Risk Assessment* that found extremely high risks to human health from the disposal of coal ash in waste ponds and landfills. According to EPA, the excess cancer risk for children drinking groundwater contaminated with arsenic from CCW disposal in unlined ash ponds is estimated to be as high as nine in a thousand - 900 times higher than EPA’s own goal of reducing cancer risks to less than one-in-one hundred thousand individuals. Figure 3 compares EPA’s findings on the cancer risk from arsenic in coal ash disposed in waste ponds to several other cancer risks, along with the highest level of cancer risk that EPA finds acceptable under current regulatory goals.

Clearly, as new technologies are mandated to filter air pollutants from power plants, cleaning the air we breathe of smog, soot and other harmful pollution, the quantity of dangerous chemicals in the ash increases. Without adequate safeguards, the chemicals that have harmed human health for years as air pollutants- mercury, arsenic, lead and thallium- will now reach us through drinking water supplies. Given the documented tendency of CCW to leach metals at highly toxic levels, there is clearly the need for scrutiny of current disposal practices.

## 3. CCW Causes Documented Damage to Human Health and the Environment

The absence of national disposal standards has resulted in environmental damage at disposal sites throughout the country. In fact, scientists have documented such damage for decades. Impacts include the leaching of toxic substances into soil, drinking water,

lakes and streams; damage to plant and animal communities; and accumulation of toxins in the food chain.<sup>9,10</sup> According to EPA's latest *Damage Case Assessment for Coal Combustion Waste* published in 2007, EPA recognizes 67 contaminated sites in 23 states where CCW has polluted groundwater or surface water. EPA admits that this is just the tip of the iceberg, because most CCW disposal sites in the U.S. are not adequately monitored.

Low-income communities and people of color shoulder a disproportionate share of the health risks from these wastes. The poverty rate of people living within one mile of coal combustion waste disposal sites is twice as high as the national average, and the percentage of non-white populations within one mile is 30 percent higher than the national average. Similarly high poverty rates are found in 118 of the 120 coal-producing counties, where CCW increasingly are being disposed of in unlined, under-regulated mines, often directly into groundwater.

Documented damage from CCW includes:

- Public and private drinking water contaminated by CCW in at least 8 states, including Wisconsin, Illinois, Indiana, New Mexico, Pennsylvania, North Dakota, Georgia and Maryland.<sup>11</sup>
- Hundreds of cattle and sheep killed and many families sickened in northern New Mexico by ingesting water poisoned by CCW.<sup>12</sup>
- Fish consumption advisories issued in Texas and North Carolina for water bodies contaminated with selenium from CCW disposal sites and entire fish populations destroyed.<sup>13,14</sup>
- Documented developmental, physiological, metabolic, and behavioral abnormalities and infertility in nearly 25 species of amphibians and reptiles inhabiting wetlands contaminated by CCW in South Carolina.<sup>15</sup>

Unfortunately, new CCW-contaminated sites are being uncovered with disturbing frequency. One need only pick up the *Washington Post*, *Baltimore Sun* or *Virginian-Pilot* over the last few months to grasp the national crisis. Evidence of poisoned water has recently surfaced in Baltimore, Charles County, Virginia Beach, and across the country in Illinois, Indiana, and Montana.

The following sites are illustrative:

- **Gambrills Fly Ash Site, Anne Arundel County, Maryland** where 3.8 million tons of ash were dumped in unlined gravel pits contaminating drinking water wells with arsenic, lead, cadmium, nickel, radium and thallium as high as 4 times the drinking water standard.

- **Faulkner Landfill, Charles County, Maryland** where leaching coal ash is contaminating a wetland with selenium and cadmium at levels high enough to kill any animal life, The Smithsonian Institution has called the affected wetlands, Zekiah Swamp, one of the most ecologically important areas on the East Coast.
- **Battlefield Golf Course, Chesapeake, Virginia** where developers used 1.5 million tons of fly ash to build a golf course over a shallow aquifer. Although the course was just completed this winter, wells are already starting to show elevated boron. Investigation into the cause of the pollution has just begun. Residential drinking water wells are in close vicinity to the unlined, uncapped site.
- **PPL Montana Power Plant, Colstrip, Montana**, the second largest coal-fired power plant west of the Mississippi, where leaking unlined coal ash ponds contaminated residential wells with high levels of metals, boron and sulfate. Five companies agreed in May 2008 to pay \$25 million to settle a groundwater contamination lawsuit brought by residents.
- **Gibson Generating Station, Gibson County, Indiana** where enormous ash ponds are exposing threatened species to dangerous levels of selenium and where the power company supplies residents with bottled water because their wells are contaminated with boron.

These injuries to human lives and the environment are entirely avoidable. Yet damage will continue to occur at site after site in the absence of minimum federal standards. As you read this testimony, approximately 1000 tons of ash is disposed daily into a New Mexico mine, although the mine continues to leach toxic levels of sulfate into scarce New Mexico waters. Constellation Energy, the company that poisoned the water in Gambrills, Maryland and paid a million dollar fine for that offense, is today seeking to dump its ash into another unlined Maryland quarry because there are no state laws prohibiting the dumping. And currently there is a permit pending in Pennsylvania that seeks to create the largest unlined coal ash dump in the U.S in a surface coal mine without any requirements for sufficient monitoring, waste or site characterization, cleanup standards, or bonds for cleanup. The damage that will result from these acts is not inevitable. It is within this subcommittee's power to require federal agencies to do their job to protect health and the environment from this toxic waste.

#### 4. *CCW is Disposed in Coal Mines without Safeguards*

Each year, approximately 25 million tons of CCW, nearly 20% of total CCW generation, are placed in active and abandoned coal mines without basic safeguards to protect health and water resources. Under pressure from electric utilities, many states have wrongly defined the dumping of CCW in coal mines as a "beneficial use" and exempted the practice from all solid waste regulations.<sup>16</sup> Consequently, enormous quantities of CCW are being dumped directly into groundwater without any monitoring or clean up requirements.

The *laissez faire* regulatory approach of many states to CCW minefilling

maximizes the risk of contamination. Mining breaks up solid rock layers into small pieces, called spoil. Compared to the flow through undisturbed rock, water easily and quickly infiltrates spoil that has been dumped back into the mined out pits. Fractures from blasting and excavation become underground channels that allow groundwater to flow rapidly offsite. Because mines usually excavate aquifers (underground sources of water), the spoil fills up with groundwater. Unlike engineered landfills, which are lined with impervious membranes (clay or synthetic) and above water tables by law, ash dumped into mine pits continually leaches its toxic metals and other contaminants into the water that flows through and eventually leaves the mine.

In fact, serious contamination has been documented at numerous mine sites across the country where CCW has been disposed. In a multi-year study of 15 coal ash minefills in Pennsylvania, researchers found that CCW made the water quality worse at 10 of the 15 mines.<sup>17</sup> At five of the sites, there was not enough monitoring data to determine whether adverse impacts were caused by the CCW. A review of the permits revealed that:

- Levels of contaminants, including manganese, aluminum, arsenic, lead, selenium, cadmium, chromium, nickel, sulfate and chloride, increased in groundwater and/or surface water after CCW was disposed in the mines.
- Contaminants increased from background concentrations (measured after mining) to levels hundreds to thousands of times federal drinking water standards.
- Pollution was found downstream from CCW disposal areas and sometimes well outside the boundary of the mines.

Even though the placement of coal ash in coal mines is often touted as a “beneficial use” for the purpose of treating acid mine drainage, the facts show that minefilling is not an effective solution. While the CCW remediated acid mine drainage *temporarily* in a few of the mines studied, in two thirds of the mines, the introduction of CCW resulted in more severe, long-term contamination than had existed at these sites from the mining operation itself. Furthermore, the stakes are high if contamination occurs. As a practical matter, dumping large quantities of CCW directly into water tables at highly fractured sites under massive quantities of mine overburden makes the prospect of cleaning up contamination far more daunting than halting leakages from conventional landfills and ash ponds.

##### *5. States Fail to Provide Adequate Regulation of CCW Disposal*

With no minimum federal standards, the states have been free to regulate as they please, or more often, abstain from effective regulation altogether. If one compares how EPA regulates the disposal of ordinary household trash with its hands-off approach to CCW, the results defy logic. While newspapers, soda cans and banana peels under no circumstances qualify as RCRA hazardous waste, EPA has established detailed federal disposal standards for the landfills that contain them.<sup>18</sup> Household trash cannot be

dumped in a mine without violating federal law, but in most states battleship quantities of metal-laden ash can be dumped with relative impunity. EPA has regulations governing all aspects of the disposal of household trash in landfills including performance standards, siting restrictions, monitoring, closure requirements, bonding, and post-closure care.<sup>19</sup> These regulations, promulgated under subtitle D of RCRA, are enforceable by states and citizens against any owner or operator of a landfill in violation of the standards. Furthermore, RCRA requires that state solid waste programs promulgate equivalent (or more stringent) regulations in order to maintain authorization.<sup>20</sup> Yet EPA has no such regulations for the disposal of toxic ash that exceeds *hazardous waste* levels for toxic metals. The result is an inconsistent patchwork of largely inadequate state regulation.

The utility industry, as well as some states, claim that the states are doing a good job of regulating coal ash despite the absence of federal standards. The fact that EPA admits at least 67 sites in 23 states have been contaminated by CCW indicates that the opposite is true. A survey of state laws governing CCW disposal in landfills and surface impoundments shows that state regulations fall short of requiring measures that would adequately protect human health and the environment. Earthjustice, along with several other environmental organizations, submitted analyses of the laws and regulations of 20 states in response to EPA's Notice of Data Availability in February 2008. Our state survey is too voluminous to repeat in this testimony, but the analyses show definitively that state solid waste programs do not provide consistent and adequate safeguards sufficient to protect human health and the environment from CCW. Most states failed to require the basic safeguards essential for waste management, including liners, leachate collection systems, groundwater monitoring, corrective action (cleanup), closure and post-closure care.

In fact, the gaps are shocking. Among the top 15 CCW generating states, which represent 74% of U.S. CCW generation, *only one state* requires all CCW lagoons (surface impoundments) to be lined and *only one state* requires all CCW lagoons to monitor groundwater for migrating pollutants. *Only three states* out of 15 require CCW landfills to be lined. It is not surprising, therefore, that EPA reported in 2000 that only 57 percent of CCW landfills and only 26% of CCW surface impoundments were lined and that only 65% of landfills and 38% of surface impoundments conducted groundwater monitoring.<sup>21</sup>

In addition, in 2005, a report prepared for EPA's Office of Solid Waste, entitled *Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities Under Part 258*, included a survey on state disposal regulations that verified that states fail to prohibit the most dangerous CCW disposal practices. The report examined the top 25 coal-consuming states to determine how much CCW is prohibited from disposal below the natural water table. Since isolation of ash from water is critical to preventing toxic leachate, it is axiomatic that disposal of ash must occur *above* the water table. Yet the report found that only 16% of the total waste volume being regulated by these 25 states is prohibited from disposal in water when waste is disposed in surface impoundments. For landfills, the total waste volume that is prohibited from disposal in water is only 25%. Thus the great majority of total CCW produced in those states is allowed to be disposed into the water table, namely 84% of the total volume of



CCW disposed in surface impoundments and 75% of the total volume disposed in landfills.<sup>22</sup>

In view of EPA's risk assessment that finds the cancer risk from ash ponds 900-times EPA's regulatory goals, the absence of basic monitoring, lining and isolation requirements at the nation's roughly 300 CCW surface impoundments is alarming. Failure to impose requirements at waste lagoons is particularly dangerous, because CCW disposed in surface impoundments is intentionally mixed with water to create a sludge. The presence of water facilitates the dissolution and migration of pollutants, particularly when the ash pond is unlined or lined with only soil or clay. As the above statistics reveal, lining and monitoring does occur at some CCW disposal units, but far too much is left to the discretion of state regulators and the whim of individual utilities.

A 2005 report published jointly by EPA and the U.S. Department of Energy (DOE), entitled "*Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*," attempted to show that certain industry practices have improved since EPA's regulatory determination. The report was based primarily on data voluntarily submitted by the utility industry. The report surveyed 56 permitted landfills and surface impoundments built between 1994 and 2004. The report cited the presence of "liners" at all newly permitted surface impoundments and landfills and concluded "[t]he use of liners has become essentially ubiquitous." This conclusion, however, is grossly misleading, because the devil is in the details. While more liners appear to be installed on disposal units built in the last decade, the type of liners is insufficient to protect health and the environment.

In fact, the DOE/EPA Report reveals that only 39% of the units, at best, installed composite liners. According to EPA's 2007 draft *Human and Ecological Risk Assessment*, landfills and surface impoundments with clay liners do not provide adequate protection of health and the environment. EPA's *Risk Assessment* states:

Risks from clay-lined units are lower than those from unlined units, but 90<sup>th</sup> percentile risks are still well above the risk criteria for arsenic and thallium for landfills and arsenic, boron and molybdenum for surface impoundments.<sup>23</sup>

The *Risk Assessment* further states that *composite liners* effectively reduce risks from all constituents to below the risk criteria for both landfills and surface impoundments. A composite liner is defined as a high-density polyethylene (HDPE) membrane combined with either geosynthetic or natural clays. Yet the DOE/EPA Report reveals that clay liners were used at 25% of the permitted units. Single liners, also deemed inadequate, were used at 18% of the surveyed units. Thus it is clear that the *majority* of new units do not have adequate liners. Unless the liner is of a sufficient quality to prevent the migration of contaminants, its use is largely irrelevant. The DOE/EPA Report's updated survey of state-permitted disposal units does not show that adequate protections are in place. Conversely, it reveals that the absence of a federal rule requiring composite liners has produced

a whole new generation of waste units in at least a dozen states that pose serious threats to human health and the environment.

Furthermore, the 2005 DOE/EPA Report documents that nearly a third of the net disposable CCW generated in the U.S. are potentially *totally exempt* from solid waste permitting requirements.<sup>24</sup> The DOE/EPA Report explains this fact in great detail:

[t]he six States that have solid waste permitting exemptions for certain on-site CCW landfills generated a total of approximately 17 million tons of net disposable CCWs in 2004, which is 20% of the total net disposable CCWs generated for all States. The one State that excludes CCW from all solid waste regulations, Alabama, generated a total of approximately 2.7 million tons of net disposable CCWs in 2004, which is about 3.3% of the total net disposable CCWs generated in all States. Ohio, which excludes “nontoxic” fly ash, bottom ash, and boiler slag from solid waste regulations, generated a total of 5.9 million tons of these wastes and 1.1 million tons of FGD wastes (about 7 million tons total) in 2004. Of these amounts, about 1.3 million tons of “nontoxic” fly ash, bottom ash, and boiler slag are beneficially used and about 1 million tons of FGD sludge are beneficially used. Hence, the net disposable CCWs that were potentially exempt from solid waste permitting requirements in Ohio in 2004 .... amount to about 4.6 million tons. .... Thus the amount of net disposable CCWs in Ohio that is potentially exempt from solid waste permitting requirements represents about 5.4% of the total net disposable CCWs generated for all States. **Overall, the portion of the net disposable CCWs that is potentially exempt from solid waste permitting requirements is approximately 24 million tons, which corresponds to 29% of the total net disposable CCWs generated in the United States during 2004.**<sup>25</sup>

(Emphasis added).

The report also explains that this exempted CCW represents almost a third of the US coal-fired generating capacity:

In terms of electric generating capacity, the six States that have solid waste permitting exemptions for certain on-site CCW landfills generated a total of approximately 66,000 MW, which is approximately 20% of the total coal-fired electric generating capacity in the United States in 2004. The one State the excluded CCWs from all solid waste regulations, Alabama, generated a total of approximately 12,000 MW in 2004, which is about 3.7% of the total. Ohio which excludes “nontoxic” fly ash, bottom ash and boiler slag from solid waste regulations, generated a total of about 24,000 MW in 2004. This represents about 7.2% of the total coal-fired electric generating capacity in the United States. **Overall, the portion of the coal-fired electric generating capacity in the States that**

**potentially exempt CCW landfills from solid waste permitting requirements and that exclude certain CCWs from all solid waste regulation is approximately 102,000 MW, which corresponds to about 30% of the total coal-fired electric generating capacity in the United States in 2004.<sup>26</sup>**

(Emphasis added.) Thus the DOE/EPA Report demonstrates that a significant portion of the CCW generated in the U.S. is potentially not subject to *any* solid waste permitting. This is another wholly unacceptable gap in regulation of CCW that is likely to have significant negative impact on health and the environment.

#### *6. Voluntary Industry Agreements are not a Solution*

It is not viable to allow the utility industry to police itself. The proliferation of contaminated sites over the last 8 years demonstrates that industry is not voluntarily ensuring safe disposal. A voluntary agreement recently signed by some utilities and presented to EPA as a substitute for enforceable regulations is unacceptable.<sup>27</sup> Its shortcomings are too numerous to describe here in detail, but suffice it to say that the utilities are proposing substantially less protection for their toxic ash than is required by law for the garbage from their cafeterias.

The voluntary industry agreement is designed to allow the electric utility industry to continue avoiding the cost of safe disposal of its voluminous waste. The plan intentionally fails to require monitoring that would detect pollution escaping CCW surface impoundments and landfills or to require any specific response should pollution be detected. The plan fails to require the most basic of safeguards, composite liners, and it fails to prohibit the placement of CCW directly into groundwater, and nothing in the plan applies to disposal of CCW in mines. In view of continuing damage from coal ash, the hundreds of disposal units operated by industry today without safeguards, and the clear direction provided by Congress, the Clinton EPA and the National Academies of Science, it is untenable for any federal agency to entertain an unenforceable, voluntary proposal.

#### *7. EPA Fails to Fulfill the Statutory Mandates of RCRA*

The goal of RCRA is to ensure the safe disposal of solid and hazardous waste and to encourage the safe reuse of waste in order to protect human health and the environment and conserve the nation's natural resources.<sup>28</sup> By failing to make good on its promise to promulgate minimum federal standards, EPA has failed in both respects. The disposal of CCW without safeguards has resulted in the creation of "open dumps," as they are defined in 40 C.F.R. Part 257, which is specifically prohibited by the statute.<sup>29</sup> Furthermore, because disposal of CCW in unlined, unmonitored pits so frequently presents the threat of an imminent and substantial endangerment to health or the environment, these disposal units violate RCRA's core statutory mandate that disposal of solid waste avoid the potential for substantial damage, as set forth in section 7003 of RCRA.<sup>30</sup> Furthermore, Section 1008 of RCRA requires EPA to "develop and publish

suggested guidelines” for solid waste management under subtitle D, as necessary to ensure protection of public health and the environment. Thus EPA has failed with regard to CCW, not only to abide by its own regulatory determination, but also to comply with the mandates of RCRA.

Further, by failing to impose disposal standards, EPA fails to encourage CCW reuse. When cheap dumping is no longer available, power plants will have far greater incentive to recycle their ash. Reuse of ash as a component of asphalt, concrete, and gypsum board are legitimate and safe reuses that should be encouraged. In addition, recycling ash in concrete can result in a large reduction of greenhouse gases. Approximately one ton of CO<sub>2</sub> is released for every ton of Portland cement produced, but certain fly ashes can replace up to 50% by mass of Portland cement.<sup>31</sup> Further, since cement kilns are one of the largest emitters of mercury in the nation, the reduction of Portland cement production will reduce mercury emissions.

In Wisconsin, for example, adequate regulation of CCW has raised recycling rates significantly. Wisconsin CCW regulations are probably the most comprehensive in the nation. As a result, the recycling rate in Wisconsin for CCW is 85%, more than double the average recycling rate for all other CCW-producing states (36%).<sup>32</sup> It stands to reason that if the true cost of disposal were borne by electric utilities, there would be far greater incentive to find beneficial uses for the ash.

### **The Federal Solution**

The solution is straightforward. EPA, or in the case of CCW disposal in mines, OSM, *in conjunction with EPA*, must provide minimum enforceable safeguards for the disposal of CCW in mines, landfills and waste lagoons. This is not a novel concept. These regulations can be similar to the regulations governing municipal solid waste landfills. For coal ash landfills, it is a simple matter to require the basics: placement above the water table, composite liners, groundwater monitoring, daily cover of the waste, cleanup standards if contamination is discovered, construction of a cap upon closure, financial assurance, and post-closure care. In fact, a coalition of environmental groups, including Earthjustice, submitted draft regulations to EPA almost 18 months ago. EPA never responded.

For disposal of coal ash in mines, the National Academies of Science established a clear framework for federal regulations in their 2006 report, recommending waste and site characterization, isolation from groundwater, effective monitoring, site specific management plans, adequate bonding, public participation in permitting, and site specific cleanup standards. Again, these basic safeguards are the familiar foundation of federal waste disposal law.

### *Recommendations*

Many complicated environmental issues have been brought before this committee, but the instant question is not one of them. Clear solutions exist and have already been

identified. Research and analysis conducted by EPA, the Science Advisory Board, and the National Academies of Science indicate a high and unacceptable risk from CCW when the waste is disposed without safeguards. The threat is not theoretical. Case after case of serious injury to health and the environment has resulted from unsafe disposal of CCW.

It is thus our hope that the Subcommittee will recommend that EPA and OSM take the following steps to protect our communities and environment from the risks posed by CCW.

*1. A timetable is needed for establishing federal regulations.*

For landfills and surface impoundments, EPA must immediately begin to formulate the basic minimum waste management requirements that will be required at all surface impoundments and landfills.

For standards applicable to mines, EPA should work closely with OSM. As necessary, RCRA authority must extend to waste disposal in mines, if it is found that SMCRA authority is not sufficient. Use of EPA's extensive expertise in waste management is essential to the development of effective and comprehensive waste disposal rules for mines, whether the regulations are promulgated under RCRA or SMCRA. EPA's decision to defer entirely to OSM and its consequent failure to work closely with OSM to ensure the quality of minefilling regulations is totally unacceptable.

In view of EPA's longstanding failure to abide by its 2000 commitment to promulgate regulations and the harm that is currently occurring because of EPA's failure to act, it is necessary to ensure that the agency is indeed moving forward to establish federal standards. Further action by this Subcommittee to conduct additional hearings and support legislation to set a deadline for federal action would be extremely helpful.

*2. EPA and OSM must promulgate federal regulations, not guidance.*

We ask the Subcommittee to ensure that EPA and OSM establish regulations, not guidance, governing CCW disposal. Promulgation of federal *regulations* is absolutely essential, because many states cannot enact CCW disposal safeguards in the absence of federal standards. Some 23 states have "no more stringent" provisions in their statutes that prohibit the states from enacting stricter standards than are found in federal law. Thus for those states, without federal regulation, *there can be no regulation of CCW beyond what few safeguards there are now.*<sup>33</sup> Among states with "no more stringent provisions" are Colorado, Kentucky, Montana, New Mexico, Tennessee and Texas. While agency guidance is a useful tool to direct the implementation of enforceable regulations, it is not an acceptable substitute for a federal rulemaking.

3. *EPA should phase-out surface impoundments (waste ponds) at existing coal-fired plants and prohibit the construction of surface impoundments at new plants.*

EPA should prohibit construction of surface impoundments at all new coal-fired plants and require a phasing-out of surface impoundments at existing plants. Electric utilities have a choice of producing dry or wet waste, and given the evidence of damage to human health and the environment from disposal of slurried (wet) ash in waste ponds, an essential and important step to improve waste management over the long term is to require utilities to move toward dry disposal of CCW. The dozens of cases of contamination from the leaching of arsenic and other pollutants from surface impoundments across the U.S. is testament to the danger of wet disposal. As described in this testimony, EPA's 2007 draft *Human and Ecological Risk Assessment of Coal Combustion Wastes* identifies exceedingly high risks of groundwater contamination from CCW surface impoundments and finds that the risk from surface impoundments is considerably higher than the risk from CCW landfills. Isolation of CCW from water is unquestionably the safest way to dispose of ash. A prohibition on new surface impoundments would greatly reduce the risk of new cases of poisoning and would ensure that waste management practices at the numerous new coal plants coming on line reflect our scientific knowledge. This prohibition would guarantee long-term protection because CCW waste units, particularly surface impoundments, are routinely used for several decades. Communities living near coal-fired power plants deserve protection from this wholly avoidable threat to their health and environment. For existing plants, EPA should establish reasonable date for termination of all wet-waste disposal. As an added benefit, disposing of dry ash in landfills preserves the ash for recycling at a later date.

4. *EPA should prohibit disposal of CCW in sand and gravel pits.*

In view of the clear threat to public health posed by disposal of CCW in sand and gravel pits, we ask this Subcommittee to recommend an immediate prohibition. Since 2000, EPA has recommended that CCW disposal in sand and gravel pits be terminated because of the many damage cases resulting from this practice. Recently, CCW disposed in an unlined pit caused serious contamination of drinking water at the Gambrills site in Maryland. The threat to public health posed by the recent dumping (1999 through 2007) is unconscionable, considering EPA's long experience with cases of water contamination from this disposal practice. EPA has long acknowledged numerous proven damage cases caused by CCW disposal in sand and gravel pits, including sites that poisoned or threatened public drinking water supplies in Massachusetts, Virginia, and three sites in Wisconsin. A prohibition is necessary because this dangerous mode of disposal is still an acceptable practice in numerous states. In fact, Iowa currently has at least four ongoing disposal operations in unlined sand and gravel pits. Once again, EPA's scientific findings must be applied in a timely way to prevent future harm. In view of CCW's propensity to leach into aquifers from sand and gravel pits and the likely paths of migration to residential areas and public water supplies, it is necessary to act immediately to avoid further injury.

5. *EPA should reject voluntary industry proposals as a substitute for regulation.*

EPA must not consider a voluntary plan proposed by the utility industry as a substitute for regulations. If the utility industry is interested in moving forward with waste management improvements prior to EPA's adoption of regulations, that is commendable. Under no circumstances, however, should EPA consider such voluntary measures an acceptable substitute for national regulation.

## **Conclusion**

In conclusion, Mr. Chairman, Representative Pearce and Members of the Subcommittee, Earthjustice asks the Subcommittee to ensure the promulgation of science-based, minimum federal standards, the hallmark of EPA's waste management program, to address the threat posed by coal combustion waste disposal. EPA and the National Research Council recognize, as does Congress, that mismanagement of CCW causes serious injury to public health and the environment. Maintenance of the status quo ensures that further damage will occur.

A great number of communities in the U.S. are concerned about this issue. OSM's *Advanced Notice of Proposed Rulemaking on the Placement of Coal Combustion Byproducts in Active and Abandoned Coal Mines* drew over 4,000 comments from citizens last June, and over 10,000 individuals responded to EPA's *Notice of Data Availability on Coal Combustion Wastes* in February 2008. Communities threatened by the disposal of coal ash are requesting that minimum standards be put in place as soon as possible. These communities, often poor and already fighting environmental threats from other sources, need to be protected from damage that is wholly preventable.

In its final *Regulatory Determination on Wastes from the Combustion of Fossil Fuels*, EPA determined that the cost to industry of compliance with tailored hazardous waste regulations would be "only a small percentage of industry revenues."<sup>34</sup> EPA estimated this cost to be "less than 0.4 percent of industry sales."<sup>35</sup> Today, EPA is considering regulating CCW under solid waste authority, not under the far more costly subtitle C requirements of RCRA. Thus in 2005, EPA recalculated the cost to industry in its report, *Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities Under Part 258*. EPA concluded that compliance with non-hazardous solid waste regulations would be less than half of the cost of compliance with hazardous waste rules.<sup>36</sup> Thus the cost of safe disposal is *not* burdensome to industry, although it has proved, at site after site, to be catastrophic to the public and the environment.

In sum, I greatly appreciate the Subcommittee's interest in the risk of harm posed by CCW and how this problem can be solved by our federal agencies. Thank you again, Mr. Chairman, for the opportunity to present to you and the Subcommittee information about this critical issue.

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- <sup>1</sup> 65 Fed. Reg. 32214, May 22, 2000.
- <sup>2</sup> U.S. EPA (1999). Report to Congress, Wastes from the combustion of fossil fuels. Volume 2 – Methods, findings, and recommendations. Office of Solid Waste and Emergency Response, Washington, DC. EPA 530-R-99-010. March 1999.
- <sup>3</sup> U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 3.
- <sup>4</sup> U.S. EPA (1999). Report to Congress, Wastes from the combustion of fossil fuels. Volume 2 – Methods, findings, and recommendations. Office of Solid Waste and Emergency Response, Washington, DC. EPA 530-R-99-010. March 1999.
- <sup>5</sup> Annual Energy Outlook, 2007 with Projections to 2030 (Early Release)- Overview. Report No. DOE/EIA-0383/2007, December 2006.
- <sup>6</sup> U.S. EPA (2006). Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control. EPA/600/R-06/008. (January).
- <sup>7</sup> Ibid.
- <sup>8</sup> U.S. EPA, Office of Research and Development. “Evaluating the Fate of Metals from Management of Coal Combustion Residues from Implementation of Multi-pollutant Controls at Coal-fired Electric Utilities,” Presentation for 32<sup>nd</sup> Annual EPA-A&WMA Information Exchange. December 4, 2007.
- <sup>9</sup> Adriano, D.C., Page, A.L., Elseewi, A.A., Chang, A.C., Straughan, I.R. (1980). Utilization and disposal of fly ash and other coal residues in terrestrial ecosystems. *Journal of Environmental Quality*, 9: 333.
- <sup>10</sup> Carlson, C.L., Adriano, D.C. (1993). Environmental impacts of coal combustion residues. *Journal of Environmental Quality*, 22: 227-247.
- <sup>11</sup> Cherry, D.S. (1999). A review of the adverse environmental impacts of coal combustion wastes. Prepared for the Hoosier Environmental Council, November 10, 1999.
- <sup>12</sup> Taugher, Mike. Water Worries & Shumway Arroyo Was At Center of 1980s Lawsuits, *Albuquerque Journal*, A1 & A10, October 24, 1999.
- <sup>13</sup> Skorupa, Joseph, P. (1998). Selenium poisoning of fish and wildlife in nature: Lessons from twelve real-world examples, from *Environmental Chemistry of Selenium*. Marcel Dekker, Inc. New York.
- <sup>14</sup> Cherry, D.S. (1999). A review of the adverse environmental impacts of coal combustion wastes. Prepared for the Hoosier Environmental Council, November 10, 1999
- <sup>15</sup> Hopkins, W.A., C.L. Rowe, J.H. Roe, D.E. Scott, M.T. Mendonça and J.D. Congdon, (1999). Ecotoxicological impact of coal combustion byproducts on amphibians and reptiles. Savannah River Ecology Laboratory, presented at the Society for Environmental Toxicology and Chemistry, 20th Annual meeting, Philadelphia, PA, November 14-18. Abstract # PMP009.
- <sup>16</sup> U.S. EPA (2002). Mine Placement of Coal Combustion Waste, State Program Elements, Final Draft, December 2002.
- <sup>17</sup> Clean Air Task Force, Impacts of Waster Quality from Placement of Coal Combustion Waste in Pennsylvania Coal Mines, September 2007. Pages 26-38. [www.catf.us](http://www.catf.us)
- <sup>18</sup> See 40 C.F.R. Part 258.
- <sup>19</sup> Ibid.
- <sup>20</sup> 42 U.S.C. § 6947.
- <sup>21</sup> US EPA. Regulatory Determination on Wastes from the Combustion of Fossil Fuels, 65 Fed. Reg. 32214 at 32216, May 22, 2000.
- <sup>22</sup> DPRA Incorporated. Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities under Part 258, prepared for U.S. EPA, Office of Solid Waste, November 30, 2005 at page 39.
- <sup>23</sup> US EPA, Human and Ecological Risk Assessment at ES-7.
- <sup>24</sup> U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 45.
- <sup>25</sup> Ibid.
- <sup>26</sup> Ibid. at 45-46.



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- <sup>27</sup> Utility Solid Waste Activities Group. Utility Industry Action Plan for the Management of Coal Combustion Products.
- <sup>28</sup> 42 U.S.C. § 6902.
- <sup>29</sup> 42 U.S.C. § 6945(a).
- <sup>30</sup> 42 U.S.C. § 6973.
- <sup>31</sup> <http://www.us-concrete.com/news/features.asp> (last checked June 1, 2008)
- <sup>32</sup> U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 5.
- <sup>33</sup> U.S. EPA (2002). Mine Placement of Coal Combustion Waste, State Program Elements, Final Draft, December 2002.
- <sup>34</sup> 65 Fed. Reg. at 32230.
- <sup>35</sup> Ibid.
- <sup>36</sup> DPRA Incorporated. Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities under Part 258, prepared for U.S. EPA, Office of Solid Waste, November 30, 2005.

Figure 1

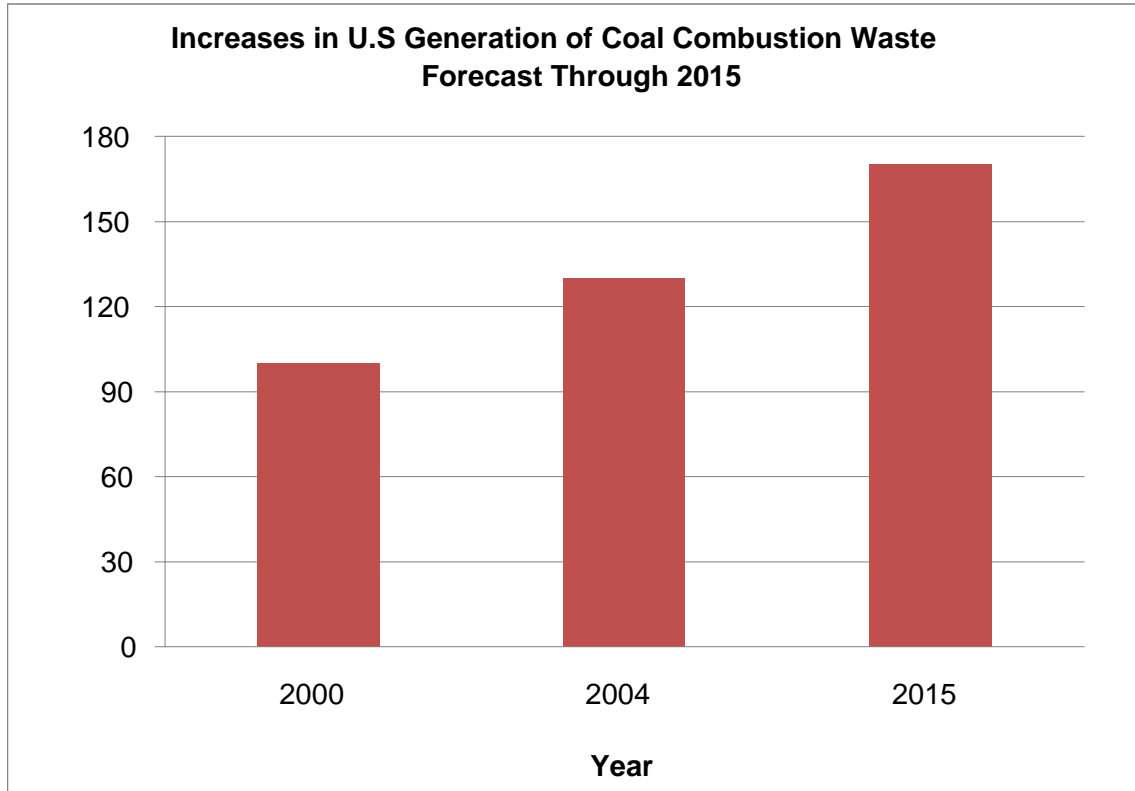


Figure 2

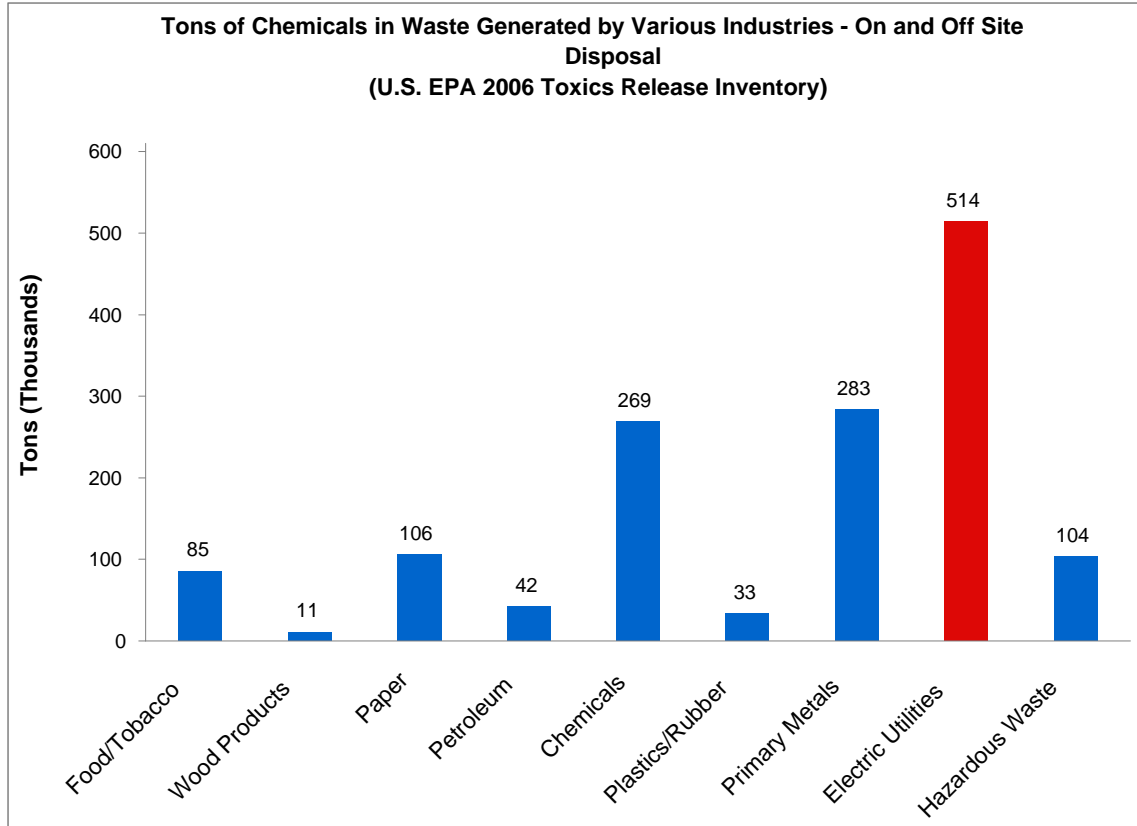


Figure 3

