

**Comments on the DOE/EPA Report
*Coal Combustion Waste Management
at Landfills and Surface Impoundments,
1994-2004***

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Introduction

The DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, presents a grossly misleading analysis of recently built or expanded coal combustion waste (CCW) disposal units and a highly inaccurate and incomplete analysis of state regulation of CCW. The following comments point out the major deficiencies of the DOE/EPA Report and address the report's dangerous fiction that current state regulatory programs adequately address the threat posed by CCW. It is essential to examine carefully the premise of this report and to expose its pervasive falsehoods, because EPA's reliance on the report's erroneous conclusions will result in an arbitrary and capricious rulemaking that will fail to protect water resources from the significant threats posed by CCW.

The report's primary fiction is that state regulation of CCW has improved and is currently adequate to protect health and the environment. To arrive at this conclusion the report provides surficial analyses of 11 CCW-producing states. Yet these analyses consistently miss significant state regulatory gaps. The report repeatedly embraces two analytical falsehoods; first, that *discretionary* authority to require basic safeguards is equivalent to mandatory requirements, and, second, that the wholesale exemption of CCW from a state's regulatory program, based on laboratory leach tests, onsite disposal, and unregulated beneficial use, is an acceptable practice. DOE/EPA's repeated failure to recognize the magnitude of the states' discretionary power and the use of widespread exemptions resulted in fundamental inaccuracies and wildly overblown claims regarding the scope and effectiveness of the state programs reviewed in the report.

There are, nevertheless, critical data in the DOE/EPA Report that EPA must seriously consider. The report contains data that unequivocally support our contention that states have *not* closed significant gaps in their regulation of CCW. For example, the report points out that 30% of the total coal-fired generating capacity in the U.S. is in states "that potentially *exempt* CCW landfills from solid waste permitting requirements and that *exclude* certain CCWs from *all* solid waste regulation."¹ Moreover, this astounding statement *underestimates* the gap in state regulation of CCW, because it does not account for the many states that exempt CCW from all solid waste regulation when "beneficially used," a term that frequently encompasses potentially dangerous fill projects for roads, gravel pits, floodplains, floodways, hill sides, valleys and mines.

To correct some of the primary deficiencies in the DOE/EPA Report, we provide the following comments as well as nine appendices that contain detailed analyses of state regulatory programs in nine major CCW-generating states. All of our state summaries reveal substantial gaps in state regulatory authority. Several reveal recent changes to state law and regulations that have substantially weakened state regulatory programs. Our analyses reinforce the data in the DOE/EPA Report that indicate state programs are

¹ United States Environmental Protection Agency and United States Department of Energy. Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004 (August 2006), hereinafter "DOE/EPA Report, at page 46. Emphasis added.

inadequate to protect health and the environment, thus demonstrating the need for federal minimum standards.

Finally, the DOE/EPA Report makes much out of the safeguards, including groundwater monitoring and liners, that are employed at the 56 permitted units described in the report. Upon close examination, however, we found that there were significant defects in the types of liners and monitoring occurring at these new units, as described in greater detail below. Even if the CCW management were sufficient in these 56 newly permitted units, moreover, one must put this evidence of "improvement" in perspective. According to EPA, there are over 600 landfills and surface impoundments currently operating in the U.S. The DOE/EPA Report says absolutely nothing about the safeguards currently employed at these units. Yet the last time anyone checked, the percentage of unlined and unmonitored units among these 600 sites was extremely high. EPA's 2000 Determination found that only 57% of all landfills and only 26% of all surface impoundments had liners. It is extremely doubtful that the safeguards on these currently operating units, which make up about *91% of the units operating today*, have improved at all. In addition, there are over 750 retired CCW waste units in the U.S., according to DOE.² No one has ever inventoried the safeguards on these landfills and surface impoundments or determined whether the units were properly closed. Clearly, the DOE/EPA Report produces data on a miniscule portion of the nation's CCW dump sites. By EPA's count, the 56 units in the DOE/EPA Report represent about 4% of the past and current CCW disposal sites in the U.S. Even if improvement has occurred at these 56 units, the overwhelming majority of disposal sites in the country are still operating without safeguards. EPA cannot base its rulemaking on a biased study that examines, with both blinders and rose-colored glasses, a very small part of an extremely significant problem facing our nation.

Thus we present the following comments and state summaries for EPA's consideration. EPA must take a hard look at current management practices at a *majority* of CCW landfills and surface impoundments and must examine actual state regulations and beneficial use programs in *all* states where CCW is generated and disposed. Only then can EPA determine the proper direction of a CCW rulemaking.

1. The DOE/EPA Report's conclusions are misleading because the universe of disposal sites examined in the report is *not* representative of all CCW disposal units built or expanded between 1994 and 2004.

a. The USWAG questionnaire intentionally introduced unacceptable bias by excluding non-permitted units from the survey.

The DOE/EPA Report purports to represent the majority of CCW disposal units that were built or laterally expanded between 1994 and 2004. The report is based primarily on information submitted in response to a voluntary survey distributed to electric utility companies by the Utilities Solid Waste Activities Group (USWAG). A

² ICF Resources, Incorporated. Coal Combustion Waste Management Study, prepared for U.S. Department of Energy, February 1993.

copy of the survey is contained in Appendix B to the report. The USWAG survey explicitly asked for information on “units where new construction or lateral expansion was permitted on or after January 1, 1994.”³ (Emphasis added.) This is a vastly different universe than all new and expanded units built or expanded after 1994, because many CCW disposal units are exempt from permitting, including “onsite” units, monofills, and grandfathered expansions. While DOE and USWAG have stated that some non-permitted units were considered in the survey, the questionnaire on its face seeks to exclude these units. Because it is likely that non-permitted units employ fewer safeguards (e.g., liners, groundwater monitoring, leachate collection) than permitted units, a full survey of all units, permitted and non-permitted, would have resulted in the detection of more units lacking essential safeguards. Therefore the study’s conclusions, which purport to represent *all* CCW disposal units expanded or built between 1994 and 2004, paint an inaccurate and far too optimistic a picture of the state of current CCW management.

b. The universe of sites captured by the USWAG survey improperly excluded vertical expansions of existing waste units.

The CCW disposal units captured by the USWAG survey did not include existing disposal units that underwent *vertical* expansions between 1994 and 2004. The report only includes those units that underwent *lateral* expansions. Inclusion of vertically expanded units may have changed the outcome of the study. According to a 1993 Coal Combustion Waste Study, prepared by ICF Resources Incorporated for the Department of Energy, vertical expansions of surface impoundments are not unusual and serve to extend significantly the life of a surface impoundment.⁴ The DOE study explained:

Considering that the operating lifetime of a coal-fired power plant may span as long as 60-65 years and that utilities typically design and engineer disposal units to last for 15 years, many utilities have chosen to extend the life of their existing surface impoundments by building up the side walls of the pond above the ground (known as ‘raising the dikes’). This strategy has been employed instead of more costly alternative management methods, including: (1) converting the existing wet handling system to direct waste to a different site; (2) acquiring land to construct new units (if it is even available); (3) converting to a new dry handling system; and (4) transporting coal combustion waste to off-site waste management units.⁵

We are aware of at least one major vertical expansion of a surface impoundment where the regulatory agency permitted a massive *unlined* expansion. In May 2006, the Pennsylvania Department of Environmental Protection permitted a 180-acre expansion of the Little Blue Run surface

³ DOE/EPA Report, Appendix B at 1.

⁴ “Coal Combustion Waste Management Study,” prepared for the U.S. Department of Energy, Office of Fossil Energy, by ICF Resources Incorporated, Contract DE-ACO1-91FE62017, Task 8, dated February 1993.

⁵ *Id.* at 46.

impoundment by First Energy, thereby extending the life of the impoundment by at least 25 years and doubling the remaining capacity of the impoundment from 46 million cubic yards to 93 million cubic yards of CCW.⁶ Yet there is no mention of this recently permitted, unlined expansion in the DOE/EPA Report. Moreover this unit likely represents one of many vertical expansions that occurred throughout the U.S. since 1994.

Given the prevalence of this method of CCW disposal and the potential for enhanced migration of contaminants downward to shallow water tables from unlined impoundments due to increased hydrostatic head from higher water levels, it was improper to exclude vertical expansion from the universe of units examined by the DOE/EPA Report. Ignoring these expansions likely overestimates the number of units with safeguards and creates a false sense of security about recent permitting decisions, some of which are actually exacerbating the danger of contamination from impoundments.

c. The universe of surveyed sites excluded disposal sites not owned by electric utilities

The surveyed universe did not include off-site disposal units (e.g., off-site monofills and landfills) that were built or expanded between 1994 and 2004, if an electric utility did not obtain a permit for construction or expansion of the unit. For example, if a coal-fired power plant transported its waste to an off-site landfill, that landfill would not have been captured in the USWAG survey. Yet such independently operated landfills represent a significant portion of the land disposal of CCW, and therefore waste management practices should have been assessed at these waste disposal sites. The fact that EPA's list of proven damage cases contains numerous off-site landfills (e.g., Vitale Fly Ash Pit, Yard 520 Landfill, Salem Acres, Lemberger Landfill, Don Frame Trucking Fly Ash Landfill) reinforces the fact that an analysis of these units should have been conducted.⁷ Assessing waste management practices at off-site landfills would also have potentially uncovered units without safeguards because state regulations often provide regulatory loopholes for CCW monofills and these owner-operated landfills are often undercapitalized. The reports' failure to determine whether independently owned units employ essential safeguards likely resulted again in the overestimate of safeguards at CCW disposal facilities.

d. The DOE/EPA Report failed to identify any CCW disposal in sand and gravel pits.

The DOE/EPA Report stated "[n]o sand and gravel pits were identified by USWAG or the EPA as being new or expanded disposal units for the 1994-2004 time

⁶ Pennsylvania Department of Environmental Protection, Press Release: DEP PERMITS DEMONSTRATION PROJECT AT LITTLE BLUE RUN IN BEAVER COUNTY, April 5, 2006. See: <http://www.depweb.state.pa.us/news/cwp/view.asp?A=3&Q=502526>. The massive Little Blue Run impoundment is located in Beaver County, Pennsylvania and Hancock County, West Virginia.

⁷ US EPA, Coal Combustion Waste Damage Case Assessments, August 2007.

period.”⁸ The DOE/EPA Report may not have identified such units, but it is completely inaccurate to say or imply that CCW was not disposed in sand and gravel pits during that time period. In fact, at least two states permitted new disposal operations in unlined sand and gravel pits during that period. Identification of CCW disposal in sand and gravel pits was especially important because of the high risk of groundwater contamination from disposal at these sites. Consequently EPA and DOE should have made a concerted effort to investigate this dangerous practice in this report.

As a start, EPA should investigate the sand and gravel pits identified in the report entitled “Iowa Coal Combustion Waste Disposal Report 2007”⁹ attached as an appendix to these comments. The State of Iowa has permitted at least five sand and gravel pits for disposal of CCW since 2000. These include the Waterloo South Quarry Reclamation Site in 2005,¹⁰ the Mid-American-Neal North CCR Landfill in 2001,¹¹ the Mid-American-Neal South Ash Landfill in 2000,¹² the Lee Crawford Quarry in 2005,¹³ and the AMSCO, Inc. Site in 2006.¹⁴ In addition, as alluded to above, the DOE/EPA Report did not include the Gambrills Quarry, a gravel pit owned by BBSS Inc., located in Anne Arundel County, Maryland where four million tons of ash, generated by Constellation Energy, were dumped without safeguards in an operation that began in 1999. Leachate from the dump contaminated numerous drinking water wells with high levels of thallium, beryllium, aluminum, cadmium, manganese and sulfate.¹⁵

Failure to identify sand and gravel pits used for the disposal of CCW is a serious omission. After identification of relevant sand and gravel pits used for disposal of CCW in Iowa, Maryland and elsewhere, the report should be amended to reflect the presence or absence of liners, groundwater monitoring, and other safeguards at these units.¹⁶ Again, it is likely that, with the inclusion of these disposal units, the conclusions of the report would change.

2. The DOE/EPA Report’s conclusions regarding the sufficiency of state permitting programs are misleading and erroneous.

The executive summary of the DOE/EPA Report states “One hundred percent of the surveyed landfills and surface impoundments were authorized by one or more permits.”¹⁷ This rosy statement, however, is extremely misleading. A closer reading of the report indicates that the vast majority of CCW disposal units, particularly surface

⁸ DOE/EPA Report at 21.

⁹ Plains Justice, “Iowa Coal Combustion Waste Disposal Report 2007,” 2007.

¹⁰ IDNR ID No. 07-SDP-20-02X

¹¹ IDNR ID No. 97-SDP-12-95P

¹² IDNR ID No. 97-SDP-13-98P

¹³ IDNR ID No. 57-SDP-23-97X.

¹⁴ IDNR ID No 82-SDP-13-93X.

¹⁵ See Baltimore Examiner, Constellation Looking to Dig More Wells, January 4, 2008 by Jason Flanagan. http://www.examiner.com/a-1137694~Constellation_looking_to_dig_more_wells.html (last checked January 7, 2008).

¹⁶ The BBSS Inc. Fly Ash Dump Site in Maryland has been submitted to EPA as a new proven damage case.

¹⁷ DOE/EPA Report at S-5.

impoundments, lack solid waste permits. The DOE/EPA Report admits that it is *solid waste permits* that “dictate the use of specific operating practices and control technologies.”¹⁸ While the DOE/EPA Report emphasizes the importance of waste management permits, it actually paints a very negative picture of the current state of permitting CCW disposal units.

The Report found that only 34% of the permits issued to CCW disposal units were actually *solid waste permits*. In fact, only 2 of the 16 new surface impoundments examined (12%) had solid waste permits.¹⁹ The fact that a CCW disposal unit is regulated only by a NPDES permit or a dam safety permit means that the requirements most meaningful to CCW waste units (e.g., the requirement to have a composite liner, groundwater monitoring, leachate collection, corrective action, closure and post-closure care, financial assurance, etc.) are likely *not* addressed by such permits.²⁰ In fact, it is very unusual for anything other than a solid waste disposal permit to require those essential safeguards. For example, if a surface impoundment is subject to NPDES wastewater discharge criteria, the state may not have the legal authority to require liner and leachate collection systems, groundwater monitoring and groundwater investigation/remediation requirements, since it is the *discharge* from the unit that is regulated rather than the design, construction and operation of the unit itself. Only state solid waste permits are directed specifically at the design, operation and maintenance of the unit and their discharge to groundwater.

The inadequacy of the permits issued to surface impoundments is not conjecture. The proof is in the report. When one examines closely the survey results for surface impoundments, the report reveals that the new permits issued to surface impoundments fail to require the most basic safeguards. The deficiencies are obvious:

- 25% of the surface impoundments have no requirement to install a liner;
- 37% have no requirement to conduct groundwater monitoring

¹⁸ DOE/EPA Report at 27.

¹⁹ The DOE Report states “most of the surface impoundments included in this study are not subject to regulation as solid waste storage or disposal units. Nevertheless, they are regulated as wastewater treatment facilities, which are evaluated on a case-specific basis to determine the need for groundwater-protection measures such as liners and groundwater monitoring.” DOE Report at 31.

²⁰ According to a study commissioned by DOE in 1993, entitled the “Coal Combustion Waste Management Study,” many utilities routinely dredge their surface impoundments to avoid the need for a solid waste permit. That report stated:

Generally the companies contacted have chosen to obtain State NPDES permits instead of State solid waste disposal permits for their surface impoundments because NPDES permits allow more flexibility and diversity in the design and operating standards that may be applied. In order to extend the lifetimes of existing facilities and avoid the need to build new facilities, many utilities will continually dredge (excavate) their existing storage impoundments and bring the resulting waste to a solid waste landfill. Because this operating strategy would result in waste being stored for less than one year, the utility would be able to retain its NPDES permit.

Coal Combustion Waste Management Study at 37.

- 89% of the surface impoundments permits do not require groundwater protection standards²¹
- 89% of the surface impoundments permits do not have closure and post-closure requirements
- 88% of the surface impoundment permits do not require financial assurance

The DOE/EPA Report should have concluded that state permitting of CCW surface impoundments was a consummate failure. Based on the industry's own self-reported data, this is the inevitable conclusion. The failure of states to regulate surface impoundment, in light of the much greater risk posed by surface impoundments to human health and the environment, is a recipe for disaster. Yet this failure was not even acknowledged by the DOE/EPA Report. Instead the report misleads readers by reporting on the largely irrelevant numbers of permits issued, without distinguishing between the types of permit required (e.g.; solid waste permit, wastewater discharge permit, dam safety permit, etc.). EPA knows that the type of permit is critical in evaluating whether the controls imposed under the permit will provide sufficient environmental protection. As stated in the DOE/EPA Report, "permits are important because they can dictate the use of specific operating practices and control technologies."²² They also provide an important enforcement vehicle, as well as a process by which the public can be informed and participate in the siting and operation of the waste disposal unit. Failure to require solid waste permits for all CCW disposal facilities is a significant and dangerous gap in state regulatory programs that was not recognized in the DOE/EPA Report.

3. The DOE/EPA Report reveals that at least 30% of the net disposable CCWs generated in the United States are potentially totally exempt from solid waste permitting requirements.

The DOE/EPA Report documents that nearly a third of the net disposable CCWs generated in the U.S. are potentially totally exempt from solid waste permitting requirements.²³ 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

²¹ Groundwater protection requirements are defined in the report as contaminant concentrations in groundwater that cannot be exceeded. DOE/EPA Report at

²² DOE/EPA Report at 27,

²³ Id. at 45.

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.**²⁴

(Emphasis added). This figure, however, likely underestimates the amount of CCW exempted from permitting requirements given that in Texas, virtually all CCW generated is exempt from solid waste permitting requirements. Texas regulators say they cannot provide a figure on the volume of CCW exempted in their state because the generators don’t even have to register most of it. In Texas, CCW is considered a Class III waste, which is an inert material for which no information need be provided to state regulators.²⁵

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.**²⁶

(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.

²⁴ Table 21 of the DOE Report states that 30.0% of total U.S. CCW generation is potentially exempt. DOE Report at 45.

²⁵ Conversation with TCEQ regulator, January 22, 2008.

²⁶ Id. at 45-46.

This conclusion represents a wholly unacceptable gap in regulation of CCW that is likely to have significant negative impact on health and the environment.

4. The DOE/EPA Report's conclusions are invalid because the report reviews only a very limited number of states.

The DOE/EPA Report purports to show that state regulatory control of CCW disposal has improved nationally since 1994 and that the regulatory gaps identified by EPA in its 2000 *Regulatory Determination on Wastes from the Combustion of Fossil Fuels* are closing. The DOE/EPA Report, however, conducted a detailed evaluation of only five states (Pennsylvania, Illinois, Indiana, Virginia and Wisconsin) and a rudimentary review of only six additional states (Alabama, Florida, Georgia, Missouri, Ohio and Texas). Thus the entire report is based on an evaluation of 11 CCW-producing states. This is far too small a sample from which to draw broad conclusions. Furthermore, the report included no state in either the interior west or on the west coast, despite the boom in new coal-fired power plants in that region. It is an irreconcilable error to omit evaluation of any western state in a report whose stated purpose is to inform the decisionmaking of EPA on a national rulemaking for CCW.

5. The DOE/EPA Report reveals that the majority of landfills and surface impoundments built or expanded between 1994 and 2004 do not have basic safeguards sufficient to protect health and the environment.

a. The DOE/EPA Report admits that the majority of surface impoundments and landfills built or expanded between 1994 and 2004 do not have liners that are sufficient to protect health and the environment.

According to EPA's *Human and Ecological Risk Assessment*, unlined and clay-lined landfills and surface impoundments do not provide adequate protection of health and the environment. The Risk Assessment states

Risks from clay-lined units are lower than those from unlined units, but 90th percentile risks are still well above the risk criteria for arsenic and thallium for landfills and arsenic, boron and molybdenum for surface impoundments.²⁷

The Risk Assessment also states that composite liners effectively reduce risks from all constituents to below the risk criteria for both landfills and surface impoundments.²⁸ A composite liner is defined as a high-density polyethylene (HDPE) membrane combined with either geosynthetic or natural clays.²⁹ Yet the DOE/EPA Report reveals that, at best, only 39% of these new units have been

²⁷ US EPA, *Human and Ecological Risk Assessment* at ES-7.

²⁸ *Id.*

²⁹ *Id.* at 3-9.

constructed with composite liners.³⁰ Clay-liners, deemed to present unacceptable level of risk for CCW landfills and surface impoundments, 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 are either unlined or do not have adequate liners. The DOE/EPA Report's glib conclusion that "[t]he use of liners has become essentially ubiquitous," is thus grossly misleading. Unless the liner is of a sufficient quality to prevent the migration of contaminants, its use is largely irrelevant. The DOE/EPA Report reveals that absence of federal regulations requiring adequate 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.

b. The DOE/EPA Report reveals that groundwater monitoring at all surface impoundments and landfills surveyed in the report is inadequate to protect health and the environment.

According to the DOE/EPA Report, groundwater monitoring is not conducted at all the newly permitted CCW disposal units and, even when it is conducted, the monitoring does not include critical CCW constituents and routinely is not conducted with sufficient frequency. First, the report admits that 22-33% of the newly permitted surface impoundments surveyed did not conduct any groundwater monitoring.³¹ Second, only three of the states that require surface impoundments or landfills to conduct groundwater monitoring require monitoring for thallium, a hazardous constituent identified by EPA's Risk Assessment as posing a threat to human health from CCW. In addition, only five states require surface impoundments and landfills to monitor for molybdenum, another hazardous constituent identified as posing significant risk to human health in EPA's Human and Ecological Risk Assessment. Lastly, the majority of the states that require surface impoundments and landfills to conduct groundwater monitoring only require semiannual monitoring. This frequency is not sufficient to detect the movement of contaminants from the units in an effective and timely manner.

6. The DOE/EPA Report reveals that no state "tightened" its regulatory controls on CCW between 1999 and 2005 to require critical CCW disposal safeguards. Therefore gaps identified by EPA in its 2000 Regulatory Determination have not been closed.

The DOE/EPA Report admits that no state surveyed *tightened* its regulatory controls pertaining to liners, groundwater monitoring, leachate collection, closure and post-closure, siting or financial assurance for CCW disposal units between 1999 and

³⁰ Table H-1 of Appendix H of the DOE Report contains liner data for the 56 surveyed landfills. This table contains inadequate information to determine conclusively that 22 of the 56 units have composite liners. For at least seven waste units, the table did not provide enough information to determine conclusively that there was a composite liner. For the purposes of these comments, it was assumed that a composite liner was constructed at these seven units. Consequently, this figure may substantially actually overestimate the number of composite liners in use.

³¹ Because all surface impoundments were not surveyed, the percent of surface impoundments that do not conduct groundwater monitoring may be as high as 33%. DOE Report at 34, footnote 17.

2004.³² In EPA's 2000 Regulatory Determination, EPA expressed significant concern about the deficiencies found in state regulatory programs. EPA's conclusions were based on its review of state programs published in its March 1999 Report to Congress, *Wastes from the Combustion of Fossil Fuels*. In the 2000 Determination, EPA concluded that federal regulations governing CCW disposal were needed to provide "incentive for states to close the remaining gaps in coverage."³³ EPA concluded that regulation under Subtitle D of RCRA was required because "[w]e also believe the time frame for improvement of current practices is likely to be longer in the absence of federal regulations."³⁴ The findings of the DOE/EPA Report, corroborate this concern indicating that no such improvement in regulatory controls has taken place in the states surveyed since 1999. Furthermore, as set forth in Appendices x and x, significant relaxation of critical regulatory controls have recently occurred in several states. (See, for example, North Carolina, as described in Appendix X.)

The DOE/EPA Report found explicitly that states have not closed significant gaps in their regulation of CCW. The remaining gaps in regulating CCW surface impoundments were particularly alarming. The report specifically found that:

- (i) Only *one* of the states surveyed had regulations requiring groundwater monitoring at CCW surface impoundments.
- (ii) Only 33% of the states surveyed had regulations requiring liners for surface impoundments.
- (iii) Only 14% of the states surveyed had regulations requiring leachate collection systems for surface impoundments.
- (iv) Only 20% of the states surveyed required corrective action and financial assurance at CCW surface impoundments.
- (v) Only 9% of the states surveyed had regulations requiring a solid waste permit for all CCW surface impoundments.

The DOE/EPA report also found that states lacked regulations requiring many basic safeguards for CCW landfills:

- (i) 45% of the states surveyed do not require permits for on-site CCW landfills. Two states of the states surveyed do not require *any* solid waste permits for CCW landfills, whether they are located on or off-site from where the CCW is generated.
- (ii) 44% of the states surveyed did not have regulations requiring liners for CCW landfills of any kind.
- (iii) 33% of the states surveyed do not have regulations requiring groundwater monitoring at CCW landfills.³⁵

³² DOE/EPA Report at 49-50.

³³ 65 Fed. Reg. at 32217.

³⁴ 65 Fed. Reg. 32229.

³⁵ Texas, the state that generates the largest amount of CCW in the U.S., does *not* require groundwater monitoring.

- (iv) No state surveyed had regulations requiring quarterly groundwater monitoring for the active life of the disposal unit.³⁶
- (v) 71% of the states surveyed did not have regulations requiring leachate collection systems for landfills.
- (vi) No state surveyed passed more stringent regulations pertaining to liners, groundwater monitoring, leachate collection or financial assurance for surface impoundments or landfills since 1999.

7. The DOE/EPA Report's conclusions regarding the "tightening" of state controls is misleading because it addresses only landfills.

Without justification, EPA in Table S-2, bases its conclusions concerning state progress in "tightening" regulatory controls solely on regulations governing CCW landfills. The country's 600 (or so) currently operating CCW disposal units are comprised of roughly the same number of landfills and surface impoundments. The DOE/EPA Report claims that there is a trend toward construction of more landfills than surface impoundments. But the use, construction and expansion of surface impoundments remain a huge component of current CCW management. Furthermore, EPA itself admits that CCW surface impoundments pose a much higher danger to human health and the environment. See draft *Human Health and Ecological Risk Assessment* (2007). Therefore, there is no rational basis for EPA to evaluate overall state progress based on regulation solely of CCW landfills.

Anyone who has read more than one state's regulations governing CCW disposal knows that landfill regulations usually require far more safeguards than surface impoundment regulations. For example, there are far more exemptions for permitting, liners, and groundwater monitoring for CCW surface impoundments than for landfills. This knowledge and the fact that CCW surface impoundments pose greater risks make EPA's decision to exclude analysis of state regulation of impoundments unjustifiable. In fact, for these reasons, the decision to solely examine landfill regulations introduced unnecessary bias in to the analysis. It is predictable that state regulatory controls look far more adequate if their failure to regulate surface impoundments is conveniently entirely ignored.

8. The DOE/EPA Report fails to assess state regulation of "beneficial use" of CCW

a. The DOE/EPA Report makes false assumptions regarding "beneficial" reuse of CCW and thereby fails to acknowledge sham CCW reuses that pose very significant threats to health and the environment.

The DOE/EPA Report grossly overestimates the amount of CCW that is currently used safely and beneficially. The report states that "significant amounts of CCW" are

³⁶ The only surveyed state that approached this benchmark was Pennsylvania, which requires "no shorter than" quarterly groundwater monitoring for indicator parameters but "no shorter than" annual monitoring for metals and volatile organic compounds.

beneficially reused.³⁷ The DOE/EPA Report relies on Energy Information Administration (EIA) and American Coal Ash Association (ACAA) data to claim that in 2004 35% to 40% of CCW was used beneficially. A closer look at these data, however, reveals that over 36% of this “beneficial” reuse represents applications that often constitute dangerous disposal of the waste. According to ACAA’s “2006 Coal Combustion By-Product (CCP) Production and Use Survey,” 54.2 million tons of CCW was reused in the following applications. Use of CCW as “structural fill/embankments” constituted 11.7 million tons of CCW, approximately 22% of the CCW used. “Mining applications” or minefills represented 1.3 million tons or 2.5% of the CCW used,³⁸ “Soil modification/stabilization” represented 1 million tons or 1.9% of CCW used. All of the above uses, particularly the use of CCW as fill and minefill, have historically caused severe groundwater and surface water contamination, including proven damage cases, throughout the U.S. No state adequately regulates the use of CCW as fill and minefill, to prevent such contamination, as described below. In addition, use of coal ash as raw feed in cement production (5.4 million tons or 9.9% of total CCW used) has been identified by EPA as a significant source of high mercury emissions from cement kilns.³⁹ Thus approximately 36%, in total, of the CCW touted as “beneficially” used poses significant risk to health and the environment, a fact the DOE/EPA Report fails totally to acknowledge and discuss. In contrast, use of CCW as a substitute for Portland cement in concrete, a legitimate beneficial use, represents only 32% of total CCW used beneficially, based on ACAA data. The report’s failure to examine critically the nature of CCW reuse creates a huge gap in the Agencies’ analysis of the sufficiency of state regulation to protect health and the environment, because a large portion of the CCW reused is, in fact, dangerously disposed.

b. The DOE/EPA Report fails to review any state regulations pertaining to reuse of CCW.

The DOE/EPA Report did not review state regulations that apply to the beneficial use of CCW. Yet the re-use of coal ash in applications that are legal, yet far from “beneficial,” has caused documented damage in numerous states. One of the most egregious examples occurred in Town of Pines, Indiana, where use of coal ash for fill and unpaved roads contaminated the town’s drinking water supply. Town of Pines is now a “proven damage case,” as well as a Superfund site. In view of the potential for CCW used as fill, minefill, road building material, etc. to contaminate groundwater, EPA should have closely examined state regulation of “beneficial” use of coal ash.

³⁷ DOE/EPA Report at 4.

³⁸ The amount of CCW used for “mining applications” is grossly underestimated by ACAA, as ACAA readily admits. One reason for their underestimation is the fact that Pennsylvania waste coal-burning plants were not included in their survey. According to the Pennsylvania Department of Environmental Protection, approximately 9 million tons of CCW is minefilled annually in that state, alone. However, for the sole purpose of rebutting the claims set forth in the DOE/EPA Report, we use the same numbers on which the report relied. It should be noted, however, that several states, in addition to Pennsylvania, use more than 1.3 million tons of CCW annually in minefill applications. Among them are West Virginia, Illinois, and Texas.

³⁹ See National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry published December 20, 2006.

Specifically, the DOE/EPA Report should have identified states that permit use of CCW as fill, minefill or road building material, without a limit on the size and location of the project. The report should have identified states that permit CCW to be placed in contact with groundwater, left uncovered, and transported without dust control, because such applications present a threat to health and the environment by allowing ash constituents to migrate to groundwater, surface water or air. The report should also have identified state beneficial use programs that do not require monitoring of beneficial use projects involving large volumes of CCW placed in the open environment. Many states do not require any such monitoring, even when these fill projects involve placement of CCW directly into water tables and near active drinking water supplies. Furthermore, we have found no post-project monitoring or corrective action standards being employed in any beneficial use "fill" projects anywhere in the nation.

9. The DOE/EPA Report fails to recognize the fallacy of relying on laboratory leach tests

Protecting human health and the environment is particularly difficult when dealing with CCW waste streams. These wastes are tremendously varied in both chemical characteristics and behavior. Potential disposal and/or placement environments are comparably variable. Two fly ashes may react entirely differently in a common disposal environment and a single CCW may be relatively benign in one disposal environment but produce highly toxic leachate in another. There is the added complexity that CCWs evolve after their disposal or placement in the environment. As their mineralogy and physical properties change with that evolution, the leachate composition and production rates will also change. Some CCWs produce leachate plumes that can mobilize *in situ* toxic metals from the aquifer or stream sediments, producing contamination that is independent of the metals composition in the CCW leachate itself.

There does not yet exist a chemical characterization protocol that allows the regulator or the public to predict what the leachate composition or environmental impact will be when any given CCW is disposed or placed in the environment. This statement holds as true for the initial disposal or placement as it does for the long-term compositions and rates as the wastes evolve.

There does exist, however, the clear understanding that testing protocols that are commonly specified in regulatory programs cannot be used to predict the character or toxicity of leachates from CCWs. These are the laboratory index leaching tests such as EP-TOX, TCLP, SPLP, and ASTM 3987. In its draft *Human and Ecological Risk Assessment of Coal Combustion Wastes* (August, 2007), the USEPA recognizes the inadequacy of these tests. In Appendix A, Table A-4 on page A-5, various types of data characterizing ash leachates are ranked. Compared with the top ranking of (1) for pore water or field leachate samples, these dilute, short-term, tumble tests rank last with (4), behind other laboratory tests. After its exhaustive consideration of CCW placement in the mining environment, the National Research Council strongly voiced similar concerns (National Research

Council, 2006, *Managing Coal Residues in Mines*, pp 145-152). The Science Advisory Board for the USEPA has recognized and expressed the inadequacies of these tests since at least 1991 and in 1999 called for a review of agency procedures (USEPA SAB, 1999, *Waste Leachability: The Need for Review of Current Agency Procedures*, EPA-SAB-EEC-COM-99-002). Anyone who has had the opportunity to compare field leachate compositions with the results of these tests again confirms the inadequacy of the tests as a predictive tool.

Yet, in state after state, program after program, the regulatory framework for control of CCW placement in the environment is determined solely based on these dilute, short-term, tumble tests known not to be adequate for the purpose, known to produce leachate test compositions that have nothing to do with what the waste will produce when they are placed in the environment. Millions of tons of CCWs can be and have been approved for disposal directly in contact with a water table used for drinking water without a single monitoring well, with the wave of a regulatory wand, based solely on these tests. It is a situation that defies not just logic, but reason itself.

Conclusion

The attachments to these comments, Attachment B-1 through B-9, comprise analyses performed by several environmental groups on laws and regulations applying to CCW in the states in which they work. These analyses examine CCW regulations in 20 states, covering each region of the country and all major CCW-generating states. All of the state summaries reveal significant gaps in state regulatory authority. In the course of our research, several states were identified that recently changed state law to *weaken* their regulatory programs. Some of the analyses, such as the analysis of Indiana law (Attachment B-4) correct errors in the DOE/EPA Report. For most states reviewed, however, the DOE-EPA Report contained no data pertaining to those particular states.

In total, these analyses reveal the failure of the DOE/EPA Report to portray accurately the status of state regulatory controls. Admittedly, the reviews in these appendices are not comprehensive analyses of all laws and regulations applying to CCW in any particular state. As EPA and DOE noted in their report, such reviews take a substantial amount of time and resources. Yet the additional review of relevant portions of state laws and regulations in 20 states indicates clearly that many state programs are wholly inadequate to protect health and the environment. Thus these reviews demonstrate the need for national minimum standards that provide consistent and sufficient rules for management, disposal and reuse of CCW.

Attachments B1-B-9

Attachment B-1

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February 11, 2008

Notice of Data Availability on the
Disposal of Coal Combustion Wastes in
Landfills and Surface Impoundments
Environmental Protection Agency
Mailcode: 5305T
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Attention: Docket ID No. EPA-HQ-RCRA-2006-0796

To Whom It May Concern:

By this letter, Southern Environmental Law Center (SELC) submits comments concerning the Notice of Data Availability (NODA) on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments, 72 Fed. Reg. 49714 (August 29, 2007). For the past 20 years, the Southern Environmental Law Center has used the full power of the law to conserve clean water, healthy air, wild lands, and livable communities throughout the Southeast. SELC's comments are intended to expand and correct the information presented in the joint U.S. Department of Energy (DOE) and Environmental Protection Agency (EPA) report entitled *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*. (DOE/EPA Report). Specifically SELC presents surveys of the statutes and regulations governing the disposal and reuse of coal combustion waste (CCW) in five southern states in which we practice, North Carolina, South Carolina, Alabama, Georgia and Tennessee, as well as, within this letter, a short summary of regulation in the state of Virginia. Our review of these states reveals significant statutory and regulatory gaps that result in state programs that do not and cannot adequately protect health and the environment from the dangers posed by CCW.

As a result of these findings, we ask that the United States Environmental Protection Agency immediately begin rulemaking to establish national safeguards for the disposal of coal combustion wastes in enforceable regulations. At a minimum, these safeguards should include siting restrictions, composite liners, covers, comprehensive monitoring, corrective action requirements and long-term financial assurance to clean up any pollution that results from placement of CCW in the environment. These safeguards should apply consistently to all sites, whether they are inside or outside of coal mines or coal-fired power plant property or whether the waste is being "beneficially placed" in the

environment. Their purpose should be to eliminate unreasonable risks to human health and the environment from CCW.

In the states that we reviewed, surface impoundments are the most common form of CCW disposal. Given the high risks revealed in the Draft Risk Assessment published as part of EPA's NODA, EPA should outlaw placement of CCW in water and phase out existing surface impoundments, as expeditiously as possible. Even with composite liners, surface impoundments for CCW leave communities facing long-term hazards to human health and the environment and burdens to ensure that liners never fail. These risks can be avoided by placing CCW in dry, composite-lined, covered and monitored landfills outside of floodplains. The price of electricity generated from coal should reflect the costs of these safeguards.

The state-specific surveys appended to this letter reveal significant gaps in state regulatory requirements. These include the failure of states to require liners for all CCW surface impoundments and landfills (all six states), the failure to require that CCW disposal units be separated from groundwater (Alabama, Georgia, and South Carolina), the failure to require that all CCW disposal units obtain solid waste permits (Alabama, Georgia, North Carolina, and Tennessee), and the failure to require all waste units to have groundwater monitoring systems (all six states).

This letter includes a summary of some of the pertinent laws and regulations of Alabama, Georgia, North Carolina, South Carolina, Tennessee and Virginia relating to the disposal and reuse of coal combustion waste. Without exception, each state allows far too much discretion on the part of regulators and law makers with regard to the safe disposal of coal combustion waste and provides numerous dangerous regulatory loopholes. The reviews below are not intended to be comprehensive surveys; such surveys should have been completed by EPA in the EPA-DOE Report. These surveys are intended to augment that report and to illustrate the significant gaps that still exist in state regulation of CCW, which can only be cured by federal regulation.

Alabama

According to the DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, Alabama generated over 3.4 million tons of CCW in 2004 and is the twelfth largest CCW-producing state in the U.S.¹ Power plants in Alabama have historically primarily managed their CCW in surface impoundments. According to an Edison Electric Institute survey, in 1994, Alabama utilities operated 11 surface impoundments and 1 landfill for CCW disposal.²

Despite being a very large CCW producing state, coal combustion waste is not regulated in Alabama. This tremendous gap in regulation must be underscored. Because of the complete lack of statutory or regulatory requirements for coal combustion waste

¹ DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, at 5.

² US EPA, Report to Congress, *Wastes from the Combustion of Fossil Fuels, March 1999*, at 3-24.

landfills and surface impoundments, regulators are unable to provide information on the number of facilities that exist in the state, nor any information regarding the effect these waste disposal units have on groundwater supplies.

While Alabama does require National Pollutant Discharge Elimination System (NPDES) permits for CCW surface impoundments that discharge to surface water, there is a tremendous amount of discretion vested in the permit writer. Where certain industries, like metal finishing, are regulated in a way that allows very little discretion on the part of NPDES permit writers in Alabama, power plants are not given similar treatment. Federal guidelines are the starting point for regulation of effluents but the experience of the permit writer will play a much greater role in determining what the final permit requirements will be. Decisions in the permit writer's discretion include, but are not limited to, what pollutants will be monitored in sampling and how those limits will be determined, how frequently sampling and reporting should be conducted and whether sampling of effluent should be done at internal waste streams (into the impoundment) or external (where the waste would leave the impoundment and enter a water of the state). Not only do regulators have great discretion, permittees also have a great deal of influence in the terms of a permit. Permittees are able to engage in extensive negotiation of draft permits. Public comment regarding the terms included in the permit rarely result in significant substantive changes to the final permit. Lastly, these NPDES permits address, at best, only the direct discharge of the impoundments to surface water and fail to address discharges to groundwater. No groundwater monitoring is required in the NPDES permits, nor are basic waste disposal safeguards, such as liners, separation from groundwater, and leachate collection, required by these permits or by Alabama law. While a permit writer may use discretion to require a liner, Alabama guidance suggests a 2-foot clay liner, which is clearly insufficient to contain waste contaminants.

The broad discretion given to NPDES permit writers for surface impoundments and the complete lack of regulation of coal combustion waste in landfills are cause for great concern and should be addressed in order to protect the health and public safety of the citizens of Alabama.

Georgia

According to the DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, Georgia generated over 3.1 million tons of CCW in 2004 and is the fourteenth largest CCW-producing state in the U.S. Power plants in Georgia have historically managed their CCW in surface impoundments. According to an Edison Electric Institute survey, in 1994, Georgia utilities operated 12 CCW surface impoundments in Georgia and no CCW landfills.

The attached survey of Georgia law and regulations identifies several major deficiencies in Georgia's state program. In Georgia, coal combustion solid waste is categorized for the purposes of solid waste permitting as industrial waste. There is a substantial gap in regulation for CCW monofills. Where facility owners or operators can

prove that the waste disposed will not be attractive to disease vectors or birds or generate methane gas, the state is authorized to provide numerous variances. The variances would be from installing liners and leachate control systems, applying daily cover, and installing groundwater and surface water monitoring systems. The variance for industrial waste monofills, like coal ash monofills, negates any groundwater monitoring requirements that would otherwise be protective.

While surface impoundments that discharge into waters of the state require NPDES permits, permitting requirements for industrial dischargers are not well delineated, and leave room for great discretion in writing of permits for regulated surface impoundments. Further, Georgia law does not require surface impoundments to be lined. There is no requirement for a CCW surface impoundment to be above the water table and groundwater monitoring for surface impoundments is also discretionary.

North Carolina

In August of 2007, North Carolina Governor Michael Easley signed into law the Solid Waste Management Act of 2007. The law has been touted by solid waste officials as the most comprehensive overhaul of North Carolina solid waste law in twenty years. Prior to passage of the law, the majority of solid waste regulations existed in the North Carolina Administrative Code at 15A NCAC 13B as guidance for North Carolina regulators and the regulated community, largely solid waste facility permit applicants. With the overhaul, most requirements have been codified in the North Carolina General Statutes at N.C.G.S. § 130A-290 et. seq. While the administrative code continues to apply to gaps in statutory regulation, the Solid Waste Division is now in the process of drafting additional rules to complement the statutory mandates.

Interestingly enough, early during North Carolina's 605 process³ there was one line-item regarding the regulation of coal combustion waste in proposed Senate Bill 1492.⁴ There was no public debate requested or provided during the course of more than 12 hours of these meetings on regulation of coal ash landfills. Before Senate Bill 1492 became law, however, there was an amendment adding N.C.G.S. § 130A-295.4, "Combustion Products Landfills." This amendment is the state of regulation for coal combustion landfills permitted after August 1, 2007. This new law that allows construction of dry ash landfills on top of existing surface impoundments and landfills⁵ is a matter of muted controversy. While the majority of solid waste facilities became subject to significantly stronger siting requirements, coal combustion waste landfills were specifically exempted from these more stringent requirements. Compliance at these new

³ North Carolina's 605 process is an informal term that describes the process whereby the environmental community, largely lobbyists, attorneys and municipality representatives, weighs in on proposed language for environmental statutes. This occurs after preliminary drafting by legislative staff of new environmental regulation and before introduction of the legislation to the floor of the North Carolina legislature for debate and eventual House and Senate vote. It is meant to narrow the field of debate, clarify existing language and conserve legislative resources.

⁴ The North Carolina Solid Waste Management Act of 2007 is Senate Bill 1492.

⁵ See *infra* at footnote 6.

facilities is based only upon leakage between liners, where the facility itself sets its own permitted Leakage Rate, and not on groundwater well monitoring.⁶ Additionally, where leaks are detected, the owner or operator of the facility is able to create their own corrective action plan, and there are no set standards nor time periods established in which a response action must take place. Perhaps most egregious is that the statutory change provides an end-run around any regular groundwater testing of the landfill or surface impoundment on top of which the new landfill is being constructed. The attached survey of North Carolina identifies this and additional major deficiencies in state law.

Under North Carolina law, surface impoundments for CCW are not included in solid waste regulations. Rather, where they discharge into surface waters of the state, they are required to have a NPDES permit. The regulations state that these impoundments need only be two feet above the seasonal high water table. It appears that only one CCW surface impoundment with a NPDES permit has monitoring requirements for any CCW constituents. When monitoring indicates that contamination has exceeded standards beyond the waste unit's compliance boundary, there is no set time established for a response action. According to 15A NCAC 02L .0016(d), in establishing a schedule for a response, the state must consider "any reasonable schedule proposed" by the polluter.

Surface impoundments that do not discharge into surface waters of the state are permitted at 15A NCAC 02T .1200 et. seq. Regulations are even less stringent here. These impoundments require no liners, despite the probability that the CCW constituents may leak into groundwater. Although it is not clear that existing post-1998 coal combustion waste landfills are exempted by law from groundwater monitoring requirements, it appears from discussion with state regulators, that they are able to participate in voluntary monitoring and reporting. Where testing does occur in North Carolina, voluntary reporting parameters do not include numerous common CCW contaminants such as molybdenum, thallium and antimony.

South Carolina

According to the DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, South Carolina generated over 2.1 million tons of CCW in 2004 and is the twentieth largest CCW-producing state in the U.S. Power plants in South Carolina have historically managed their CCW in surface impoundments. According to an Edison Electric Institute survey, in 1994, South Carolina utilities operated 10 CCW surface impoundments and 2 landfills.

The failure of state law and regulations to mandate basic safeguards, such as liners and groundwater monitoring, at all newly constructed or expanded CCW surface impoundments and landfills poses a significant threat to health and the environment in South Carolina. The attached survey of South Carolina law and regulations identifies major deficiencies in South Carolina's state program.

⁶ N.C.G.S. § 130-295.4 (c). "Compliance with performance of the landfill to prevent releases of waste to the environment may be determined based on leakage rate rather than monitoring well data."

South Carolina's regulation of coal combustion waste surface impoundments is through their Code provisions for Standards for Wastewater Facility Construction. FOIA requests to the State of South Carolina for impoundments and/or landfills in the cities of Berkeley, Darlington and Andersen should bear out the extent to which monitoring and construction is being done for the protection of groundwater sources. Only after receiving this information can a detailed evaluation occur regarding whether sufficient safeguards are being employed at particular units. On the basis of what the law requires, however, significant gaps in authority exist. The regulations do not show sufficient regulation for surface impoundment siting, construction or monitoring. Location, liner requirements, cover provisions, size and pollutant testing are permitted on a case-by-case basis. Further, where surface impoundments discharge into groundwater, variances are available to release the permittee from monitoring.

In South Carolina, the stringency of regulation of CCW landfills depends on the results of a short-term leach test, the Toxicity Characteristic Leaching Procedure (TCLP). This test has been soundly discredited by EPA for its failure to accurately predict the migration of contaminants from coal ash. (See U.S. EPA, *Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control* 2006 and 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 32nd Annual EPA-A&WMA Information Exchange, December 4, 2007). EPA admits that the TCLP can grossly underestimate migration of pollutants from coal ash, such as arsenic and selenium.

In EPA's *Coal Combustion Damage Case Assessment* dated July 2007, EPA notes that the South Carolina Electric & Gas Canadys Plant is a "proven damage case" due to the off-site contamination of groundwater in 2000 above state standards by arsenic flowing from CCW surface impoundments operated by the power plant. Despite this evidence of groundwater contamination from CCW disposal in South Carolina, it is highly likely that most of the coal ash generated in the state, when tested by the TCLP, will lead to disposal in Class I landfills, a class of landfills that lacks basic safeguards. According to South Carolina regulations, such landfills are not required to have any liners or leachate collection systems. Furthermore, even if the TCLP indicates that a particular coal ash must be disposed in a Class II landfill, such landfills are required only to have clay liners. According to EPA's draft *Human Health and Ecological Risk Assessment*, clay-lined CCW landfills still pose unacceptable risks to human health and the environment. Only Class III landfills in South Carolina are required to have composite liners, which EPA determined may be sufficient to lower the risk of groundwater contamination to acceptable levels. Furthermore, for all new CCW landfills, South Carolina allows the bottom elevation of the landfill to be two (2) feet above the seasonal high water table. For all classes of landfills, particularly those landfills with no liners or clay liners, this distance from the water table is clearly insufficient to protect groundwater and drinking water. Lastly, South Carolina requires only semi-annual groundwater monitoring. This is too infrequent for the timely detection of contamination of

groundwater. Moreover, the groundwater monitoring parameters are at the discretion of the Department, which raises the question of whether all CCW contaminants are routinely monitored at these waste units.

Tennessee

Tennessee generates over 3.8 million tons of coal combustion waste (CCW) a year and is the ninth largest CCW producing state in the United States.⁷ Power plants in Tennessee historically manage most of their CCW in surface impoundments. According to a 1994 survey by the Edison Electric Institute, Tennessee utilities operated nine CCW surface impoundments.⁸ It is not known how many CCW surface impoundments and landfills are currently operating in Tennessee, but there are at least two operating CCW landfills in addition to numerous CCW surface impoundments.

A review of Tennessee regulations and interviews with Tennessee regulators reveal significant deficiencies in state regulations. First, there are no regulations governing CCW disposal in surface impoundments. CCW surface impoundments are subject only to dam safety requirements mandated by individual permits and the NPDES discharge requirements, if such permits are applicable. According to a Tennessee Department of Environment and Conservation (TNDEC) employee, since 1990 a section of the regulations was reserved for future surface impoundment regulations, but TNDEC has yet to promulgate regulations due to a lack of resources and EPA guidance. This section has since been repealed.⁹

Secondly, the regulations governing solid waste disposal in Tennessee embrace a tiered approach based on perceived waste toxicity. Theoretically, CCW may be disposed of in a Class I or a less stringent Class II landfill.¹⁰ According to a TNDEC employee, in practice, CCW disposed of in landfills is disposed largely, if not entirely, in Class II facilities.¹¹ The safeguards required for Class II facilities are insufficient for protection of health and the environment from CCW, as described in the attached survey.

Lastly, the regulations applying to CCW disposal in Tennessee provide state regulators with excessive discretion. Any standard or requirement in the Tennessee solid waste regulations may be waived by the TNDEC commissioner "if the [disposal unit] operator can demonstrate . . . that the standard is inapplicable, inappropriate, or unnecessary to his facility, or that it is equaled in effect by alternative standards or requirements."¹² Where possible, this comment notes regulatory requirements that are frequently waived by TNDEC for CCW disposal. The routine waiver of critical safeguards, such as leachate collection systems, for CCW landfills is significant cause for concern. A TNDEC employee indicated that composite liner requirements have been

⁷ DOE/EPA Report, *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*, at 5.

⁸ US EPA, Report to Congress, *Wastes from the Combustion of Fossil Fuels*, March 1999 at 3-24.

⁹ Glen Pugh, TNDEC Division of Solid/Hazardous Waste Management, December 2007.

¹⁰ Tenn. Comp. R. & Regs. 1200-1-7-.01(3)(a) & (b).

¹¹ Jeff Norman, TNDEC Division of Solid Waste Management, December 2007.

¹² 1200-1-7-.01(5).

waived for every CCW landfill in the state and that according to TNDEC's Solid Waste Program Policy and Guidance Manual, CCW Class II facilities require no leachate collection systems.¹³

In sum, we find state regulation of CCW landfills and surface impoundments severely deficient in Tennessee.

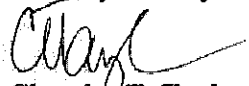
Virginia

A detailed survey of Virginia statues of regulations on CCW is not included in the attached surveys. In summary, coal ash is regulated as industrial waste in the Virginia solid waste regulations. The regulations for industrial waste are at 9 Virginia Administrative Code 20-80-270. Design requirements include a liner system, and leachate collection system as well as groundwater monitoring in accordance with 9 VAC 20-80-300. In certain circumstances however, a dual liner system may be used in lieu of groundwater monitoring, obviating the protective benefit of monitoring. Virginia specifically excludes surface impoundments that obtain water pollution control permits from the solid waste regulations. These facilities have no liner requirements, and while the Virginia State Water Control Board has groundwater standards at 9 VAC 25-280-10 et. seq., it is not mandated that those standards be incorporated into each permit. The gaps in the law that allow less stringent or no groundwater monitoring are important indicators in support of the need for stronger regulation of coal combustion waste in Virginia.

Conclusion

Attached to this letter are surveys of Alabama, Georgia, North Carolina, South Carolina and Tennessee that parse out particular areas of concern with CCW regulation. The evidence already in the possession of the EPA, the submissions of other parties in response to the NODA and the inconsistent regulation of CCW across the Southeast provide ample, irrefutable bases for the EPA to proceed as expeditiously as possible with the development of more stringent national regulation for coal combustion waste.

Thank you for your attention to this matter,



Chandre T. Taylor,
Staff Attorney

Southern Environmental Law Center

¹³ Document 93, TNDEC, *Solid Waste Program Policy and Guidance Manual 105* (Oct. 2006), available at: <http://www.state.tn.us/environment/swm/pdf/SWPolicyManual.pdf>.

Attachment

Surveys of CCW Regulation in
Alabama, Georgia, North Carolina,
South Carolina, and Tennessee

Alabama

1) Does state law exempt CCW from solid waste regulations?

Yes. Coal ash is completely exempted from regulation as a solid waste in the state of Alabama.¹ It is also not regulated as an industrial solid waste.²

2) Are waste disposal permits required for all CCW disposal units?

No solid waste disposal permits are required.³

3) Are liners required for CCW landfills/surface impoundments?

No, there are no requirements for liners at coal combustion waste landfills. However, while ash may not be regulated for the purposes of solid waste permitting, surface impoundments that discharge into waters of the state are regulated as industrial waste treatment facilities in Alabama.⁴ The director may require a liner as a part of a best management practices plan.⁵

4) If so, what type of liner?

If required, the director may ask that it be impervious⁶, but does not state what type of impervious liner would be required. Guidance suggests a minimum of 2 feet of compacted clay, unless an alternate method is deemed acceptable by the Department.⁷

5) Are there requirements for waste to be above the water table?

No, there are no requirements for CCW to be placed above the water table. Alabama Department of Environmental Management (ADEM) guidelines, however, state that at a minimum, the impoundment bottom should be above the high groundwater level.⁸ If an

¹ Ala. Admin. Code r. 335-13-1-.03(12). "The terms solid waste, garbage, and ash, as defined in this Chapter, do not include fly ash waste, bottom ash waste, boiler slag waste, or, flue gas emission control waste which result from the combustion of coal, untreated wood, or the ash resulting from the combustion of other fossil fuels at electric or steam generating units."

² Ala. Admin. Code r. 335-13-1-.03(63). "Industrial waste - ... This term does not include fly ash waste, bottom ash waste, boiler slag waste, or flue gas emission control waste which result from the combustion of coal or other fossil fuels at electric or steam generating plants."

³ Id.

⁴ In Alabama's Water Pollution Control Act, industrial wastes are defined as "[l]iquid or other wastes resulting from any process of industry, manufacture, trade or business or from the development of natural resources. Code of Ala. § 22-22-1 (b)(5). The discharge of industrial waste into the waters of the state of Alabama requires a NPDES permit. See Ala. Admin. Code r. 335-6-6-.03(1)(a)(1).

⁵ Ala. Admin. Code R. 335-6-6-.08(1)(j)(8).

⁶ Id.

⁷ See infra at note 9.

⁸ Id.

alternate construction proposal is found to be acceptable by the Department, this guideline does not have to be followed.⁹

6) Are there requirements for covers for CCW landfills/surface impoundments? If so, are the covers only caps that are part of final closure or are there intermediate cover requirements, i.e., do the facilities have to cover the waste before they are full?

No, there are no requirements for covers for CCW landfills or surface impoundments. Caps may be required, at the discretion of the Director, for industrial wastewater impoundment closures.¹⁰

7) Is groundwater monitoring required? If so, do the regulations require upgradient and downgradient wells? Do the regulations require baseline monitoring prior to placement of the waste?

No, there is no groundwater monitoring requirement applying to coal waste landfills and surface impoundments. For closure of surface impoundments, a groundwater monitoring plan may be required at the discretion of the Director, but it is not mandated.¹¹

8) What are the monitoring parameters and frequency of monitoring (annual, semi-annual or quarterly), if required?

There are no bright-line requirements for monitoring of solid waste coal ash landfills and surface impoundments.

9) Are there setback provisions for water supply sources?

No.

10) Are there meaningful corrective action provisions for responding to rises in pollution at monitoring points? What does the state require if exceedances are found?

There is no bright-line requirement for monitoring of coal combustion solid waste monofills, and thus no meaningful corrective action provisions.¹²

11) Are there beneficial use exclusions that are exempt from regulatory safeguards? If so, what are they? For example, does the state have a broad exemption for fill projects?

⁹ ADEM guidance for construction of industrial surface impoundments.
<http://www.adem.state.al.us/WaterDivision/Industrial/NPDES/Forms/construc.doc>.

¹⁰ Closure guidelines for industrial wastewater impoundments. (Rev. Mar. 2000)
<http://www.adem.state.al.us/WaterDivision/Industrial/NPDES/Forms/closure.doc>.

¹¹ Id.

¹² June 18, 2008 conversation with Chief of Alabama Solid Waste Division.

Because of the lack of regulation of coal ash, coal ash monofill operators have not attempted to find a source to recycle ash, nor are beneficial uses addressed in Alabama regulations.¹³

12) Are there exclusions (loopholes) for on-site waste disposal, monofills, or grandfathered units?

Coal combustion waste is unregulated, but for discharge into surface waters of Alabama.¹⁴

13) Does the state issue NPDES permits for CCW disposal units? If so, do they monitor for CCW constituents (e.g. metals, boron, etc). Do they set limits for these constituents?

Yes, the state issues NPDES permits for CCW disposal units. The permitted disposal units are industrial surface impoundments that discharge into waters of the state.¹⁵ The state does not require across the board monitoring for CCW constituents.¹⁶ The permits are drafted by regulators who use Federal guidelines¹⁷ and experience to determine monitoring parameters.¹⁸ On a case-by-case basis, regulators write draft permits and negotiate with power companies on the extent to which certain constituents should be monitored, how frequently they should be monitored and whether monitoring will be at internal points or at the outfall to the receiving stream.¹⁹

14) Can the state provide a list of CCW disposal units in the state that indicates location, size of unit, years of operation, and whether the unit is lined?

Because of the lack of regulation of dry ash coal combustion waste in the state, the solid waste division would be unable to provide a list of coal combustion waste monofills. Where the surface impoundment discharges into a water of the state, those sites would be permitted by the Water Division of the Alabama Department of Environmental Management (ADEM). They are able to provide permit information for Alabama Power through file review or through mailing copies of permits.²⁰

15) Have any changes been made in the statute or regulations since 1994 and, if so, have these changes increased or decreased the required safeguards for disposal of CCW?

¹³ Id.

¹⁴ See supra at note 4.

¹⁵ Id.

¹⁶ For example, in a NPDES permit to Alabama Power issued on September 6, 2007 the ash pond monitoring parameters included only monitoring of effluent for Copper and Iron, with no stated maximum discharge limitation, and monitoring of Arsenic not to exceed a monthly average of .037 mg/l. NPDES permit number AL 0002909.

¹⁷ 40 C.F.R. 423; Steam Electric Power Generating Point Source Category.

¹⁸ January 24, 2008 conversation with ADEM staff in NPDES permitting for Alabama power plants.

¹⁹ Id.

²⁰ Id.

No. The complete lack of regulation of dry ash coal combustion waste monofills that do not discharge into waters of the state remains the same. The state of Alabama has made a policy choice to loosely regulate coal ash. There are no relevant safeguards for its disposal other than what is available through the NPDES permitting program.

Georgia

1) Does state law exempt CCW from solid waste regulations?

No. CCW falls under the definition of "Industrial Waste" in the regulations.¹

2) Are waste disposal permits required for all CCW disposal units?

No. Though Georgia law states that "[n]o person shall engage in solid waste handling or construct or operate a solid waste handling facility...without first obtaining a permit from the Director authorizing such activity,"² CCW disposal units may not always have permits.

Surface impoundments that discharge any pollutant to a water of the state from a point source require a NPDES permit.³ Surface impoundments that discharge any pollutant from a non-point require written approval, but not a permit.⁴

Additionally, recovered material and recovered materials processing facilities are excluded from regulation as solid wastes and solid waste handling facilities.⁵ To be exempt from regulation, the material must have a known use, reuse, or recycling potential...⁶ While coal ash is not mentioned specifically, to the extent that a coal ash landfill is considered recovered material, it would be exempt from regulation, and thus require no permit.

3) Are liners required for CCW landfills/surface impoundments? If so, what type of liner?

Industrial waste disposal facilities permitted to receive only a single type of industrial waste (monofill) or receive only a single industry's waste may be given a variance by the Director from installing liners and leachate collection systems...if the applicant can demonstrate to the satisfaction of the Director that the waste to be disposed of would not cause odors or be attractive to disease vectors or birds or generate methane gas.⁷

¹ O.C.G.A. § 391-3-4-.01(27). "'Industrial Waste' means solid waste generated by manufacturing or industrial processes that is not a hazardous waste regulated under the Hazardous Waste Management Act...Such waste includes...wastes resulting from...[e]lectric power generation..."

² O.C.G.A. § 391-3-4-.02(1). *See also*, O.C.G.A. § 391-3-4-.02(2) "Permits shall be required for, but are not limited to, persons engaged in the collection, transportation, treatment, utilization, storage, processing, or disposal of solid wastes, or any combination thereof..."

³ O.C.G.A. § 391-3-6-.06(3)(a).

⁴ O.C.G.A. § 391-3-6-.06(3)(b).

⁵ O.C.G.A. § 391-34-.04(7).

⁶ O.C.G.A. § 391-34-.04(7)(a).

⁷ O.C.G.A. § 391-3-4-.07(4)(a).

Liners for surface impoundments are determined on a case-by-case basis, and could be required to protect groundwater. The NPDES permit regulations state that any proposed discharge into groundwater will prohibit disposal or require additional terms, but does not specify that a liner will be required.⁸

4) Are liners required for CCW surface impoundments?

No. A surface impoundment that receives industrial wastes such as CCWs must have an NPDES permit if it will discharge any pollutant from a point source into waters of the State, including both surface waters and subsurface waters.⁹ If there will be a nonpoint-source discharge, a surface impoundment that receives industrial wastes such as CCWs must have a written approval for the discharge, either in the NPDES permit, if there is also a point-source discharge, or in a letter. In either case, liners are not required, but requirements may be established, as necessary, on a case-specific basis to protect subsurface waters.¹⁰

5) Are there requirements for waste to be above the water table?

No. Siting guidance for industrial solid waste landfills state "the thickness and nature of the unsaturated zone and its ability for natural contamination control must be evaluated" but makes no specific recommendation that the waste should be above the water table.¹¹

6) Are there requirements for covers for CCW landfills/surface impoundments? If so, are the covers only caps that are part of final closure or are there intermediate cover requirements, i.e., do the facilities have to cover the waste before they are full?

NPDES permitting regulations do not specify cap or post-closure care requirements for industrial coal combustion waste surface impoundments. Also industrial solid waste landfills are eligible for a variance that would allow them to not provide daily cover.

7) Is groundwater monitoring required? If so, do the regulations require upgradient and downgradient wells? Do the regulations require baseline monitoring prior to placement of the waste?

A CCW monofill may be given a variance by the Director from installing groundwater monitoring systems...if the applicant can demonstrate to the satisfaction

⁸ O.C.G.A. § 391-3-6-.06(14).

⁹ O.C.G.A. § 391-3-6-.06(3)(a).

¹⁰ O.C.G.A. § 391-3-6-.06(14).

¹¹ "Criteria for Performing Site Acceptability Studies for Solid Waste Landfills in Georgia," Circular 14, Appendix A: Criteria for Industrial Waste Landfills.

of the Director that the waste to be disposed of would not cause odors or be attractive to disease vectors or bird or generate methane gas.¹²

Coal combustion waste surface impoundments may require monitoring as dictated by their NPDES permit.¹³

8) What are the monitoring parameters and frequency of monitoring?

If an industrial waste monofill does not have a variance from the groundwater monitoring requirements, the following MSWLF requirements would apply. "At a minimum, a detection monitoring program must include the monitoring for the constituents listed in Appendix I¹⁴ of this Rule."¹⁵

"The Director may delete any of the Appendix I monitoring parameters for a MSWLF unit if it can be shown that the removed constituents are not reasonably expected to be contained in or derived from the waste contained in the unit."¹⁶

"The Director may establish an alternative list of inorganic indicator parameters for a MSWLF unit, in lieu of some or all of the heavy metals (constituents 1-15 in Appendix I to this Rule), if the alternative parameters provide a reliable indication of inorganic releases from the MSWLF unit to the groundwater. In determining alternative parameters, the Director shall consider the following factors:

- The types, quantities, and concentrations of constituents in wastes managed at the MSWLF unit;
- The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit;
- The detectability of indicator parameters, waste constituents, and reaction products in the groundwater; and
- The concentration or values and coefficients of variation of monitoring parameters or constituents in the groundwater background."¹⁷

The monitoring frequency for all constituents listed in Appendix I to this Rule, or in the alternative list approved by the Director, "shall be at least semiannual during the active life of the facility (including closure) and the post-closure care period. A minimum of four independent samples from each well (background and downgradient) must be collected and analyzed for the Appendix I constituents, or the alternative list approved [by the Director], during the first semiannual sampling event.

¹² O.C.G.A. §391-3-4-.07(4)(a).

¹³ O.C.G.A. § 391-3-6-.06(14).

¹⁴ O.C.G.A. § 391-3-4-.14(4) "When referenced in this Rule, Appendix I and Appendix II constituents shall refer to those constituents as listed in Appendix I and Appendix II of 40 CFR § 258, as amended, 56 Fed. Reg. 51032-51039 (October 9, 1991), which are hereby incorporated by reference."

¹⁵ O.C.G.A. § 391-3-4-.14(21).

¹⁶ O.C.G.A. § 391-3-4-.14(21)(a).

¹⁷ O.C.G.A. § 391-3-4-.14(21)(b).

At least one sample from each well (background and downgradient) must be collected and analyzed during subsequent semiannual sampling events.”¹⁸

“The Director may specify an appropriate alternative frequency for repeated sampling and analysis for Appendix I constituents, or the alternative list approved in accordance with paragraph (21)(b) of this Rule, during the active life (including closure) and the post-closure care period. The alternative frequency during the active life (including closure) shall be no less than annual. The alternative frequency shall be based on consideration of the following factors:

- Lithology of the aquifer and unsaturated zone;
- Hydraulic conductivity of the aquifer and unsaturated zone;
- Groundwater flow rates;
- Minimum distance between upgradient edge of the MSWLF unit and downgradient monitoring well screen (minimum distance of travel); and
- Resource value of the aquifer.”¹⁹

These groundwater monitoring requirements would only apply to industrial solid waste landfills that do not have a variance from groundwater monitoring requirements.²⁰

9) What if, any CCW contaminants are monitored?

“At a minimum (where a variance has not been granted), a detection monitoring program must include the monitoring for the constituents listed in Appendix I²¹ of this Rule.”²² Appendix 1 includes the following CCW contaminants:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium (Total)
- Cobalt
- Copper
- Fluoride
- Lead
- Nickel

¹⁸ O.C.G.A. § 391-3-4-.14(22).

¹⁹ Id.

²⁰ “Unless a variance is granted, the [industrial waste facility] applicant must demonstrate compliance with all applicable provisions of the Rule [for landfill siting and operations]. O.C.G.A. § 391-3-4-.07(4)(a).

²¹ O.C.G.A. § 391-3-4-.14(4) “When references in this Rule, Appendix 1 and Appendix II constituents shall refer to those constituents as listed in Appendix 1 and Appendix II of 40 CFR § 258, as amended, 56 Fed. Reg. 51032-51039 (October 9, 1991), which are hereby incorporated by reference.”

²² O.C.G.A. § 391-3-4-.14(21).

- Selenium
- Silver
- Thallium
- Zinc

Appendix 2 contaminants are only required to be tested for if an assessment monitoring program is required.²³ Appendix 2 includes the following CCW contaminants:

- Antimony
- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium (Total)
- Cobalt
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

The following CCW contaminants are absent from Appendices 1 & 2:

- Ph
- Conductivity
- Total Dissolved Solids
- Iron
- Aluminum
- Magnesium
- Manganese
- Boron
- Calcium
- Chloride
- Chromium (hexavalent)
- Molybdenum
- Potassium

²³ O.C.G.A. § 391-3-4-.14(25).

- Sodium
- Sulfate

These contaminants are only monitored where there is no variance from Rule 391-3-4-.07(4)(a).

10) Are there regulatory setback provisions for water supply sources?

No. For industrial waste landfills permitted before 2003, there may be a variance from setback provisions. For industrial solid waste landfills within the inner and outer management zones of existing wells and springs used as sources for public water supply, the Georgia Environmental Protection Division has published a guidance document that advises against issuing new permits.²⁴ However, there is no regulation prohibiting the placement of waste disposal units in these sensitive areas. It is unclear from the NPDES permit regulations whether there are setback requirements for surface impoundments.

11) Are there meaningful corrective action provisions for responding to rises in pollution at monitoring points? What does the state require if exceedances are found?

Surface impoundments and industrial waste monofills may get variances that require little or no testing or action plans dictated by the permittee.

12) Are there beneficial use exclusions that are exempt from regulatory safeguards?

Yes. "Recovered materials and recovered materials processing facilities are excluded from regulation as solid wastes and solid waste handling facilities. To be considered exempt from regulation, the material must have a known use, reuse, or recycling potential; must be feasibly used, reused, or recycled; and must have been diverted or removed from the solid waste stream for sale, use, reuse, or recycling, whether or not requiring subsequent separation and processing."²⁵

13) Are there exclusions (loopholes) for on-site waste disposal, monofills, or grandfathered units?

Industrial waste disposal facilities permitted to receive only a single type of industrial waste (monofill) or receive only a single industry's waste may be given a variance by the Director from installing liners and leachate collection systems...if the applicant can demonstrate to the satisfaction of the Director that the waste to be disposed of

²⁴ "Criteria for Performing Site Acceptability Studies for Solid Waste Landfills in Georgia," Circular 14, Appendix A: Criteria for Industrial Waste Landfills.

²⁵ O.C.G.A. § 391-34-.04(7).

would not cause odors or be attractive to disease vectors or birds or generate methane gas.²⁶

14) Does the state issue NPDES permits for CCW disposal units? If so, do they monitor for CCW constituents? Do they set limits for these constituents?

Generally, the following CCW constituents may be monitored under a NPDES permit²⁷:

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Chromium (hexavalent)
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

The following CCW constituents are not monitored:

- pH
- Conductivity
- Total dissolved solids
- Aluminum
- Barium
- Boron
- Calcium
- Chloride
- Chromium (Total)
- Cobalt
- Fluoride
- Iron

²⁶ O.C.G.A. § 391-3-4-.07(4)(a).

²⁷ The constituents monitored under the NPDES permit are listed under O.C.G.A. § 391-3-6-.06(4)(d)(5)(i) " The EPD will review available data for reported concentrations of any of the following chemical constituents detected at levels based upon analytical methods described in Federal Regulations 40 C.F.R. 136, or that have EPA concurrence, which establishes guidelines on test procedures for the analysis of pollutants."

- Magnesium
- Manganese
- Molybdenum
- Potassium
- Sodium
- Sulfate

Still, for industrial point source dischargers, the Department has discretion in the parameters for monitoring technology-based effluents, which could result in lesser regulation of even those CCW constituents listed above.²⁸

15) Can the state provide a list of CCW disposal units in the state that indicates location, size of unit, years of operation, and whether the unit is lined?

The state can provide a list of CCW permitted facilities, whether surface impoundments or landfills.²⁹ There is a large potential for variances to be granted for industrial monofills, thus there is a lesser chance of the state being able to provide information on those facilities.

²⁸ O.C.G.A. § 391-3-6-.06(4)(d)(5)(v)(c).

²⁹ January 18, 2008 phone conversation with Georgia Solid Waste Management staff.

North Carolina

1) Does state law exempt CCW from solid waste regulations?

Yes, with regard to surface impoundments and certain new CCW landfills.

Coal combustion waste is generally regulated in the solid waste regulations as industrial waste, and industrial solid waste does not include surface impoundments.¹ Since CCW ponds are generally considered surface impoundments, this exclusion removes CCW ponds from industrial solid waste regulation.

Certain new coal ash landfills constructed on top of existing ones *may* be permitted at N.C.G.S. Section 130A-295.4.² This permitting is discretionary, not mandated, and thus provides for a potential exclusion from solid waste regulations.

2) Are waste disposal permits required for all CCW disposal units?

No. Certain structural fill sites are not required to have a solid waste management permit.³ Structural fill is an engineered fill with a projected beneficial end use constructed using coal combustion by-products properly placed and compacted.⁴ While they do not need a permit, the applicant must submit notice to the Solid Waste Division with a Toxicity Characteristic Leaching Procedure (TCLP) analysis from a representative sample of each different coal combustion by-product source to be used in the project.⁵ These sites must not be within 50 horizontal feet from a wetland or perennial stream or surface water body, two feet of the seasonal high groundwater table, 100 horizontal feet from any source of drinking water, within the 100 year flood plain, unless it can be demonstrated that the fill will not wash out, within 25 feet of any property boundary and within 25 feet of a bedrock outcrop.⁶

3) Are liners required for CCW landfills/surface impoundments?

Landfills permitted under N.C.G.S. § 130A-295.4 require liners.⁷ Landfills permitted

¹15A N.C.A.C. 13B .0101(57). "Industrial Solid Waste Landfill" means a facility for the land disposal of "industrial solid waste" ... and is not a ... surface impoundment..."

²N.C.G.S. § 130A-295.4. "The Department may permit a combustion products landfill to be constructed partially or entirely within areas that have been formerly used for the storage or disposal of combustion products at the same facility as the coal-fired generating unit that generates the combustion products, provided the landfill is constructed with a bottom liner system consisting of three components in accordance with this section."

³15A N.C.A.C. 13B .1702. "A solid waste management permit is not required for coal combustion by-products structural fills which meet the requirements listed in this Section."

⁴15A N.C.A.C. 13B .1701(4).

⁵15A N.C.A.C. 13B .1703(a)(4).

⁶15A N.C.A.C. 13B .1704(1) - (7).

⁷N.C.G.S. § 130A-295.4(b). "The Department may permit a combustion products landfill to be constructed partially or entirely within areas that have been formerly used for the storage or disposal of combustion products at the same facility as the coal-fired generating unit that generates the combustion products,

under 15A N.C.A.C. 13B .0503 sometimes require liners. If a liner is required it is a composite liner.⁸ Slurry ponds permitted under 15A NCAC 02T .1201 do not require liners.

4) If so, what type of liner (typically, composite or clay)?

See question 3.

5) Are there requirements for waste to be above the water table?

For dry ash permitting under N.C.G.S. §130A-295.4, where the waste would be placed on top of existing coal combustion waste ponds and for slurry ponds regulated at 15A N.C.A.C. 02T .1206 the waste must be 2 feet above the seasonal high water table. For dry ash permitting under 15A N.C.A.C. 13B .0503(d)(i) the site must be designed such that the waste is a minimum of four feet above the seasonal high water table.

6) Are there requirements for covers for CCW landfills/surface impoundments? If so, are the covers only caps that are part of final closure or are there intermediate cover requirements, i.e., do the facilities have to cover the waste before they are full?

For CCW landfills permitted at 15A N.C.A.C. 13B .0503 et seq., the waste is to be covered each day with a six inches of compacted suitable cover.⁹ For sites that are not closed, but that will not be used for disposal for 12 months or more, at least one foot of intermediate cover must be placed.¹⁰ At closure, the landfill must be covered with at least two feet of suitable compacted earth.¹¹ It is unclear whether landfills placed upon existing coal combustion waste ponds, as per N.C.G.S. § 130A-295.4 will be required to

provided the landfill is constructed with a bottom liner system consisting of three components in accordance with this section. Of the required three components, the upper two components shall consist of two separate flexible membrane liners, with a leak detection system between the two liners. The third component shall consist of a minimum of two feet of soil underneath the bottom of those liners, with the soil having a maximum permeability of 1×10^{-7} centimeters per second. The flexible membrane liners shall have a minimum thickness of thirty one-thousandths of an inch (0.030"), except that liners consisting of high-density polyethylene shall be at least sixty one-thousandths of an inch (0.060") thick. The lower flexible membrane liner shall be installed in direct and uniform contact with the compacted soil layer. The Department may approve an alternative to the soil component of the composite liner system if the Department finds, based on modeling, that the alternative liner system will provide an equivalent or greater degree of impermeability."

⁸ 15A N.C.A.C. 13B .0503. The design, in the discretion of the Solid Waste Division, may need to include "a leachate collection system, a closure cap system, and a composite liner system consisting of two components: the upper component shall consist of a minimum 30-ml flexible membrane (FML), and the lower components shall consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec. FML components consisting of high density polyethylene (HDPE) shall be at least 60-ml thick."

⁹ 15A N.C.A.C. 13B .0505(3)(a).

¹⁰ 15A N.C.A.C. 13B .0505(3)(b).

¹¹ 15A N.C.A.C. 13B .0505(3)(c).

have daily cover.¹² In fact, at least one regulator stated that daily cover would be impracticable, but that a cover of some sort would eventually be required at closure of the landfill.¹³

7) Is groundwater monitoring required? If so, do the regulations require upgradient and downgradient wells? Do the regulations require baseline monitoring prior to placement of the waste?

Those CCW facilities that are regulated by the state to ensure *modeling* for leachate monitoring (but not necessarily actual monitoring, which remains in the discretion of what is "acceptable to the Division") include new industrial landfills that are not constructed partially or entirely on top of existing ones, lateral expansions of existing industrial solid waste landfills and industrial solid waste landfills receiving solid waste on or after January 1, 1998.¹⁴ Operators of these facilities must submit a design to the North Carolina Solid Waste Division that ensures modeling for leachate monitoring.¹⁵ The law regarding construction of new CCW landfills on top of existing coal combustion waste disposal ponds, N.C.G.S. § 130A-295.4, appears to allow regulators the flexibility to exclude from modeling for leachate monitoring requirements, lateral expansions onto new land where part of that landfill is partially on top of an existing coal combustion waste disposal pond.

For slurry ponds permitted by the North Carolina Division of Water Quality, the rules in the administrative code would indicate that groundwater monitoring and reporting is required, unless an exemption is granted.¹⁶ Regulators, however, in the North Carolina Division of Water Quality have stated that groundwater monitoring around coal combustion waste ponds has not consistently been done in the past, and that when done, monitoring is only in sensitive areas.¹⁷ As to dry ash landfills, while the regulations and statutes do not seem to bear out that the coal combustion waste producers disposing of waste in dry landfills are exempt from reporting,¹⁸ it appears that they are not required to do so.¹⁹

8) What are the monitoring parameters and frequency of monitoring (annual, semi-annual or quarterly), if required?

In North Carolina, voluntary reporting parameters include the following contaminants not

¹² Written notes from third-party conversation with representative from North Carolina Solid Waste Division, December 13, 2007.

¹³ Id.

¹⁴ See footnote 15.

¹⁵ 15A N.C.A.C. 13B .0503(2)(d)(ii)(A),(B).

¹⁶ 15A NCAC 02L .0110.

¹⁷ Written notes from third-party discussion with Division of Water Quality regulators, December 2007.

¹⁸ 15A N.C.A.C. 13B .0505(1)(b) states "Any person who maintains or operates a sanitary landfill site...shall maintain and operate the site...[and] specified monitoring and reporting requirements shall be met."

¹⁹ Emails of third-party communications with staff at North Carolina Division of Aquifer Protection.

to exceed the listed numerical value in mg/l: Arsenic(.05), Barium (2), Boron (.315), Cadmium (.00175), Chromium (.05), Copper (1), Selenium (.05), Iron (.3), Manganese (.05), pH(6.5-8.5 units), Zinc (1.05), Lead (.015), Nitrate (10), TDS (500), Sulfate (250).²⁰ These are voluntary reporting parameters, thus there is no requirement that each of these constituents be measured for each coal combustion waste pond or landfill.

9) Are there setback provisions for water supply sources?

A site permitted under 15A N.C.A.C. 13B .0503 must have a 500-foot minimum buffer between the disposal area and wells.²¹ It is not clear whether this requirement will apply to dry ash landfills permitted under N.C.G.S. § 130A-295.4.

10) Are there meaningful corrective action provisions for responding to rises in pollution at monitoring points? What does the state require if exceedances are found?

The landfills that may be placed on top of existing landfills are able to create their own response plan that will be reviewed by the Solid Waste Division.²² For slurry ponds permitted by the Division of Water Quality that report a concentration of a substance in excess of the standards beyond the compliance boundary, they must demonstrate to the Division of Water Quality that they are taking appropriate steps to correct the problem.²³

11) Are there beneficial use exclusions that are exempt from regulatory safeguards? If so, what are they? For example, does the state have a broad exemption for fill projects?

See question number 2. Beneficial use in North Carolina means projects promoting public health and environmental protection, offering equivalent success relative to other alternatives, and preserving natural resources.²⁴

²⁰ "Ash Pond-Flyash Voluntary Monitoring report", Exceedances and Elevated Concentrations, available by request from North Carolina Division of Water Quality, Aquifer Protection Section.

²¹ 15A N.C.A.C. 13B .0503(2)(f)(ii.)

²² N.C.G.S. § 130A-295.49(c). "An applicant for a permit for a combustion products landfill shall develop and provide to the Department a response plan, which shall describe the circumstances under which corrective measures are to be taken at the landfill in the event of the detection of leaks in the leak detection system between the upper two liner components at amounts exceeding an amount specified in the response plan (as expressed in average gallons per day per acre of landfill, defined as an Action Leakage Rate). The response plan shall also describe the remedial actions that the landfill is required to undertake in response to detection of leakage in amounts in excess of the Action Leakage Rate. The Department shall review the response plan as a part of the permit application for the landfill."

²³ 15A N.C.A.C. 02L .0106(d). "Any person conducting or controlling an activity which is conducted under the authority of a permit issued by the Division and which results in an increase in concentration of a substance in excess of the standards...at or beyond a compliance boundary, shall assess the cause, significance and extent of the violation of standards and submit the results of the investigation, and a plan and proposed schedule for corrective action to the Director, or his designee. The permittee shall implement the plan as approved by and in accordance with a schedule established by the Director, or his designee. In establishing a schedule the Director, or his designee shall consider any reasonable schedule proposed by the permittee."

²⁴ 15A N.C.A.C. 13B .1701(1).

12) Are there exclusions (loopholes) for on-site waste disposal, monofills, or grandfathered units?

Pre-1998 industrial waste landfills are excluded from the groundwater protection requirements at 15A N.C.A.C. 13B.0503(2)(d). See also question 15.

13) Does the state issue NPDES permits for CCW disposal units? If so, do they monitor for CCW constituents (e.g. metals, boron, etc). Do they set limits for these constituents?

The state does require NPDES permits where facilities discharge into surface water, but it is unclear as to the extent to which monitoring for CCW constituents is required, as opposed to occasional voluntary reporting.²⁵

14) Can the state provide a list of CCW disposal units in the state that indicates location, size of unit, years of operation, and whether the unit is lined?

Coal combustion products landfills and slurry ponds²⁶ are required to report each year volume of waste produced, disposed, used in structural fill or used for other uses.²⁷ Industrial waste landfills are listed on the Solid Waste Divisions website.²⁸ Some permitting information is listed for open landfills, but the posting is not comprehensive.

15) Have any changes been made in the statute or regulations since 1994 and, if so, have these changes increased or decreased the required safeguards for disposal of CCW?

The new law allowing construction of dry ash landfills on top of existing landfills²⁹ is a matter of muted controversy. While virtually all other solid waste landfills became subject to much more strict siting requirements with passage of the Solid Waste Management Act of 2007, dry coal ash landfills were exempted from these same requirements, and not held to bright line tests for protection of human health and natural resources.³⁰ Compliance at these new facilities permitted under N.C.G.S. § 130A-295.4 is based only upon leakage between liners, not on well monitoring.³¹ This statutory change provides an end-run around groundwater testing.

²⁵ Email documenting conversation with N.C. Aquifer Protection staffer.

²⁶ Coal combustion products resulting from wastewater treatment are regulated at 15A N.C.A.C. 2T .1200 et seq. Subchapter T is entitled Waste not Discharged to Surface Water.

²⁷ 15A N.C.A.C. 13B .1710; 15A N.C.A.C. 02T .1209.

²⁸ Division of Waste Management <http://www.wastenotnc.org/sw/swfacilitylist.asp>.

²⁹ See supra at footnote 1.

³⁰ N.C.G.S. § 130A-195.6(9)(b)(5) states: "To the extent that G.S. 130A-295.6, as enacted by this section, imposes requirements that are more stringent than those in effect prior to 1 August 2007, the more stringent requirements do not apply to...: [a] permit for a sanitary landfill used only to dispose of waste generated by a coal-fired generating unit that is owned or operated by an investor-owned utility subject to the requirements of G.S. 143-215.107D.

³¹ N.C.G.S. § 130-295.4 (c). "Compliance with performance of the landfill to prevent releases of waste to the environment may be determined based on leakage rate rather than monitoring well data."

South Carolina

- 1) Does state law exempt CCW from solid waste regulations or from the requirement to employ certain safeguards based on leach test results (e.g., TCLP)?

Yes, the regulations apply differently to landfills depending on what class they are in (1, 2, or 3) and whether they are existing landfills or new landfills. See below.

- 2) Are waste disposal permits required for all CCW disposal units?

Yes. "No facility for the disposal of industrial solid waste shall be operated in the State of South Carolina without first obtaining a written permit from the South Carolina Department of Health and Environmental Control."¹

- 3) Are liners required for CCW landfills/surface impoundments? If so, what type of liner?

Existing industrial solid waste landfills (ISWLF) do not have liner requirements.² New ISWLFs are given a classification, which in turn dictates the liner requirement for the landfill. There are three classifications:

- New Class 1 landfills³ (TCLP of 10 times MCL or less) are not required to have a liner.⁴
- New Class 2 landfills⁵ (TCLP of 10 to 30 times MCL) are required to have a clay liner⁶ and a leachate collection system.⁷
- New Class 3 landfills⁸ (TCLP of above 30 times MCL) are required to have a composite liner⁹ and a leachate collection system.¹⁰

¹ S.C. Code Reg. § 61-107.16.1.h.

² S.C. Code Reg. § 61-107.16.1.c., Existing ISWLFs are not subject to the design criteria outlined in Subpart D that establishes the liner requirements for new ISWLFs. However, under S.C. Code Reg. § 61-107.16.1.e., "existing ISWLFs that do not meet the...design criteria outlined in Subpart D, and which have confirmed exceedances of environmental standards must, within six (6) months of the date that the exceedance of environmental standards has been confirmed, establish a compliance schedule with the Department for correction of the cause and the exceedance, or for the closure of all areas of the ISWLF which have received waste."

³ S.C. Code Reg. § 61-107.16.5.b.1. Class 1 landfills are those that "dispose of wastes that test less than or equal to ten (10) times the Maximum Contaminant Level (MCL) published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations current at the time of the permit application."

⁴ S.C. Code Reg. § 61-107.16.40.

⁵ S.C. Code Reg. § 61-107.16.5.b.2. Class 2 landfills are those that "dispose of wastes that test greater than ten (10) times the MCL and less than or equal to thirty (30) times the MCL as published in the South Carolina DHEC R.61-58, State Primary Drinking Water Regulations current at the time of the permit application."

⁶ S.C. Code Reg. § 61-107.16.41.b. "[C]lay liner means a liner consisting of at least a two (2) foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec., or other approved material."

⁷ S.C. Code Reg. § 61-107.16.41.a.1.

⁸ S.C. Code Reg. § 61-107.16.5.b.3. Class 3 landfills are "all other ISWLFs accepting waste that is not determined to be a hazardous waste in accordance with the South Carolina DHEC R.61-79, Hazardous Waste Management Regulations."

⁹ S.C. Code Reg. § 61-107.16.42.b. "[C]omposite liner means a system consisting of two (2) components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two (2) foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec., or other approved material. FML components consisting of High Density

Surface impoundments are specifically excluded from the definition of a landfill.¹¹ Construction of a surface impoundment for a CCW landfill is handled through the Code's provisions for Standards for Wastewater Facility Construction.¹² Location, liner requirements, size and other constructions standards are reviewed on a case by case basis.¹³

4) Are there requirements for waste to be above the water table?

The following is required for all new ISWLFs:

- "The bottom elevation of the landfill excavation shall be a minimum of two (2) feet above the seasonal high water table¹⁴ as it exists prior to construction of the disposal area."¹⁵

Existing ISWLFs are not subject to the location criteria outlined in Subpart B that establishes the requirements for waste location in relation to the water table.¹⁶

Construction of surface impoundments is evaluated on a case by case basis. See question number 3.

5) Are there requirements for covers for CCW landfills/surface impoundments? If so, are the covers only caps that are part of final closure or are there intermediate cover requirements, i.e., do the facilities have to cover the waste before they are full?

Yes. "[A]ll ISWLFs must cover disposed industrial solid waste with six (6) inches of earthen material at the end of each operating day, or at more frequent intervals if necessary..."¹⁷ However, the Department may approve the use of alternative materials for cover placement, an alternative frequency of cover placement or not require cover placement at all on a case by case basis.¹⁸

Additionally, all ISWLFs must install a final cover system that must be designed and constructed to:

Polyethylene shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component."

¹⁰ S.C. Code Reg. § 61-107.16.42.a.1.

¹¹ S.C. Code Reg. § 61-107.16.2(p).

¹² S.C. Code Reg. § 61-67(F).

¹³ Phone conversation with SC DHEC staff in NPDES and construction permits, January 23, 2008.

¹⁴ S.C. Code Reg. § 61-107.16.2.m. "High water table means the highest water elevations measured at the uppermost aquifer in on-site monitoring wells for a period consisting of four (4) consecutive quarters."

¹⁵ S.C. Code Reg. § 61-107.16.18.a.6.

¹⁶ S.C. Code Reg. § 61-107.16.1.c. However, under S.C. Code Reg. § 61-107.16.1.e., "existing ISWLFs that do not meet the siting criteria outlined in Subpart B...and which have confirmed exceedances of environmental standards must, within six (6) months of the date that the exceedance of environmental standards has been confirmed, establish a compliance schedule with the Department for correction of the cause and the exceedance, or for the closure of all areas of the ISWLF which have received waste."

¹⁷ S.C. Code Reg. § 61-107.16.21.a.

¹⁸ S.C. Code Reg. § 61-107.16.21.c-d.

- Have a permeability less than or equal to the permeability of any bottom liner system or natural sub-soils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less;
- Minimize infiltration through the closed ISWLF by the use of an infiltration layer that contains a minimum eighteen (18) inches of earthen material; and,
- Minimize erosion of the final cover by the use of an erosion layer that contains a minimum one (1) foot of earthen material that is capable of sustaining native plant growth.¹⁹

The department may approve an alternative final cover design as long as the alternative achieves an equivalent amount of infiltration and exposure protection.²⁰

Cover requirements for surface impoundments are on a case by case basis.

6) Is groundwater monitoring required? If so, do the regulations require upgradient and downgradient wells? Do the regulations require baseline monitoring prior to placement of the waste?

Yes, all ISWLFs (existing²¹ and new) must install a groundwater monitoring system “that consists of a sufficient number of wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer that represent the quality of background groundwater that has not been affected by leakage from an ISWLF and represent the quality of groundwater passing the relevant point of compliance.”²²

The regulations require upgradient wells to determine the background groundwater quality, unless:

- Hydrological conditions do not allow the owner or operator to determine what wells are hydraulically upgradient; or
- Sampling at other wells will provide an indication of background groundwater quality that is as representative or more representative than that provided by upgradient wells.²³

The regulations require that “at least one sample from each well (background and downgradient) must be collected and analyzed during each sampling event.”²⁴ The Regulations do not explicitly state that there must be downgradient wells.

¹⁹ S.C. Code Reg. § 61-701.16.60.a.1-3.

²⁰ S.C. Code Reg. § 61-701.16.60.b.

²¹ Under S.C. Code Reg. § 61-107.16.50.c-d., existing ISWLFs not performing groundwater monitoring must come up to speed in accordance with the regulation and existing ISWLFs already performing groundwater monitoring and must certify the monitoring complies with the requirements of the regulation.

²² S.C. Code Reg. § 61-107.16.52.a.1-2. Class 1 ISWLFs which only dispose wastes listed in Appendix 1 are exempted from the groundwater monitoring requirement, but coal combustion waste does not qualify for this exemption.

²³ S.C. Code Reg. § 61-701.16.52.a.1.a-b.

²⁴ S.C. Code Reg. § 61-701.16.54.b.

ISWLFs are not required to do baseline monitoring prior to placement of the waste, but ISWLFs are required to install a groundwater monitoring system that yields samples that represent the quality of background water that has not been affected by leakage from an ISWLF.²⁵

Groundwater monitoring is not always required for surface impoundments²⁶, though staff for SC DHEC indicate that groundwater monitoring occurs near most CCW surface impoundments in South Carolina.²⁷ Testing of the groundwater should occur, but variances may be granted from monitoring of groundwater samples.²⁸

7) What are the monitoring parameters and frequency of monitoring?

“The Department will approve an appropriate list of groundwater monitoring parameters for routine monitoring based on the chemical and physical nature of the waste stream received by the ISWLF and analytical data for the waste stream provided by the owner and or operator.”²⁹

Monitoring for all constituents approved by the Department “shall be at least semiannual during the active life of the facility (including closure) and the post-closure period.”³⁰ However, the Department may specify an alternative frequency for routine sampling and analysis, which must be at a minimum semiannual.³¹

8) Are any CCW constituents monitored?

Monitoring is tied to South Carolina MCL's listed in South Carolina's drinking water regulations.³² CCW contaminants listed that may be monitored include Antimony, Arsenic, Barium, Beryllium, Cadmium, Chloride, Chromium, Copper, Lead, Mercury, Nickel Selenium and Thallium.

9) Are there setback provisions for water supply sources?

New ISWLFs “shall not be located within two hundred (200) feet of any surface water body which holds visible water for greater than six (6) consecutive months, excluding ditches, sediment ponds, and other operational features on the site.”³³

²⁵ S.C. Code Reg. § 61-701.16.52.a.1.

²⁶ Groundwater was added to waters of the state in 1985 in Water Classification and Standards for NPDES permits. S.C. Code Reg. § 61-68. The groundwater discharge permit, where the facility does not discharge to surface water is the Land Application Permit. Id. Groundwater monitoring may be required for land application permit sites. Id.

²⁷ Phone conversation with SC DHEC staff in NPDES and construction permits, January 23, 2008.

²⁸ S.C. Code Reg. § 61-68(D)(8), (16).

²⁹ S.C. Code Reg. § 61-107.16.54.a.1.

³⁰ S.C. Code Reg. § 61-107.16.54.b.

³¹ S.C. Code Reg. § 61-107.16.54.c.

³² S.C. Code Reg. § 61-58.5.P(2)(b).

³³ S.C. Code Reg. § 61-107.16.18.a.2.

“The ISWLF shall not be located within the following distances from any well used as a source of water for human consumption, that is in a hydrologic unit potentially affected by the landfill:

- Less than five hundred (500) feet hydraulically downgradient of the groundwater well;
- Less than seven hundred fifty (750) feet hydraulically sidegradient of the groundwater well; and,
- Less than one thousand (1000) feet upgradient of the groundwater well.”³⁴

Exemptions may be granted by the Department if the applicant can show that the hydrologic conditions below the landfill provide protection to the aquifer in use.³⁵

New ISWLFs located in a one hundred (100) year floodplain “must demonstrate that the ISWLF will not restrict the flow of the one hundred (100) year flood, reduce the temporary water storage capacity of the flood plain, or result in washout of industrial solid waste so as to pose a hazard to human health and the environment.”³⁶

“New ISWLFs shall not be located in wetlands” unless the owner or operator can demonstrate to the Department that:

- The presumption that a practicable alternative to the proposed landfill is available which does not involve wetlands is clearly rebuttable;
- The construction and operation of the ISWLF will not cause or contribute to any applicable state water quality standard or any violations of certain provisions of the CWA, the Endangered Species Act, or the Marine Protection, Research, and Sanctuaries Act;
- The ISWLF will not cause or contribute to significant degradation of wetlands;
- Steps have been taken to attempt to achieve no net loss of wetlands by offsetting unavoidable wetland impacts; and,
- Sufficient information is available to make a reasonable determination with respect to these demonstrations.³⁷

Surface impoundment construction is on a case by case basis. See question 3.

10) Are there meaningful corrective action provisions for responding to rises in pollution at monitoring points? What does the state require if exceedances are found?

“If the owner or operator determines that a groundwater protection standard has potentially been exceeded for one or more of the constituents required for routine monitoring at any monitoring well at the relevant point of compliance, the owner or operator:

- Shall, within fourteen (14) days of this finding, notify the Department which constituents have potentially exceeded groundwater standards;

³⁴ S.C. Code Reg. § 61-107.16.18.a.5.

³⁵ Id.

³⁶ S.C. Code Reg. § 61-107.16.11.a.

³⁷ S.C. Code Reg. § 61-107.16.12.a.1-3.

- Shall, within thirty (30) days of this finding, resample the monitoring well(s) in question to determine the validity of the data, and report the results of this resampling within forty-five (45) days to the Department; and
- If the data are validated by resampling, shall establish an assessment monitoring program meeting the requirements of 16.55...³⁸

An assessment monitoring program requires the following:

- Within ninety (90) days of triggering an assessment monitoring program, the owner or operator shall submit for Department review and approval a groundwater quality assessment plan for characterizing the nature and extent of the release.³⁹
- Upon approval of the groundwater quality assessment plan, the owner or operator shall implement the provisions of the groundwater quality assessment plan;⁴⁰
- Upon confirmation of exceedance of a groundwater protection standard, the owner or operator shall notify all persons who own land or reside on land that directly overlies any part of the plume of contamination if contaminants have migrated off-site as indicated by the sampling of groundwater monitoring wells;⁴¹
- Upon completion of the groundwater quality assessment, the owner or operator shall submit to the Department a corrective action plan detailing the actions to be taken to address groundwater quality...and a schedule for the initiation and completion of remedial activities.⁴²

Corrective action remedies shall:

- Be protective of human health and the environment;
- Attain groundwater remediation levels approved by the Department;
- Control the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases of constituents into the environment that may pose a threat to human health or the environment; and,
- Comply with all applicable standards for management of wastes.⁴³

The owner or operator must implement the corrective action plan within ninety (90) days of approval by the Department and the plan must contain provisions for the installation of a groundwater monitoring program and network to demonstrate the effectiveness of the corrective action program.⁴⁴

³⁸ S.C. Code Reg. § 61-107.16.54.d

³⁹ S.C. Code Reg. § 61-107.16.55.b. "The groundwater quality assessment plan shall contain a detailed schedule for the implementation and completion of the provisions of the plan."

⁴⁰ S.C. Code Reg. § 61-107.16.55.c.

⁴¹ S.C. Code Reg. § 61-107.16.55.d.

⁴² S.C. Code Reg. § 61-107.16.55.e.

⁴³ S.C. Code Reg. § 61-107.16.55.e.1.a-d.

⁴⁴ S.C. Code Reg. § 61-107.16.55.f.

The owner or operator must continue the corrective action measures or revise them to the extent necessary to ensure that the groundwater remediation levels approved by the Department are not exceeded for a period of three (3) consecutive years.⁴⁵

The owner or operator also has to submit semi-annually to the Department a report which discusses the effectiveness of the corrective action program.⁴⁶

Corrective action activities shall be continued, as necessary, throughout the active life of the facility and the post-closure period. If groundwater remediation levels approved by the Department are exceeded at the end of the post-closure care period, the owner or operator shall be responsible for maintaining the corrective action program to the extent necessary.⁴⁷

See question 6.

Exceedances of limits in NPDES permits for surface impoundments do not have standards set out for compliance with permit limitations.⁴⁸ Rather, the Department requires an action plan created by the permittee to bring the facility in compliance with the permit.⁴⁹

11) Are there beneficial use exclusions that are exempt from regulatory safeguards?

“Permanently located Industries may use certain solid waste that is generated on-site for structural fill. Such activities are exempt from the requirements of this regulation...”⁵⁰ The “certain solid wastes” include:

- Hardened concrete;
- Brick;
- Block;
- Untreated lumber; and,
- Other items specifically approved in writing by the department.⁵¹

12) Are there exclusions (loopholes) for on-site waste disposal, monofills, or grandfathered units?

Yes. “Existing ISWLFs are not subject to the location criteria outlined in Subpart B or the design criteria outlined in Subpart D, but are subject to all other provisions of this regulation.”⁵² Also, see answer # 3 re: existing landfills/grandfathered units.

⁴⁵ S.C. Code Reg. § 61-107.16.55.g.-i. Although the Department may alter the length of time the corrective action measures must be in place.

⁴⁶ S.C. Code Reg. § 61-107.16.55.h.

⁴⁷ S.C. Code Reg. § 61-107.16.55.j.

⁴⁸ Phone conversation with SC DHEC employee in NPDES and construction permits, January 23, 2008.

⁴⁹ Id.

⁵⁰ S.C. Code Reg. § 61-107.16.1.g.

⁵¹ S.C. Code Reg. § 61-107.16.1.g.3.a-e.

⁵² S.C. Code Reg. § 61-107.16.1.c.

- 13) Does the state issue NPDES permits for CCW disposal units? If so, do they monitor for CCW constituents? Do they set limits for these constituents?

The state does issue NPDES permits for CCW disposal units. Where monitoring is conducted for waters of the state, surface or groundwater, there are stated limits for pH, Total Dissolved Solids, Antimony, Arsenic, Beryllium, Chloride, Chromium III and IV, Copper, Nickel, Manganese, Selenium, Silver, Thallium and Zinc.⁵³ Other common CCW constituents appear to be missing.

- 14) Can the state provide a list of CCW disposal units in the state that indicates location, size of unit, years of operation, and whether the unit is lined?

Existing landfills and Class 1 landfills do not require a liner. See question/answer # 3. South Carolina keeps lists of industrial landfills and of NPDES permitted facilities, organized by standard industrial classification (SIC) codes. They provide these lists pursuant to South Carolina Freedom of Information Act requests.⁵⁴

- 15) Have any changes been made in the statute or regulations since 1994 and, if so, have these changes increased or decreased the required safeguards for disposal of CCW?

Yes. Regulation 61-107.16 became effective on June 26, 1998. This regulation does not mention CCW by name but incorporates it into the definition of industrial solid waste as waste generated by electric power. It consists of minimum criteria for all ISWLFs. While the inclusion of specific groundwater monitoring requirements occurred in 1998, the method of monitoring in accordance with the TCLP is not sufficient for the protection of public health.

⁵³ S.C. Code Reg. § 16-68 (Appendix).

⁵⁴ Phone conversations with SC DHEC staff.

Tennessee

1) Are waste disposal permits required for all CCW disposal units?

Beneficial use as fill is permitted by rule (discussed under beneficial use heading 8 *infra*).¹

CCW surface impoundments do not require solid waste permits; however, water division permits such as NPDES or dam safety applications may be required.

2) Are liners required for CCW landfills/surface impoundments?

Typically, Class I and II facilities must have composite liners² and leachate collection systems.³ However, a TNDEC employee indicated that composite liner requirements have been waived for every CCW landfill in the state.⁴

According to TNDEC's Solid Waste Program Policy and Guidance Manual, fossil fuel fly ash and bottom ash disposed of in a Class II facility requires no leachate collection system.⁵ A TNDEC employee stated that this policy was adopted at the beginning of the decade when many of TVA's surface impoundments reached capacity and TVA decided to construct landfills above or adjacent to these surface impoundments. He also states that this policy has not been used in roughly 3 years and should probably be removed from the policy book. This same employee stated that a leachate collection system is required at dredge CCW landfills, but is waived at dry stack fills. The majority of CCW landfills in the state are dredge fills (he could only think of 2 dry stacks, both operated by TVA).⁶

3) Are there requirements for waste to be placed above the water table?

Class I and II facilities require a buffer

- with a "maximum hydraulic conductivity of 1.0×10^{-5} cm/s" measuring at least 10 feet from the bottom of the liner to the seasonal high water table,⁷
- with a "maximum hydraulic conductivity of 1.0×10^{-6} cm/s" measuring at least 5 feet from the bottom of the liner to the seasonal high water table,⁸ or
- "other equivalent or superior protection"⁹

¹ 1200-1-7-.02(1)(b)3(xxii)

² 1200-1-7-.04(4)(a)1(i), "A composite liner consisting of two components; the upper component must consist of a minimum 30-mil flexible membrane liner (FML), and the lower component must consist of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1.0×10^{-7} cm/sec. FML components consisting of high density polyethylene (HDPE) shall be at least 60-mil thick. The FML component must be installed in direct and uniform contact with the compacted soil component."; 1200-1-7-.04(4)(b).

³ 1200-1-7-.04(4)(a)5; 1200-1-7-.04(4)(b).

⁴ Glen Pugh, TNDEC Division of Solid/Hazardous Waste Management, December 2007.

⁵ Document 93, TNDEC, *Solid Waste Program Policy and Guidance Manual* 105 (Oct. 2006), available at: <http://www.state.tn.us/environment/swm/pdf/SWPolicyManual.pdf>.

⁶ Glen Pugh, TNDEC Division of Solid Waste Management, December 2007.

⁷ 1200-1-7-.04(4)(a)2(i); 1200-1-7-.04(4)(b).

⁸ 1200-1-7-.04(4)(a)2(ii); 1200-1-7-.04(4)(b).

⁹ 1200-1-7-.04(4)(a)2(iii) & 1200-1-7-.04(4)(a)4; 1200-1-7-.04(4)(b).

However, according to TNDEC's Solid Waste Program Policy and Guidance Manual, fossil fuel fly ash and bottom ash disposed of in a Class II facility requires only a 3-foot buffer with a maximum hydraulic conductivity of 1.0×10^{-6} cm/s.¹⁰ Again, according to a TNDEC employee, this policy was adopted when TVA constructed new landfills at the beginning of the decade, and these less stringent liner requirements have not been used in roughly three years.¹¹

4) Is groundwater monitoring required for both landfills and surface impoundments?

Groundwater monitoring is required for Class I and II disposal facilities.¹²

5) What are monitoring parameters/frequency?

The following requirements apply to all Class I disposal facilities.¹³ These requirements also apply to Class II facilities "[u]nless the operator demonstrates to the satisfaction of the Commissioner that, due to the nature of his waste or operation, such facility will not generate harmful leachates in significant quantities."¹⁴ A TNDEC employee stated that these monitoring requirements have not been waived at any Class II facilities.¹⁵

Default monitoring constituents include a list of organic constituents, as well as Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Fluoride, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.¹⁶ However, "the Commissioner may delete any of the Appendix I monitoring parameters for a [landfill] unit if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit and . . . may establish an alternative list of inorganic indicator parameters for a [landfill] unit, in lieu of some or all of the heavy metals . . . if the alternative parameters provide a reliable indication of inorganic releases."¹⁷ "Class II disposal facilities are not required to perform the analysis for the volatile organic compounds in Appendix I unless specifically required by the Commissioner."¹⁸

For Class I facilities, detection monitoring frequency must be "at least semi-annual."¹⁹ "Class II disposal facilities are required every six months to conduct the sampling and perform the analysis for all or certain indicator parameters selected by the Commissioner and

¹⁰ Document 93, TNDEC, *Solid Waste Program Policy and Guidance Manual* 105 (Oct. 2006), available at: <http://www.state.tn.us/environment/swm/pdf/SWPPolicyManual.pdf>.

¹¹ Glen Pugh.

¹² 1200-1-7-.04(7)(a)3(i), 1200-1-7-.04(7)(b)7.

¹³ 1200-1-7-.04(7)(a).

¹⁴ 1200-1-7-.04(7)(b).

¹⁵ Glen Pugh.

¹⁶ 1200-1-7-.04 Appendix I.

¹⁷ 1200-1-7-.04(7)(a)5(i)(I) & (II).

¹⁸ 1200-1-7-.04(7)(b)1.

¹⁹ 1200-1-7-.04(7)(a)5(ii).

to annually conduct sampling and analysis for parameters specified by the Commissioner to be characteristic of the wastes to be disposed at the facility.”²⁰

If detection monitoring shows a statistically significant increase over background for any detection monitoring constituent, the unit owner/operator must inform TNDEC within 14 days.²¹ Unless the owner/operator can demonstrate the increase can be attributed to sampling error, natural variation, or another disposal unit,²² they must begin assessment monitoring within 90 days.²³

Assessment monitoring parameters for Class I facilities are listed in Appendix II of the regulations.²⁴ The TNDEC commissioner “may delete any of the Appendix II monitoring parameters . . . if it can be shown that the removed constituents are not reasonably expected to be in or derived from the waste contained in the unit.”²⁵ Class II facilities use Appendix I constituents for assessment monitoring unless Appendix II parameters are “specifically required by the Commissioner.”²⁶

6) Are there setback provisions for water supply sources?

Class I and II disposal facilities established on March 18, 1990 or later²⁷ must be “500 feet from all wells determined to be downgradient and used as a source of drinking water by humans or livestock,”²⁸ 500 feet from residences unless the owner consents to a shorter distance,²⁹ and “200 feet from the normal boundaries of springs, streams, [and] lakes.”³⁰

Note: While water supply setbacks apply to Class II disposal facilities, Class II facilities permitted prior to March 18, 1990 are exempt from placement restrictions related to floodplains, wetlands, karst, airports, faults, and seismic impact zones.³¹

7) Are there meaningful corrective action provisions?

If assessment monitoring at a Class I or II facility exceeds groundwater protection standards, the owner/operator must commence an assessment of corrective measures within 90 days.³² Factors to consider when evaluating corrective measures include cost and ease of implementation.³³

²⁰ 1200-1-7-.04(7)(b)3.

²¹ 1200-1-7-.04(7)(a)5(iii)(I).

²² 1200-1-7-.04(7)(a)5(iii)(III).

²³ 1200-1-7-.04(7)(a)5(iii)(II).

²⁴ 1200-1-7-.04(7)(a)6(ii).

²⁵ 1200-1-7-.04(7)(a)6(ii).

²⁶ 1200-1-7-.04(7)(b)2.

²⁷ 1200-1-7-.04(1)(b)2-3.

²⁸ 1200-1-7-.04(3)(a)3; 1200-1-7-.04(4)(b).

²⁹ 1200-1-7-.04(3)(a)2; 1200-1-7-.04(4)(b).

³⁰ 1200-1-7-.04(3)(a)4; 1200-1-7-.04(4)(b).

³¹ 1200-1-7-.04(1)(b)3.

³² 1200-1-7-.04(7)(a)7, 1200-1-7-.04(1)(b)5.

³³ 1200-1-7-.04(7)(a)7(iii).

Selected remedies must be protective of human health and the environment, attain the applicable groundwater protection standard, and “[c]ontrol the source(s) of releases so as to reduce or eliminate, to the maximum extent practicable, further releases.”³⁴ The owner/operator must establish a schedule for “initiating and completing remedial activities.”³⁵

“The Commissioner may determine that remediation of a release . . . is not necessary if the owner or operator demonstrates” that ³⁶

- “The ground water is additionally contaminated by substances that have originated from [another source] and those substances are present in concentrations such that cleanup of the release from the . . . unit would provide no significant reduction in risk to actual or potential receptors”³⁷
- “The constituent(s) is present in ground water that:
 - I. Is not currently or reasonably expected to be a source of drinking water; and
 - II. Is not migrating or is not likely to migrate in a concentration(s) that would exceed the ground water protection standard to other hydraulically connected waters.”³⁸
- “Remediation of the release(s) is technically impracticable,”³⁹ or
- “Remediation results in unacceptable cross-media impacts.”⁴⁰

8) Are there beneficial use exclusions? If so, what are they?

Coal ash disposed of as fill “in engineered structures for the following projects: a highway overpass, levee, runway, or foundation backfill” or “other similar uses as the Commissioner may approve in writing” is deemed to have a permit by rule.⁴¹ Permit by rule sites must be approved by the TNDEC commissioner before construction can begin.⁴²

Other beneficial use determinations are made on a case-by-case basis.⁴³

9) Financial Assurance Requirements?

Except for those owned or operated by Tennessee or the Federal Government, all disposal facilities in operation on March 18, 1990 or later must meet financial assurance requirements.⁴⁴ “The amount of financial assurance required of the operator shall be established by the Commissioner based upon the estimated cost of operating the facility for a

³⁴ 1200-1-7-.04(7)(a)8(ii).

³⁵ 1200-1-7-.04(7)(a)8(iv).

³⁶ 1200-1-7-.04(7)(a)8(v).

³⁷ 1200-1-7-.04(7)(a)8(v)(I).

³⁸ 1200-1-7-.04(7)(a)8(v)(II).

³⁹ 1200-1-7-.04(7)(a)8(v)(III).

⁴⁰ 1200-1-7-.04(7)(a)8(v)(IV).

⁴¹ 1200-1-7-.02(1)(c)(ii).

⁴² 1200-1-7-.02(2).

⁴³ Document 28, TNDEC, *Solid Waste Program Policy and Guidance Manual 44-45* (Oct. 2006), available at: <http://www.state.tn.us/environment/swm/pdf/SWPolicyManual.pdf>.

⁴⁴ 1200-1-7-.03(1)(b).

thirty (30) day period plus the estimated closure and post-closure care costs. . . . In no case, however, shall the amount of financial assurance be less than 1,000 dollars per acre, or fraction thereof, affected by the facility operation.”⁴⁵

⁴⁵ 1200-1-7-.03(3)(b).

Attachment B-2

**Analysis of the Deficiencies of Texas
Law and Regulations
Governing the Use and Disposal of Coal Combustion Waste**

**Prepared by Jeffrey Stant
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**Prepared in response to:
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August 29, 2007
RCRA Docket No. EPA-HQ-RCRA-2006-0796**

Submitted February 11, 2008

Deficiencies in Texas Regulation of Coal Combustion Waste: *A Generator's Guide to Avoiding Safeguards*

Introduction:

Despite the existence of at least three proven ecological damage cases from impounded CCW in Texas and arguably more CCW being generated within its borders than in any other state, as the staff most knowledgeable on rules governing the classification of CCW in Texas stated to the Clean Air Task Force in a recent interview, the great preponderance of CCW generated in the Lonestar State is “flying under the radar screen.”¹ This is because CCW in Texas has either been deemed not to be a solid waste or is being dumped in volumes of any size on property owned by its generators and therefore exempt from ALL safeguards other than for its existence to be registered with the Texas Commission on Environmental Quality, TCEQ.

By conveniently focusing only on disposal, the EPA/DOE Report avoids telling the reader of the untold volumes of CCW deemed not to be a solid waste much less that regulations were clarified to encourage that exemption in 2001. It does concede that generators managing their CCW onsite that is considered a solid waste must only meet a registration requirement but then falsely overstates “requirements” in that registration as well as “technical guidelines” that generators are under no obligation to meet and for which the TCEQ monitors little compliance with.

Regardless of the danger posed by the CCW, there are no groundwater monitoring or engineering safeguards that must be met if the CCW is being dumped on land controlled by the utility. This is true even for surface impoundments despite the DOE/EPA report's indication that TCEQ may require safeguards on a “case by case” basis in NPDES permits for such disposal operations. In fact, onsite CCW can be dumped in an unlined surface impoundment immediately upgradient of a public water supply – yet the TCEQ can require no liner, no cover, no leachate collection, no monitoring, no corrective action standard, financial assurance or other safeguard unless contamination of the public water supply or some other

¹ Telephone conversation with Jesse Boultinghouse,, Industrial and Hazardous Waste Permits Section, TCEQ, January, 22, 2008

migration of pollution from the CCW posing harm beyond the sites property boundaries is subsequently documented. TCEQ staff knowledgeable on CCW regulation based in three different regulatory programs (captive site CCW registrations, CCW classification regulations, and industrial waste water discharges from surface impoundments), could only point to one surface impoundment for CCW in Texas for which TCEQ had required any engineering safeguards.

Most CCW Is Not Even a Solid Waste:

The TCEQ cannot provide even rough estimates of the amount of CCW being generated in Texas today. Nevertheless, although TCEQ is not tracking volumes of CCW generated, staff knowledgeable on the rules for nonhazardous, industrial solid waste at TCEQ estimate that the large preponderance of CCW in Texas, conservatively 90 percent, has been deemed not to be a solid waste and therefore does not even have to be registered with the TCEQ.²

CCW generators have been clarifying this exemption from registration requirements with Texas regulators for some time. The following excerpt from an November 1988 letter from Aluminum Company of America (ALCOA) to the Railroad Commission of Texas concerning whether a permit is needed to use bottom ash from its Sandow Power Plant in Rockdale for construction of road ramps is illustrative:

This letter is in response to your 1988 January 4 letter regarding the proposed reclamation plan for ramps 2C and 3C. We herein request to change our reclamation plans to include the use of a Class III waste (mainly Sandow Unit #4 bottom ash) as a fill material for reclamation in the area of ramps 2C and 3C. . . . Your letter indicated we should furnish a copy of the Texas Water Commission Permit. As stated, "the Texas Water commission (TWC) is the principal regulator of solid waste disposal sites in Texas;" however, no permits are actually issued for onsite activities unless a waste is defined as hazardous by the Environmental Protection Agency. Disposal sites for non-hazardous wastes are registered with TWC. Material classified as Class III by

² Telephone conversation with Jesse Boultinghouse, TCEQ, February 7, 2008

TWC is essentially inert and no permit is required; in fact, Class III material, such as that proposed for Ramps 2C and 3C, may be "beneficially used" as fill dirt without even notifying TWC.

Indeed in response to an earlier inquiry from ALCOA on this matter, the TWC, a predecessor agency to the TCEQ, informed ALCOA that this interpretation of Texas requirements was correct:

ALCOA's letter of inquiry to TWC dated April 4, 1986 states:

The general rules governing solid waste management appear to permit the beneficial use of Class III wastes as fill material without requiring that such fill areas be registered with your agency and recorded in the county deed records. For that reason, we do not plan to amend our registration to reflect this activity. If you concur with our interpretation, we would appreciate a letter from you confirming that registration and deed recordation are not required in the situation I have described.

TWC's letter of response dated May 1, 1986 states:

Additionally, your interpretation regarding the need to deed record this activity and to update the company's Notice of Registration appears accurate.³

According to 30 TAC 335.1(133)(H), coal combustion waste is not considered a solid waste if it is being "recycled by being applied to the land or used as ingredients in products that are applied to the land," provided eight criteria are met that assure that the ash is being recycled and does, "not present an increased risk to human health, the environment, or waters in the state when applied to the land or used in products which are applied to the land ..." To demonstrate that such increased risk is not posed, the ash must not leach more pollutants than a Class III waste in the seven day distilled water leach test. Exceptions are provided for arsenic, cadmium, chromium, lead mercury, nickel, and selenium that can leach from the ash in concentrations that would classify the ash as a Class II waste. According to 30 TAC 335.506(a)(2) (Class 2 Waste Determination), these concentrations

³ The three letters are from the public files of the 1990 Permit Renewal Application of ALCOA, (P.O. Box 1491, Rockdale, TX 76567), for the Sandow Surface Mine in Milam and Lee Counties, TX.

cannot equal or surpass 180 times the current federal drinking water standard, MCL, for arsenic, 100 times the MCL for cadmium, 50 times the MCL for chromium, 100 times the MCL for lead, 100 times the MCL for mercury, 700 times the old MCL for nickel, and 20 times the MCL for selenium in the TCLP test (the levels specified as "Maximum Leachable Concentrations" in Appendix 1, Table 1 in 30 TAC 335.521(a)(1)).

There are no limits placed on the volumes of ash that could clearly leach toxic levels of metals under these thresholds yet be recycled, as material for road bases, fill for low areas or structural fills exempt even from registration requirements. TCEQ staff have no records of the volumes of ash that are deemed not to be solid waste in Texas because generators are under no obligation to report on the volume of CCW they are exempting or the continued generation or use of this ash after they have furnished information one time documenting that it has not leached the levels of metals specified above in Appendix 1 of 30 TAC 335.521. The estimate that nine tenths of all CCW generated in Texas is deemed not to be a solid waste under this exclusion was based on the judgment of the staff person considered by his peers at TCEQ to be highly knowledgeable on Texas regulations for coal combustion waste.⁴

The exemption provision in 30 TAC 335.1(133)(H) was adopted into regulation in May, 2001. Prior to then, CCW was exempt from being a solid waste by TCEQ on a "case by case" basis.⁵

Registration Does Not Afford Protection:

Appendix A of the DOE/EPA Report concedes TCEQ does not regulate onsite CCW in Texas with industrial waste permits but then ignores the fact that such waste is not even subject to registration requirements in the large majority of instances and further overstates what generators must do when they do register CCW that is not exempt from being a solid waste. On page A-26, the Report states:

Information that must be submitted with the registration includes, but is not limited to, waste composition, waste

⁴ Task Force staff were directed by TCEQ Waste Permitting staff on Jan. 18, 2008 and TCEQ Waste Registrations staff on January 25, 2008 to Mr. Boultinghouse as an expert in the application of TCEQ's rules to CCW. Mr. Boultinghouse estimated that 75% or more of CCW in Texas was not registered as a solid waste under the exemption afforded by 30 TAC 335.1(133)(H).

⁵ Telephone conversation with Mr. Boultinghouse, January 22, 2008. See source notes at the end of 30 TAC 335.1.

management methods, facility engineering plans and specifications, and the geology where the facility is located.

In fact the relevant regulation, 30 TAC 335.6(a) states:

Any person who intends to store, process, or dispose of industrial solid waste without a permit, as authorized by §335.2(d), (e),(f), or (h) of this title ... shall notify the director in writing ... that storage, processing, or disposal activities are planned, at least 90 days prior to engaging in such activities. ... The executive director may require submission of information necessary to determine whether storage, processing, or disposal is compliant with the terms of this chapter. Required information **may** include, but is not limited to, information concerning waste composition, waste management methods, facility engineering plans and specifications, **or** the geology where the facility is located. emphasis added)

Indeed, a TCEQ CCW rule expert described, the characterization in the DOE/EPA report as “going beyond the actual situation. This is not routinely required. We don’t normally request this information up front.” This staff person said that, facility engineering plans and specifications, “are not requested” and they “seldom ask for” information on the geology where the facility is located.⁶

Another staff person in TCEQ’s Industrial and Hazardous Waste Permits Section presented a different picture, asserting that all the information in the regulation is normally presented in Notices of Registration.⁷ Partial materials forwarded by this staff to the Task Force for two Class Two Registrations submitted by TXU to cover CCW at its Big Brown, Lake Creek, Morgan Creek, Tradinghouse Creek and Valley power stations suggest that information is being provided for each of the categories mentioned in 30 TAC 335.6(a). However it is not clear whether the utility is voluntarily producing the information or the TCEQ is requesting it.

⁶ Telephone conversation with Mr. Boltinghouse, January 22, 2008.

⁷ Telephone conversation with Mary Talley, Industrial and Hazardous Waste Permits Section, TCEQ, January 24, 2008.

Furthermore the level of detail is not at all clear in the materials which are comprised of outlines and agendas of information presumably to be discussed with TCEQ. For example, the item, "6.3 Groundwater Quality (if known)" on a "Draft Registration Submittal Outline" for CCW at four of these five plants, does not demonstrate that actual data on groundwater quality around CCW disposal sites is being collected, discussed or assessed. On the other hand, listing items such as "Historic Groundwater Elevations," "Boring Locations," and "Geologic Cross-Sections" as "Tables" and "Figures" on this outline suggests that TXU anticipates discussing at least some detailed information about the geology of the disposal sites covered in this Registration submittal.

This staff person could not locate any Notices of Registrations for CCW declared by generators to be Class III waste and could find no other staff person who could locate Registrations for Class III CCW. Much of the CCW disposed around Texas power plants, that is not exempt from being a solid waste, is classified as Class III, the lowest level of regulated solid waste. According to 30 TAC 335.507, "Class 3 Waste Determination", Class III CCW is "inert and essentially insoluble and poses no threat to human health and/or the environment."

The basis for making this claim is whether the ash leaches levels of the 8 RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury selenium or silver) exceeding their federal drinking water standards, MCL's established under the Safe Drinking Water Act in a Seven Day Distilled Water Leachate Test. While there is scientific consensus that benchmark laboratory leaching tests cannot predict whether a CCW is "inert and essentially insoluble and poses not threat to human health and/or the environment" when it is dumped without safeguards, the procedure used by Texas regulators for this test is particularly egregious for making this assertion based on the test's results. This protocol is stated in 30 TAC Chapter 335.521 (d) Appendix 4 as follows:

1. Place a 250 gram (dry weight) representative sample of the waste material in a 1500 milliliter Erlenmeyer flask.
2. Add 1 liter of deionized or distilled water into the flask and mechanically stir the material at a low speed **for five (5) minutes**.
3. Stopper the flask and allow to stand for **seven (7) days**.
4. At the end of **seven (7) days**, filter the **supernatant solution** through a 0.45 micron filter, collecting the **supernatant** into a separate flask.
5. Subject the leachate to the appropriate analysis. (emphasis added)

While the total duration of the test and concentration of waste being leached are improved over the shorter periods and more dilute conditions in other lab leach tests, agitating the sample for only five minutes to enhance conditions for leaching, is extremely short compared to the duration of agitation used in other tests which typically extends for 18 to 24 hours. A geochemist knowledgeable on CCW leaching had the following insights:

Analyzing only for RCRA metals with MCLs is absurd for a waste that produces lots more toxins than just RCRA metals with MCLs.

Analyzing only the supernatant fluid is outrageous. After 5 minutes, the sample is give 7 days to settle and react. The reaction will occur in the settled sediments. The only way reactants are released in the 7 days is to the degree they can diffuse out of the sediments on the bottom and into the supernatant (overlying) water. Decanting the supernatant fluid for analysis ignores the leachate where the actions are – in the sediment. The appropriate procedure would be to decant the supernatant fluid and pour it down the drain. Then, filter or centrifuge the saturated sediments to extract the leachate, and analyze that.⁸

It cannot be over emphasized also that generators only need to subject their CCW to this test and the TCLP test used in the classification of Class II waste one time - assuming it passes the test – in order to permanently classify their waste as not being a waste, a Class III waste or a Class II waste. Granted, the regulations state generators should inform the TCEQ promptly of any changes or new information about their CCW or how its managed (in 30 TAC 335.6(b) but leave such reporting entirely up to the goodwill of generators to comply with. The entire Classification program for CCW is based on the good faith of this self reporting system. Allowing such a pitiful test as its backbone combined with this level of rigor ensures only two results: 1) that CCW is posing danger to water supplies throughout the state of Texas and 2) the TCEQ is oblivious to most of that danger.

For example, staff could find documents revealing 29 Class III CCW disposal sites at the Martin Lake Power Plant near Tatum, Texas but could

⁸ Email from Charles Norris, GeoHydro, Inc, Denver CO, February 9, 2008.

not find any Notices of Registration for this CCW. Staff did locate two "Notification of Recycling" Forms for CCW at Martin Lake, one for fly ash dated January 16, 1995 and another for bottom ash dated October 24, 1999. These were presumably used by the former owner of the power plant, TXU, to declare CCW at this site was no longer a solid waste and therefore no longer covered under a registration requirement.⁹ All of these Class III disposal sites are "closed" at Martin Lake, with most closures taking place from 1988 through 1993. There is no monitoring data from any of these sites in TCEQ files. Contrary to what is stated in the DOE/EPA report in Appendix A (page A-48, Table A.14), TCEQ's latest guidance recommends that Class III landfills need no monitoring nor any separation of the waste from groundwater and be built only to avoid "wash out" of the CCW.¹⁰

This staff person was not aware that Martin Lake is a documented damage case involving fish kills, the bioaccumulation of selenium in fish and birds, and fish consumption advisories which resulted from unpermitted discharges of selenium and other metals from ash ponds at the power plant.¹¹

According to the staff person, there have been no waste permits issued for the Martin Lake Plant, with CCW disposed there purely as registered waste. In fact, the files maintained for this site by the Industrial Waste Permits Division at TCEQ have no documentation of any surface impoundments ("ash ponds") at Martin Lake.¹²

While TCEQ's industrial waste staff has more information on registered Class II and Class I CCW disposal sites, CCW registrations lack the accountability of enforceable permits and leave the TCEQ less aware of contamination that may be occurring and thus less capable of responding to it. For example according to TCEQ staff, there are three surface impoundments and one coal ash landfill at the Sam Seymour (also called Fayette) power plant operated by the Lower Colorado River Authority. These disposal units are taking Class II CCW and Class I low-volume power plant cleaning wastes (nearly a RCRA hazardous waste). The utility has installed liners and is monitoring. However, because these are onsite units

⁹ "GENERATOR NOTIFICATION FORM FOR RECYCLING HAZARDOUS OR INDUSTRIAL WASTE" is the formal name for these forms which are also called Form Number 0525.

¹⁰ TCEQ, "Industrial Solid Waste Landfill Site Selection, Technical Guideline No. 2", Revised 09/15/04, Table 1, LANDFILL HYDROLOGIC RECOMMENDATIONS, page 6.

¹¹ U.S. Environmental Protection Agency, Office of Solid Waste, "Coal Combustion Waste Damage Case Assessments", Texas Utilities Electric, Martin Lake Reservoir, Texas, July 9, 2007, pages 34 & 35.

¹² Information in industrial waste file on Martin Lake obtained from a telephone call with Mary Talley, TCEQ, on February 8, 2008.

taking only registered waste, TCEQ staff explained that there are no permits requiring the liners or the monitoring, and the monitoring data being collected by the utility is kept onsite. Thus TCEQ must rely entirely on the utility to inform them of any water quality problems and otherwise would not know of them unless a complaint is received, or an inspector happens upon pollution at the site or notices data in monitoring reports during a visit.

There are a number of Technical Guidance Documents issued by TCEQ for nonpermitted industrial waste landfills and surface impoundments for CCW several of which were emphasized by the DOE/EPA Report in Appendix A. Relevant guidance includes Technical Guideline No. 2 on "Industrial Solid Waste Landfill Site Selection", Technical Guideline No. 3 on "LANDFILLS", Technical Guideline No. 4 on "Nonhazardous Industrial Solid Waste Surface Impoundments", Technical Guideline No. 6 on "GROUND-WATER MONITORING", and Technical Guideline No. 10 on "Closure and Post Closure". However, while TCEQ staff can write letters recommending these guidance documents be followed at nonpermitted disposal sites for registered CCW, "they (the letters) do not carry the force of law." "We cannot enforce this (the guidance) for sites with CCW generated and disposed onsite."¹³

The DOE/EPA report also states in Appendix A, page A-26, that operators of nonpermitted CCW landfills must "close and remediate the facility in accordance with the Texas Risk Reduction Program (30 TAC 350)." While there is a broad requirement in 30 TAC 350.2(h) to close all disposal sites "in a manner that minimizes the release of contaminants to the environment," closure plans and the post closure monitoring they may require are a fundamental component of the waste disposal permit that nonpermitted landfills do not apply for. According to TCEQ staff, nonpermitted CCW landfills might still be required to pursue "Remedy Standard B," in 30 TAC 350.33 to "close with the waste in place," and thus install a cap. This closure requirement however is dependent upon TCEQ receiving new information under a Notice of Registration informing the agency that a nonpermitted CCW disposal site is closing which might then result in the TCEQ requiring a closure plan. Post closure monitoring could then be required on a case-specific basis.¹⁴ It would appear however from

¹³ Telephone discussion with Mary Talley, TCEQ, January 24, 2008.

¹⁴ Information on the Risk Reduction Program was gathered from a telephone discussion with Paul Lewis, Technical Support Section, Remediation Division of Office of Permitting, Registrations and Remediation in TCEQ, February 8, 2008.

the lack of evidence of closure plans for registered CCW sites in files of the Industrial Waste Permitting Program, that closing unpermitted, registered CCW disposal sites is a low priority for TCEQ. Ascertaining whether releases are occurring at such sites when monitoring has been scant or never taken place is likely to be difficult. Implementing monitoring for the first time at closure will be further hampered by lack of baseline pre-disposal water quality data needed to properly measure impacts from the CCW.

The Permits That Do Exist Are Not Very Protective:

Despite assertions in the DOE/EPA report that TPDES (Texas NPDES permits) discharge permits or solid waste permits for surface impoundments require safeguards such as liners, monitoring, or leak detection on a case by case, basis, TCEQ staff could only point to one facility where some of these safeguards have been mandated. A solid waste permit (SW-39099 for a Class 1 Disposal Facility) was required for two surface impoundments at the Big Brown Power Plant in Freestone County when the Plant's owner (TXU or Texas Utilities Company) proposed to dispose CCW from TXU facilities across Texas in the impoundments. The impoundments are only eight acres each, but each can hold up to 38 million gallons of slurried waste. The permit requires a liner of 3 feet of compacted clay (to a hydraulic conductivity of 1×10^{-7} cm/sec), groundwater monitoring and closure requirements. A large sand aquifer exists at depths starting 13 feet below the impoundments.

Contrary to the DOE/EPA Report's assertion (in Appendix A, page A-57) that leachate detection systems are recommended by TCEQ, Technical Guideline No. 4 does not recommend this safeguard for Class II Surface Impoundments unless they are utilizing a geomembrane liner alone. In this case, these surface impoundments are not only accepting Class II bottom ash but also Class I power plant cleaning wastes from multiple sources that regulators believe is more dangerous than the Class II ash. Yet the permit does not require the double liner and leak detection system recommended in Technical Guideline No. 4 for "any surface impoundment accepting Class I waste" because TCEQ staff also believes that the Class I wastes will be safely diluted by much larger quantities of Class II bottom ash sluiced to the impoundments.¹⁵

¹⁵ Phone conversation with Mary Talley, TCEQ, February 8, 2008.

There are five downgradient monitoring points and one upgradient point. The permit lays out corrective action standards, but they apply only to the 8 RCRA metals. Signature contaminants from CCW such as boron, thallium, molybdenum, antimony, nickel, manganese, sulfates and other constituents concentrated in lignite coal ash, can rise 'through the roof' and yet no response would be required to address the pollution.

A review of NPDES permit parameters controlled in discharges from surface impoundments for CCW found that selenium was the only constituent of concern in CCW controlled in the discharges of some of the impoundments. Considerable efforts to find out if selenium limits were prevalent in most impoundment TPDES permits were unsuccessful due to the expense of paying for huge amounts of data and refusal by TCEQ water and data management staff to explain how to request information on effluent parameters in discharge permits so that our requests could be narrowed down. In any event, TCEQ staff maintained that the only pollutants that are regulated assuredly in all TPDES for ash impoundments are Oil and Grease and Total Suspended Solids.¹⁶

¹⁶ Phone conversation with Michael Sunderlin, TCEQ, Wastewater Permitting Section, January 25, 2008.

Attachment B-3

**Analysis of the Deficiencies of Indiana Law and Regulations
Governing the Use and Disposal of Coal Combustion Waste**

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**Prepared in response to:
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Introduction

Indiana regulations on coal combustion waste (CCW) landfills were enacted in 1988. Since that time, significant weakening of state regulations governing both CCW landfills and surface impoundments, as well as “beneficial” use of coal ash, has occurred in the state. Indiana is ranked third in the United States in its generation of CCW, generating 9,549,000 million tons of coal ash in 2004. The inadequate regulation of disposal and reuse of CCW in Indiana has caused significant degradation of drinking water and surface water in the state. The failure to require safe CCW disposal and reuse has created numerous proven and potential damage cases, including a superfund site. This failure to require safe disposal and reuse poses a significant, continuing threat to the health of Indiana citizens and to the state’s water resources.

CCW Landfills

There are significant gaps in the regulations pertaining to CCW landfills in Indiana. CCW landfills are regulated as Type I, II, or III restricted waste landfills, depending on the results of leachate tests run on the wastes. The leach test used to characterize CCW in Indiana is the Toxicity Characteristic Leaching Procedure (TCLP). Yet the use of the TCLP to predict migration of contaminants from CCW has been soundly discredited by both EPA and DOE. Both agencies admit that the TCLP cannot accurately predict movement of hazardous constituents from CCW, and it can grossly underestimate migration of pollutants such as arsenic and selenium. (US EPA, *Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control* 2006) By employing the TCLP, Indiana generally classifies CCW as a Type III waste. Consequently the safeguards required at CCW landfills are grossly inadequate to protect health and the environment. For example, there are no requirements for liners of CCW landfills of any type and no ground water monitoring requirements for Type III and Type IV landfills. After contamination of drinking water supplies in the Town of Pines in northern Indiana by CCW dumped in the partially unlined Yard 520 Landfill and by coal ash used as fill, citizens and environmental groups made several requests to the commissioner of the Indiana Department of Environmental Management (IDEM) for a review of the state’s disposal standards for CCW. All of these requests were turned down. In fact, an Indiana law remains in force that prohibits the Land Pollution Control Board, the rulemaking body for Indiana environmental regulations on wastes, from developing any regulations on the use of CCW as fill. (See details, below.)

CCW Surface Impoundments

Most of the 9.5 million tons of CCW generated in Indiana is disposed in largely unregulated surface impoundments. At least 17 Indiana power plants have coal ash impoundments, and many of these facilities have more than one ash impoundment. In comparison, there are only 7 permitted and 2 proposed CCW landfills in the state. None of the coal ash impoundments are required to monitor groundwater by the state and only one has a liner. Furthermore, even those plants with landfills still rely heavily on surface impoundments as disposal sites for their coal ash. For example, Duke Energy’s Gibson Generating Station, the second largest power plant in the country, maintains a landfill and multiple CCW impoundments for disposal of coal ash.

Indiana surface impoundments are exempted from any meaningful requirements to prevent or even detect groundwater contamination by two major exemptions in Indiana law. Permit requirements for these surface impoundments were significantly weakened during the time period of 1994-2004 studied by the DOE/EPA Report, "Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004." In 1999, the Indiana General Assembly enacted a law that effectively exempted any new or expanded surface impoundment from needing a construction permit if the facility held an existing National Pollution Discharge Elimination System (NPDES) permit.¹ Accordingly, any surface impoundment with an NPDES permit is exempt from meeting solid waste standards under 329 IAC 10-3-1(8). These exemptions renders the Indiana Department of Environmental Management (IDEM) incapable of requiring any regulatory safeguards for new or expanded impoundments beyond those required by the NPDES permit, which do not include solid waste standards.

Claims in the DOE/EPA Report are Erroneous

The DOE/EPA Report, "Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004," makes numerous erroneous claims regarding state regulatory authority in Indiana. The report claims in its summary tables, A.6, A.13, A.15, A.17, A.19, and A.20, that in Indiana liners, groundwater monitoring, leachate collection, post-closure requirements, corrective action requirements, and siting controls are "established, as necessary, on a case-specific basis." I examined five NPDES permits and talked with the head of the industrial permit section and a permit writer for the Indiana Department of Environmental Management (IDEM) Office of Water Quality.² The five permits examined contain no discussion of controls beyond the NPDES permit, and the Office of Water Quality staff asserts that they do not have the technical expertise necessary to address issues outside of the surface water discharge. Only the Office of Land Quality has the engineering expertise to evaluate the need or adequacy of controls such as a liner or a groundwater monitoring system, and they are prevented from requiring any such safeguards by the exemption under 329 IAC 10-3-1(8). Furthermore, the NPDES permits that I examined contain no enforceable limits for numerous common CCW contaminants, including arsenic, selenium, lead, boron, and aluminum. Many of the permits have begun to include these contaminants for monitoring purposes only, meaning that the permittee has no enforceable limits on the discharge levels for these contaminants, even though they are monitoring for them. The five NPDES permits examined, for the Petersburg Power Plant, Wabash River Generating Station, Clifty Creek Power Plant, Tanners Creek Power Plant, and RM Schafer Generating Station, constitute a significant source of CCW in the state.

Current laws and regulations in Indiana create a regulatory loophole for CCW surface impoundments that prevents the state agency from even considering any sort of solid waste safeguards for these facilities. These surface impoundments continue to pose a serious threat to water quality, human health, and wildlife. Even when the facility poses a possible risk to a municipal drinking water supply, the IDEM is incapable of requiring any additional safeguards for impoundments. Indiana government is always reluctant to require any environmental

¹ IC 13-14-8-11.6

² Based on discussions with Beth Tallon and Steve Roush of IDEM on 12/12/07

regulations that are stronger than federal requirements so this situation will not change without federal regulations that set a base minimum of protection for surface impoundments.

Examples of CCW Disposal Units Expanded or Constructed in Indiana 1994-2004

The following are examples of CCW disposal units that were constructed or expanded between 1994 and 2004, the period ostensibly covered by the DOE/EPA Report. The DOE/EPA Report either neglected to mention the units or their assessment was inaccurate, as detailed below. Regarding expansions of existing surface impoundments during this time period, it is very difficult to determine whether any other expansions occurred since these expansions do not require any solid waste permit from the state.

1. Wabash River Generating Station

The most recently constructed surface impoundment at Duke Energy's Wabash River Generating Station located near Terre Haute, IN was built in 2001 and is included in the DOE/EPA Report. The 131-acre impoundment sits directly upgradient of the municipal drinking water wells of the Marion Heights Conservancy District and is located within the conservancy district's groundwater management zone. The aquifer that the municipal wells draw from is an unconfined sand and gravel aquifer without overlying clay deposits, and thus it is very vulnerable to contamination. Despite its location in close proximity to a drinking water supply and in an area vulnerable to groundwater contamination, the state could not require either a solid waste or construction permit for the impoundment due to the exemptions in Indiana law discussed above. Surface water monitoring for the site, required by the NPDES permit, has detected high levels of arsenic, cyanide, cadmium, chromium VI, and selenium in the ash ponds that are above drinking water levels (the maximum contaminant levels (MCL) of the Safe Drinking Water Act). The discharges consistently exceed the drinking water standard for arsenic at levels over the last 3 years that have ranged from 0.05-0.394 ppm, 5 to nearly 40 times the MCL for arsenic. Selenium levels have exceeded the MCL on a number of occasions and are consistently at levels that are harmful to fish and other aquatic life. The Wabash River Generating Station is also discharging chromium VI directly into the river at levels between 0.12- 0.54 ppb, over 5 times the MCL for chromium. Because there are no enforceable standards for these metals in the NPDES permit, IDEM has taken no enforcement actions against the plant for these exceedances.

Despite the serious public health and environmental concerns posed by this site, the IDEM cannot under Indiana law require any additional permits or require the company to install safeguards at the site except for an NPDES permit. The Wabash River Generating Station conceded to installing a clay liner after being threatened with legal action by the local municipality, but no groundwater monitoring or other safeguards are required at the site by the state. Under these conditions, any leak in the liner will go undetected unless or until the contamination is found in the municipal drinking water wells. The DOE/EPA Report's claim that current laws and regulations in Indiana are adequate is clearly wrong. This site demonstrates that the state agency is actually prevented from requiring the most basic regulatory safeguards at a surface impoundment, even when a clear threat to public health and drinking water exists.

2. Tanners Creek Generating Station

AEP's Tanners Creek Generating Station, located near Lawrenceburg, IN, also expanded their fly ash impoundment in 2001. This site is not included in the DOE/EPA Report because the report did not include expansions of CCW disposal units that did not require permits. Since this was an expansion of the existing impoundment, it was exempt from needing a construction or solid waste permit under Indiana law. There is not even a mention of the expansion in the site's NPDES permit. The expansion occurred within the floodway of the Ohio River, yet there was no evidence of a liner or ground water monitoring being installed at the site.

Regulation of CCW in Indiana

The following summarizes important regulatory gaps in Indiana law and regulations that were not discussed in the DOE/EPA Report:

1) Indiana regulations allow exemption of CCW from regulation based on short-term leach tests.

CCW landfills are designated as Type I, II, III, or IV restricted landfills based on the results of short-term leachate tests, using the TCLP.³ Standards for the landfills vary depending on type (details are listed below). Furthermore, a landfill can receive a variance from a more stringent designation. For example, millions of tons of CCW sent to the Clifty Creek Landfill and the southern cell of the Yard 520 Landfill exceeded the pH standard for Type I wastes, but both landfills were permitted as Type III landfills based on the erroneous assumption by IDEM that high pH will inhibit the release of metals by the waste. This incorrect assumption is reinforced by an Indiana regulation that allows IDEM to grant the variance if "the pH range encountered under leaching conditions likely to be encountered at the site will produce lower concentrations of waste constituents in any leachate generated".⁴ The Tanners Creek and Gibson Generating Stations have opted to build Type I facilities even though they could apply for this exemption in order to avoid doing the routine leachate tests on the waste and the public controversy over this type of exemption raised in the Clifty Creek Landfill permit appeal.

2) Indiana law does not require waste disposal permits for all CCW disposal units.

CCW surface impoundments with an active National Pollution Discharge Elimination System (NPDES) permit are exempted from solid waste regulations.⁵ A holder of a NPDES permit is also exempted from the need for a construction permit for an expanded or modified permit.⁶

3) Indiana regulations do not require liners for all CCW surface impoundments and mandate only weak barrier requirements for some landfills.

³ 329 IAC 10-9-4

⁴ 329 IAC 10-9-4(g)(1)

⁵ 329 IAC 10-3-1(8)

⁶ IC 13-14-8-11.6

Landfills: For CCW monofills, Indiana regulations only require a soil barrier with an average “equivalent hydraulic conductivity through the barrier of less than or equal to 1×10^{-6} centimeters per second” throughout the proposed landfill site between the waste and the nearest aquifer. By comparison, a typical compacted clay liner has a hydraulic conductivity of 10^{-7} centimeters per second, and the typical plastic liner has a hydraulic conductivity of 10^{-9} centimeters per second. The thickness of the barrier varies according to the landfill type.⁷

Type I: 15-10 feet depending on the permeability of the wastes

Type II: 10-5 feet depending on the permeability of the wastes

Type III: 3 feet

The barrier thickness may be reduced if a synthetic liner and/or leachate control system is installed.⁸ If the local soils and clays cannot meet the hydraulic conductivity requirement, IDEM requires the landfill operator to submit an engineering plan detailing how they meet the requirement, which is typically done through installation of a liner.⁹ Due to the location of many CCW monofills in the floodplain or other locations with shallow groundwater tables or soils incapable of meeting the hydraulic conductivity requirements, monofills in Indiana may typically have to resort to installing these controls in order to meet the barrier thickness requirements.

Surface impoundments: Surface impoundments are exempted from solid waste requirements as long as they have an NPDES permit. IDEM Division of Water staff, who oversee NPDES permits, do not have the technical expertise needed to evaluate the need for a liner¹⁰.

5) Indiana regulations do not require CCW surface impoundments to be placed above the water table.

Indiana regulations on surface impoundments do not require any separation of the wastes from ground water.

6) Indiana regulations do not require groundwater monitoring for existing, newly constructed or newly expanded surface impoundments or for Type III landfills.

Landfills: Type I and Type II landfills are required to conduct groundwater monitoring. The applicant proposes the exact number and spacing of the monitoring wells based upon a site-specific geological study. A minimum of one upgradient well and three downgradient wells is required.¹¹ The regulations for Type III landfills do not include any requirements for groundwater monitoring. While the Type III landfills typically have

⁷ 329 IAC 10-26-1 and 329 IAC 10-34-1

⁸ 329 IAC 10-26-1(b)

⁹ Based on discussions with Anup Raychowdhury, IDEM engineer, on 1/25/08

¹⁰ Based upon discussion with Beth Talon and Steve Rousch, IDEM Division of Water, on 12/12/07

¹¹ 329 IAC 10-29-1

groundwater monitoring, there should be regulations in place to ensure that all landfills have adequate monitoring.

Surface Impoundments: These facilities are exempted from solid waste regulations if they have an NPDES permit, and there are no specific regulations addressing impoundments without a NPDES permit. The only new surface impoundment to be built within the last decade without an NPDES permit, located at the Wabash River Generating Station, was not required to install groundwater monitoring even though it is located directly upgradient of municipal drinking water wells. According to IDEM Division of Water staff, they do not have the technical expertise necessary to evaluate the need for a groundwater monitoring system as part of the NPDES requirement.

7) Even when monitoring is required, Indiana regulations do not require CCW landfills to monitor for a sufficient number of parameters and with adequate frequency.

Type I and II landfills are required to monitor for field pH, specific conductance, chloride, boron, ammonia, sodium, chemical oxygen demand, total phenolics, methylene chloride, 1,1-dichloroethane, toluene, benzene, 1,2-dichloroethene, ethyl benzene, and 2-butanone, methyl ethyl ketone. IDEM may also require any additional parameters deemed necessary by the IDEM commissioner.¹² If a statistically significant increase over background has been detected between background and downgradient monitoring devices for two or more parameters, the facility must add chloride, copper, manganese, iron, sulfate, total dissolved solids, and zinc to the monitoring regime.¹³ There is no set frequency of monitoring stated in the regulations.

Type III landfills regulations do not contain any groundwater monitoring requirements.

8) Indiana regulations do not contain sufficient setback provisions for protection of water supply sources.

Landfills: Type I, II, and III landfills must be at least 600 ft. from a potable drinking water well. For surface water supplies such as lakes or reservoirs, the required setback is 100 ft.¹⁴

Surface impoundments: There are no setback requirements for surface impoundments.

9) Indiana solid waste regulations do not contain numeric corrective action standards for Type III landfills and surface impoundments.

Landfills: The regulations for Type III landfills do not have numeric corrective action standards outside of the Indiana groundwater rule. In the case of both the Yard 520 Landfill and the Clifty Creek Landfill, IDEM failed to require any sort of corrective action from the facility despite documented increases in boron levels in groundwater monitoring levels. In the case of the Yard 520 Landfill, clear signs of CCW

¹² 329 IAC 10-29-6

¹³ 329 IAC 10-29-7

¹⁴ 329 IAC 10-25-1 and 329 IAC 10-33-1

contamination could be found in the groundwater monitoring documents extending back over a decade of time. IDEM still failed to take any action until after drinking water wells had become contaminated, and the site came under heavy scrutiny by the public and the press.

Type I and II landfills must implement a corrective action program if groundwater monitoring detects an exceedance of the Indiana groundwater standards or a statistically significant increase over background levels of a constituent without a groundwater standard (note: boron, a common CCW contaminant, does not have a groundwater standard).¹⁵ This contamination must spread beyond the facility's groundwater management zone, which extends 300 ft. from the boundary of the waste or to the property line whichever is closer, before ground water standards are applied.¹⁶

Surface impoundments: Corrective action requirements in the surface impoundment regulations only apply to surface water. Standards for surface water discharges are supposed to be decided on a permit by permit basis.¹⁷ However, none of the NPDES permits I examined had numeric standards for typical CCW contaminants such as arsenic, selenium, and boron. These permits were monitor only, and thus effectively have no corrective action standards.

10) Indiana law contains significant loopholes for disposal of CCW under "beneficial" use exemptions.

Indiana law prohibits the Land Pollution Control Board, the rulemaking body for Indiana environmental regulations on wastes, from developing any regulations on the use of CCW as fill.¹⁸ As a result, neither IDEM nor the Department of Natural Resources (DNR) has any policies or processes in place to evaluate potential impacts from these fill projects. The agencies also have no process for evaluating possible environmental impacts from the fill projects.

Fill projects have been allowed in areas with a high probability of groundwater contamination such as karst topography, floodways, and areas with high groundwater tables. Proposed fill projects in floodways must obtain floodway fill permits, but previous CCW floodway fill permits have failed to consider the potential contamination from CCW into account. They only consider the possible impact of the fill on flooding. Despite contamination from CCW used as fill for roads in the Town of Pines being conclusively linked to contamination of drinking water wells, the state has made no changes to its policies on CCW fill projects. There is no monitoring required for any fill projects, regardless of the amount of CCW involved or where it is placed. For example:

Grandview, Spencer County

¹⁵ 329 IAC 10-29-9

¹⁶ 327 IAC 2-11-9

¹⁷ 327 IAC 15

¹⁸ IC 13-19-3-3(2)(E).

Rockport Terminals, Inc. applied to the Indiana Department of Natural Resources (DNR) for a floodway fill permit to use 500,000 tons of coal ash for fill to construct a new port facility. The proposed fill is located within the floodway of the Ohio River and little over a mile from the municipal wells of the town of Grandview. It is also upstream of a major mussel bed. The proposed permit did not include any testing of the toxicity of the wastes or any plans to monitor the fill for potential contamination of ground and surface waters.

DNR only considered the project's impact on flood levels in its review of the permit. No consideration was made of the toxicity of the waste or the potential impact of the wastes on water resources and wildlife. Local residents appealed the floodway fill permit on the grounds that the DNR had failed to consider potential hazards to property and people (via contamination of drinking water supplies) or potential harm to wildlife by the wastes as required by Indiana floodway regulations.¹⁹ The town of Grandview intervened in the case on the citizens' behalf out of concern over contamination of the town's municipal wells.

Gosport, Owen County

The Indianapolis Power and Light Company (IPL) planned to dump 300,000–400,000 tons of power plant waste on a farm field. The company and land owner claim they will use the coal ash to construct a private airstrip, elevated 25 feet off the ground so planes can avoid trees on neighboring properties. The fill is being placed directly on top of karst, and most of the local residents use this karst system to supply their drinking water wells. At one point, drainage from the waste placed on the site was routed directly into a sinkhole. Due to the exemption in Indiana law for CCW used as fill, no permit or regulatory safeguards were required for the site.

Local residents were successful in halting further placement of the wastes on the property by convincing the Owen County Commissioners to reject the zoning request to allow for expansion of the landing strip. Even though the waste could no longer be used for the stated purpose, IDEM refused to require that the waste remaining on the property be removed.

Indianapolis, Marion County

DNR granted IPL a permit to use 40,000 tons of ash as fill in the floodway of Highland Creek. The fill site was used to store construction material while IPL was installing air pollution controls on their Harding St. plant. The fill is located in an area already prone to frequent flooding. DNR did not consider any issues other than the impact of the fill project upon flood levels in the area. The permit did not require any steps to prevent mixing of the waste with ground and surface water or any requirements to monitor potential contamination. Citizens attempted to appeal the permit, but were forced to drop the appeal over standing issues.

¹⁹ 312 IAC 10-4-4

11) Indiana regulations do not require financial assurance for surface impoundments.

Impoundments: Indiana impoundments do not have financial assurance requirements.

Attachment B-4

**Analysis of the Deficiencies of Illinois Law and Regulations
Governing the Use and Disposal of Coal Combustion Waste**

**Prepared by Brian Wright
Consultant
Indianapolis, Indiana
for Earthjustice and the Clean Air Task Force**

**Prepared in response to:
US EPA, Notice of Data Availability
72 Fed. Reg, 49,714
August 29, 2007
RCRA Docket No. EPA-HQ-RCRA-2006-0796**

Submitted February 11, 2008

Introduction

Illinois regulations on coal combustion wastes (CCW) contain serious deficiencies. The reuse regulations are written in such a way that open dumping could be allowed under the guise of fill projects. Many CCW landfills and surface impoundments do not require solid waste permits. CCW disposal sites located on-site at the landfill do not require a solid waste permit. While the exempted facilities must meet the engineering requirements for landfills, the exempted facilities deprive nearby residents of any public participation in the approval process and are exempt from financial assurance requirements. Surface impoundments are exempt from solid waste requirements so long as they remove the wastes for final disposal elsewhere before closure of the impoundment. The continued existence of such serious weaknesses in regulation of CCW despite the growing evidence of the potential threat to human health and the environment from these wastes demonstrates the need for federal regulations to establish a basic level of safeguards at CCW disposal sites.

1. "Beneficial use" of CCW as fill, structural fill and road construction material without safeguards under Illinois Law

Section 3.135 of the Illinois Environmental Protection Act allows for CCW to be "beneficially used" for a variety of purposes including road base, construction fill, fill material in coal mines, soil substitute, and for making concrete and asphalt. The Illinois Environmental Protection Agency (IEPA) may also approve any use not specified in the act so long as the applicant demonstrates to the agencies satisfaction that the project will not harm the environment. The Illinois Pollution Control Board is required under the Act to write regulations specifying the criteria a project must meet to get agency approval, but these regulations have been written yet.

CCW reused under Sec. 3.135 is classified as coal combustion by-products (CCB) and are exempt from the solid waste standards applied to CCW. CCB used as road base, fill or in coal mines must not exceed Illinois Class I ground water standards in leachate tests. Illinois requires the use of the ASTM method D3987-85, which is similar to the TCLP test.¹ The project must also take steps to reduce fugitive dust. The project is not required to monitor the site or enact any other on-site controls to prevent pollution. A fill project in Vermillion County shows the need for better controls on Illinois CCB fill projects:

Grays Siding, Oakwood Illinois

Approximately 380,000 tons of CCW generated by fluidized bed coal-fired boilers at the Bunge North America Corporation, which operates a dry corn mill in

¹ The short-term leach test used to characterize CCW in Illinois fails to accurately predict the migration of contaminants from CCW. Both EPA and US DOE have found that short-term leach tests cannot accurately predict movement of hazardous constituents from CCW, and it often underestimates the migration of pollutants such as arsenic and selenium. (US EPA, *Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control* 2006)

Dansville, Illinois, were dumped over a 10-year period in a ravine adjacent to the Grays Siding neighborhood, a rural subdivision of 30 homes that all draw their drinking water from ground water. The disposal was allowed under state law as a fill operation. State testing of the waste dumped at the site found lead levels 3.5-4 times the Illinois standard of 0.007 mg/L. Subsequent testing of the fill surface found high boron levels. High levels of lead, iron and manganese, above the state ground water standards, have also been found in two home wells in the adjacent Grays Siding neighborhood. Illinois (IPA) advised the residents in these two homes to stop drinking water from their wells, but no alternative source of drinking water has been provided. The only available source of drinking water for this neighborhood consists of private drinking water wells. In addition, the coal ash itself has been encroaching on residential property, and the residential community is adversely affected by fugitive dust from the site.

The Bunge dump site is also located next to Kickapoo State Park. Drainage from the site is flowing into Number Six Lake in the park. The lake is a designated fishing lake within the park, and has a boat ramp. Drainage from the lake goes into the Middle Fork of the Vermillion River, a designated National Wild and Scenic River.

In 2001, IEPA sent a notice to the owners and operators of the dump informing them that the site was an illegal open dump. The response of the owner/operators was to claim that the site was not a landfill, but a beneficial use site and that a building would be constructed on top of the coal ash. No building or impervious surface has ever been constructed on top of the "fill" site. The Illinois Environmental Protection Agency has attempted to install monitoring wells on-site and to have some of the ash removed, but they have been unable to take these actions due to the site owner declaring bankruptcy.

2. Illinois regulations do not require a solid waste permit for all CCW disposal in landfills and surface impoundments

Illinois regulations provide several significant permitting exemptions for both on-site CCW landfills and CCW surface impoundments. First, a solid waste permit is not required for CCW disposed on-site at the power plant.² Facilities granted this exemption must file an initial facility report that documents that the site meets all the engineering standards for a waste landfill. This report does not go through the regular permit application process. These sites establish an unfair double standard for the citizens living near these facilities, since the site does not have to go through the regular public participation process required of other landfills through the permitting process. The exempted sites also do not need to file a cost analysis on their closure and post-closure plans and are not subject to financial assurance requirements.³

Exempted onsite CCW landfills must file an annual report giving the amount of waste dumped at the facilities, the remaining capacity, and any changes to the site. These facilities are only required to report their groundwater monitoring results once per year.

² Illinois Environmental Protection Act Section 21(d)

³ 35 IAC 815.201

Permitted facilities must report groundwater monitoring results four times per year for the first five years, and twice per year after that.⁴

Illinois regulations generally do not require CCW surface impoundments to obtain solid waste permits. Surface impoundments are only treated as a solid waste facility if the power plant plans to use the impoundment as a permanent disposal area. If the plant uses the impoundment as a "temporary" disposal area and plans at some later date to haul the wastes to another facility for permanent disposal, the impoundments are only regulated as a wastewater treatment facility and need not obtain a solid waste permit. Given the long life of most coal-fired power plants, this would allow a surface impoundment to be in operation for decades as a waste disposal site and still never fall under waste disposal regulations.⁵

3. Illinois regulations do not mandate sufficient safeguards in the construction and operation of CCW surface impoundments

If the surface impoundment is only considered a temporary waste storage site by the state, it is regulated as a wastewater treatment facility under 35 IAC 309.⁶ These regulations only set standards for the National Pollution Discharge Elimination Systems (NPDES) permit for these facilities and do not require any environmental standards such as liners or groundwater monitoring to prevent contamination to ground water. Only if the power plant intends to leave the waste in place once the surface impoundment is closed is the facility regulated as a solid waste landfill.

4. Illinois regulations do not require all CCW surface impoundments and landfills to have liners

Only surface impoundments that are considered permanent disposal sites for the wastes are required to meet solid waste requirements such as liners.

CCW disposal sites must have a liner of compacted soil at least 5 ft. thick and with a maximum hydraulic conductivity of 1×10^{-7} centimeters/second. Landfills may as an alternative install a composite liner with a geomembrane liner at least 60 millimeters thick and 3 ft. of compacted clay. Other alternative liners may be submitted to the agency for approval.⁷

5. Illinois regulations do not require all CCW surface impoundments and CCW landfills to have groundwater monitoring

Only surface impoundments that are considered permanent disposal sites for the wastes are required to meet solid waste requirements such as groundwater monitoring (see comments above).

⁴ 35 IAC 815.301

⁵ Based upon discussions with Steve Nightingale, Illinois EPA Bureau of Land, on 1/28/08

⁶ Based upon discussions with Steve Nightingale, Illinois EPA Bureau of Land, on 1/28/08

⁷ 35 IAC 811.306

CCW disposal sites are required to have groundwater monitoring. The Illinois regulations require "a network of monitoring points shall be established at sufficient locations downgradient with respect to groundwater flow and not excluding the downward direction, to detect any discharge of contaminants from any part of a potential source of discharge."⁸ The regulations require at least one downgradient monitoring well.⁹

Groundwater monitoring wells must be sampled 4 times per year during the first five years of waste disposal. After the first five years, the facility may be allowed to reduce the monitoring frequency to twice per year.¹⁰ Landfills located at the site where the waste was generated only need to report monitoring results once per year. The type of constituents to be monitored for is determined based on the constituents found to be in the leachate of the wastes.¹¹

Monitoring continues for 15 years after the closure of the site. For onsite disposal facilities, monitoring is only required to continue for 5 years after the closure of the site.¹²

6) NPDES permits issued by IEPA (permits for point source discharges to streams, rivers or lakes required under the federal Clean Water Act) for CCW surface impoundments generally do not require monitoring for CCW pollutants

NPDES permits are only required for surface impoundments that discharge into water of the state.¹³ A review of NPDES permits on the EPA Envirofacts database found that most power plants only monitored their ash pond discharge for pH, oil and grease, and total suspended solids with three plants also requiring monitoring for boron. Only the Prairie River Generating Station permit required monitoring for a comprehensive list of CCW constituents, and this was only required due to public pressure.

⁸ 35 IAC 811.318(b)(1)

⁹ 35 IAC 811.318(b)(5)

¹⁰ 35 IAC 811.319(a)(1)(A)

¹¹ 35 IAC 811.319(a)(2)(A)

¹² 35 IAC 811.319(a)(1)(C)

¹³ 35 IAC 309.102

Attachment B-5

February 11, 2008

Notice of Data Availability on the Disposal of
Coal Combustion Waste in Landfills and
Surface Impoundments
Environmental Protection Agency
Mailcode: 5305T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-RCRA-2006-0796

Dear Administrator Johnson:

These comments are submitted by Appalachian Center for the Economy and the Environment and describe examples of serious environmental degradation caused by the disposal of coal combustion waste (CCW) in West Virginia. EPA's failure to take the lead in both acknowledging the threats that CCW poses and establishing strict federal standards for its disposal has paved the way for West Virginia's weak regulatory program. That program allows some of the largest and most dangerous disposal sites, older, larger and unlined slurry impoundments, to entirely avoid regulation under West Virginia's solid waste provisions. It has also allowed easy off ramps from solid waste regulations for other CCW disposal sites. See §33-1-5.5.a.2. See a summary of West Virginia's regulatory deficiencies attached to the end of these comments.

Coal combustion waste (CCW) degrades water quality in West Virginia

Two CCW facilities in West Virginia that have caused serious water quality problems are the slurry impoundments associated with the Ohio Power Mitchell Plant and the Appalachian Power John Amos Plant. Since both plants were constructed prior to 1990 they are not required to obtain a West Virginia Solid Waste Permit if they have "adequate ground water monitoring in place." See § 33-1-5.5.b.2.C.

The Ohio Power – Mitchell Plant: The Conner Run Impoundment receives ash from the Mitchell Plant. It is approximately 124 acres, unlined¹ and discharges effluent to Conners Run of Fish Creek of the Ohio River. The start date is unknown² but is prior to 1990. Conners Run has a site specific variance from the statewide numeric criteria for selenium and iron.

¹ Data request response from WVDEP to Margaret Janes of the Appalachian Center.

² Id.

Except that site-specific numeric criteria shall apply to the stretch of Conners Run (0-77-A), a tributary of Fish Creek, from its mouth to the discharge from Conner Run impoundment, which shall not have the Water Use Category A and may contain selenium not to exceed 62 ug/l; and iron not to exceed 3.5 mg/l as a monthly average and 7 mg/l as a daily maximum. §47-2-7.2.d.16.1.

Note that West Virginia's statewide selenium numeric criteria for the protection of aquatic life are 5 ug/l chronic and 20 ug/l acute. §47-2-8.26. State regulations require that site specific numeric criteria be fully protective of designated and existing uses:

Site-specific numeric criteria. The Secretary may establish numeric criteria different from those set forth in Appendix E, Table 1 for a stream or stream segment upon a demonstration that existing numeric criteria are either over-protective or under-protective of the aquatic life residing in the stream or stream segment. A site-specific numeric criterion will be established only where the numeric criterion will be fully protective of the aquatic life and the existing and designated uses in the stream or stream segment. ... §47-2-8.4.

Despite this requirement there is substantial evidence that aquatic life uses of Conners Run are being seriously degraded due to selenium discharges associated with the Mitchell plant. Data from an April 2006 WVDEP report stated that Conners Run had an average fish tissue concentration of selenium of 24.4 ppm. See Power Point presentation at <http://www.wvdep.org/item.cfm?ssid=11&sslid=747>. A later WVDEP data set indicated an average selenium fish tissue concentration of selenium of 31.5 ppm.³ These levels exceed EPA's proposed selenium fish tissue criterion of 7.9 ppm for the protection of aquatic life by 3 and 4 fold respectively. See <http://www.epa.gov/waterscience/criteria/selenium/>. These levels also greatly exceed threshold values of 4 ppm established by a fisheries selenium expert at the USDA Forest Service.⁴ In addition, fish containing 31.5 ppm selenium should trigger a West Virginia human fish consumption advisory restricting consumption to just one meal a month.⁵

Point sources related to the Mitchell Plant have essentially consumed much of Conners Run and include the ash slurry impoundment that receives waste from the power plant and an underground mine and refuse impoundment owned by McElroy Mining, WVDEP mining permits U003383 and O102392, that supplies coal to the plant.

Ohio Power holds Clean Water Act (CWA) NPDES permit WV0005304. Outlet 004 discharges effluent from the fly ash impoundment to Conners Run. The outfall has a .062 mg/l max daily

³ Id.

⁴ Lemly, Dennis A. Selenium Assessment in Aquatic Ecosystems, A Guide for Hazard Evaluation and Water Quality Criteria. Springer. New York. 2002. p. 31.

⁵ See West Virginia Sport Fish Consumption Advisory Guide, 2nd Ed., p. 72, <http://www.wvdhhr.org/fish/documents/WV%20FISH%20ADVISORY%20GUIDE%202ND%20EDITION%20rev%202007decTOC.pdf>

limit for selenium based on the site specific variance. Ohio Power exceeded the selenium limit at Outlet 004 in August of 2005, August and September of 2006 and in 2007 every month from May through December with values ranging from .063 to .254 mg/l with an average value of .118 mg/l. See

http://oaspub.epa.gov/enviro/pcs_det_reports.detail_report?npdesid=WV0005304⁶

While ground water monitoring required by this NPDES permit do not show exceedences of the West Virginia ground water standard for selenium, they do show moderate exceedences of the arsenic ground water criterion down gradient from the impoundment in March, July, September, and December of 2005; and March and June of 2006.⁷

McElroy Mining holds CWA NPDES permit, WV0020834, which regulates discharges from the mines listed above. The Company is required to monitor selenium discharges (but not arsenic) from Outlet 006 along with upstream and downstream water quality but no effluent limits are in force. The monitoring, though infrequent, indicate the outfall from the refuse impoundment is not discharging significant amounts of selenium to the receiving stream⁸.

Appalachian Power DBA AEP – John Amos Plant – The Scary Creek Impoundment receives waste from the John Amos Plant. It is approximately 177 acres, unlined and was constructed in 1971.⁹ The impoundment discharges to Little Scary Creek of the Kanawha River. Little Scary Creek also has a site specific variance from the statewide numeric criteria for selenium and copper.

Except the stretch between the mouth of Little Scary Creek (K-31) and the Little Scary impoundment shall not have Water Use Category A. The following site-specific numeric criteria shall apply to that section: selenium not to exceed 62 ug/l and copper not to exceed 105 ug/l as a daily maximum nor 49 ug/l as a 4-day average. §42-2-7.2.d.20.2.

At this site there is also substantial evidence that aquatic life uses are being seriously degraded due to the disposal of fly ash in the headwaters of the creek. WVDEP data from September of 2006 indicate an average selenium fish tissue concentration of selenium of 58.02 ppm.¹⁰ These levels exceed EPA's proposed selenium fish tissue criterion of 7.9 ppm for the protection of aquatic life by 7 fold. See <http://www.epa.gov/waterscience/criteria/selenium/>. These levels also greatly exceed threshold values of 4 ppm established by a selenium expert at the USDA Forest Service.¹¹ In addition, fish containing 58.02 ppm selenium should trigger a West Virginia

⁶ DMR date request response from WVDEP to Margaret Janes of the Appalachian Center.

⁷ Ground water monitoring reports as reviewed by Margaret Janes of the Appalachian Center 2/7/08.

⁸ DMR date request response from WVDEP to Margaret Janes of the Appalachian Center.

⁹ Data request response from WVDEP to Margaret Janes of the Appalachian Center.

¹⁰ Data request response from WVDEP to Margaret Janes of the Appalachian Center.

¹¹ Lemly, Dennis A. Selenium Assessment in Aquatic Ecosystems, A Guide for Hazard Evaluation and Water Quality Criteria. Springer. New York. 2002. p. 31.

fish consumption advisory restricting consumption to no more than 6 meals a year.¹²

Appalachian Power holds CWA NPDES permit, WV0001074, that regulates discharges from the fly ash impoundment. Outfall 001 discharging to Little Scary Creek is required to monitor for selenium but has no effluent limits. In November and December of 2005 AEP had violations of then permit limits and discharged selenium at 73 and 63 ug/l respectively. In September, October and November of 2007, 16-27 ug/l were discharged from 001.¹³ While these levels are below the site specific criterion for selenium at the site they exceed the statewide chronic aquatic life criterion and have led to significant bioaccumulation of selenium in the fish.

In summary, these examples demonstrate that CCW disposal is causing serious degradation of the aquatic resources in West Virginia. We urge EPA to quickly promulgate strict performance standards for the regulation of CCW disposal and use.

Sincerely,

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¹² See West Virginia Sport Fish Consumption Advisory Guide, 2nd Ed., p. 72,
<http://www.wvdhhr.org/fish/documents/WV%20FISH%20ADVISORY%20GUIDE%202ND%20EDITION%20rev%202007decTOC.pdf>

¹³ As reported on the EPA PSC website. These are the only months posted see
http://oaspub.epa.gov/enviro/pcs_det_reports.pcs_tst?npdesid=WV0001074&rvalue=13&npvalue=7

Survey of West Virginia Regulatory Requirements for CCW Landfills and Surface Impoundments

The following survey identifies significant regulatory gaps in West Virginia law and regulations governing CCW disposal and reuse. Regulatory gaps include the failure to require composite or double liners at all landfills and surface impoundments, failure to require quarterly groundwater monitoring, grandfathering of all CCW surface impoundments operating before 1990, no requirements for financial assurance for CCW landfills and surface impoundments, and the granting of great discretionary power to state regulators to waive regulatory requirements. These gaps as well as other aspects of the CCW program in WV is discussed below.

1) Are waste disposal permits required for all CCW disposal units?

All CCW disposal units require permits under the WV Solid Waste Management Rule except:

- “coal combustion by-product disposal surface impoundments in existence on or before May 1, 1990 and which are operating under a permit issued under W. Va. Code §22-11-1 et seq. [the WV Water Pollution Control Act].”¹⁴ These surface impoundments are exempt from all WV Solid Waste Management Rule provisions, “except that all such impoundments will be required to have an adequate groundwater monitoring system in place;”¹⁵ and
- beneficial use exclusions (see below).

2) Are liners required for all CCW landfills/surface impoundments?

Landfills:

“Landfills . . . or portions thereof placed in operation after May 1, 1990 must”¹⁶ meet the following liner requirements:

- landfills not located in “major domestic use aquifer areas, major alluvial aquifers, or karst regions” may employ a compacted clay liner combined with “an appropriate groundwater interceptor drainage system, which will also serve as a leachate detection system . . . installed under the clay liner in such a manner as to avoid groundwater penetration of the liner system and to facilitate detection of leachate penetrating the liner.”¹⁷

¹⁴ W. Va. Code R. § 33-1-5.5.b.2.C.

¹⁵ W. Va. Code R. § 33-1-5.5.b.2.C.

¹⁶ W. Va. Code R. § 33-1-5.5.b.1.

¹⁷ W. Va. Code R. § 33-1-5.5.b.1.B., “alternative liner system . . . consisting of at least two (2) feet of clay having a permeability no greater than 1×10^{-7} centimeters per second and compacted in six (6) inch lifts to a Standard Proctor density of at least ninety-five percent (95%) as determined by ASTM D-698. Taking into account site-specific conditions, an appropriate groundwater interceptor drainage system[/]leachate detection system must be installed under the clay liner in such a manner as to avoid groundwater penetration of the liner system and to facilitate detection of leachate penetrating the liner. An appropriate leachate collection system, which can consist of bottom ash, having a minimum permeability of 1×10^{-3} centimeters per second must be installed on top of the compacted clay liner”

- Landfills in karst or aquifer areas must install a composite clay/synthetic membrane liner and a leachate collection system,¹⁸
- “Other alternative liner systems for landfills may be approved by the Secretary on a case-by-case basis. Such alternative liner system may be more or less stringent than the” composite liner specifications.¹⁹

Landfills operating “on May 1, 1990 may remain in operation . . . without a liner retrofit unless there is a statistically significant increase in groundwater monitoring parameters.”²⁰ Landfills or portions of landfills closed prior to May 1, 1990 need not meet the liner requirements.²¹

At the WVDEP secretary’s discretion, a CCW permit applicant may be exempted from 3.11.c, which requires the applicant to “demonstrate that leachate will not adversely affect the physical or chemical characteristics of the proposed [landfill] liner system, or inhibit the liner’s ability to restrict the flow of solid waste, solid waste constituents or leachate.”²²

5.5.b.1.C. Other alternative liner systems for landfills may be approved by the Secretary on a case-by-case basis. Such alternative liner system may be more or less stringent than the liner system described in subparagraph 5.5.b.1.A of this rule as determined by sound engineering judgment taking into consideration the type of waste to be disposed, type of facility, site characteristics, operating experience of similar landfills, and protection of the groundwater.

Surface Impoundments:

All surface impoundments (other than those receiving leachate), “or portions thereof placed in operation after May 1, 1990 must”²³ include either:

- a leachate collection system topped by a composite clay/synthetic liner,²⁴ or
- an alternative liner system “considered by the Secretary on a case-by-case basis”²⁵

¹⁸ W. Va. Code R. § 33-1-5.5.b.1.A, specifically, the liner system must consist “of eighteen (18) inches of clay, having a permeability no greater than 1×10^{-7} centimeters per second and compacted in six (6) inch lifts to a Standard Proctor density of at least ninety-five percent (95%) as determined by ASTM D-698. A sixty (60) mil HDPE synthetic liner must be installed on top of the compacted clay liner. A leachate collection system consisting of a perforated piping system embedded within an eighteen (18) inch drainage layer, which can consist of bottom ash, having a minimum permeability of 1×10^{-3} centimeters per second must be installed on top of the synthetic liner. The eighteen (18) inch leachate collection system layer must serve as the protective cover for the synthetic liner.”

¹⁹ W. Va. Code R. § 33-1-5.5.b.1.C.

²⁰ W. Va. Code R. § 33-1-5.5.b.2.A.

²¹ W. Va. Code R. § 33-1-5.5.b.2.B.

²² W. Va. Code R. § 33-1-5.5.a.1.A.

²³ W. Va. Code R. § 33-1-5.5.b.1.

²⁴ W. Va. Code R. § 33-1-5.5.b.1.E. The liner system for . . . surface impoundments must be designed and constructed with a leachate detection system imbedded in a filter media having a minimum permeability of 1×10^{-3} centimeters per second topped by eighteen (18) inches of clay having a permeability no greater than 1×10^{-7} centimeters per second and compacted in six (6) inch lifts to a Standard Proctor density of at least ninety-five percent (95%) as determined by ASTM D-698, with a sixty (60) mil synthetic liner installed over the compacted clay.

²⁵ W. Va. Code R. § 33-1-5.5.b.1.F.

All surface impoundments receiving leachate must have “an appropriate groundwater interceptor drainage system, which must also serve as a leachate detection system . . . to avoid groundwater penetration of the liner system and to facilitate detection of leachate penetrating the liner”²⁶ installed under

- two feet of clay,
- a composite liner, or
- any other alternative liner system approved by the Secretary on a case-by-case basis.²⁷

CCW surface impoundments are exempted from 4.8.c.3.B, which requires other surface impoundments to employ 2 liners and a leak detection system, or to be closed or retrofitted.²⁸

5.5.b.1.F. Other alternative liner systems for solid waste disposal surface impoundments may be considered by the Secretary on a case-by-case basis. Such determination must be based upon sound engineering judgment taking into consideration the type of waste to be disposed, type of facility, site characteristics, and groundwater monitoring results at similar existing solid waste disposal surface impoundments.

3) Are there requirements for waste to be placed above the water table?

“No person may construct a liner system for a [landfill] unless there is [sic] at least four (4) feet maintained between the bottom of the subbase of the liner system and the seasonal high groundwater table,”²⁹ and “at least eight (8) feet can be maintained between the bottom of the subbase of the liner system and the permanent groundwater table.”³⁰ However, both of these requirements may be waived at the WVDEP secretary’s discretion for CCW disposal facilities.³¹

Surface impoundments collecting leachate must be constructed a minimum of five (5) feet above the seasonally high groundwater table.”³²

²⁶ W. Va. Code R. § 33-1-5.5.b.1.G

²⁷ *Id.*

²⁸ W. Va. Code R. § 33-1- 5.5.b.1.H

²⁹ W. Va. Code R. § 33-1- 4.5.d.2.A.

³⁰ W. Va. Code R. § 33-1-4.5.d.2.B.

³¹ W. Va. Code R. § 33-1-5.5.a.2.

³² W. Va. Code R. § 33-1-4.8.c.3.A.

There appear to be no water table provisions for solid waste disposal surface impoundments.

4) Is groundwater monitoring required for both landfills and surface impoundments?

“A Phase I Detection Monitoring Program is required for all groundwater monitoring wells at all landfills and solid waste disposal surface impoundments;”³³ however “surface impoundments associated with a coal combustion by-product facility are not subject to any of the groundwater monitoring requirements of this rule if such impoundments are covered by the overall groundwater monitoring plan for the coal combustion by-product facility.”³⁴

Landfills must include a groundwater monitoring system consisting of “a sufficient number of wells” – a minimum of four, one upgradient and three downgradient – “installed at appropriate locations and depths, to yield groundwater samples from the uppermost aquifer or the uppermost aquifer at all landfill sites.”³⁵ “Monitoring is not required for [landfills] that are closed prior to May 1, 1990 except for currently-permitted closed facilities or in connection with any remedial or corrective action program ordered by the Secretary.”³⁶

For surface impoundments receiving leachate, “a minimum of three (3) groundwater monitoring wells, one upgradient and two (2) downgradient of any surface impoundment may be required to be installed and sampled at the discretion of the WVDEP secretary.”³⁷

There appear to be no provisions regarding number or placement of monitoring wells for solid waste surface impoundments (as opposed to leachate collection impoundments). According to a WVDEP employee, surface impoundments at CCW disposal facilities are typically covered under the facility-wide groundwater monitoring plan.

5) What are monitoring parameters/frequency?

Groundwater:

The WVDEP “Secretary will specify in the permit those parameters to be included in a Phase I [detection] monitoring program as appropriate for the types of waste to be disposed in a particular solid waste facility or which are reasonably expected to be present For coal combustion by-product facilities, the monitoring parameters must consist of some combination of the following: pH, temperature, alkalinity, hardness, total dissolved solids, total suspended solids, specific conductance, total organic carbon, calcium, magnesium, sodium, iron, manganese, aluminum, chloride, sulfate, arsenic, copper, nickel, selenium, zinc, barium, mercury, total and hexavalent chromium, lead, boron, molybdenum, cadmium,

³³ W. Va. Code R. § 33-1-4.11.b.1.

³⁴ W. Va. Code R. § 33-1-5.5.b.1.H,

³⁵ W. Va. Code R. § 33-1-3.8.d.

³⁶ W. Va. Code R. § 33-1-5.5.b.2.B.

³⁷ W. Va. Code R. § 33-1-4.8.c.3.D.

and vanadium.”³⁸ However, the WVDEP “Secretary may establish an alternative list of inorganic indicator parameters . . . in lieu of some or all of the heavy metals . . . if the alternative parameters provide a reliable indication of inorganic releases from the SWLF to the groundwater.”³⁹

Monitoring for these constituents must be carried out “at least twice a year during the active life of the facility, including closure and the post-closure periods,”⁴⁰ or “[t]he Secretary may specify an appropriate alternative frequency”⁴¹ so long as the alternative frequency is no less than annual.⁴²

If Phase I monitoring detects statistically significant increases over background parameters, then, “unless otherwise directed by the Secretary,”⁴³ or the permittee can demonstrate that “a source other than a [solid waste landfill facility] caused the contamination or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.”⁴⁴ Phase II assessment monitoring is required,⁴⁵ Phase II monitoring requires testing for a lengthy list of constituents (for complete list, see WV Solid Waste Management Rule Appendix II).⁴⁶ Phase II monitoring is semiannual,⁴⁷ or the WVDEP secretary may specify an alternative frequency.⁴⁸

Leachate:

If such a system is required, “on a daily basis, the flow rate and volume of flowing liquids from the leachate collection and detection systems must be determined”⁴⁹

“On a semiannual basis, the chemical composition of the leachate flowing into a leachate treatment system from a coal combustion by-product facility must, unless waived by the Secretary, be determined through the analysis of the leachate for the following parameters: alkalinity, arsenic, barium, bicarbonate, hardness, boron, cadmium, calcium, chloride, total and hexavalent chromium, iron, lead, manganese, magnesium, sulfate, total dissolved solids,

³⁸ W. Va. Code R. § 33-1-4.11.b.2.

³⁹ W. Va. Code R. § 33-1-4.11.b.2.B.

⁴⁰ W. Va. Code R. § 33-1-4.11.b.3.A.

⁴¹ W. Va. Code R. § 33-1-4.11.b.3.D.

⁴² W. Va. Code R. § 33-1-4.11.b.3.E.

⁴³ W. Va. Code R. § 33-1-4.11.b.4.

⁴⁴ W. Va. Code R. § 33-1-4.11.b.5.A.

⁴⁵ W. Va. Code R. § 33-1-4.11.c.1.

⁴⁶ W. Va. Code R. § 33-1-4.11.c.2.A.

⁴⁷ W. Va. Code R. § 33-1-4.11.c.2.

⁴⁸ W. Va. Code R. § 33-1-4.11.c.3.

⁴⁹ W. Va. Code R. § 33-1-4.8.d.1.

total organic carbon (TOC), specific conductance, zinc, and any other parameter which is specifically known to be associated with the wastes in question and specified by the Secretary in writing.”⁵⁰ These parameters “must be reported as total metals, unless otherwise specified by the Secretary.”⁵¹

6) Are there setback provisions for water supply sources?

“SWLFs [solid waste landfill facilities] cannot be located within twelve hundred (1,200) feet of any public or private water supply well in existence at the time of initial facility siting.”⁵² It is unclear from the regulations if solid waste disposal surface impoundments are considered “solid waste landfill facilities,”⁵³ but, according to a WVDEP employee, these setback provisions are applied to surface impoundments as well.

7) Are there meaningful corrective action provisions?

If phase II groundwater monitoring detects a phase II parameter above groundwater protection standards (typically SDWA MCLs), the permittee must notify WVDEP⁵⁴ and “initiate an assessment of corrective action measures.”⁵⁵

However, the permittee can avoid these requirements if they can demonstrate that “a source other than a [solid waste landfill facility] caused the contamination, or that the [groundwater protection standard exceedance] resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.”⁵⁶

The WVDEP secretary has the discretion to determine when remedial action is necessary.⁵⁷ The secretary may make a determination that remediation is not required if

- “groundwater is additionally contaminated by substances that have originated from [another] source . . . and those substances are present in concentrations such that cleanup of the release . . . would provide no significant reduction in risk to actual or potential receptors,”⁵⁸
- remediation is “technically impracticable,”⁵⁹
- remediation would result in “unacceptable cross-media impacts,”⁶⁰ or
- if both of the following requirements are met:

⁵⁰ W. Va. Code R. § 33-1-5.5.b.3.A.

⁵¹ W. Va. Code R. § 33-1-5.5.b.3.A.1.

⁵² W. Va. Code R. § 33-1-3.2.i.1.

⁵³ compare definitions of “Solid Waste Landfill Facility (SWLF),” W. Va. Code R. § 33-1-2.124; “Solid Waste Disposal Surface Impoundment,” 2.122; and “Surface Impoundment” 2.131; if SWLF’s do not include solid waste disposal surface impoundments, these impoundments would be exempt from many other regulatory provisions (e.g. location prohibitions regarding proximity to surface waters (3.2.a.1), wetlands (3.2.b), fault areas (3.2.f.1), airports (3.2.g), etc; open burning (3.2.n.2); financial assurance requirements (3.13.a.4); fencing/barrier requirements (4.6.a.1.E); etc.)

⁵⁴ W. Va. Code R. § 33-1-4.11.c.7.A.

⁵⁵ W. Va. Code R. § 33-1-4.11.c.7.A.4

⁵⁶ W. Va. Code R. § 33-1-4.11.c.7.B.1., 4.11.c.7.B.4.

⁵⁷ W. Va. Code R. § 33-1-4.11.e.

⁵⁸ W. Va. Code R. § 33-1-4.11.f.5.A.

⁵⁹ W. Va. Code R. § 33-1-4.11.f.5.C.

⁶⁰ W. Va. Code R. § 33-1-4.11.f.5.D

- the groundwater is not “currently or reasonably expected to be a source of drinking water,” and
- the groundwater is not “hydraulically connected with waters to which the hazardous constituents are migrating or are likely to migrate in a concentration(s) that would exceed the groundwater protection standards”⁶¹

If an assessment is required, it must be “completed within a period of time as agreed to in writing by the Secretary.”⁶² The selected remedy must:

- be protective of human health and the environment,
- maintain existing groundwater quality,
- attain the identified groundwater protection standard, and
- “[c]ontrol the source(s) of releases so as to reduce or eliminate further releases of Phase II constituents into the environment.”⁶³
- Finally, solid wastes managed pursuant to the remedy must be handled in accordance with RCRA and in a manner protective of human health and the environment.⁶⁴

In selecting a remedy, the permittee must consider a multitude of factors relating to the efficacy, ease of implementation, and cost of potential solutions.⁶⁵ Notably, one of these factors is the economic capability of the permittee to carry out the corrective action;⁶⁶ as discussed below, many CCW disposal facilities are exempted from financial assurance requirements.⁶⁷

8) Are there beneficial use exclusions? If so, what are they? (i.e., do they allow fill projects without meaningful restrictions?)

“The following uses of coal combustion by-products are deemed to be beneficial and do not require a permit.”⁶⁸ Coal combustion by-products used:

- “as a material in manufacturing another product (e.g., concrete, flowable fill, lightweight aggregate, concrete block, roofing materials, plastics, paint) or as a substitute for a product or natural resource (e.g., blasting grit, filter cloth precoat for sludge dewatering);”⁶⁹
- “for the extraction or recovery of materials and compounds contained within the coal combustion by-products;”⁷⁰
- “as a stabilization/solidification agent for other wastes” if:

⁶¹ W. Va. Code R. § 33-1-4.11.f.5.B.

⁶² W. Va. Code R. § 33-1-4.11.e.1.A.

⁶³ W. Va. Code R. § 33-1-4.11.f.2.

⁶⁴ W. Va. Code R. § 33-1-4.11.g.4.

⁶⁵ W. Va. Code R. § 33-1-4.11.f.

⁶⁶ W. Va. Code R. § 33-1-4.11.f.3.D.

⁶⁷ W. Va. Code R. § 33-1-3.13.a; 2.81; 5.5.a.1.

⁶⁸ W. Va. Code R. § 33-1-5.5.b.4.

⁶⁹ W. Va. Code R. § 33-1-5.5.b.4.A.

⁷⁰ W. Va. Code R. § 33-1-5.5.b.4.B.

- “The person or entity proposing the use has . . . given advance written notice to the Secretary; and”
- “The use results in altered physical or chemical characteristics of the other waste and a reduction of the potential for the resulting stabilized mixture to leach constituents into the environment;”⁷¹
- pursuant to the West Virginia Abandoned Mine Lands and Reclamation Act or Surface Coal Mining And Reclamation Act (§§ 22-2-1 et seq. and 22-3-1 et seq).⁷²
- “as pipe bedding or as a composite liner drainage layer;”⁷³
- “as a daily or intermediate cover for Class A, Class B, or Class C solid waste facilities if the specific permit allows for such use;”⁷⁴
- “as a construction material (e.g., subbases, bases) for roads or parking lots that have asphalt or concrete wearing surfaces if approved by the West Virginia Division of Highways or the project owner;”⁷⁵ or
- “bottom ash or boiler slag used as an anti-skid material if such use is consistent with Department of Highways specifications. The use of fly ash as an anti-skid material is not deemed to be beneficial use.”⁷⁶

The end of section 5.5.b.4. states: “Note: Paragraph 5.5.b.4 of this rule does not specifically address the beneficial use of coal combustion by-products for structural fills and as soil amendment. These beneficial use applications will be considered in future rulemaking. Until such time, the established prior practices will be continued.” According to a WVDEP employee, use of CCW as structural fill is “rather infrequent” and use as soil amendment is “even more rare” both uses are regulated by WVDEP on a site specific basis.

10) Financial Assurance Requirements

Solid waste facilities “owned and operated by a person for the sole purpose of disposing of solid wastes created by that person or such person and other persons on a cost-sharing or nonprofit basis” are exempt from financial assurance requirements.⁷⁷ The secretary may also waive financial assurance requirements for CCW landfills and surface impoundments.⁷⁸

9) Postclosure

⁷¹ W. Va. Code R. § 33-1-5.5.b.4.C.

⁷² W. Va. Code R. § 33-1-5.5.b.4.D.

⁷³ W. Va. Code R. § 33-1-5.5.b.4.E.

⁷⁴ W. Va. Code R. § 33-1-5.5.b.4.F.

⁷⁵ W. Va. Code R. § 33-1-5.5.b.4.H.

⁷⁶ W. Va. Code R. § 33-1-5.5.b.4.G.

⁷⁷ W. Va. Code R. § 33-1-3.13.a; *see also* definition of Noncommercial Solid Waste Facility, 2.81.

⁷⁸ W. Va. Code R. § 33-1-5.5.a.1

Postclosure plans for solid waste facilities require the installation of a cover; however this requirement can be waived by the WVDEP secretary.⁷⁹ According to a WVDEP employee, typically WVDEP requires one to two feet of soil for CCW disposal unit covers. Leachate collection and groundwater monitoring must continue for “up to thirty years after final closure . . . unless otherwise modified by the Secretary.”⁸⁰

⁷⁹ W. Va. Code R. § 33-1-6.1.e.1.

⁸⁰ W. Va. Code R. § 33-1-6.3.

Attachment B-6

February 11, 2008

Notice of Data Availability on the
Disposal of Coal Combustion Wastes in
Landfills and Surface Impoundments
Environmental Protection Agency
Mailcode: 5305T
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

Attention: Docket ID No. EPA-HQ-RCRA-2006-0796

Re: The Failure of State Regulatory Controls for Coal Combustion Waste Disposal in the Intermountain West

To Whom It May Concern:

By this letter, Earthjustice, Montana Environmental Information Center, San Juan Citizens Alliance, Great Basin Mine Watch, Powder River Basin Resource Council, Clean Air Task Force and Utah Physicians for a Clean Environment submit comments concerning the Notice of Data Availability on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments (NODA), 72 Fed. Reg. 49714 (August 29, 2007). In particular, our comments are intended to address an overwhelming flaw in the joint U.S. Department of Energy (DOE) and Environmental Protection Agency (EPA) report entitled *Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004*. (DOE/EPA Report).

We, as groups active in the protection of health and the environment in the Intermountain West, are particularly concerned about the threats posed by coal combustion waste (CCW) in our region. As a result, we were particularly dismayed with the very limited scope of the DOE/EPA Report. The report purports to show that state regulatory control of CCW disposal has improved nationally since 1994 and that the widespread regulatory gaps identified by EPA in its 2000 *Regulatory Determination on Wastes from the Combustion of Fossil Fuels* are closing. The DOE/EPA Report, however, conducted a detailed evaluation of only five states (Pennsylvania, Illinois, Indiana, Virginia and Wisconsin) and a rudimentary review of only six additional states (Alabama, Florida, Georgia, Missouri, Ohio and Texas). Thus the entire report is based on an evaluation of 11 states. Furthermore, the report included no state in the Intermountain West, despite the boom in new coal-fired power plants in that region. It is irreconcilable error to omit evaluation of any western state in a report whose stated purpose is to inform the decision making of EPA on a national rulemaking for CCW.

Thus our comments present information on the statutes and regulations governing disposal and reuse of coal combustion waste in six CCW-producing states in the Intermountain West. Our research reveals significant statutory and regulatory gaps in

these western state programs that render the programs inadequate to protect health and the environment from the dangers posed by CCW.

In other comments to the record for this NODA, we pointed out numerous significant errors and omissions in the DOE/EPA Report. EPA must correct these evaluations and then expand its research to examine all states. Clearly an incomplete evaluation of 20% of U.S. states cannot accurately determine the current state of regulatory controls and cannot serve as the basis for a rulemaking decision.

An examination of additional states is essential, particularly in the Intermountain West. New plants or expansions to existing coal-fired plants are being considered in at least six western states including Arizona, Montana, Nevada, New Mexico, Utah and Wyoming. Approximately 12 proposals for new western plants are currently under consideration. In these comments we demonstrate why it is critical to examine the law in these states. Our preliminary review indicates that the laws of five of these six states, and those of Idaho, are wholly inadequate to protect health and the environment from damage caused by mismanagement of CCW.

The following evaluation is far from comprehensive. As nonprofit public interest groups, we had neither the time nor the resources to perform in-depth analyses. We firmly believe that it is EPA's responsibility to complete this research and that a supplemental report including all 50 states should be an essential part of the rulemaking record. Despite the constraints, however, our limited research yielded rich results. While we understand that anecdotal evidence of inadequately lined and monitored facilities may not tell the whole story, in the absence of any discussion of western sites in the DOE/EPA Report, save one plant in New Mexico, we feel we must fill the void with a recitation of relevant state law and our knowledge of mismanaged facilities. The state law described below in each of the six states speaks for itself. Quite simply, regulatory controls on CCW landfills and surface impoundments are inadequate in all of the states reviewed, and these regulatory gaps are likely to result in CCW waste units that lack basic safeguards such as liners, groundwater monitoring and corrective action.

Arizona

The law and regulations applying to CCW disposal in Arizona are particularly complex. It is clear, nevertheless, that the law contains a broad exemption for CCW disposal, as explained below. Furthermore, we are aware of at least one operating unlined surface impoundment at the APS Cholla Generating Station in Navajo County, Arizona. The Cholla Generating Station is a proven damage case as a result of groundwater contamination from leaking CCW surface impoundments. The absence of regulations in Arizona requiring liners for CCW landfills and surface impoundments poses a threat to the state's scarce water resources.

The following exemptions for CCW are found in Arizona law:

- Arizona exempts facilities that store CCW from the definition of "solid waste landfill." See A.R.S. § 49-701(30) According to A.R.S. § 49-701(30)

Solid waste landfill' means a facility, area of land or excavation in which solid wastes are placed for permanent disposal. Solid waste landfill does not include a land application unit, surface impoundment, injection well, compost pile or waste pile or an area containing ash from the on-site combustion of coal that does not contain household waste, household hazardous waste or conditionally exempt small quantity generator waste.

(emphasis added).

- Arizona's definition of "solid waste" also excludes, among other things, "discharge from a facility regulated pursuant to" state law governing aquifer protection permits. A.R.S. § 49-701.01(B)(3). Arizona law governing aquifer protection permits, in turn, applies to a broad variety of facilities including "[s]urface impoundments including holding, storage settling, treatment or disposal pits, ponds and lagoons," and most "[s]olid waste disposal facilities." See A.R.S. § 49-241. In light of A.R.S. § 49-701(30), it is unclear whether "solid waste disposal facilities" includes facilities that contain CCW.

- Solid waste and special waste facilities may be excused from obtaining an aquifer protection permit "when rules addressing aquifer protection are adopted by the director pursuant to section 49-761 or 49-855 and those facilities obtain plan approval pursuant to those rules." A.R.S. §49-250(B)(17).

Idaho

The State of Idaho has no regulations governing CCW disposal. Idaho defines coal combustion waste as an "inert waste." See Solid Waste Rules § 005.19. According to section.00519, "Inert waste' includes, but is not limited to, rock, concrete, cured asphaltic concrete, masonry block, brick, gravel, dirt, inert coal combustion by-products, inert precipitated calcium carbonate and inert component mixture of wood or mill yard debris." (emphasis added). Inert wastes are exempted from Idaho's Solid Waste Rules. Id. § 001.003(b)(i). According to Idaho law, the state solid waste rules "do not apply" to inert waste unless it is "mixed with more than incidental quantities of regulated waste"

Consequently the state does not require solid waste disposal permits for CCW landfills or surface impoundments. Because there are no regulations pertaining to CCW disposal, Idaho does not require liners, ground water monitoring, corrective action, financial assurance or any other safeguards for CCW landfills and surface impoundments. In fact, the absence of such requirements was cited as a primary reason for the Idaho legislature passing in 2005 a two-year moratorium against siting new coal-fired power plants in the state. In 2005, farmers and ranchers near a proposed merchant power plant realized that the lack of regulations for the planned CCW surface impoundment put their aquifer at risk. However, since the moratorium, Idaho has enacted no laws or regulations addressing the issue.

Montana

Similarly, Montana law exempts coal combustion waste from its solid waste regulations. Montana Code Ann. § 75-10-214(1)(b) provides an exclusion from the Montana Solid Waste Management Act for the operation of electric generating facilities. Id. Furthermore, electric generating facilities that dispose of coal combustion waste on-site are exempt from all solid waste laws of the state. MCA § 75-10-214(1)(b). According to the Montana Department of Environmental Quality (DEQ), the 2001 legislative change works as follows:

During the 1991 legislative session, HB 660 modified those entities identified in Montana Code Annotated 75-10-214 that were regulated under the Montana Solid Waste Management Act. As a result of the 1991 change, solid wastes generated at electric generating facilities were excluded from landfill licensing requirements based upon existing regulatory requirements promulgated under the Major Facility Siting Act (MFSA). During the 2001 legislature, power plant wastes were excluded from MFSA thereby removing the state's authority to manage disposal of these wastes at a power generation facility.

(Excerpted from a Montana DEQ fact sheet prepared for the 2007 Montana Legislature.)

Consequently, landfills and surface impoundments are not required by Montana law to have liners, groundwater monitoring, corrective action, financial assurance or any other basic safeguards. Electric generating facilities that were in operation prior to the exemptions provided for in the Montana Solid Waste Act may be subject to ground and surface water discharge permit requirements. The requirements and monitoring parameters vary by facility.

The failure to require liners for CCW surface impoundments has resulted in widespread groundwater contamination from unlined waste ponds at the Colstrip Power Plant in Colstrip, Montana. State regulators admit that the ponds are leaking and that scrubber sludge has been disposed in ponds "lined" only by native soils. The Colstrip impoundments are currently threatening homes and ranches with water heavily polluted by sulfate, boron and metals. In fact, two lawsuits have been recently filed against the six corporations that jointly own and operate the 2,094-megawatt Colstrip plant.

The requirements for surface water and groundwater monitoring at CCW landfills and surface impoundments in Montana are determined on a case-by-case basis. The parameters and frequency of testing vary by facility but are generally infrequent and minor in scope. For example, the Yellowstone Energy Limited Partnership and the PPL Corette plant are required to test surface water annually for pH, oil, grease, PCB's and total suspended solids, and weekly for effluent flow rate, TSS, phosphorous, oil and grease, pH, and TDS. No surface monitoring at either facility is required for any of the metals common to CCW. While groundwater monitoring is extremely limited at the

Yellowstone Energy Limited Partnership Facility, no groundwater monitoring requirements exists at Corette.

New Mexico

New Mexico law also exempts CCW from all hazardous and solid waste regulations.¹ According to N.M. Stat. § 74-4-3K(2), “‘Hazardous waste’ does not include . . . fly ash waste; bottom ash waste; slag waste; flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels.” According to N.M. Stat. § 74-9-3N, “Solid waste” does not include

: . . . fly ash waste, bottom ash waste, slag waste and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels and wastes produced in conjunction with the combustion of fossil fuels that are necessarily associated with the production of energy and that traditionally have been and actually are mixed with and are disposed of or treated at the same time with fly ash, bottom ash, boiler slag or flue gas emission control wastes from coal combustion.

Consequently, as in Idaho and Montana, there are absolutely no specific safeguards required by regulation for CCW land disposal in New Mexico.

CCW disposal units may be subject to New Mexico water discharge permits.² At such units, New Mexico Environmental Department may, at its discretion, require disposal unit operators to develop groundwater monitoring plans, closure and postclosure plans, and meet financial assurance requirements.³ The water discharge permit regulations do not mention water table or liner provisions.⁴ These permits also have no setback provisions for wells, alluvial areas, etc. Closure plans are only required when closure is anticipated within the upcoming 5-year permitting period. Postclosure plans require only eight consecutive quarters of groundwater sampling within groundwater standards, at which point postclosure monitoring can stop. NMED has not required financial assurance in permits for power plants. NPDES permits from CCW units in New Mexico also fail to include common CCW pollutants, as evidenced by the permits at the San Juan Generating Station, Four Corners Power Plant and Escalante Generating Station.

¹ See also N.M. Code R. § 20.9.2.7R(9); Auralie Ashley-Marx, Solid Waste Bureau; Bruce A. Dockter and Diana M. Jagiella, Engineering and Environmental Specifications of State Agencies for Utilization and Disposal of Coal Combustion Products: Vol. 2 – Environmental Regulations 36 (July 2005) available at <http://www.undeerc.org/carrc/Assets/Vol2Environmental.pdf>; EPA, Regulation and Policy Concerning Mine Placement of Coal Combustion Waste in Selected States 92 (Dec. 2002), available at <http://www.epa.gov/epaoswer/other/fossil/meeting4/com-mine.pdf>

² Bill Olson, NMED Ground Water Bureau Chief.

³ N.M. Code R. § 20.6.2.3107.

⁴ N.M. Code R. § 20.6.2.3000 et seq.

According to a New Mexico Environmental Department (NMED) Groundwater Program Manager,⁵ groundwater monitoring is required at all *sites* where CCW disposal occurs, but this monitoring is not necessarily tailored to monitor groundwater from a specific disposal unit at that site. Where groundwater exceedances are detected, NMED requires “some form of abatement, including requiring liners for any unit expansions.” Parameters typically include total dissolved solids, “some heavy metals,” sulfate, nitrate, and chloride, but do not always include common CCW contaminants.

The DOE/EPA Report disingenuously includes New Mexico in the list of states that do not exempt onsite landfills from solid waste permitting requirements.⁶ This is technically true only because New Mexico exempts all CCW landfills from solid waste permitting requirements. Similarly, the study included New Mexico among states that granted no CCW disposal variance requests.⁷ Obviously there is no need to request a variance when disposal is already unregulated.

Utah

Utah also exempts coal combustion waste from its solid waste regulations. According to Utah Code Ann. § 19-6-102(18)(b)(iii),

Fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels, unless such waste causes a public nuisance or public health hazard or is otherwise determined to be a hazardous waste

is excluded from the definition of “solid waste.” In addition, Utah Code Ann. § 19-6-102.1 excludes “the recycling, use, reuse, or preprocessing of fly ash waste, bottom ash waste, slag waste, or flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels” from other statutory provisions concerning treatment and disposal.

Utah does not require solid waste disposal permits for CCW disposal units. CCW facilities are exempt from the industrial solid waste landfill requirements set forth in Utah Admin. Code R315-304. See Utah Admin. Code R315-304-2 (“The requirements of Rule R315-304 do not apply to the following materials managed at an industrial facility: (a) fly ash waste, bottom ash waste, slag waste, or flue gas emission control dust generated primarily from the combustion of coal or other fossil fuels.”) Because CCW is exempt from Utah’s industrial solid waste landfill requirements, it appears that no regulations require liners, groundwater monitoring, corrective action, financial assurance or any other basic safeguards for CCW disposal facilities.

⁵ George Schuman, NMED GW program manager 505-827-2945.

⁶ Coal Combustion Waste at Landfills and Surface Impoundments 1994-2004, US Department of Energy and US Environmental Protection Agency 44 (2006), Docket ID No. EPA-HQ-RCRA-2006-0796-0002.

⁷ *Id.* at 52.

Utah law also provides a broad exemption for facilities that recycle, use, reuse or reprocess coal combustion waste:

- Pursuant to Utah Code Ann. §§ 19-6-102.1 and 19-6-104(1)(j)(i) & (ii)(B), the state Solid and Hazardous Waste Control Board is not obligated to require facilities that “recycle[e], use, reuse, or reprocess” CCW submit to the Board plans, specifications, and other information prior to the construction, modification, installation, or establishment of a facility.
- Pursuant to Utah Code Ann. §§ 19-6-102.1 and 19-6-108(3)(b), the state does not require the executive secretary to approve an operating plan for facilities that intend to “recycle[e], use, reuse, or reprocess” CCW with the intent to make a profit, or facilities that receive CCW wastes “solely for the purpose of recycling, reuse, or reprocessing.”
- Pursuant to Utah Code Ann. §§ 19-6-102.1 and 19-6-108(3)(c)(2)(B) facilities that “recycle[e], use, reuse, or reprocess” CCW or receive CCW wastes “solely for the purpose of recycling, reuse, or reprocessing” are exempt from having to receive approval from the governor and legislature.
- Pursuant to Utah Code Ann. §§ 19-6-102.1 and 19-6-119(1)(a), facilities that “recycle[e], use, reuse, or reprocess” CCW are exempt from paying certain fees.

Wyoming

The State of Wyoming also provides sweeping exemptions for CCW disposal units. According to the Wyoming Industrial Landfill Regulations, coal combustion waste landfills over 1 acre in size are exempt from “engineered containment system” requirements, including liners and caps, groundwater monitoring requirements, and monthly cover requirements. *See* Chapter 3, Sections 4(j)(iv)), 6(b)(1)(A)(VI)), and 5(q)(1). According to Wyoming regulations these unlined, unmonitored CCW landfills can be as large as 2.5 million cubic yards, equivalent to a capacity of approximately 2.5 million tons of ash.

Furthermore, if the CCW is generated at a mine-mouth plant and the CCW disposal occurs in the mine, the disposal facility is exempt from solid waste division permits. (Solid Waste Management Rules, Ch. 1, Sect. 1(l)(x)) In this case, the CCW disposal would be regulated through the Land Quality Division of Wyoming's Department of Environmental Quality (LQD) and must be in accordance with restrictions the LQD applies. These restrictions are not defined in the LQD regulations, and there is no guidance. The LQD can also consider requirements of the Solid Waste Management Regulations that are “deemed appropriate” (LQD Environmental Protection Performance Standards for Surface Coal Mining Operations). The absence of guidance and regulations gives excessive discretion to state regulators and leaves no guarantee that adequate safeguards will be required.

Conclusion

In view of our findings, which reveal weak or absent regulatory controls in numerous western states, we ask the U.S. Environmental Protection Agency to immediately begin rulemaking to establish national safeguards for the disposal of coal combustion waste in enforceable regulations. At a minimum, these safeguards should include siting restrictions, composite liners, covers, comprehensive monitoring, corrective action requirements and long-term financial assurance to clean up any pollution that results from the disposal of CCW. These safeguards should apply consistently to all sites, whether they are inside or outside of coal mines or coal-fired power plant property or whether the waste is being "beneficially placed" in the environment. Their purpose should be to eliminate unreasonable risks to human health and the environment from CCW.

Thank you for your consideration of these comments.

Respectfully submitted,

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Attachment B-7

Regulation of Coal Combustion Wastes in Kentucky

In the Commonwealth of Kentucky, coal combustion wastes are classified as "special wastes" under Kentucky Revised Statute (K.R.S.) 224.50-760, which provides in relevant part that

special wastes are those wastes of high volume and low hazard which include. . . utility wastes (fly ash, bottom ash, scrubber sludge)

By statute, these special wastes are exempt from hazardous waste regulation and solid waste regulation but

may be regulated by the cabinet consistent with the Resource Conservation and Recovery Act of 1976 and regulations issued pursuant thereto

Generators of special waste are required to register with the state Environmental and Public Protection Cabinet, and in promulgation of regulations governing special wastes, the state agency is instructed to:

recognize special waste as a separate and distinct indivisible category . . . due to the fact that special wastes have large volume but low hazardousness. The cabinet's regulations for the generation, transport, recordkeeping, reporting, treatment, storage and disposal shall reflect those distinct differences.

K.R.S. 224.50-760.

Kentucky has adopted a separate chapter of waste regulations governing special wastes, at 401 Kentucky Administrative Regulations (KAR) Chapter 45. Management, processing, and disposal of special waste requires a permit and financial assurance. Siting and design requirements are outlined.

Formal permits are required for special waste landfills, landfarming operations, and composting operations. 401 KAR 45:010 Section 1(9).

While formal permits are required to obtain formal permits and to comply with financial responsibility, design, operating, and closure obligations, two categories of special waste facilities are largely exempt from these obligations. Special waste "permits by rule" allow management of coal combustion wastes without application for a permit for "special waste impoundments in substantial compliance with KPDES permits," 401 KAR 45:060 Section 1(4) and for "disposal of coal combustion fly ash, bottom ash, and scrubber sludge in an active mining operation, if the owner or operator of the mining operation . . . has a mining permit issued under K.R.S. Chapter 250 that includes the disposal of special waste; and . . . complies with the conditions of the mining permit," 401 KAR 45:060 Section 1(6); and for "beneficial reuse of coal combustion by-products as an ingredient or substitute ingredient in the manufacturing of produce, including but

not limited to, cement, concrete, paint, and plastics; antiskid material; highway base course; structural fill; blasting grit; roofing granules' and mine stabilization and reclamation material" provided that the utilization of the wastes does not cause a nuisance, erosion and sedimentation measures are undertaken, the use isn't within 100 feet of streams, 300 feet of water wells, floodplains or wetlands, the generator characterizes the nonhazardous nature of the coal combustion by-products, and an annual report is submitted. 401 KAR 45:060.

Additionally, a category of "special waste registered permit-by-rule" is created under 401 KAR 45:0070 that allows for an undefined category of "beneficial reuse of special waste not specified in" the permit-by-rule regulation.

The contrast between requirements for a special waste landfill and permits-by-rule is stark. The former category requires that the engineering design demonstrate compliance with environmental performance standards to protect surface and groundwater based on the physical and chemical characteristics of the waste, evaluation of the hydrogeology of the site, and proximity to surface and groundwater. 401 KAR 45:110. Where the state agency determines it necessary based on waste or site characteristics, surface and groundwater monitoring may be required. Where it is required, groundwater monitoring must accurately analyze the groundwater quality and regional and local groundwater flow system, and at a minimum include one background and two downgradient wells, sampled semiannually for chloride, COD, TDS, TOC, specific conductance, pH, and copper. Ironically, baseline groundwater monitoring for coal combustion waste landfills requires those parameters and nickel, zinc, iron, sodium, arsenic, cadmium, lead, mercury, selenium, calcium, magnesium, potassium, sulfate, bicarbonate and carbonate. Buffer zones are provided to protect intermittent and perennial streams, sinkholes and karst features, and property lines from special waste placement.

In contrast, "beneficial reuse" of coal combustion wastes are governed in an after-the-fact manner in which scant advance review of proposed uses occurs, and no groundwater or surface water monitoring nor baseline sampling is required. Characterized as "drive by permitting," beneficial reuse permits by rule rely on complaint-based allegations of violations of the environmental performance standards of 401 KAR 30:01 to trigger regulatory scrutiny.

Disposal of coal combustion by-products at surface coal mining operations in the Commonwealth of Kentucky is governed by a specific statute, K.R.S. 350.270, which requires extensive site characterization, evaluation of hydrology, chemical and metals testing of the coal combustion byproducts and of surface and groundwater, performance bonding, isolation from surface and groundwaters, and other design and performance standards.

Anecdotally, it has been suggested that the rigorous nature of the requirements for disposal of coal combustion byproducts at coal mines in the Commonwealth has led to disposal in surrounding states where such standards are more lax. But for the historical fact that the coal industry sought to adopt a statute governing coal combustion byproducts

at coal mines during the same time period that a controversial proposal was pending to backhaul coal ash from a Tampa Florida power plant for disposal in a hollow in the eastern Kentucky area that was represented by the Chair of the House Committee that had jurisdiction over the coal industry-backed bill, the state law might have been enacted with far less protections.

Attachment B-8

**Analysis of the Deficiencies of Ohio
Law and Regulations
Governing the Use and Disposal of Coal Combustion Waste**

**Prepared by Jeffrey Stant
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**Prepared in response to:
US EPA, Notice of Data Availability
72 Fed. Reg, 49,714
August 29, 2007
RCRA Docket No. EPA-HQ-RCRA-2006-0796**

Submitted February 11, 2008

Introduction:

Notwithstanding whatever approach has been taken in the DOE/EPA report to assert that Ohio has been strengthening its regulation of CCW, basic standards driving the regulatory oversight of coal ash in Ohio are actually weaker today than they were in 1982. A relaxed threshold for what constitutes a nontoxic ash exempted most CCW disposal facilities from meaningful safeguards in 1982. Guidance policies were developed nonetheless for facilities taking nontoxic fly ash and bottom ash that were being enforced in Permits To Install by Ohio EPA's Water Pollution Control Program for two decades. However those guidance policies were thrown out by the Director of OEPA in April 2003 as illegal rules, leaving no standards to enforce at most CCW disposal sites in Ohio. Aside from this broad and widened regulatory gap, a closer examination reveals further that OEPA has rarely been requiring engineering safeguards such as liners or leachate collection/detection at surface impoundments.

Stronger Regulatory Posture from 1969 through 1982:

The State of Ohio adopted solid waste regulations in July 1, 1969 that prohibited the open dumping of solid wastes such as coal combustion wastes, CCW, under ORC 3734.01 and 3741.02. The regulations implementing this prohibition were HE-24-06, administered by the Ohio Department of Health. After the Ohio EPA was established in 1972, the regulations addressing industrial wastes such as CCW were transferred to OEPA's jurisdiction as OAC 3745-27 and 3745-37 (OAC stands for Ohio Administrative Code) effective July 29, 1976. From July 1, 1969 until March 19, 1969, Ohio environmental regulators considered ALL coal ash to be a solid waste and its disposal outside of the regulations was considered open dumping. Generators, property owners and/or haulers engaged in open dumping of CCW were cited for violations under ORC 3734 (the law) and required to move the CCW away from surface water sources, grade it to provide positive drainage and cover it with two feet of well compacted earth.

A revision of ORC 3734 was enacted which added an exclusion of "nontoxic" foundry, fly ash and bottom ash from coal combustion to the definition of solid waste in ORC 3734.01 (E). The regulated community requested that OEPA clarify the definition of "nontoxic" in analytical terms. In response, OEPA's Office of Land Pollution Control (OLPC) issued OLPC Policy – Disposal of Fly Ash and Foundry Sand on March 27, 1980. For coal ash, this Policy required that the ash be subjected to leaching tests developed by USEPA. Initially the test was the EP-Toxicity Procedure and it was replaced later with the Toxicity Characteristic Leaching Procedure although in both cases, an allowance was made to use distilled or deionized water to more closely mimic disposal settings. Levels of arsenic, cadmium, chromium, lead and selenium could not leach in the tests in concentrations exceeding Drinking Water Standards.

The regulated community lobbied for a higher regulatory threshold than Ohio's Drinking Water Standards (which were identical to the federal MCLs) for the limit of metals that could leach under the nontoxic exemption. As a result, a revision was made

by OEPA's OLPC on January 4, 1982 in Policy for Disposal of Fly Ash and Foundry Sand. When the revised Policy was issued is not clear, although a directive implementing it from the Director is dated October 20, 1982. This revision raised the regulatory threshold or ceiling for what constituted a "nontoxic" ash from the drinking water standard to 30 times the Drinking Water Standard for these five metals and added barium and mercury to the metals to be analyzed for in the test. *Thus 26 years ago, the threshold for CCW that came under enforceable safeguards in regulations was substantially tighter in Ohio than it is today.* Nonetheless OEPA regulators used this Policy to require some siting criteria for sites taking nontoxic ash. The policy stated,

If an analysis demonstrates that the leachate levels are less than those listed above, the wastes are not regulated by ORC Chapter 3734. However the use of sand and gravel pits, quarries, wetlands, flood plains and other places where disposed wastes could be in intimate contact with ground water should be avoided.

Upgraded Administrative Guidance Policies Have Been Revoked:

Substantial further revisions were made to the Policy on August 1, 1988, issued as Ohio EPA Policy No. 407, Design Criteria: Disposal of Non-Toxic Fly Ash Bottom Ash, Foundry Sand, and other Exempt Waste. This substance of this policy was transferred over to OEPA's Division of Surface Water (DSW) in late November, 1994 and subdivided into two separate policies, one addressing reuse (Policy DSW 0400.007: Beneficial Use of Non-Toxic Bottom Ash, Fly Ash, and Spent Foundry Sand and Other Exempt Waste) and the other disposal (Policy DSW 0400.028: Disposal of Non-Toxic Bottom Ash, Fly Ash and Spent Foundry Sand, and Other exempt Waste).

Policy DSW 0400.028 said that detailed plans and applications for Permits To Install, Air Permits to Operate and NPDES Permits should be filed for nontoxic ash sites. It established siting criteria to keep nontoxic ash disposal sites away from drinking water aquifers and wells and out of sand and gravel pits, limestone or sandstone quarries and geologically unstable areas. The policy called for an isolation distance to the uppermost aquifer of not less than five feet of in situ or added geological material acceptable to the Director. In addition the policy called for a recompacted soil liner at least 1.5 feet thick with a maximum permeability of 1×10^{-7} cm/sec and a leachate collection system "for the entire disposal area, with the contaminated drainage directed to a waste water treatment facility." Ponds used for waste water treatment and storm water collection had to be double lined or use three feet of material with a permeability of 1×10^{-7} cm/sec or less. The ponds had to hold all water generated by a 10 year, 24-hour storm event that would drain to them from the surrounding watershed and be supplemented with diversion ditches to convey rain water from peak storm volumes "around the perimeter of the disposal area to minimize the contact of clean, off-site runoff with the waste fill." The Policy also said that a Storm Water Pollution Prevention Plan and a NPDES Permit with water quality based controls for sulfate, TDS and eight RCRA metals would be necessary. It said that, "the need for control of fugitive dust shall be addressed in an air permit to install and permit to operate, coordinated with and reviewed by the Division of

Air Pollution Control in the district office.” It went into detail about the thickness and slope of covers needed over the ash. It required a management plan “that details the operation of the facility.” And it stated that groundwater monitoring may be required at the discretion of the district office. Finally under “General conditions,” the Policy stated,

Fly ash, bottom ash, and/or foundry sand may not be used for indiscriminate dumping or fill.

Ash disposal should only occur in dedicated disposal areas approved by Ohio EPA.

Policy DSW 0400.007 allowed for beneficial uses of nontoxic fly and bottom ash including structural fills but specified that such uses, “cannot create a nuisance condition. The waste may not be used in a manner that is likely to cause an adverse impact to public health or the environment.” A Category 4 of Beneficial Use under the Policy required approval by the OEPA’s DSW of beneficial use applications and among other steps stated,

3. [The Application shall] Demonstrate that the intended use will not adversely affect public health or the environment.

5. The Ohio EPA Division of Surface Water, after considering the potential for water pollution, shall notify the applicant of the final determination on each beneficial use request in a timely manner.

6. The Ohio EPA may require discontinuation of a beneficial use if it is found that the beneficial use is being conducted in a manner inconsistent with the original request, or whenever the beneficial use is adversely affecting public health or the environment.¹

In 2001, Burger Environmental Inc. submitted a “beneficial use” application to Ohio EPA requesting authorization to use as much as 7,000 tons of bottom ash as cover and stabilization for its construction and demolition landfill. The landfill sits in an old gravel pit and is unlined. Ohio EPA’s Division of Surface Water in the agency’s Southwest District Office denied the request on the grounds that the proposed use of coal ash posed a threat to a sole-source aquifer, the Great Miami/Little Miami River Basin Buried Valley Aquifer, lying directly underneath the landfill. Ohio EPA stated

Based on the process used for beneficial use requests that exists now the site proposed has been reviewed by members of the Division of Drinking and Groundwaters, and Division of Solid and Infectious Waste Management. The proposed site is located above a sole-source aquifer. Based on the above information, the Beneficial Use requested in this proposal is denied.²

¹ Copies of OEPA Guidance Policies on nontoxic ash and foundry sand are maintained at Ohio EPA’s Northeast District Office (NEDO) in Twinsburg Ohio. Contact Bill Zawiski of the Division of Surface Water at 303-963-1134. This discussion also relied partly on a chronology of the Policies provided in Interoffice Memorandum from staff of NEDO “Re: Applicability of OAC 3745-27-13 to Historical Foundry Sand Disposal Sites and Solid Waste Disposal Sites, Cleveland Hopkins International Airport Property,” March 12, 1998.

² Letter, OEPA, Southwest District Office to Kit Cooper, November 14, 2001.

Burger Environmental filed a complaint against Ohio EPA in 2003 alleging that the agency cannot assert protection of groundwater as a reason to deny a beneficial use permit. Burger asserted that Ohio EPA is statutorily prohibited from creating new requirements within policy statements and that district offices are statutorily prohibited from creating their own policies. In denying the beneficial use application, Burger asserted that Ohio EPA created a new requirement in violation of the statute, that being the protection of a sole source aquifer.

In response to the complaint, Ohio EPA revoked the "Beneficial Use Policy" (DSW Policy 0400.007) on April 16, 2003 because, according to the Director of Ohio EPA, "After careful review and consideration, I find that that DSW Policy 0400.007 does, in fact contain certain affirmative requirements that have not been established in statute or rule." The director acknowledged his District Office's concerns that the ash would pose a threat of contamination to the aquifer and subsequently asked Burger to demonstrate how the company will assure that the material will not result in a discharge to groundwater. The Ohio EPA Director, however, sided with Burger asserting that a requirement to protect a sole source aquifer was not set forth in the Policy, not promulgated as law or established by regulation, and cannot therefore be used legally to deny a beneficial use application, even if the DSW believed placing bottom ash into an unlined quarry directly over this sole source aquifer would pose the potential for water pollution that would adversely affect public health or the environment.

The aquifer in question is a drinking water supply used by hundreds of thousands of Ohioans over a ten county area. There is little to no separation between the bottom of the quarry and this aquifer. Subsequent to the Director's revocation of DSW Policy 0400.007, the OEPA's southwest Office asked Burger Environmental to make a demonstration that its application to use bottom ash at this site would not pollute groundwater in violation of Ohio water pollution law, ORC 6111. Burger chose not to respond to this request and instead has proceeded to place bottom ash into this construction and demolition debris landfill as fill in the quarry.³

In revoking the Beneficial Use Policy as violating the state's rulemaking act, the Director of OEPA also revoked the Policy for Disposal of nontoxic coal ash, DSW-0400.028 on April 30, 2003, placing dozens of Permits to Install and other permits granted for nontoxic ash sites and the environment they were issued to protect in jeopardy.⁴ Collectively, these permits would appear to cover a large component of the CCW in Ohio, indeed according to the DOE/EPA report, "virtually all coal ash and slag"

³ Information on the Burger Complaint and subsequent results was gathered from the Complaint, filed with the Director of OEPA on January 17, 2003 pursuant to ORC 3745.30 (D), OEPA letters to Burger Environmental, Inc., dated November 14, 2001 and April 16, 2003 and telephone discussions with Jim Simpson, District Manager, Division of Surface Water, Ohio EPA Southwest District Office, February 11, 2008.

⁴ Notice regarding removal of DSW-0400.028 from Division of Surface Water Policy Manual, which also states that OEPA is "considering addressing this topic in a future rulemaking." For more information, contact Ohio EPA, Division of Surface Water, Permits and Compliance Section, P.O. Box 1049, Columbus OH, 43216-1049, phone 614-644-2001.

generated in the state. Consequently, when state agencies rely on guidance to protect health or the environment from dangerous applications of ash or when they rely on guidance to impose safeguards on CCW disposal units or operations, the agencies are vulnerable to challenge. Such requirements must be set forth in enforceable regulations, not guidance, if they are to accomplish their objectives.

Liners and Leachate Collection/Detection Have Not Been Installed at Ohio Surface Impoundments:

The DOE/EPA Report refers repeatedly to the authority that regulators have in Ohio to require safeguards at permitted CCW disposal facilities, particularly surface impoundments, on a case by case basis. In other words, while there are no engineering safeguards in regulations for surface impoundments, ORC 6111 and OAC 3745, grant broad authority to OEPA to require them in Permits To Install and in NPDES permits. Such statements were made in Appendix A on page A-25 regarding Permits to Install, in Table A.6 on page A-30 regarding liners, Table A.13 on page A-46 regarding groundwater monitoring, and Table A.15 on page A-57 regarding leachate collection.

An examination of 13 surface impoundments in Ohio found that since the amendment of the Clean Air Act in 1988, only one impoundment had been required by OEPA to install a liner in the entire Buckeye state. That was a 1.5 foot thick clay liner (with a permeability of 1×10^{-7} cm/sec) under one of four impoundments at the Stuart Station in southeast Ohio. An "ancient" clay liner was reportedly installed under the impoundment built nearly 50 years ago at the Bay Shore Plant on Lake Erie in Northwest Ohio although its permeability and thickness are unknown. A very old liner, of recompacted clay three feet thick was reportedly installed under the surface impoundment at the Zimmer Power Plant in southwest Ohio. OEPA staff could not state what permit required the liner or indicate what its permeability was -- only that the liner was very old and the clay used was of poor quality, taken from "across the street" from the plant and "up the hill." Not far from the Zimmer Plant, surface impoundments at the Beckjord Plant have contaminated a public water supply well in the Pierce Union Batavia Wellfield with high sulfates for years. CG&E has refuse to line the impoundment causing the problem even though this is a practical option given Beckjord alternates between two impoundments and could repair the problem while relying on the other impoundment. Opting for an easier path of letting the contamination of a public water supply aquifer continue indefinitely, authorities have instead converted the contaminated well into an interceptor well discharging its water into the Ohio River to keep contaminants from spreading to other wells.

Rather than an artifact of modern regulation, lined surface impoundments in Ohio are a fiction. Not surprisingly, without double liner systems, leachate collection/detection systems have been entirely absent from any surface impoundment in Ohio.⁵ Thus in

⁵ Information on surface impoundment safeguards was provided in data bases from the Southeast Ohio District Office Division of Surface Water/Permit Section and telephone discussions with staff in Southeast, Southwest, Northeast and Northwest District Offices from February 4 through February 11. The Clean Air Task Force will forward those data bases upon request.

Ohio, a state that has strengthened its regulation in all six areas measured according to the DOE/EPA Report (see Table S-2 on page S-8), two of the key safeguards that, according to USEPA's Draft Risk Assessment in the NODA, are needed to protect people and the environment from the highest dangers posed by CCW, are completely nowhere to be found. ***There are no double liners or leachate collection/detection systems at the state's numerous coal ash surface impoundments.***

Attachment B-9

February 11, 2008

Notice of Data Availability on the Disposal of
Coal Combustion Waste in Landfills and
Surface Impoundments
Environmental Protection Agency
Mailcode: 5305T
1200 Pennsylvania Ave., NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-RCRA-2006-0796

Dear Administrator Johnson:

By this letter, Clean Air Task Force submits comments concerning the *Notice of Data Availability on the Disposal of Coal Combustion Waste in Landfills and Surface Impoundments* ("NODA") published on August 29, 2007. The following answers to questions prepared on behalf of the Clean Air Task Force by J. Edward Brown, of Virtual Streams Consulting in Iowa, (phone 515-314-6588) reveal weak safeguards and major gaps in the regulatory programs' for coal combustion waste in the states of Nebraska and North Dakota.

Respectfully submitted:

Jeffrey Stant
Director
PPW Project – Safe Disposal Campaign
Clean Air Task Force
217 South Audubon Road
Indianapolis, IN 46219

Phone: 317-359-1306

Nebraska

1. Does the state allow “beneficial use” of CCW as fill, structural fill and road construction material without safeguards?

Nebraska regulations require all solid waste to be disposed of in a permitted solid waste facility. Nebraska Department of Environmental Quality Rules, Chapter 2, Section 002 of Title 132 allows for exceptions and details potential uses as follows:

“002.01A The use of fill for the purpose of erosion control, erosion repair, channel stabilization, landscaping, roadbed preparation or other land improvement; . . .”

Based on this exception in the rule, The Nebraska Department of Environmental Quality has issued an environmental guidance document entitled “Beneficial Use of Coal Combustion By-Products Steel Manufacturing By-Products and Other Similar Materials”. The guidance, the latest version published in March 2007, begins by saying that the beneficial uses are not regulated under Title 132 and therefore do not require approval from the Waste Management Division of NDEQ provided that the materials meet the exemption requirements of Title 128-Nebraska Hazardous Waste Regulations, Chapter 2, 009.03. This reference incorporates EPA regulations and specifically 40 CFR 266.112.

The beneficial uses included are:

- construction or manufacture of products
- hazardous waste stabilization
- ice control (control of ice dams on rivers)
- stabilizing agents and soil modification
- aggregate for roads
- structural fill
- controlled density/slurry fill
- soil amendment
- and feedlot applications.

The guidance notes three specific conditions. First as a hazardous waste stabilizer, the use must comply with Title 128-Nebraska Hazardous Waste Regulations, Chapter 20, Land Disposal Restrictions. When ash is used for ice control preventing ice dams in rivers, the guidance notes that an NPDES permit is required. Thirdly, when ash is used as a soil amendment, the application rate is based upon neutralizing capacity in acid soils at a maximum rate of 10 tons per acre per year. Only in the use within feedlots does the guidance note that the use should not impact surface or groundwater quality. The guidance goes further to provide for application for approval by the department to use ash beneficially for even more purposes than the guidance sets out. In reviewing new potential uses, the department looks to whether the waste is a hazardous waste, whether it

has been contaminated by other wastes, or whether it poses a threat to human health or the environment.

As long as the fly ash is used in one of the listed options, there appears to be no requirement that the department be notified, no monitoring required and no public notification prior to commencement of the activity. The guidance also provides no restrictions based on underlying geologic conditions, placement near water supplies fugitive dust or other environmental concerns beyond the general statement at the beginning of the guidance.

2. How is coal combustion waste regulated in the state? In other words, is it classified as a solid waste, industrial solid waste, "special" waste or in some manner otherwise exempted from most or all regulation under the state's solid waste laws and regulations?

The handling of coal combustion waste is set out in Title 132-Nebraska Integrated Solid Waste Management Regulations, Chapter 4. This is an independent chapter that covers only CCW's. Waste acceptable for disposal under these permits must not be a hazardous waste within the criteria established by EPA in 40 CFR 266.112.

3. Do the state regulations require a solid waste permit for all CCW disposal in landfills and surface impoundments?

Nebraska rules require that facilities operated under this chapter must have permits. There are no particular chapters that have been identified which govern the construction and operation of surface impoundments.

4. Are there state regulations for surface impoundments, and if so do they mandate any safeguards in the construction and operation of these surface impoundments?

As noted in question 3, above, no specific provisions regarding the regulation of CCW impoundments have been located. No staff person from Nebraska DEQ was contacted in completing this document and it is possible that a guidance document exists for impoundments but is not available electronically.

5. Do the state regulations require CCW surface impoundments and all CCW landfills to have groundwater monitoring?

Title 132-Nebraska Integrated Solid Waste Management Regulations, Chapter 4, details several criteria with respect to concerns for groundwater contamination. The regulations in Chapter 4, Section 002 Locational Criteria, discuss an evaluation of the geologic features underlying the proposed site. The regulations require documentation that the landfill operations will be above the maximum water table elevation. It calls for identification of the background and initial quality of

groundwater that could be impacted by the potential zone of influence of the facility. Later in §002.01 the applicant must describe the "groundwater condition" including flow below and adjacent to the facility. All of these elements would appear to require groundwater monitoring, but there is no discussion of monitoring requirements prior to application or following the issuance of the permit.

The regulations do not set out numbers of wells, frequency of monitoring, parameters to be analyzed for or reporting requirements. The application for a permit is to include a map that locates among other things the location of groundwater monitoring wells, but again there is no discussion of where the wells should be and how many are required. The discussion of "groundwater protection" appears to focus on a dual layer compacted earth and flexible membrane system. This requirement also allows the applicant to propose alternative liners. Leachate collection systems are not mandated in every case. Title 132-Nebraska Integrated Solid Waste Management Regulations, Chapter 4, section 005.09 does call for inclusion of monitoring wells as part of a closure plan. Section 006 post closure criteria (§ 006.01D) details monitoring twice annually and requires that the results be reported to the Department.

North Dakota

6. Does the state allow "beneficial use" of CCW as fill, structural fill and road construction material without safeguards?

North Dakota, through its Department of Health, has been allowing beneficial uses for approximately ten years. The program is managed in accordance with the terms of a guidance document that sets out key issues which include the characterization of the ash, details of the proposed use, laboratory simulation of leachability of materials "as placed", site characteristics, potential impacts on adjacent areas, a description of how the placement is going to be accomplished, consideration of contingencies, approval by local governments, and potentially environmental monitoring. In terms of criteria for placement they place particular attention on the geology looking for potential for groundwater contamination--particularly if there are wells nearby.

Use in concrete and road construction is becoming routine and there is not much oversight at this time. Significant amounts of ash are placed in abandoned mines as a slurry mixture of sand, cement and ash. There are no regulations on beneficial use of fly ash and the guidelines are the sole basis for the program. They do suggest that applicants for approval should be familiar with general solid waste rules and the potential for water pollution.

7. How is coal combustion waste regulated in the state? In other words, is it classified as a solid waste, industrial solid waste, "special" waste or in some manner otherwise exempted from most or all regulation under the state's solid waste laws and regulations?

North Dakota deals with coal combustion waste as a "special waste" along with waste from the oil industry.

8. Do the state regulations require a solid waste permit for all CCW disposal in landfills and surface impoundments?

These facilities receive "special waste" or "surface impoundment" permits. The state classifies various facilities and deals with them somewhat separately. Some requirements such as monitoring addressed in question 4 appear less restrictive than for other solid waste sites.

9. Are there state regulations for surface impoundments, and if so do they mandate any safeguards in the construction and operation of these surface impoundments?

Chapter 33-20-08.1-01 details criteria for establishing and operating surface impoundments. The rules provide for alternative requirement which include compacted soil, a combination of compacted soil and underlying soil or a flexible membrane liner. The rules do not require a combination of compacted soil and a membrane. Dikes must be designed "...to maintain their structural integrity under conditions of a leaking liner...". Monitoring is required, but it is physical monthly physical monitoring to observe deterioration or malfunction of control systems, sudden drops in the level of impounded material, or severe erosion, seepage etc. When a malfunction occurs, the operation is to be shut down and immediately repaired. If the leak can't be stopped, the rules call for emptying the impoundment and cleanup of all released waste. The rules require notification of the department within 24 hours. a contingency plan must detail actions to be taken in the event of failure. In the whole section relating to impoundments there is no detailed discussion of monitoring for leachate on any periodic basis and no other reporting requirements except for a reference to Chapter 33-20-13-01 Water Protection Provisions. This chapter deals with site characterization and ground water quality monitoring. In the siting portion there are no specific prohibitions for operation below the water table. In the monitoring provisions, owners must incorporate a groundwater monitoring system into the design, and calls for one well up-gradient and two down-gradient. The rules provide a total exception from groundwater monitoring. "If the owner or operator demonstrates to the department that there is no potential for migration of solid waste constituents to the uppermost aquifer during the life of the solid waste management unit and the postclosure period, the department may suspend this requirement." (Chapter 33-20-13-02.1)

10. Do the state regulations require CCW surface impoundments and all CCW landfills to have groundwater monitoring?

Groundwater monitoring, if required, must be designed as a water quality monitoring system. There are to be at least one up-gradient and two down-gradient wells. Groundwater samples are to be taken prior to acceptance of waste to establish background levels, sampling is required twice annually unless the type of waste,

evidence of leakage or the value of the aquifer dictate more frequent sampling is appropriate. The rules call for the parametric requirements to be set out in the permits. A comprehensive list of potential parameters is in the rules and includes those which would typically be expected in coal ash. If contamination is detected, further monitoring may be required and the owner/operator must begin to develop a set of remedial options within 90 days. The plan options must be identified within a "reasonable" period of time. The options identified are to consider the reliability and ease of implementation, the time required to begin and complete the measures, the cost of implementation, and any permit requirements. If the department requests it, the owner/operator may need to have a public meeting with affected parties prior to selecting the option. The operator selects the alternative for remediation and is subject only to concurrence by the department. The selection process should include the practicality of the measures as well as the operator's capability to complete them. (Chapter 33-20-13-05.3)