

REGIONAL ENVIRONMENTAL CONCERNS WITH DISPOSAL OF COAL COMBUSTION WASTES (CCW) AT MINES

Tom FitzGerald
Kentucky Resources Council, Inc.
Frankfort, Kentucky

Background

In the interests of full disclosure, I am Director of a nonprofit environmental advocacy organization, the Kentucky Resources Council, which has for 20 years provided legal and technical assistance without charge to low-income individuals and communities on air, waste, water, and resource extraction issues. I joke that no one calls us when they're having a good day, and because of that, my perspective tends to be somewhat jaundiced. In mining and coal waste disposal matters, KRC represents people living downhill, downwind and downstream.

Before presenting in brief my concerns, let me apologize that I will not be able to stay for questions – the state Public Service Commission has scheduled a siting hearing on a proposed coal-fired merchant power plant this morning, and I am obligated to be there.

Lisa Evans will present a national perspective on coal combustion waste issues – I have been asked to give the regional perspective concerning the regulation of disposal and beneficial reuse of coal combustion wastes. My perspective, from 31 years of mining-related advocacy on behalf of communities and injured homeowners, and from 23 years as an attorney representing injured parties in a number of coal waste-related cases, is straightforward and simple.

If you want to encourage reuse of coal combustion wastes then you should embrace uniform, comprehensive and appropriate standards for the characterization and management of coal combustion wastes for reuse and disposal.

USEPA must cease its flirtation with issuing guidance and instead assert regulatory authority over the disposal of coal combustion wastes and over beneficial reuse of such wastes, developing minimum standards for the states to adopt in order to level the playing field. EPA must take the lead since it, rather than OSM is the appropriate agency to develop national minimum standards and assure state implementation of standards for disposal and other land application of coal combustion wastes in mine pits and backfill.

EPA MUST LIVE UP TO ITS COMMITMENT TO REGULATE CCW

In the absence of EPA stepping in and completing the commitment it made some years ago to avoid Subtitle C hazardous waste regulation by assuring proper application of Subtitle D solid waste regulations to coal combustion wastes, we have had, among the very competitive coal producing States, a very predictable one-downsmanship in the area of environmental quality and environmental protection when it comes to the management of these wastes. The under-regulation of CCW, particularly of the beneficial use of these wastes, is a problem. In Kentucky, where we have a fairly decent regulatory framework for the regulation of co-disposal of coal

waste at mine sites, we have, as do many of the States, a superficial "drive-by" permitting of coal combustion waste beneficial reuse. The potential toxicity and the fate and transport of constituents of concern is not given the sort of attention that it should have in light of the intended end uses and disposal or beneficial reuse of these materials.

Why embrace comprehensive regulation of CCW beneficial reuse and disposal? The lack of comprehensive regulation engenders a suspicion from the host communities. For example, we had a situation where one of the major industrial entities in Jefferson County had been disposing its boiler waste (a CCW) by delivering the ash to a company who commingled the ash with spent concrete waste and disposed of the mixture in a dry cavern in Louisville, where it was being used to elevate the floor of the former mine for document storage. The coal company who was supplying the fuel underbid that process in order to secure market share. The coal company was trying to offer a package of selling the coal and providing the service of hauling the ash back – a situation not atypical in this current market. In order to make the contract viable, the coal company proposed to dispose of the CCW as roadbed material at a farm in a nearby county and to use the material for agricultural application. The use of this material for agriculture is one area where EPA had expressed significant concern in its recent analysis because of the levels of arsenic. In this instance, we were fortunate that the county had zoning and planning powers and denied the application. The material is now going back into the cavern where it is properly managed in terms of the fate and transport potential of the constituents of concern in the waste.

As Jeff Stant and Lisa Evans will address, sufficient evidence exists of contamination from disposal of coal combustion wastes to warrant promulgation by EPA of national management standards.

The uneven and inadequate state regulation of disposal of coal combustion wastes, including a failure of states to require adequate background characterization of geologic and hydrogeologic conditions relative to the disposal of these wastes, and the haphazard characterization of the fate and transport of these wastes under proposed disposal and "reuse" conditions, is the inevitable product of the failure of USEPA to establish a federal "floor" of regulation of coal combustion wastes.

The problem is that the short-term interests of those that are managing or disposing of the wastes are not necessarily consistent with the long term interests of either the host communities or the generators of these materials. It is of interest to note that, when we were negotiating Kentucky's bill on this issue, most of the in-State utilities had no desire to let the coal mining industry manage their wastes. They said they would manage their wastes and the long term liabilities connected with them in contained facilities or on-site rather than allow them to be commingled with backfill materials at coal mines.

FEDERAL REGULATION NEEDED INSTEAD OF GUIDELINES

Unfortunately I have to depart from the position of the Jeff Conrad and the Interstate Mining Compact Commission that guidelines at the national level rather than regulations are an appropriate solution. The failure of EPA to promulgate regulations establishing minimum standards for coal combustion waste disposal, including "beneficial" uses of coal combustion

wastes and the disposal of coal combustion wastes at mine sites, and the proposal to instead issue "guidance" raises a number of concerns.

First, a lack of federal minimum standards results in uneven state standards and under-regulation of wastes that typically exceed drinking water standards for a number of metals. Kentucky, for example, has more rigorous standard for mine filling, but extremely weak controls on beneficial reuse and disposal in "ash ponds." The lack of federal minimum standards has and will continue to result in one-downsmanship and a "race to the bottom" among the coal states, as companies desirous of securing market share from the purchaser of the lion's share of their output, the utility industry, offer to backhaul and dispose of coal combustion wastes as a package deal;

Second, issuance of national guidance is insufficient to assure proper management of these wastes, since many states have "no more stringent" provisions that would prevent states from extending regulatory authority over disposal of the wastes to incorporate federal guidance, since states can adopt and impose only those standards that have been adopted by regulation at the federal level. Also, some states cannot under state law impose substantive requirements based on "policies."

Third, the lack of minimum standards penalizes utilities who manage wastes under higher standards relative to their brethren who allow disposal of coal wastes by the coal industry either for "beneficial" uses or as mine fill.

Fourth, the lack of standards heightens conflicts between host communities and the utility and coal industry due to concerns with under-regulation of the coal combustion wastes relative to their potential to leach metals and other constituents at levels posing environmental or health risks.

Finally, the failure of EPA to assert federal leadership in establishing up-front baseline standards for management of the disposal of coal combustion wastes invites significant judicial intrusion into the field, and implicates the disposers, transporters and generators in a web of liability that is as open-ended as are the state management programs themselves.

THE ROLE OF EPA AND SMCRA

With respect to disposal of coal combustion wastes in mining areas, KRC must respectfully part ways with Kimery, who by now is *wondering why he invited me*. *KRC believes that SMCRA is not the appropriate vehicle for management of co-disposal at coal mines*. OSM's authority under SMCRA is not sufficient, standing alone to manage coal mine co-disposal, and was not intended to supplant EPA's responsibility under RCRA for management of such wastes.

Disposal of coal combustion wastes is of particular concern at coal mines. The available evidence suggests that disposal of coal combustion wastes in mine pits or other workings may be of particular concern, due to a number of factors: the increase in surface area available for leaching of elements resulting from fracturing of overburden and confining layers; higher total dissolved solids levels in mine spoils that compete for sorption sites on solids with toxic elements released from the buried ash; direct communication between surface and underground

mine workings and aquifers through stress-relief fracture systems and subsidence-induced fracture flow; the dependence of residents of coal-bearing regions on private, groundwater supplies and the significant potential for contamination of those supplies; and the presence of site conditions conducive to creation of acid or toxic-forming material that can solubilize constituents of concern from the waste.

The information concerning the leaching potential of these wastes, the vulnerability of coalfield groundwater resources, and the documented cases of damage are sufficient to allow for immediate action by USEPA and control such wastes where co-disposed in coal mines. Coal combustion wastes containing leachable metals at levels well above accepted drinking water standards for safe potability of water, yet are in some states being placed indiscriminately in unlined backfills of coal mining operations in direct communication with groundwaters, and without proper characterization, isolation, management, closure, financial responsibility, monitoring and post-closure corrective action requirements attendant to such wastes.

It must be acknowledged and understood that the "driver" concerning the disposal of coal combustion wastes backhauled and disposed of in mine workings (including both underground mine voids and more commonly, in surface mine backfills or spoil/mine waste fills) is *not* the inherently preferential beneficial attributes of the wastes relative to other backfill materials, or the lack of alternative locations available to utilities and non-utility customers for coal combustion waste disposal. It is the coal industry seeking to improve its position by offering backhauling and disposal as a "service" or incentive in order to attract buyers for their coal in an increasingly competitive marketplace.

Many areas in which mining occurs are those in which individuals and small community water systems rely on groundwater for domestic and other beneficial uses, including irrigation, livestock, commercial and institutional uses. The dependence of residents of coal-bearing regions on private, groundwater supplies and the significant potential for contamination of those supplies due to groundwater regimes characterized by highly transmissive secondary (fracture) permeability make the supplies highly vulnerable to contamination and disruption from mining.

Potential impact on utility consumers of passed-through costs of future remediation of areas where such wastes are under regulated and disposal contaminates land or water resources.

What is needed to properly regulate CCW disposal at mines? Such controls should include a prohibition on open-end dumping of coal combustion wastes in mine backfill, characterization of the waste, a requirement for controlled placement in a discrete, properly engineered and lined land disposal facility, groundwater monitoring, leachate collection, closure and post-closure care, and financial responsibility.

When EPA determined that issuance of regulations under Subtitle C of RCRA was not necessary to adequately manage the environmental risks associated with disposal of coal combustion wastes, it premised that determination on the assumption that the environmental performance standards and protections of Subtitle D would be extended to the management of that industrial waste stream.

EPA's failure to implement that commitment and to promulgate regulations establishing minimum standards for characterization and management of the waste streams associated with combustion of coal has had significant adverse environmental consequences; consequences which will continue absent fulfillment of that commitment by EPA.

My experience in litigating cases involving coal combustion waste management, both in disposal at mine sites, and disposal through so-called "beneficial uses," has convinced me that national standards and accountability to adopt, administer and enforce those standards under RCRA is essential to assure that the wastes are managed to prevent environmental and public health impacts. The Surface Mining Control and Reclamation Act of 1977 is not the appropriate vehicle to regulate these wastes. SMCRA was neither intended nor designed to handle these materials. You would need a significant overhaul of SMCRA in the way you characterize and manage CCW in order to make this program fit.

A number of provisions of SMCRA are implicated in any proposal for disposal of CCW at a mine site. For example, no CCW can lawfully be placed in a location where it would displace spoil and cause more material to be disposed of in a hollow fill, because such additional spoil displacement would violate the requirement that all spoil generated by the mine be returned to the mined area except excess spoil.

Additionally, the requirement for contemporaneous reclamation would be offended by any delay in reclamation associated with disposal of coal combustion wastes in active mining and reclamation areas. Placement of coal combustion wastes in backfill without proper barriers to prevent migration to groundwater and to prevent saturation of the waste from infiltration of rainfall or groundwater would also violate provisions of the law addressing protection of the hydrologic balance and prevention of off-site damage, through isolation of acid- or toxic-forming materials from surface or groundwater.

Congress did not direct that SMCRA take the lead in disposal of CCW, they directed EPA to take the lead. SMCRA's mandates are supplemental to but are not designed to supplant RCRA and EPA's role in standard-setting. Current SMCRA regulations do not fully address issues of proper characterization of, and long-term management of CCWs, and would need modification to fully account for the use of the mined area for waste disposal.

SMCRA does not contain a requirement that the chemical, physical, and radiological characteristics of the non-coal wastes be assessed, or the fate and transport mechanics of those wastes;

The groundwater monitoring requirements are not designed to identify the presence of and migration of constituents of concern from disposal areas; and do not test for the full panoply of constituents needed to assess the presence of CCW constituents. The groundwater system in many coal fields is particularly vulnerable to contamination because of the high transmissivity of the fracture-dominated aquifer system, and because of the high degree of interconnection of aquifers through subsidence-induced deformation of strata above underground coal seams.

The duration of monitoring and bonding for coal mines is far too short relative to the timeframe needed to demonstrate that the disposed wastes have been properly isolated to prevent off-site contamination.

Issues concerning right-of-entry and responsibility for contamination could be complex since SMCRA's enforcement, insurance, bonding and right-of-entry provisions are focused on mining regulation.

To satisfy the surface coal mining regulatory program obligations under federal and state law of protecting the hydrologic balance on and off the mine site, a broad array of metals and any other constituents identified through chemical characterization of the composition of the coal combustion waste, would need to be imposed as monitoring parameters for on-going groundwater and surface water monitoring. Each of the 17 potentially toxic elements are commonly present in CCW: aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, mercury, molybdenum, nickel, selenium, vanadium, and zinc, other metals present, radionuclides, and in the case of fluidized bed combustion (FBC) wastes, volatile and semi-volatile elements would need to be assessed.

The placement of groundwater monitoring wells would need to be sufficient to detect leachate generation and movement off-site at the bench elevation and through fracture systems, for strip mine bench disposal, and along and below the seam for pit disposal. Monitoring parameters and well location must be altered to detect contamination at the waste boundary, necessitating continuous monitoring wells along the area where the waste is disposed. Blending of mine wastes with spoil constitutes open dumping that is prohibited under state and federal law.

Disposal of coal combustion waste on a mine site, where a part of a surface coal mining operation, would need to be subject to **all** of the procedural protections, including demonstration of the right to enter and conduct such disposal activities, and all enforcement procedures of the federal Act and state regulatory program attach.

Long term site maintenance and groundwater monitoring after mining bond release would need to be addressed.

Separate approval by the landowner and local government for disposal of the material. No CCW should be allowed on an active Title V permit absent public notice and a public comment period. There is a concern that CCW disposal is added to a mine permit by minor modification, and OSM could clarify that, at a minimum, inclusion of non-coal waste disposal of any kind on a mine site is a major modification.

Finally, financial responsibility requirements would need to be addressed, since the performance bond guarantees only reclamation under Title V and is neither calculated nor liable for on of off-site damage and reclamation needed to address the CCW disposal. Separate bonding, insurance, and long-term financial responsibility is needed.

In sum, the placement of uncontrolled and unconsolidated deposits of coal combustion waste in mine backfills, valley or hollow fills, or underground mine voids, is irresponsible. The

groundwater system in many coal fields is particularly vulnerable to contamination because of the high transmissivity of the fracture-dominated aquifer system, and because of the high degree of interconnection of aquifers through subsidence-induced deformation of strata above underground coal seams. Ample hydrologic evidence is available to suggest that further co-disposal of coal combustion wastes should be prohibited pending development of sufficient standards for the characterization, management, placement and monitoring of such disposal and that EPA should move promptly to develop such standards.

A program developed under RCRA Section 3004(x) should, among other things, provide for: separation and proper disposal of other fossil fuel-related wastes, such as FBC wastes, that may contain residual unburned organics not associated with typical coal ash. Greater scrutiny is warranted for FBC waste, which as noted in the Boulding Report presents a higher potential for leaching elements of concern; and wastes generated through the firing of hazardous waste fuels and waste oils with or without coal, and those which are fired or co-fired with waste tires and refuse-derived fuel. Each of these categories adds constituents to the combustion process which may significantly increase the hazards of improper disposal of the waste, including a range of products of incomplete combustion of chlorinated and other synthetic organic compounds that warrant extensive analysis, characterization and careful management beyond that necessary for coal combustion waste.

Clarification should also be provided that coal combustion wastes do not include utility wastes such as metal and boiler cleaning wastes, nor other wastes generated from power plants beyond those directly resulting from combustion of coal and control of emissions from the combustion process.

All coal combustion wastes to be screened for radionuclides and managed as low-level radioactive wastes in accordance with the applicable state and federal laws, where those wastes exhibit activity that is above background levels. Coal combustion waste which contains elevated radionuclides is properly classified as technologically-enhanced low-level radioactive waste.

No disposal should be allowed absent the complete characterization of the waste stream(s) proposed for land disposal, and assurance that the engineering design of the disposal facility will assure compliance with the environmental performance standards (including no contamination of aquifers above drinking water standards and no increase in groundwater of any constituents above background levels of those contaminants). Whenever possible the chemical and physical composition of the actual waste stream that will be produced by the combustion process at the utility from which the waste will be generated, should be used for testing.

In order to properly design a facility for disposal of coal combustion waste, the full extent of the characteristics of the waste must be known, and the leachate potential must be established by use of appropriate modeling of the disposal site, the amount of rainfall infiltration, the pH of the waste and associated materials through which the rainfall will pass, and a hydrogeologic investigation into the location, extent, and characteristics of the surface and groundwater systems at the site.

Groundwater monitoring must be sufficient to allow for prompt detection of leachate migration at the waste site (and not the mine) boundary. Monitoring parameters and well locations must be such that they are appropriate to the area in which the waste is disposed.

Finally, blending of mine wastes with spoil in the backfill, rather than controlled placement of the wastes in a designed facility should be treated as prohibited open dumping.

CONCLUSION

I end where I began. If you want to encourage the beneficial reuse of CCW, make sure that the characterization is sufficient to address the long term concerns of leaching and mobility of organic and inorganic materials from the waste. In particular, as the composition of the waste changes when we impose stricter controls on airborne emissions, we will of necessity change the composition and potentially increase leachate toxicities. The best way to improve the beneficial utilization is to approve adequate comprehensive safeguards so that we will not be undercut in the market place by those more interested in short term economic gain rather than the long term public interest.

Tom FitzGerald is the Director of the Kentucky Resources Council, Inc. a non-profit environmental advocacy organization providing free legal, strategic, and policy assistance to individuals, organizations, and communities concerning environmental quality and resource extraction issues. He holds numerous appointments on State and National environmental advisory organizations. He holds a Juris Doctor degree from the University of Kentucky, College of Law, is an adjunct professor of energy and environmental law at the University of Louisville, Brandeis School of Law, and has authored numerous articles on the citizen perspective of environmental issues related to coal mining and reclamation.