Environmental Health Policy Institute

Coal Ash in Minefills

By Petra Wood and John Wood

This essay is in response to: How toxic is coal ash, the waste material left after coal is burned? How does it come to poison the waters and dust the land in communities across the nation? And what can be done to prevent further toxic contamination?

We live in northern West Virginia where minefill disposal of coal ash is pervasive. In the early 1990's, a beneficial-use rider in the WV Solid Waste Management Rule (The Rule)[1]legislated that surface mines reclaimed with coal combustion by-products need not have leachate liners nor water-treatment systems other than for acid mine drainage (AMD) parameters (i.e., pH, iron, manganese, and aluminum). The rider externalizes the costs that should be imposed on the extractive and electrical-generating industries, allowing them to freely dispose of their waste in unregulated landfills rather than have to pay for the containment and treatment of surface and ground water pollutants that The Rule was intended to regulate. We initially thought this was a local issue, but we now know that improper disposal of coal ash is occurring throughout the US and adversely affects the health of humans and the environment.

In our watershed, Scotts Run, about 23% of the total land area is already composed of coal ash minefill dumps. Up to 10,000 tons per acre have been dumped on at least 3,500 acres of reclaimed surface mines in the last 12 years in three watersheds near the community of Cassville. Hundreds more minefill acres are being added every year. The high-sulfur coal being mined near our home is burned with limestone at a local "alternative energy" fluidized bed combustion (FBC) power plant. The FBC method removes 90% or more of the toxic metals (mercury, arsenic, boron, beryllium, thallium, etc.) from the smoke stack emissions, but concentrates them in the ash. This highly alkaline, contaminant-laden ash is then deposited back in surface mines as a "beneficial use" byproduct, which makes it legal to strip mine these high-sulfur coal seams. Were it not for the special exemption in The Rule, the high-sulfur coal seams in and around Cassville could not be mined.

The bottom of this West Virginia mine pit is being covered with a layer of coal ash from a coal-fired power plant. While some minefill involves dumping coal ash into deep mineshafts, in this instance and many others the ash is dumped into the pit of a surface mine. This results in exposure to the water table, increasing the likelihood of toxicants leaching into groundwater; runoff from precipitation, posing a threat to surface waters; and a high risk of airborne ash. Coal ash disposal can generate dangerous quantities of so-called "fugitive dust," whether due to dumping or to coal ash transport. The coal ash is brought to this minefill by truck, and the authors estimate that during working hours, an ash truck leaves the power plant about every 7 minutes. Several homes lie within about 500 feet of this surface mine; many more lie along the roads to the mine. All are exposed to fugitive dust.

The Rule assumes that coal ash is beneficial in minefills because it reduces AMD and ignores studies documenting that toxic metals concentrated in coal ash are leaching into groundwater and surface waters. Studies by the National Academy of Sciences (nationally),[2]the Clean Air Task Force (Pennsylvania),[3]and Downstream Strategies (West Virginia)[4] found high concentrations of toxic trace metals and total dissolved solids (TDS) leaching from coal ash dumped on surface mines. At the same time, the Pennsylvania study found that AMD was not reduced at half the mines examined. Analysis of surface water monitoring data from a northern West Virginia coal refuse area that was reclaimed with approximately 1.5 to 2.2 million tons of coal ash revealed antimony, arsenic, lead, selenium, and thallium concentrations that were 2-140 times greater than WV State water quality standards (WQS).[5]The runoff from surface mines near Cassville contained concentrations of manganese, selenium, and arsenic that exceeded the WV numerical WQS by 2-30 times, as well as sulfate, TDS and conductivity greatly exceeding narrative WQS.

Each new mine that is approved by the West Virginia Department of Environmental Protection (DEP), the agency responsible for issuing surface mine permits, adds to the daily load of metallic pollutants, sulfates, and other indicators of ionic stress such as TDS and specific conductivity. These pollutants adversely affect the physiology and behavior of freshwater aquatic life to the point where many species have been displaced from the portions of Scotts Run downstream of the mines. By continually approving new point sources of pollutants that exceed WQS, the DEP is violating the Clean Water Act. Aquatic systems never have the opportunity to recover.

Near Maidsville, W VA. This is a roughly 140-acre coal ash/coal refuse dump. Both substances are brought to the site by truck. The white and light gray portions are coal ash from the Fort Martin and the Hatfields Ferry coal-fired power plants. "We're not certain," write the authors, "but the dark gray/black portions may be a mixture of coal refuse and ash, so everything above the brown section crossing the center of the photo [may be] coal ash/refuse." When another power plant came online recently, the additional ash generated prompted the application for an expansion of this site to about 355 acres. Photo: Petra Wood and John Wood

Based on review of mine permit applications, we estimate that about 10 million tons of coal ash have been dumped on surface mines near Cassville since 1999. To put this in perspective, EPA recently reported that about 10.5 million tons of coal ash were used in the entire U.S. for mining applications during 1998.[6] In addition, a coal ash/coal refuse area complex a few miles north of where we live has already stockpiled millions of tons on several hundred acres and is proposing to dump an additional 2.85 million tons of coal refuse and coal ash every year, for 25 to 30 years, on 355 acres in an unlined pile that would be approximately 500 feet deep. [7] The permits that DEP has issued for these mines require little monitoring in the short-term, and no long-term monitoring □ particularly for toxic metals concentrated in coal ash – meaning that the long-term effects of coal ash deposition on human and environmental health, and on our air and water resources, is playing second fiddle to corporate profits.

Hundreds of acres of exposed coal ash that lie on the surface of unreclaimed mines near our home have remained exposed to the open air for years. Although no air quality monitoring is occurring, we suspect that air quality is degraded by airborne fly ash which includes fine, glassy particulates in the respirable (PM2.5) and thoracic (PM10) size ranges. When it is dumped from trucks onto the mines, moved around with bulldozers, or blown around by wind, it becomes airborne and leaves the mines as fugitive dust. Trucks leaving the mines carry considerable amounts of dirt and coal ash onto public roads, resulting in clouds of ash. How does the airborne coal ash affect the health of families living nearby? In northern WV, hundreds of families live near these mines. For example, just one 225 acre mine has approximately 500 homes nearby.

Despite the evidence, DEP continues to disregard the cumulative adverse impacts of coal ash use in these minefills. Coal ash must be disposed of responsibly; the owners and operators of these minefills must be required to install leachate liners and wastewater treatment systems. These are extra costs for companies, but a mining or utility company that generates wastes should have to pay for proper disposal just like everyone else must pay for disposal of the

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waste they generate. Our community and hundreds of others around the country should not continue to be used as a dumping ground for hazardous waste.

PSR invites concerned readers to sign our petition urging President Obama to direct the EPA to issue strong coal ash protections.

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[1]See §33 CSR 01.5.5.b.4. at http://apps.sos.wv.gov/adlaw/csr/.

[2] National Academy of Sciences. 2006. Managing coal combustion residues in mines. The National Academies Press, Washington, D.C. 238pp.

[3] Stant, J., ed. 2007. Impacts on water quality from placement of coal combustion waste in Pennsylvania coal mines. Clean Air Task Force. <http://www.catf.us/publications/view/94>

[4] Hansen, E. and M. Christ. 2005. Water quality impacts of coal combustion waste disposal in two West Virginia coal mines. Morgantown, WV: Downstream Strategies. April.

[5] See §47 CSR 02 (surface water standards) and §46 CSR 12 (groundwater standards) at http://apps.sos.wv.gov/adlaw/csr/.

[6] Office of Inspector General. 2011. Evaluation Report: EPA Promoted the Use of Coal Ash Products WithIncomplete Risk Information. U.S. Environmental Protection Agency Report No. 11-P-0173. 27pp.

[7] Report Cites Coal Ash Pollution in West Virginia.

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Betsy Lawson said ..

Petra and John Wood have succinctly described the complexity of the dumping of fly ash in the Morgantown area. Although I was aware of the problems, I did not realize that reducing smoke stack emissions meant greater levels of toxicity in the residue. Of course, it all has to go somewhere and just proves that there is no such thing as 'clean coal'. As someone who regularly drives along Route 7 west of Morgantown, I can attest to the steady stream of large trucks carrying fly ash from the downtown power plant. The tops are usually open so the ash is free to blow off all along the route, leaving houses, roads, trees and ground covered in ash. But our congressman, David McKinley, is spearheading the move to deregulate the disposal of fly ash because it would interfere with his concrete block business.

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