



Dangerous Disposals: Keeping Coal Combustion Waste Out of Our Water Supply

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Each year, America's coal-fired power plants and industrial facilities produce approximately 130 million tons of coal combustion waste (CCW), the residue left behind when coal is burned. That's enough waste to fill a train of box cars stretching from Washington, D.C., to Melbourne, Australia.¹ Because CCW contains pollutants like arsenic, mercury, lead, and other toxic substances, its disposal carries many risks. Without proper monitoring and safeguards, disposing of toxic coal combustion waste can pose serious dangers to nearby ground and surface waters—and the people who rely on these sources for safe drinking water.

Given our national dependence on coal as a source of energy, the problem of disposing of CCW is one we will face for many years to come. Because CCW contains toxic chemicals such as arsenic and mercury that can cause serious health problems—especially in children—this is a problem we cannot ignore. But just as we have made strides to reduce the danger of air pollution from power plants, we can also act to reduce the danger presented by what is left at the bottom of the stacks.



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Health Hazards of Coal Combustion Waste

There are multiple types of coal combustion waste, including coal ash (fly ash, bottom ash), flue gas desulfurization waste (waste created when the exhaust from smokestacks at coal-burning facilities is treated to remove sulfur), and boiler slag (molten coal ash collected from the bottom of coal-burning furnaces). This waste contains toxic chemicals such as aluminum, arsenic, boron, cadmium, chromium, lead, manganese, molybdenum, selenium and sulfate—pollutants that can cause cancer, birth defects, reproductive problems, damage to the nervous system and kidneys, and learning disabilities in children.

For some types of CCW there are alternative uses as raw material for construction products such as concrete, plaster, and wallboard. When directed toward these “encapsulated uses,” the dangerous chemicals in the waste are not subject to erosion and leaching into the environment, but unfortunately the majority of CCW is not disposed of in this way.

Toxic Waste in Landfills and Surface Impoundments Seeps into Drinking Water

The majority of coal combustion waste produced each year is disposed of in landfills or surface impoundments (artificial ponds into which CCW mixed with water is dumped).

When water mixes with CCW in a landfill, such as when it rains, toxic chemicals from the waste dissolve in the water. This polluted water, called leachate, can then spread underground, contaminating groundwater and surface waters.

CCW disposed of in surface impoundments is intentionally mixed with water to create a sludge that can be more easily transported through a pipe from the coal-burning facility to the site where it will be dumped. Surface impoundments receive about 23 million tons of coal ash every year. Some of these CCW facilities are lined with a layer of clay or other material at the bottom to prevent pollutants from getting into the soil and the groundwater, but others are not. Across the nation, 40 percent of landfills accepting coal waste and 80 percent of surface impoundments do not have liners that would prevent leachate from infiltrating nearby water supplies. Even facilities with liners are not guaranteed to be safe, as liners can and do fail.

CCW contamination presents a serious risk to drinking water supplies near landfills and impoundments, whether they are public water systems, domestic drinking water wells, or springs. According to an EPA draft report, pollution from coal combustion waste dumps and lagoons has contaminated surface water and groundwater at up to 24 sites in 13 states.²



“Reclaiming” Mines with Dangerous Coal Waste

After mining activities at a site are completed, mining companies cannot simply abandon the area; they must take steps to repair some of the environmental damage caused by the mining, a process referred to as reclamation. The “reclaiming” of the mine often involves filling it with a type of CCW called coal ash.

Filling mines with coal ash is considered a convenient and low-cost way to dispose of huge amounts of coal ash. The ash is supposed to improve drinking water quality in the area by neutralizing the acidity in mines and controlling the release of toxic chemicals, but this so-called “beneficial” use of coal ash is risky. If the ash is not sufficiently alkaline, it will not neutralize the acidic environment in the mine. And if there is significant water flow within the mine from rainwater infiltration or groundwater flow, the water may dissolve the toxic chemicals in the ash itself and then carry these chemicals into nearby groundwater and surface waters.

Further, because this type of reclamation is often done without the proper safeguards, the process of reclaiming the mine—advertised as protecting those living in the surrounding communities—may instead cause significant harm to their health.

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Are There CCW Toxics In Your Drinking Water?

The table below lists the most common pollutants released by CCW landfills, surface impoundments, and minefills, along with their negative health effects.

| Contaminant | Negative health effects | Drinking water quality criteria concentration (mg/liter) |
|-------------|--|--|
| Aluminum | Bone or brain disorders, especially in people with kidney disease and in children. | 0.2 |
| Arsenic | Cancer of the bladder, kidneys, liver, lungs, prostate, and skin. | 0.01* |
| Boron | Harm to male reproductive organs, birth defects. | 7 |
| Cadmium | Kidney damage | 0.005* |
| Chromium | Hexavalent chromium can cause stomach ulcers, convulsions, kidney and liver damage, and can increase the risk of cancer. | 0.1* |
| Lead | Nervous system, brain and kidney damage; miscarriage. Learning and behavioral problems in children. | 0.015* |
| Manganese | Changes in the brain and nervous system; learning problems and poor coordination in children. | 0.05 |
| Molybdenum | Pain and inflammation of the joints. | 0.2 |
| Selenium | Nausea, vomiting, diarrhea. Long-term exposure can cause hair loss, nail brittleness, and neurological problems. | 0.05 |
| Sulfate | Laxative effect. To prevent dehydration, water with high levels of sulfate should not be used in infant formula. | 250 |

Sources: Agency for Toxic Substances and Disease Registry, and U.S. Environmental Protection Agency.
*Enforceable water quality standard.

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What You Can Do

Let the government know that you want them to protect the health and safety of your family and community by minimizing the threats posed by CCW. Contact the U.S. Environmental Protection Agency Office of Solid Waste and urge it to protect our water sources and the health of communities near CCW disposal facilities. Ask that the EPA immediately establish rules requiring effective pollution controls and monitoring systems at all landfills that receive coal combustion waste and prohibiting the construction of new surface impoundments for these wastes.

You can write to the EPA at:

Hon. Lisa Jackson, Administrator
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, NW
Mail Code 1101A
Washington DC, 20460



Massive Coal Ash Spill in Tennessee

In December 2008, the failure of a coal combustion waste impoundment caused a massive spill at the Tennessee Valley Authority's (TVA) Kingston Fossil Plant that flooded more than 300 acres in Roane County, Tennessee, with 1 billion gallons of toxic coal ash sludge. This toxic sludge contaminated wells with arsenic and heavy metals, creating concerns over drinking water contamination for local residents. The coal ash also entered the Emory River, putting communities downstream of TVA's Kingston facility at risk. This disaster demonstrated yet another risk of disposing of CCW in surface impoundments. Not only is there a risk of contaminants slowly seeping into the groundwater, but ponds such as the one in Kingston can suffer catastrophic failures and release massive amounts of waste and toxic contaminants.

¹ http://action.earthjustice.org/earthjusticeaction/alert-description.tcl?alert_id=9709845

² U.S. EPA, Damage Case Assessments under RCRA for Fossil Fuel Combustion Wastes [Draft], November 2005