

INDIANA MANUFACTURERS ASSOCIATION
One American Square, Suite 2400 | Box 82012 | Indianapolis, IN 46282
Phone: 317-632-2474 | Toll-Free: 800-462-7762 | Fax: 317-231-2320
Email IMA: ima@imaweb.com

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Environment and Energy FORUM



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Regulatory Update on the Management of Coal Combustion Products

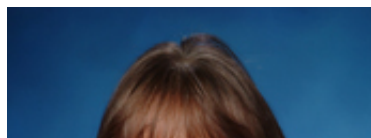
The following article was contributed by Perre E. Burns, PhD, PE, of KERAMIDA and Sue A. Shadley, Esquire, of Plews Shadley Racher & Braun, LLP.

Each year, approximately 115 million tons of coal combustion products (CCPs) are produced in the United States. Nearly 70 percent of these materials are disposed of in saturated ash impoundments or ash landfills. Most of the mass of CCPs (99 wt percent) is made up of Si, Al, Fe, Ca, K, Mg, Na, O, P, and Ti; the same elements that make up the composition of natural soil. It is the remaining 1 wt percent of trace elements that have raised debate concerning the environmental risk associated with CCPs.



Perre Burns

The concentrations of most trace elements in coal ash are typically higher than those found in the



Earth's crust, coal, and soil, indicating the coal combustion process tends to enrich the wastes in trace elements (Eary et al. 1990). This enrichment process occurs through a vaporization-condensation mechanism during the coal combustion process. Trace elements that sublime at temperatures below those attained during coal combustion (e.g., As, Se, Hg, Zn) are subject to vaporization into furnace gases. Once these gases, and fly ash particles entrained in the gases, are vented from the combustion furnace they quickly cool, leading to the condensation of volatilized elements onto the surfaces of fly ash particles (Natusch et al. 1974; Smith 1980). Condensates of these volatile elements are predicted, and in some cases observed, to principally form relatively soluble metal oxides and simple ionic salts. The net effect of the coal combustion process is the concentration of numerous 'priority pollutant' metals onto the surfaces of fly ash particles in forms that are relatively soluble, and thus bioavailable.



Sue Shadley

The environmental ramifications concerning the disposal of CCPs have been subject to increasing debate in the United States since Congress enacted the Solid Waste Disposal Act amendments in to the Resource Conservation and Recovery Act (RCRA) in 1980. In those amendments CCPs were temporarily exempted from Subtitle C regulation (which regulates disposal of material classified as hazardous waste), allowing them to be classified under Subtitle D regulation (subject to regulation only at the state level). However, the amendments did direct the United States Environmental Protection Agency (EPA) to produce a report regarding CCPs and to pursue the appropriate regulation of these wastes.

In pursuit of this mandate, the U.S.EPA issued a report to Congress in 1988 titled Waste from the Combustion of Coal Electric Utility Power Plants (EPA/5-30-SW-88-002). In this report the EPA concluded that CCPs generally do not exhibit hazardous characteristics and that the regulation of CCPs should remain under state Subtitle D authority. Following this report, litigation was brought against the EPA by the Bull Run Coalition, which claimed the EPA had failed to issue a timely regulatory determination as stated in its 1988 report to Congress. The EPA entered into a consent decree with the Bull Run Coalition, which included a time frame for the EPA to issue a formal recommendation regarding regulation of CCPs. In accordance with this consent decree, the EPA issued a final regulatory determination applicable to fly ash, bottom ash, boiler slag, and flue-gas desulphurization materials. This ruling became effective in September 1993, and stated that regulation of CCPs generated by coal fired electric utilities and independent power producers as hazardous waste was unnecessary and that the materials would remain exempt from Subtitle C regulation. In April 2000 the EPA

stated that these additional wastes would continue to be exempted from Subtitle C regulation.

EPA announced on May 4, 2010 that it is proposing to regulate coal combustion residuals and is proposing two alternative regulations for public comment. There will be a 90 day public comment period following publication in the Federal Register, which should appear soon.

Under the first proposal, EPA would reverse its 1993 and 2000 regulatory determinations that CCPs are not hazardous waste and would list CCPs as special wastes subject to Subtitle C regulation. Under the second proposal, EPA would regulate disposal of CCPs under Subtitle D by issuing national minimum criteria.

If regulated under the hazardous waste Subtitle C program, CCPs would be regulated from the point of their generation to the point of their final disposition, including during and after closure of any disposal unit. This would include the generator and transporter requirements and the requirements for facilities managing CCPs, such as siting, liners, run-on and run-off controls, groundwater monitoring, fugitive dust controls, financial assurance, corrective action, including facility-wide corrective action, closure of units, and post-closure care. In addition, facilities that dispose of, treat, or store CCPs would be required to obtain permits for the units in which such materials are disposed, treated and stored. The rule would also regulate the disposal of CCPs in sand and gravel pits, quarries, and other large fill operations such as a landfill.

If regulated under Subtitle D, EPA would establish national criteria to ensure the safe disposal of CCPs in these units. The units would be subject to location standards; composite liner requirements (new landfills and surface impoundments would require composite liners; existing surface impoundments without liners would have to retrofit within five years, or cease receiving CCPs and close); groundwater monitoring and corrective action standards for releases from the unit; closure and post-closure care requirements; and requirements to address the stability of surface impoundments and possibly requiring financial assurance. The rule would also regulate the disposal of CCPs in sand and gravel pits, quarries, and other large fill operations as a landfill. The rule would not regulate the generation, storage or treatment of CCPs prior to disposal. The rule would not require permits, nor could EPA enforce the requirements. Instead, states or citizens could enforce the requirements under RCRA citizen suit authority; the states could also enforce any state regulation under their independent state enforcement authority.

The EPA is seeking comment on three topics to aid it in deciding which route to go. First, it is seeking comment on the extent of existing damage cases, the extent of risks posed by the mismanagement of CCPs, and the adequacy of state programs to ensure proper management of CCPs. Second, the EPA is requesting states and others to provide further information on state programs, including the prevalence of groundwater monitoring at existing facilities. Third, the EPA is requesting public comment on the exact location of CCP waste management units so that the Agency can more fully account for water bodies that

may exist between a waste management unit and a drinking water well.

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