



ENVIRONMENTAL
SCIENCE,
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DANIEL D. LOWELL

EDITOR

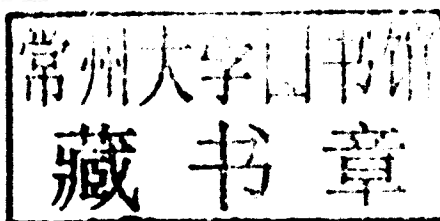
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Nova Science Publishers, Inc.

New York

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Additional color graphics may be available in the e-book version of this book.

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Coal combustion waste : management and beneficial uses / editor, Daniel D. Lowell.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-61728-962-0 (hardcover)

1. Coal ash--Environmental aspects. 2. Coal ash--Recycling. I. Lowell, Daniel D.

TD195.C58C6125 2010

621.31'21320286--dc22

2010027144

Published by Nova Science Publishers, Inc. ✦ New York

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PREFACE

Coal fired power plants account for almost 45% of electric power generated in the United States. The coal combustion process at those facilities generates a tremendous amount of waste. In 2008, industry estimates indicate that 136 million tons of coal combustion waste (CCW) was generated. That would make CCW the second largest waste stream in the United States, second to municipal solid waste, or common household garbage. How CCW is managed and how those management methods are regulated have come under increased scrutiny in recent years. This book examines the potential harm from CCW to human health and the environment, and delves into the investigation of the management of CCW which is essentially exempt from federal regulation.\

Chapter 1- In 2008, coal-fired power plants accounted for almost half of the United States' electric power, resulting in as much as 136 millions tons of coal combustion waste (CCW). On December 22, 2008, national attention was turned to issues regarding the waste when a breach in an impoundment pond at the Tennessee Valley Authority's (TVA's) Kingston, Tennessee, plant released 1.1 billion gallons of coal ash slurry. The estimated cleanup cost will likely reach \$1.2 billion.

The characteristics of CCW vary, but it generally contains a range of heavy metals such as arsenic, beryllium, chromium, lead, and mercury. While the incident at Kingston drew national attention to the potential for a sudden catastrophic release of waste, the primary concern regarding the management of CCW usually relates to the potential for hazardous constituents to leach into surface or groundwater, and hence contaminate drinking water, surface water, or living organisms. The presence of hazardous constituents in the waste does not, by itself, mean that they will contaminate the surrounding air, ground, groundwater, or surface water. There are many complex physical and biogeochemical factors that influence the degree to which heavy metals can dissolve and migrate offsite—such as the mass of toxins in the waste and the degree to which water is able to flow through it. The Environmental Protection Agency (EPA) has determined that arsenic and lead and other carcinogens have leached into groundwater and exceeded safe limits when CCW is disposed of in unlined disposal units.

In addition to discussions regarding the potential harm to human health and the environment, the Kingston release brought attention to the fact that the management of CCW is essentially exempt from federal regulation. Instead, it is regulated in accordance with requirements established by individual states. State requirements generally apply to two broad categories of actions—the *disposal* of CCW (in landfills, surface impoundment, or mines) and

its *beneficial use* (e.g., as a component in concrete, cement, or gypsum wallboard, or as structural or embankment fill).

Chapter 2- The U.S. Environmental Protection Agency's Office of Solid Waste (EPA OSW) is currently developing methods to evaluate the environmental, human health, and economic outcomes of specific EPA programs. As an initial step, OSW is examining the extent to which the costs and benefits of source reduction, reuse, and recycling may be quantified for a range of materials targeted by the Resource Conservation Challenge (RCC).

Coal combustion products (CCPs) are among the materials targeted by EPA's Resource Conservation Challenge (RCC). The RCC is designed to facilitate changes in the economics and practice of waste generation, handling, and disposal (e.g., by promoting market opportunities for beneficial use). Under the RCC, EPA has established three goals for increased beneficial use of CCPs:

Chapter 3- On December 22, 2008, the retaining wall broke on a waste retention pond at the Tennessee Valley Authority (TVA) Kingston Fossil Plant, Tenn., and an estimated 4.1 million m³ of coal ash slurry was spilled onto the land surface and into the adjacent Emory and Clinch Rivers (TVA, 2009). This was the largest coal ash spill in US history. The coal ash sludge spilled into tributaries that flow to the Emory River and directly into the Emory River itself (Figure 1), which joins to the Clinch River and flows to the Tennessee River, a major drinking water source for downstream users. With funds provided by the Dean of the Nicholas School of the Environment of Duke University, in January 2009 our team began a preliminary investigation of the potential environmental and health effects of the spill. This preliminary work (Vengosh et al., 2009; Ruhl et al., in revision) has thus far revealed three major effects: (1) The surficial release of coal ash formed a sub-aerial deposit that contains high levels of toxic elements (arsenic concentration of 75 mg/kg; mercury concentration of 150 &g/kg; and radioactivity (radium-226 + radium-228) of 8 pCi/g). These pose a potential health risk to local communities as a possible source of airborne re-suspended fine particles (<10 µm). (2) Leaching of the coal ash sludge in the aquatic environments resulted in severe water contamination (e.g. high arsenic content) in areas of restricted water exchange such as the Cove area, in a tributary of the Emory River. Further downstream, in the Emory and Clinch rivers, much lower levels of metals were found due to river dilution, but with metals concentrations above the background upstream levels. (3) High concentrations of mercury in downstream sediments of the Emory and Clinch rivers indicate physical transport of coal ash in the rivers. The high concentration of mercury and sulfate in the downstream river sediments could impact the aquatic ecosystems by formation of methylmercury in anaerobic river sediments.

A recent survey of the amount of coal ash generation in the United States revealed that 500 power plants nationwide generate approximately 130 million tons of coal ash each year, 43 percent of which is recycled into other materials. The remaining 70 million tons are stored in 194 landfills and 161 ponds in 47 states (Lombardi, 2009). An EPA study (USEPA, 2007) identified 63 coal ash landfills and ponds in 23 states where the coal sludge is associated with contaminating groundwater and the local ecosystem. One of the major potential hazards of coal ash storage in ponds is the continuous leaching of contaminants and their transport to the hydrological system. As such, the TVA coal ash spill provides a unique opportunity to evaluate the large-scale impact of coal ash leaching on the environment and water resources.

Chapter 4- Chairwoman Johnson, Ranking Member Boozman, and members of the Committee. I appreciate this opportunity to discuss the coal ash spill at the Tennessee Valley

Authority's (TVA) Kingston Fossil Plant, the actions taken in response to the event, and our progress and plans for remediation of the site and protection of the environment.

The incident being discussed today occurred at TVA's Kingston Fossil Plant in Roane County, Tennessee. On behalf of TVA, we deeply regret the failure of the ash storage facility dike, the damage to adjacent private property in the Swan Pond community, and the impact on the environment. We are extremely grateful that no one was seriously injured.

TVA is committed to cleaning up the spill, protecting the public health and safety, and restoring the area. In the process, we will look for opportunities, in concert with the leaders and people of Roane County, to make the area better than it was before the spill occurred. This commitment will stand because TVA is part of the Kingston community through our employees who live and work there, and through the partnership of our historic mission to work for the economic progress of the Tennessee Valley region.

We are also committed to sharing information and lessons-learned from this event and the recovery with those in regulatory and oversight roles, such as this committee, and with others in the utility industry.

Today marks the 99th day since the spill occurred. We have made steady progress in the initial recovery work, including development of a Corrective Action Plan that includes comprehensive monitoring of the air, water and soil. It is important to note that according to the Tennessee Department of Health, the environmental monitoring analyzed to date has not shown any adverse health threat to the immediate or surrounding community, including air quality or drinking water supplies. On March 19, we began the initial phase of dredging ash from the Emory River channel adjacent to the failed storage facility. This activity is being thoroughly monitored and precautions are in place to prevent or minimize environmental impacts during the dredging process. The dredging plan was approved by the Tennessee Department of Environment and Conservation (TDEC) and the U.S. Environmental Protection Agency (EPA).

Chapter 5- On December 22, 2008, at 1:00 a.m., an ash disposal cell at the TVA Kingston Fossil Plant failed, causing the release of an estimated 5.4 million cubic yards of fly ash to the Emory and Clinch Rivers and surrounding areas. The release extended over approximately 300 acres outside the ash storage area. The failed cell was one of three cells at the facility used for settling the fly ash. The initial release of material created a wave of water and ash that destroyed three homes, disrupted electrical power, ruptured a natural gas line in a neighborhood located adjacent to the plant, covered a railway and roadways in the area, and necessitated the evacuation of a nearby neighborhood.

Shortly after learning of the release, EPA deployed an On-Scene Coordinator to the site of the TVA Kingston Fossil Plant coal ash release. EPA joined TVA, the Tennessee Department of Environment and Conservation (TDEC), the Roane County Emergency Management Agency, and the Tennessee Emergency Management Agency (TEMA) in a coordinated response (i.e., unified command in the National Incident Management System). EPA provided oversight, as well as technical advice, for the environmental response portion of TVA's activities. TVA has conducted extensive environmental sampling and shared results with EPA personnel. As discussed in more detail below, EPA staff and contractors have also conducted extensive independent sampling and monitoring to evaluate public health and environmental threats. In addition to providing information on environmental conditions at the site, EPA's data have also served as an independent verification of the validity of the TVA data.

Chapter 6- Coal combustion residuals (CCR) are one of the largest waste streams generated in the United States, with approximately 131 million tons generated in 2007. Of this, approximately 36% was disposed of in landfills, 21% was disposed of in surface impoundments, 38% was beneficially reused, and 5% was used as minefill. In comparison, EPA's Biennial Hazardous Waste Report shows that approximately 33.7 million tons of hazardous waste was generated in the United States in 2007. CCR typically contain a broad range of metals, including arsenic, selenium, and cadmium; however, the leach levels, using EPA's Toxicity Characteristic Leaching Procedure (TCLP), rarely reach the Resource and Conservation Recovery Act (RCRA) hazardous waste characteristic levels. Due to the mobility of metals and the large size of the typical disposal unit, metals (especially arsenic) may leach at levels of potential concern from impoundments and unlined landfills.

The beneficial use of CCR provides environmental benefits in terms of energy savings, greenhouse gas emission reductions, and resource conservation. In 2007, 56 million tons of CCR were reused. For example, use of CCR contributed to the construction of the Hoover Dam, the San Francisco-Oakland Bay Bridge, and the new I-35 bridge in Minneapolis, Minnesota. Many state environmental statutes and regulatory programs, as well as state road construction agencies, provide for the beneficial use of CCR. In 2007, use of coal fly ash as a substitute for Portland cement in concrete reduced energy use in concrete manufacturing by 73 trillion British thermal units (BTUs), with associated greenhouse gas emission reductions estimated at 12.5 million tons of carbon dioxide equivalent (MTCO₂).

Chapter 7- Thank you, Mr. Chairman, for the opportunity to testify before the Subcommittee on Water Resources and Environment today. My name is Eric Schaeffer, and I am Director of the Environmental Integrity Project, a nonprofit and nonpartisan organization that advocates for more effective enforcement of federal environmental laws. I also served as director of the USEPA's civil enforcement program from 1997 to 2002. The testimony that follows is offered on behalf of myself and my colleague Lisa Evans, a senior attorney at Earthjustice and one of the nation's leading experts on coal ash. Our testimony will make the following points:

- 1) Coal ash is a hazardous material that tends to leak toxic metals into groundwater and surface water, especially when the ash is saturated or stored in wet ponds.
- 2) The discharge of wastewater from coal ash ponds, as well as the runoff from so-called dry landfills, can release arsenic, selenium and other pollutants in amounts known to be toxic to human health and aquatic life in our rivers and lakes. Despite the risks, discharges of toxic metals are generally not restricted under Clean Water Act permits at power plants and are often not even monitored.
- 3) Air pollution control equipment installed to comply with the Clean Air Act will generate thousands of tons of scrubber sludge at a typical power plant. USEPA and industry data show that the wastewater discharged from scrubber sludge treatment systems can release toxic metals like selenium in concentrations that are hundreds of times higher than water quality standards designed to protect aquatic life.
- 4) USEPA has promised to develop federal safeguards for the disposal of coal ash, but is also evaluating whether to set limits on the toxic discharges from ash and sludge treatment systems. The monitoring data indicate that such limits are overdue, and there is little time to lose.

Chapter 8- Madame Chairman, Members of the Committee and Distinguished Panelists:

My name is Dave Goss, former Executive Director of the American Coal Ash Association (ACAA) and I have been asked to appear before you today by ACAA's current Executive Director and its membership. ACAA promotes the recycling of coal combustion products (or CCPs) which include fly ash, bottom ash, boiler slag and air emission control residues, such as synthetic gypsum. It is our opinion, that the U.S. Environmental Protection Agency (EPA) regulatory determinations, made in 1993 and reaffirmed in 2000, are still correct that CCPs DO NOT warrant regulation as hazardous waste.

The recycling of these materials is a tremendous success story that has displaced more than 120 million tons of greenhouse gases since 2000. During that same period, more than 400 million tons of CCPs have been recycled in road construction, architectural applications, agriculture, mine reclamation, mineral fillers in paints and plastics, wallboard panel products, soil remediation and numerous other uses that would have required other materials if these CCP products were not available. Use of 400 million tons of CCPs displaces enough landfill capacity to equal 182 billion days of household trash.

The use of CCPs goes back more than forty years. In the last three decades, the EPA, other federal agencies, numerous universities and private research institutes have extensively studied CCP impact on the environment. The U.S. Department of Energy and the U.S. Department of Agriculture have both funded, conducted and evaluated mining and land case studies using a variety of applications. Consistently, these federal agencies found that when properly characterized, managed and placed, CCPs do not have a harmful impact on the environment or on public health.

EPA reported to Congress on March 31, 2009, results of data collected and analyzed by the Agency from the Tennessee Valley Authority ash spill on December 22, 2008. This data showed that there were no exceedances to drinking water or air quality standards. This information was based on hundreds of water samples and more than 26,000 air samples.

Chapter 9- Thank you for the opportunity to appear before the Subcommittee on Energy and Mineral Resources of the House Committee on Natural Resources. The subcommittee has called this hearing to address the question: "How Should the Federal Government Address the Health and Environmental Risks of Coal Combustion Waste?" Implicit in this question is the concern that coal combustion wastes may contain toxic constituents that pose long-term damage to water supplies and the resources that depend on them.

I have spent most of my professional career working on mining issues, with a particular emphasis on coal mining. I was also a member of the National Research Council (NRC) Committee that was called upon recently to study the disposal of coal combustion residues (CCRs) in coal mines as part of the mine reclamation process. That effort was especially relevant to the question posed by the committee.

I have two recommendations that respond to the question posed by the subcommittee. First and foremost, federal policy should treat the *disposal* of coal combustion residues — whether in coal mines, impoundments or landfills — as the option of last resort. Whenever possible, CCRs should be used for secondary beneficial purposes, and such use should be promoted through incentives for secondary use as well as disincentives for disposal. The NRC Committee recommended that secondary use of CCRs be "strongly encouraged." I would go further and argue that disposal of CCRs in coal mines, landfills, and impoundments should not be authorized unless and until the producer demonstrates a substantial and good faith effort to make the CCRs available for secondary use.

Chapter 10- Chairman Costa, and honorable members of the Committee, thank you for the opportunity to share Maryland's experience with coal combustion waste with you and, more importantly, for your interest in this very important issue.

We also greatly appreciate Congressman Sarbanes' interest and attention to issues surrounding the disposal of this by-product of producing energy from coal.

In 2006, the most recent year for which complete information is available from Maryland's Public Service Commission, coal generated 60.1% of the electricity generated in the State. In Maryland, there are five companies who generate coal combustion by-products at 9 facilities. Approximately 2 million tons of coal ash (fly and bottom ash) is generated annually from Maryland plants. Of that 2 million tons, approximately 1.6 million tons of coal ash is from the plants owned and operated by two companies, Constellation and Mirant.

In Maryland, the Maryland Healthy Air Act requires flue gas desulphurization equipment (known as "scrubbers") to be put in place by 2010 to reduce sulphur dioxide (SO₂) emissions by 80%. A second phase of requirements in 2013 will increase the emission reductions to 85%. That equipment, while reducing SO₂ emissions by over 200,000 tons will also increase the volume of scrubber sludge produced by 2.5 million tons. By 2013, therefore, facilities in Maryland will generate 4.5 million tons of CCWs.

As you are aware, coal combustion by-products are frequently reused. Currently, approximately 1 million tons, or one half of the coal ash produced annually, is beneficially used in Maryland. Fly ash can be reused for concrete manufacturing and in building material. It can also be used as structural fill in roadway embankments and development projects. (It can also be used in agricultural applications. While these are just a few of the reuse applications, there are many outstanding questions with regard to the safety of reuse.) For example, when used for structural fill, should liners be used; should there be defined distances between use of CCWs and potable water sources; should it be prohibited in shoreline areas such as the Chesapeake Bay Critical Area, source water protection areas, wetlands, or other areas of special concern; if used in agriculture, should it be applied to crops that are for human consumption. These are issues being examined as the State begins to develop a second phase of regulations to more effectively control reuse.

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Chapter 12- Good morning, Mr. Chairman. My name is David Goss, Executive Director of the American Coal Ash Association. I sincerely appreciate the opportunity to address you, the members of the Committee and other distinguished experts appearing before you on this important topic. ACAA is an industry association of producers, marketers, end-users, researchers and others who support the beneficial use of what our industry refers to as coal combustion products, commonly known as CCPs. This includes coal ash and residues from air emission control systems such as synthetic gypsum products. These materials are the residuals from the burning of coal to generate electricity. By the very nature of the energy generation process utilizing coal, these byproducts cannot be eliminated entirely and must be managed like many other industrial byproduct streams. We consider CCPs to be mineral resources that if not used, become resources that are wasted.

In a perfect world, energy generation would not have any byproducts because the process would efficiently use all of the raw materials needed to generate electricity. Yet, the coal fueled generation process is not perfect. Even other energy options have consequential impacts, for example wind, which yields noise pollution and bird impingement. The coal-based energy generation industry generates byproducts including fly ash, bottom ash, slag and gypsum. The difference is that many of our products can replace or improve other commonly used commodities including portland cement and constituents which are used to produce concrete and other construction materials. The safe re-use of CCPs has a significant positive impact on this nation's mineral resources, its environment and economy. It is essential to promote and support activities that contribute to a more sustainable nation. By sustainable nation, I mean efficient, socially responsible and environmentally friendly usage of CCPs. I think the majority of us would agree that byproduct re-use which is environmental, health and safety conscience is much better than putting wastes in a disposal facility. Recognizing this common interest to promote safe and environmentally sound byproducts use, I am here to address how the beneficial use of CCPs contributes measurably to reduce environmental impact and is properly being regulated by the federal and state authorities.

Chapter 13- The question the subcommittee is exploring carries important, implicit understandings in its phrasing. There is implicit understanding that coal combustion waste (CCW) exists. There is implicit understanding that there are health and environmental risks with CCW. There is implicit understanding that the risks need be addressed. There is implicit understanding that federal action is needed to address the risks. I share the each of those understandings with the author(s) of the question, although I must admit resistance in reaching the last understanding.

My understandings are founded in 5½ decades of personal observation, management, and study of CCW. In the 1950s I became responsible for removing, carrying, and dumping the “clinkers” from our coal furnace. They were put to “beneficial use,” providing traction and filling ruts on the lane coming up the hill to the farmhouse. In the 1960s, I became painfully aware that even beneficial use of these materials carries risks, as did everyone else who tried to skate on an icy road after the township trucks had spread cinders or who tripped on the cinder track during the hand-off in the mile relay. In the 1960s and 1970s, I was episodically subjected to the rain of fly ash and the taste and feel of sulfur dioxide in my throat when the wind was from the university’s power plant in Champaign, Illinois. Since the mid-1980s, a significant portion of my professional career has been the study and evaluation of CCW, now remove from the air, and how best to manage it. My client base through the years has included individuals, coal companies, environmental organizations, power companies, governmental units, and citizens’ groups.

My testimony today represents my personal understanding and opinions, and is not intended to represent those of any other individuals or organizations. My opinions and understanding have evolved and should continue to evolve as I learn more. If they don’t, I should retire. I am not being paid to be here and my preparation for this hearing is similarly donated, although I am seeking reimbursement of direct travel expenses.

Chapter 14- I thank you for the opportunity to testify today concerning the health effects of exposure to coal combustion waste. I am Dr. Mary Fox, Assistant Professor in the Department of Health Policy and Management in the Johns Hopkins Bloomberg School of Public Health. I am a risk assessor with doctoral training in toxicology, epidemiology and environmental health policy. I am a core faculty member of the Hopkins Risk Sciences and Public Policy Institute where I teach the methods of quantitative risk assessment. In my research I evaluate the health risks of exposure to multiple chemical mixtures.

My testimony focuses on the health effects associated with exposure to coal combustion waste and assessing the public health risks of such exposures.

Chapter 15- Chairman Costa and Members of the Subcommittee, thank you for holding this hearing to consider the federal government’s role in addressing the health and environmental risks of coal combustion waste. When mismanaged, coal combustion waste damages aquatic ecosystems, poisons drinking water and threatens the health of Americans nationwide. One of the dangers posed by coal combustion waste is disposal in coal mines, a practice that threatens the already heavily impacted communities and natural resources of our nation’s coal mining regions.

I am Lisa Evans, an attorney for Earthjustice, a national non-profit, public interest law firm founded in 1971 as the Sierra Club Legal Defense Fund. Earthjustice represents, without charge, hundreds of public interest clients in order to reduce water and air pollution, prevent toxic contamination, safeguard public lands, and preserve endangered species. My area of expertise is hazardous and solid waste law. I have worked previously as an Assistant Regional Counsel for the Environmental Protection Agency enforcing federal hazardous waste law and providing oversight of state programs. I appreciate the opportunity to testify this morning.

The question before this subcommittee, how the federal government should address the risks of coal combustion waste, has a straightforward answer. Simply stated, the U.S. Environmental Protection Agency (EPA) must do what it committed to do in its final *Regulatory Determination on Wastes from the Combustion of Fossil Fuels*, published 8 years ago.¹ In that determination, mandated by Congress in 1980, EPA concluded that federal

standards for the disposal of coal combustion waste under the Resource Conservation and Recovery Act (RCRA) and/or the Surface Mining Control and Reclamation Act (SMCRA) are required to protect health and the environment. EPA's commitment to set minimum federal disposal standards extended to coal ash disposed in landfills, lagoons and mines. Yet eight years later, and 25 years after Congress required this determination, EPA's commitment remains an entirely empty promise.

Chapter 16- "How should the Federal Government address the Health and Environmental Risks of Coal Combustion Waste"?

I live in a very conservative multi-cultural neighborhood that was once predominantly African American. Being an African American and having been exposed to the many facets of public service, I was soon able to transfer skill sets and assistance to this small community that was besieged by large corporations and landfill operators. For decades these corporations had targeted them with disposal of chemical waste and toxic materials. Too often, and on a continuing basis, large organizations and businesses too eager to turn a large profit margin, target communities of disproportionate underrepresented minority groups (i.e. African Americans, Alaska Natives, American Indians, Mexican Americans and Hispanic groups) for chemical and toxic waste disposal.

Often focusing on certain areas of disparity in subject matter areas such as education, criminal and environmental justice, these corporations prey on these groups' socioeconomic status to unfairly take advantage of their communities, homes and lifestyles. The impact of these criminal predators is long felt months if not years later when health issues arise, and property and home values diminish. State and County officials who often work hand in hand to appease these perpetrators have either left office or attribute their decisions to the greater good of county revenue generated from taxes, permits and fees imposed. The Maryland Department of Environment (MDE), an agency charged to protect the environment and public health of its citizens, has consistently failed the very citizens that have been aggrieved in the Evergreen Road and Waugh Chapel communities.

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Chapter 1

MANAGING COAL COMBUSTION WASTE (CCW): ISSUES WITH DISPOSAL AND USE

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SUMMARY

In 2008, coal-fired power plants accounted for almost half of the United States' electric power, resulting in as much as 136 millions tons of coal combustion waste (CCW). On December 22, 2008, national attention was turned to issues regarding the waste when a breach in an impoundment pond at the Tennessee Valley Authority's (TVA's) Kingston, Tennessee, plant released 1.1 billion gallons of coal ash slurry. The estimated cleanup cost will likely reach \$1.2 billion.

The characteristics of CCW vary, but it generally contains a range of heavy metals such as arsenic, beryllium, chromium, lead, and mercury. While the incident at Kingston drew national attention to the potential for a sudden catastrophic release of waste, the primary concern regarding the management of CCW usually relates to the potential for hazardous constituents to leach into surface or groundwater, and hence contaminate drinking water, surface water, or living organisms. The presence of hazardous constituents in the waste does not, by itself, mean that they will contaminate the surrounding air, ground, groundwater, or surface water. There are many complex physical and biogeochemical factors that influence the degree to which heavy metals can dissolve and migrate offsite—such as the mass of toxins in the waste and the degree to which water is able to flow through it. The Environmental Protection Agency (EPA) has determined that arsenic and lead and other carcinogens have leached into groundwater and exceeded safe limits when CCW is disposed of in unlined disposal units.

In addition to discussions regarding the potential harm to human health and the environment, the Kingston release brought attention to the fact that the management of CCW is essentially exempt from federal regulation. Instead, it is regulated in accordance with requirements established by individual states. State requirements generally apply to two broad

categories of actions—the *disposal* of CCW (in landfills, surface impoundment, or mines) and its *beneficial use* (e.g., as a component in concrete, cement, or gypsum wallboard, or as structural or embankment fill).

In May 2000, partly as a result of inconsistencies in state requirements, EPA determined that national regulations regarding CCW disposal were needed. To date, regulations have not been proposed. However, on March 9, 2009, EPA stated that regulations to address CCW disposal in landfills and surface impoundments would be proposed by the end of 2009. Also, in March 2007, an advance notice of proposed rulemaking regarding the disposal of CCW in mines was released by the Department of the Interior's Office of Surface Mining (OSM). Draft rules have not yet been proposed. With regard to potential uses of CCW, EPA has stated that there have been few studies that would definitively prove that certain uses of CCW are safe, but that its use should include certain precautions to ensure adequate groundwater protection. It is unknown whether regulations regarding beneficial uses of CCW will be included in the upcoming rulemaking.

Some Members of Congress and other stakeholders have expressed concern regarding how CCW will ultimately be regulated. Among other issues, there is concern that the upcoming regulations will be either too far-reaching, and hence costly, or not far-reaching enough—meaning that they will not establish consistent, enforceable, minimal federal requirements applicable to CCW disposal units. On December 17, 2009, EPA issued a statement that its pending decision on regulating CCW would be delayed for a “short period due to the complexity of the analysis the agency is currently finishing.”

OVERVIEW OF DISPOSAL AND USE ISSUES

Coal fired power plants account for almost 45% of electric power generated in the United States. The coal combustion process at those facilities generates a tremendous amount of waste. In 2008, industry estimates indicate that 136 million tons of coal combustion waste (CCW) was generated.¹ That would make CCW the second largest waste stream in the United States, second to municipal solid waste, or common household garbage. How CCW is managed and how those management methods are regulated have come under increased scrutiny in the last year.

Coal combustion waste is managed in two ways: It may be *disposed of* in landfills or surface impoundment ponds, or in mines as minefill, or it may be *used* in some capacity (commonly referred to as “beneficial use”)—for example, as a component in concrete, cement, or gypsum wallboard, or as structural or embankment fill. These management methods are largely unregulated at the federal level. Instead, they are regulated according to state requirements that vary from state to state.

On December 22, 2008, national attention was turned to potential risks associated with CCW management when a breach in an impoundment pond at the Tennessee Valley Authority's (TVA's) Kingston, Tennessee, plant released 1.1 billion gallons of coal fly ash slurry. The release covered more than 300 acres and damaged or destroyed homes and property. The sludge discharged into the nearby Emory and Clinch rivers, filling large areas of the rivers and resulting in fish kills. Sampling at the site in January 2009 found arsenic