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DRINKING WATER AND PUBLIC HEALTH IMPACTS OF COAL COMBUSTION WASTE DISPOSAL

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT

OF THE

COMMITTEE ON ENERGY AND COMMERCE
HOUSE OF REPRESENTATIVES

ONE HUNDRED ELEVENTH CONGRESS

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CONTENTS

	Page
Hon. Edward J. Markey, a Representative in Congress from the Commonwealth of Massachussetts, opening statement	1
Hon. Ed Whitfield, a Representative in Congress from the Commonwealth of Kentucky, opening statement	3
Hon. John Shimkus, a Representative in Congress from the State of Illinois, opening statement	4
Hon. Cliff Stearns, a Representative in Congress from the State of Florida, opening statement	5
Hon. Steve Scalise, a Representative in Congress from the State of Louisiana, opening statement	6
Hon. Gene Green, a Representative in Congress from the State of Texas, prepared statement	95
Hon. Joe Barton, a Representative in Congress from the State of Texas, prepared statement	97
Hon. Fred Upton, a Representative in Congress from the State of Michigan, prepared statement	99
Hon. Joseph R. Pitts, a Representative in Congress from the Commonwealth of Pennsylvania, prepared statement	103

WITNESSES

Robyn Whitaker-Pierce, Resident of Chesapeake, Virginia	8
Prepared statement	11
Gayle Queen, Resident of Gambrills, Maryland	14
Prepared statement	17
Raymond Hunt, Jr., Resident of Waterflow, New Mexico	19
Prepared statement	21
Carla Hunt, Resident of Waterflow, New Mexico	19
Prepared statement	21
Lisa Evans, Senior Administrative Counsel, Earthjustice	33
Prepared statement	36
Answers to submitted questions	139
Mary A. Fox, Ph.D., MPH, Assistant Professor, Johns Hopkins Bloomberg School of Public Health	61
Prepared statement	63
Ken Ladwig, Senior Program Manager, Electric Power Research Institute	68
Prepared statement	70
Answers to submitted questions	153
Donald McGraw, M.D., Pittsburgh, Pennsylvania	76
Prepared statement	78
Answers to submitted questions	167

SUBMITTED MATERIAL

Letter of June 18, 2009, from Members of Congress to U.S. EPA, submitted by Mr. Shimkus	105
Letter of July 17, 2009, from Illinois EPA to U.S. EPA, submitted by Mr. Shimkus	111
Letter of October 1, 2009, from City of Springfield, Illinois to U.S. Conference of Mayors, submitted by Mr. Shimkus	113
Letter of April 10, 2009, from Pennsylvania Department of Environmental Protection, submitted by Mr. Doyle	116
Letter of July 28, 2009, from Pennsylvania Public Utility Commission, submitted by Mr. Doyle	118

Page

Resolution by Environmental Council of the States, submitted by Mr. Shimkus 122
Letter of April 1, 2009, from Association of State and Territorial Solid Waste Management Officials to U.S. EPA, submitted by Mr. Shimkus 125
Letter of September 19, 2009, from Unions for Jobs and the Environment to U.S. EPA, submitted by Mr. Shimkus 134
Letter of November 17, 2009, from U.S. Chamber of Commerce to U.S. EPA, submitted by Mr. Shimkus 136

DRINKING WATER AND PUBLIC HEALTH IMPACTS OF COAL COMBUSTION WASTE DISPOSAL

THURSDAY, DECEMBER 10, 2009

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The Subcommittee met, pursuant to call, at 9:35 a.m., in Room 2322 of the Rayburn House Office Building, Hon. Edward Markey [Chairman of the Subcommittee] presiding.

Members present: Representatives Markey, Doyle, McNerney, Matheson, Barrow, Upton, Stearns, Whitfield, Shimkus, Pitts and Scalise.

Also present: Representatives Sarbanes and Forbes.

Staff present: Greg Dotson, Chief Counsel, Energy and Environment; Tracy Sheppard, Senior Counsel; Melissa Bez, Professional Staff Member; Caitlin Haberman, Special Assistant; Peter Ketcham-Colwill, Special Assistant; Jackie Cohen, Counsel; Karen Lightfoot, Communications Director, Senior Policy Advisor; Lindsay Vidal, Special Assistant; Mitchell Smiley, Special Assistant; Jerry Couri, Republican Professional Staff; Andrea Spring, Republican Professional Staff; and Garrett Golding, Republican Legislative Analyst.

OPENING STATEMENT OF HON. EDWARD J. MARKEY, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF MASSACHUSETTS

Mr. MARKEY. Good morning, and we welcome you all to the Subcommittee on Energy and Environment, and this hearing is called to order.

Almost 1 year ago, on December 22, 2008, hundreds of acres of land in Tennessee were buried in toxic sludge after an accidental breach at a disposal pond at a TVA plant. The breach resulted in the release of 1.1 billion gallons of the byproducts of burning coal. It covered more than 300 acres of land in a gray, poisonous muck, damaging homes and property and tainting nearby rivers. This toxic stew contained high levels of arsenic, selenium, mercury and other dangerous substances. It was quite literally a poisonous lump of coal dumped on a nearby community just 3 days before Christmas last year.

Exposure to these pollutants can wreak havoc on human health including increased risk of cancer, birth defects, reproductive problems, gastrointestinal illnesses, damage to the nervous system and kidneys, and learning disabilities to children. They have also been

associated with acute symptoms of hair loss, severe muscle cramps, nausea, joint pain, confusion and blistering skin. The cleanup for the catastrophic event that occurred in eastern Tennessee is estimated to cost more than $1 billion. It completely destroyed three homes, displaced all nearby residents, crumpled docks and wiped out roads.

The Kingston catastrophe caused the media, the public and the Congress to focus attention on EPA's longstanding failure to promulgate meaningful regulations for the disposal of this material. Despite the litany of damage from coal combustion waste, current regulations have been left largely to the States resulting in widespread inconsistencies in waste management.

In the wake of the TVA disaster, I wrote two letters to the EPA addressing the lack of national policy to regulate and monitor coal combustion waste and its impact on health and the environment. A decade after announcing that national regulations were needed, the EPA finally said in March of this year that it would propose regulations for coal waste disposal by the end of 2009. Every State in the Nation currently gets at least some of its electricity from coal-fired plants. Each year these power plants along with industrial facilities produce approximately 130 million tons of coal combustion waste. Every day in almost every State, coal ash is dumped into ponds, dry landfills and abandoned mines. Accidental breaches are not the only threats associated with the management of coal combustion waste. The slow leakage of the toxins the waste contains even when dumped into dry but unlined storage sites has poisoned water supplies, damaged ecosystems and jeopardized public health. And what oozes into the soil and water are dangerous substances such as arsenic, cadmium, selenium and mercury. In fact, the National Academy of Sciences has identified 24 potentially hazardous metals in coal ash. As EPA moves forward with its regulations, it must ensure that public health is protected for all disposal practices, not just the type of wet impoundment ponds that led to the Tennessee disaster.

The good news is, that these materials can be recycled. In fact, industry estimates that 45 percent of coal ash is currently being beneficially reused. However, not all methods of reuse are equally beneficial when it comes to protecting public health. For example, using coal fly ash to make concrete doesn't allow the dangerous chemicals to leach out and also likely to reduce greenhouse gas emissions compared to other means of producing concrete. But other so-called beneficial uses are less protective of public health. Using the material as filler for some road embankments or, as we will hear today, to build golf courses can lead to leakage of the very same poisons into the drinking water. EPA should encourage the beneficial uses that truly do protect public health and derive economic benefit to the industry while restricting those that have the potential to cause economic or physical harm to nearby communities. That is what the subject of today's hearing will be. We look forward to hearing from our witnesses.

Mr. MARKEY. Let me now turn and recognize the gentleman from Kentucky, Mr. Whitfield.

OPENING STATEMENT OF HON. ED WHITFIELD, A REPRESENTATIVE IN CONGRESS FROM THE COMMONWEALTH OF KENTUCKY

Mr. WHITFIELD. Mr. Chairman, thank you very much for this important hearing on drinking water and public health impacts on coal combustion waste disposal.

As you have already stated, 50 percent of our electricity, in fact, a little bit more than that, is produced by coal in the United States and 92 percent of electricity in my home State of Kentucky is produced by coal. I definitely believe it is important that we continue to be able to use coal in the United States for two main reasons. First of all, it provides cheap electricity which creates jobs and makes us more competitive in the global marketplace, and second of all, it is our most abundant resource here in the United States since we have about a 250-year reserve of coal.

Now, unfortunately, since the 111th Congress began, many, we believe, have been targeting coal specifically for the purpose of making it more difficult to burn coal in the United States in the long term. I think one of the objectives of cap and trade is certainly to make it more difficult to use coal, the Obama Administration recently in its endangerment finding to give them an opportunity to regulate CO_2 emissions which they had never done before. We have seen that it is much more difficult to get permitting to burn coal. And then we know that in Copenhagen that coal is a principal target as they discuss climate change issues.

Now, I don't think any of us are opposed to examining newer methods that will allow coal to be used in a cleaner way and we are totally supportive of that, and I know that today we have witnesses in the first panel who have experienced some health problems. They will tell us about what it is from. And obviously we want to do everything that we can do to protect health. But as the chairman has already indicated, there are many beneficial uses in building materials and as structural fill for building sites using this material. And I would also point out that EPA has looked at this issue repeatedly about whether or not coal ash should be listed as a hazardous material. States already regulate this material, and we are willing to work with the federal government to regulate this material, but if you are going to try to classify it as a hazardous material, then there is going to be a major issue on that because when you burn a material at over 3,000 degrees temperature, it is very difficult to see how the residue can be very hazardous, and I might say that EPA looked at this in 1993 and determined not to regulate. They looked at it in 1999 and decided not to regulate. They looked at it in 2000 and decided not to regulate. And then back in 1980 when Congress first passed the Bevel amendment, they determined that this was not a hazardous product.

So I think that it is very important that we have this hearing but I think it is also important that we proceed in a balanced way because if America is going to continue to create jobs and if America is going to continue to be competitive in the global marketplace, then there is not any way that we can eliminate the use of fossil fuel the way Albert Gore and others are suggesting that we do.

So this type of hearing is vitally important because it gives us an opportunity to look at it in a balanced approach. We look for-

ward to the testimony of those witnesses on our first panel as well as all witnesses today. And with that, I would yield back the balance of my time.

Mr. MARKEY. The gentleman's time has expired. The chair recognizes the gentleman from Pennsylvania, Mr. Doyle.

Mr. DOYLE. Thank you, Mr. Chairman, for calling this important hearing. I am going to waive my opening statement and look forward to hearing from the witnesses.

Mr. MARKEY. The gentleman's time will be preserved. The Chair recognizes the gentleman from Georgia, Mr. Barrow.

Mr. BARROW. Thank you, Mr. Chairman. I will waive opening.

Mr. MARKEY. The Chair recognizes the gentleman from California, Mr. McNerney.

Mr. MCNERNEY. Thank you, Mr. Chairman, for hosting this important hearing on the disposal of coal waste, and we are going to need coal for a long time to come so we better figure out how to use it properly and how to dispose of the waste.

Unfortunately, some of the waste products have caused major health problems, and I thank the witnesses for coming forward today to discuss this. I know it is difficult to come out here and sit in front of a panel, so you deserve credit for that. I know there are some good ways to do it. As the chairman mentioned, encasing it in concrete is an excellent opportunity for us to use that in a beneficial way but we do need to be careful about using it in other ways. I look forward to the testimony today to make some decisions and to help the EPA in their regulatory process.

Thank you, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. The chair recognizes the gentleman from Illinois, Mr. Shimkus.

OPENING STATEMENT OF HON. JOHN SHIMKUS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. SHIMKUS. Thank you, Mr. Chairman, and I do appreciate the hearing today and appreciate the witnesses on both panels for coming in, and we will hear issues that affected the lives of individuals. I always also like to highlight how what we do here in Washington affects other people's lives, and I always have historically put up this poster of 1,200 miners who lost their jobs last time we enacted clean air regulations. This isn't just one mine in my district. In Ohio, Ohio lost 35,000 coal-mining jobs. So we better tread carefully on how we balance the environmental risk with what we do see, and I agree with my colleague from Kentucky, an all-out attack on coal mining, coal use in this country and so I will also be focusing on the impacts to these guys who come from real families, real communities and where small communities in rural parts of my State were destroyed because of the attack on coal.

I also would like, Mr. Chairman, to ask unanimous consent for three letters to be submitted in the record. I know you will want to look at those.

[The information appears at the conclusion of the hearing.]

Mr. MARKEY. Without objection, so ordered.

Mr. SHIMKUS. The first letter is from 74 Members of Congress to Lisa Jackson at the EPA regarding our position against listing coal combustion byproducts as hazardous. In fact, there are at least 15

members of this committee on this letter on both sides of the aisle. This letter is an original letter by our good friend from Pennsylvania, Mr. Tim Holden. The second is from the Illinois EPA. In it, they state, "Based on our past experience, it is our position that classifying coal combustion waste as a hazardous waste is not warranted and would place unnecessary barriers on its beneficial use and reuse in the future. We feel our approaching of regulating coal combustion waste under the non-hazardous solid-waste regulations is protective of both human health and the environment and is an effective and logical way to safely manage coal combustion waste," and that is from the Illinois EPA. The last letter is from the Office of Public Utilities in the city of Springfield, Illinois, which is partially in my district. In it, they say, "Listing coal combustion byproducts as hazardous waste would have dramatic adverse consequences for the city of Springfield." That is our State capital. And that the CWLP, which is the city water, light and power, due—"City of Springfield CWLP due to the increase in cost associated with the managing and disposing of coal combustion byproducts as well as a lack of availability of coal combustion byproducts for construction purposes." They go on to associate the cost of CCBs were listed as hazardous. They identify four locations as facilities that are permitted to receive RCRA hazardous waste. These amounts reflect treatment and transportation costs, and we have in the millions of dollars. What does this mean? We better tread very, very carefully. When this country is in one of the worst economic periods that I can remember, to have another attack on good jobs in this country is unwarranted. So I would caution us to go carefully, Mr. Chairman. I yield back my time.

Mr. MARKEY. The gentleman's time has expired. The chair recognizes the gentleman from Maryland, Mr. Sarbanes.

Mr. SARBANES. Thank you, Mr. Chairman. I appreciate your giving me the opportunity to participate briefly here.

Mr. MARKEY. I am sorry. I just want to remind you that the gentleman is not on the subcommittee, so let me recognize the remaining members of the subcommittee. The gentleman from Florida, Mr. Stearns, is recognized.

OPENING STATEMENT OF HON. CLIFF STEARNS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF FLORIDA

Mr. STEARNS. Thank you, Mr. Chairman.

You know, when I lived in Massachusetts, I had a coal-burning furnace to try and keep my house warm because it was so expensive, and then I had a wood stove. You know, when I finished, I used to take the coal ash and put it on my garden, and every year that garden worked just so remarkably well. It worked to the benefit of the garden and me because we had fresh vegetables. And I used to take the ash from the wood too and I would put it in the garden, so I would just say to the chairman and to the others that I think there is some redeeming value to some of this coal ash.

I note, Mr. Chairman, that the EPA Administrator Jackson is not here to testify, and it would be very helpful to have her here to answer some of the questions about this issue. As I understand it, for three decades EPA has resisted subjecting this coal ash to federal hazardous waste management regulation, and more specifically in

1993 and 2000, the EPA conducted two regulatory determinations on the management and use of coal combustion products which determined that, "in conducting these two regulatory determinations, EPA did not identify any," let me repeat, "any environmental harm associated with the beneficial use of coal combustion products" and concluded in both determinations that these materials do not, do not warrant regulation as a hazardous waste material. So it is pretty clear that the EPA has a strong message on this and the EPA is not here. So I think, Mr. Chairman, it would be helpful for the committee if you explain why the EPA Administrator is not here to help us further explain her remarks on this coal ash.

Imposing a hazardous waste designation on this coal ash will do little to prevent the situation that occurred at the TVA's Kingston, Tennessee, plant and will only force greater landfilling of it while eliminating the environmental benefits of using coal ash. So I think, Mr. Chairman, in light of my opening statement, we still have some questions to ask.

Mr. MARKEY. The gentleman's time has expired. The gentleman from Louisiana, Mr. Scalise.

OPENING STATEMENT OF HON. STEVE SCALISE, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF LOUISIANA

Mr. SCALISE. Thank you, Mr. Chairman. I appreciate the opportunity to discuss the impacts of coal combustion waste disposal.

While I strongly support measures that protect the safety of our Nation's drinking water, I am concerned about the negative implications that could result from the regulation of coal combustion waste by EPA as a hazardous waste instead of under RCRA's subtitle D non-hazardous waste authority. This issue involves a very critical component to our country's overall energy policy, and an EPA decision to regulate coal combustion waste as hazardous waste could be devastating to our Nation's economy.

Mr. Chairman, as we discuss this issue of energy policy in general, I also want to take this opportunity to express my serious concerns about recent decisions from the current Administration and the direction that this Congress is taking regarding our energy policy. While we await EPA's final ruling on how they plan to regulate coal combustion waste. I also have serious concerns about the EPA's recent announcement regarding their proposed regulation of greenhouse gases. The EPA's regulation of greenhouse gas emissions would result in the largest power grab of any United States agency over our national economy. The threat of heavy-handed EPA regulation or a cap-and-trade energy tax will result in millions of American jobs being shipped overseas to countries like China and India, who don't have the current environmental regulations that we have today. In my home State of Louisiana, thousands of jobs will be lost under a cap-and-trade energy tax, and as a matter of fact, there is a company in south Louisiana that is currently basing their decision to locate in either Brazil or Louisiana in part on what Washington does on emissions regulations not to mention the Climate Gate scandal, which has not only proven that there have been efforts to silence those scientists who present evidence to the contrary of global warming alarmists would have our

world believe about climate change, but as we have seen, the science on climate change was actually corrupted in an effort to help make their case. It seems, Mr. Chairman, that this Administration and those running Congress will stop at nothing to pursue this liberal agenda that is killing our economy, resulting in thousands of dollars in higher electric bills for American families and small businesses and shipping millions more American jobs overseas. Thank you, and I yield back.

Mr. MARKEY. Great. The gentleman's time has expired. All time for opening statements of members has expired. So what we will do is, we will ask our witnesses to come up to the panel, if they would, and I would ask Representative Forbes if he would to come over to introduce our first witness.

Mr. FORBES. Mr. Chairman, first of all, I would like to thank the members of the subcommittee for giving me the courtesy to join you briefly to introduce one of the witnesses on your panel, and I would also like to thank you for holding this very important hearing.

This is an important hearing for at least two reasons. First, Members of Congress need to hear from Americans whose daily lives have been interrupted because of uncertainty surrounding a basic need like safe drinking water. At some point today rain or shine, a family from my district will drive to their local church, gather around a spigot and bottle up as much water as they need to survive the weekend. Over the past 19 months, hundreds of constituents from my district have not been able to drink a single glass of water from their wells without fear of consuming poisonous toxins. They have not been able to bathe their children without pausing to wonder whether they will pass on a deadly disease, and they have not been able to finance the education of their loved ones because their equity lines of credit on their homes have been devastated.

The second reason I believe this hearing is important is because the members of this committee must be made aware that irrespective of any new coal ash regulations, the Environmental Protection Agency is already doing a disservice to our constituents by providing contradictory test results to some of the residents and by withholding hazard scores that could highlight dangers threatening the health and welfare of the citizens we are supposed to protect. Yesterday, I sent a follow-up request to the EPA requesting immediate access to a hazard ranking system evaluation and score for the Battlefield Golf Club in Chesapeake. This information would provide families and constituents from my district an understanding of the nature and severity of any toxic contamination on or near their personal property. To date, it has been withheld by the EPA as a part of the deliberative process.

Mr. Chairman, if the federal government continues to deliberate for another 18 months, constituents from my district will continue to live with uncertainty about their drinking water, their health and their homes. If the Congress and this Administration are truly committed to transparency and accountability, certainly we can do better. But rather than requiring you to continue to listen to more words from me at this time, I would like to introduce you to someone who can tell you what it means to live with uncertainty about

the safety of her family's drinking water. Mrs. Robyn Whitaker-Pierce is a long-time resident of my hometown of Chesapeake and her family owns a home near the Battlefield Golf Course, which was built atop a foundation that includes coal fly ash. Her family has had to live with the uncertainty as to whether her drinking water is safe for many months, and she has a compelling story to share. Mrs. Pierce, I want to thank for you for taking time to be here today and I know the committee looks forward to your testimony.

Mr. Chairman, thank you for allowing me to introduce Mrs. Pierce.

Mr. MARKEY. Thank you, Congressman Forbes, and Mrs. Whitaker-Pierce, whenever you feel comfortable, please begin.

STATEMENTS OF ROBYN WHITAKER-PIERCE, RESIDENT OF CHESAPEAKE, VIRGINIA; GAYLE QUEEN, RESIDENT OF GAMBRILLS, MARYLAND; RAYMOND HUNT, JR., RESIDENT OF WATERFLOW, NEW MEXICO; AND CARLA HUNT, RESIDENT OF WATERFLOW, NEW MEXICO

STATEMENT OF ROBYN WHITAKER-PIERCE

Mrs. WHITAKER-PIERCE. Good morning. Thank you for your time.

In 2001, our local utility company, Dominion Virginia Power, orchestrated an aggressive campaign convincing area residents and local city council that a golf course constructed with coal ash was not only safe but a great benefit for our neighborhood. Residents and local government were assured on numerous occasions and in various forums that the use of such material posed no threat to our community, and that any and all safeguards would be adhered to, and quote fly ash in this specific use was "safe as dirt."

We now know differently thanks to the diligent work of a local newspaper reporter, Robert McCabe. Mr. McCabe reported tests of monitoring wells on a golf course sculpted with 1.5 million tons of fly ash yielded alarmingly high levels of toxins in groundwater. All of the homes in the immediate area rely on private wells as our water source. Immediately the local city government ordered area wells tested and requested the EPA's help in discerning the potential risks to our community.

Nineteen months later, my home has been tested multiple times by three different agencies including the EPA and results are inconsistent and confusing. Lead levels have been detected in excess of three times the EPA's action standard, and on one such occasion water tests were done on the same day by three firms. Two of the three detected elevated lead levels yet a call from the EPA's representative said "Good news. There is no lead in your water."

You can imagine my alarm as a mother when the EPA representative asked about young children in my home and their ages, and later that day, I received a call from a doctor at the Centers for Disease Control urging me to get the children's lead level tested. The EPA continues to test my water every few months and I get those results but to the layperson they are confusing and I feel as in the dark now as I was when all this started. For example, just Tuesday, 2 days ago, an EPA representative came to my home to continue another water test. It turns out that all of the tests that

have been conducted inside my home have been done at the only sink with the only dedicated filter, auxiliary filter—let me put it that way—and is used least in our home. Consequently, all of the data that they have collected to this point is not a true representation of our exposure as the water we brush our teeth with and bathe with has yet to be evaluated.

How did this happen? For 5 years, hundreds of truckloads of coal ash were dumped daily in our community. We have since learned that those same truck drivers and were required to have haz-mat licenses, were wearing masks and protective clothing yet our children unknowingly played outside amongst this dangerous dust. Neighbors recall coming home and finding layers of gray chalky residue on vehicles and pool surfaces. None of my neighbors had any inkling of the dangers we were being exposed to. Dominion did but we didn't.

We now know that experts warn of the dangers of heavy metal toxins leaching from coal ash when exposed to water. Yet coal ash was spread over a 220-acre site in our backyards in a region with a notoriously high water table, I think we have some pictures. Ladies and gentlemen, this is someone's yard, and please understand that this is just a small area but boy, if you could flip over to the next picture, that is my street. We have recreational boating every time a storm comes through to our neighborhood. Please explain to me how it is that coal ash, no liners, was thrown into my backyard in an area like this, and this is not a one-time occurrence. Our streets and yards are underwater when storms come, but even after Dominion Virginia Power commissioned feasibility studies that discouraged using fly ash as a construction material, they pushed on. Permits for a septic system on the golf course location were denied by the health department due to the high water table, yet that 1.5 million tons of fly ash was dumped on the same site, and Dominion pushed on.

Just 50 miles from Chesapeake, between 1957 and 1974, fly ash from Dominion's Yorktown power generating station was disposed of in four abandoned burrow and gravel pits. This area later was designated by our own EPA as the Chisman Creek Superfund site. Even in light of this previous debacle, Dominion pushed on in Chesapeake.

The reverberation from this lack of regulation has been enormous. Numerous families have recently been diagnosed with cancer, asthma and autoimmune diseases, not to mention our fear for our children's future health. Are these illnesses related to dust and water exposure? It may take years for the effects of our exposure to this toxic waste dump to manifest themselves.

Since May of 2008, my family and other families in our neighborhood have not used their tap water to cook or drink. We have been reduced to traveling to a municipal cistern where two to three times per week we fill empty gallon jugs with water to bring back home for our use. Most of us still bathe and brush our teeth with the tap water. What other alternative do we have, and who is there to provide for our safety?

The financial ramifications are devastating. As a professional realtor, I can assure you that as long as the specter of fly ash looms over our community, our houses will not sell. We are literally held

hostage in our homes not at the barrel of a gun but by the cesspool of poisons in our back yards.

We have retired military veterans who have proudly served our country for 20-plus years. They want to move home but they can't because no one will buy their house. Elderly couples who have lost a spouse and cannot keep up with their homes want and need to downsize but they cannot. My husband has been a self-employed electrical contractor for over 25 years. The equity in our home is our retirement. We have been wiped out. There is no equity in a home no one will buy. How will we put our boys through college, and what am I going to do with my children if my husband passes away? One family in our neighborhood cannot qualify for financial aid for their child's college education because they own their home, but it is worthless.

My children are afraid. Their friends' parents are concerned about their children's exposure when visiting my home. An 11-year-old was at our house for a sleepover and asked me, "Miss Robyn, I just washed my hands. Do I need to do something about the poison water?" I was just excited that he washed his hands after going to the bathroom, frankly.

But the Virginia health department has been no help. Virginia's Department of Environmental Quality let this happen again and has been a colossal disappointment. The EPA, they are out to lunch. I have absolutely no faith in an environmental protection agency that continues to come to my house but until 19 months after coming to my house just realizes that they are testing the wrong tap, the tap that my children brush their teeth and bathe with.

We certainly cannot expect the local power company to operate in a conscientious manner, if our government doesn't help. We the public are stunned to find there is no regulation in place to protect us. The current definition of beneficial use quite frankly is an oxymoron. As long as coal ash remains unregulated, we the people have no protection from the companies who use beneficial use as a cover for corporate malfeasance.

In our opinion, the only hope we have is for the far-reaching hand of our federal government to mandate the EPA to designate coal ash as a hazardous waste, to regulate its use with the strictest of protocols, and order that this tumor in my community gone. And ladies and gentlemen, until that is done, the inmates are running the asylum.

[The prepared statement of Mrs. Whitaker-Pierce follows:]

House of Representative Subcommittee on Energy and Environment
Testimony of Robyn Pierce
December 10, 2009

In 2001 our local utility company Dominion Virginia Power, orchestrated an aggressive campaign convincing area residents and local city council that a golf course constructed with coal ash was not only safe but a great benefit for our neighborhood. Residents and local govt. were assured on numerous occasions and in various forums that the use of such material posed no threat to our community, that any and all safeguards would be ad heard to, and quote fly ash in this specific use was "safe as dirt."

We now know differently thanks to the diligent work of a local newspaper reporter Robert McCabe. Mr. McCabe reported tests of monitoring wells on a golf course sculpted from 1.5 million tons of fly ash yielded alarmingly high levels of toxins in ground water. All of the homes in the immediate area rely on private wells as our water source.

Immediately the local city government ordered area wells tested and requested the EPA's help in discerning the potential risks to our community.

19 months later, my home has been tested multiple times by 3 different agencies including the EPA and results are inconsistent and confusing. Lead levels have been detected in excess of 3x the EPA action standard. On one such occasion water tests were done on the same day by 3 firms. Two of the three detected elevated lead levels yet a call form the EPA representative said "good news" no lead was detected in your water.

You can imagine my alarm as a Mom, when the EPA representative asked about young children in my home and their ages. Later that day, I received a call from a doctor at the CDC office in Pennsylvania urging me to get the children's lead levels tested . The EPA continues to test my water EVERY few months and I get the results but they are confusing and I'm as in the dark now as I was when this started.

How did this happen? For 5 years hundreds of truckloads of coal ash were dumped daily in our community. We've since learned those same truck drivers and were required to have haz-mat licenses, and wore masks and protective clothing yet our children unknowingly played outside amongst this dangerous dust. Neighbors recall coming home and finding layers of gray chalky residue on vehicles and pool surfaces. None of my neighbors had any inkling of the dangers were being exposed to.

We now know that experts warn of the dangers of heavy metal toxins leaching from coal ash when exposed to water. Yet coal ash was spread over a 220 acre site in our backyards in a region with a notoriously high water table. Our streets and yards are

underwater when storms come, but even after Dominion commissioned feasibility studies that discouraged using fly ash as construction material they pushed on. Permits for a septic system on the golf course location were denied by the health department due to the high water table, yet 1.5 million tons of coal ash was dumped on the same site, Dominion pushed on.

Just 50 miles from Chesapeake between 1957 and 1974 fly ash from Dominions Yorktown Power generating station was disposed of in 4 abandoned sand and gravel borrow pits. This area was designated as the Chisman Creek superfund site by the EPA. Even in light of this previously egregious debacle, Dominion pushed on in Chesapeake.

The reverberation from this lack of regulation has been enormous.

Numerous families have recently been diagnosed with cancer, asthma and auto immune diseases. Not to mention our fear for our children's future health. Are these illnesses related to dust and water exposure? It may take years for the effects of our exposure to this toxic waste dump to manifest themselves.

Since May 2008, my family and other families in this community have not used their tap water to cook or drink. We have been reduced to travailing to a municipal cistern where we 2-3 times per week fill empty gallon jugs with water to bring back home for use. Most of us still bathe and brush our teeth with the tap water. What other choice do we have? Who is there to provide for our safety?

The financial ramifications are devastating. As a professional realtor, I can assure you as long as the specter of fly ash looms over our community our houses will not sell. We are literally held hostage in our homes not at the barrel of a gun but by the cesspool of poisons in our back yards.

We have retired military veterans who have proudly served our country for 20 plus years, and want to move back home, but they cannot because no one will buy their home. Elderly couples who have lost a spouse and cannot keep up with their homes want and need to downsize but cannot move. My husband has been a self employed electrical contractor for 25 years, the equity in our home is our retirement. We've been wiped out--there is no equity in a home no one will buy. How will we put our boys through college? What will happen to us if he passes away? One family in our neighborhood cannot qualify for financial aid for their son's education because they own a home--- but it's worthless.

My children are afraid. Their friends' parents are concerned about their children's exposure when visiting my house. An 11 year old who was at our house for a sleep over asked me "Miss Robyn, I just washed my hands do I need to do anything about the poison water?"

Virginia's health department has been no help. Virginia's DEQ let this happen again and has been a colossal disappointment. The EPA is out to lunch. We certainly cannot expect the local power company to operate in a conscientious manner, if government doesn't help.

We the public are stunned to find there is no regulation in place to protect us. The current definition of "beneficial use" is quite frankly an oxymoron. As long as coal ash remains unregulated-we the people have no protection from the companies who use beneficial use as a cover for corporate malfeasance.

In our opinion, the only hope we have is for the far reaching hand of our federal government to mandate the EPA to designate coal ash a hazardous waste, regulate its use with the strictest of protocols, and order that this tumor in our community be removed. And until that is done the inmates are running the asylum.

Mr. MARKEY. We thank you very much for being here.

Let me now turn to Representative Sarbanes from Maryland to introduce our next witness.

Mr. SARBANES. Thank you, Mr. Chairman. I appreciate your giving me the opportunity to participate this morning in the hearing, and I thank you for the issues that you are going to be looking at. I have the unhappy distinction that this is now the second hearing that has occurred in this Congress, the first was in Natural Resources and Mineral Resources Subcommittee, in which a constituent of mine will be testifying on the effects of coal combustion waste, fly ash, in terms of exposure to that harmful substance. And I congratulate Ms. Queen, who I am going to introduce now, for her willingness to come forward and testify on what the effects have been on her and her family because they have been devastated, just as we have heard from Mrs. Whitaker-Pierce.

Let me introduce Gayle Queen. Before her illness forced her to stop working, she was a supervisor in the family support division of the Department of Social Services in Glen Burnie, Maryland, which is in my district, where she helped young women obtain jobs, earn GEDs and go back to school. She moved to her present home in Gambrills, which is part of my district and which is where the witness in the Natural Resources Committee, Norm Harvey, also resides. Ms. Queen moved to Gambrills in 1997. She has two adult sons and her younger son and her three daughters living with her were exposed to the coal ash contamination until they moved in 2008. The leaching of this fly ash into the drinking water supply is a really critical, critical issue for us to examine.

Again, I appreciate your taking the time and resources of this committee to focus on it. I thank Ms. Queen for being here and we look forward to her testimony.

Mr. MARKEY. Great. We thank the gentleman, and Ms. Queen, whenever you are ready, please begin.

STATEMENT OF GAYLE QUEEN

Ms. QUEEN. Good morning, and thank you. My name is Gayle Queen and I live at 2401 Queen Mitchell Road in Gambrills, Maryland. My family has lived in this area for over 100 years. I am a 56-year-old and a widow. I am no longer employed. I lived in Gambrills community while for over 10 years during that time 4.1 million tons of coal ash was dumped next to my home by a power company.

I am here to tell you about what happened in Gambrills, Maryland, and how the contamination of the air and drinking water has affected my health, the health of my family and community. I am here today to ask you to make sure that Congress passes legislation so that another community doesn't have to suffer like my community.

The coal ash was dumped into an unlined 80-foot-deep pit on 84 acres. The coal ash went into an aquifer that supplies my community drinking water and we all breathe the dust in. Once the community was informed of the problem in 2007, we were given no help by the State or federal government. Later, one of the solutions was to hook up some of my neighbors to a fire hydrant for water. The hoses froze in the winter. For other people, bottled water was

supplied and it is still supplied today. Every 2 weeks I get bottled water to wash, bathe, to do everything with every 2 weeks, but this did nothing for our past exposure both in our drinking water and in the air.

The problem in Gambrills with coal ash started in the 1990s at another coal ash dump site when the power company dumped coal ash in another community. The residents of that community complained and they moved it down to the dumping area that I showed you over there. When it was required to have a continued 36-inch-thick layer of clay at the bottom of the ash pit, the power company decided to dump the coal ash near my home in Gambrills. There was supposed to be no contact between the coal ash and the surface of the groundwater with a four-foot separation between the coal ash and the groundwater. No expense, no liner or 30-inch layer of clay was required at the Gambrills site. Sadly, the coal ash went directly into standing water and sand and gravel pit which had excavation as deep as 80 feet. There was no liner or four-foot barrier either. The truck drivers who dumped the coal ash dumped it without any remorse. My community was never warned of the danger of toxic coal ash or that it would go into our water or our lungs and cause injury.

Starting in 1999 and through 2007, tests showed that arsenic, iron, manganese and sulfate were being leached at dangerous levels and finally these dangerous chemicals got into our private wells.

I have a well at my home. I rely on my well water to provide cooking, drinking and bathing water. In 2007, the power company began providing me bottled water. Before this, I had never heard of coal ash or its dangers and didn't know this toxin was being dumped in my community. If I had known about the dangers, I would have protected me and my family and community long ago. But we didn't know of the dangers or even that dumping was going on.

Thankfully, the power company did finally take responsibility for the situation by helping the community with these problems. But the contamination of the water remains. It should never have happened.

Because of the coal ash contamination, I have lost both my financial security and my health. My biggest monetary asset, my home, is worthless. I cannot afford to pay the mortgage after the death of my husband in 2006, and I may have to file for bankruptcy or foreclosure because it is not worth anything.

Because of the coal ash, I have trouble breathing, and I am not a smoker. My doctor has told me I have the lungs of an 80-year-old woman because of breathing in something, coal ash. I am terrified about my future health. My husband died in 2006 from renal failure, and I worry that my organs will fail, I will get cancer or I will get another disease because of my exposure to this ash. I also worry about my grandchildren. They drank the water, they bathed in it, they brushed their teeth. Will they get a disease, too? No one can tell me for sure. But I do know they never should have been exposed to this stuff.

I ask that you pass legislation to protect people like me and my family. If the Environmental Protection Agency had the authority

to require liners and force power companies not to dump close to drinking water systems, what happened to me and my community would not happen to anyone else. We do not have the power to protect ourselves. These companies and the State agencies are not protecting us. Coal ash contamination ruins the lives of the people in the community and our environment. It cannot be allowed to happen again. Thank you very much.

[The prepared statement of Ms. Queen follows:]

House of Representative Subcommittee on Energy and Environment
Testimony of Gayle Queen
December 10, 2009

My name is Gayle Queen. I live at 2401 Queen Mitchell Road in Gambrills, Maryland. My family has lived in this area for over 100 years.

I am 56 years old and a widow. I am no longer employed. I lived in the Gambrills community while for over 10 years during that time 4.1 million tons of coal ash was dumped next to my home by a power company.

I am here to tell you about what happened in Gambrills, Maryland and how the contamination of the air and drinking water has affected my health, the health of my family and community. I am here today to ask you to make sure that Congress passes legislation so that another community doesn't have to suffer like my community.

The coal ash was dumped into an unlined, 80 foot deep pit on 84 acres. The coal ash went into an aquifer that supplies my communities' drinking water, and we all breathed the dust in. Once the community was informed of the problem in 2007, we were given no help by the state or federal governments. Later, one of the "solutions" was to hook up some of my neighbors to a fire hydrant for their water. The hoses froze in the winter. For other people, bottled water was supplied. But this did nothing for our past exposure, both in our drinking water and in the air.

The problems in Gambrills with coal ash started in the 1990s at another coal ash dump site when the power company dumped coal ash in another community. The residents of that community complained about the dust from the trucks dumping the coal ash and the grading on the site. When it was required to have a continuous 30-inch thick layer of clay at the bottom of that ash pit, the power company decided to dump coal ash near my home.

There was supposed to be no contact between the coal ash and the surface or ground water with a four foot separation between the coal ash and ground water. No expensive liner or 30 inch layer of clay was required at the Gambrills site.

Sadly, the coal ash went directly into standing water, in a sand and gravel pit which had excavations as deep as 80 feet! There was no liner or four foot barrier either. The truck drivers who dumped the coal ash said that there was water often sitting in those pits, even without any recent rain.

My community was never warned of the dangers of toxic coal ash, or that it could go into our water and our lungs and cause injury.

Starting in 1999 and through 2007 tests showed that arsenic, iron, manganese, and sulfate were being leached at dangerous levels and finally these dangerous chemicals got into our private wells.

I have a well at my home. I rely on my well water to provide cooking, drinking and bathing water.

In 2007, the power company began providing me bottled water. Before this, I had never heard of coal ash or its dangers and didn't know this toxin was being dumped in my community. If I had known about the dangers, I would have protested along with my community and this dumping would not have happened. But we didn't know of the dangers, or even that dumping was going on.

Thankfully, the power company did finally take responsibility for the situation by helping the community with these problems. But the contamination of the water remains. It should never have happened.

Because of the coal ash contamination, I have lost both my financial security and my health. My biggest monetary asset, my home, is worthless. I cannot afford to pay the mortgage and the bank has foreclosured on me. I may have to file for bankruptcy.

Because of the coal ash, I have trouble breathing. I am not a smoker. My doctor has told me I have the lungs of an 80 year old woman because of breathing in the coal ash. I am terrified about my future health. My husband died in 2006 from renal failure, and I worry that my organs will fail, I will get cancer or I will get another disease because of my exposure to this ash.

I also worry about my children and grandchildren. They drank the water, bathed in it, brushed their teeth and breath in this dust. Will they get a disease, too? No one can tell me for sure. But I do know they never should have been exposed to this stuff.

I ask that you pass legislation to protect people like me, and my family. If the Environmental Protection Agency had the authority to require liners and force power companies not to dump close to drinking water systems, what happened to me and my community would not happen to anyone else.

We do not have the power to protect ourselves these companies and the state agencies are not protecting us.

Coal ash contamination ruins the lives of the people in the community and our environment. It cannot be allowed to happen again. Thank you.

Mr. MARKEY. Thank you, Ms. Queen, very much.

Our final witness is Mr. Raymond George Hunt, Jr. He and his family have lived in Waterflow, New Mexico, as sheep ranchers for generations. Mr. Hunt and his family operate a small business in supply meat to the local Native American tribes in the Four Corners area of New Mexico. Mr. Hunt's home is adjacent to the San Juan Generating Station of Public Service Company of New Mexico and the San Juan coal mine operated by BHP, and he and his family have been directly impacted by the coal combustion waste disposal practices at these facilities. So we welcome you, sir. Please begin.

STATEMENT OF RAYMOND HUNT, JR.

Mr. HUNT. Thank you, sir, for letting me attend this.

I own and operate a small family business on land my grandfather established in the early 1940s where I raised my four children. For generations we drank from the fresh water on our property without any adverse effects. Our animals grazed nearby and drank from the natural springs and the arroyo during the irrigation season. These water sources were healthy and very productive for our business, which provides meat to the Native American Tribes.

In 1974, Public Service Company built the San Juan Power Plant and began using the dry arroyo to discharge their wastewater. They began burying fly ash in the nearby dry streambeds, rather than into lined ponds, which then leached into our underground aquifers, contaminating our good water with very high levels of arsenic, selenium, potassium, chromium, lead, sulfate and many others.

By 1975, after the dumping of the coal ash began, my family started to get sick. I was diagnosed with heavy metal poisoning with extremely high arsenic, iron, lead and selenium levels. I lost nearly 100 pounds in less than a year. I was so weak I couldn't stand or walk, and wasn't expected to live. For several years, my diet consisted of steamed chicken, squash and potatoes. Any variation caused extreme diarrhea, nausea and vomiting. My stomach ached and I suffered constant indigestion. My wife was sick most of the time with similar symptoms. We had difficulty comprehending simple conversations. Her body became misshapen causing——

Mr. MARKEY. Take your time.

Mrs. HUNT. My name is Carla Hunt and I am his second wife. If it would be all right with you, I will finish his statement.

My wife was sick most of the time with similar symptoms. We both had difficulty comprehending simple conversations. Her body became misshapen, causing many complications that remain today. Our children lost weight and complained of stomachaches. They had constant indigestion and diarrhea. Their hair was falling out and unhealthy looking. Their teeth and eyesight were compromised to the extent they still wear glasses and require frequent monitoring. The children's teachers reported that they had difficulty with simple tasks of concentration and comprehension. One son was enrolled in special education classes throughout his high school years.

Two days before Christmas in 1982, PNM approached us offering us $2,500 to sign a release as a good neighbor gesture on their part. We asked them, instead, to cover the cost of hooking into the public water system for our family, and they refused.

For two years, we bought drinking water and carried it into our home until we could afford the connection fees for the public water system. Once we stopped using the well, we began slowly to improve. My wife, kids and I had been sick for over ten years. My animals were not so fortunate. I watched 1,400 head of sheep slowly suffer and die from the lack of safe drinking water. Within 2 years I lost my entire sheep herd and took outside jobs, rather than risk selling contaminated meat to my customers.

Although they lined the ponds, as required by an EPA enforcement action and fine in 1984, PNM set up an agreement that the fly ash would be returned to the neighboring BHP San Juan Coal Mine and buried in the unlined pits there. The result is that the fly ash and scrubber sludge continues to contaminate the arroyo and groundwater through unlined sites.

My children are grown and married now. Two sons have served several tours of duty in Iraq, Afghanistan and Germany. All have some evidences of the childhood problems they experienced due to the polluted water. My daughters have had very difficult pregnancies and deliveries, which doctors have said may be the result of the childhood poisoning. I have three grandchildren who have been diagnosed autistic, also linked to heavy metal poisoning in their mothers, and another who is ADHD. My brother developed multiple sclerosis and spent 20 years in a care unit. My father died of cancer. Four of my stepbrothers and sisters have died prematurely due to cancer and cancer-related illnesses. All were under the age of 40 and healthy, athletic children throughout their high school years with no apparent contributing illnesses. All of them drank from these same polluted water wells and streams. I rely heavily on others to help me with the management and operation of my business, because, although recovered, I still suffer many side effects from the poisoning.

In conclusion, this is only the story of my family. I have many neighbors with similar stories. Some have lost young children. Others have children and parents with major health problems. Many have lost their livelihoods, their animals, and the ability to provide for their families because of the pollution that has come down the Shumway Arroyo and through our underground water sources from improperly disposed coal ash. They, too, were offered good neighbor settlements from PNM in exchange for their silence and agreement to sign a hold harmless contract.

My experience is that the energy industry cannot be entrusted with innocent lives or to regulate themselves, for the good of the community, in lieu of a profit for their stockholders. I urge you to take every measure available to you to prevent this from happening to anyone, anywhere in our Nation, ever again.

[The prepared statement of Mr. Hunt follows:]

R. G. Hunt, Jr.

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Prepared statement for the Congressional Subcommittee

on Energy and Environment

December 10, 2009

By _____

Thank you for the opportunity to address you this morning. My name is R G Hunt, and I am 58 years old. I live in Waterflow, New Mexico, adjacent to the San Juan Generating Station and the adjoining coal mine. I own and operate a small family business on land my grandfather established in the early 1940's, where I've raised my four children.

For generations, we drank from a fresh water well on our property, without any adverse effects. Our animals grazed nearby and drank from the natural springs and the arroyo during the irrigation season. These water sources were healthy and very productive for our business, which provides meat to the neighboring Native American tribes.

In 1972 Public Service Company (PNM) built the San Juan Power Plant and began using the dry arroyo to discharge their wastewater. They began burying fly ash in the nearby dry streambeds, rather than into lined ponds, which then leached into our underground aquifers, contaminating our good water with very high levels of arsenic, selenium, potassium, chromium, lead, sulfate and many others.

By 1975 after the dumping of the coal ash began, my family started to get sick. I was diagnosed with heavy metal poisoning with extremely high arsenic, iron, lead and selenium levels. I lost nearly 100 pounds in less than a year. I was so weak I couldn't stand or work, and wasn't expected to live. For several years, my diet consisted of steamed chicken, squash, and potatoes. Any variation caused extreme diarrhea, nausea, and vomiting. My stomach ached and I suffered constant indigestion. My wife was sick most of the time with similar symptoms. We both had difficulty comprehending simple conversations. Her body became misshapen causing many medical

complications that remain today. Our children lost weight and complained of stomachaches. They had constant indigestion and diarrhea. Their hair was falling out and unhealthy looking. Their teeth and eyesight were compromised to the extent they still wear glasses and require frequent monitoring. Their teachers reported that they had difficulty with simple tasks of concentration and comprehension. One son was enrolled in special classes throughout his education.

Two days before Christmas in 1982, PNM approached us offering us $2,500 to sign a release as a "good neighbor" gesture on their part. We asked them, instead, to cover the cost of hooking into the public water system for our family. They refused.

For two years, we bought drinking water and carried it into our home until we could afford the connection fees for the public water system. Once we stopped using the well, we began, slowly, to improve. My wife, kids, and I had been sick for over ten years. My animals were not so fortunate. I watched 1,400 sheep slowly suffer and die from the lack of safe drinking water. Within two years I lost my entire sheep herd and took outside jobs, rather than risk selling contaminated meat to my customers.

Although they lined the ponds, as required by an EPA enforcement action and fine in 1984, PNM set up an agreement that the fly ash would be returned to the neighboring BHP San Juan Coal Mine and buried in the unlined pits. The result is that the fly ash and scrubber sludge continues to contaminate the arroyo and groundwater through unlined sites.

My children are grown and married, now. Two sons have served several tours of duty in Iraq, Afghanistan, and Germany. All have some evidences of the childhood problems they experienced due to the polluted water. My daughters have had very difficult pregnancies and deliveries,

which doctors have said may be the result of the childhood poisoning. I have three grandchildren who have been diagnosed autistic, (linked to heavy metal poisoning in their mothers) and another who is ADHD.

My brother developed Multiple Sclerosis and spent 20 years in a care unit. My father died of cancer. Four of my step brothers and sisters have died prematurely, due to cancer and cancer-related illnesses. All were under the age of 40 and healthy, athletic children throughout their high school years with no apparent contributing illnesses. All drank from these same polluted water wells and springs.

I rely heavily on others to help me with the management and operation of my business, because, although recovered, I still suffer many side effects from the poisoning.

In conclusion, this is only the story of my family. I have many neighbors with similar stories. Some have lost young children. Others have children and parents with major health problems. Many have lost their livelihoods, their animals, and the ability to provide for their families because of the pollution that has come down the Shumway Arroyo and through our underground water sources from improperly disposed coal ash. They, too, were offered "good neighbor settlements" from PNM in exchange for their silence and agreement to sign a "hold harmless" contract.

My experience is that the energy industry cannot be entrusted with innocent lives or to regulate themselves, for the good of the community, in lieu of a profit for their stockholders. I urge you to take every measure available to you to prevent this from happening to anyone, anywhere in our nation, ever again.

Mr. MARKEY. Thank you.

Mr. HUNT. There is one other thing I wanted to mention about this. Them poor animals would die and they wouldn't even rot. They would mummify. And for the cost of putting in city water so we did not have to haul water was only $175, and they refused to do that. And, you know, my kids, I dropped out in the 8th grade in Kirkland and my kids when the State epidemiologist showed up says under the circumstances, only one family is not worth investigating. My kids said from age 5 to 2 we want to be better to our government than what our government was to us. And them kids got 52 years perfect attendance.

Mr. MARKEY. Thank you, Mr. Hunt, very much, and we thank each of our witnesses for your very compelling testimony here today.

The Chair will now recognize himself for a round of questions, and any of you can respond to this who would like. On our second panel right after you, we will hear from some witnesses that the characteristics of coal ash are similar to that of dirt or rocks and that the material is extremely unlikely to pose a health risk. How would you respond to that statement?

Mr. HUNT. Pardon me?

Mr. MARKEY. How would you respond to that statement?

Mr. HUNT. Coal ash is dangerous stuff, and, just like I say, them animals that I had with all—they created a deal by the name of polyencephalomalacia, and just like the sheeps they would lay down and they couldn't get up because they had lesions on the brains and the crows would peck their eyes out. And coal ash is a dangerous substance and it needs to be controlled rather than the stockholders making a huge profit. They need to take care of it in a proper way.

Mr. MARKEY. There are no federal regulations in this area. The States have regulations or they have responsibility for putting regulations on the books. How would you characterize the regulations that your State has for protection of families against the adverse effects of coal ash?

Mr. HUNT. Well, in our case, the State of New Mexico had full knowledge that our well was polluted, and also the EPA had full knowledge and the power plant also, and they did absolutely nothing to do anything about it, and I am sure that there is laws on the books that they are supposed to regulate them but they never did nothing, and like I say, they just ignored us like we was nobody.

Mr. MARKEY. Ms. Whitaker-Pierce.

Ms. WHITAKER-PIERCE. Yes, I would like to comment on that. I think that the information that we presented today speaks for itself. You have got the Yorktown situation that happened and the identical same utility company came back out and did it in our backyard. I am not against beneficial use if it is used beneficially. I don't think that it has to be one or the other. But what there has to be is someone that is going to hold these utility companies responsible for disposing of it in ways that we know without a question of a doubt are not harmful to the general public.

Mr. MARKEY. So you are saying your State did not do enough?

Ms. WHITAKER-PIERCE. Oh, absolutely—well, I am here. I am here. Absolutely no.

Mr. MARKEY. Ms. Queen, did your State do enough?

Ms. QUEEN. I don't know if they did enough but they did fine them $1 million. It was too late then but they were fined for $1 million.

Mr. MARKEY. Have all of you been provided with water in order to deal with the effect of this issue? Did they provide water to you, Ms. Queen?

Ms. QUEEN. Yes, I still——

Mr. MARKEY. You testified that that was the case?

Ms. QUEEN. Yes, I still get water.

Mr. MARKEY. And do you receive water?

Ms. WHITAKER-PIERCE. Sir, we have asked the utility company to give us bottled water to see us through this and they have across the board rejected it. Our source of water is to go up to a, it looks like an outhouse. I wish I had pictures for you. The local city government did build a structure around it so that we weren't exposed to the elements when we were trying to fill up those gallon jugs two to three times a week, but the insulation is pouring down around it. I mean, you would be appalled at the conditions, and that is how our families in our neighborhood get their water is to go to this municipal source and fill up jugs.

Mr. MARKEY. Let me ask you one more question before my time expires. Dominion has stated in correspondence that the developer of the Battlefield Golf Club project met all relevant Virginia environmental regulations when it used coal ash. Do you believe that that is the case?

Ms. WHITAKER-PIERCE. No, sir, absolutely not, and my well tests say differently.

Mr. MARKEY. What regulations were violated in your——

Ms. WHITAKER-PIERCE. Well, it is my understanding that the rate of bonders was not at the rate that it should have been with that coal ash. It is also my understanding that liners should have been placed; they were not. The developer, hundreds of truckloads on a daily basis took out the good dirt, sold that and then replaced it with the coal ash that Dominion paid them to take, and my common sense tells me that if the United States of America went to some Third World country and paid this country to take our toxic waste material off of their hands but we turned a blind eye because we weren't quote, unquote, personally responsible for making sure that that stuff went down the right way, the public outcry globally would be outraged.

Mr. MARKEY. We thank you. We thank each one of you. Would you like to add something?

Mr. HUNT. Yes. On that situation we had down there, they were dumping untreated human waste down through there also, and what happened when the State had full knowledge that our well was polluted and the kids was involved, they acted like they was a subsidy of the big large power company and the large coal mine and there is no excuse for that.

Mr. MARKEY. Thank you, Mr. Hunt.

The Chair recognizes the ranking member of the subcommittee, the gentleman from Michigan, Mr. Upton.

Mr. UPTON. Thank you, Mr. Chairman. I apologize for being a little bit late. We had an important Michigan delegation meeting involving the Great Lakes that required all of our attendance.

I appreciate your stories, obviously everyone here. I have sympathy for you and the circumstances surrounding that. Ms. Queen, I had one question as it related to your testimony. You indicated that the waste was put into an unlined landfill. Is there a requirement in the State of Maryland that it be a lined facility? Do you know if they violated—is there such a standard in Maryland, do you know? If you don't know the answer——

Ms. QUEEN. No, I am not sure, but it is too late now. They have one now.

Mr. UPTON. So there is one now?

Ms. QUEEN. Now, but——

Mr. UPTON. Now there is a requirement that it has to be put into a lined——

Ms. QUEEN. Yes. I don't know if it was a requirement before but they didn't have one but now I am told there is a liner.

Mr. UPTON. I know in my district in Michigan, in our State we have a number of coal facilities and it is my understanding, and we are trying to find out for sure, but it is my understanding that the waste that isn't used for particleboard and shingles and working with asphalt and highways does in fact go to a lined facility which would then prevent what happened.

Ms. QUEEN. Yes, they do have one now.

Mr. UPTON. Thank you. I yield back.

Mr. MARKEY. The gentleman's time is expired. The Chair recognizes the gentleman from Pennsylvania, Mr. Doyle.

Mr. DOYLE. Thank you, Mr. Chairman, and all of us obviously feel badly about what has happened to you three individuals, and you know, the problem is with no national standards, some States do better jobs than other states in regulating this problem. Some States are doing nothing, which is a real problem. In my State of Pennsylvania, our Department of Environmental Protection has provided oversight on beneficial reuse since 1985 and implemented stringent standards in 1992, and Mr. Chairman, I do have letters from our Pennsylvania Department of Environmental Protection and Public Utility Commission which I would like to submit for the record.

[The information appears at the conclusion of the hearing.]

Mr. MARKEY. Without objection, it will be included in the record.

Mr. DOYLE. It basically hopes that as EPA makes this rulemaking that they say there is clearly a need for regulation of States with lax requirements or no requirements but they should look at States that do have stringent requirements and are doing this right and not preempt their laws, especially if our laws are more stringent than what the federal government may end up implementing, so I hope that we don't preempt those States that already have strict standards in place in this process.

Ms. Whitaker-Pierce, I am curious, you got conflicting results from the testing, right? Did you ever have an independent lab? Did you ever you yourself hire somebody? You know, I am thinking about what I would do in your situation if I started—you know, one person said there is lead and one person said there isn't lead, I

would want my own independent testing, and I was just curious, how many different testers were in your home and did you have anybody that was testing your water samples for you?

Ms. WHITAKER-PIERCE. No, I did not personally commission an agency to test the waters. The city of Chesapeake tested the waters. They also hired a third party expert firm, J.R. Reed and Associates, to do water tests along with the EPA.

Mr. DOYLE. And you also said they all tested from just one source in your home and it was a source that had an auxiliary filter. Why was that selected and did you ever ask the—were you present when the testing was done?

Ms. WHITAKER-PIERCE. Yes, sir, I was. I am glad you asked because my 5 minutes didn't give me enough time to elaborate on that. They had tested in two locations at my home. They have tested at the well head and then they have gone in and tested at my kitchen tap, and this has been done every single time. When I say inconsistencies, sometimes they will come and take a first draw and then they will purge the system for 5 minutes and then they will purge it for 10 minutes and 20 minutes and they will do various tests along that timeline, and then they were the ones that said OK, well, we need to go to your kitchen tap, but that kitchen tap has the auxiliary filter that I had put on when we moved out there.

Mr. DOYLE. Did you tell them that there was a filter on that?

Ms. WHITAKER-PIERCE. Yes, sir, absolutely, absolutely, and when I say that they are conflicting and confusing, the sheet that I get, this report that I get has all of the different levels that have been detected but I still don't know what the EPA standard on arsenic is, for example. I mean, it was just by coincidence that I found out that the EPA's level for lead was .15 percent, and that was because the city of Chesapeake on their documentation included that benchmark.

Mr. DOYLE. So you are getting data but you are not getting any experts to sit down——

Ms. WHITAKER-PIERCE. No, sir.

Mr. DOYLE [continuing]. I mean, as a layperson to explain what that data means in real terms to you and your family?

Ms. WHITAKER-PIERCE. No, and I would welcome that. As a matter of fact, it was offered by one of our city representatives and they said, you know, the EPA is the expert so if it is OK with you, what we would like to do with your permission is to turn over those results to the EPA and then the EPA person can sit down with their results and then explain to you what all this means. We are still waiting.

Mr. DOYLE. Thank you.

Mr. Hunt, was there ever any testing done? I mean, there is no disputing what happened to you and your family. You can see what happened, and then as you started to drink bottled water or other water, you eventually started to recover. Was there ever any testing done by any enforcement agency to determine what was in your water?

Mr. HUNT. Well, I am glad you brought that up. What happened, there was a lady that lived down the street there. Her and her husband both met at BYU and they were very outstanding citizens and

they had five boys and she was pregnant with the sixth one, and what happened, they would come down and they would have her open up her basement to allow them to go in and pull samples out of the well less than 100 feet from the arroyo, and what happened, she was pregnant with the sixth son, and what happened, she came down with leukemia and she chose not to have any treatment because of her baby, so after the baby was born, the baby was a year old when she passed away and what happened, the four younger children that she has got, they have done missions for the Mormon Church and stuff like that, very outstanding people, and they got hormones to keep from wetting the bed at night. And there is another little boy, his dad owned a dairy and his uncle come running across the street one day and he says Joe is drowning, come quick, so I run over to see and what it was, it was the mother's dad's birthday that day and they had Joe on the floor and they were working with him doing CPR and stuff like that and you could tell he was dead.

Mr. DOYLE. I saw that and I saw what has happened to your sheep. I am saying did anyone ever test this water and issue a report——

Mr. HUNT. Yes, they did test it but they never warned the woman down there that died of leukemia. They come to her house and make them open the door to pull samples and they never warned her about what had happened.

Mr. DOYLE. You never got results?

Mr. HUNT. None whatsoever.

Mr. DOYLE. Wow. I see my time has more than passed. Thank you.

Mr. MARKEY. The gentleman's time has expired. The gentleman from Kentucky, Mr. Whitfield.

Mr. WHITFIELD. Thank you, Mr. Chairman, and thank you three people for being with us this morning and explaining your personal experiences.

In listening to your testimony, I think that I understand that each of you has well water, you don't have city water, you don't have county water but all of you had well water. Is that correct?

Ms. WHITAKER-PIERCE. Yes.

Mr. HUNT. I have got city water now but I had to pay to hook onto it but at the time we had spring water.

Mr. WHITFIELD. OK, but at the time it was spring water or well water. And Mr. Hunt, I noticed that in the article out there that it said what killed over 1,000 sheep and it says rancher, State and PNM. I am not sure what PNM is but it must——

Mr. HUNT. Public Service Company of New Mexico.

Mr. WHITFIELD. OK. And then it says that at odds over the bad water. So there was no agreement between the State, the PNM and you as to whether or not this water was bad or what caused the bad water.

Mr. HUNT. Well, what happened when they hit the Albuquerque Journal, it was 13 months that they played around and made them animals drink that bad water, and what happened, there was an individual that come in out of the New Mexico environmental department. They got him out of risk management and they put him in as the deputy secretary under the Johnson Administration, and

then when things started heating up, he become the general counsel, and what happened, the State ordered the sheep to be hauled off and tested after me feeding them for 13 months and watched them die, and when they would die we would have to pile them up in piles and burn them, and the man come back and he said poor carrot killed the animals but you can notify the New Mexico State animal health people, and in the document it says all animals was in good nutritional condition and I don't know where he got that information from. I would really love to know that.

Mr. WHITFIELD. But as far as the water that the sheep drank, that was well water——

Mr. HUNT. No, no, that was out of the arroyo there, and what happened, after the article come out in Albuquerque Journal front page, they sent a surveillance man down there and the surveillance man said 500 parts per million on sulfate is all that is allowed for animals, and it was eight times above that, and they never did nothing. They just sat back and laughed at me.

Mr. WHITFIELD. All of you it sounds like are not really satisfied with the way the State dealt with this, the way the State environmental people dealt with this, the way the utility companies dealt with it, which is understandable, but I would ask did any of you go to an attorney to explore a class-action lawsuit or some sort of lawsuit against any of the utility companies?

Mr. HUNT. I tried to do that, and what happened is kind of like going down trying to beat the hell out of Mike Tyson. The only thing you are going to do is get the hell beat out of you.

Mr. WHITFIELD. So you determined that was not in your best interest?

Mr. HUNT. Yes. There is no justice whatsoever in this mess.

Mr. WHITFIELD. Well, you know, the chairman mentioned this briefly but one of the confusing things for us is, we know that EPA has looked at this coal ash repeatedly through the years and we know that 1 percent or less of coal ash has trace elements of arsenic, cadmium, lead, mercury and selenium in it, and the scientists have said, and there is going to be people testifying to this later, that fly ash or coal ash has no more of these trace elements in it than regular soil and regular rocks do. So, you know, it presents a puzzle for us as to whether or not—I mean, I think there is probably agreement that maybe this should be regulated, that there should be some federal regulation, but to classify this as a hazardous material from the scientific evidence that I have looked at, I mean, I would have some question about that. But from your personal experience, though, you are 100 percent certain that your problems were caused by your exposure to coal ash. Is that correct?

Mr. HUNT. Absolutely, and when you burn it down and condense is up, what happens, it becomes very poisonous.

Mr. WHITFIELD. But you did indicate, I heard you say that there was proof that there had been some human waste that had been——

Mr. HUNT. That also.

Mr. WHITFIELD. So——

Mr. HUNT. But just like today, they haven't dumped human waste in a long time, but it is still up around eight times above

what is allowed running right into the San Juan River right on down towards Mexico.

Mr. WHITFIELD. Now, have they corrected this human waste issue?

Mr. HUNT. I have no idea. Nothing would surprise me about them people.

Mr. WHITFIELD. OK.

Ms. WHITAKER-PIERCE. Mr. Whitfield, I would like to respond to that.

Mr. WHITFIELD. Yes.

Ms. WHITAKER-PIERCE. You will also—you can get experts to testify to anything that you want to hear. The utility companies obviously have a dog in the fight. You can find experts out there that will say that absolutely coal ash is dangerous, certainly should not be breathed, certainly should not be exposed to water, certainly should not be involved in one's water system, and there is no doubt in my mind that the careless actions and the ineptitude of our EPA and our local government and our State governments to regulate this and make sure that people are acting responsibly is the reason that we are all here today.

Mr. WHITFIELD. Now, Ms. Pierce, did you consider legal action or did you have the same view as Mr. Hunt?

Ms. WHITAKER-PIERCE. Well, we are currently represented, yes, by counsel to try to get the right thing done here.

Mr. WHITFIELD. So you are in litigation now or at least you have retained an attorney to explore it?

Ms. WHITAKER-PIERCE. Correct.

Mr. WHITFIELD. OK. I see my time is about expired, Mr. Chairman.

Mr. MCNERNEY [presiding]. Thank you, Mr. Whitfield.

The chairman stepped out for a minute and asked me to step in his seat while he is gone.

First of all, again, I want to thank the witnesses for coming forth and testifying, very compelling words that you have spoken this morning. You know, when coal-fired plants are required to scrub their emissions from mercury and other sulfates and so on, I can't imagine how people would think that the fly ash is perfectly safe, but apparently we have some evidence here this morning. Ms. Whitaker-Pierce, I would like to ask if you think that Mr. McCabe's work that brought light to the dangers there, if he hadn't done that investigative work, do you think you would still be in the dark about the risks and dangers?

Ms. WHITAKER-PIERCE. Well, I am still in the dark, but there is no doubt that he is our knight in our shining armor. We had this construction going on in our backyard for 7 years and really thought that it was safe. So yes, had he not brought this to light, we would still be drinking the water, and we owe him a huge debt, yes.

Mr. MCNERNEY. And so you would be facing potential health problems, you and your family and your neighbors, so he does deserve a certain amount of thanks for that, a lot of thanks.

Ms. WHITAKER-PIERCE. Yes, sir, he does, and we are not out of harm's way yet. We had been drinking that stuff for 5 years and are still using it for various purposes in the home.

Mr. MCNERNEY. Thank you.

Ms. Queen, you mentioned that tests showing arsenic, iron, manganese and sulfates were leaching at dangerous levels but that these tests were not shared with the community. Is that right, the tests showing that these substances were leaking into your water but you were not notified of the test results?

Ms. QUEEN. Not in the beginning but later on we did. Someone came to the door to say that the water, you know, was going to be tested and we should stop drinking the water, and right away—not right away they started to bring in bottled water for everybody except for over on the other side of the road they put hoses out but the hoses froze so they got bottled water too, but we are still getting bottled—they made it right. They are going to put city water in to everybody that had well water. We are getting city water hookup and it hasn't come yet. They started, city water hookup and no water bill for as long as you own the home, and I still get bottled water today every 2 weeks. So they made right on—the power company did.

Mr. MCNERNEY. Thank you. Now, when did you first started noticing the dust and started feeling that that was being a hazard, that that was hazardous to you and your family?

Ms. QUEEN. When I first moved there, I noticed, but we just cleaned the house, you know. We just cleaned it up. You know how it would get on the house and on the porch and we started cleaning it up, and then after it came out in 2007, then we realized, oh, that is not good, you know.

Mr. MCNERNEY. So you were breathing it in for years basically without knowing that it was dangerous?

Ms. QUEEN. No, I didn't know anything about it.

Mr. MCNERNEY. Mr. Hunt, thank you again for your testimony and thank you for your children's service to our Nation. Would you say that the behavior of PNM and the State agencies was conducted in ignorance or do you think that they knew the dangers and still prevented action from being taken on your behalf?

Mr. HUNT. To tell you the truth, I feel it was criminal, and there is one thing I will say about the man that asked if we ever tried to take legal action. We tried to take it to court and I have only got an 8th-grade education, and what happened when it was all said and done, our lawyer was sitting up there testifying against us and we refused to accept the settlement, which was $190,000, and we wrote on the release we are signing this against our will under duress and intimidation, and went down and filed it at the county clerk's office to make it a public document information. And, you know, bless their hearts, they went down and said it was a nuisance litigation. It cost me $73,300 for a tax attorney to keep from losing everything I owned.

Mr. MCNERNEY. Was the local media, the Albuquerque Journal or——

Mr. HUNT. The only thing they are out for is mainly sell advertising, and the reason why we subscribe to the paper is just to read the obituaries and the advertisements. Like I say, I could have lost everything I own.

Mr. MCNERNEY. It looks like my time has expired, and the first panel has finished, so your testimony has been very beneficial. Thank you.

It is now time for the second panel to step forward.

Mr. HUNT. I have been waiting 28 years for this date. Thank you.

Mr. MCNERNEY. Would all the second panel witnesses please take their seats at the testimony table, please? Now, we have the second panel in front of us and I would like to introduce the witnesses and then I will ask for their testimony. First we have Lisa Evans, who is an attorney specializing in hazardous-waste law. Ms. Evans has been active in hazardous-waste litigation advocacy for over 25 years and is an expert on coal ash issues. She has been a project attorney for Earthjustice since 2006. Prior to Earthjustice, Ms. Evans worked on toxic coal waste for the Boston-based nonprofit Clean Air Task Force. Ms. Evans began her career as an assistant regional counsel at the Environmental Protection Agency region I. Ms. Evans, you can begin your testimony when you are ready.

STATEMENTS OF LISA EVANS, SENIOR ADMINISTRATIVE COUNSEL, EARTHJUSTICE; MARY A. FOX, PH.D., MPH, ASSISTANT PROFESSOR, JOHNS HOPKINS BLOOMBERG SCHOOL OF PUBLIC HEALTH; KEN LADWIG, SENIOR PROGRAM MANAGER, ELECTRIC POWER RESEARCH INSTITUTE; AND DONALD MCGRAW, M.D., PITTSBURGH, PENNSYLVANIA

STATEMENT OF LISA EVANS

Ms. EVANS. Thank you. Members of the subcommittee, thank you for holding this hearing to examine the threats posed to our health and environment by coal ash, the hazardous substance generated by power plants that burn coal.

When mismanaged, this toxic waste damages the health and environment of Americans nationwide by poisoning drinking water, fouling the air and destroying aquatic ecosystems. Federal action on this issue is imminent. Last March, EPA Administrator Lisa Jackson made a commitment to publish a proposed rule governing the disposal of coal ash by year's end. My testimony today recognizes the primary goal of this impending rule: the protection of human health.

The committee has heard today from witnesses whose health and the health of their families and neighbors have been seriously compromised by exposure to the toxic contaminants in ash. Today's witnesses represented three separate instances of coal ash contamination but they have three important things in common. First, dry dumping of coal ash, not wet disposal, caused serious harm. Much of the focus this year has been on the deadly dangers posed by wet ash ponds. Wet disposal has drawn national attention since the cataclysmic failure of the TVA dam, whose release of over 1 billion gallons of toxic sludge was 100 times the size of the Exxon Valdez spill. But today it is significant to note that dry disposal and release of dry ash is a cause of damage. This is not surprising. EPA has identified a significant threat from dry disposal in unlined landfills, estimating that such disposal can result in a risk of cancer 50 times EPA's regulatory goal.

Second, at each site State law was woefully inadequate to protect the health of the affected communities. Today, regulation of coal ash is left totally up to the States but in New Mexico, Virginia and Maryland, where the witnesses reside, the States failed to put in place even the most basic safeguards. In none of these States, not even household garbage would be allowed to be disposed of in the manner that ash was. In these States and in most of the States in the United States, improper, unsafe and ultimately harmful disposal of toxic ash is permitted and sometimes even encouraged.

Third, the witnesses and their communities were harmed economically. While the focus today is properly on health, significant damage to communities occurs when cheap disposal is unfettered by federal law. Today you heard how Mr. Hunt, a sheep rancher, lost his herd, how the housing values in Robin Pierce's community have plummeted and how Gayle Queen may tragically lose her home to foreclosure. These economic hardships produce stress that tears at the fabric of our community. The dumping of ash in all three situations was the cheapest route for industry but the true costs were borne by these witnesses and their neighbors.

As a former EPA attorney, I worked to enforce the Resource Conservation Recovery Act. This experience gave me a deep appreciation of the statute's fundamental goal. In one word, the driving force of RCRA is prevention. Congress passed RCRA in 1976 to put in place regulations to prevent in the first instance the mismanagement of waste in order to prevent the migration of toxic chemicals. Further, in 1980, Congress explicitly directed EPA to require safe disposal of coal ash. But for decades, nearly 30 years, EPA has failed to promulgate national regulations and this omission is huge and dangerous. EPA tells us that in 2008 U.S. electric utilities produced 136 million tons of coal ash. This is enough ash to fill the boxcars of a train from this room to Melbourne, Australia, and this amount is rapidly climbing as we capture more toxics like mercury and other hazardous metals at the power plant stacks.

The bright spot today is that the prevention of harm from the dumping of ash is a problem we know how to solve. Isolation of toxic waste from water in engineered landfills is 20th century technology at best. Thus, the essential next step is for EPA to promulgate federally enforceable regulations that guarantee that all U.S. citizens are protected from the harms posed by mismanagement of ash. Only under subtitle C of RCRA will all States be required to adopt minimum disposal standards that protect the health of all living near coal ash dump sites.

In sum, I respectfully ask the subcommittee to end the 30-year impasse and encourage EPA to promulgate federally enforceable regulations that will prevent the harm that these witnesses have suffered from occurring again.

About 2 years ago, I held Mr. Hunt's infant granddaughter, and I would like nothing better than to guarantee to her that what happened to her grandfather will not happen to her family in Waterflow, New Mexico, nor to Mrs. Queen's grandchildren in Gambrills, Maryland, nor to Ms. Pierce's children in Chesapeake, Virginia. This subcommittee may have a hand in making the same guarantee.

Thank you again for the opportunity to comment on this critically important issue and thank you especially for allowing the witnesses in the previous panel to have their voices heard.

[The prepared statement of Ms. Evans follows:]

TESTIMONY OF
LISA EVANS, SENIOR ADMINISTRATIVE COUNSEL, EARTHJUSTICE
BEFORE THE
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT,
COMMITTEE ON ENERGY AND COMMERCE,
U.S. HOUSE OF REPRESENTATIVES
DECEMBER 10, 2009

Chairman Markey and Members of the Subcommittee, thank you for holding this hearing to examine the threats posed by coal combustion waste -- the voluminous hazardous substance generated by coal-fired power plants. When mismanaged, coal combustion waste damages the health and environment of Americans nationwide by poisoning drinking water, fouling the air, and destroying aquatic ecosystems.

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 U.S. Environmental Protection Agency (EPA) enforcing federal hazardous waste law and providing oversight of state programs. I appreciate the opportunity to testify this morning.

Federal action on coal ash is imminent. Spurred by the Tennessee Valley Authority (TVA) coal ash disaster, EPA Administrator Lisa Jackson pledged to propose a rule addressing the dangers of coal ash by year's end. My testimony today recognizes the primary goal of this impending rule—the protection of human health. The committee will hear today from witnesses whose own health and the health of their families, neighbors and communities have been seriously harmed by exposure to the toxic constituents in coal ash.

This subcommittee is very appropriately focusing on the threat coal ash poses to our health and drinking water. While the nation awoke last December to the deadly hazard posed by poorly constructed, unregulated coal ash dams, it is clear that coal ash poses an even greater danger to our citizens through a much more subtle movement of its poisons. Communities are harmed when coal ash is disposed without proper safeguards or when ash is carelessly reused, and, as a result, the hazardous chemicals found in the ash escape to water and air. And because no federal regulations require basic safeguards, this exposure occurs again and again, quietly, but with the potential for great harm, everywhere coal is burned.

Any rule addressing the disposal of this toxic waste must ensure that all citizens are protected from such preventable harm. To guarantee this protection, EPA must promulgate federally enforceable regulations under the Resource Conservation and Recovery Act (RCRA). There are four primary reasons to promulgate such federal regulations as soon as possible:

(1) The threat to health and the environment by improper disposal of coal ash is deadly, pervasive, and increasing;

(2) Improperly disposed coal ash has created a dangerous legacy of poisoned water supplies, damaged aquatic resources, and unstable dams that must be identified and rectified;

(3) The majority of states have failed for decades to regulate coal ash adequately and ensure the safety of their citizens; and

(4) EPA has the clear authority under RCRA to promulgate tailored, federally enforceable standards that will ensure the protection of *every* U.S. community near coal ash disposal sites-- while allowing the legitimate beneficial reuse of coal ash to continue.

1. The threat to health and the environment from improper disposal of coal ash is deadly, pervasive and increasing.

a. Coal combustion waste contains some of the deadliest chemicals known to man.

Coal combustion waste, or coal ash, is largely made up of ash and other unburned materials that remain after coal is burned in a power plant to generate electricity. Burning concentrates the metals naturally found in coal. Toxic elements such as arsenic, cadmium, chromium, lead, mercury, selenium, thallium and numerous other dangerous contaminants are found in much higher concentrations on a per volume basis in ash compared to coal.[1] In addition, coal ash includes the particles captured by pollution control devices installed to prevent air emissions of particulate matter (soot) and other gaseous pollutants from the smokestack. As power plants employ more and better pollution control devices to capture hazardous air pollutants, the volume and toxicity of coal combustion waste grows. Most importantly, it is not the mere presence of these dangerous toxins in ash that pose the threat—it is their propensity to *leave* the ash when the waste comes into contact with water.

The hazardous substances found in coal ash are poisonous and can cause cancer and damage the nervous systems and other organs, especially in children. (See Figure 1, Table of Human Health Impacts of Coal Ash Pollutants.) One of the most common and mobile pollutants in coal ash is arsenic. Arsenic has been found to cause multiple forms of cancer, including cancer of the liver, kidney, lung, and bladder, and an increased incidence of skin cancer in populations consuming drinking water high in inorganic arsenic.[2] According to an EPA risk assessment, the excess cancer risk for children

[1] Office of Solid Waste & Emergency Response, U.S. Envtl. Prot. Agency, Report to Congress: Wastes from the Combustion of Fossil Fuels (Mar. 1999).

[2] EPA, Integrated Risk Information System (IRIS), Arsenic (CASRN 7440-38-2). http://cfpub.epa.gov/ncea/iris/index.cfm?fuseaction=iris.showQuickView&substance_nmbr=0278.

drinking groundwater contaminated with arsenic from coal ash codisposed with coal refuse in unlined ash ponds is estimated to be as high as 1 in 50.[3] For context, EPA typically considers cancer risk to be unacceptable when environmental exposures result in more than one additional cancer per 100,000 people.[4] Consequently, a lifetime cancer risk of 1 in 50 represents a risk 2000 times EPA's regulatory goals.

The EPA risk assessment also states that living near ash ponds and unlined landfills increases the risk of damage to the liver, kidney, lungs and other organs as a result of being exposed to toxic metals like cadmium, cobalt, lead, thallium and other pollutants at concentrations far above levels that are considered safe.[5] Figure 2 presents the elevated risks posed to human health from ponds and landfills as documented in EPA's risk assessment. Further, the EPA study warns that peak pollution from dump sites can occur long after the waste is placed. For example, peak exposures from coal ash ponds are projected to occur approximately 78 to 105 years after the ponds first began operation—thus retired sites still pose very significant threats.[6] Clearly, coal ash, when disposed improperly, poses an extraordinary and highly unacceptable long-term risk to human health.

Further, as new technologies are mandated to filter air pollutants from power plants, cleaning the air we breathe of smog, soot and other harmful pollution, the quantity of dangerous chemicals in the ash increases.[7] Without adequate safeguards, the chemicals that have harmed human health for years as air pollutants- mercury, arsenic, lead and thallium- will now reach us through drinking water supplies. Given the documented tendency of coal ash to leach metals at highly toxic levels, there is clearly the need to ensure that basic safeguards prevent the migration of these chemicals.

Studies completed by EPA's Office of Resource and Development in 2006 and 2008 document the increasing toxicity of coal ash.[8] Testing of numerous ashes and scrubber sludge at plants employing air pollution control devices revealed the resulting solid wastes to be far more dangerous than earlier tests revealed. Using an improved leaching protocol,[9] EPA documented that the coal combustion waste leached *16 to 680*

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[3] U.S. Envtl. Prot. Agency, Human and Ecological Risk Assessment of Coal Combustion Wastes (released as part of a Notice of Data Availability) (Aug. 6, 2007) (draft)

[4] EPA Risk Assessment, supra note 3, at 4-1.

[5] *Id.*

[6] *Id.* at 4-7 to 4-8.

[7] *See*, e.g., Office of Research & Dev., U.S. Envtl. Prot. Agency, Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control (July 2008) and Office of Research & Dev., U.S. Envtl. Prot. Agency, Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control (Feb. 2006).

[8] *See* Office of Research & Dev., U.S. Envtl. Prot. Agency, Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control (Feb. 2006), Office of Research & Dev., U.S. Envtl. Prot. Agency, Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control (July 2008) and Susan Thorneloe et al., "Improved Leach Testing for Evaluating Fate of Mercury and Other Metals from Management of Coal Combustion Residues," Proceedings Global Waste Management Symposium: Promoting Technology and Scientific Innovation (Sept. 7–10, 2008).

[9] *See* D.S. Kosson et al, *An Integrated Framework for Evaluating Leaching in Waste management and Utilization of Secondary Materials*, 19 Environmental Engineering Science 159 (2002) *and* F. Sanchez and

times the chromium, arsenic, selenium, boron and thallium than previously documented in EPA and industry data. (See Figure 3.) Thus, unless the solid waste is disposed or reused in a manner that ensures that these toxic chemicals are not released into the environment, our careful efforts to capture the pollutants at the power plant stacks will have unintended, and unwelcome consequences—the pollution of our water.

b. The rapidly rising volume of coal ash at hundreds of dump sites threatens public health throughout the U.S.

Exactly 18 months ago I testified before the Subcommittee on Energy and Mineral Resources of the House Natural Resources Committee. At that time, the volume of coal ash generated annually in the United States was 129 million tons-- enough toxic waste to fill the boxcars of a train stretching from Washington, D.C. to Melbourne, Australia.[10] This year, total annual generation has risen to over 136 million tons. In just another five years, EPA estimates that coal-fired electric plants will produce *175 million tons* per year. (See Figure 4.) As the volume of this dangerous waste rapidly climbs, finding a solution to ensure its safe disposal becomes more even more urgent.

The coal ash disaster in Harriman, Tennessee last December vividly demonstrates why federal action is so critical to our health, environment and security. On December 22, 2008, a dam over six-stories high burst at the Tennessee Valley Authority's Kingston Fossil Plant, causing more than 1 billion gallons of coal ash to flow over 300 acres of river, wetlands and residential property in a toxic tsunami 100 times the size of the Exxon Valdez spill. We subsequently learned from EPA that there are 584 coal ash dams, including over 50 "high hazard" dams holding back tens of millions of tons of coal ash that threaten, if they fail, to take the lives of those who live below them.[11] In fact, one of the highest dams east of the Mississippi, 40 stories tall, would threaten the lives of 50,000 people should it fail.[12] The volume of toxic waste currently stored in the nation's coal ash ponds has reached epic proportions—it would flow over Niagara Falls for over three days straight.

The threat of catastrophic failure of any of the nearly 600 coal ash impoundments in 35 states is only one danger posed by unregulated (or under-regulated) coal ash disposal. EPA estimates that hundreds, 74% of these 584 ponds, are unlined, and consequently there is a high probability that hazardous contaminants are leaching out of the coal ash and into the underlying groundwater.[13] Similarly, there are hundreds of

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D.S. Kosson, *Probabilistic Approach for Estimating the Release of Contaminants under Field Management Scenarios,* 25 Waste Management643 (2005).

[10] NRC, *Managing Coal Combustion Residues in Mines* 127 (2006) at 13, *available at* http://www.nap.edu/catalog.php?record_id=11592#toc

[11] *See* EPA, "Coal Ash Survey Results: Responses from Electric Utilities to EPA Information Request Letter at http://www.epa.gov/osw/nonhaz/industrial/special/fossil/surveys/index.htm#surveyresults.

[12] *See* statement by the Pennsylvania Department of Environmental Protection regarding the high hazard dam at the 1300- acre Little Blue Run Surface Impoundment in Beaver County, PA at http://www.pittsburghlive.com/x/pittsburghtrib/news/regional/s_604497.html.

[13] Final Regulatory Determination on Wastes from the Combustion of Fossil Fuels, 65 Fed. Reg. 32214 (Envtl. Prot. Agency, May 22, 2000) at 32216.

landfills without proper safeguards to prevent the migration of contaminants. EPA estimates that 43% of existing coal ash landfills are unlined.[14] Because most of these waste units are not properly monitored, this slow leaching of poisons often goes undetected and unremediated.

2. Improperly disposed coal ash has left a legacy of poisoned communities and severely damaged aquatic resources.

The Subcommittee today will hear from victims of coal ash contamination from three sites in New Mexico, Maryland and Virginia. Unfortunately, these sites are far from unique. The absence of national disposal standards has resulted in serious and widespread damage at coal ash disposal sites throughout the country. In fact, citizens, scientists, state agencies, and EPA have documented such damage for decades. Coal ash mismanagement *routinely* results in air pollution from fugitive dust; the leaching of toxic substances into soil, drinking water, lakes and streams; damage to plant, animal and human communities; and accumulation of toxins in the food chain from *both* wet ponds and dry landfills.[15]

According to EPA's latest *Damage Case Assessment for Coal Combustion Waste*, the agency recognizes 67 contaminated sites in 23 states where coal ash has polluted groundwater or surface water or caused widespread ecosystem damage.[16] These identified cases of damage are almost equally divided between "wet" and "dry" disposal sites (ponds and landfills). EPA, moreover, admits that this is just the tip of the iceberg. Because most coal ash disposal sites in the U.S. are not adequately monitored, much of the contamination remains undetected.[17] Further, for the last ten years, EPA has readily admitted that it has not actively looked for cases of contamination, but has relied instead on citizens and advocacy groups to call their attention to contaminated sites.[18] EPA has also admitted that if the agency had used its considerable investigative authority under RCRA to systematically attain information directly from electric generating facilities and state regulators, it is likely that the number of damage cases would have increased substantially. EPA stated in its 2000 Final Regulatory Determination on Wastes from the Combustion of Fossil Fuels:

> We acknowledge, moreover, that our inquiry into the existence of damage cases was focused primarily on a subset of states . . . Given the volume of

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[14] *Id.*

[15] Adriano, D.C., Page, A.L., Elseewi, A.A., Chang, A.C., Straughan, I.R. (1980).Utilization and disposal of fly ash and other coal residues in terrestrial ecosystems. Journal of Environmental Quality, 9: 333. *See also*, Carlson, C.L., Adriano, D.C. (1993). Environmental impacts of coal combustion residues. Journal of Environmental Quality, 22: 227-247.

[16] U.S. Envtl. Prot. Agency, Coal Combustion Waste Damage Case Assessments (July 9, 2007), *available at* www.regulations.gov (Document ID No. EPA-HQ-RCRA-2006-0796-0015). For reference to four additional damage cases, *see* GAO, Coal Combustion Residue: Status of EPA's Efforts to Regulate Disposal, Briefing to Congressional Committees at 24, *available at* http://www.gao.gov/new.items/d1085r.pdf.

[17] 65 Fed. Reg. 32214, May 22, 2000.

[18] U.S. Envtl. Prot. Agency, Coal Combustion Waste Damage Case Assessments (released as part of a Notice of Data Availability) (July 9, 2007) at 2–7.

> coal combustion wastes generated nationwide (115 million tons) and the numbers of facilities that currently lack some basic environmental controls, especially groundwater monitoring, other cases of proven and potential damage are likely to exist.[19]

Yet despite the absence of active federal investigation, the number of documented cases of coal ash contamination has risen precipitously. By EPA's official count, documented cases of "proven" damage to human health and the environment from coal ash have more than doubled since 2000. Since it appears that EPA's assessment of damage cases, however, is current only until 2005, there are many more cases that should be counted. In addition to the 2008 TVA disaster in Kingston, Tennessee, deadly contaminants have leaked from both *wet and dry* coal ash dumps at the following 19 sites, which do not yet appear on EPA's latest list of damage cases:

1. **TVA's Widows Creek Fossil Plant, Stevenson, Alabama,** where approximately 10 million gallons of coal ash and scrubber sludge waste were released from an impoundment on January 9, 2009 into Widows Creek.

2. **PPL Corp.'s Martin's Creek Plant,** Northampton County, Pennsylvania where approximately 100 million gallons of coal combustion waste were released from an impoundment into the Delaware River in 2005.

3. **Gambrills Fly Ash Site, Anne Arundel County, Maryland**, where 3.8 million tons of dry ash were dumped in unlined gravel pits, contaminating drinking water wells with arsenic, lead, cadmium, nickel, radium, and thallium as high as 4 times the drinking water standard.

4. **PPL Montana Power Plant, Colstrip, Montana,** where leaking unlined coal ash ponds contaminated drinking water wells with high levels of metals, boron, and sulfate.

5. **Gibson Generating Station, Gibson County, Indiana,** where coal ash ponds hundreds of acres in size have contaminated adjacent federally managed wetlands with selenium harming aquatic life and federally-threatened bird species and where the power company supplies residents with bottled water because their wells are contaminated with boron and manganese from the leaking impoundments.

6. **Battlefield Golf Course, Chesapeake, Virginia**, where developers used at least 1.5 million tons of dry fly ash to build a golf course over a shallow aquifer. Groundwater wells and private drinking water wells in close proximity to the unlined site reveal elevated levels of lead, arsenic, chromium, and boron.

7. **Faulkner Landfill, Charles County, Maryland** where leaching ash at a dry landfill is contaminating a wetland with selenium and cadmium at levels high

[19] 65 Fed. Reg. at 32,216.

enough to kill any animal life, The Smithsonian Institution has called the affected wetlands, Zekiah Swamp, one of the most ecologically important areas on the East Coast.

8. **Karn and Weadock Landfills, Saginaw, Michigan** where groundwater contamination from two impoundments has resulted in elevated levels of arsenic, boron, and lithium in groundwater flowing into the Saginaw River and Saginaw Bay. Arsenic levels 100 times the federal drinking water standard have been detected in the groundwater. The area where the Saginaw River flows into Saginaw Bay has been designated an Area of Concern (AOC) by the U.S./Canada International Joint Commission. Studies have found that the Karn and Weadock Landfills are major contributors of arsenic contamination to the AOC.[20]

9. **SCE&G Wateree Station, Eastover, South Carolina** where coal ash dumped into an unlined 80-acre impoundment is contaminating groundwater. In 2001, the South Carolina Department of Health and Environmental Control cited the plant for violations of the state groundwater standards. Two wells on the plant property have detected arsenic at levels 18 times the maximum contaminant level, and leaks have been found in the containment wall between the impoundment and the river that have arsenic levels 190 times the federal drinking water standard. Testing by private consultants on an adjacent property found arsenic levels at 5 times the state limit. Fish tissue sampled near the impoundment indicates that the arsenic is being accumulated in the biota of the river. The site is upstream of the Congaree National Park, which is home to the largest contiguous section of floodplain forest in North America.

10. **Reid Gardner Generating Station, Moapa, Nevada** where contamination from unlined ponds entered the local groundwater. Groundwater monitoring at the site found elevated levels of arsenic, selenium, vanadium, boron, sulfate, TDS, and other contaminants as a result of seepage from the ash impoundments.

11. **Progress Energy Asheville Plant, Arden, North Carolina** where unlined ash impoundments, covering a total area of approximately 91 acres, are leaching boron and manganese to groundwater above state standards.

12. **Progress Energy Cape Fear Steam Plant, Moncure, North Carolina** where leaching from unlined ash impoundments covering a total area of 153 acres is resulting in levels of boron, manganese, iron and sulfates above state groundwater standards.

13. **Progress Energy Lee Plant, Goldsboro, North Carolina** where an unlined coal ash impoundment covering 143 acres is leaching arsenic, lead, boron iron and manganese to the groundwater.

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[20] Michigan DEQ. 2005. Phase II Final Report, Karn/Weadock Landfills.

14. **Progress Energy Sutton Plant, Wilmington, North Carolina** where coal ash ponds covering a total of 135 acres are leaching levels of arsenic, boron, iron, and manganese levels above state groundwater standards. Arsenic contamination at the site was up to 29 times the federal maximum contaminant level.

15. **Duke Energy Belews Creek Station, Walnut Grove, North Carolina** where voluntary groundwater monitoring of an ash impoundment at the site indicates that the impoundment is currently contaminating groundwater with levels of arsenic, iron, and manganese that exceed state groundwater standards.

16. **Duke Energy Buck Station, Spencer, North Carolina** where voluntary monitoring at three high hazard impoundments has detected levels of boron, iron, and manganese that exceed state groundwater standards.

17. **Duke Energy Dan River Steam Station, Eden, North Carolina** where voluntary monitoring at two high hazard ash impoundments has detected levels of boron, iron, and manganese that exceed state groundwater standards.

18. **Duke Energy Marshall Steam Station, Terrell, North Carolina** where voluntary monitoring at a high hazard coal ash impoundment has detected groundwater contamination from boron and manganese in exceedance of state groundwater standards.

19. **Duke Energy Riverbend Steam Station, Mount Holly, North Carolina** where voluntary monitoring of two high hazard coal ash impoundments has detected levels of boron and manganese in exceedance of state groundwater standards.

Thus, conservatively speaking, the damage case total is at least 87, including the above 19 sites (and the Kingston site). Furthermore, environmental groups identified numerous additional sites in comments submitted to EPA in 2008 in response to the Agency's Notice of Data Availability on the Disposal of Coal Combustion Waste in Landfills and Surface Impoundments.[21] Again, these examples of damages cases are only a small sampling of the contamination currently occurring at wet and dry dump sites throughout the U.S. The above cases were discovered because monitoring data existed for the units. At hundreds of sites across the country, *no* monitoring data exist, and state agencies, local officials, and nearby residents are kept in the dark—at great peril to their safety and economic security.

When tragedy strikes and drinking water is poisoned, the economic vitality of the community is harmed as well as the health of its residents. The effects of water contamination are many: housing prices plummet, sales of homes are difficult or

[21] 72 Fed. Reg. 49,714 (Aug. 29, 2007).]. *See* Comment from Earthjustice et al., App. C (Feb. 2008), *available at* www.regulations.gov (Document ID No. EPA-HQ-RCRA-2006-0796-0446.3).

impossible, monthly municipal water bills become a necessity. When coal ash pollutants enter an aquifer, a resource of great value to the community, its clean well water, is often forever destroyed. Economic and psychological stress plagues communities that must undergo Superfund remediation. Rarely can a community be made whole again.

Lastly, it is essential to note that low-income communities and people of color shoulder a disproportionate share of the deadly health risks from coal ash. The poverty rate of people living within one mile of coal ash disposal sites is twice as high as the national average, and the percentage of non-white populations within one mile is 30 percent higher than the national average. Similarly high poverty rates are found in 118 of the 120 coal-producing counties, where coal ash is increasingly being disposed of in unlined, under-regulated mines, often directly into groundwater. Specifically with regard to coal ash impoundments, the mean annual income of people living within 1 kilometer of such impoundments is $33,455, compared with $44,389 nationally. This means that those living very close to a coal ash pond make only around three-fourths (75.37%) of the national average. (See Figure 5.)

In some states the disparity of impact to those in poverty is even more striking:

- In Arizona, coal ash ponds in are in zip codes that are poorer than the national average and that are in the poorest quarter of zip codes in the state.
- In New Mexico, coal ash ponds are located in zip codes that are among the poorest 2% of zip codes in the country, and among the poorest 8% of zip codes in the state. (See Figure 6.)
- In South Carolina, coal ash ponds are located in zip codes that are poorer than the national average and that average in the 81st percentile for poverty in the nation. In comparison with the rest of South Carolina, zip codes containing ash ponds are in the 68th percentile for poverty.

These trends are also apparent in Kentucky, Louisiana and Tennessee. Such disparities make it critical that federal regulations provide mandatory minimum safety standards at disposal sites to ensure all U.S. communities are protected equally.

3. *The majority of states fail to require basic disposal safeguards for coal ash disposal.*

When one examines state regulations nationwide, the absence of basic waste disposal requirements is shocking. According to a 2005 report prepared for EPA's Office of Solid Waste, there are extensive deficiencies in state regulation of coal ash landfills and ponds in the 34 coal ash generating states surveyed. Among the findings of the2005 report:

(i) 69% of the states do not require groundwater monitoring and leachate collection at all surface impoundments (new and existing). For example, 16 states fail to require *any* groundwater monitoring

(ii) 47% of the states do not require post-closure groundwater monitoring at coal ash surface impoundments.
(iii) Over 50% of the states do not require liners for surface impoundments.
(iv) Over 50% of the states have no requirement for financial assurance for surface impoundments.
(v) 38% of the states do not require groundwater monitoring at all landfills. For example, eleven states only require groundwater monitoring at landfills constructed after a certain date.
(vi) 29% of the states do not require fugitive dust controls at coal ash landfills.
(vii) 17% of the states do not require liners, leachate collection systems or financial assurance for coal ash landfills—even those newly constructed. Of the remaining 83% of states surveyed, 32% of those states only require liners and leachate collection at "new construction." [22]

In addition, the 2005 report verified that states fail to prohibit the most dangerous coal ash disposal practices. The report examined the top 25 coal-consuming states to determine how much coal ash is prohibited from disposal below the water table. Since isolation of ash from water is critical to preventing toxic leachate, it is axiomatic that disposal of ash must occur *above* the water table. Yet the report found that only 16% of the total waste volume being regulated by these 25 states is prohibited from disposal in water when waste is disposed in waste ponds. For landfills, the total waste volume that is prohibited from disposal in water is only 25%. Thus the great majority of coal ash produced in those 25 states is allowed to be disposed *into the water table*.[23] This practice places the nation's drinking water aquifers at great risk.

Further, in 2006, EPA and the U.S. Department of Energy (DOE) jointly published a report that also found significant deficiencies in state regulations.[24] In fact, the report found that a substantial percentage of large ash-producing states lacked one of the most basic mechanisms for regulating waste disposal, namely the authority to *permit* coal ash units. The report concluded that approximately 30% of the net disposable coal ash generated in the U.S. is potentially *totally exempt* from solid waste permitting requirements.[25] This is another wholly unacceptable gap in regulation of coal ash that is likely to have significant negative impact on health and the environment.

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[22] DPRA Incorporated. Estimation of Costs for Regulating Fossil Fuel Combustion Ash Management at Large Electric Utilities under Part 258, prepared for U.S. EPA, Office of Solid Waste, November 30, 2005 at 2-12 – 2-21.
[23] *Id.* at 39.
[24] U.S. Dep't of Energy & U.S. Envtl. Prot. Agency, Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994–2004 (Aug. 2006).
[25] *Id.* at 45-46.

Lastly, even the most recent data submitted to EPA *by the states themselves* indicate that basic safeguards are simply not required by the majority of states.[26] According to a survey by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), only 33% of the states responding to the survey impose a requirement that coal ash surface impoundments have a liner, only 14% of the states require leachate collection at coal ash ponds, and only 31% of the states require financial assurance for coal ash ponds.[27] It is not clear from the ASTSWMO survey how many states responded, so these percentages may, in fact, overestimate the number of states that have regulatory safeguards. (See Figure 7 for complete results of the ASTSWMO survey.)

In view of EPA's risk assessment that finds a significantly elevated threat to human health from both coal ash landfills and ponds, the absence of basic monitoring, lining and isolation requirements at the nation's approximately 1000 coal ash ponds and landfills is very alarming. In fact, the absence of regulations mandating basic safeguards has produced unsafe waste units, even among the most recently constructed landfills and ponds. The 2006 DOE/EPA report surveyed 56 permitted landfills and ponds built between 1994 and 2004. Although the report cited the presence of "liners" at nearly all newly permitted units, the types of liners installed at the sites are insufficient to protect human health and drinking water. The report found that, at best, only about half of the landfills and ponds installed composite liners.[28] According to the report, the remaining units were built with clay liners, single liners or no liners.

These types of liners, EPA tells us, are not sufficient to protect human health and the environment. According to EPA's 2007 *Human and Ecological Risk Assessment of Coal Combustion Wastes*, landfills and ponds with clay liners do <u>not</u> provide adequate protection. EPA's *Risk Assessment* states:

> Risks from clay-lined units are lower than those from unlined units, but 90th percentile risks are still well above the risk criteria for arsenic and thallium for landfills and arsenic, boron and molybdenum for surface impoundments.[29]

The *Risk Assessment* further states that only *composite liners*[30] effectively reduce risks from all constituents to below the risk criteria for both landfills and ponds. Thus the 2006 DOE/EPA survey of recently constructed disposal units

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[26] *See* Letter from Brian Tormey and Stephen Cobb, Association of State and Territorial Solid Waste Management Officials (ASTSWMO) to Matt Hale, Director, Office of Resource Conservation and Recovery, EPA, dated April 1, 2009.)

[27] Letter from Brian Tormey and Stephen Cobb, Association of State and Territorial Solid Waste Management Officials (ATSTWMO) to Matt Hale, Director, Office of Resource Conservation and Recovery, EPA, dated April 1, 2009.

[28] *Id.* at 33.

[29] US EPA, Hunan and Ecological Risk Assessment at ES-7.

[30] A composite liner is defined as a high-density polyethylene (HDPE) membrane combined with either geosynthetic or natural clays.

reveals that the absence of a federal rule requiring composite liners has produced a whole new generation of waste units in at least a dozen states that pose serious threats to the communities that host them.

4. *EPA has the clear authority under RCRA to promulgate tailored, federally enforceable standards for the safe disposal of coal ash that will ensure the protection of every U.S. community residing near coal ash disposal sites.*

a. Hazardous waste regulation of coal ash is necessary to ensure protection of health and the environment nationwide.

The way in which EPA chooses to regulate coal ash under RCRA—either as "hazardous" or "non-hazardous" waste-- will determine whether the promised regulations offer communities sufficient protection or whether the status quo of patchwork state rules and inadequate standards will remain.

Coal ash fulfills both the statutory definition of hazardous waste under RCRA[31] and the regulatory criteria for a listed hazardous waste.[32] EPA has determined through numerous studies, damage case assessments, and its latest human and ecological risk assessment that coal ash significantly increases the incidence of cancer and other serious diseases in humans and causes death, reproductive failure and other injury to fish, amphibians and wildlife.[33] Furthermore, in recent tests conducted by EPA, using an improved and more accurate leach test, the quantities of dangerous metals, such as arsenic, selenium, and thallium, leaching from coal ash are over 100 times the federal maximum contaminant level, which is the standard at which waste is judged "hazardous" under RCRA.[34]

If EPA regulates coal ash as a hazardous waste under Subtitle C of RCRA, it will provide far greater protection of health and the environment than is available under Subtitle D. Under RCRA Subtitle C, EPA could promulgate a set of regulations specifically tailored to address the threats posed by ash disposal. Under Subtitle C:

(1) All states *must* adopt standards *at least as stringent* as the federal regulations thereby ensuring critical nationwide consistency;

(2) EPA has the power to inspect coal ash disposal facilities;

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[31] RCRA defines a hazardous waste as a solid waste that because of its quantity, concentration, or physical or chemical characteristics may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or pose a substantial present or potential hazard to human health or the environment when improperly treated, transported or disposed, or otherwise managed. 42 USC § 6901(5).

[32] See 40 C.F.R. § 261.11(a)(3).

[33] EPA. Human Health and Ecological Risk Assessment of Coal Combustion Wastes (draft) (2007).

[34] Office of Research & Dev., U.S. Envtl. Prot. Agency, Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control (Feb. 2006).

(3) EPA has the authority to enforce the regulations; and

(4) EPA must require solid waste permits and regular inspections of waste units.

Thus under Subtitle C of RCRA, coal ash disposal would ultimately be regulated under far more comprehensive state programs with permitting capabilities and federal inspection and enforcement authority, which would implement consistent minimum standards that protect communities in every state in the U.S.

In contrast, if EPA regulates coal ash as a non-hazardous waste, its authority is severely limited. First, *none* of the essential authority and safeguards listed above would be available under Subtitle D. EPA can issue only "guidelines" under Subtitle D, which EPA has no authority to enforce. Nor can EPA mandate that the states promulgate regulations equivalent to those guidelines. Subtitle D guidelines are enforceable by states and citizens through RCRA's citizen suit provision, but reliance on this very limited enforcement authority does not guarantee effective nationwide compliance.

Since state regulations pertaining to coal ash have been shown to be grossly deficient in many states, it is clear that Subtitle D guidelines cannot solve the national problem. In fact, the states are not required by law to improve their regulations at all, if EPA does not regulate coal ash as a hazardous waste. The states have had decades to regulate coal ash, and they have clearly chosen not to do so. There is no reason to believe that states will remove the loopholes and lax standards, if there is no federal requirement mandating those changes.

Finally, issuance of national guidance may be insufficient to assure proper management of coal ash in all 50 states, since approximately 23 states have a version of "no more stringent" provisions in their laws that prohibit states from promulgating regulations that are more stringent than federal regulations. Such provisions could restrict or preclude those states' agencies from asserting regulatory authority over the use or disposal of coal ash if those standards are set forth in guidance rather than regulations. States with "no more stringent" provisions are typically limited to adoption and imposition of counterpart state rules based only on 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." States with "no more stringent" provisions include some of the largest coal ash generating states, such as Kentucky, New Mexico, Alabama, Illinois and Pennsylvania

b. EPA can specifically tailor federal hazardous waste regulations for coal ash disposal.

RCRA contains a statutory provision, applying specifically to several solid wastes, including coal ash, which gives EPA the ability to tailor hazardous waste regulations to the particular characteristics of the waste, such as its high volume.[35] Thus EPA need *not* require that coal ash be disposed in existing hazardous waste landfills, but

[35] RCRA § 3004(x), 42 U.S.C. § 6924(x).

can mandate that the ash be disposed in engineered landfills that have specific safeguards sufficient to safely contain the ash. Hazardous waste regulations are not "one size fits all" under RCRA. Thus fears that coal ash will fill up the nation's existing hazardous waste landfills are unfounded—EPA has the authority to develop less stringent standards for coal ash disposal under Subtitle C that take into account the specific nature of the waste. These regulations will certainly prompt the upgrade of currently operating landfills and spur the construction of new ones. The disposal of most of the nation's coal ash on the power plant property will likely continue if Subtitle C regulations are promulgated. The difference will be that such disposal will be safe and secure through the use of basic engineering requirements. As an added benefit, such upgrades to existing landfills and the construction of new engineered landfills will aid local economies and provide green jobs.

c. Regulation of coal ash disposal under Subtitle C of RCRA will promote beneficial reuse.

By imposing disposal standards, EPA will encourage coal ash reuse. When cheap dumping is no longer available, power plants will have far greater incentive to recycle their ash. In Wisconsin, for example, more stringent regulation of coal ash has raised state recycling rates significantly. Wisconsin coal ash rules constitute some of the most comprehensive regulations in the nation. As a result, the recycling rate in Wisconsin for coal ash is 85%, more than double the average recycling rate for all other coal ash-producing states (36%).[36] It stands to reason that if the true cost of disposal were borne by electric utilities, there would be far greater incentive to find beneficial uses for coal ash.

It is not appropriate, however, to promote reuse of ash at the expense of health and the environment. While certain reuses of coal ash appear to be safe and beneficial, EPA has not been vigilant in requiring characterization of the waste and testing of processes and products to ensure that hazardous substances do not escape from coal ash when reused. As the committee has learned, the placement of 1.5 million tons of ash to build a golf course over a shallow aquifer is not "beneficial" reuse, but unregulated and highly dangerous dumping of toxic waste. EPA must closely examine all reuse claimed to be "beneficial" to determine its long-term safety.

In fact, a recent article, co-authored by an EPA scientist and the former president of the American Coal Ash Association, acknowledges concerns about the safety of some common coal ash reuses, particularly when the reuse involves high temperature processing.[37] According to the authors, the heating of ash greatly increases the likelihood of significant release of mercury. The article also acknowledges that the changing nature of coal combustion waste calls for closer examination of the fate of mercury and other metals that are captured by air pollution control equipment and transferred to the ash and

[36] U.S. Department of Energy (2004). Coal Combustion Waste Management at Landfill and Surface Impoundments 1994-2004. DOE/PI-004, ANL-EVS/06-4 at page 5.

[37] Senior, Constance L., Susan Thorneloe, Bernine Khan, David Goss. Fate of Mercury Collected From Air Pollution Control Devices, EM, Air and Waste Management Association (July 2009).

flue gas desulfurization (FGD) sludge. The study notes, in particular, that fly ash used as a feedstock to cement kilns can result in large mercury emissions, stating "virtually all mercury will be volatilized when [coal ashes] are used as feedstock to cement kilns as the result of high operating temperatures (1450 degrees C)."[38] These concerns, as well as others raised by the use of coal ash as structural fill, minefill, and soil amendment should be investigated and addressed by EPA.

Recommendations

Unsafe disposal of coal ash has resulted in case after case of serious injury to health and the environment. Research conducted by EPA and the National Academies of Science[39] indicate a high and unacceptable risk from coal ash when the waste is disposed without safeguards. It is thus our hope that the Subcommittee will recommend that EPA take the following steps to protect our communities and environment:

1. *Promulgate federally enforceable regulations for coal ash disposal in landfills under Subtitle C of RCRA.*

EPA must designate coal combustion waste as a hazardous waste under Subtitle C of RCRA because federal regulations are needed to address the substantial hazard to human health and the environment when coal combustion waste is improperly stored or disposed. Regulation as a non-hazardous solid waste under Subtitle D of RCRA will not afford sufficient protection from the release of hazardous pollutants from the hundreds of ponds, dumps, piles and mines throughout the United States. Enforceable minimum requirements for dry disposal of coal ash in landfills should include siting restrictions, composite liners, groundwater monitoring, leachate collection systems, financial assurance, closure requirements, post-closure care, and corrective action.

2. *EPA should phase-out coal ash surface impoundments (waste ponds) at existing coal-fired plants and prohibit the construction of surface impoundments at new plants.*

EPA should prohibit construction of surface impoundments at all new coal-fired plants and require a phasing-out of surface impoundments at existing plants. Electric utilities have a choice of producing dry or wet waste, and given the evidence of damage to human health and the environment from disposal of slurried (wet) ash in waste ponds, an essential step to improve waste management over the long term is to require utilities to move toward dry disposal of ash. The TVA disaster as well as the dozens of cases of contamination from the leaching of arsenic and other pollutants from ponds across the U.S. is testament to the danger of wet disposal. For existing plants, EPA should establish a reasonable date for termination of all wet ash disposal. As an added benefit, disposing of dry ash in landfills preserves the ash for recycling at a later date.

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[38] *Id.* at 5-6.

[39] Committee on Mine Placement of Coal Combustion Waste, Nat'l Research Council, Managing Coal Combustion Residues in Mines (2006).

3. EPA should prohibit disposal of coal ash in sand and gravel pits.

In view of the clear threat to public health posed by disposal of coal ash in sand and gravel pits, EPA should promulgate an immediate prohibition. Since 2000, EPA has recommended that coal ash disposal in sand and gravel pits be terminated because of the many damage cases resulting from this practice. As the committee heard in testimony by Ms. Gayle Queen, coal ash disposed in an unlined pit poisoned the drinking water of a community in Gambrills, Maryland and sickened its residents. The threat to public health posed by the recent dumping in Gambrills (1999 through 2007) is unconscionable, considering EPA's long experience with cases of water contamination from this disposal practice. EPA has long acknowledged numerous proven damage cases caused by coal ash disposal in sand and gravel pits, including sites that poisoned or threatened public drinking water supplies in Illinois, Massachusetts, Michigan, Ohio, Virginia, and Wisconsin. A prohibition is necessary because this dangerous mode of disposal is still an acceptable practice in numerous states. In fact, Iowa currently has at least four ongoing disposal operations in unlined sand and gravel pits. In view of the propensity of coal ash to leach into aquifers from sand and gravel pits and the likely paths of migration to residential areas and public water supplies, it is necessary to act immediately to avoid further injury.

4. EPA should assess all coal ash reuses to determine their safety and legitimacy.

EPA should encourage the legitimate and safe reuse of coal ash only when such reuse does not pose a threat to health and the environment. Safe beneficial reuse can conserve virgin resources and reduce emission of greenhouse gases. Because unregulated reuse of coal ash can lead to endangerment of human health, however, the agency should carefully and systematically examine reuse practices, particularly structural fill and minefilling, to determine what standards and guidelines should be imposed to guarantee that these practices do not cause harm. In addition, EPA should examine any reuse of coal ash that involves changes in temperature or pH during processing to ensure that hazardous constituents are not released during the manufacture or use of the recycled product.

Conclusion

In sum, I greatly appreciate the Subcommittee's interest in the risk to public health posed by the failure to regulate coal ash. Today's testimony before the Subcommittee amply demonstrates that dry coal ash disposal as well as dangerous reuse of dry ash can cause significant harm to the health and economic well-being of communities near landfills and reuse sites. I appreciate the Subcommittee's interest in protecting public health and in finding a federal solution to this decades-old problem.

Figure 1: Human Health Effects of Coal Ash Pollutants

Aluminum	Lung disease, developmental problems
Antimony	Eye irritation, heart damage, lung problems
Arsenic	Multiple types of cancer, darkening of skin, hand warts
Barium	Gastrointestinal problems, muscle weakness, heart problems
Beryllium	Lung cancer, pneumonia, respiratory problems
Boron	Reproductive problems, gastrointestinal illness
Cadmium	Lung disease, kidney disease, cancer
Chromium	Cancer, ulcers and other stomach problems
Chlorine	Respiratory distress
Cobalt	Lung/heart/liver/kidney problems, dermatitis
Lead	Decreases in IQ, nervous system, developmental and behavioral problems
Manganese	Nervous system, muscle problems, mental problems
Mercury	Cognitive deficits, developmental delays, behavioral problems
Molybdenum	Mineral imbalance, anemia, developmental problems
Nickel	Cancer, lung problems, allergic reactions
Selenium	Birth defects, impaired bone growth in children
Thallium	Birth defects, nervous system/reproductive problems
Vanadium	Birth defects, lung/throat/eye problems
Zinc	Gastrointestinal effects, reproductive problems

Source: ATSDR ToxFAQs, available at www.atsdr.cdc.gov/toxfaq.html

Figure 2:
Risks Posed by Coal Ash Surface Impoundments and Landfills (EPA, Human and Ecological Risk Assessment of Coal Combustion Wastes 2007)

Table A: Surface Impoundments: Highest Health Risks (Groundwater to Drinking Water)			
	90th Percentile HQ or Cancer Risk Value[1 2]		
Chemical	Unlined Units	Clay-Lined Units	Potential health Risks
Conventional CCW			
Arsenic (cancer risk)	1 in 500	1 in 1,111	Nausea; Vomiting; Diarrhea; Cardiovascular Effects; Encephalopathy; Dermal Effects; Peripheral Neuropathy; Skin, Bladder & Lung cancer
Nitrate/nitrite (MCL)	20	10	Methemoglobinemia, infants are particularly vulnerable
Molybdenum	8	5	Fatigue; Headaches; Joint Pains
Boron	7	4	Stomach, Intestines, Kidneys, Liver and Brain Damage; Death; Negative Effects on Male Reproduction
Selenium	2	1	Dizziness; Fatigue; Respiratory Effects; Selenosis (Hair Loss; Nail Brittleness; Neurological Abnormalities)
Lead (MCL)	3	0.7	Learning Disabilities; Kidney, Blood, and Nerve Damage; Children are especially vulnerable to Lead exposure
Codisposed CCW and Coal Refuse			
Arsenic (cancer risk)	1 in 50	1 in 143	Nausea; Vomiting; Diarrhea; Cardiovascular Effects; Encephalopathy; Dermal Effects; Peripheral Neuropathy; Skin, Bladder & Lung cancer
Cadmium	9	3	Diarrhea; Stomach Pains; Severe Vomiting; Bone Fracture; Reproductive Effects; Nerve Damage; Immune System Damage; Psychological Disorders
Cobalt	8	3	Vomiting and Nausea; Vision Problems; Heart Problems; Thyroid Damage
Lead (MCL)	9	1	Learning Disabilities; Kidney, Blood, and Nerve Damage; Children are especially vulnerable to Lead exposure
Molybdenum	3	2	Fatigue; Headaches; Joint Pains

Sources: U.S. Envtl. Prot. Agency (EPA), Human and Ecological Risk Assessment of Coal Combustion Wastes (released as part of a Notice of Data Availability) (Aug. 6, 2007) (draft), Table 4-7, Page 4-14 (does not include data on composite-lined units); and U.S. Department of Health and Human Services, Agency for Toxic Substances & Disease Registry, "Frequently Asked Questions About Contaminants Found at Hazardous Waste Sites" <http://www.atsdr.cdc.gov/toxfaq.html>.

[1] Values are HQs for all chemicals except arsenic; arsenic values are cancer risk.

[2] The Hazard Quotient (HQ) is the ratio of the exposure estimate (dose of contaminants) to a "no adverse effects level" considered to reflect a "safe" environmental concentration or dose.

Figure 2
(Continued)

Table B: Landfills: Highest Health Risks (Groundwater to Drinking Water)			
	90th Percentile HQ or Cancer Risk Value[1,2]		
Chemical	Unlined Units	Clay-Lined Units	Potential Health Risks
Conventional CCW			
Arsenic (cancer risk)	1 in 2,500	1 in 5,000	Nausea; Vomiting; Diarrhea; Cardiovascular Effects; Encephalopathy; Dermal Effects; Peripheral Neuropathy; Skin, Bladder & Lung Cancer
Thallium	3	2	Stomach Pains; Nerve Damage; Joint Pains; Vision Damage; Fatigue; Headaches
Antimony	2	0.8	Eye Irritation; Hair Loss; Lung Damage; Heart and Fertility Problems. Liver and Blood Damage; Skin Irritation
Codisposed CCW and Coal Refuse			
Arsenic (cancer risk)	1 in 2,000	1 in 5,000	Nausea; Vomiting; Diarrhea; Cardiovascular Effects; Encephalopathy; Dermal Effects; Peripheral Neuropathy; Skin, Bladder & Lung cancer
Thallium	2	1	Stomach Pains; Nerve Damage; Joint Pains; Vision Damage; Fatigue; Headaches
Molybdenum	2	0.6	Fatigue; Headaches; Joint Pains

Sources: U.S. Envtl. Prot. Agency (EPA), Human and Ecological Risk Assessment of Coal Combustion Wastes (released as part of a Notice of Data Availability) (Aug. 6, 2007) (draft). Table 4-5, Page 4-12 (does not include data on composite-lined units); and U.S. Department of Health and Human Services, Agency for Toxic Substances & Disease Registry, "Frequently Asked Questions About Contaminants Found at Hazardous Waste Sites" <http://www.atsdr.cdc.gov/toxfaq.html>.

[1] Values are HQs for all chemicals except arsenic; arsenic values are cancer risk.

[2] The Hazard Quotient (HQ) is the ratio of the exposure estimate (dose of contaminants) to a "no adverse effects level" considered to reflect a "safe" environmental concentration or dose.

Figure 3: Increase in Contaminants in Coal Ash from EPA Office of Research and Development Testing 1999-2008

Hazardous Constituent	1999 Report to Congress' Leachate Concentration (ug/l)[1]	2008 ORD Report's Leachate Concentration (ug/l)[2]	Increase in Leachate Concentration (at upper bounds of range) 1999-2008	MCL (ug/L)
Antimony	1.05 - 12.5	<0.3 – 200	16 times	6.0
Arsenic	0.875 - 236	<1.0 – 1,000	Nearly 5 times	10
Boron	103 – 9,630	200-300,000	31 times	n/a
Chromium	0.67 – 5.89	1 – 4,000	680 times	5.0
Selenium	4.83 - 440	5 – 10,000	Nearly 23 times	50
Thallium	1.85 – 15.2	<0.3 – 300	> 19 times	2.0

[1] Office of Solid Waste & Emergency Response, U.S. Envtl. Prot. Agency, Report to Congress: Wastes from the Combustion of Fossil Fuels (Mar. 1999) at 3-19, tbl. 3-9.
[2] Susan Thorneloe et al., "Improved Leach Testing for Evaluating Fate of Mercury and Other Metals from Management of Coal Combustion Residues," Proceedings Global Waste Management Symposium: Promoting Technology and Scientific Innovation (Sept. 7–10, 2008) at 17.

Figure 4: Increases in U.S. Generation of Coal Combustion Waste: Forecast Through 2015

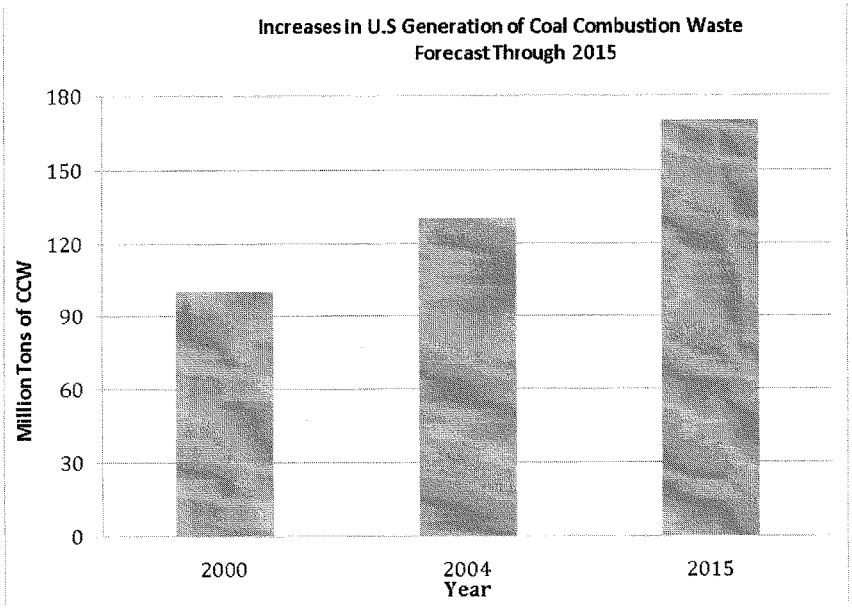

Figure 5: Income Within 1 -5 Kilometers of U.S. Coal Ash Impoundments

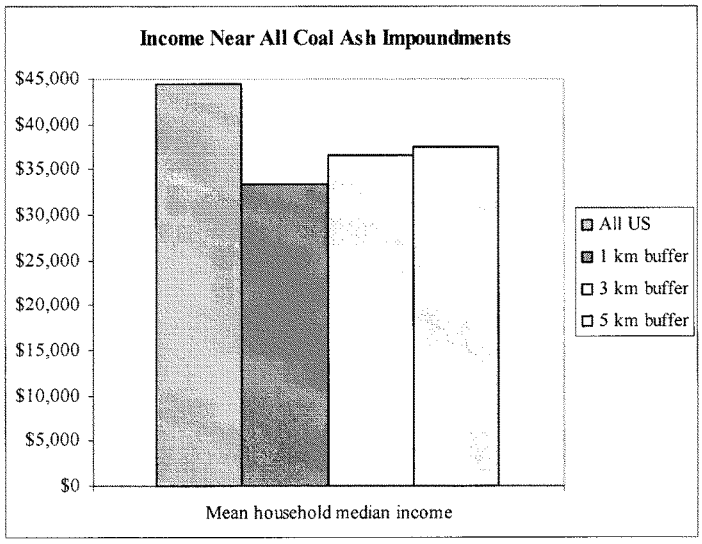

Figure 6: Coal Ash Ponds and Environmental Injustice
Poverty and the Location of Coal Ash Ponds in Arizona and New Mexico

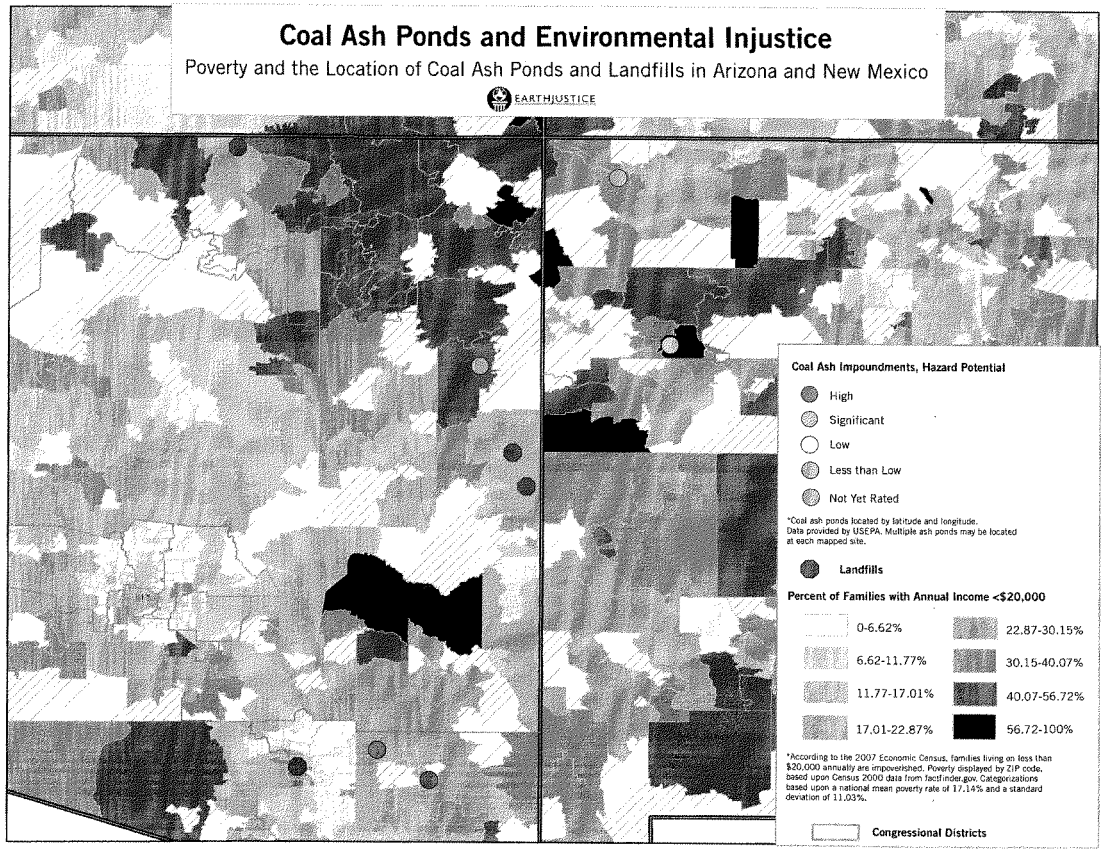
Coal Ash Ponds and Environmental Injustice
Poverty and the Location of Coal Ash Ponds and Landfills in Arizona and New Mexico
EARTHJUSTICE
Coal Ash Impoundments, Hazard Potential
High
Significant
Low
Less than Low
Not Yet Rated
*Coal ash ponds located by latitude and longitude.
Data provided by USEPA. Multiple ash ponds may be located
at each mapped site.
Landfills
Percent of Families with Annual Income <$20,000
0-6.62%
6.62-11.77%
11.77-17.01%
17.01-22.87%
22.87-30.15%
30.15-40.07%
40.07-56.72%
56.72-100%
*According to the 2007 Economic Census, families living on less than
$20,000 annually are impoverished. Poverty displayed by ZIP code,
based upon Census 2000 data from factfinder.gov. Categorizations
based upon a national mean poverty rate of 17.14% and a standard
deviation of 11.03%.
Congressional Districts

Figure 7: Survey of Association of State and Territorial Solid Waste Management Officials (ASTSWMO), April 1, 2009

Percentage of States with Coal Ash landfills and surface impoundments with specific regulatory requirements

Regulatory Requirement	Landfills	Surface Impoundments
Bottom Liner	64%	33%
GW Monitoring	81%	39%
Leachate Collection	52%	14%
Final Cover System	79%	36%
Post Closure Care	79%	39%
Siting Controls	83%	39%
Corrective Action	86%	39%
Structural Stability	69%	42%
Financial Assurance	69%	31%

Mr. MCNERNEY. Thank you, Ms. Evans.

The second witness I would like to call is Mary Fox, Dr. Mary Fox. She is an assistant professor of policy and management at the Johns Hopkins Bloomberg School of Public Health. She is part of the core faculty of the school's Risk Sciences and Public Policy Institute and her research focuses on the human health effects of exposure to chemical mixtures. Dr. Fox received her Ph.D. in environmental and occupational health policy from the Johns Hopkins Bloomberg School of Public Health. Ms. Fox, please begin your testimony when you are ready.

STATEMENT OF MARY A. FOX

Ms. FOX. Thank you, and good morning. I appreciate the opportunity to address the subcommittee today.

There are a few important things to know when addressing the health impacts of coal combustion waste. First, coal combustion waste is a complex mixture of well-documented hazardous substances. The types of and severity of health effects of coal combustion waste constituents range from benign and cosmetic changes to organ function changes to cancer. As a Nation, we produce a large volume of waste. The uses and types of disposal may allow distribution into the broader environment. Taken together, these considerations present us with a public health protection challenge.

Some examples of the health effects associated with specific combustion waste constituents include cancer associated with arsenic, neurological effects associated with aluminum, lead and manganese, kidney effects from barium and mercury, effects on the gastrointestinal system related to beryllium, and copper. It is important to note that multiple coal combustion waste constituents contribute to certain health effects. Exposure to combinations or mixtures of these constituents may increase the risk of developing these health problems.

As we have seen in some of the pictures this morning from the particular sites, people can come into contact with coal combustion waste through breathing if the dust is in the air or through drinking water if constituents have leached from a disposal site into groundwater that is tapped by drinking-water wells. And as we have heard, not far from here in Gambrills, Maryland, coal combustion waste was used to reclaim a former sand and gravel pit. Constituents of the coal combustion waste reached the drinking-water wells of nearby residents and sampling by the county health department found concentrations of aluminum, arsenic, beryllium, cadmium, lead, manganese and thallium above drinking-water standards in some wells.

It is difficulty to study and therefore accurately quantify the population-level health impacts of coal combustion waste exposure. Three of the common coal combustion waste management practices, landfill, surface impoundment or use in reclamation of mines, result in localized disposal. Communities surrounding such disposal sites are typically small. Proximity to the coal combustion waste disposal site will likely spur interest in evaluating community health. Unfortunately, systematic health effects research in any one small community will have limited statistical power to detect changes in health outcomes. An absence of traditional epidemiolog-

ical studies, human health risk assessment methods are available to evaluate population exposures to multiple contaminant mixtures. Because coal combustion waste is a complex mixture of constituents, risk assessment methods will be essential to evaluating the health risks of exposure to coal combustion waste.

And let me conclude with a few key points. Coal combustion waste is a complex mixture that can be mobilized in the environment, depending on the uses and disposal methods. People can be exposed to coal combustion waste through breathing or inhalation, direct contact and ingestion. Health effects of exposure will be underestimated if we ignore the potential for simultaneous exposure to multiple components of the mixture and prevention of exposure through better management of the waste is ultimately the most sound public health approach.

Thank you again for the opportunity to speak with you this morning.

[The prepared statement of Ms. Fox follows:]

Written testimony prepared by Mary A. Fox, PhD, MPH, Assistant Professor
Johns Hopkins Bloomberg School of Public Health

House of Representatives Committee on Energy and Commerce
Subcommittee on Energy and Environment Hearing

Thursday, December 10th at 9:30 a.m.

Introduction

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 will address the toxic constituents of coal combustion waste, the health effects associated with exposure to coal combustion waste constituents, and how public health risks of such exposures are evaluated.

Background: What is coal combustion waste and how is it used?

Coal combustion waste includes several waste streams produced at coal-burning power plants, bottom ash and boiler slag from the furnace, fly ash or particulates in the exhaust gases, and flue gas desulfurization material (NRC 2006). Both the fly ash and flue gas desulfurization material occur because of air pollution controls put in place to protect air quality. These pollutants which were once released into air must now be managed as part of the solid waste stream.

The focus of my remarks will be on the health effects of the numerous elements that are found in coal combustion waste as a result of the natural mineral content of the coal. The elements of most concern from a health standpoint are listed in Table 1. Some of the commonly recognized toxic constituents are arsenic, lead, and mercury. Exposure to arsenic, lead, and mercury are associated with health effects including cancer, neurological damage and kidney damage. Further discussion of the health effects appears below. The listing of coal combustion waste constituents was developed from the 2006 National Research Council (NRC) report "Managing Coal Combustion Residues in Mines". The health effects information referenced here comes from the Centers for Disease Control and Prevention, and the Environmental Protection Agency.

In current practice coal combustion waste may be disposed in lined or unlined landfills or surface impoundments. Uses of coal combustion waste include reclamation of mines, use

as road bed material, or use in construction materials such as cement, concrete, and wallboard among others (NRC 2006).

How are people exposed to coal combustion waste?

People come into contact with and are exposed to natural and man-made components of the environment through the air we breathe, the water and food we drink and eat and by absorption through skin when we touch things.

Some uses and types of disposal of coal combustion waste are more likely to result in broader distribution of the material in the environment and therefore increase opportunities for human contact or exposure. For example, disposal in an unlined landfill or mine can increase the chances of coal combustion waste coming into contact with ground water. Coal combustion waste constituents may then travel off site and potentially contaminate drinking water wells increasing the likelihood of human exposure. On the other hand, uses such as for cement or concrete will encapsulate or sequester the coal combustion waste constituents reducing the opportunities for human exposure. Each use of coal combustion waste should be carefully evaluated for the potential to facilitate or reduce the distribution of the waste constituents into the ambient environment.

In Gambrills, Maryland coal combustion waste was used to reclaim a former sand and gravel pit. Over time coal combustion waste constituents leached into the ground water that was tapped by private drinking water wells of near-by residents. The county health department sampled the wells and found concentrations of aluminum, arsenic, beryllium, cadmium, lead, manganese, and thallium at levels above primary and secondary drinking water standards in some wells (Phillips 2007).

Health effects of exposure

Health effects information is available for the majority of coal combustion waste constituents listed in Table 1. The data in Table 1 summarizes health effects from studies of ingestion. (The health effects from inhalation or dermal exposures may differ.) The types and severity of the health effects range from benign and cosmetic effects to changes organ or system function to cancer. Several coal combustion waste constituents share a common type of toxicity or target organ or system. Three coal combustion waste constituents have neurological effects (aluminum, lead, manganese); three (barium, cadmium, mercury) have effects on the kidney; three have a variety of effects on blood (cobalt, thallium, zinc); two have effects on the gastrointestinal system (beryllium and copper). If exposures to these mixtures occur, there is a greater chance of increased risk to health.

While not the focus of this testimony, the NRC report documented numerous examples of damage to ecological populations (mammals, fish, birds and plants) resulting from exposure to coal combustion waste constituents (NRC 2006).

Assessing public health risks

Three of the common coal combustion waste management practices (landfill, surface impoundment, use in or reclamation of mines) result in localized disposal. Communities surrounding such disposal sites are typically small. Proximity to the coal combustion waste disposal site will likely spur interest in evaluating community health. Unfortunately, systematic health effects research in any one small community will have limited statistical power to detect changes in health outcomes.

In absence of traditional epidemiological studies, human health risk assessment methods are available to evaluate population exposures to multiple chemical mixtures (EPA 2000). Coal combustion waste is a complex mixture of constituents. Risk assessment methods for multiple chemical exposures will be essential to evaluating health risks of exposure to coal combustion waste.

Conclusions

Coal combustion waste is a mixture of well-recognized substances. The approach to evaluating exposures to coal combustion waste should acknowledge potential interactions among the constituents in the body. Methods are available to assess health risks from exposure to mixtures of chemical substances, however, current regulatory strategies were not designed to control such mixture exposures. Coal combustion waste disposal practices must be improved to ensure population exposures are controlled through appropriate long-term containment and management. Human health risks are reduced or eliminated if human exposure is reduced or eliminated.

Key points:

- Coal combustion waste is complex mixture that can become mobilized in the environment, depending on uses and disposal methods.
- Uses and disposal methods must be evaluated to understand the potential for mobilization and distribution in the environment.
- People can be exposed to coal combustion waste through breathing or inhalation, direct contact, and ingestion. Exposures may occur indoors and outdoors.
- Health effects of exposure will be underestimated if the potential for mixture exposure is ignored.

Thank you very much for this opportunity to address the Subcommittee.

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Table 1. Health effects of coal combustion waste (CCW) constituents

CCW Constituent	Health Effect(s) of Concern (Exposure by Ingestion)	Information Source
Aluminum	Neurological	ATSDR 2007
Antimony	Longevity, changes in blood glucose and cholesterol	EPA IRIS
Arsenic	Cancer, hyperpigmentation, keratosis of skin	EPA IRIS
Barium	Nephropathy	EPA IRIS
Beryllium	Gastrointestinal	EPA IRIS
Boron	Decreased fetal weight	EPA IRIS
Cadmium	Significant proteinuria	EPA IRIS
Chromium (III)	No effects observed	EPA IRIS
Chromium (VI)	No effects observed	EPA IRIS
Cobalt	Blood	ATSDR 2007
Copper	Gastrointestinal	ATSDR 2007
Fluorine	Cosmetic fluorosis of teeth	EPA IRIS
Iron	NA	NA
Lead	Neurological	CDC 2005
Manganese	Neurological	EPA IRIS
Mercury	Kidney	ATSDR 2007
Molybdenum	Increased uric acid levels	EPA IRIS
Nickel	Decreased body and organ weight	EPA IRIS
Potassium	NA	NA
Selenium	Selenosis – hair and nail loss	EPA IRIS
Silver	Argyria - benign skin pigmentation	EPA IRIS
Strontium	Bone growth and mineralization	EPA IRIS
Thallium	Change in blood chemistry	EPA IRIS
Vanadium	Decreased hair cystine	EPA IRIS
Zinc	Decreased red blood cell copper and enzyme activity	EPA IRIS

Abbreviations: ATSDR, Agency for Toxic Substances and Disease Registry; CCW, coal combustion waste; EPA, Environmental Protection Agency; IRIS, Integrated Risk Information System; NA, not available.

Mr. MARKEY. Thank you, Dr. Fox, very much.

Our next witness is Ken Ladwig. He is senior project manager at the Electric Power Research Institute, responsible for research on the management and use of coal combustion waste. Since joining EPRI in 1999, he has worked on various aspects of coal waste and groundwater research including the potential for environmental release, disposal site management and coal waste options. We welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF KEN LADWIG

Mr. LADWIG. Thank you, Mr. Chairman. I appreciate the opportunity to provide testimony to this subcommittee.

At EPRI, we have been engaged in coal combustion product research both disposal and use for over 30 years. Our goal in meeting with legislative staff recently and attending this hearing is to ensure that all pertinent technical information is available to those that may be involved in this important decision-making process.

In my brief time today, I will focus primarily on coal ash, and I believe it was Congressman Whitfield that said that it is confusing to hear coal ash referred to both as a toxic sludge or something of high toxicity, and on the other hand hear it referred to as being the same as soil. I hope to provide some illumination on that topic, and as usual, I think the answer is probably somewhere in the middle.

Coal ash is derived from the inorganic minerals in coal, and as such its element composition is similar to the composition of rocks and soil, so that is inevitable. Trace metals make up less than 1 percent of the total composition. However, while the trace elements are qualitatively the same as those in rocks and soil, they are enriched slightly relative to rocks and soil and therefore the material does need to be managed. The toxicity characteristic leaching procedure, TCLP, is the leaching test that has been used to draw the line between hazardous and non-hazardous waste under RCRA since 1990. In samples from more than 30 power plants in testing we have done at EPRI, no coal ash samples exceeded any TCLP limits for any trace metals. These data are consistent with data from U.S. EPA. We have also compared leachate from fly ash to leachate from other non-hazardous waste such as metal slags and found them to be similar. There are literally hundreds of other laboratory leaching protocols that have been used by EPRI and other researchers to evaluate coal ash and there is quite a bit of disagreement among the technical community as to which is the best procedure. We are coordinating with EPA on interpretation and use of a new set of leaching protocols that offer a number of benefits in understanding CCP leaching mechanisms. However, the tests produce a lot of data that requires careful evaluation and application on a site-specific basis. Indiscriminate use of selected results from these complicated tests is both misleading and inaccurate.

Power plants have been generating and managing coal ash for more than 60 years. EPA released a report in 2007 describing 67 CCP management sites with either groundwater or surface water impacts characterized as proven or potential damage cases. Most of these damage cases represent older facilities without liners, onsite releases and low-toxicity constituents. Remediation is actively oc-

curring or has been completed at nearly all of the EPA damage case sites. Conversely, a DOE EPA report recently found that nearly all new CCP disposal cells built between 1994 and 2004 were lined and included groundwater monitoring networks. Several States such as Wisconsin have had successful non-hazardous disposal requirements in place for CCPs for many years.

The physical and chemical properties of CCPs make them valuable raw materials for many construction and geotechnical applications, and I think from the comments I have heard today, we all agree that using the CCPs in safe applications is the best outcome. In 2007, over 50 million tons of CCPs were used rather than disposed. The primary uses for fly ash are as an ingredient in concrete and cement and use in geotechnical fills. FGD gypsum is largely used as a direct replacement for rock gypsum in panel products, and U.S. EPA, USDA and Federal Highway Administration are all actively involved in CCP use.

We recently worked with the Recycling Materials Resource Center to use lifecycle analysis programs to quantify the environmental benefits of using CCPs in sustainable construction. Based on 2007 data, using CCPs in place of mined materials saved over $160 trillion BTUs in energy consumption, which is roughly the equivalent of the amount of energy used in 1.7 million homes, or a decent-sized city, 32 billion gallons in water consumption and 11 million tons in greenhouse gas emissions, and that equates to about taking two million autos off the road in a year. In addition, use rather than disposal saved a land area the size of Central Park in New York in 2007.

In conclusion, the Kingston release made coal ash a front-page news item and we are a lot more aware of some of the issues surrounding coal ash. What we need to do now is define a clear path forward that ensures safe disposal and allows for continued growth in CCP use. This will require continuing to fix problem sites such as Kingston and the damage cases, and I believe there was a hearing on Kingston yesterday that presented the progress that has been made on that site in just a year. And along with that, we need to identify and implement components of successful disposal site designs and practices. This is not an intractable for difficult task, and I agree with Lisa that there are technologies out there for dealing with the disposal of these materials. There are many examples of successful CCP disposal sites in all parts of the country right now.

Finally, we need to continue to grow the use of these materials in applications that are demonstrated to be both safe and of value. Every ton that is used rather than disposed provides savings in energy, water, greenhouse gas emissions, land area and natural resources. Thank you.

[The prepared statement of Mr. Ladwig follows:]

EPRI | ELECTRIC POWER RESEARCH INSTITUTE

Written Testimony

before the

SUBCOMMITTEE ON ENERGY AND ENVIRONMENT
UNITED STATES HOUSE OF REPRESENTATIVES
WASHINGTON, D.C.

Ken Ladwig

Senior Research Manager
Electric Power Research Institute
Palo Alto, California

December 10, 2009

I am Ken Ladwig, senior project manager at the Electric Power Research Institute (EPRI). EPRI is an independent nonprofit organization carrying out research on technology, operations and the environment for the global electric power industry. EPRI brings together scientists and engineers, along with experts from academia, industry and other research centers, to address the major issues facing the electric sector.

EPRI appreciates the opportunity to provide testimony to the House Subcommittee on Energy and Environment on the topic of coal combustion by-products (CCBs). The US EPA is currently reconsidering the classification of CCBs under the Resource and Conservation Act (RCRA), and the results may have a profound effect on both the disposal and use of these materials. The U.S. electric utility industry burns more than 1 billion tons of coal annually, with coal-fired generation supplying about 50% of the electricity used in the United States. Coal combustion generates approximately 125 million ton of residues or by-products—fly ash, bottom ash, and flue-gas desulfurization solids—each year. Currently, a little less than half (40-45%) of the by-products are used primarily as raw materials in construction and geotechnical applications—bridges, roads, commercial developments, and buildings—and the rest are stored or disposed in landfills and impoundments.

Given its scale, the proper management of CCBs is important both to the electric power industry and to society. EPRI has been engaged in CCB research for nearly 30 years. Our goal in meeting with legislative staff and attending this hearing is to ensure that all technical information are available to anyone that may be involved in the decision-making process.

Included with this written testimony is a copy of a slide presentation summarizing the information presented.

CHARACTERISTICS OF COAL COMBUSTION BYPRODUCTS

There are two primary types of CCBs, ash and FGD solids. Coal ash is the incombustible mineral matter in coal, and FGD solids are the products of sulfur capture from the flue gas. They are chemically and physically distinct materials.

Coal ash is collected as bottom ash and fly ash after the coal is combusted. The amount of coal ash produced at a power plant depends on the volume of coal burned, the amount of mineral matter in the coal, and the combustion conditions. In 2007, U.S. coal-fired power plants produced about 92 million tons of coal ash, including 72 million tons of fly ash, 18 million tons of bottom ash, and 2 million tons of boiler slag. The chemical composition of coal ash is determined primarily by the chemistry of the source coal and the combustion process. Because ash is derived from the inorganic minerals in the coal, such as quartz, feldspars, clays, and metal oxides, the major elemental composition of coal ash is similar to the composition of a wide variety of rocks in the Earth's crust (Slide 9). Oxides of silicon, aluminum, iron, and calcium comprise more than 90% of the mineral component of typical fly ash. Minor constituents such as magnesium, potassium, sodium, titanium, and sulfur account for about 8% of the mineral component, while trace constituents such as arsenic, cadmium, lead, mercury, and selenium, together make up less than 1% of the total composition. Trace element composition of fly ash is qualitatively similar to rocks and soil, but some of the trace elements are enriched relative to typical concentrations in rocks and soil. The physical and chemical properties of fly ash and bottom ash make them useful for a variety of construction applications.

The most important of the FGD solids is FGD gypsum, a by-product produced by using a wet limestone forced oxidation process to scrub sulfur from the flue gas. FGD gypsum is very similar to mined rock gypsum, typically 95% pure calcium sulfate. Trace element concentrations are low in FGD gypsum, similar to rock gypsum and other rocks and soils. FGD gypsum is a valuable mineral commodity readily substituted directly for rock gypsum in construction and agricultural applications.

LEACHING CHARACTERISTICS

EPRI and other have researched coal ash leaching for nearly three decades. This research has included both field and laboratory tests.

The regulatory leaching test used since 1990 to determine whether a waste is hazardous or non-hazardous under the federal RCRA program is the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP protocol has set limits that define a waste as hazardous for 8 trace metals—arsenic, selenium, barium, cadmium, silver, chromium, lead, and mercury. In EPRI data on tests from more than 30 power plants, no coal ash samples exceeded any of the TCLP limits (Slide 14). These data are consistent with data from the US EPA that suggest only rare exceedances of the TCLP limits by coal ash samples. We have also compared TCLP leachate from fly ash to TCLP leachate from other non-hazardous wastes, such as metal slags. The range of concentrations for fly ash is similar to the ranges found for non-hazardous metal slags (Slide 15). Leaching of trace constituents from FGD gypsum using standard protocols is very low.

In addition to TCLP, there are more than 100 other laboratory leaching protocols that have been used by EPRI and others to estimate leachate concentrations from wastes. These data can then used with infiltration and groundwater models to evaluate the potential risks posed under prescribed site-specific conditions. Used properly, the data from these leaching tests provide valuable information on the mechanisms of CCB leaching and potential for long term release.

We also coordinating with US EPA on the interpretation and use of a new suite of four leaching protocols that are currently under review for incorporation into SW-846. In addition, EPRI and DOE developed a detailed database of field leachate characteristics using samples from more than 30 CCB disposal sites.

DAMAGE CASES

In 2007 US EPA released a report describing 24 proven and 43 potential CCB damage cases, sites where CCB management facilities impacted groundwater or surface water and met a list of conditions. The CCB managed at most of the sites was coal ash. None of the sites represented FGD gypsum management facilities. EPRI recently completed an independent evaluation of these sites, focusing largely on the more prevalent groundwater damage cases (Slide 16). While we believe some are questionable with respect to identification of CCB impacts, many do suggest that the facilities have had an effect on groundwater quality. However, the damage case sites largely represent older facilities, on-site releases, and low toxicity constituents. Conversely, DOE and EPA tabulated landfill design criteria for 56 CCB management new facilities constructed from 1994 to 2004, which showed that all except one bottom ash landfill were constructed with liners. These sites also have extensive groundwater monitoring networks.

Mobile, low toxicity constituents such as boron and sulfate generally provide the first indication of groundwater impacts at CCB sites. As a result, there were few off-site MCL exceedances at the damage case sites, and nearly two-thirds do not have reasonable potential for off-site receptors. This information combined with the fact that remediation is actively occurring or has been completed at nearly all of the damage case suggests that there is a relatively low likelihood for receptor impacts at many of these sites. This is an important consideration when evaluating the long-term groundwater quality risks associated with CCB management facilities.

Key observations from analysis of data obtained from the 63 CCB damage cases (4 oil ash cases were not included) include:

1. Most damage case facilities were opened before current landfill regulations were promulgated. Specifically, two-thirds of the sites for which operating periods were known opened prior to promulgation of RCRA in 1976, and all opened before 1990.
2. Most cases (90%) do not have liners or only have liners in newer cells, and most (98%) do not have leachate collection systems in all cells. The one facility that was completely lined and built with a leachate collection system has a geomembrane liner that would be considered too thin by today's landfill design standards—yet the release from this facility was operational in nature rather than a release through the liner.
3. The majority of damage cases have little potential to impact groundwater receptors. Nearly two-thirds (61%) of the 54 groundwater damage case facilities were located such that there was little potential for downgradient receptors. In the majority of cases (85%), there either were no exceedances of groundwater quality standards attributable to CCB, or exceedances only occurred in on-site monitoring wells.

4. Six of the eight facilities with off-site groundwater quality exceedances were opened prior to 1970 (one opened in 1980 and the date of the other is unknown), and none were originally built with liners or leachate collection systems. Five of these eight have provided alternative drinking water supplies, one has a sentinel monitoring program to indicate water quality conditions so alternative water supply can be provided prior to impacting downgradient receptors, one off-site exceedance is in a different direction than the only potential receptor, and one case has no downgradient receptors.
5. Off-site exceedances of health-based MCLs attributable to CCBs impacts were observed at only three (6%) of the 54 groundwater CCB damage cases.
6. Available information indicates that remediation is completed or underway at all sites where remediation was required. The most common remediation was capping (44% of the 63 CCB cases).

BENEFICIAL USE

The physical and chemical properties of CCBs make them valuable raw materials for many construction and geotechnical uses. In 2007, over 50 million ton (41%) of all CCBs were used rather than disposed, including: 32 million tons of fly ash, 9 million tons of bottom ash and boiler slag, and 9 million tons of FGD gypsum.

The primary uses for fly ash is as an ingredient in concrete and cement, and use in geothechnical fills. The primary uses for bottom ash and boiler slag are skid control/blasting grit/roofing granules, geotechnical fills, and cement and concrete. FGD gypsum is largely used as a direct replacement for rock gypsum in gypsum panel products (e.g., wallboard).

US EPA actively promotes coal ash use under the Coal Combustion Partnership Program (C2P2), and has set a goal of 50% utilization by 2011. The Federal Highway Administration provides technical guidance on the use and benefits of fly ash for highway construction projects.

Life cycle analysis programs were used to quantify the benefits of using CCBs from electric power production in sustainable construction. The analysis focused on fly ash, bottom ash, and FGD gypsum and their most common applications. Comparisons were made between energy consumption, water use, and greenhouse gas (GHG) emissions associated with conventional materials and procedures and those employing CCBs.

The analysis showed remarkable societal benefits are obtained by using CCBs in sustainable construction in lieu of natural resources (e.g., limestone for Portland cement, rock gypsum) (Slide 22). Using 2007 CCB use data, energy consumption was reduced by 162 trillion Btu, water consumption was reduced by 32 billion gallons, GHG emissions were reduced by 11 million tons CO_2e, and $5-10 billion is saved. The reduction in energy consumption is commensurate with the energy consumed by 1.7 million homes (a large US city), the water saved is equal to 31% of the annual domestic water use in California, and the reduction in GHG emissions is comparable to removing 2 million automobiles from the roadway. The financial savings is equivalent to the average income for approximately 200,000 Americans.

Benefits are also achieved by avoiding disposal; 3.7 trillion Btu of energy is saved (≈ 38,600 households) and CO_2e emissions are reduced by 0.3 million tons (≈ 46,300 automobiles) by not disposing CCBs in landfills. The financial savings obtained by avoiding disposal ranges between $0.5-5.3 billion/yr depending on the disposal approach (on-site vs. commercial) and the type of disposal facility (Subtitle D vs. Subtitle C). Disposal of the material rather than utilization would annually require a land area the size of Central Park in New York.

ECONOMIC ANALYSIS – POTENTIAL IMPACTS TO RELIABILITY

A national coal combustion products regulation will alter the technology and economics of coal-fired power plants. Some owners would decide to prematurely shut down rather than incur the costs of compliance, while others would convert their ash handling and disposal systems and continue to operate in the post-regulation market. Since coal-fired generation accounts for almost half of all the electricity generated in the United States, this could have significant financial and reliability impacts. EPRI performed a power market simulation to assess unit-level baseline financial condition and compares that with estimated compliance costs of potential CCB regulations to calculate probabilities of premature shutdowns and corresponding capacity reductions in a Monte Carlo framework. This preliminary assessment was intended to provide early insight into the potential financial and reliability impacts of a hazardous waste regulation and phase-out of wet management methods

This assessment found that the Midwest (MISO), Mid-Atlantic (PJM), Southeast (SERC), and Texas (ERCOT) face potential reliability issues that could place future reserve margins in jeopardy (Slide 26). The study indictaed that potentially 190 to 411 coal fired generating units could shut down due to future costs of hazardous waste regulation of CCBs. The PJM region could be impacted the greatest with a loss of 12-19% of generation capacity, ERCOT with 7-14% loss, MISO with a 5-8% loss and SERC with a 4-9% loss of capacity.

The magnitude of potential shutdowns in terms of lost capacity (resource adequacy) is only a partial picture of the regulatory impacts. Other metrics that have not yet been evaluated include increases in electricity prices, job losses, distributional equity (i.e. identification of who would benefit and who would bear the costs), and impacts to secondary markets such as coal mining, natural gas production, CCB beneficial use markets (e.g., concrete manufacturing, wallboard manufacturing, and the construction industry). Transmission security impacts due to unit closures also were not been evaluated.

SUMMARY

- Total Composition
  - Ash composition similar to rocks; trace metals slightly enriched
  - FGD gypsum composition very similar to mined gypsum
- Leaching
  - CCB leachate does not exceed hazardous waste limits (TCLP)
  - Ash leachate similar to non-hazardous inorganic wastes
- Damage Cases
  - Proven/potential damage cases typically old (pre-1980), unlined sites

- Most exceedances were on-site; only 3 off-site exceedances of an MCL were noted
- Remediation is ongoing or completed at all of the sites where remediation was required

- Beneficial Use of CCBs
  - CCB use yield significant benefits in energy and water savings, reduces CO_2 emissions, reduces land space required for disposal, and conserves natural resources
  - 2007 savings: 159 trillion Btu, 32 billion gallons, 11 million tons of CO_2e, 51 million cubic yards in land space

- Electric Reliability
  - Between 40,000 and 97,000 coal-fired MW at risk
  - Potentially critical in Midwest, Mid-Atlantic, Southeast, and Texas regions

Mr. MARKEY. Thank you, Mr. Ladwig, very much.

Our final witness, Dr. Donald McGraw, is a practicing physician in Pittsburgh, Pennsylvania. Dr. McGraw has 30 years of experience in occupational and environmental medicine and has received a master's degree in public health from Johns Hopkins University. We welcome you, sir. Whenever you are ready, please begin.

STATEMENT OF DONALD McGRAW

Dr. MCGRAW. Thank you, Mr. Chairman.

I would like to first say that I grew up in a small town in southeastern Ohio to a family of farming, coal mining and steel working people. When I grew up, we had a coal-fired furnace which I stoked every morning. I shoved the coal in as a lad through a window into the basement and I helped my grandfather dump the coal ash on our garden, which grew wonderfully, as the Congressman from Florida mentioned earlier. When I left the area to attend school, I ended up back in Pittsburgh. I have been there for some 30 years now. I serve on the faculties of the University of Pittsburgh Schools of Medicine and Public Health and have taught medical students and residents for several decades. I previously was at least briefly on the faculty at Johns Hopkins prior to coming home. I am on the attending medical staff at a number of prominent area hospitals. I see patients in those hospitals, in clinics, in their worksites and in their homes. I have been in coal mines, steel mills, coal tar plants. I have been on coke ovens. I have been just about everywhere that coal has been used.

Only hearts of stone could fail to be moved to compassion by the stories and personal plights of the three families who spoke before but tragedies occur all too frequently in the form of tsunamis or typhoons in Thailand, the Philippines and mainland China, hurricanes like Katrina in New Orleans and Biloxi where I have participated in the aftermath and helped in at least a small way with my church in the cleanup. Hurricane Ike in Galveston, earthquakes in Peru and Russia and elsewhere around the world have brought death and devastation. Volcanic eruptions in Mexico and elsewhere leave in their wakes tragedy that is all too real. But in my experience, the main tragedy in coal combustion is the devastating job loss and economic devastation in the wake of steel mill shutterings and coal mine closures in southwestern Pennsylvania, southeastern Ohio, the mountains of West Virginia, Kentucky, Illinois and elsewhere. It would be truly a misadventure, a tragic misadventure to plunge these people even deeper into economic darkness.

In the course of my work in 2005, I was asked to see a number of individuals including adults and children, a half dozen, maybe even more than that, when an accidental spill of fly ash occurred in Forward Township not far from Pittsburgh. This was a large pile of ash that had been there for probably 50 years and slid down the hill into this tiny community and coated the ground where these people lived a foot or two in depth, and this was a soft, flaky ash, much like you would see coming out of any coal-powered facility. These people unfortunately waded around in it for days, cleaned it, shoveled it, swept it, breathed it in their own personal cleanups before some attention was paid. The DEP in Pennsylvania is very good and they came to the rescue and ultimately that cleanup has

been underway. I saw those individuals as individual patients. I listened to their stories. I evaluated them physically and I could find no objective abnormalities in any of those people. Simultaneously, or concomitantly, the Allegheny County Health Department, part of Bruce Dixon, who is just a marvelous physician, examined these people tested their urine, their blood, their hair, their nails and could find no evidence of any increased exposure to any heavy metals or any medical problems. Subsequently, these people were re-examined by the county health department in 2009, last spring, and once again were given a clean bill of health after extensive evaluation.

Last year I had the opportunity to go to Tennessee, and I am not sure why I was asked other than the fact that I had been involved with individuals from Pittsburgh and vicinity. I went down to Kingston and saw the massive upheaval down there that was caused by the release of a large stock of coal fly ash in a retention pond, which gave way after a very long period of heavy rain, much like the weather caused the problems in Forward Township. This ash slid largely into the waterways nearby but it did slide into the yards and homes of I think probably about five or six families whose houses were certainly adversely affected. I also had the opportunity aside from touring the area not to examine any of these individuals but to participate in an open meeting at a local school in which any community residents or interested parties could attend and probably some 150 people or some came, some of whom were residents and some others were just interested, and asked questions about the potential adverse health effects of their exposure in this setting, and I tried to reassure them that their exposure now and in the future was extremely unlikely to be detrimental to their personal health, the health of their children, their animals, et cetera.

In the course of my practice, I have had the opportunity to address the potential toxicity of heavy metals such as arsenic and a wide variety of settings. I have examined hundreds, if not thousands, of individuals whose work has required that they be in the presence of compounds like arsenic and coal and coal tar and coke oven emissions and other potentially toxic materials, and as it was pointed out earlier, all of these are natural occurring minerals. They occur in the substrata of the earth. They are released by volcanic eruptions, by forest fires in far greater amounts than are released as a result of industrial production. Arsenic——

Mr. MARKEY. If you could summarize, please, Dr. McGraw?

Dr. MCGRAW. Yes. I am sorry.

Arsenic is present in water, in high concentrations in mineral springs all over North America, and we eat it every day in our foodstuffs and we drink it in our water. That is not to say that it is not potentially toxic but so are a wide variety of other materials. Cars are dangerous too but if we ban them or extremely limit their use, it would be devastating to the economy of this country.

[The prepared statement of Dr. McGraw follows:]

Testimony of Donald J. McGraw, M.D.

House Energy and Commerce

Subcommittee on Energy and Environment

Hearing Entitled: "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal"

December 10, 2009

Mr. Chairman, Honorable Members of the Subcommittee, I am honored to have been invited to participate in this subcommittee hearing entitled, "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal."

As a physician trained and practicing for some 30 years in the area of Occupational and Environmental medicine, I have had countless occasions to address issues of both individual and public health concerns. In the context of today's hearing, I have examined as many as a half dozen individuals who were exposed to fly ash when an accidental spill occurred on January 25, 2005 in the Forward Township of Western Pennsylvania. These individuals included both adults and children and involved a large collection of ash, which slid down a hillside and covered the ground in and around several homes and at least one business on this neighborhood. While there were some complaints registered of non-specific airway irritation, I was able to identify no objective clinical findings among the individuals evaluated. These same individuals and several others were also separately examined and tested utilizing both blood and urine studies for possible heavy metal poisoning, by the Allegheny County Department of Public Health, with no resultant evidence of any abnormalities detected. On the follow-up examinations of these individuals by the Health Department in the spring of 2009, they were again found to have normal assessments. It should be noted that these individuals were exposed for a period of days to weeks, to ash, which covered the ground to a depth of one to two feet in some areas, Several of them were involved with shoveling and otherwise cleaning and removing the ash from their neighborhood.

I also had the opportunity to participate in addressing similar potential human health issues related to a fly ash release in the Emory and Tennessee Rivers and surrounding countryside near Kingston, Tennessee, which occurred on December 22, 2008. In this instance, it was a Tennessee Valley Authority (TVA) facility containing coal fly ash in a retention pond, which gave way following a long period of heavy rainfall. On this occasion, though I did not personally evaluate any individuals, I visited the site, reviewed data collected by both the TVA and the EPA, and assessed potential human health concerns regarding fly ash contamination to air, soil, and water in the vicinity of the Kingston TVA facility. I had the opportunity to speak with residents of the area and interested individuals about their specific health concerns. In that setting, among several concerns voiced were the potential for arsenic contamination of the drinking water of residents both in the area and downstream from the TVA facility. Various water samples, some of which I had the opportunity to examine, were collected in the Tennessee River near the intake of the Kingston utility water treatment intake and demonstrated no evidence of abnormally high levels of arsenic or other potentially toxic materials.

In addition, I have had the opportunity to address the potential toxicity of heavy metals such as arsenic in the course of my working practice in the setting of various industrial sites and among individuals working in facilities where arsenic and/or other potentially toxic compounds might exist as possible contaminants or intended production constituents. In my work as an occupational health physician, I have examined, tested, and counseled individuals who have been exposed to arsenic and other potentially toxic materials in the workplace over many years.

It would be perhaps constructive to appreciate a basic understanding of the nature of the material, namely, in this instance arsenic, in order to more realistically assess the potential for a human health hazard for exposure through drinking water. Arsenic is a ubiquitous element, widely distributed in nature in a number of minerals, especially as arsenides of copper, nickel, and iron or as arsenic sulfides or oxides. Arsenic is naturally present in virtually all soils, with a range of levels from 0.1-40 ppm, and an average of about 5-6 parts per million (ppm). Soils which contain arsenic as part of sulfide ore deposits can demonstrate concentrations of several hundred ppm. Arsenic is also a naturally present in all waters, including rivers, lakes, springs, and wells. The arsenic content of hot springs is especially notable, with extremely high concentrations being reported in ground waters from areas of normal thermal activity and in wells from areas high arsenic rock content, such as Oregon, Utah, Nevada, and several locations in Canada.

Arsenic is ingested daily through virtually all food stuffs at a level of usually 1 mg/kg. Meat, fish, and poultry generally have the highest levels. Fish usually contain 1-10 mg/kg, and some crustaceans and algae may contain more that 50 mg/kg. Beverage, especially bottle water and wine, contribute significant amounts of arsenic to the human diet. The toxicology of arsenic is a complex subject, for arsenic exists as trivalent (+3) arsenite, pentavalent (+5) arsenate, and also in multiple organic forms. It is thought by some investigators to be an essential trace element, necessary to human metabolism. Medicinal uses of arsenic have included historically anti-parasitical therapies, especially in the treatment of syphilis, psoriasis, and ingestion as a tonic. Arsenic may be toxic to plants, animals, and bacteria, but in a very selective fashion. The acute

toxicology of inorganic arsenic has been well known for a long time, with the trivalent species is considered to be more toxic than the pentavalent forms. With

the levels that have been mentioned in the preceding, and understanding that the permissible arsenic level in domestic water supply has been set at 0.01 mg/L, one realizes that despite regular daily exposures in both water and foodstuffs, there have been no identifiable adverse human health effects seen in the U. S. to date. There is, of course, considerable variation to exposure levels of arsenic throughout the world, and studies have been conducted in sites in Taiwan and Bangaladesh, demonstrating extremely high levels of arsenic in regularly used potable water supplies. For example, arsenic concentration in various Taiwanese Villages has ranged from very low levels to more than 600 *mcg/L* with no evidence of excess risk of significant adverse health effects in some studies even above these levels. (Brown and Chen 1995 and Guo, et.al., 1994). Even higher concentrations have been identified in various wells in Bangaladesh. There are unfortunately many common misconceptions about exposure to elements such as arsenic, which we all experience on a daily basis, and the potential for adverse human health effects. It is obviously a very important goal to protect the safety of our public drinking water in the United States and avoid the potential for risk from over-exposure to toxic contaminants, but regulatory decision-making is appropriately based on sound science and reason. The history of exposure to arsenic in the air and water in North America is one which has not identified any significant adverse human health effects. Our practical and epidemiologic experience has shown that the presence of fly ash contaminated with trace amounts of arsenic and/or other elements does not represent a significant human health hazard. While the level of possible arsenic and other heavy metal contamination might temporarily

increase in waterways such as the Tennessee River in the Kingston incident, this represents an extremely transient and clinically insignificant event. It also is well known that while arsenic may be conceivably temporarily increased in the water supply in such instances, its insolubility in water affords a natural level of protection from untoward exposure.

In summary, on the basis of my own clinical experience and review of the literature regarding the potential for human adverse health effects secondary to accidental contamination of potable water sources by fly ash and/or its constituents, it is my reasoned professional judgment that any such risks would be extremely unlikely and limited. This does not mean that every effort should not be made to properly and safely contain fly ash wherever it is stored or used in some practical application and that potential exposures be minimized. That is only good and prudent practice. Such practice should be based on sound science, measurement and practical experience, and not on presumptive, unproven and unrealistic fears.

Mr. MARKEY. Thank you, Dr. McGraw, very much.

Now we will turn to our questions from the subcommittee. Let me ask you, Dr. Fox, I just heard Dr. McGraw talking about arsenic, you know, as not a particularly dangerous substance to be ingested by human beings. Could you talk a little bit about the ingestion of arsenic or other heavy metals over a period of many years in terms of what that risk might be to human beings?

Ms. FOX. Yes. That is a distinction that is useful to make in several of the examples I think that Dr. McGraw discussed. In Forward Township, for example, and in Kingston, Tennessee, those were situations where the exposures were relatively short term and sort of the immediate nature of the spill prompted a quite rigorous cleanup. In situations as in Gambrills, Maryland, that we heard about earlier, the waste has been disposed in this former sand and gravel pit since the mid-1990s approximately, and the contamination of the groundwater there may have been going on for years and may continue for some time. So chronic exposure to arsenic and some of the other constituents is associated with a number of health problems that I already discussed.

Mr. MARKEY. Do you agree with that, Dr. McGraw?

Dr. MCGRAW. Which part?

Mr. MARKEY. The part where she is saying that continuous exposure to these constituent elements over a period of time are related to serious medical consequences.

Dr. MCGRAW. That all depends on the concentration, the dose, the area of exposure, how it is taken in. Our body has numerous capabilities for eliminating potential toxins from it. We are very well constructed to manage our health despite exposure to many natural elements, and while there are huge concentrations of materials like arsenic sadly in the well water in places like Taiwan and Bangladesh, they are many degrees of magnitude higher than any that might ever be potentially even occurring in the United States in any conceivable way.

Mr. MARKEY. So you are saying that the hundreds of thousands of people who died in Bangladesh related to ingestion of arsenic is something that we shouldn't be concerned about here as a warning to us?

Dr. MCGRAW. I am not sure of those numbers, Mr. Markey.

Mr. MARKEY. But you cited Bangladesh, so hundreds of thousands of people——

Dr. MCGRAW. Perhaps I would have to check and see what those numbers were, but——

Mr. MARKEY. The World Health Organization says that hundreds of thousands of people have died in Bangladesh. You cited Bangladesh, relating it to your World Health Organization analysis.

Dr. MCGRAW. Correct.

Mr. MARKEY. Do you dispute the World Health Organization?

Dr. MCGRAW. No, no, I don't, but——

Mr. MARKEY. So take the arsenic findings there and extrapolate them for the purposes of what lesson you want us to draw from Bangladesh in terms of exposure to arsenic, please.

Dr. MCGRAW. Those levels in those countries are hundreds and hundreds and thousands of micrograms per liter relative to our required water levels of one-hundredth of a microgram per liter.

Mr. MARKEY. But the EPA and the World Health Organization have identified arsenic as a carcinogen. Do you disagree with that finding?

Dr. MCGRAW. No, I don't, Mr. Chairman. Let me give you——

Mr. MARKEY. We are trying to find——

Dr. MCGRAW. If I may provide you with an analogy, thousands of women and possibly men are injected on a daily basis with botulinum toxin, the deadliest material known to humankind. They are injected in their faces for cosmetic purposes. One-eighteenth of a millionth of an ounce is a lethal dose for a human being and yet it goes into syringes and into people's bodies on a daily basis. There are many, many toxins that we either voluntarily or involuntarily expose ourselves to on a daily basis. Once, again, it depends on the dose, the level, and in this country, those levels will never be replicated——

Mr. MARKEY. Exactly.

Dr. MCGRAW [continuing]. Ever.

Mr. MARKEY. No, no, I don't think that is so. I think what we are learning here and we are seeing this in the testimony of the witnesses beforehand that if enough of it is placed in areas that are adjacent to populated areas that it can leach into the water system and over a sustained period of time there could be a dramatic impact on human beings as they ingest this material. You were referring to earlier about a one-time or two-time exposure. Here we are talking about something that is——

Dr. MCGRAW. With all due respect, Mr. Chairman, three cases, as tragic as they might be, do not represent epidemiology. I have looked at countless workers who have been working for decades with exposure to these and other materials and seen no evidence of any harm, and they certainly were exposed at far higher levels than the general public would ever——

Mr. MARKEY. You know, 3,000 young people are going to begin smoking today in America. One thousand of them will die from smoking-related illnesses and two will not.

Dr. MCGRAW. I am not sure I see the point.

Mr. MARKEY. But the one that is is really is our concern, so you may—and again, you are not an epidemiologist, I don't think.

Dr. MCGRAW. I have studied it extensively and I do appreciate it. I read the literature regularly.

Mr. MARKEY. I appreciate that, but you are taking personal examples and extrapolating, which is different from actually presenting an epidemiological study.

Dr. MCGRAW. I have read the epidemiologic literature.

Mr. MARKEY. Ms. Evans, can you tell us if there is just a small number of examples here or are there more people like the witnesses that we saw on the first panel that represent the population that we are concerned with?

Ms. EVANS. Absolutely. Thank you. I would say we have a country full of examples similar to the people who spoke today. There are so many unlined dump sites, whether they be unlined ponds or unlined landfills or simply holes in the ground by gravel pits and mines where we place this waste. For 30 years having unregulated disposal, it is resulted in a lot of waste sites that present dangers to the general public. The EPA has identified 71 sites so far as Ken

referenced where there has been contamination of ground and surface water in 23 States. That is a drop in the bucket, and EPA does admit that, and one reason that we can say with some certainty that it is a drop in the bucket is that so many of these dump sites are not monitored, and if you don't monitor the dump sites, you don't know what is leaving them. So I would say that in my experience in numerous communities over the last 10 years, there are certainly many, many communities that——

Mr. MARKEY. Thank you, Ms. Evans, very much. I think——

Dr. MCGRAW. If I could respond, Mr. Chairman, just briefly to Ms. Evans' comment, she identified sites but I challenge her to identify numbers of individuals or communities where it has been demonstrated objectively, medically that they have developed either life-threatening illnesses or have died as a result of exposure to coal tar ash. I challenge her because it doesn't exist. I have seen people die a thousand different ways, Mr. Chairman, but I have never seen one either die or become ill from exposure to coal ash.

Mr. MARKEY. Ms. Evans?

Ms. EVANS. I would be happy to provide the subcommittee with medical reports from people who—and this mostly occurs in litigation where they have to draw the connection between the coal ash and the disease, but we do have reports to that effect and can submit those to the committee.

Dr. MCGRAW. Anecdotal legal cases do not represent epidemiology. That is not science. That is law.

Mr. MARKEY. Well, I appreciate that, but we also have certain other kind of, we call them in the law res ipsa loquitur, which is the thing speaks for itself. I think that is what we heard from Robin Whitaker-Pierce earlier. The property cannot be sold. The entire community is frozen. We have widespread health impacts. And to a certain extent, there has been a see no evil, hear no evil aspect to this issue over the years. So we are just kind of catching up with this issue in the same way that we caught up with the tobacco issue as well, and I think that the witnesses here today provide very compelling evidence that there is a problem here, that long-term exposure to these elements is dangerous and again, the EPA is in the process of completing their recommendations, and when they do, we will have them here for the hearing and we will be able to ask them those questions.

Let me turn now and recognize the gentleman from Michigan, Mr. Upton.

Mr. UPTON. Thank you, Mr. Chairman.

Ms. Evans, Mr. Ladwig, we have checked with my Michigan utilities as they expose of this ash. I am told that they use landfills that are clay lined unlike I guess what now Maryland is now pursued in terms of my question for Ms. Queen on the last panel. They have monitoring. It requires monitoring of any leakage as well. It is regulated as an industrial waste in the State of Michigan. And my question is, how many States have a similar type of procedure for the disposal of waste? Do you know?

Ms. EVANS. The majority of States do not require what you just——

Mr. UPTON. So Michigan is more advanced than most States. Is that what you are saying?

Ms. EVANS. I would say if you are talking about States that require clay liners for all waste disposal units would be in the minority but I would also say that the——

Mr. UPTON. And monitoring as well.

Ms. EVANS. And monitoring. What you have——

Mr. UPTON. I want to make sure I don't run out of time.

Mr. Ladwig, would you concur with that?

Mr. LADWIG. Not exactly. I don't know the number of States that currently have liner requirements. I do know that as I said in my testimony, essentially all new facilities built between 1994 and 2004 when DOE and EPA did their study all employed liners. So either their States are requiring them or they are voluntarily installing liners.

With respect to groundwater monitoring, almost all landfills have groundwater monitoring, as far back as the 1990s. Ponds have had a little bit more checkered history with respect to monitoring and it was more like half at that time had monitoring in the 1990s when we did a study on this. I am not sure what the number is now.

Mr. UPTON. Now, in Michigan, a good share of the waste is actually used for highway cement, particleboard, that type of thing. In fact, I am aware of a letter that the Michigan Department of Transportation sent to the Federal Highway Administration saying that this is a good use of the substance actually. It performs better with that. A question I think in a lot of people's view if we could recycle this somehow in terms of a meaningful way. I am told that again in Europe, perhaps as much as 80 to 90 percent of the ash is used for this type of purpose. In the United States, we are closer to about 40 percent or about half. The question is, if we classify it as a hazardous waste, as some perhaps have suggested, what would that do to the efforts to then recycle this versus putting it all into a landfill or that type of thing?

Ms. EVANS. Before I respond to the recycling question, let me just quickly go back to Michigan's landfill regulations because I think it is also in Ken's statement regarding the 56 facilities that were built between 1994 and 2004 because the important point has to be made that all liners are not equal, and the requirement that landfills and surface impoundments have clay liners was shown by EPA to be insufficient. So the standard that landfills and surface impoundments need to have composite liners is something that EPA stated in its risk assessment and that landfills and surface impoundments that are not so lined present an unacceptable risk of migration.

Mr. UPTON. You are saying they need to have a composite?

Ms. EVANS. A composite liner, and the——

Mr. UPTON. And how many States have that today?

Ms. EVANS. Very few have a requirement that all landfills and all——

Mr. UPTON. So almost none?

Ms. EVANS. I mean, 50 percent of the States in the United States don't require ponds to have any liners.

Mr. UPTON. Moving to my next question, if it was classified as a hazardous waste, would in fact we be able to recycle much of the material there like we do today? Yes or no.

Ms. EVANS. Yes. EPA has the flexibility to deal with recycled waste as solid waste. It can parse out, and under the state it can regulate waste that is disposed as hazardous, perhaps put——

Mr. UPTON. Would that not add tremendously to the cost and therefore diminish the amount that is recycled today?

Ms. EVANS. It shouldn't. If it is going to cost more to recycle the waste—I mean if it is going to cost more to dispose of the waste, there is going to be an incentive to recycle.

Mr. UPTON. Mr. Ladwig, do you have a guess as to what the cost would be to the industry, not only to go to a composite-type liner versus the clay liners that are used today, with the monitoring that they have which I think might have resolved Ms. Queen's problem because in her testimony, she indicated that it went to an unlined site, but how would that impact recycling as well?

Mr. LADWIG. Well, I think you have a couple questions embedded there. The costs of moving to hazardous waste requirements of these facilities would increase the cost of disposal by a factor of 10, would be up into the billions of dollars for the utility industry. Thirteen billion dollars I think was one estimate that was provided. That is a significant cost, and we have done an analysis that the impact of that cost as well as the cost of phasing out wet management, what those costs would actually do to utilities, how many units it would——

Mr. UPTON. It would cost billions of dollars more. That would have to be passed along to the ratepayers, right?

Mr. LADWIG. I would assume so. You know, I am not familiar with utility finances.

Mr. UPTON. My time is expired, so just tell me how would impact recycling.

Mr. LADWIG. From everything we have heard and I believe USWAG, the Utility Solid Waste Activities Group, has collected a number of letters. There are somewhere on the order of 150 to 200 letters from utilities, marketing companies and users all stating very clearly that a hazardous waste designation would have a chilling effect on any use just simply because using a material when it is deemed hazardous if it goes in one direction and usable when it goes in another direction is not a workable situation.

Mr. UPTON. Thank you.

Mr. DOYLE [presiding]. The Chair will recognize himself.

Dr. McGraw, my grandfather got off the boat from Ireland in 1900 and landed in Pittsburgh. He worked 41 years at Kerry Furnace in Rankin. My father followed him in the steel industry and worked 31 years at Eggert Thompson in Braddock. I worked there two summers and realized that I didn't want to be a steelworker. I appreciate the steel industry and coal. All my constituents get their electricity from coal in Pittsburgh, and I lived my entire 56 years there. We Pittsburghers didn't much appreciate Mr. Carnegie dumping all his waste in the Monongahela River and the Allegheny River and at one point those rivers got very dark and nobody fished in those rivers, and regulations finally were put in place that made sure that people just didn't indiscriminately dump things into the rivers or up into the air. John Surma is a dear friend of mine, the current CEO of U.S. Steel, and he will tell you that he thinks that a clean environment and a steel industry can coexist. This com-

mittee is not talking about putting the coal industry or the steel industry out of business but what we are saying, that in this country there are many States that have no regulations on this or very lax regulations. Pennsylvania has been overseeing beneficial reuse of coal ash since 1985. We have standards in place since 1992. States like Wisconsin have good standards. We believe that these industries can coexist with good regulation and partnership. So when you said in your testimony that you were much more concerned about the job loss in the coal industry than you were about the potential health hazards, I would tell you that we need to do both. We can protect jobs and protect people's lives. That is what we are trying to research here on the committee.

I am familiar with Forward Township. I used to represent it for 8 years before redistricting. I am curious, how did you come to get involved in the Forward Township case? You mentioned you were involved in examining people there.

Dr. MCGRAW. I believe that they were referred to me through the graduate school of public health at the University of Pittsburgh where I have been a faculty member for a long time because they knew me as someone who would see anyone for virtually any kind of problem, and I believe the chairman of the department referred them all to me when they called in to his office. You know, I don't disagree with anything you just said, Mr. Doyle. I respect the need to have a clean environment and certainly want nothing less myself, and I think the commonwealth should be particularly proud in having already done a good job. But to classify a relatively benign material as a hazardous waste would I think lead to a cascade of events that would cost jobs and enormous resources to the power industry, the coal industry, the steel industry and all the way down the line.

Mr. DOYLE. So it is your testimony then that you believe coal ash to be completely benign and not a health risk to anyone?

Dr. MCGRAW. That is correct.

Mr. DOYLE. We could just eat this stuff, and——

Dr. MCGRAW. If you put some on my cereal, it might not be very tasty but you would have to put it on a long, long time before we would get to the point where those poor people in other countries are consuming it and would be at risk. So in this country, the likelihood of that happening is like being struck by lightning.

Mr. DOYLE. I want to be certain about your testimony. You talked about the arsenic levels in Bangladesh. You are certainly not subscribing to the fact that we should adopt Bangladesh water standards here in the United States. I mean, you are saying it is OK to drink that much? If that amount of arsenic was in the U.S. water, that wouldn't concern you?

Dr. MCGRAW. Of course not. All I am doing is contrasting and trying to show that with any material, however apparently benign, whether it is salt, sugar, arsenic, mercury or anything else, there is a does and there is a length of time of exposure that is required to cause a potential problem. Presumably in these hallowed halls, we probably already met government requirements of introducing the appropriate kind of new green fluorescent bulbs, all of which contain a particularly lethal form of metallic mercury and for

which there is no hazardous waste reclamation plant in place to my knowledge.

Mr. DOYLE. Right. I understand. My time is starting to run out and I have a couple more.

Dr. Fox, you just heard what Dr. McGraw said. He basically says we could eat this stuff and it might not taste so good but it is not going to hurt us. What is your reaction to that?

Ms. FOX. Well, I would like to bring the subcommittee's attention to some recent findings from some of my colleagues at Hopkins and others that address the issue of sort of typical U.S. exposures. There have been research findings in the last 2 or 3 years of relating arsenic exposure to cancer and also diabetes. So there is a growing body of literature that reflects the exposure conditions in the United States and associates arsenic exposure with some health effects of concern.

Mr. DOYLE. Thank you. I see my time is expired. Who is next up on the list here? Ed.

Mr. WHITFIELD. Thank you, Mr. Chairman, and thank you all for being with us this morning.

Mr. Ladwig, you state that since 1990 that EPRI has used the toxicity characteristic leaching procedure protocol which is used by EPA to test for the hazardous characteristics of eight trace metals that EPA would consider critical to a hazardous-waste designation: arsenic, selenium, barium, cadmium, silver, chromium, lead and mercury, and that EPRI data from all the analysis and tests that they have conducted shows no coal ash samples exceeded any of the TCLP limits. Is that correct?

Mr. LADWIG. That is correct.

Mr. WHITFIELD. And we know that EPA has looked at this issue repeatedly from three or four dates. I don't have the dates with me right now of the most recent one but it was 2000 and even they decided not to classify this as a hazardous material. In your tests, were there any types of coal or coal mined from certain regions of the country or world that is burned here in the United States that you did not test?

Mr. LADWIG. I couldn't vouch that we have tested every type of ash from every coal that is burned, you know, from anywhere in the world but we have tested a broad range. We have a very representative database.

Mr. WHITFIELD. Well, you know, I think the key here today, as our chairman stated, that we need a balanced approach here because we have to use coal to meet our electrical demands and remain competitive in the world and to continue to create jobs and not lose jobs. And the thing that bothers me about Ms. Evans and the group that she represents, in her testimony she says we need a federal standard to police this disposal of ash, which I agree with, we do need a federal standard. And then she goes on and says even if we get one, it is not enough. So we need a federal standard but even if we get one, that is not enough. So I think that is the problem that we have, and I know we are getting ready to vote, Mr. Chairman, so I will yield back the balance of my time.

Mr. DOYLE. Thank you very much, Mr. Whitfield.

Ms. EVANS. May I just take——

Mr. DOYLE. We have votes coming up and we are going to try to get these witnesses in so hopefully you will get a chance to elaborate, and when we come back we will try to give you some more time.

Mr. Matheson.

Mr. MATHESON. Thanks, Mr. Chairman.

I have a question for Ms. Evans. In your testimony, you highlight that more stringent regulation of coal ash has raised State recycling rates significantly. I think you were referring probably to Wisconsin.

Ms. EVANS. Yes, I am.

Mr. MATHESON. Does more stringent regulation include a hazardous waste subtitle C designation?

Ms. EVANS. Well, there is no subtitle C designation currently. It means more stringent—Wisconsin has more stringent regulations than its neighbors and its recycling rate is about double of the neighboring States.

Mr. MATHESON. In your testimony, you recommend that EPA must designate coal combustion waste as hazardous waste under subtitle C of RCRA. Is that correct?

Ms. EVANS. That's correct.

Mr. MATHESON. What would be the impact of the recycling and reuse efforts in Wisconsin if we end up—if there is federal action to regulate coal ash as hazardous waste under subtitle C of RCRA?

Ms. EVANS. I don't think it would change. I think that there might even be tightening that would have to be done on the Wisconsin regulations so there might even be more incentive. If costs go up to dispose of waste in mine landfills there would be more incentive to find safe reuse.

Mr. MATHESON. The State of Wisconsin actually has a different opinion. They have sent a letter from the Department of Natural Resources that says, and I will quote, "If coal ash were to be regulated under RCRA subtitle C, the options for beneficial using or reusing the ash would be significantly impacted and severely limited. So we have to keep looking at this, and the balanced option I think that Mr. Whitfield was talking about before about what we are trying to do, people like the recycling idea but if you go to a hazardous-waste designation, you know, there are other consequences to this, and I just want to make sure that was on the record.

Ms. EVANS. But I think you are looking at this very black and white. There are a lot of hazardous wastes that are successfully recycled into products.

Mr. MATHESON. I am looking at it for coal ash waste, not for all products.

Ms. EVANS. Right, but you have to realize that EPA has flexibility going into this regulatory process and really does want to——

Mr. MATHESON. I just want to get on the record that there is a potential conflict there, and you suggested that we ought to—you know, you log Wisconsin and they are saying don't do what you are suggesting we do. I just want that on the record.

Mr. Ladwig, have you analyzed coal ash in relationship to EPA's test to determine if a waste is hazardous under RCRA?

Mr. LADWIG. Yes, well, we have done the TCLP test. We just talked about that.

Mr. MATHESON. And what did you find?

Mr. LADWIG. We find it always passes the TCLP test. The EPA finds that it almost always passes.

Mr. MATHESON. How does coal ash compare to another large volume solid waste stream like municipal solid waste?

Mr. LADWIG. It is roughly on par with that. The risks posed by any of these materials that are non-hazardous are roughly in the same ballpark.

Mr. MATHESON. Mr. Ladwig, can you describe just quickly benefits to the environment from recycling the coal ash?

Mr. LADWIG. Yes, I listed some of those in my presentation but there are benefits in energy savings, water savings, greenhouse gas emissions and land use. Those are probably what I would call the four primary benefits from an environmental perspective and there is obviously cost benefits.

Mr. MATHESON. Dr. McGraw, in your testimony you highlight the need to properly and safely contain fly ash wherever it is stored or used in some practical application. Do you believe that a hazardous waste designation is necessary to properly and safely contain coal ash?

Dr. MCGRAW. I do not.

Mr. MATHESON. I know that my colleague from Illinois is anxious to ask, so I am going to do one more.

I think that this question about classifying coal ash as hazardous waste and the potential to eliminate or at least greatly reduce reuse opportunities is an issue that we need to talk about as a committee. I think that that conflict or at least that potential conflict is something that we need to flesh out more. I think that is why it is important we are having this hearing. Mr. Chairman, I will yield back.

Mr. DOYLE. Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. First, I have a unanimous consent for opening statements that all members may be included into the record.

Mr. DOYLE. Without objection, so ordered.

Mr. SHIMKUS. And also, these are pre-cleared. Unanimous consent for letters have been pre-cleared with your staff from the ECOS resolution on hazardous waste, the April 1, 2009, letter to the EPA from ASTSWMO, September 19, 2009, letter to the EPA from the Unions for Jobs and the Environment, and a November 17, 2009, letter to EPA from the U.S. Chamber of Commerce.

[The information appears at the conclusion of the hearing.]

Mr. DOYLE. Without objection, so ordered.

Mr. SHIMKUS. Thank you, Mr. Chairman.

For our panel, do you reject the assertion that the Illinois EPA is the closest to the citizens of Illinois and has a vested interest in protecting the health of the citizens of Illinois? Dr. McGraw, yes or no?

Dr. MCGRAW. The State?

Mr. SHIMKUS. The State EPA.

Dr. MCGRAW. The State EPA I think would have the most direct relationship or familiarity with the issue.

Mr. SHIMKUS. Dr. Fox, do you reject the fact that the Illinois EPA's mission is to protect the health and safety of the citizens of the State of Illinois?

Ms. FOX. No.

Mr. SHIMKUS. Ms. Evans, state of Illinois EPA. I am just talking about the State of Illinois.

Ms. EVANS. Yes, and as a former federal EPA employee, I would say that there is often a conflict between the State EPA and——

Mr. SHIMKUS. My question is, do you reject the premise that the State of Illinois EPA does not have the interests of the citizens of the State in health and safety issues?

Ms. EVANS. They might have the interests but not always the political power to regulate the——

Mr. SHIMKUS. So you are saying that they don't have the interests of the citizens of the State of Illinois?

Ms. EVANS. They have the interest. They might have the political will to properly——

Mr. SHIMKUS. So you reject this letter from the Illinois EPA that says that they can best regulate this?

Ms. EVANS. Yes.

Mr. SHIMKUS. OK. Thank you.

Mr. Ladwig?

Mr. LADWIG. No, I don't reject that.

Mr. SHIMKUS. Thank you very much.

Dr. McGraw, part of our job is to make the complex simple as possible so that we can help educate our constituents and educate ourselves. Epidemiologic, define.

Dr. MCGRAW. That is the study of populations and in contrasting groups of individuals within a population, a designated population who have a specific injury or illness and comparing them with those individuals who don't, and trying to determine as a result what might have led to that specific problem whether there was a——

Mr. SHIMKUS. So you are familiar with the scientific method in essence?

Dr. MCGRAW. Yes, I studied epidemiology as part of my training.

Mr. SHIMKUS. And the scientific method creates—and we have been dealing with this with the whole Climate Gate debate—is that there are facts. There are basic facts that can be gathered and reviewed to make an analysis on what is going on, and that is what you were testifying to and that that is what your testimony says.

Dr. MCGRAW. Facts versus presumption, which is what I am saying.

Mr. SHIMKUS. And that is why I am trying to make the complex simple because we always talk about arsenic. We have talked about arsenic in this committee since I have been a member. An Olympic-sized swimming pool filled with arsenic would be hazardous to human health. Wouldn't you agree, Dr. McGraw?

Dr. MCGRAW. Filled, yes, it would——

Mr. SHIMKUS. Filled completely.

Dr. MCGRAW. It would sink to the bottom and you probably wouldn't get much if you were swimming in it because——

Mr. SHIMKUS. Now, let me ask this——

Dr. MCGRAW [continuing]. It is not soluble in water.

Mr. SHIMKUS. Let me ask, A, Olympic-size swimming pool filled with water with one eye drop of arsenic, would that be hazardous to human health?

Dr. MCGRAW. Of course not.

Mr. SHIMKUS. So this whole debate is this. Using real science to determine the health effects, and at what cost. It would probably be cheaper to drain and Olympic-size swimming pool filled with arsenic than it would be to take out the one eye dropper of arsenic, and the issue is, at what cost based upon what science. We are having this same debate on the Climate Gate issue. When the scientists can't give us the facts, then you go on emotion, and when emotions run rampant it costs the jobs that you are referring to that I refer to in this whole issue. So I applaud my colleague, Mr. Matheson, for trying to get to the point of we better be careful not solely to run on emotion because there is a cost-benefit analysis of all this stuff, and we all understand that, so let us get to the facts. And I think why your testimony is so compelling is because you are doing it based on your great credentials, epidemiological background and on the facts of study of the health of individuals, and I want to thank you for your time and I yield back my time, Mr. Chairman.

Mr. MARKEY. The gentleman's time has expired. We apologize to you for the floor schedule. We have 45 minutes of roll calls till our votes begin out on the House Floor, and that is unfortunate.

So this is a very important hearing. It is in anticipation of the Environmental Protection Agency promulgating new rules that will deal with public health-related issues here but of course the question of jobs is also part of this discussion. We have heard here today that there are materials that are hazardous. They have poisoned people. They have destroyed homes and have contaminated the environment. No one, as Mr. Doyle said, is talking about shutting down the coal industry. What we are talking about is prohibiting unsafe disposal practices from being allowed to continue so that we can ensure that there continues to be safe commercial use of all of the materials that are in question. The EPA can use its statutory authority to craft a rule that both protects public health and allows for safe practices to continue without causing jobs to be lost. We can do both. Mr. Doyle has made that point. We did both when we decided that we were going to regulate clean water, safe food. We don't want to prohibit but at the same time we want to ensure we put in those protections for public health.

So we thank each of the witnesses. We want to continue to work with you. We apologize to you, Ms. Evans, and to others. I know you have other points which we would like to include in the record in its written form if you would like to provide it to the committee. This hearing is adjourned. Thank you.

[Whereupon, at 12:00 p.m., the Subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

Congressman Gene Green
Subcommittee on Energy and Environment
"Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal"
December 10, 2009

Mr. Chairman, thank you for holding today's hearing on the "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal."

Coal Combustion Waste, or CCW, is produced by utilities at each step of the coal combustion process, generating hundreds of millions of tons of inorganic residue each year -- including fly ash, bottom ash, or flue gas desulfurization material.

While representing the second largest waste stream in the U.S., most Americans did not become familiar with CCW until the tragic events which occurred one year ago at the Tennessee Valley Authority's Kingston Fossil Plant in Tennessee.

Over one billion gallons of coal fly ash slurry was released onto the community, damaging homes and property while raising questions as to any potential lingering health impacts from the spill.

These concerns will only continue as the amount of future CCW waste increases with more stringent emission standards for power plants or when more contaminants are captured by emission control devices.

The Solid Waste Disposal Act Amendments of 1980 excluded CCW from regulation under Subtitle C of the Resource Conservation and Recovery Act (RCRA) until further studies and reports were conducted by EPA to determine the potential danger of CCW to human health.

Since the passage of this Beville Amendment, EPA has conducted several studies which generally found that CCW did not warrant regulation under Subtitle C of RCRA and that states had strengthened regulation of landfill liners and groundwater monitoring for new disposal units.

EPA also found that additional regulations were not warranted for CCW used beneficially, stating that the beneficial uses of CCW "conserve natural resources, reduce disposal costs and reduce the total amount of wastes destined for disposal."

Instead of disposal in landfills, approximately 38% of CCW was blended in cement, road-base materials, roofing tiles or other uses in 2007.

EPA recognizes that national regulations for CCW are needed as individual states manage CCW in accordance with their own voluntary solid waste management program requirements.

Congress and the EPA must be vigilant to protect human health from the impacts of CCW with appropriate, science-based standards that permit beneficial uses while reflecting on the unique expertise of waste management by the individual states.

I look forward to testimony by today's witnesses to learn how we can protect the public health and environment while conserving resources through CCW beneficial use.

Thank you Mr. Chairman. I yield back the balance of my time.

Opening Statement of the Honorable Joe Barton
Ranking Member, House Committee on Energy and Commerce
Hearing by the Subcommittee on Energy and Environment on "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal"
December 10, 2009

Thank you, Mr. Chairman, for recognizing me and for calling this hearing today on an issue that has been getting a lot of attention in the national media over the last year. As usual with very controversial matters, our difficult job is to hear individual accounts, but also to assemble a comprehensive and balanced picture of what is needed, and then use that picture to shape national policy.

Protecting public health through ensuring clean drinking water is serious business. Both federal and state regulators must do their jobs right in order to ensure that protections are adequate and that regulated entities comply with the necessary requirements.

We must have protective standards, but we must not have simplistic solutions. Let me put some perspective on why I think that applies in this case.

This hearing is focused on whether placing coal combustion waste in a solid waste landfill is best for protecting public health. According to statistics from 2007, coal combustion waste represents one of the largest single waste streams in the United States, second only to household garbage. If this waste is designated as hazardous, however, it will be used *less* in concrete, wall board, or green products, and more of this waste product – not less – will be destined for landfills across America.

Indeed, under the existing regime, fly ash can be used in cement, where it displaces 55 gallons of the oil otherwise needed to produce one ton of cement. It also requires less water, an important issue for the Western United States. Boiler slag usage eliminates potential risks from the lung disease, silicosis. And flue gas materials displace the need to mine gypsum, a main problem with the Chinese and U.S. wallboard that reportedly has made people ill.

A "hazardous" designation would eliminate these beneficial uses. We must also remember that as plant emission standards become more stringent, we will capture more contaminants, and both the amount of waste generated and the toxins in that waste can be expected to increase.

Some people will want to solve the problem by surreptitiously turning off vast amounts of electric power in the name of environmental protection, but I think we need to be more judicious and intelligent than that. I hope we can drill down on a couple of very relevant facts concerning coal combustion waste and its impacts. Noteworthy is that the Congressional Research Service reports that the presence of hazardous constituents in coal combustion waste does not, by itself, mean that contamination of the surrounding air, ground, groundwater, or surface water will occur.

And while we know from EPA that roughly 46 million people draw drinking water from thousands upon thousands of private wells, I understand that the EPA has reported that only 43 are suspected of coal-waste contamination and just 24 have any.

I want to understand the stories that we'll hear from the first panel to see if they are emblematic of something more widespread. I am also quite interested in the testimony of Dr. McGraw on the second panel – who has examined persons exposed to fly ash and boiler slag in high profile cases in Pennsylvania and Tennessee – and hope to better understand the clinical reality, as opposed to the theory of the effects of exposure.

We do not need to be coy about the intended audience for this hearing. The EPA, which for three decades has resisted calls to regulate coal combustion leftovers as hazardous waste, is now reviewing its existing regulations on this matter and hopes to make an announcement this month. Some here wish to send EPA a pointed message telling them what to decide.

I recognize this is a serious issue for those who rely on wells for their drinking water and who need it to be safe. It is also a very serious issue for Americans who rely on the reliable power provided by coal to heat their homes, cook their food and make life normal, comfortable and affordable. That's why, like state officials representing environmental departments across America, I wonder if what is being considered here today is a very wise solution.

I thank the witnesses for the time and effort they took to be with us here today, and I sincerely look forward to hearing their testimony and getting the facts. I yield back the balance of my time.

December 12, 2009
Opening Statement
Raking Member Fred Upton
Subcommittee on Energy and Environment
Hearing on Coal Combustion Waste Disposal and Its Effects on Drinking Water and Human Health

Our hearing today is a timely one, with the EPA poised to propose regulations to address disposal of Coal Combustion Waste (CCW) by the end of this year. Though, I'm a little surprised that EPA wasn't invited to testify today. Nor was former EPA chief and current Obama Administration climate/environment Czar Carol Browner. Ms. Browner would surely have offered an insightful perspective on this subject, since she was heading the EPA when CCW was last examined and essentially the Agency decided AGAINST classifying CCW as a hazardous substance. She had good reason not to make that classification. It was the right decision then and it would be wrong to reverse that decision now.

We all want clean water -- there is no argument there -- and we want laws that will protect human and environmental health. For three decades, EPA has resisted specifically changing this dynamic and subjecting CCW to federal hazardous waste management regulations.
But this does not mean that nothing is being done and government is not responsible. CCW has been regulated in accordance with varying requirements and programs established by the states. The States, who are also charged to uphold and enforce many other environmental laws, argue they are up to the task – and strengthening their own programs if needed. I agree.

An unwarranted hazardous designation will eliminate the environmental benefits of reusing CCW, create serious economic and environmental consequences -- not the least of which is forcing new siting needs and greater disposal in landfills. In 2007, over 40% of

the CCW generated in the United States was recycled to supplement or help create other products. CCW, is widely used in concrete, shingles, asphalt, wall boards and bricks. The Michigan Department of Transportation sent a letter to the Federal Highway Administration noting that the Michigan DOT relies on fly ash to enhance the performance and durability of concrete and relayed their concerns about their ability to beneficially reuse this material in construction -- if it is regulated. I would note that according to the Congressional Research Service our friends in Europe use the vast majority of their coal ash for beneficial reuses, not mandating that it be sent to hazardous waste landfills or incinerators.

Recycling CCW falls right in line with our new "green" era of responsibility. Both the Green Building Initiative (GBI) and U.S. Green Building Council (USGBC) encourage using fly ash in concrete or products that contain recycled materials in "green buildings." The annual benefits that would be lost if CCW is designated a hazardous waste are significant. Energy loss -- 159 trillion Btu, the equivalent of annual energy use for 1.7 million households, or 47% of annual wind power generation in the U.S. Carbon emissions -- the CO2 equivalent of 11 million tons, which is like removing 1.9 million cars from roadways. Ironically, it seems that designating CCW as "hazardous" is worse for the environment than following the Clinton Administration's lead and keeping CCW's current status.

Coal-fired power plants play a very important role in our economy providing for almost half of our electricity generation. Electricity generated from coal is both affordable and reliable. Inexpensive base load power drives our economy, and powers the homes of millions of working families in middle America. Without it, our already struggling manufactures can't compete in the global economy and would be forced to either shut down or move jobs overseas. While it is imperative that coal waste be properly handled – and I want to underscore that point, it would be a mistake to add needless regulations that

would pointlessly increase the cost of electricity and eliminate the many positive uses for CCW.

The increased costs for Michigan businesses due to a new EPA classification, would be significant. Many businesses will file Chapter 11 since they could not afford to deal with the cost of training and handling hazardous wastes. Wallboard plants that were built nearby power plants to recycle the gypsum from scrubber operations -- will close down since no one will want to take the risk. If people think they can solve the Chinese wallboard situation by killing a domestic coal ash alternative, I know a bunch of Chinese workers who are only to happy to have those jobs. When is enough enough? Our state's unemployment rate hovers just below 15%, the Nation's at 10%, and yet here we are today debating an EPA action that will eliminate more jobs at a time when we can least afford it.

I see a reoccurring theme – a war on coal, and a war on families in the heartland. The EPA has proposed changing SO2 standards; this has already led to the announcement of the closure of 11 coal generating units, with more sure to come. The EPA has been delaying mining permits for "extended review." The Department of the Interior is reviewing state-issued mining permits. Just this week, Consol Energy announced 500 layoffs due to denial of a Clean Water permit for a West Virginia mine. This is only the beginning of the job losses we will see from this ideological vendetta. Cap-and-trade legislation will be ruinous for the domestic mining industry, costing jobs and raising electricity prices. And, now, we're having yet another hearing on efforts to make coal -- our leading source of electricity -- uneconomic. This is bad news for our economy. Continuing with anti-coal policies won't help the environment, but it will keep our unemployment numbers in double digits.

In conclusion, I would like to express my sympathies to the members of the first panel and their families for any hardships they may have faced. I While I ultimately don't think

reclassifying coal combustion waste will prevent accidents in the future or erase bad practices from the past, I hope our hearing will give us all a better appreciation of the scope of impacts of this issue.

I yield back.

Opening Statement for Energy and Environment Subcommittee Hearing:

Coal Combustion Waste Disposal and Its Effects on Drinking Water and Human Health

December 10, 2009

Mr. Chairman, thank you for convening this hearing today on coal combustion waste disposal and its effects on drinking water and human health.

Like all of us, I want to ensure that harmful substances are kept from infiltrating drinking water and causing health problems.

As many of you know, coal is the most abundant energy resource in the United States and is particularly plentiful in my home state of Pennsylvania. It plays a crucial role in Pennsylvania's economy.

However, I fear the future of coal is under attack. Along with the cap and trade legislation that passed earlier this year, an EPA decision to classify coal combustion waste as a hazardous waste will be devastating for the industry.

This is why I joined over 70 of my colleagues earlier this year in signing a bipartisan letter, which stated we believe that federal regulation of CCW pursuant to the Resource Conservation and Recovery Act's non-hazardous waste authority is the most appropriate option.

We believe this for several reasons—first of all, we understand that approximately 20 states have taken the position that the best management option for regulating CCW is to classify it as non-hazardous.

Regulating CCW as hazardous would be environmentally counter-productive because it would end the beneficial uses of CCW.

In addition, the EPA, on four separate occasions, has stated that CCW does not warrant hazardous waste regulation.

In reaching this decision, the EPA agreed with states that "the regulatory infrastructure is generally in place at the state level to ensure that adequate management of these wastes" and that regulating CCW as hazardous would "adversely impact beneficial use."

I think we all agree that we want a balanced approach that ensures the cost-effective management of CCW while also protecting human health and the environment.

I look forward to hearing our witnesses' thoughts today.

I yield back.

COMMITTEES
VICE CHAIRMAN—AGRICULTURE
Chairman—Conservation, Credit, Energy, and Research
Livestock, Dairy, and Poultry

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CONGRESS OF THE UNITED STATES
HOUSE OF REPRESENTATIVES
June 18, 2009

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

Dear Administrator Jackson:

We understand that EPA is evaluating its regulatory options for the management of coal combustion byproducts (CCBs) and plans to propose federal management standards for CCBs by the end of the year. This issue involves an important component of the nation's overall energy policy as EPA's decision could affect electricity costs from coal-fired plants, the continued viability of CCB beneficial use practices (which plays a significant role in the reduction of greenhouse gases), and the ability of certain power plants to remain in service. It is important therefore that the final rule reflect a balanced approach that ensures the cost-effective management of CCBs that is protective of human health and the environment, while also continuing to promote and encourage CCB beneficial use. As explained below, we believe that the federal regulation of CCBs pursuant to RCRA's Subtitle D non-hazardous waste authority is the most appropriate option for meeting these important goals.

As part of its evaluation of this issue, EPA has wisely sought input from the States regarding their preferences with respect to the three regulatory options under consideration: (1) federal regulation of CCBs as non-hazardous solid waste under RCRA Subtitle D, (2) regulation as hazardous wastes under RCRA Subtitle C, and (3) a hybrid approach where CCBs would be regulated as hazardous wastes with an exception from hazardous waste regulation for CCBs that are managed in conformance with specified standards.

We understand that, thus far, approximately 20 states, in addition to ASTSWMO, have responded to EPA's request for input on this issue and that *every* State has taken the position that the best management option for regulating CCBs is pursuant to RCRA Subtitle D. The States effectively argue that they have the regulatory infrastructure in place to ensure the safe management of CCBs under a Subtitle D program and, equally important, make clear that regulating CCBs as hazardous waste would be environmentally counter-productive because it would effectively end the beneficial use of CCBs. For the same reasons, the Environmental Council of States (ECOS) has issued a declaration expressly arguing against the regulation of CCBs as hazardous waste under RCRA.

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We respectfully suggest that the unanimous position of informed State agencies and associations cannot be ignored as EPA evaluates its regulatory options for CCBs. Among other things, the Bevill Amendment to RCRA directs that, as part of its decision-making process for CCBs, EPA will consult with the States "with a view towards avoiding duplication of effort." RCRA 8002(n). The States have made clear that regulating CCBs under RCRA Subtitle C would result in regulatory overkill and effectively end CCB beneficial uses.

The States' position is not surprising since it reflects EPA's own well-reasoned conclusions on four separate occasions that CCBs do not warrant hazardous waste regulation. EPA has issued two formal reports to Congress, in 1988 and 1999, concluding that CCBs do not warrant hazardous regulation. Most recently in 2000, EPA again determined that the better approach for regulating CCBs is "to develop national [non-hazardous waste] regulations under subtitle D rather than [hazardous waste regulations under] subtitle C. 65 Fed. Reg. 32214, 32221 (May 22, 2000). In reaching this decision, EPA agreed with the States that "the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes" and that regulating CCBs as hazardous "would adversely impact [CCB] beneficial use." *Id.* at 32217, 32232.

As we know you appreciate, the impact on CCB beneficial use is another statutory consideration that EPA must consider in evaluating its regulatory options for CCBs. *See* RCRA §8002(n)(8); 65 Fed. Reg. at 32232. Given that both EPA and the States have recognized that regulating CCBs as hazardous waste would have an adverse impact on CCB beneficial use, we find it difficult to imagine a legitimate basis for EPA pursuing the hazardous waste regulatory option for CCBs, even the so-called hybrid approach. As EPA correctly reasoned in selecting the Subtitle D approach in its 2000 regulatory determination, it did not want "to place any unnecessary barriers on the beneficial uses of [CCBs], because they conserve natural resources, reduce disposal costs and reduce the total amount of wastes destined for disposal." *Id.* at 32232. As stated earlier, the beneficial use of CCBs will also play a significant role in the country's Climate Change policies.

In addition to promoting increased CCB beneficial use, a Subtitle D approach will be protective of human health and the environment, as EPA has already concluded that State programs are in place to effectively regulate CCBs. *Id.* at 32217. A 2006 EPA/DOE report reinforces this conclusion by confirming the recent development of even more robust state controls for CCBs.

In view of the above, we respectfully urge EPA to work closely with the States in developing a performance-based federal program for CCBs under RCRA's Subtitle D non-hazardous waste authority. Such an approach would meet the Bevill Amendment's goals of ensuring the safe management of CCBs while continuing to promote and expand their beneficial use.

Thank you for your consideration.

Sincerely,

Tim Holden

Charles A. Wilson

Tim Ryan

Jean Schmidt

Frank D. Lucas

Charles W. Dent

Mac Thornberry

Walter B. Jones

Robert E. Latta

Zachary T. Space

Cynthia M. Lummis

Lynn Jenkins

Jim Gerlach

Bill Shuster

Sue Wilkins Myrick

Ed Whitfield

Harold Rogers

Jerry Moran

Jim Jordan

John Fleming

Marion Berry

Brad Ellsworth

Steven C. LaTourette

Steve Driehaus

Mike Ross

Dan Boren

Ralph M. Hall

Louie Gohmert

Joseph R. Pitts

Patrick T. McHenry

Travis W. Childers

Earl Pomeroy

John Kline

John P. Murtha

Jason Altmire

Todd Tiahrt

Michael F. Doyle

Tim Murphy

Mark E. Souder

Erik Paulsen

Shelley Moore Capito

John Shimkus

Bob Goodlatte

Charles W. Boustany, Jr.

Steve Buyer

Henry E. Brown, Jr.

John T. Salazar

James F. Sensenbrenner, Jr.

Baron P. Hill

J. Gresham Barrett

Michele Bachmann

Denny Rehberg

Thomas E. Petri

Howard Coble

Dennis Moore

Vic Snyder

Peter J. Visclosky

Charlie Melancon

Roy Blunt

W. Todd Akin

Henry Cuellar

Christopher P. Carney

Roscoe G. Bartlett

Ron Kind

Glenn Thompson

Joe Wilson

Stephanie Herseth Sandlin

André Carson

Parker Griffith

Rick Boucher

Steve Austria

Bill Cassidy

Tammy Baldwin

Gene Green

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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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DOUGLAS P. SCOTT, DIRECTOR

217/524-3300

July 17, 2009

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

Re: Proposed Regulations for Coal Combustion Waste

Dear Administrator Jackson:

It is our understanding the U.S. EPA is in the process of evaluating the existing federal regulations and current policies as they would relate to coal combustion waste (CCW), and intends to propose new regulations for CCW by the end of the 2009 calendar year. As a result of these activities we have been contacted by some of the coal companies in Illinois. They have voiced a concern that this process includes the possibility of classifying CCW as a hazardous waste. Based on this information we are providing the following comments for your consideration as the U.S. EPA develops these new regulations for CCW.

Currently Illinois regulates CCW as both a special waste and a solid waste and would therefore require any site accepting CCW for disposal to be designed, constructed, and operated in accordance with the appropriate non-hazardous solid waste disposal regulations. This position is consistent with the position U.S. EPA has taken since 1988. And in fact in 2000 EPA had determined it would develop national regulations for management and disposal under subtitle D (non-hazardous waste) rather than subtitle C (hazardous waste). Illinois regulations also have provisions to allow CCW to be beneficially reused and not be considered a waste, provided the generator meets certain restrictions and requirements.

Based on our past experience, it our position that classifying CCW as a hazardous waste is not warranted and would place unnecessary barriers on its beneficial use/reuse in the future. We feel our approach of regulating CCW under the non-hazardous solid waste regulations is protective of both human health and the environment and is an effective and logical way to safely manage CCW. However, if U.S. EPA feels there is a need to develop specific regulations to address the disposal of CCW we would recommend the waste be regulated as a non-hazardous waste under an expansion to the subtitle D regulations.

If you or your staff have any questions, or would like to discuss our position in more detail, please contact Steve Nightingale, P.E., of my staff at 217/558-6213.

Respectfully,

Gary P. King

Gary P. King, Acting Chief
Bureau of Land

GPK:SFN:bjh\091771s.doc

cc: Mathy Stanislaus
Barry Breen
Matt Hale

OFFICE OF PUBLIC UTILITIES
CITY OF SPRINGFIELD, ILLINOIS
TIMOTHY J. DAVLIN, MAYOR
R. TODD RENFROW, GENERAL MANAGER
GENERAL OFFICE

October 1, 2009

Ms. Judy Sheahan
U. S. Conference of Mayors
jsheahan@usmayors.org

RE: U. S. EPA Coal Ash Reclassification and Estimated Costs to CWLP

Dear Ms. Sheahan,

I am writing to you as General Manager of the City of Springfield's Office of Public Utilities, d/b/a City Water, Light and Power ("CWLP").

I am writing to inform you of a pending proposal by the U.S. Environmental Protection Agency which may seek to regulate as a hazardous waste coal ash generated during the combustion of coal to produce electricity (referred to as coal combustion byproducts or CCBs). Listing CCBs as hazardous waste would have dramatic adverse consequences for the City of Springfield and CWLP due to the increase in costs associated with managing and disposing of CCBs as well as the lack of availability of CCBs for construction projects. We wish to register our strong opposition to regulating CCBs as hazardous waste and request that you contact the U.S. EPA with our objection as possible opposing the designation of CCBs as hazardous waste.

We agree with the position expressed nearly universally by state transportation authorities, and virtually all industry groups that EPA should regulate CCBs as *non*-hazardous waste. Regulating CCBs pursuant to a federal non-hazardous waste program would allow for the imposition of management and disposal controls on CCBs that are fully protective of human health and the environment without unduly impacting the beneficial uses of CCBs and imposing substantial unwarranted costs on cities and municipalities across the nation.

In contrast, the regulation of CCBs as hazardous waste could require CWLP to dispose of CCBs generated during the production of electricity at commercial hazardous waste disposal facilities. There are very few such facilities in the U.S.

ROOM 400 MUNICIPAL CENTER EAST • 800 EAST MONROE • SPRINGFIELD, ILLINOIS 62757 • (217) 789-2116 • FAX (217) 789-2136

and these facilities have limited capacity and impose substantial costs for the disposal of hazardous wastes. The costs of disposing of CCBs will be substantially greater if CCBs are regulated as hazardous waste than if CCBs are regulated as non-hazardous. These costs will be borne directly by taxpayers and/or ratepayers in Springfield, notwithstanding the fact that CCBs can be regulated as non-hazardous waste while ensuring the safety of the public and the protection of the environment. Furthermore, because the few commercial hazardous waste disposal facilities are often located great distances from the generation of electricity (and CCBs), the costs of transporting significant volumes of CCBs to these facilities would substantially increase the already high costs of disposal of CCBs as hazardous waste.

The listing of CCBs as hazardous waste will also significantly reduce the opportunities for beneficially using these materials, which could impact the cost and availability of materials for a variety of construction projects. As detailed in a letter to EPA, the American Concrete Institute maintains that due to potential liability concerns CCBs will not be used in concrete and other construction materials if regulated as hazardous waste. Unavailability of CCBs could increase the costs and/or seriously delay projects in Springfield including road construction projects, which often include substantial quantities of fly ash (a CCB).

It is necessary for EPA to understand that these unnecessary increases in costs for the disposal and transportation of CCBs as hazardous wastes as well as construction projects that use CCBs as construction materials are taking place in the context of drastic cuts in the services many cities and municipalities have had to impose during these challenging economic times. Many cities, including Springfield, have had to impose furloughs on some of its employees and has had to cut some services. Diverting city and municipality resources to the management of CCBs as hazardous waste will interfere with the priorities of Springfield and compound the difficulties of managing already tight budgets.

In light of the issues addressed above, we urge you to contact U. S. EPA to register opposition to the regulation of CCBs as hazardous waste. The estimated costs to CWLP is enclosed. The deadline for the comments to the EPA is October 1st 2009.

Please contact me at (217) 789-2116 with any questions. Thank you for your attention to this matter.

Sincerely,

R. Todd Renfrow
General Manager, CWLP

City of Springfield, Office of Public Utilities d/b/a City, Water, Light and Power ("CWLP")
Estimated Costs to CWLP Associated With Coal Ash as a Hazardous Material

The following information was prepared by the Environmental Health and Safety Staff of CWLP after being notified that EPA is considering classifying coal ash as a hazardous waste. The required treatment cost can only be estimated at this time. The total of boiler slag, bottom ash and fly ash for 2008 was 65,300 tons, so a figure of 70,000 tons will be used in the cost estimates. The following locations have been identified as facilities that have been permitted to receive RCRA Hazardous Waste at their facilities:

1. Peoria Disposal Company, Peoria, IL (80 miles), Holly Cooper (309/676-4893)

They no longer have the capacity to landfill hazardous waste at their facility, but can treat it for the characteristic wastes and then transfer it to one of their non hazardous landfills. The cost would range from $100 to $120 per ton for this service.

2. Heritage Environmental Services, Roachdale, IN (180 miles), Raven Shryock (317-243-0811)

   Treatment cost is estimated at $113 per ton.

3. Wayne Disposal Landfill, Bellville, Michigan (430 miles) Margaret Harwood (734/329-8021)

   Treatment cost is estimated at $125 per ton.

4. Waste Management, Emelle, AL (590 miles) Polly Goodwin (205-652-8156)

If the waste has a characteristic code because of metals, the cost for stabilization and disposal would be $175 per ton. If it could be directly landfilled similar to MGP Waste (Manufactured Gas Product), the cost would be $80 per ton.

Cost Estimates

Facility	Distance (in miles)	Treatment (per ton/total)	Transportation * (per ton/total)	Total (per ton/total)
PDC	80	$100-$120/ $7M to $8.4	$26/ $1.82M	$126-$146/ **$8.82M to $10.22M**
HES	180	$113/$7.91M	$50/$3.5M	$163/**$11.41M**
WDL	430	$125/$8.75M	$90/$6.3M	$215/**$15.05M**
WM	590	$80 -$175 $5.6M to $12.25M	$110/$7.7M	$190-$285/ **$13.3M to $19.95M**

* Transportation estimates are based on figures provided by Bodine Environmental.

Not included in the above figures are the CWLP expense associated with loading the materials and handling all required waste manifests, which can be estimated to range up to $200,000 annually.

Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
P. O. Box 8472
Harrisburg, PA 17105-8472

April 10, 2009

Office of Waste, Air and Radiation Management 717-772-2724

Mr. Matt Hale, Director
Office of Resource Conservation and Recovery
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Mr. Hale:

We would like to thank EPA for giving the Pennsylvania Department of Environmental Protection (DEP) the opportunity to provide comments in advance of your agency's efforts to develop regulations on the management of coal combustion waste. The management of coal combustion waste is very important to the state, both environmentally and economically as most of the facilities generating electricity in Pennsylvania combust either pulverized coal or waste coal as fuel and depend on an environmentally sound program to ensure the effective management of their waste coal ash.

Since 1985, DEP has provided oversight on the use of the beneficial use of coal ash for mine reclamation and other uses. In 1992, Pennsylvania implemented regulations governing the management of coal combustion wastes covering storage, disposal and beneficial use. Under those regulations and oversight, coal has been successfully used for mine reclamation throughout the Commonwealth. Through our groundwater monitoring program and data collected at reclamation sites, we have found no indication of ground water degradation attributable to the placement of coal ash. In addition to coal ash, DEP regulates other coal combustion wastes, such as flue gas desulfurization (FGD) sludge and gypsum, and requires permits prior to the beneficial use of these wastes.

DEP understands EPA is considering three options for managing coal combustion waste: as hazardous waste under RCRA Subtitle C, as industrial waste under RCRA Subtitle D, or a combination of the two. We believe regulation of coal combustion waste as hazardous waste is unnecessary, as none of these wastes generated by Pennsylvania power plants has been observed to exhibit characteristics of hazardous waste. Classification of coal combustion waste as hazardous would likely end its beneficial use without any tangible increase in environmental protection. Pennsylvania has no commercial permitted hazardous waste disposal facilities, and none are being proposed. Therefore, all coal combustion waste generated in Pennsylvania would need to be transported to other states for disposal causing the power industry to incur significant costs for transportation and disposal.

In summary the broad classification and regulation of coal ash as a hazardous waste is not supported by science, and if coal ash were to be classified as hazardous waste it would have a significant economic impact to Pennsylvania, leading to higher electricity production costs for industry and increases in costs for electricity for businesses and every citizen of the Commonwealth.

From our perspective, regulation of coal combustion wastes under Subtitle D affords sufficient environmental protection and allows beneficial use opportunities. Pennsylvania, however, would be supportive of ending the exclusion from regulation as hazardous waste under the Bevill Amendment. While this would have little or no effect on Pennsylvania coal combustion waste generators, the more stringent management standards of Subtitle C would then apply to coal ash waste that actually exhibits the well established and nationally accepted characteristics of hazardous waste in RCRA.

While we understand that federal rules are needed for states that have lax or no regulatory oversight of coal combustion waste, there are states, like Pennsylvania, that have established and implemented effective programs. In the federal rulemaking, EPA should be careful not to preempt states that have programs that work well.

As stated above, DEP has a great deal of experience with coal combustion waste. Some of our experiences are documented in our report *Coal Ash Beneficial Use in Mine Reclamation and Mine Drainage Remediation in Pennsylvania*, found at: http://www.dep.state.pa.us/dep/deputate/minres/bmr/beneficial_use/Index.htm. We will be happy to provide additional information on our program or meet with you to discuss our experience in beneficially managing this waste stream for the betterment of the Commonwealth.

Sincerely,

Thomas K. Fidler

Thomas K. Fidler
Deputy Secretary

PENNSYLVANIA PUBLIC UTILITY COMMISSION
COMMONWEALTH OF PENNSYLVANIA
HARRISBURG, PENNSYLVANIA

July 28, 2009

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

Re: Federal Rulemaking for Coal Combustion Byproducts

Dear Administrator Jackson:

As members of the Pennsylvania Public Utility Commission ("PUC"), we write because electric utilities and generators have recently brought to our attention a decision to be made shortly by EPA that could significantly affect future electricity prices and, in some cases, the ability of utilities and generators to provide reliable and uninterrupted power services. While the PUC does not generally involve itself in environmental issues, EPA's plans to develop federal regulations for coal combustion byproducts ("CCBs") has the potential to compromise the ability of utility companies in Pennsylvania to provide reliable electric services at consistent and affordable rates. Because of the far-reaching effects that this issue could have on electric services in Pennsylvania, we feel compelled to express our views on the subject.

In particular, we understand that EPA is evaluating whether to regulate some or all CCBs as hazardous wastes under Subtitle C of RCRA, or as non-hazardous wastes under Subtitle D of RCRA. EPA also reportedly is evaluating whether to require the early retirement of active surface impoundments used by power plants to manage CCBs. We understand that, to date, every state environmental agency that has weighed in on the issue (approximately twenty state agencies) has opposed regulating CCBs as hazardous waste because CCBs exhibit no hazardous characteristics and regulation of CCBs as hazardous would prevent the beneficial uses of the material due to the stigma that would attach. Instead, every state has taken the position that the best management option for regulating CCBs is as non-hazardous waste under RCRA Subtitle D. The states take this position because it would preserve and expand the beneficial use of CCBs (which uses preserve natural resources and reduce the amount of

wastes disposed) and because the states have the regulatory infrastructure in place to ensure the safe management of these materials. We believe that this is certainly the case in Pennsylvania.

As noted in the Pennsylvania Department of Environmental Protection (DEP) letter to you dated April 10, 2009, from Deputy Secretary Thomas K. Fidler, classification of coal combustion waste as hazardous would likely end its beneficial use practices without any tangible increase in environmental protection. Since 1985, DEP has provided oversight on the beneficial use of coal ash for mine reclamation and other uses. In 1992, Pennsylvania implemented regulations governing the management of coal combustion wastes covering storage, disposal, and beneficial use. Under those regulations and oversight, coal has been successfully used for mine reclamation throughout the Commonwealth. Through a groundwater monitoring program and data collected at reclamation sites, DEP has found no indication of ground water degradation attributable to the placement of coal ash. In addition to coal ash, DEP regulates other coal combustion wastes, such as flue gas desulfurization (FGD) sludge and gypsum, and requires permits prior to the beneficial use of these wastes.

We are concerned that, notwithstanding the views of the states, EPA could nonetheless regulate CCBs as hazardous waste and that power plants in our state will be confronted with sharply higher operating costs which will eventually be passed on to customers. Some smaller plants may actually have to cease operations because the costs of retrofitting their CCB management units to meet the hazardous waste standards and/or losing the capacity to manage CCBs in surface impoundments will be too high to allow these plants to recover the conversion costs given the limited capacity of these units. In Pennsylvania, this would affect our many smaller pulverized coal-fired and waste coal-fired plants which are not large enough to absorb the cost of disposing of large volumes of "hazardous" waste, which are not hazardous under any commonly accepted definition of that term.

As you can appreciate, the loss of generating capacity is a significant concern to us as it would directly threaten our utilities' ability to provide reliable and cost-effective power. Since the states have already made clear that their programs will ensure the safe management of CCBs, we see no reason for EPA to pursue the hazardous waste option. Such an approach would appear to be regulatory overkill and, more importantly, could threaten cost-effective and reliable provision of electric services in Pennsylvania.

While we understand that federal rules are needed for states that have lax or no regulatory oversight of coal combustion waste, there are states, like Pennsylvania, that have established and implemented effective programs, including beneficial waste programs. In the federal rulemaking, EPA should be careful not to preempt states that have programs that work well.

For these reasons, we respectfully urge EPA to regulate CCBs as non-hazardous wastes under RCRA Subtitle D.

Thank you for your consideration of our views.

Sincerely,

James H. Cawley
Chairman

Tyrone J. Christy
Vice Chairman

Robert F. Powelson
Commissioner

Kim Pizzingrilli
Commissioner

Wayne E. Gardner
Commissioner

cc: Honorable Arlen Specter
Honorable Robert P. Casey, Jr.
Honorable Jason Altmire
Honorable Robert Brady
Honorable Christopher Carney
Honorable Kathy Dahlkemper
Honorable Charles W. Dent
Honorable Mike Doyle
Honorable Chaka Fattah
Honorable James W. Gerlach
Honorable Tim Holden
Honorable Paul E. Kanjorski
Honorable Patrick J. Murphy
Honorable Timothy F. Murphy
Honorable John P. Murtha, Jr.
Honorable Joseph R. Pitts
Honorable Todd Platts
Honorable Allyson Y. Schwartz
Honorable Joe Sestak
Honorable Bill Franklin Shuster
Honorable Glenn Thompson
Carol Browner, Assistant to the President for Energy and Climate Change

APPENDIX 1

ECOS

Resolution Number 08-14
Approved September 22, 2008
Branson, Missouri

As certified by
R. Steven Brown
Executive Director

THE REGULATION OF COAL COMBUSTION PRODUCTS

WHEREAS, The 1980 Bevill Amendment to the Resource Conservation and Recovery Act (RCRA) requires the U.S. Environmental Protection Agency (USEPA) to "conduct a detailed and comprehensive study and submit a report" to Congress on the "adverse effects on human health and the environment, if any, of the disposal and utilization" of fly ash, bottom ash, slag, flue gas emission control wastes, and other byproducts from the combustion of coal and other fossil fuels and "to consider actions of state and other federal agencies with a view to avoiding duplication of effort;" and

WHEREAS, USEPA conducted the comprehensive study required by the Bevill Amendment and reported its findings to Congress on March 8, 1988 and on March 31, 1999, and in both Reports recommended that coal combustion wastes (CCW) not be regulated as hazardous waste under RCRA Subtitle C; and

WHEREAS, on August 9, 1993, USEPA published a regulatory determination that regulation of the four large volume coal combustion wastes (fly ash, bottom ash, boiler slag, and flue gas emission control waste) as hazardous waste under RCRA Subtitle C is "unwarranted;" and

WHEREAS, on May 22, 2000, USEPA published a final regulatory determination that fossil fuel combustion wastes, including coal combustion wastes, "do not warrant regulation [as hazardous waste] under Subtitle C of RCRA," and that "the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes;" and

WHEREAS, USEPA is under no statutory obligation to promulgate federal regulations applicable to CCW disposal following the regulatory determination that hazardous waste regulation of CCW disposal is not warranted, and throughout the entire Bevill regulatory process, CCW disposal has remained a state regulatory responsibility and the states have developed and implemented robust regulatory programs tailored to the wide-ranging circumstances of CCW management throughout the country; and

WHEREAS, In 2005, USEPA and the U.S. Department of Energy (DOE) published a study of CCW disposal facilities constructed or expanded since 1994 and evolving state regulatory programs that found: state CCW regulatory requirements have become more stringent in recent years, the vast majority of new and expanded CCW disposal facilities have state-of-the-art environmental controls, and deviations from state regulatory requirements were being granted only on the basis of sound technical criteria; and

WHEREAS, the states have demonstrated a continuing commitment to ensure proper management of CCWs and several states have announced proposals for revising and upgrading their state CCW regulatory programs.

NOW, THEREFORE BE IT RESOLVED THAT THE ENVIRONMENTAL COUNCIL OF THE STATES:

Agrees with USEPA's assessment that CCW disposal does not warrant regulation as hazardous wastes under RCRA Subtitle C; and

Agrees with USEPA's finding in the 2005 study previously cited that "the regulatory infrastructure is generally in place at the state level to ensure adequate management of these wastes" and believes that states should continue to be the principal regulatory authority for regulating CCW as they are best suited to develop and implement CCW regulatory programs tailored to specific climate and geological conditions designed to protect human health and the environment; and

Supports safe, beneficial reuse of CCW, including for geotechnical and civil engineering purposes; and

Believes that the adoption and implementation of a federal CCW regulatory program would create an additional level of oversight that is not warranted, would be duplicative of existing state regulatory programs, and require additional resources to revise or amend existing state programs to conform to new federal regulatory programs and to seek USEPA program approval; and

Therefore calls upon USEPA to conclude that additional federal CCW regulations would be duplicative of most state programs, are unnecessary, and should not be adopted, and instead, calls upon EPA to begin a collaborative dialogue with the states to develop and promote a national framework for beneficial use of CCW including use principles and guidelines, and to accelerate the development of markets for this material.

ECOS

THE
ENVIRONMENTAL
COUNCIL OF
THE STATES

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Director, Virginia Department of Environmental Quality
PAST PRESIDENT

R. Steven Brown
Executive Director

December 14, 2009

The Honorable Edward J. Markey (D-MA), Chairman
The Honorable Fred Upton (R-MI), Ranking Member
Subcommittee on Energy and the Environment
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

Re: Subcommittee Hearing on Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal

Dear Chairman Markey and Ranking Member Upton:

On behalf of the Environmental Council of the States (ECOS) Waste Committee and pursuant to your December 10 hearing, I appreciate the opportunity to submit for the record the association's formal policy on Coal Combustion Waste (CCW) regulation.

ECOS is the non-profit, non-partisan association of state and territorial environmental commissioners. The association's position on the regulation of CCW is articulated in Resolution 08-14 adopted on September 22, 2008, entitled "The Regulation of Coal Combustion Products" (see Appendix 1).

ECOS asserts that the federal regulation of CCW is unwarranted in light of the potential state fiscal impacts and the regulatory implications. In the resolution, ECOS expresses support of EPA's previous assessment that CCW disposal does not warrant regulation as hazardous waste under Subtitle C of the Resource Conservation and Recovery Act (RCRA). Moreover, ECOS agrees with EPA's finding in a 2005 study that "the regulatory infrastructure is generally in place at the state level" to ensure adequate management of these wastes.

Accordingly, the ECOS resolution calls on EPA to conclude that additional federal CCW regulations are unnecessary because they would be duplicative of most state programs. In addition, the resolution notes that a federal CCW regulatory program would require additional resources to revise or amend existing state programs to conform to new federal regulatory programs. It also points out that ECOS supports safe, beneficial reuse of CCW, including for geotechnical and civil engineering purposes. ECOS members have expressed serious concerns about the chilling effect that any RCRA C or hybrid RCRA C-D approach might have on beneficial reuse programs across the nation.

For additional information, please do not hesitate to contact ECOS Executive Director Steve Brown at (202) 624-3660 or sbrown@sso.org.

Regards,

John W. Mitchell
Chair, ECOS Waste Committee/
Director, Division of Environment,
Kansas Department of Health and Environment

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April 1, 2009

Matt Hale
Director
Office of Resource Conservation and Recovery
USEPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code: 5301P
Washington, DC 20460

Dear Matt,

ASTSWMO has a demonstrated track record of active interest in the management of coal combustion by-products (CCB). ASTSWMO's Fossil Fuel Combustion Waste (FFCW) Work Group gathered information about State regulation of CCB in late 2006 – early 2007. The results of that effort indicated that the majority of the responding States had regulatory programs in place for the management of CCB. On February 11, 2008, the FFCW Work Group provided comments on USEPA's "Notice of Data Availability (NODA) on the Disposal of Coal Combustion Wastes in Landfills and Surface Impoundments." Comments were based in part on the 2006-2007 survey results. The FFCW Work Group recommended a more flexible regulatory approach that allows consideration by the permitting authority of the waste type, climate, site geology and environment, and encourages a scientific and engineering approach to minimize potential risks to acceptable standards. They stated that this approach was the current practice in many States. The FFCW Work Group questioned the need for additional federal regulations related to CCB materials.

The Tennessee Valley Authority (TVA) spill in December 2008 brought renewed attention to the question about the need for federal regulation of CCB. In response to EPA's fast-track regulatory process for coal combustion waste, the ASTSWMO Board of Directors formed a CCB ad hoc Workgroup in January 2009 to review and respond to EPA's proposed regulatory schemes.

The first action of the group was to modify and reissue the 2006 survey of States initially designed by the FFCW Workgroup. In February 2009, ASTSWMO's CCB ad hoc Workgroup surveyed State waste and water program managers, working in conjunction with ECOS and ASIWPCA. There were three parts to the survey: general information about CCB management, questions specific to landfills and questions specific to surface impoundments. The survey has been completed by 44 States. Eight States do not have CCB. Fourteen States do not have CCB surface impoundments. Enclosed as an attachment to this letter are the summary results from the survey for States that have CCB.

The Workgroup also called on States to provide comments on EPA's possible regulatory proposals. A compilation of State responses is also enclosed as an attachment to this letter.

There is no question that releases, such as the December 2008 TVA Impoundment Failure in Kingston, Tennessee, should be prevented to the extent practical though appropriate engineering, design, and operating standards. However, it is also critical that all relevant factors be considered in deciding the appropriate course of action.

Presented below are the pros and cons of the possible regulatory proposals for CCB prepared by the CCB ad hoc Workgroup, based on the survey results and State comments.

Justification of preference for Subtitle D regulation of CCB:

USEPA should implement an approach to coal combustion by-product (CCB) regulations similar to the approach that is taken with municipal solid waste pursuant to 40 CFR Part 258, commonly referred to as RCRA Subtitle D. Using the lessons learned by States since the adoption of 40 CFR Part 258 and historical CCB data collected by States, RCRA Subtitle D could be modified to specifically address CCB waste disposal facility requirements and is the framework that the USEPA should build upon.

Most States regulate CCB. Thirty-six out of 42 States that have CCB have permit programs for CCB landfills (86 percent). Only 3 States responded "no" and 3 States did not respond. Twenty-five out of 36 States that have CCB surface impoundments have permit programs for those impoundments (69 percent). Only 3 States responded "no" and 8 States did not respond. Most States regulate CCB under general solid waste regulations (43 percent) and general industrial waste regulations (43 percent). Several States use regulations specifically designed for CCB (29 percent). According to USEPA, the design and performance standards will likely be the same no matter what regulatory scheme is chosen. Many States voluntarily impose minimum performance standards for both landfills and surface impoundments under Subtitle D, demonstrating that minimum federal Subtitle D requirements will be sufficient to ensure that States properly regulate CCB.

Percentage of States with CCB landfills and surface impoundments with specific regulatory requirements		
Regulatory Requirement	Landfills	Surface Impoundments
Bottom Liner	64%	33%
GW Monitoring	81%	39%
Leachate Collection	52%	14%
Final Cover System	79%	36%
Post Closure Care	79%	39%
Siting Controls	83%	39%
Corrective Action	86%	42%
Structural Stability	69%	36%
Financial Assurance	69%	31%

The fact that more than half the States already require each of the technical standards identified above for landfills demonstrates that minimum federal Subtitle D requirements will be sufficient to ensure that States properly regulate CCB. A considerable number of States have these requirements for surface impoundments as well, although we acknowledge that more States may have to upgrade their surface impoundment requirements than will have to for landfills. Establishing federal minimum standards under Subtitle D will provide the impetus needed for all States to conform. It is also important to note that currently, 36 percent of States with CCB are contemplating changes to their CCB regulations and 27 percent of those already have draft revised regulations.

State experiences

Michigan - "Michigan currently regulates coal ash as a solid waste under Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) ... in 1993 when Michigan became an approved State under the Resource Conservation and Recovery Act (RCRA) Subtitle D program. Based on the analytical information that we have seen on coal ash, we believe that the levels of contaminants contained in coal ash are similar in nature to those found in cement kiln dust, wood ash, foundry sands, paper mill wastes, or steel mill waste. With the promulgation of the 1993 rules, we consider all these waste to be low-hazard industrial waste (i.e. they leach less than ten percent of the hazardous waste limits when using the appropriate leaching tests)."

West Virginia - "I have been regulating coal ash facilities for 26 years for the State of West Virginia. I have never found a TCLP [Toxicity Characteristics Leaching Procedure] or other chemical characterization that would indicate that coal ash could be labeled as a hazardous waste. Most of the time the metal concentrations, which would be the main characteristic that could be considered hazardous, are at or below MCL for drinking water."

Iowa - "The Department understands that the USEPA is considering options to regulate [CCB] as a hazardous waste under RCRA Subtitle C. This option is not supported by the historic data that has been collected from generators of [CCB] in Iowa which shows that [CCB] does not exceed RCRA Subtitle C hazardous waste characteristics."

Arguably, municipal solid waste (MSW) presents more extensive environmental concerns than CCB. Municipal waste streams contain not only heavy metals, but also organic, acidic and alkaline materials. The organics in MSW can be more problematic than industrial wastes, which are generally inorganic in nature. Logically, if Subtitle D is adequate for MSW, then it certainly should be sufficiently protective for CCB.

Based on federal minimum standards for location, design, environmental monitoring, operation, closure, post-closure care, corrective action, and financial assurance, the States have established federally approved Subtitle D State programs. These programs have proven successful dealing with municipal solid waste, including household hazardous wastes and Conditionally Exempt Small Quantity Generator (CESQG) waste at the State's option. A substantial number of damage cases supported the federal adoption of minimum national Subtitle D municipal solid waste landfill standards. A similar Subtitle D approach can successfully implement minimum federal standards for coal combustion waste disposal facilities. The Subtitle D approach can address any concern regarding the stability of a CCB disposal facility through establishing minimum federal design standards and routine inspection and evaluation.

Most States have some mechanism to recognize and regulate the beneficial use of Subtitle D wastes. According to the ***2006 ASTSWMO Beneficial Use Survey Report***, 34 out of the 40 reporting States (85 percent) indicated they had either formal or informal decision-making processes or beneficial use programs relating to use of non-hazardous solid wastes.
The Subtitle D approach, with minimum federal standards, will facilitate the continued beneficial use of CCB. As the anticipated volume of CCB produced is expected to increase or even double in many States as the Clean Air Act requirements for installation of scrubbers for flue gas desulfurization (FGD) are implemented, it is vital that the recycling of those materials which can be safely used in products or as raw materials be so used. Adopting a Subtitle D approach to the regulation of high volume, low toxicity coal combustion by-products would offer the best fit with existing and developing State beneficial use programs.

Explanation of opposition to Subtitle C regulation of CCB:

State experiences

Iowa – "Declaring CCB a hazardous waste creates an even greater hardship in Iowa because of the amount that is generated and the fact that there is no RCRA C permitted disposal facilities in the State. The likelihood of siting such a facility borders on the impossible. The implications of this action are that CCB generators would be forced to ship materials to surrounding States for disposal. That could become very costly for Iowans and extremely difficult to justify when there is little scientific data supporting such drastic measures."

Michigan – "RCRA Subtitle C wastes in Michigan are currently regulated under Part 111, Hazardous Waste Management, of the NREPA. The regulation of coal ash under full RCRA Subtitle C would end the current beneficial uses of coal ash. Existing surface impoundments and landfills would be subject to more stringent design standards and would require either 1) retrofitting of existing landfills (if even possible) or 2) closure of those disposal facilities. Neither of these options could be implemented immediately."

Florida – "If USEPA decides to call coal ash a hazardous waste under Subtitle C, then current Florida law (Section 403.7222, Florida Statutes) would prohibit the disposal of this coal ash in landfills unless it was first treated to be non-hazardous. This could add tremendous costs to the power industry for managing this material. They would either have to treat their ash before disposal or ship it out of State for disposal. It is also likely that if existing disposal areas were disturbed after USEPA determined coal ash was a hazardous waste, then these old disposal sites could become hazardous waste disposal units too."

Virginia – "If USEPA was to regulate CCB as a hazardous waste under the RCRA Subtitle C authorities, Virginia would no longer allow these materials to be beneficial reused under our CCB Regulations (9 VAC 20-85) and, also, there would be no beneficial reuse exclusions/exemption under our Virginia Solid Waste Management Regulations (9 VAC 20-80), as well."

As noted above, the vast State experience with testing CCB shows that it is generally not characteristically hazardous. Coal combustion by-products rarely if ever fail the criteria by which materials are determined to be hazardous waste. To artificially classify them as hazardous will needlessly limit the management options for both the CCBs and other wastes legitimately classified as hazardous which will be competing with CCBs for limited hazardous waste disposal capacity, while not producing any greater degree of environmental protection. Transportation, manifesting and licensing requirements for CCBs as a listed hazardous waste are excessively burdensome without sufficient evidence of a benefit. It would be more appropriate to regulate and manage CCBs using design and operation standards specified for Subtitle D programs except in the cases where a particular source material is deemed hazardous upon testing for characteristics.

The prospect of adding a significant new waste stream to

be managed by severely underfunded State hazardous waste programs is unconscionable unless a significant amount of new sustained funding is included. ASTSWMO's Hazardous Waste Subcommittee conducted a pilot program to determine the cost to States for implementing a complete and adequate RCRA Subtitle C Program (hereafter referred to as "RCRA C" or "RCRA") in 2006. The report entitled ***State RCRA Subtitle C Core Hazardous Waste Management Program Implementation Costs - Final Report (January 2007)*** revealed that the cost to States of implementing a complete and adequate RCRA Program (converted to 2008 dollars) is, at a minimum, $367M in State and federal funding. The State share should be $92M (25 percent) with the remaining $275M in State Hazardous Waste Financial Assistance grants. However, the FY 2008 federal appropriation was only slightly more than half of what States needed. Congress appropriated $101M rather than $175M. States are making up the difference for these federally mandated programs from already strained State budgets. These programs are already stretched to the breaking point. Expectations should not be high for a successful incorporation of CCB into State Subtitle C programs without the guarantee of commensurate increases in State grant funding.

USEPA should avoid a "one size fits all" approach that will unnecessarily divert limited technical resources away from existing permitting or compliance and enforcement work. Instead, USEPA should recognize that many States have adequate controls in place and allow them to maintain their programs. USEPA could then focus its efforts on correcting any deficiencies identified by their investigations.

The most compelling reason not to impose Subtitle C regulations is that the beneficial use of CCB has been very successful. The "hazardous" label of Subtitle C would be detrimental to State CCB beneficial use programs, as discussed below. Regulation under RCRA Subtitle C has the potential to put an end to many beneficial uses for CCB. In most States, a primary requirement for a beneficial use determination is that the waste not be hazardous. RCRA Subtitle C wastes in Michigan are currently regulated under Part 111, Hazardous Waste Management, of the NREPA. The regulation of coal ash under full RCRA Subtitle C would end most of the current beneficial uses of coal ash. Existing surface impoundments and landfills would be subject to more stringent design standards and would require either 1) retrofitting of existing landfills (if even possible) or 2) closure of those disposal facilities. Neither of these options could be implemented immediately.

Implications for beneficial use if CCB is regulated under Subtitle C:

The American Coal Ash Association reports that 43 percent of CCB is currently used in a beneficial way rather than disposed in a landfill. About 20 percent of CCB is used in products – 14 percent is bound in concrete and cement; 6 percent is used to make gypsum wallboard. Currently, 56 percent, or 75 million tons, is not beneficially used. States are concerned that designating CCB as a hazardous waste under Subtitle C or a hybrid Subtitle D/C regulation would prevent beneficial use of CCB and result in all 134 million tons of CCB being shipped to hazardous waste landfills that in many States have insufficient capacity. As the anticipated volume of CCBs produced is expected to increase or even double in many States as requirements for FGD are implemented, it is vital that the recycling of those materials which can be safely used in products or as raw materials be so used.

Not only do many State regulations prohibit the beneficial use of CCB if it is declared hazardous (see State experiences insert), such a designation will stigmatize the material in a way that will adversely affect beneficial use. The stigma issue also applies to the proposed hybrid Subtitle D/C approach. The uncertainty that a presumed non-hazardous material could be deemed hazardous as a result of a determination that a generator failed to follow the Subtitle D requirements will create too much uncertainty and liability concerns for the beneficial user.

State experiences

Michigan – "Michigan currently has regulations in place governing the reuse and disposal of coal ash that are protective of public health and the environment. If coal ash were determined to be subject to regulation under Subtitle C, it would necessitate considerable changes to Michigan solid and hazardous waste statutes and regulations. Such changes would likely be subject to considerable opposition from any industry and/or municipality that generates coal ash waste, and would likely lead to increased costs for energy generation."

Missouri – "Given the current State of CCB management activities in Missouri there does not appear to be a compelling reason, from a human health or environmental protection standpoint, to manage these materials as hazardous waste under RCRA Subtitle C. To do so would be an undue disruption to current State CCB and UWLF management practices and would likely result in a significant increase in the cost of CCB management without a corresponding increase in human health or environmental improvement/protection."

Coal combustion by-products or residue generally consists of fly ash, bottom ash, or wet slurry depending on the combustion unit and associated air pollution control devices. The character of the end stream varies and is dependent upon several factors. However, all seem to be lumped together in this regulatory analysis without discussion of segregate.characteristics or potential for beneficial use.

States require testing of beneficially reused materials. Testing can include initial analysis of the material and additional testing when sources of fuel change or when there is a change in plant processes, if such changes cause a change in the constituents generated. States report that their beneficial programs do not allow the use of coal ash in road construction if the material fails the Toxicity Characteristics Leaching Procedure (TCLP). Many States report that they do not have any data to suggest that coal ash projects that have been reviewed have failed TCLP.

Examples of the beneficial use of CCB

- a component of concrete, grout, mortar, or casting molds
- a raw material in asphalt for road construction
- aggregate or road or building material which will be stabilized or bonded by cement, limes or asphalt
- road base or construction fill that is covered with asphalt, concrete, or other material approved by the State
- a soil amendment or for soil stabilization provided the materials meet State criteria

States have incorporated technical standards in their regulations and approvals for storage of CCB. For example, in Missouri, a waste to be beneficially reused is kept above the seasonal high groundwater table, unless a variance is obtained from the department's Water Protection Program (WPP.) This requires an interpretation by a geologist registered in the State. A 3-foot cap of clean soil is required unless the material is placed under a structure or a paved/concreted area.

Recycling this waste material into new products, rather than having to mine additional virgin material, is integral to sustainable development and sustainable infrastructure. To disallow the

beneficial use of coal combustion by-products (CCB) would cause an increase in the use of valuable mineral resources rather than reusing a waste product. This would in turn increase disposal costs for the utilities which would be passed on to the consumer. Counties and municipalities which use bottom ash as snow and ice control would instead have to purchase chemicals or salts to treat the roads. State transportation departments and other entities using CCB would have to purchase soil to use in place of the fly ash currently used for structural fill, road base, as a soil amendment or for soil stabilization. This could impact the number of miles of roads that can be constructed or repaired and increase costs. In other cases, specific beneficial use projects limit the amount of transportation that would otherwise be needed if the material were considered a hazardous waste. Some coal-fired power plants are co-located near gypsum wallboard manufacturers. The FGD sludge is transported by conveyor belt directly to the wallboard facility for beneficial use. These operations result in safe uses and minimal transport of the FGD sludge.

Concerns about existing facilities:

An issue that has not been addressed adequately in discussions is whether USEPA plans to address existing facilities, and if so how. If USEPA pursues the Subtitle C regulatory route, it might subject all existing facilities in a State to RCRA corrective action. Additionally, bringing existing facilities under Subtitle C raises resource-intensive permitting issues. States generally have legislatively prescribed staffing levels based upon workload, mission, funding, and statutes passed to implement federal RCRA authority or delegation. As noted previously, ASTSWMO's report entitled ***State RCRA Subtitle C Core Hazardous Waste Management Program Implementation Costs - Final Report (January 2007)*** demonstrates that State Subtitle C programs are already seriously underfunded. Additionally, retrofitting of existing Utility Waste Landfills (UWLFs) to meet Subtitle C standards is likely to be technically impracticable. Even if technically feasible, the cost of retrofitting UWLFs to meet current RCRA Subtitle C standards would likely be prohibitively expensive. Any additional compliance costs borne by the utility companies in retrofitting existing UWLFs or permitting new ones would undoubtedly be passed along to consumers at a time when economic conditions in the U.S. are less than ideal.

Enforcement:

There have been suggestions that Subtitle C is necessary so that USEPA will have enforcement authority. States are held accountable by their citizens through State statutes and obligations to regularly inspect landfills and investigate complaints, and to utilize State enforcement authority as warranted. Subtitle D requires State programs to have the necessary enforcement authority as part of the federal approval process. This approach has been successful for over a decade as evidenced by the relative absence of federal citizen suits or demonstrated failure of State Subtitle D programs. The States are not aware of USEPA expressing concerns regarding this State based enforcement approach in the municipal solid waste landfill program. A similar Subtitle D approach can successfully ensure compliance with minimum federal standards for coal combustion waste disposal facilities.

Applicability of Federal Regulations:

Based upon discussions to date with USEPA and States, it appears that the intended coverage of any federal CCB regulations would be limited to CCBs generated by coal-fired utilities, and not extended to CCBs generated by other industries. If this is correct, then the federal regulations should clearly make this distinction. Otherwise, an unreasonable burden will be placed upon the States to individually sort out the applicability issue, likely resulting in uneven application of the base federal requirements.

State Program Authorization:

Regardless of the regulatory approach selected, the States request that the procedures for authorization of State programs to implement the CCB rules be streamlined and designed to operate in harmony with existing Subtitle D (and/or Subtitle C) program authorization procedures. Where there are existing State programs in place regulating these materials, considerable deference should be given to the State program in the authorization process. States with CCB programs in place should be provided the option to 1) demonstrate that their programs are consistent with and not less stringent than the federal program, and 2) be more stringent than the federal program if they so choose. Further, authorization for any new CCB regulations should be treated as an amendment to a State's existing Subtitle D (or Subtitle C, as applicable) program authorization, as opposed to considering the CCB program as separate and distinct from existing authorizations.

Funding:

Federal funding may be necessary to help build State program capacity in the few States that do not have CCB programs if USEPA mandates standards under Subtitle D. It should be noted that some State Subtitle D programs would likely not seek federal funding for a Subtitle D program because of the impact that would have on current State solid waste program financing structures. As the ASTSWMO survey demonstrates, many States already have Subtitle D CCB programs and would not incur a financial hardship. On the other hand, State Subtitle C programs, which are supposed to be funded at a level of 75 percent federal funding, would require significant new appropriations. Thus, the federal funding needs for a Subtitle D approach would be much less than a Subtitle C regulatory approach.

Any decisions to regulate the management and disposal of coal ash will likely have an implication for State regulatory programs including: the need to undertake regulatory action; authorization/approval for implementation (if necessary); budgetary impacts; and staffing/workload resource issues related to implementation (i.e., possible permitting/compliance/enforcement program impacts). The implications could have a dramatic impact on the already strained budgets of many State environmental agencies. It is hoped that USEPA's decision will include review of the work that many States have undertaken to regulate coal combustion by-products.

Summary:

The ATSWMO ad hoc CCB Workgroup, based on results of a survey of States and State comments, recommends that if it is determined that federal regulation of CCB is necessary, Subtitle D regulations would be the preferred approach. Most States already regulate CCB under Subtitle D regulations. Furthermore, a Subtitle D approach would foster the beneficial use of appropriate CCB rather than inhibit it, as would a Subtitle C or hybrid Subtitle C/D approach.

On behalf of ASTSWMO, we thank you for your diligence in ensuring that the most efficient and effective regulatory approach to CCB is proposed.

Sincerely,

Brian Tormey

Brian Tormey (IA)
Chair
ASTSWMO Solid Waste Subcommittee

Stephen Cobb (AL)
Chair
ASTSWMO Hazardous Waste Subcommittee

cc: Rick Brandes (USEPA ORCR)
Rich Kinch (USEPA ORCR)
ASTSWMO Board of Directors
ASTSMWO ad hoc CCB Workgroup
Steve Brown (ECOS)
Linda Eichmiller (ASIWPCA)

Unions for Jobs And the Environment

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United Mine Workers of America
United Transportation Union
Utility Workers Union of America

President
Bill Cunningham

September 19, 2009

The Honorable Lisa Perez Jackson
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Administrator Jackson:

The collapse of a dam at a coal ash pond operated by the TVA near Kingston, Tennessee was a major environmental event which will require an extensive cleanup effort which concerns us all. EPA deserves praise for its quick action following the spill, and for its initiative to review and determine the integrity and safety of other sites where coal combustion byproducts (CCB's) are stored.

The magnitude of this spillage has obviously raised public concern about storage of CCB's and the potential for accidents that might harm surrounding communities. And, understandably EPA has raised the issue of regulation of CCB's at the federal level and even the possibility of classifying CBB's as hazardous waste.

We believe the evidence shows that it would not be appropriate to classify CCB's as hazardous waste. In 1999, during the Clinton Administration, EPA submitted their finding to Congress that CCB's do not exhibit the characteristics of hazardous waste, which are: corrosivity, reactivity, ignitability and toxicity. The following year, EPA determined that CCB's should not be regulated as hazardous waste under Subtitle C of RCRA.

Classifying CCB's as hazardous waste would all but rule out their beneficial recycling and reuse which provides energy savings, greenhouse gas emissions reductions, and resource conservation. Currently, about 46% of these materials are used for beneficial purposes, a figure that is increasing, and with proper incentives could be raised much higher.

In the past, CCB's contributed to the construction of the Hoover Dam the San Francisco-Oakland Bay Bridge and more recently was used for the new I-35 bridge in Minneapolis, Minnesota. Their use for such purposes not only conserves resources and energy, but is often superior to the materials they replace.

At this time, CCB's are regulated primarily by state agencies. An argument for state regulation is that a one size fits all approach will not work. Flexibility and discretion by the states is needed due to the many differences in storage sites in each state. As a state environmental administrator pointed

out, states must be able to tailor standards based on the type of ash generated, the characteristics of that ash, the land disposal methods used, and the geology and groundwater conditions.

If EPA decides to regulate CCB's at the federal level, comprehensive and stringent measures are available to EPA without classifying them as hazardous waste. Levels of contaminants are similar in nature to low-hazard industrial wastes including kiln dust, wood ash, foundry sands, paper mill wastes, or steel mill waste.

CCB's can be regulated in the same way as municipal solid waste. They present less of an environmental concern than municipal solid waste which contains not only heavy metals, but also organic, acidic and alkaline materials. And the organics in municipal waste can be more problematic than industrial wastes. Regulation of CCB's as municipal solid waste would give the public sufficient protection from any environmental problem that might be posed by CCB's including the kind of spillage that occurred near Kingston.

Steps to regulate CCB's should be taken judiciously, given the importance of coal in providing secure and affordable energy for our nation. Coal currently provides about half of the electricity generated in the US and is the cheapest and most abundant domestic fuel. Regulations should recognize the importance of reuse of CCB's and ensure their continued beneficial use. The misclassification of CCB'S as hazardous waste would hurt the ability to use this resource and greatly increased the need for disposal sites.

Sincerely,

Bill Cunningham

Bill Cunningham, President
Unions for Jobs and the Environment

CHAMBER OF COMMERCE
OF THE
UNITED STATES OF AMERICA

WILLIAM L. KOVACS
SENIOR VICE PRESIDENT
ENVIRONMENT, TECHNOLOGY &
REGULATORY AFFAIRS

1615 H STREET, N.W.
WASHINGTON, D.C. 20062
(202) 463-5457

November 17, 2009

Re: EPA Proposed Rule Regulating Coal Combustion Byproducts under RCRA Subtitle C

Mr. Mathy Stanislaus
Assistant Administrator, Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Mail Code 5101-T
Washington, DC 20460

Dear Mr. Stanislaus:

As your office evaluates regulatory options for managing coal combustion byproducts (CCBs) and prepares to issue a proposed rule setting forth new federal management standards, the U.S. Chamber of Commerce, the world's largest business federation representing more than three million businesses and organizations of every size, sector, and region, urges you to consider the potentially devastating economic effect of regulating CCBs as "hazardous waste" under Subtitle C of the Resource, Conservation and Recovery Act (RCRA).

While the Chamber recognizes the need for and supports regulation that is protective of human health and the environment, your agency – and virtually every State agency – has already concluded that regulating CCBs as non-hazardous under RCRA Subtitle D is the appropriate regulatory approach. In two separate reports to Congress, in 1988 and 1999, and more recently in a 2000 regulatory determination,[1] the Environmental Protection Agency (EPA) determined that CCBs do not warrant regulation as hazardous waste. In addition, there are robust State programs already in place that effectively implement CCB regulation and ensure their safe management as a non-hazardous waste under a Subtitle D program.

1 65 Fed. Reg. 32214 (May 22, 2000).

EPA's decision to revisit its regulatory approach to CCBs followed the recent release from a wet coal ash impoundment owned and operated by the Tennessee Valley Authority in Kingston, Tennessee. EPA subsequently conducted a survey of coal ash surface impoundments nationwide in an effort to assess their structural integrity and determine what improvements, if any, were necessary.[2] The Chamber believes this survey was both an appropriate and necessary precaution for identifying potential problems and ensuring that public health and welfare were being adequately protected, and where deficiencies were noted, the Chamber would support reexamining existing safety regulations for these impoundments. However, setting new federal management standards for *all* CCBs (i.e., fly ash, bottom ash, boiler slag, and flue gas desulfurization gypsum) and regulating them as hazardous waste, is unnecessary, will do nothing to further protect human health or the environment, and will have a significantly adverse economic impact. As such, the Chamber would strongly oppose any proposed rule that would regulate CCBs as a hazardous waste under RCRA Subtitle C.

Regulating CCBs as hazardous waste will increase the price of electricity for both businesses and consumers as power generators face higher compliance, transportation, storage, handling, and disposal costs. Gypsum manufacturers that have made capital investments in new synthetic gypsum plants in reliance on EPA's previous regulatory determination that CCBs are non-hazardous, would face catastrophic losses. Because CCBs are routinely used in a vast number of manufacturing processes, including concrete, paints, wood and plastics products, and even agricultural applications (as a soil conditioner), regulating them as hazardous will have widespread economic repercussions.

Even a proposed rule that includes an exception for "beneficial uses" will still create a stigma for CCBs and reduce its utilization. Manufacturers will likely employ alternative ingredients in light of potential tort liability implications, increasing the consumption of raw materials and raising product costs that ultimately will be passed on to consumers. This, in turn, will also increase greenhouse gas emissions as fewer industries – such as the cement industry, which uses substantial amounts of coal ash in its manufacturing processes – may be inclined to forgo utilizing CCBs altogether.

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2 EPA's initial conclusion was that some impoundments needed repairs, but none of them were in imminent danger of collapse or failure.

The Chamber would welcome the opportunity to discuss with you further any of the issues raised in this letter. Thank you for considering our concerns.

Sincerely,

William L. Kovacs

cc: Cass Sunstein
Kevin Neyland
Cortney Higgins
Matt Hale

March 22, 2009

By Email

Earley Green
Chief Clerk
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, D.C. 20515-6115

Earley.Green@mail.house.gov

Dear Mr. Green:

Attached please find my response to two sets of follow-up questions from the Honorable Edward Markey and the Honorable Joe Barton to the testimony I presented before the Subcommittee on Energy and Environment on December 10, 2009 at the hearing entitled "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal."

As requested, I have addressed separately the questions from the individual Members who submitted questions. Tomorrow, I will send my response to the final set of questions from the Honorable Fred Upton.

Thank you sincerely for this opportunity to provide the Subcommittee with additional information.

Sincerely,

Lisa Evans
Senior Administrative Counsel

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By Email

March 23, 2010

The Honorable Fred Upton
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Washington, DC 20515

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Dear Honorable Fred Upton:

Thank you for the questions submitted as a follow-up to my testimony before the Subcommittee on Energy and Environment on December 10, 2009 at the hearing entitled "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal." This letter provides my response to your questions.

1. *In your written testimony, you identified two Consumers Energy landfills –DE Karn and Weadock – on a list of landfills that have leaked contaminants, but have not yet been designated on EPA's list of damage cases. Isn't it true that both of these sites were initially thought to be in noncompliance with a groundwater discharge permit, but due to a calculation error by the Water Division of the Michigan Department of Environmental Quality (MDEQ) and subsequent analysis by MDEQ, both DE Karn and Weadock were found in compliance with their permits? Further, weren't both of these landfills relicensed for disposal on October 15, 2009?*

The fact that the State of Michigan may have granted an extension of the landfill permits to the Consumer Energy landfills is not material to the issue of whether the landfills were leaking dangerous contaminants. Specifically, whether the landfills were relicensed by the Water Division of the Michigan Department of Environmental Quality (MDEQ) or found to be in compliance with their permits does not change the fact that both disposal sites contributed significant quantities of contaminants, including arsenic and boron, to groundwater, Saginaw Bay and the Saginaw River.

According to MDEQ documents, the State of Michigan and Consumer Energy first determined that there was a potential for leakage from the landfills (actually large surface impoundments) in 1982. In 2001, an assessment determined that the contaminants could reach Lake Huron. Groundwater monitoring later confirmed that contaminants were reaching Saginaw Bay in levels that exceed federal standards.[1]

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[1] Michigan Department of Environmental Quality. Overview: DEQ Information Sharing Meeting (Oct. 13, 2009), *available at* http://www.michigan.gov/documents/deq/OverviewCompHist_298495_7.pdf.

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In response to the contamination, the MDEQ issued a Letter of Warning to Consumer Energy as the first step in an enforcement action. As a result, the State and Consumer Energy have been negotiating a consent decree that will require Consumer Energy to build slurry walls around both landfills in order to reduce the flow of contaminants outside of the landfill. One wall has already been finished, and the other is currently being constructed.

The Karn and Weadock Landfills are located adjacent to where the Saginaw River flows into Saginaw Bay. The two disposal sites receive coal ash from Consumer Energy's Karn/Weadock Generating Facility and were constructed in 1959 and 1961. The two disposal sites cover a total of 174 acres and have a capacity of 4,175,000 cubic yards. Ash was traditionally sluiced from the generating station to the two impoundments, but the Weadock Landfill is transitioning over to a dry ash disposal system in response to the ongoing contamination problems.

According to state documents, groundwater contamination from the two impoundments has resulted in elevated levels of arsenic, boron and lithium. A groundwater mound has developed beneath the impoundments, and as a result the contamination is flowing into both the Saginaw River and Saginaw Bay. Arsenic levels up to 0.997 mg/L have been measured in the groundwater between the berm of the impoundment and Lake Huron.[2] The contamination plumes are estimated to extend 100 to 500 feet from the dike of the Karn Landfill and 100 to 300 feet from the dike of the Weadock Landfill.

The area where the Saginaw River flows into Saginaw Bay has been designated an Area of Concern by the International Joint Commission, which is a joint American and Canadian board that addresses issues concerning the Great Lakes and Boundary Waters area. An Area of Concern is declared due to impairments of beneficial uses by contamination, which, in the case of the Saginaw Bay Area of Concern, includes damage to fish and wildlife populations and restrictions on drinking water consumption. The Area of Concern is a result of multiple sources of pollution, but studies have found that the Karn and Weadock Landfills are major contributors of arsenic contamination to Saginaw Bay.[3] The attached

2. *Your written testimony refers to a September 26, 2005 written report entitled Phase II Groundwater Discharge Evaluation. With the calculation correction made by MDEQ, as referenced in the above question (1), the report now shows that Consumers Energy is not out of compliance with discharge requirements. Do you dispute that the current record reflects Consumers Energy's compliance with permit requirements for DE Karn and Weadock?*

My written testimony did not address whether the Karn and Weadock landfills are in compliance with permits issued by the MDEQ. Elsewhere in my testimony, I assert that state regulatory agencies often fail to place stringent controls on coal ash disposal units and may, in fact, license units that are causing environmental harm. The fact remains, as shown by the state's own reports and data, that the Karn and Weadock Landfills have indeed discharged large quantities of

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[2] Michigan Department of Environmental Quality. DEQ CE Karn Weadock Ground Water Monitoring, *available at* http://www.michigan.gov/documents/deq/GSI_MZ_Monitoring_298496_7.pdf

[3] Michigan Department of Environmental Quality. Phase II Final Report, Karn/Weadock Landfills.

hazardous chemicals to the ground and surface water. Furthermore, the action taken by the MDEQ to require the installation of a slurry wall is proof that the state recognizes that dangerous contamination is leaving the site and that remediation is indeed necessary.

In fact, according to an August 26, 2009 letter from MDEQ to Consumers Energy, the company has committed to installing a new system of monitoring wells by June 30, 2010 and to completing the installation of a slurry wall by December 31, 2010.[4] Surely the State of Michigan would not require, nor would the company undertake, the construction of such expensive remediation measures if they were not necessary to address ongoing serious leakage from the landfills.

Thank you for the opportunity to provide additional information on this important issue.

Respectfully submitted by:

Lisa Evans
Senior Administrative Counsel

[4] Correspondence from Terry L. Walkington, P.E., Michigan Department of Environmental Quality to Dr. Larry Dawson, Consumers Energy. "Revisions to GSI Criteria and Facility Relicensing for Consumer Energy's Weadock and Karn Landfills, Bay County," dated August 26, 2009.

By Email

March 20, 2010

The Honorable Joe Barton
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Dear Honorable Joe Barton:

Thank you for the questions submitted as a follow-up to my testimony before the Subcommittee on Energy and Environment on December 10, 2009 at the hearing entitled "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal." This letter provides my response to your questions. For your convenience, I have repeated your questions, followed by my response:

1. *Your testimony calls Earthjustice the legal defense fund of the Sierra Club. Interestingly, on the Sierra Club website is a section entitled "Beyond Coal" where a case is made that all coal use should be ended in the United States. That being the case, can you assure me that your coordinated testimony and active legal filings related to coal combustion waste are merely about encouraging its management as a hazardous waste and not more about killing the use of coal in the United States to produce electricity?*

In my written testimony I stated that Earthjustice is a "national non-profit public interest law firm founded in 1971 as the Sierra Club Legal Defense Fund." We are not, nor have we ever been, "the legal defense fund of the Sierra Club."

While we were founded in 1971 as the Sierra Club Legal Defense Fund, we have always been a separate non-profit organization from the Sierra Club. Earthjustice has provided legal representation at no cost to over 700 clients, including public interest, environmental, public health and grassroots organizations from across the country. We represent these clients in various environmental litigation to ensure federal agencies follow laws passed by Congress such as the Clean Air Act, the Clean Water Act, the Endangered Species Act, the Resource Conservation and Recovery Act, and more. We represent the Sierra Club in litigation, but we also represent the Natural Resources Defense Council, the Environmental Defense Fund, the American Lung Association and many other groups, both small and large, representing both national and local interests. Because of the understandable confusion about our sovereign governance and mission and the name of the organization, in 1997 we changed our name to Earthjustice.

The second part of your question asks for assurance that my testimony and Earthjustice's active legal filings related to coal combustion waste are about encouraging its management as a

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hazardous waste and "not about killing the use of coal in the United States to produce electricity."

My testimony and Earthjustice's related legal filings are about forcing industry to pay the fair and reasonable cost of preventing harm from the disposal of the toxic waste they generate. Electric utilities that burn coal to generate power have historically enjoyed a free pass to dump their toxic waste product in the cheapest possible manner. But this dumping is "free" only for the polluter. For the millions of Americans who have the misfortune to live near these coal ash dumps and to drink water that may be poisoned by this waste, the dumping comes at a great cost.

Most Americans believe it's basically unfair for industry to pollute and then avoid the cost of cleanup. Forcing polluters to pay for their pollution is just basic American decency-- a concept strongly supported by the majority of Americans.

We believe that strong environmental laws passed by Congress have a vital role in protecting public health and the environment. We encourage federal agencies charged with enforcing these laws to take their responsibility seriously, since so much is at stake. We believe that industries have a responsibility to follow the law as Congress passed it, and we will continue to work for the promulgation of fair laws and regulations that provide no free pass for polluters.

2. *You state: "Coal combustion waste contains some of the deadliest chemicals known to man." Yet, the Congressional Research Service says that 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 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. Is it your contention that the mere presence of a potential hazard is enough to justify certain actions even if the likelihood of exposure is miniscule to non-existent?*

First, it is instructive to quote fully the Congressional Research Service (CRS) in their January 2010 Report, *Managing Coal Combustion Waste (CCW): Issues with Disposal and Use.* The full quotation is as follows:

> 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. <u>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.</u>[1]

(Emphasis added.) We agree with the CRS that it is the <u>combination</u> of (1) the presence

[1] Congressional Research Service, Managing Coal Combustion Waste (CCW): Issues with Disposal and Use," January 12, 2010.

of toxic metals in coal ash, (2) the likelihood that the ash will come into contact with water when it is disposed in unlined or inadequately lined ponds and landfills, and (3) the propensity of such metals, such as arsenic and lead, to leach in dangerous quantities from the waste when it comes into contact with water that creates a high risk of harm to human health and the environment.

While the mere presence of hazardous constituents in the waste does not, by itself, mean that these pollutants will contaminate surrounding media, we have ample evidence that such contamination is occurring. As long as coal combustion waste continues to be dumped into direct contact with water in unlined ponds and pits, the likelihood of exposure is far from "miniscule to non-existent" -- it is certain.

In the case of coal combustion waste, it is abundantly clear that toxic constituents, such as antimony, arsenic, boron, cadmium, chromium, lead, selenium and thallium, leach in harmful quantities from the waste. The U.S. Environmental Protection Agency (EPA) to date has identified 71 coal combustion waste sites that have damaged groundwater, surface water, or both. A new report by the Environmental Integrity Project and Earthjustice released last month identifies an additional 31 cases, which were reviewed by a team of hydrogeologists, attorneys and other experts based on data and other information publicly available in state agency files.[2]

Furthermore, the U.S. Environmental Protection Agency's Office of Research and Development (ORD) have published numerous studies between 2006 and 2009 that document the high levels of heavy metals that leach from coal ash. Three reports, published in 2006, 2008 and 2009, identified significantly higher levels of leaching than found previously by the EPA. In fact, the EPA's latest findings from its December 2009 Report, indicate that levels of arsenic, barium, chromium and selenium, leached from coal fly ash in quantities many times above the toxicity characteristic, the benchmark by which substances are deemed a "hazardous waste" under RCRA.[3] For these heavy metals, levels of the contaminants in ash leachate were 3.6 times (arsenic), 6.7 times (barium), 1.5 (chromium) and 29 times (selenium) the threshold level of hazardous waste.[4]

The data presented in the most recent EPA reports reveal a dramatically different picture when compared to the data presented in EPA's 1999 Report to Congress on Wastes from the Combustion of Fossil Fuels.[5] In the 1999 Report to Congress, testing of coal combustion waste only infrequently resulted in exceedances of the toxicity characteristic. According to the EPA, one of the reasons for the dramatic increase in heavy metal leaching is the use of a more accurate leach test. In the most recent report, the EPA explained:

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[2] Earthjustice and Environmental Integrity Project, "Out of Control: Mounting Damage at Coal Ash Waste Sites," February 2010, available at http://www.earthjustice.org/library/reports/ej-eipreportout-of-control-final-234am.pdf.

[3] U.S. EPA, Characterization of Coal Combustion Residues from Electric Utilities Using Multi-Pollutant Control Technology – Leaching and Characterization Data (EPA-600/R-09/151) Dec 2009, http://www.epa.gov/nrmrl/pubs/600r09151/600r09151.html at xiv.

[4] *Id.*

[5] EPA, Report to Congress, Wastes from the Combustion of Fossil Fuels, Volume 2 – Methods, Findings and Recommendations, EPA 530-R-99-010 (March 1999).

> In developing data to characterize the leaching potential of [constituents of potential concern] from the range of likely CCRs resulting from use of state-of-the-art air pollution control technology, improved leaching test methods have been used. The principle advantage of these methods is that they consider the impact on leaching of management conditions. These methods address concerns raised by National Academy of Science and EPA's Science Advisory Board with the use of single-point pH tests. Because of the range of field conditions that CCRs are managed during disposal or use as secondary (or alternative) materials, it is important to understand the leaching behavior of materials over the range of plausible field conditions that can include acid mine drainage and codisposal of fly ash and other CCRs with pyrites or high-sulfur coal rejects. The methods have also been developed into draft protocols for inclusion in EPA's waste testing guidance document, SW-846, which would make them available for more routine use. (http://www.epa.gov/osw/hazard/testmethods/sw846/index.htm)
>
> The selected testing approach was chosen for use because it evaluates leaching over a range of values for two key variables [pH and liquid-to-solid ratio (LS)] that both vary in the environment and affect the rate of constituent release from waste. The range of values used in the laboratory testing encompasses the range of values expected to be found in the environment for these parameters. Because the effect of these variables on leaching is evaluated in the laboratory, prediction of leaching from the waste in the field is expected to be done with much greater reliability.[6]

Further information on the toxicity of coal ash can be found in the following EPA Reports:

> (1) "Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers for Multi-Pollutant Control" (EPA/600/R-08/077) July 2008, available at:
> http://www.epa.gov/nrmrl/pubs/600r08077/600r08077.htm.
>
> (2) "Characterization of Mercury-Enriched Coal Combustion Residues from Electric Utilities Using Enhanced Sorbents for Mercury Control" (EPA-600/R-06/008) Feb 2006; available at:
> http://www.epa.gov/nrmrl/pubs/600r06008/600r06008.pdf
>
> (3) U.S. EPA, Characterization of Coal Combustion Residues from Electric Utilities Using Multi-Pollutant Control Technology – Leaching and Characterization Data (EPA-600/R-09/151) Dec 2009,
> http://www.epa.gov/nrmrl/pubs/600r09151/600r09151.html

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[6] U.S. EPA, Characterization of Coal Combustion Residues from Electric Utilities Using Multi-Pollutant Control Technology – Leaching and Characterization Data (EPA-600/R-09/151) Dec 2009, http://www.epa.gov/nrmrl/pubs/600r09151/600r09151.html at viii –ix.

(4) U.S. EPA, Evaluating the Thermal Stability of Mercury and Other Metals in Coal Combustion Residues Used in the Production of Cement Clinker, Asphalt, and Wallboard (EPA-600/R-09/152), Dec 2009, http://www.epa.gov/nrmrl/pubs/600r09152/600r09152.html

(5) Senior, C; Thorneloe, S.; Khan, B.; Goss, D. Fate of Mercury Collected from Air Pollution Control Devices; EM, July 2009, 15-21. http://docs.google.com/viewer?a=v&q=cache:Ja3eLhFq5Y0J:oaspub.epa.gov/eims/eimscomm.getfile%3Fp_download_id%3D491053+Fate+of+Mercury+Collected+from+Air+Pollution+Control+Devices&hl=en&gl=us&pid=bl&srcid=ADGEEShUcTwEh2Rs8gD3Xao_5JiUFwhQYib4AYsrhvISgRhRsHDhU1Vtr9IgyeSf6cNj8GTiCwrZHRwJ-pYuSOyM3UO0IBk6c_0hbmJ9vo9dLas-U4yJyC2ux-8pNbmq6sbw5eiAxbHX&sig=AHIEtbRjyt8wc-CNU58RCc0YCDm6iOSaJA

These EPA reports together conclude that hazardous levels of metals are indeed present in coal combustion waste, and these heavy metals do leach in dangerous quantities when the waste is mismanaged.

3. *Some people believe the threat of potential third party litigation presents a strong deterrent. Based on Earthjustice's practice of litigating to advance its policy objectives on many environmental issues, I think you would agree? What authorities, especially citizen suit or third party enforcement authorities under existing Federal environmental law, are so lacking that you would need a change to existing regulations to respond to any malfeasance or imminent threat?*

It is clear to Earthjustice that existing citizen suit authority under the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA) is inadequate to protect the public and environment from the mismanagement of toxic coal ash.

HSWA currently provides for two supplementary citizen suits. RCRA § 7002(a)(1)(A) authorizes citizens to sue for any violation of RCRA requirements, while RCRA § 7002(a)(1)(B) authorizes citizens to sue for "imminent and substantial endangerment" (ISE) caused by solid or hazardous waste. 42 U.S.C. § 6972, 6973.[7] You suggest that these provisions already provide sufficient authority to address the threats posed by coal ash, and therefore it is not necessary for the EPA to promulgate regulations governing coal ash. This claim, however, is entirely without merit, as discussed in detail below. RCRA is a preventative statute, and these reactive citizen suit provisions were never intended to serve as the backbone of a management program. Nor, as

[7] RCRA § 7002(a)(1)(A) authorizes citizen suits for "violation of any permit, standard, regulation, condition, requirement, prohibition, or order" issued under RCRA. 42 U.S.C. § 6972(a)(1)(A). RCRA § 7002(a)(1)(B) authorizes citizen suits against parties contributing to "the past or present handling, storage, treatment, transportation, or disposal of any solid or hazardous waste which may present an *imminent and substantial endangerment* to health or the environment" 42 U.S.C. § 6972(a)(1)(B) (emphasis added).[7] RCRA § 7003(a) authorizes the EPA Administrator, "upon receipt of evidence" of such imminent and substantial endangerment, to file suit and issue "orders ... necessary to protect public health and the environment." 42 U.S.C. § 6973(a).

a practical matter, could citizens feasibly employ these provisions to prevent coal ash from harming the public and the environment. The hazards of coal ash cannot reasonably be addressed through reactive litigation approaches. What is needed is a comprehensive regulatory program for coal ash under EPA's existing Subtitle C authority.

First, RCRA is a proactive statute, in contrast to remedial statutes such as CERCLA. It is designed primarily to address risks from wastes *before* they become a problem through comprehensive regulation. "RCRA is *preventative* in nature – 'it attempts to deal with hazardous waste *before* it becomes a problem by establishing minimum federal standards . . . and the permitting of facilities . . .." *S.C. Dep't of Health & Envtl. Control v. Commerce & Indus. Ins. Co.*, 372 F.3d 245, 256 (4th Cir. 2004) (quoting *Envtl. Tech. Council v. Sierra Club*, 98 F.3d 774, 779 (4th Cir. 1996) (emphasis added); *see also B.F. Goodrich Co. v. Murtha*, 958 F.2d 1192, 1202 (2d Cir. 1992) ("RCRA is preventative; CERCLA is curative."); *U.S. v. E.I. du Pont de Nemours & Co., Inc.*, 341 F. Supp. 2d 215, 237 (W.D.N.Y. 2004) (noting "RCRA was designed to address present and prospective threats"). Congress has also noted "RCRA is basically a prospective statute." Report on Hazardous Waste Disposal, Subcomm. on Oversight & Investigations, Comm. on Interstate & Foreign Commerce, 96th Cong, 1st Sess., H.R. COMM. PRINT 96 IFC-31, at 31 (Sept. 1979). The ISE provision is RCRA's "only tool" for addressing unsound past disposal practices, *id.*, and the statute as a whole is intended to deal with disposal practices and sites *before* problems emerge.

Second, *these citizen suit provisions were never intended to be primary enforcement mechanisms.* The legislative history of RCRA and HSWA clearly demonstrates that the citizen suit and ISE provisions are *supplemental* to a comprehensive, proactive federal regulatory system for hazardous wastes. Both provisions were included in the Senate bill that ultimately became RCRA from its first introduction,[8] along with regulatory authority over hazardous wastes. *See* S. 2150, 94th Cong., 1st Sess. (July 21, 1975); Pub. L. No. 94-580, § 7002–7003, 90 Stat. 2795, 2825–26 (Oct. 21, 1976). Thus, from the outset, Congress envisioned *both* an EPA-administered federal regulatory system *and* for citizens to enforce RCRA should EPA fail to do so.[9]

While legislative history discussing these provisions during the initial passage of RCRA is sparse, it is clear that the ISE provision was understood as an "emergency authority." *See* S. REP. NO. 94-988, 94th Cong., at 16 (June 25, 1976). And both the imminent hazard provision and the citizen suit provision in RCRA were modeled on similar provisions in the Clean Air Act and Clean Water Act, both statutes with comprehensive regulatory systems. *See id.* at 16, 18.

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[8] However, as discussed below, the original version of RCRA did not authorize citizen suits on ISE grounds, but only for violations of RCRA requirements. ISE citizen suits were subsequently authorized by HSWA.

[9] Legislative history predating S. 2150, the bill that became RCRA, reinforces that these supplemental provisions were intertwined with comprehensive hazardous waste regulation. S. 2150's citizen suit provision (in substantially identical form) and imminent hazard provision (in a somewhat different form) originated in a bill from the 93rd Congress that did not pass prior to adjournment. *See* S. 1086, 93rd Cong., 1st Sess. (Mar. 6, 1973), at 18, 23. Like S. 2150, S. 1086 proposed a comprehensive federal regulatory system. In contrast, competing bills from opponents who favored federal assistance or research, rather than federal regulation, did not contain citizen suit or ISE provisions. Such provisions have never been *alternatives* to comprehensive regulation but rather companions to it.

The legislative history of HSWA is more explicit about the supplementary status of these provisions. While HSWA substantially expanded these provisions — authorizing citizen suits to enjoin ISE situations under section 7002, *see* Pub. L. No. 98-616, §§ 401–402, 98 Stat. 3221, 3268 (1984) — the legislative history of these amendments is explicit that both provisions are "an *alternative and supplement* to other remedies." *See* Report of the Comm. on Env't and Public Works, S. REP. NO. 98-284, 98th Cong., at 57, 59 (Oct. 28, 1983, Calendar No. 500) (emphasis added). The sponsor of the expanded citizen-suit provision, Senator George Mitchell, was equally explicit: "I reiterate: These amendments are a supplement to, and not a substitute for Government action." 130 CONG. REC. 20,815 (1984); *see also* id. at 30,696 (statement of Sen. George Mitchell) (referring to the provision as "an important and necessary *supplement* to EPA's efforts" (emphasis added)); H.R. REP. NO. 98-198, at 53 ("[T]his expansion of the citizens suit provision will *complement*, rather than conflict with, the Administrator's efforts to eliminate threats . . . .") (emphasis added).[10] In one citizen suit under section 7002, the Supreme Court similarly observed that "[c]hief responsibility for the implementation and enforcement of RCRA rests with the [EPA] Administrator," reinforcing the limited role of citizen suits in only "some circumstances." *Meghrig v. KFC Western, Inc.*, 516 U.S. 479, 483 (1996).

These straightforward statements clarify that the citizen suit provision serves to buttress, not replace, proactive EPA enforcement under Subtitle C. *Nothing* in the legislative history supports your suggestion that citizen suits alone can adequately address the risks of hazardous substances such as coal ash. None of Congress' proposed bills ever severed these provisions from comprehensive regulatory schemes, nor did any member of Congress ever speak out against this dual system as redundant or unnecessary. The drafters of RCRA and HSWA clearly did not view these provisions, standing alone, as adequate to protect public health and the environment.

Third, relying on these provisions to control coal ash is infeasible and impractical. The history of ISE suits in the courts makes clear that the financial and evidentiary burdens placed on plaintiffs will generally be beyond the means of citizen groups. And even EPA, with its greater resources, cannot reasonably be expected to prosecute every ISE case, or even obtain evidence sufficient to prove imminent and substantial endangerment without the monitoring and data collection requirements that only a full *regulatory* program can provide.

In particular, citizen suits under section 7002 are a singularly inadequate method for protecting the public and the environment from the threat of substances like coal ash. The first limitation on the effectiveness of such suits is the significant cost — in time, money, and effort — to any citizen bringing suit. These costs are substantial not only for the advocacy organizations perhaps best equipped to bear them, but especially for individuals who may be most directly affected by endangering conditions. Second, citizen plaintiffs are subject to certain

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[10] The House Committee on Interstate and Foreign Commerce reflected a similar understanding of citizen suits as a "stop-gap" measure by quoting with approval the following in a discussion of federal facility regulation: "[A] citizen suit provision . . . provides a "second line" of enforcement by non-Federal officials or interested citizens. These citizen suit provisions are valuable for plugging holes that develop in a Federal enforcement program. However, they should not be relied upon as a primary source of surveillance and enforcement . . . ." H.R. REP. NO. 94-1491, 94th Cong., 2d Sess., at 50 (quoting report accompanying Administrative Conference of the United States, Recommendation 75-4, *reprinted with modifications at* William R. Shaw, The Procedures to Establish Compliance by Federal Facilities with Environmental Quality Standards, 5 Envtl. L. Rep. (Envtl. Law Inst.) 50,224 (1975)).

limitations that are not imposed on EPA. *See* 42 U.S.C. § 6972(b); *see also* H.R. CONF. REP. NO. 98-1133, at 117–118 (Oct. 3, 1984) (describing how the citizen suit provision was continually narrowed during legislative process through increasing limitations on its use). Third, plaintiffs may not be able to establish the requisite causal links to obtain a preliminary injunction in these lawsuits, allowing producers of harmful wastes to continue their conduct for the duration of the trial. *See, e.g.*, *Att'y General of Okla. v. Tyson Foods, Inc.*, 565 F.3d 769, 777 (10th Cir. 2009) (upholding district court's denial of preliminary injunction because plaintiff "fail[ed] to establish a causal link" between defendant's actions and bacterial contamination).

Finally, citizen suits are available only in a narrow set of circumstances — either imminent and substantial endangerment or RCRA violations left unaddressed by EPA — the existence of which may be extremely difficult and costly to demonstrate. The Supreme Court has been clear that ISE suits require an endangerment that "threatens to occur immediately," and cannot be used to address "waste that no longer presents a danger." *Meghrig*, 516 U.S. at 486. Similarly, courts have found that the citizen suit provision requires "continuous or intermittent" RCRA violations. *See Marrero Hernandez v. Esso Standard Oil Co.*, 597 F. Supp. 2d 272, 283 (D.P.R. 2009) (citing cases). Often, it may be impossible for plaintiffs to meet these standards given their limited means. *See, e.g.*, *Cordiano v. Metacon Gun Club, Inc.*, 575 F.3d 199, 211–12 (2d Cir. 2009) (finding lead contamination did not meet ISE standard, despite an expert report finding "potential exposure risk" and lead levels in excess of state standards).

Evidentiary hurdles are particularly substantial in ISE cases, because the circumstances of imminent and substantial endangerment are intensely fact-bound. This means that plaintiffs must often rely on costly expert witnesses and data acquisition. *See Burlington N. & Santa Fe Ry. Co. v. Grant*, 505 F.3d 1013, 1022 (10th Cir. 2007) (plaintiff relying on numerous sampling reports and an expert witness); *Cordiano*, 575 F.3d at 203–04 (describing competing rounds of expert testing at contamination site); Furthermore, such cases can rarely be decided at summary judgment because they often involve issues of material fact requiring a full trial. *See Grant*, 505 F.3d at 1021–22 (reversing summary judgment for defendant because "genuine issues of material fact" remained); *Marrero Hernandez*, 597 F. Supp. 2d at 284 (refusing to grant summary judgment to defendants since plaintiffs raised an issue of material fact regarding ongoing conduct by defendants); *K-7 Enterprises, L.P. v. Jester*, 562 F. Supp. 2d 819, 829 (E.D. Tex. 2007) (refusing to grant summary judgment to defendants because ISE condition unresolved due to presence of contaminants above recommended allowable limits). Even when these summary judgment motions are resolved in plaintiffs' favor, they yield extended full trials with all their attendant costs and burdens.

While some courts have found that plaintiffs have demonstrated imminent and substantial endangerment, the degree of evidence required for these determinations only underscores the difficulty of obtaining the necessary level of evidence. In *Interfaith Community Organization v. Honeywell International, Inc.*, for instance, the Third Circuit upheld the lower court's finding of ISE. 399 F.3d 248, 261 (3d Cir. 2005). The plaintiff had demonstrated contamination levels many times greater than the state standards, "present and continuing pathways for exposure" such as liner breaches, "ponding," and percolation, and "ample evidence of human trespass," and had presented expert testimony on "current risk[s] associated with current exposures" and elevated mortality rates in local organisms. *Id.* at 261–62. Most significantly, however, the

evidence also included *admissions* by the defendant of seepage, contamination, and inadequate containment measures, and an earlier finding by a state agency that the site presented a "substantial risk of imminent damage." *Id.* at 261–63. Other cases have also found ISE only in the presence of similarly overwhelming evidence. *See, e.g.*, *Parker v. Scrap Metal Processors, Inc.*, 386 F.3d 993, 1015 (11th Cir. 2004) (finding sufficient basis for jury's ISE finding in EPA test results, photographic evidence of disposal, and testimony from experts and witnesses). It seems likely that such unequivocal evidence will only be sporadically available, and perhaps only at considerable cost. With such evidentiary burdens, citizen ISE suits cannot reasonably be expected to address even a substantial minority of the coal ash sites endangering public health and the environment.

These considerations also impact ISE suits brought by EPA itself. While EPA may have greater resources and data collection capabilities than the average citizen, under section 7003 it too can only act reactively to address limited types of existing, hazardous situations, must meet high evidentiary burdens to prevail in proving ISE, and may have to wait until the conclusion of the litigation to obtain an injunction against the ongoing actions. EPA's evidentiary burdens are particularly acute given the absence of any monitoring or data collection obligations on the part of potentially responsible parties. Without a comprehensive regulatory program, EPA cannot mandate that such parties provide the data the agency needs to determine if an imminent and substantial risk exists. The agency therefore lacks the tools to determine when prosecution is warranted and to carry its burden in such a prosecution.

Congress was not unaware of these limitations on EPA's section 7003 authority when it chose to provide EPA with more rigorous enforcement powers in HSWA. Early on, when EPA's *only* authority was the ISE provision, Congress recognized that this approach was completely inadequate. In 1979, a House Committee report (known as "the Eckhardt Report") critiqued EPA's use of this provision. *See* Report on Hazardous Waste Disposal, Subcomm. on Oversight & Investigations, Comm. on Interstate & Foreign Commerce, 96th Cong, 1st Sess., H.R. COMM. PRINT 96 IFC-31 (Sept. 1979). While acknowledging that section 7003 "is designed to provide the Administrator with overriding authority to respond to situations involving a substantial endangerment," *id.* at 32, the Committee noted that "EPA has not effectively exercised its imminent hazard authority," *id.* at 18. The Committee went on to explain the inadequacies of the ISE provision:

> This authority is of limited utility for several reasons. First, it is *not preventative.* It requires that an actual hazard exists. Second, EPA can *only* exercise this authority where the owner or responsible party is identifiable and financially and otherwise able to remedy it. Third, even where these conditions obtain, the "imminent and substantial" test carries a *high burden of proof* in court. Fourth, any remedial efforts can only begin *after* successful judicial action, which can take a long time.

Id. at 32 (emphasis added). It would be difficult to state the problems with reliance on the ISE provisions more clearly than the Committee did in the Eckhardt Report. And these same hurdles still pose significant challenges to EPA actions today.

4. *You mention that we need a Federal standard and then you state that even if we get one it will not be good enough. What outcome is it that you seek?*

We seek federal standards promulgated by the U.S. Environmental Protection Agency addressing coal ash disposal under subtitle C of the Resource Conservation and Recovery Act. These federal regulations would be "good enough," if these standards require minimum basic safeguards that minimize the likelihood that coal ash contaminants will migrate from the waste into groundwater, surface water and air.

5. *Your testimony makes it sound like it's easy to permit a hazardous waste landfill. Have you ever tried to get one permitted? Have you or your organization ever tried to challenge the permits for such landfills?*

I have not personally been involved in the permitting of a hazardous waste landfill. In addition, to my knowledge, Earthjustice has not challenged a permit for a hazardous waste landfill.

6. *You urge that the EPA get in the business of certifying the safety of products that use fly ash. Why are the Department of Transportation and the Consumer Product Safety Commission incapable of handling these matters?*

In order to ensure that products made from coal combustion waste are safe, it is necessary to characterize the waste and determine (1) whether toxic substances will be emitted during manufacture of the product; (2) whether toxic substances will be released in harmful quantities during the life of the product; and (3) whether the harmful constituents of the waste will be released from the product when it is disposed. The EPA is most knowledgeable about how to characterize waste and predict its behavior. The EPA's Office of Research and Development has already done extensive research on the leaching behavior of coal combustion waste. (*See* response to question 2, above.) The Department of Transportation and the Consumer Product Safety Commission may also have important roles to play in this process, depending on the particular product and its intended use. Nevertheless, to ensure consumer safety and protection of the environment, the EPA must play a major role in assessing the safety and legitimacy of hazardous waste recycling.

Thank you for the opportunity to provide additional information on this important issue.

Respectfully submitted by:

Lisa Evans
Senior Administrative Counsel

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February 9, 2010

Honorable Joe Barton

Subject: Responses to Written Questions from Testimony on December 10, 2009 before the Subcommittee on Energy and the Environment, "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal"

Dear Congressman Barton:

Thank you for the opportunity to expand on some of my comments from the December 10 hearing. I have provided my responses to your questions below. Your questions are provided in italics for reference.

1. *In EPRI's research you compared constituents that might leach from fly ash as opposed to regular municipal solid waste – ordinary garbage. Is it true you found the contaminants that leached from the garbage to be more toxic than the fly ash? Do you think it would be wise to make household trash a hazardous waste under Subtitle C and subject to all those restrictions?*

   Risks associated with leaching of fly ash and MSW are difficult to compare directly because municipal solid waste risk is driven by organic compounds and coal combustion product risks are driven by inorganic compounds (e.g., metals). The specific question of how to regulate particular substances is beyond the scope of our work at EPRI.

2. *In your opinion, is it fair to use damage case sites that largely represent older facilities, on-site releases, and low toxicity constituents to accurately portray the state of thing today and have EPA make its decision based on these factors?*

   The damage cases are not representative of most new coal combustion by-product (CCB) site designs. The most significant difference is that most of the sites in the 2007 EPA damage case are not lined. A Department of Energy report (United States Department of Energy, 2006. *Coal Combustion Waste Management at Landfills and Surface Impoundments: 1994-2004*. DOE/PI-0004) found that 55 of 56 disposal units constructed between 1994 and 2004 were lined. The use of liners significantly reduces the likelihood of groundwater contamination. The damage cases also are not representative of non-hazardous waste disposal design under RCRA Subtitle D for municipal solid wastes, or non-hazardous regulations in states such as Wisconsin, where they have more than 20 years experience with lined CCB disposal sites. As such, while the damage cases provide valuable lessons in what does not work, they provide little information on disposal facilities that are lined and operated under state non-hazardous waste regulations.

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3. *Ms. Evans testimony disputes the claims of our testimony that DOE and EPA tabulated landfill design criteria for 56 CCB management new facilities constructed from 1994 to 2004, and they showed that all except one bottom ash landfill are constructed with liners and that these sites also have extensive groundwater monitoring networks. What makes you confident in your statement on this matter about the sophistication of current disposal facilities?*

   The 2006 DOE report is the only one that I have seen published that documents the designs of newly constructed cells for CCBs. While we have not done an independent survey, the results of the DOE report are consistent with my past experience.

4. *Your testimony makes six key observations about coal combustion waste damage sites. Ms. Evans testimony grandfathers in a number of sites that were not part of the EPA report. Do you believe your six key observations apply to her additional sites as well?*

   We reviewed available technical information for the sites documented in the 2007 EPA Damage Case Assessment report (USEPA, 2007. *Coal Combustion Waste Damage Case Assessments*. July 9, 2007, docket ID EPA-HQ-RCRA-2006-0796). We have not reviewed documentation for new sites not included in the EPA assessment.

5. *You state that the majority of damage cases have little potential to impact groundwater receptors. In view of our first panel of witnesses, I am intrigued. Could you please explain the significance of your conclusion that in the majority of cases, there either were no exceedances of groundwater quality standards attributable to coal combustion waste, or exceedances only occurred in on-site monitoring wells?*

   My comment was based on a variety of factors related to the damage cases. The majority of sites are located in areas that we determined were unlikely to have downgradient (downflow) groundwater receptors (e.g., located near a major river). Additionally, in all of the proven damage cases and most of the potential damage cases, remediation is underway or has been completed, greatly limiting the likelihood for receptor impacts. And in some cases, the groundwater impacts were not attributable to coal combustion by-products. For example, four of the sites contained only oil combustion wastes, and two of the sites contained a very small percentage of coal ash compared to the other wastes at the site.

6. *Could you please discuss the benefits of using coal ash in concrete and other road building materials? What would be the impact on road construction and the cost of federal highways if coal combustion wastes were to be labeled as hazardous?*

   In addition to lower cost for the end-user, the technical advantages of using coal ash in these applications are many-fold. Benefits of using coal ash in concrete include improved fresh concrete properties (i.e., improved workability, reduced water demand, better cohesion, and improved pumpability), reduced heat of hydration, improved long-term strength, reduced permeability, improved resistance to the penetration of chlorides and

sulfates, and improved resistance to alkali-silica reaction. Fly ash is often used in concrete designed for high strength performance. FGD gypsum is added to cement to control the set time characteristics.

Benefits of using coal ash in road construction (pavement, base, and sub-base) include more durable pavement with longer service life, lower maintenance requirements, stabilization of soft soils, and the ability to perform in-place pavement recycling. These advantages allow more rapid completion of roadway project, fewer traffic delays, reduced need for other construction materials, and less waste generation.

The Federal Highway Administration recognizes the value of using coal ash in roadway applications, and has developed technical guidance on the use and benefits of fly ash for highway construction projects. We have not performed an analysis of the impact of hazardous waste designation on road construction costs.

7. *Conserving water, lessening our dependence on foreign oil, reducing carbon outputs have been a major focus of the work of this committee. Could you discuss each of the environmental off-set/benefits obtained? How do beneficial uses work to address these matters? How would a hazardous waste designation by EPA affect the ability of U.S. consumers to realize these benefits?*

The Recycled Materials Resource Center (RMRC) performed a life cycle analysis for us to quantify the benefits of using CCBs from electric power production in sustainable construction. The analysis focused on fly ash, bottom ash, and FGD gypsum and their most common applications. Comparisons were made between energy consumption, water use, and greenhouse gas (GHG) emissions associated with conventional materials and procedures and those employing CCBs.

The preliminary analysis showed considerable savings are obtained by using CCBs in lieu of natural resources (e.g., limestone, rock gypsum). Using 2007 CCB use data, energy consumption was reduced by 162 trillion Btu, water consumption was reduced by 32 billion gallons, GHG emissions were reduced by 11 million tons CO2e, and $5-10 billion is saved. The reduction in energy consumption is commensurate with the energy consumed by 1.7 million homes (a large US city), the water saved is equal to 31% of the annual domestic water use in California, and the reduction in GHG emissions is comparable to removing 2 million automobiles from the roadway. An additional benefit is avoided disposal of the material that is used, conserving land area.

8. *How much coal combustion waste does California use in beneficial use applications. Does California have to import all its ash?*

The California Department of Transportation (Caltrans) has a very active program using fly ash in concrete for roads and bridges (see Pyle, T., 2009. *Industrial byproducts in highway applications, and California protocols for byproducts in cement and concrete*

applications, Industrial Materials Recycling Educational Forum USEPA Region 9, January 13, 2009). I do not have any figures on their total annual usage. My understanding is that California imports the ash they use from surrounding states.

9. *I don't want to be alarmist, but are you suggesting that making coal combustion waste a hazardous substance could destabilize electric power generation just enough that we could face the potential for brown outs because of it?*

   We performed a screening analysis of the costs of hazardous waste designation and the phase out of wet ash handling, looking on a unit by unit basis in six regions in the East and Midwest. The screening level analysis suggested that these costs are of the magnitude that could cause the expense of some generating units to exceed revenues, all other things being equal. However, power plant economics and dispatch are also affected by several factors that were not considered in this screening-level analysis, and a full market simulation was not performed.

10. *What would a hazardous waste designation of coal combustion waste do for electricity rates and electric reliability?*

    As discussed in the previous question, hazardous waste designation can be expected to increase near term operating costs for coal-fired power plants. We did not do a full market simulation, which would be required to quantitatively assess pricing and reliability.

11. *Your testimony did not go into job impacts, but would it be fair to say that places with a higher propensity to have coal mines or coal plants – and thus easier access for material to create products for beneficial uses – would be the areas most likely to see negative economic consequences if coal ash is designated a hazardous waste?*

    We did not evaluate the economic impact on the communities in coal mining areas or surrounding power plants.

12. *Much of EarthJustice's testimony relies on the EPA's draft risk assessment on coal ash, which I understand was critically questioned by an independent panel of peer review experts. While the panel had differing view, I understand that all the peer reviewers agreed that the draft risk assessment had fundamental flaws. I also understand that EPA has years worth of real-world data on alleged risks from coal ash management units and that these real world data do not show the alleged risks from coal ash management as that modeled in the draft risk assessment. Could you please elaborate on the peer review panel's criticisms of the draft risk assessment: specifically, why it is problematic in using the draft in drawing any definitive conclusions regarding coal ash management. Also could you discuss the inherent flaws with using a draft risk assessment in assessing the risks from coal ash management in light of the overwhelming amount of real world data EPA has assembled showing lesser risks from coal ash management units?*

EPA's draft risk assessment received many comments from all perspectives when it was published in the Federal Register in 2007, and subsequently was critically evaluated by a panel of peer reviewers. The commenters and peer-reviewers pointed out a number of significant issues with the draft risk assessment.

Many of the peer-reviewers comments centered around the large variability in sites inherent in a modeling study of this type, the lack of site specific data, and the uncertainty associated with many of the data inputs. Reviewers commented on the use of a 10,000 year model simulation, assumptions used regarding the extent and duration of leaching, receptor assumptions, and lack of sensitivity analysis. Several of the reviewers noted the large range of risks in the modeling results, and questioned whether the results adequately reflect overall risks posed by current CCB sites.

EPA did not attempt to compare real world data to modeled risks in the 2007 report. Multiple peer-reviewers suggested the need to validate the risk model with field measurements. The draft risk assessment does not consider several factors that in actual practice may have a significant impact on the modeled risk. These include the limited potential for downgradient receptors from many of these sites due to their physical locations, the reduced probability that new drinking water wells will be sited down-gradient from a waste site, and the role of remediation in mitigating the potential for receptor impacts over the long-term. All of the peer-reviewers acknowledged the difficulty of conducting a risk assessment on a national level considering the diversity in geography, hydrogeology, etc. In our comments, we suggested EPA should focus their efforts on evaluating the existing data from actual sites to assess risks, rather than attempting to perform an all encompassing Monte Carlo (statistical) modeling effort based on a large number of assumptions.

Sincerely,

K. Ladwig

Kenneth Ladwig
EPRI Senior Research Manager

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February 9, 2010

Honorable Edward J. Markey

Subject: Responses to Written Questions from Testimony on December 10, 2009 before the Subcommittee on Energy and the Environment, "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal"

Dear Congressman Markey:

Thank you for the opportunity to expand on some of my comments from the December 10 hearing. I have provided my responses to your questions below. Your questions are provided in italics for reference.

1. *In your testimony, you state that fly ash is similar in composition to a wide variety of naturally occurring rocks found on Earth.*

    a. *Isn't it also true that your own research finds that levels of arsenic typically found in coal ash are always much higher than those that are found in rocks, and can be as much as 200-300 times higher?*

    In my testimony I stated that "Because ash is derived from the inorganic minerals in the coal, such as quartz, feldspars, clays, and metal oxides, the major elemental composition of coal ash is similar to the composition of a wide variety of rocks in the Earth's crust (Slide 9)." As shown on Slide 9 (submitted with my written testimony), oxides of silicon, aluminum, iron, and calcium comprise more than 90 percent of both coal and rocks. My testimony further stated that, "Trace element composition of fly ash is qualitatively similar to rocks and soil, but some of the trace elements are enriched relative to typical concentrations in rocks and soil." This is shown on Slide 10 showing trace element ranges for both coal ash and rocks.

    Our data indicate that median arsenic concentrations in fly ash are about 50 times higher than median arsenic concentrations in rock. While arsenic concentrations in fly ash are usually higher than those in rocks, they are not always higher. The bar chart in Slide 10 submitted with my written comments depicts the 10th to 90th percentile arsenic concentrations for both fly ash and rock, and these two ranges do not overlap. However, if the minimum and maximum ranges are used, the rock data range is extended significantly due to extremes in the rock data, and the fly ash range for arsenic lies completely inside the rock range. However, we believe that the 10th to 90th percentile ranges provide a better representation for the two materials because outliers are eliminated, particularly from the rock data which exhibits an unusually large range.

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b. *Aren't levels of selenium, barium, lead and several other heavy metals also typically considerably higher in coal ash than they are in naturally occurring rocks?*

Again referring to Slide 10 from the materials submitted with my written testimony, our data indicate that the fly ash 10th to 90th percentile ranges for several trace metals are near the upper end or above the 10th to 90th ranges for rocks.

c. *Can arsenic and other heavy metals leach out of rocks as easily as they can leach out of coal combustion waste? Why or why not?*

We have not performed or reviewed any leaching studies on rocks, so I cannot make a generalized comparison. Arsenic leaching from many rock types varies considerably depending on rock type and geochemical environment. For example, the USGS has done an extensive characterization of arsenic in groundwater in the United States (*Arsenic in Ground-Water Resources of the United States,* http://pubs.usgs.gov/fs/2000/fs063-00/). While concentrations were generally low, they also found naturally high concentrations (exceeding 100 microgram per liter [µg/L]) in groundwater associated with a variety of different rock types in several parts of the United States, including the West, Midwest, Southwest, and Northeast. High levels of arsenic associated with geologic origins also occur in groundwater in many parts of the world, notably Bangladesh, West Bengal, and China, ranging from less than 0.5 µg/L to greater than 5,000 µg/L (Smedley and Kinniburg, 2002. "A review of the source, behaviour, and distribution of arsenic in natural waters" Applied Geochemistry, v. 17, p. 517–568; World Health Organization, 2009. *Arsenic in drinking water*, http://www.who.int/mediacentre/factsheets/fs210/en/).

We do have quite a bit of data on leaching of arsenic from fly ash. The leaching process is complex, depending primarily on fly ash type, arsenic speciation, pH conditions, and presence of iron and calcium (Wang, J. et al, 2008. *Adsorption of arsenic(V) onto fly ash: a speciation-based approach*, Chemosphere, V72, pp371-378). The As(III) species is more mobile than the As(V) species. Minimum arsenic leaching generally occurs in the middle pH range of 4 to 6 for low calcium fly ash. In high calcium fly ash, it appears that the release of arsenic is controlled by formation of calcium compounds (Wang, T. et al., 2009. *Leaching Characteristics of Arsenic and Selenium from Coal Fly Ash: Role of Calcium*, Energy & Fuels, V 23, PP 2959–2966). In some cases, secondary reactions within the ash, such as adsorption to iron oxides, can partially immobilize the arsenic.

Actual field data provides the best measure of leaching for any material. In a relatively large field study with the Department of Energy, we found that the median arsenic concentration in fly ash leachate was 25 µg/L, with a range from 1.4 to 1380 µg/L, and that As(V) was the dominant species present (EPRI, 2006. *Characterization of Field Leachates at Coal Combustion Product Management Sites: Arsenic, Selenium,*

Chromium, and Mercury Speciation. EPRI, Palo Alto, CA, and US Department of Energy, Pittsburgh, PA: 2006. 1012578). Arsenic concentrations in groundwater would typically be lower due to attenuation processes (EPRI, 2006. *Chemical Attenuation Coefficients for Arsenic Species Using Soil Samples Collected from Selected Power Plant Sites: Laboratory Studies*, EPRI, Palo Alto, CA, and U.S. Department of Energy: 2004. 1005505.)

d. *You say that the materials that leach out of coal ash are comparable to the materials that leach out of non-hazardous inorganic wastes-but your own data shows higher potential concentrations for 6 of the 13 elements you're measuring for. Could these different leach rates lead to a different human health impacts associated with coal ash than those associated with non-hazardous inorganic wastes?*

The data provided with my testimony shows generally overlapping ranges for fly ash and metal slag wastes. As you have noted, for about half of the constituents the maximum is higher for fly ash, and for about half the maximum is higher for metal slag. My statement that they are comparable was based on a qualitative comparison of the overall data, with the general overlap in ranges and the variability in maximums.

Each of the trace constituents found in fly ash and metal slag has different environmental characteristics, including differing toxicology, differing release rates, and differing mobilities in groundwater. These factors and others have to be considered on a site-specific basis to evaluate the potential for human health risks for any material.

2. *In your testimony, you mention that many of the most problematic cases identified by EPA involved leaching from older storage facilities that didn't have liners.*

a. *We heard from one witness on the first panel who indicated that the company that had previously disposed of coal ash in a dry waterway was now disposing of it in a old mine, leaching from which is now causing new contamination into the groundwater. Is it your belief that if dry coal ash disposal is to occur in old mines, that they too should be lined to ensure that leaching not occur? Why or why not?*

We have not done a broad evaluation of mine placement of coal combustion by-products (CCBs). Mine environments vary widely in their hydrogeologic and geochemical characteristics, and need to be evaluated on a site-by-site basis.

b. *We heard from another witness on the first panel that the so-called beneficial use of constructing a golf course using coal fly ash resulted in leaching of contaminants into the water table. Do you believe that any beneficial use approved by EPA should ensure that the materials either be completely isolated from water,*

or remain inert when they come into contact with water, such as using them to make concrete?

I have no specific knowledge of the site referenced and so cannot comment on any technical aspects of that particular site. In general, the environmental performance of a structural fill site depends on several site-specific factors, including ash characteristics, site size, depth to water table, surficial features, locational criteria, construction, and end use. EPRI currently is developing a methodology for evaluating the environmental suitability of structural fill applications using these criteria.

c. *In your testimony, you state that most of the landfills in the 63 problematic cases EPA has examined are older cases, which were opened before RCRA was enacted. What difference does that make, since coal combustion wastes have never been regulated under RCRA in the first place?*

CCB disposal sites have been and continue to be subject to the Part 257 requirements (Criteria for Classification of Solid Waste Disposal Facilities and Practices) contained in RCRA. In addition, following the enactment of RCRA, several states developed non-hazardous disposal regulations including design standards that are applicable to coal combustion by-products. In my testimony, I cited Wisconsin as an example of such a state, which has required liners, leachate collection systems, and groundwater monitoring for CCB disposal sites since 1988. In addition, the 2006 DOE report (United States Department of Energy, 2006. *Coal Combustion Waste Management at Landfills and Surface Impoundments: 1994-2004.* DOE/PI-0004) found that nearly all CCB disposal units licensed between 1994 and 2004 are lined, which represents a clear departure from the older units in the Damage Case Assessment report.

One purpose of our review of the 2007 EPA Damage Case Assessment was to evaluate the relevance of the damage cases in assessing the risks posed by various disposal site management options currently under consideration by the USEPA. In that context, the ages and the designs of the damage case sites are important considerations.

d. *Isn't it also true that the list of cases doesn't even contain the Gambrills Maryland case, which resulted in the contamination of 30 drinking water wells?*

Our review was limited to the cases and criteria documented in the 2007 EPA Damage Case Assessment report (USEPA, 2007. *Coal Combustion Waste Damage Case Assessments.* July 9, 2007, docket ID EPA-HQ-RCRA-2006-0796). The EPA report does not include the Gambrills site.

e. *What about the Battlefield Golf Club-wasn't that a more recent case?*

As noted in the previous question, our review included the cases documented in the 2007 EPA report. The EPA report did not include the Battlefield Golf Club.

f. It seems clear that EPA's list of more problematic sites is not complete. Do you think this list includes all of the proven damage cases that were well known when it was compiled by EPA?

EPA's evaluation included 85 sites, of which 67 sites were determined to represent either potential or proven damage cases (43 potential, 24 proven). As outlined above, additional possible sites have recently become public that were not included in the EPA study, but to my knowledge EPA has not yet published any data or an assessment of those sites.

g. Do you believe that EPA currently has the data it needs to come up with a complete list?

I do not know what data EPA has in its possession, therefore I cannot answer this question definitively. A variety of data can be obtained from a review of state records, utility records, and other sources.

3. Some have said that the regulation of coal wastes should be left to the States.

a. In one case in Montana, contaminants from coal ash migrated more than half a mile from its site, and this case was recently settled for more than $25 million dollars. The State of Montana recently eliminated all state oversight of coal waste generated by any new coal plant. Do you believe this is acceptable?

I have not reviewed any technical information specific to the Montana site or the action taken by the State of Montana.

b. In Iowa, most coal waste disposal occurs in unlined gravel quarries with no groundwater monitoring. Do you believe this is acceptable?

I do not have any technical information specific to disposal site design or monitoring requirements in Iowa.

4. In your testimony, you also state that there is little chance for the most problematic cases identified by EPA to result in groundwater contamination, and you indicated that off-site toxic contaminants were found at only 3 of the sites on EPA's list. Have you reviewed documentation demonstrating that either State or federal regulators attempted to test the groundwater off-site at all of these sites? If not, is it possible that a reason why there aren't more known cases involving groundwater contamination could be because no one has even looked for it?

I believe the comment from my testimony that you are referring to was that the majority of damage cases in the 2007 EPA report had little potential for impacting groundwater receptors. This finding is predicated on the fact that the location of the

damage cases limits the likelihood of potential downgradient groundwater receptors at the majority of sites (e.g., adjacent to major rivers), and remediation activities either have been completed or are occurring at most of the sites that will significantly limit the potential for receptor impacts. Regarding the prevalence of on-site versus off-site monitoring data, we reviewed all of the documentation in the 2007 EPA report, along with additional information from utilities, states, and other sources. In general, I would expect that there would be more on-site wells, because on-site wells are generally employed to provide the first indication of a groundwater impact, with the goal of preventing off-site movement of contaminants.

5. *EPRI recently released a study that assessed the costs of regulating coal combustion waste as a hazardous waste under Subtitle C of RCRA.*

   a. *In this work, did you assume that all wet impoundments would have to be shut down and that the waste would have to be transferred into dry storage facilities?*

   We assume that wet management would be phased out by 2016, and all newly generated material for disposal would be managed in dry landfills.

   b. *Did you also assume that the dry storage facilities would be typical, licensed hazardous waste dumps under Subtitle C of RCRA?*

   Yes, we assume the landfills would adhere to applicable RCRA Subtitle C requirements.

   c. *Did you also assume that no beneficial use of coal combustion waste would be allowed by the regulation?*

   We did not assume that no beneficial use would be allowed. We are modeling two basic scenarios in our study; in one scenario, no beneficial use occurs, while in the second scenario, the use of ash in concrete and FGD gypsum in wallboard continues at rates similar to those in 2008. See my answer to the next question for a more detailed discussion of the reasons for our selection of these two scenarios.

   d. *The EPA is expected to imminently propose RCRA regulations for coal combustion waste. Which of your assumptions used to calculate the costs of regulation have been validated by the EPA's proposal (Please feel welcome to wait until after the EPA issues its proposal before responding to this question)?*

   As of this response, EPA has not released their proposal. The two scenarios described in my response to the previous question were selected to represent two possible regulatory scenarios: 1) full Subtitle C regulation as a hazardous waste and phase out of all wet management; and 2) a hybrid approach, with Subtitle C hazardous waste regulation of disposed material, phase out of wet management, and exemption of

selected beneficial use applications. We cannot quantify the extent to which beneficial use will be affected by a hazardous waste designation, and it is likely to be several years following regulation before that impact can be fully judged. The scenarios we modeled represent two reasonable end points of the hazardous waste and hybrid approaches. If the final proposal is substantially different than either of these scenarios, we will consider additional analyses.

6. *You state in your testimony, "Leaching of trace constituents from FGD gypsum using standard protocols is very low."*

   a. *Have you seen the results of leach testing performed on FGD gypsum by US EPA staff at Research Triangle Park?*

   Yes.

   b. *Are you aware that selenium leached from FGD gypsum at 3,000 micrograms/liter in EPA's tests? (See Report 2 - Characterization of Coal Combustion Residues from Electric Utilities Using Wet Scrubbers –EPA/600/R-08/077, July, 2008) That level is three times higher than the concentration of selenium leaching that would classify the gypsum as a hazardous waste (the " toxicity characteristic" under RCRA). It is also 600 times higher than the level of selenium in freshwater that can make fish populations unable to reproduce. Do you think this is a "very low level" of leaching?*

   The 3000 microgram per liter concentration cited in your question was for unwashed gypsum leached under conditions where a pH of 2 was maintained. This is a highly acidic condition and is not representative of disposal or use applications, with the possible exception of a highly acidic mine environment or one where pyrite oxidation is occurring. Most wastes and construction materials, as well as soil and rocks, will leach constituents under such acidic pH conditions. The selenium concentration for the same gypsum sample, when leached at its natural pH of 6.9, was about an order of magnitude lower.

   As you stated, my comment referred to "standard leaching procedures". This refers to typical <u>single point</u> batch leaching procedures that have been in use for many years and are most commonly used in regulatory contexts (TCLP, SPLP, DI water, etc.). The single concentration generated by these tests can be compared directly to an established limit (e.g., the TCLP hazardous waste limit).

   The Research Triangle Park (RTP) leaching framework you are referring to (here referred to as the RTP procedure) is a new suite of tests that are not standard at this point in time. The RTP methods are <u>multi-point tests</u>, which produce several concentrations for each constituent at different pH levels ranging from 2 to 12, and different liquid-solid ratios. This information is much more complex to interpret,

yielding a range of concentrations for each constituent. The results can only be interpreted with knowledge of the actual environmental conditions that a material will be exposed to after disposal or use. It is not valid to simply select the highest observed concentration and assume that is representative of how the material will behave.

The RTP protocol has not been routinely applied to wastes in the US, and I don't believe it has ever been used in a regulatory context in the US. To my knowledge, the 2008 report and an earlier 2006 report on fly ash are the only two published applications of this method by EPA. The RTP method actually consists of four separate test methods (two batch, one column, and one diffusion). These four methods are in draft form for inclusion in SW-846, and EPA is just in the beginning phases of the first inter-laboratory validation study of the two batch tests. There are only a handful of research labs that have conducted this leaching protocol in the US.

c. *Do you think that the tests used by the EPA staff that found this much leaching of selenium are more accurate at telling what the gypsum will leach in the environment or are the "standard protocols" that you refer to more accurate? Please fully explain you response.*

The RTP procedure is a very sound laboratory protocol. EPRI and others have used similar protocols in past research to evaluate a material under a variety of disposal and use environments, to analyze the geochemical mechanisms controlling leaching, and to gain a much broader perspective on a material's performance. The standard single point tests are more limited in their application.

However, with more data comes more need for critical data evaluation. The single point tests have the advantage that they are simple to perform, they have been applied to many wastes, and the results are easily compared to a single limit. The same cannot be done with the multiple data points generated by the RTP protocol. Vanderbilt University (co-developers of the RTP leaching protocol), are also developing geochemical software called LeachXS to assist in analyzing the data produced by the protocol. It is inaccurate to simply select a single point from these large datasets produced by the RTP protocol and assume that it is representative of an actual material and disposal/use environment. In essence, that reduces the RTP protocol to a single-point test based on worst possible leaching conditions (often either very low or very high pH).

The RTP protocol is best applied to a risk evaluation for an individual site, where site conditions are known and the appropriate range of results can be extracted from the data and used in a meaningful way. I have been working with Vanderbilt University to use the protocol in this context.

7. *Recently, a number of companies have refused to provide information about the size of their coal waste impoundments to EPA because they say that doing so could pose a homeland security risk. Do you believe that in light of this risk, Congress should consider legislation to upgrade security requirements at these facilities? Why or why not?*

   This question is outside my specific area of research, and the scope of EPRI's technical work on CCBs.

Sincerely,

Kenneth Ladwig
EPRI Senior Research Manager

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January 28, 2010

The Honorable Edward J. Markey

Chairman

House Energy & Commerce

Subcommittee on Energy and Environment

Dear Chairman Markey:

Pursuant to committee rules, I am hereby submitting my responses to the questions, which you have directed to me, in follow-up to my appearance and testimony before the
Subcommittee on Energy and Environment on December 10, 2009, at the hearing entitled, "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal."

1. The first question inquires as to whether the individuals whom I had evaluated as a result of their concerns regarding exposure to fly ash in a spill that occurred in their neighborhood in Forward Township, PA. on January 25, 2005, were actually aware that an accident had occurred?

My understanding, based on what I was told by the individuals involved and the photographs that I have seen of the site at issue, was that the individuals I saw were acutely aware that an accidental spill had occurred from an adjacent hillside into their neighborhood, streets and yards. The published description of the slide in the local newspaper identified a large landslide of wet fly ash, which clogged the local stream, Perry Mills Run, for a considerable distance, creating a large dam initially, until the water gradually drained through the muddy slide area. It would not have been conceivable for the residents not to have been aware of this unfortunate incident.

Subpart B of question 1 asks whether any of the individuals I evaluated were drinking bottled water or taking other protective measures to avoid exposure. I was not aware of any of the individuals involved utilizing bottled water or taking other specific protective measures. In fact, most of the adults involved told me that they had been out walking through ash and mud and shoveling it, and doing their best to remediate their properties before any outside agencies/organizations had even become aware of it. .

The next inquiry, Subpart C, under question 1 had to do with two of the individuals who testified at the Subcommittee Hearing on December 10, 2009. These were among a panel of witnesses who reportedly were unaware that their drinking water supply had been contaminated. The continuing question asked whether I would agree that the ingestion of high levels of heavy metals such as selenium or arsenic over a period of many years would pose a different degree of health risks than a short term exposure, as in the case that I had cited.

In that regard, acute and chronic exposure to any material is, by definition, entirely different. There are some materials that might pose a potentially acute health risk and others that could represent a potential chronic health risk. All of such health risks are dependent upon numerous factors, which include, most importantly, the concentration or dose of the material in question, the route of exposure such as air, water or food; the chemical form of the substance, various other chemical characteristics of the specific substance, the human metabolism of the substance, whether or not the structure and composition of the material is altered in the course of its being acted upon by normal bodily elimination systems, and a host of other factors, all of which enter into the potential toxicity of
a compound. Certainly there are dose levels of arsenic and all chemical substances, at which they are potentially lethal, and the acute toxicity of materials is generally far better characterized than the potential for long term harmful effects. Nevertheless, dose is always critical. In recent times the process of adaptation has entered into the mix as a further complicating factor in the case of long term exposures to all materials. Perhaps one of the most fascinating examples of adaptation is in the mountainous region of Central Europe known historically as Styria. Individuals there were known to consume small quantities of arsenic trioxide as a natural health remedy. Many eventually increased their doses to as much as 400 mg of arsenic trioxide daily, a quantity that would have the potential to cause serious morbidity or even mortality for ordinary people. Yet, the arsenic eaters reputedly enjoyed longer than average life spans. Many other examples of adaptation with regard to chemicals abound and has been further elucidated in the toxicological literature. Two of the most familiar examples are alcohol and nicotine. Basically, the process represents an habituation to exposure to increasing levels of a material, which in turn may induce enzymes or other bodily factors that can actually convert what might be otherwise a potentially toxic material into a beneficial one. The study of this process, known as "hormesis", has been the subject of intense investigation by scientists such as professor Edward Calabrese and colleagues at the University of Massachusetts - Amherst ("U.S. News & World Report", 10/18/2004, 74-75).
In any event, the consumption of any material or even food stuff, for that matter, on a regular basis, over a long period of time, in contrast with a short term exposure to the material, would have to be evaluated on a case by case basis. I have seen no specific medical or scientific data of any type to corroborate the quantities and/or specific nature of the alleged exposures of the panel witnesses.

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Subpart D of question 1 asks whether or not I examined the Forward Township residents because they were my patients. These five or six individuals were referred to me by the Chairman of the Department of Public Health at the University of Pittsburgh Medical Center, where I have been a faculty member for the past 30 years. I did not charge these individuals for the private services that I provided to them, including their history and physical examination, and my counseling. It was not until a couple of years later that I was contacted by an attorney representing these individuals in a legal action, who requested their medical records. At that time, the attorney compensated me for retrieval of the medical records at the request of these individuals, and when he had learned that I had not received any payment for the service I had rendered to them, provided me with a modest unsolicited reimbursement at that time.

2. With regard to my experience addressing the aftermath of the TVA coal ash incident of December 22, 2008, in Kingston, Tennessee, I visited that site at the invitation of the American Coal Ash Association, who had learned of my prior experience in evaluating individuals exposed to coal ash during the previously discussed ash slide in Forward Township, Pennsylvania in January 2005. I did not receive any compensation for that visit or for the time that I spent in a public meeting discussing their concerns with local residents involved in the spill. I did, however, receive reimbursement for my travel expenses to Tennessee and a modest amount of compensation ($1,800.00) for several hours of preparation time I spent in advance of the visit, reviewing EPA and TVA documents regarding the composition and levels of arsenic, mercury, and other constituents in the ash, soil and the local waterways. I felt that the time involved with my visit there and my counseling of the community residents was a public service.

3. In subpart A, the inquiry asks whether or not I was suggesting that there was no arsenic in the coal ash that was discharged? That question defies the obvious. Of course there was arsenic identified in the discharged coal ash. What I had stated in my testimony before the Subcommittee in December was that I did not identify abnormally high levels in the drinking intake areas that were measured at those river sites by both the EPA and the TVA.

Subpart B. The question is whether or not I would agree that a slow leach of arsenic and other heavy metals into ground water could eventually reach drinking water sources? That is a very open ended question, which demands an open ended response. Certainly, whether or not arsenic or other heavy materials might eventually reach drinking water sources would be entirely dependent upon a wide variety of independent factors, including the relative location of the ground water supply or individual wells in relation to the source of the metals. Many soils have the capability of attenuating the presence of arsenic in soil or water, and it is well known that arsenic in water may undergo a complex series of transformations including biotransformation, oxidation-reduction reactions, precipitation, and other responses. The presence of metals such as sulfide ions, iron, barium, calcium in the soil or water; together with temperature, salinity, and

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other critical factors, all would play a role in whether or not a metal would be bound to another mineral, dissolved in the water or potentially reach a ground water site or not. Again, it would be dependent upon a multiplicity of such cofactors and would require a review on a site by site basis to determine whether or not such a leaching process might be expected to occur or not.

Subpart C. In this segment of question 3, I am asked whether or not the levels of variety of metals exceeded drinking water standards at wells in Gambrills, Maryland due to a slow leaching process from a nearby pit. While I listened to the testimony of the individual who was a resident of Maryland and provided her personal story regarding well water contamination, I am not sufficiently acquainted with any of the details of that individual's drinking water and any contaminants that might have been present and have reviewed no medical or scientific documents corroborating that testimony and cannot reasonably comment on such a question.

4. This inquiry asks whether or not exposure to toxins from different pathways such as air, food or water might not magnify the potential for adverse health affects?

Once again, it is not possible to respond specifically to a generic question. Certainly individuals exposed to toxins via different pathways will experience differing risk factors, but once again it would be entirely dependent upon the concentrations,ie.,doses, involved in each instance, the route of exposure, the length of the exposure, the chemical nature of the contaminant involving a specific route of exposure, and a host of other factors. Arsenic, for example, is ubiquitous in the environment. As I stated in my testimony before the Subcommittee in December, some areas of the United States contain unusually high naturally occurring levels of arsenic in rock, which can lead to potentially high levels of arsenic in soil or water. Regardless, most arsenic in the body, as pointed out in the Public Health Toxicological Profile for arsenic provided by the Agency for Toxic Substances & Disease Registry (ATSDR 2004), much of the arsenic ingested from water, soil or food is likely to be modified into a less harmful organic form and eliminated from the body in a relatively short period of time. Surveys of United States drinking water indicate that about 80% of public water supplies have less than 2 ppb of arsenic but approximately 2% of those supplies exceed 20 ppb of arsenic. Levels of arsenic in food range from 20-140 ppb; however, the levels of inorganic arsenic that form the greatest health concern are far lower, with urban areas generally demonstrating average arsenic levels ranging from 20-30 ng/m3. It is actually quite interesting to realize the levels of arsenic concentration in fresh or well water measured in the United States is considerably variable depending on location, with significant levels being identified particularly in the northwest, segments of the southwest and in thermal waters throughout the U.S. and Canada. As mentioned previously, arsenic has been found in a wide variety of comestibles and is especially omnipresent in seafood, but representing a relatively nontoxic form. Arsenic is naturally present in virtually all waters including rivers, lakes, springs, and wells;

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and is ingested daily in foodstuffs usually at a rate of less than 1 mg per kilogram. Meat, fish, and poultry generally have the highest levels, with marine fish, some crustaceans, algae, and seaweed containing upward of 50 mg per kilogram. Some beverages, including bottled water, especially mineral waters from springs, and wine also contribute significant amounts of arsenic to the diet. Once again, what is critical to note is that the levels that have been experienced

in all of these areas of the United States do not represent a significant public health hazard. In California, a number of reports of isolated instances of higher than usual concentrations of arsenic in well water ranging from 0.1-1.4 mg per liter were identified. These levels represented upwards of 30 times greater than the United States Public Health Service, EPA, and WHO recommendations for drinking water standards of 0.05 mg per liter, yet evaluation of individuals consuming those water supplies did not demonstrate any evidence of any specific illness. Similarly, a study conducted on human subjects drinking in excess of the recommended standard of 0.05 mg per liter of arsenic for at least five years were examined and compared with controls in the early 1980s("Chromosome Studies in Human Subjects Chronically Exposed to Arsenic in Drinking Water", B.K. Vig, et.al., "American Journal of Industrial Medicine", 6:325-338, 1984). These individuals were examined not only with regard to their general health but with respect to chromosomal aberrations and other biologic parameters, and no health effects of arsenic at those elevated concentrations were identified.

5. I am asked whether simultaneous exposure to multiple toxic heavy metals including mercury, lead, cadmium, and arsenic might have additive effects that are more potent than exposure to a single metal.

The response to that general question must reflect the same caveats that I have pointed out elsewhere insofar as specific issues being identified. The nature of the exposure, the concentration of the exposure, the duration of the exposure, the route of the exposure, and human metabolic interactions on the basis of such exposures are critical to making a determination of whether toxicity might be manifested. The fact that other metals could be present does not necessarily have any bearing on the toxicity of one of those metals, and specific issues must be addressed in order to accurately assess what any alleged combined toxic potential might be. We are all living in a general environment in which mercury, lead, cadmium, and arsenic, as well as countless other organic and inorganic compounds are known to be present and to which we are exposed on a daily basis without any adverse consequences. In fact, ongoing epidemiologic studies such as the National Cancer Institute (NCI) SEER program (Surveillance, Epidemiology and End Results), instituted in 1973 and followed since that time among patient samples from across the U.S. indicate a leveling off of cancer rates since inception, with only a 1% age-adjusted increase . It is also well documented that even this very slight rise is directly secondary to a rapid increase in lung cancer, itself almost exclusively related to cigarette smoking. The only other upward trend has been seen in the incidence of skin cancers,

clearly attributable to a well documented increase in sunbathing and wearing fewer clothes outdoors, this despite universal and regular admonitions by health care providers to the contrary. Other factors, such as diet (increased fat ingestion

and morbid obesity), increasing levels of alcohol consumption, decreased levels of exercise and other personal behavior patterns reflecting increased risks of morbidity and mortality will continue to exert a negative influence on these rates going forward and must all be considered in evaluating any presumed external adverse health risks. The level, route, and duration of exposure and structure of the chemical substance of interest are, as previously noted, all issues that must be addressed before any determination of potential toxicity can accurately be determined. For example, in the instance of mercury, a child who might accidentally swallow the mercury from a broken thermometer will not be harmed, but one who breaks the thermometer or a new mercury containing fluorescent light bulb and then inhales the vapor form of this very volatile liquid metallic mercury, is at increased risk of danger.

6. With regard to my testimony of the extremely high levels of arsenic found in wells
in Bangladesh and Taiwan, reports of a significantly increased mortality and even cancer have been seen in studies involving individuals associated with exposures to high levels of arsenic in drinking water from shallow wells in that environment. It was not my intention in the course of my testimony to dispute that. Arsenic, like any other chemical substance, has a potential for toxicity, but simply to emphasize, regarding toxicity, that it is the dose or the concentration of

the exposure that will ultimately have the predominant effect in determining the degree of toxicity. What I further pointed out was that the levels of arsenic contaminated well water in places like Bangladesh have not been identified as occurring in the United States, and the likelihood of exposure to ongoing concentrations of arsenic in drinking water at those levels have not been found to occur in the United States and are highly unlikely to occur as a consequence of contamination by coal combustion waste.

Subpart B. With regard to arsenic being used for anti-parasitic therapies; treatments for syphilis and psoriasis, and ingestion as a tonic, the use of arsenic for treatment of human ailments ended in the 1940's and persists only in homeopathic and folk remedies today. The question also goes on to suggest that arsenic has been implicated in the illness and death of a number of prominent people in history including King George III and Napoleon. First of all, it

is well accepted by historians that George III suffered in later years from bouts of

acute intermittent porphyria, a hereditary, genetically transmitted condition and probably gout, as well, but there is no evidence to implicate arsenic or lead or any other metals, for that matter. Napoleon, despite various allegations, is generally felt to have met his demise from the ravages of stomach cancer. Moreover, while it is extremely interesting to speculate about the potential poisoning of prominent individuals in history by arsenic, it should be noted that many materials have been identified as potentially effective poisons from pre-history forward. Masai warriors living 18,000 years ago fashioned arrow poisons

from the juices of various plants, including strophantin, a digitalis-like compound,

to increase the lethality to their prey, sometimes including other tribesmen. Interestingly, this agent is closely related to digoxin, a widely used cardiac anti-arrhythmic medication. Similar substances continue to be used by some tribes in remote areas of the Amazon today. Hemlock was utilized in the execution of Socrates in Ancient Greece, and Cleopatra reportedly relied on the deadly bite of an asp to bring about her own end in Egypt 2,000 years ago. Aconite, opium, mandrake, cyanide, strychnine and even cannabis (tetrahydrocannabinol), recently made available in some states as a medical therapy, all have long been employed as useful means of dispatching one's friends or enemies. The infamous Borgias of 15th century Italy developed poisoning into a virtual art form. There are, in fact, countless agents that are potentially capable of lethality either
through voluntary or involuntary administration. Perhaps one of the most common of these that has sadly been associated with the toxic deaths of countless young people is quite simply alcohol, the poisoning from which is accomplished once again, in accordance with dose on a regular basis in this country. Nicotine is another widely ingested poison. Chlorine gas, potentially toxic in even small airborne concentrations, is present in household bleach and is inadvertently swallowed by countless swimmers in pools all over the world.

Arsenic may play a very minimal role in the contemporary pharmacopeia for human ailments, but its use as a poison seems also to have diminished in popularity over the centuries. Again, there are many more toxic materials, which are regularly utilized on a daily basis including, as I pointed out in my earlier testimony, botulinum toxin, which is arguably the most lethal poison known, approximately 2 mcg or a 14 millionth of an ounce representing a lethal dose for an adult human, yet it continues to be injected by dermatologists into their patients on a daily basis for cosmetic applications.

Subpart C of question 6 notes that IARC and EPA both list arsenic as a carcinogen together with other potential adverse health effects. The question asks whether I dispute those findings.

Certainly, both IARC and the EPA have listed thousands of chemical compounds with their respective potential toxicities. These include arsenic and many other chemicals, which are mainstays in our industrial environment, yet with all of these listings there is a safe exposure level and potentially toxic exposure level to each

and every one of the agents identified, as well as numerous other factors involved. At the risk of being repetitive, these include; concentration or dose, route of entry, duration of exposure, chemical composition of the compound, and human metabolic interaction to name only a few.

Subpart D of question 6 asks if I encourage patients to utilize arsenic medicinally. I can only respond that I have not yet and do not have any plans to prescribe arsenic in the near future, but I know many of my colleagues who utilize botulinum toxin and numerous other potentially highly toxic medicaments on a regular basis.

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PART 2

RESPONSE TO QUESTIONS SUBMITTED BY MEMBERS

OF THE HOUSE ENVIRONMENTAL SUBCOMMITTEE ON

ENERGY AND ENVIRONMENT

The Honorable Joe Barton, Texas

Dear Congressman Barton:

I will endeavor to respond as concisely and accurately as possible to the questions

that
you have submitted subsequent to my testimony before the House Subcommittee on Energy and Environment on December 10, 2009 at the hearing entitled, "Drinking Water and Public Health Impacts of Coal Combustion Waste Disposal."

1. In your first interrogatory, your query relates to the "gulf" between clinical experience and academic theorizing.

Basically, what I was attempting to point out in my testimony was that the Subcommittee's first witness panel commentary not withstanding, the medical experience reported in the literature regarding the potential for human health hazards from exposure to arsenic and other heavy metals identified in fly ash essentially emphasizes the toxicological appreciation for the fundamental issue of dose-related effects. In other words, for every known chemical compound from arsenic to sodium chloride, there is a dose below which it is generally accepted as being safe, whether by general exposure or consumption, and a higher dose demonstrated usually in experimental animal studies, as being of potential human harm. To illustrate, sodium chloride, or common table salt, is a chemical that is known to be potentially acutely toxic, but ingested in small amounts on a daily basis it is essential for life. Salt, has a documented oral LD50 (dose required to achieve mortality of 50% of experimental animals) of about 3 g/kg. If salt were not excluded from the Hazardous Substances Labeling Act because it is a food, it would be required to be labeled with a caution that it might
be harmful if swallowed (LD50 from 50 mg/kg up to 5 g/kg). A lethal dose of table salt for a one-year-old child could be about 2 tablespoons. On a chronic basis, table salt might be toxic to people with heart or kidney disease, and excessive use of salt has been recognized in recent years as potentially contributing to the aggravation of high blood pressure. Yet, as previously noted, salt is an essential daily nutrient for life in virtually all mammalian species. Arsenic is well described
in the medical literature as being potentially toxic. It too has safe levels for exposure and/or consumption and levels above which it may result in a potential adverse human health effect. I have seen individuals who have been harmed by an imprudent consumption of table salt, but I have not yet seen or read of human

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adverse health effects secondary to fly ash exposure. Epidemiologically, arsenic has been well studied both in the environment and in the workplace. It is in the latter setting where potential exposures have been the highest, among individuals engaged in the production and/or application of wood treating chemicals such as CCA for the preservation of outdoor wood products such as telephone poles, railroad ties, and dock pilings. My personal experience in that environment, working with individuals who were exposed to arsenic in far higher concentrations than anyone in the community would ever experience, has not demonstrated any adverse human health effects. Even among studies conducted on human subjects with exposures to naturally occurring levels of waterborne arsenic in different locations in the world no evidence of adverse health effects have been observed even following chronic consumption of waterborne arsenic at levels as much as 30 times greater than the recommended water EPA and WHO water standard. And, despite the presence of high levels of naturally occurring arsenic in ground water and/or well water supplies in Canada, the northwest and southwest of the United States, as well as New Hampshire, including a study, which investigated the levels of arsenic in drinking water in the

United States between 1968 and 1984 in which 30 counties in 11 states had mean arsenic levels with a range of 5.4-91.5 mcg/L, 15 counties had mean levels

from 5-10 mcg/L, ten counties had means from 10-20 mcg/L, and five counties showed levels greater than 20 mcg/L. The highest levels were seen in Churchill County, Nevada where 89% of the population were exposed to mean arsenic concentrations of 100 mcg/L. These levels have been due almost entirely to the geology of the area. There have, however, been reports of elevated arsenic concentration in homes adjacent to open pit copper mines and smelters in Arizona and Montana, but most of the private wells showed arsenic levels from 2.5 mcg/L to 90 mcg/L. In 1995, there were reports of levels of elevated arsenic in Woburn, Massachusetts of up to 70 mcg/L between 1966 and 1986. Again, to maintain a proper perspective, the Federal Drinking Water Standard in the United States is 50 mcg/L. This is the reason why problems have not been seen in the United States related to arsenic contamination in drinking water. These levels, as I have previously stated, pale by comparison with levels typically measured in such locales as Bangladesh, where shallow ground water supplies contain levels of arsenic that have been measured in excess of 2000 mcg/L. These are not levels that are seen in the United States in drinking water supplies. So, once again, the gulf between practical considerations and clinical reality and the academic theorization of potential harm represents a considerable chasm.

2. Organic and inorganic arsenic are significantly different entities. Low levels of

arsenic are seen typically in most foodstuffs in the United States with average dietary levels ranging from 0.02 ppm in grains and cereals to 0.14 ppm in meat, fish, and poultry. The highest concentration is generally seen in shellfish and other marine foods, which represent the largest dietary source of arsenic. Marine organisms demonstrate the ability to accumulate arsenic naturally present in seawater, at levels which range from 5 ppm to 170 ppm, including in seaweed. Most of the arsenic in these food sources represent the benign, nontoxic, organic

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arsenicals known as arsenobetaine, which is excreted rapidly and unchanged in urine. While a portion of the arsenic present in food supplies may be inorganic, it represents a minimal proportion of the overall arsenic to which those consuming these food items are exposed, and has not demonstrated, in all studies conducted, any adverse health effects as a consequence of such consumption. Nevertheless, it is important to recognize the difference between the two forms of arsenic, as urine arsenic levels may be elevated to extremely high levels due to seafood consumption of the benign form of this compound. The arsenic present in fly ash represents the inorganic form. However, as previously stated, the arsenic in fly ash is typically quite insoluble in water and tends to settle out at the
bottom of carrying streams and other bodies of water, thus moving it along and generally depositing the arsenic substantially downstream, during which time substantial dilution and binding with other minerals also takes place.

3. With respect to Dr. Fox's comments that there is limited statistical power to detect systematic health effects in a small community, what she is pointing out is an epidemiologic rule of thumb that indicates that the small numbers of individuals involved typically in a small community may not have sufficient epidemiologic "power" to enable the detection of a subtle potential health problem. Nevertheless, if individuals were, in fact, developing adverse health effects from exposures in communities around the country as a result of adverse health effects secondary to the presence of arsenic in fly ash, one would anticipate that eventually these manifestations would be identified and recognized. Fly ash has been present in the environment for 100 years with no epidemiologic evidence to date of any type of outbreaks of significant health problems in this country. In my prior testimony, I identified settings such as

Bangladesh to demonstrate the extreme contrast between conditions as they exist in the United States and in places where concentration levels of potential toxins represent substantial degrees of magnitude of exposure differences. Moreover, as I pointed out earlier, the highest levels of exposure historically recognized in the United States have been among workers who have been directly exposed and yet not been seen to develop adverse health effects in spite of exposure levels well in excess of any that would be seen in a residential community with or without the presence of fly ash.

4. This inquiry suggests there would be some type of "added or layering effect" on individual health. This proposition makes no scientific sense, as it presumes that the material in question is never eliminated from the body but simply resides there accumulating more and more with additional exposure, which is totally an inaccurate perception of how the human body eliminates waste and potential toxins on a daily basis. Insofar as the potential for a multiplicative effect from multiple agents, once again the agents have to be looked at separately, and it must be recognized how each of those individual agents is metabolized and eliminated from the body in order to even vaguely ascertain any type of such effect. Such effects have not been demonstrated practically in my experience.

5. I indicated that while it is quite clear that the levels of arsenic and other heavy
metals deriving from a source such as fly ash, as described by the accidental spill in Forward Township, Pennsylvania in 2005 and the December 2008 Kingsport, Tennessee TVA spill, it is quite clear that larger concentrations may appear in adjacent waterways, but it is also equally demonstrated by the measurements that have been documented, that those concentrations dilute extremely rapidly, and that heavy metals such as arsenic settle out and are carried along in the bottom of waterways moving them quickly out from the immediate area of the spills. This results in a very rapid diminution of the concentration levels in the water and does not represent a realistic clinical effect

with respect to the potential for contamination of local water sources. Individuals with far greater expertise than my own in fate and transport of materials like heavy metals in water and soil would be better able to explain the multiplicity of differences that lead to such a relatively rapid decrease in the waterway concentrations of the materials in question, but certainly I have seen it demonstrated substantially in my own experience.

6. Regarding Dr. Fox's testimony with respect to the potential health effects from ingestion of various components of heavy metals present in coal combustion waste, Dr. Fox correctly identifies certain molecular forms of arsenic as having hyperpigmentation and cancer capabilities, of which both effects have been seen among natives of Bangladesh and Taiwan consuming shallow well water with extremely high concentrations of arsenic over long periods of time. I pointed out the tremendous contrast between that experience and those in the United States where levels do not even approach those seen in such settings, and as I have pointed out in numerous instances, dose and concentration represents the most important single factor in determining the potential for adverse human health effects. My own experience in the workplace among individuals exposed to substantially higher levels of arsenic compounds than those in the communities I have seen where fly ash has temporarily contaminated the environment have not demonstrated any evidence of such adverse health effects in the trace amounts

that are seen in these instances.

7. Dr. Fox seems to be cognizant of the potentially toxic adverse health effects of the constituents that she has identified as being present in coal ash, but it is not

clear to me what she means by risk assessments other than using questionable techniques such as modeling and other hypothetical constructs that do not represent clinical reality in determining the potential for human health effects. Such risk evaluations have led to the development of allowable exposure levels to a wide variety chemical substances and typically are set at degrees of magnitude several levels above what have been demonstrated in animal or other toxicological studies. The pitfalls of utilizing such assessments in the absence of epidemiological studies and practical experience is that it represents a cookbook type approach with multiple nonrealistic assumptions not based on clinical realities being relied upon to set standards, and typically do not accurately represent the realities seen in the real world of clinical medicine and/or

toxicology. Again, I turn to my own practical experience in evaluating individuals who have been seen in the aftermath of genuine exposure instances, and in the case of the Forward Township, Pennsylvania accident of 2005, the potential exposures were extremely high in view of the fact that the residents were attempting to work on and clean up their own environment for a significant period of time, before being evaluated, yet never demonstrated any objective clinical findings of abnormalities, including findings of any unusual levels of arsenic in their blood or urine, which was well documented by the Allegheny County Public Health Department on multiple occasions shortly after the incident, and as long as four years later. It is my considered clinical opinion, based on my own medical experience (not hypothesis) of many years of working with individuals exposed to these and numerous other chemical compounds, that the clinical assessments made in the workplace, as well as the environment, together with actual epidemiologic studies that have been performed represent the most useful source of medical intelligence in addressing the potential hazards associated with exposures to such materials. Further, it is my opinion that hypothetical risk assessments based on complex modeling schemes that do not represent real life settings and typically make multiple unrealistic assumptions in arriving at their end results are not useful or accurate means to determine the potential for risk in such settings.

8. Finally, it is my experience that the real world exposure to materials such as those found in fly ash are seen on a daily basis and demonstrate that in the absence of circumstances, which have not yet been demonstrated in the United States, that most individuals in our modern industrial society are regularly exposed to a wide variety of potentially toxic substances, the nature of which have been studied in great depth, and in the instances of coal combustion waste do not represent a significant potential hazard to human health and should not, in my opinion, be regulated as a hazardous substance. As I pointed out, there are countless materials to which we are exposed on a daily basis, voluntarily and involuntarily, which have not been regulated as hazardous substances including botulinum toxin and alcohol and even nicotine, even when we are very conscious and well-informed about the potential risks, especially in those instances where human excesses are involved.

Thank you for the opportunity to respond to your inquiries.

Very truly yours,

Donald J. McGraw, MD, MPH

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