

# Fact Sheet

## All about...Coal Ash

April 2009

### Introduction

Beginning early in the 1800s, America was fueled largely by coal. Today coal-burning power plants supply more than half of the electricity used in the United States. While we develop alternative sources of energy, coal remains an important part of our energy industry.

### What is coal ash?

Burning coal to produce electricity at any generating station results in unburned “coal ash;” also called coal combustion byproducts. Coal ash is simply the ash left over from burning coal.

Coal comes from the earth, and is mostly made up of carbon. Like soil in our yards and fields, coal also contains naturally occurring minerals that are not burned in the power generating process. After the coal is burned, coal ash remains and is made up mostly of silica, similar to sand, and other naturally occurring materials, including iron, calcium, and aluminum. Coal ash may also contain trace amounts of other substances that occur naturally in coal and soils, such as arsenic, cadmium, lead, mercury, and selenium.

Coal ash has been studied extensively for decades by universities and government regulatory agencies. The US Environmental Protection Agency (USEPA) has conclusively determined that it is not a hazardous waste. In fact, many of the constituents of coal ash are commonly found in many everyday products. For example, some forms of coal combustion byproducts have beneficial uses in many building products like cement, mortar, stucco, wallboard, and grout. It also is used in some potting soils and as a soil conditioner.

### Are there different types of coal combustion byproducts?

Generally, there are four types of coal combustion byproducts. Their classification is based on how and when each is generated in the coal combustion process.

“**Bottom ash**” and “**boiler slag**” settle to the bottom of the main combustion chamber (the boiler) in the coal burning process. Bottom ash is typically a gray or black, coarse material. Boiler slag is similar to bottom ash, but it is material that has melted during the burning process. Boiler slag is collected at the base of the boilers and is quenched with water. This causes it to break into black, angular pieces that have a smooth glass-like appearance.

“**Fly ash**” is ash that exits the combustion chamber in the flue of the boiler and is collected prior to being released into the air. This type of coal ash is similar to the small particles that exit the chimney when a fire is burned in a fireplace or fly upward off a campfire. Fly ash is a fine powder and is generally light gray in color. It consists mostly of very small-sized glassy spheres. Its consistency is somewhat like talcum powder.

“**Flue gas desulfurization byproducts**” result from the treatment of air in the flue of the boiler. When coal is burned, sulfur dioxide is released; this gas is often removed from the air in the flue gas scrubber before the air reaches the atmosphere. This collection process converts the sulfur dioxide into gypsum, which is used in the manufacture of wallboard.

### What happens to coal ash – where does it go in the environment?

There are beneficial reuses for coal ash, such as roofing granules, blasting abrasives, waste stabilization, and as a replacement for Portland

cement in concrete. Over 42% of all coal ash created in the US are reused. Coal ash that is not reused is typically managed in landfills and surface impoundments.

### Is coal ash toxic?

For anything to be toxic – including coal ash – there must be an exposure pathway from where the coal ash is present in the environment to a receptor (or person), and the exposure must be high enough to trigger a response. If there is a low level of exposure, or no exposure, then the potential for toxicity is reduced or nonexistent. Utility management and state regulation of coal ash are designed to prevent potential exposure to the constituents in coal ash and, the potential for adverse effects on our neighbors and the public.

### Is there risk from touching coal ash?

If there is contact with coal ash, you should follow normal hygiene (washing) after contact, like you would with dirt or soil. In some persons who are already sensitized to certain metals (for example, nickel or chromium), skin contact with coal ash may cause localized irritation.

### Is airborne dust a concern?

As explained above, the fly ash type of coal ash is a fine grained, powdery-like material and, when dry, can become airborne in windy conditions. The primary concerns with airborne coal ash are the same as those with any dusty material, in that long term inhalation of any airborne particulates should be avoided.

### Where can I get more information?

Additional information is available from a number of online sources:

- The American Coal Ash Association - <http://www.acaa-usa.org/>
- USEPA's Coal Combustion Products Partnership (C<sup>2</sup>P<sup>2</sup>) - <http://www.epa.gov/epawaste/partnerships/c2p2/index.htm>
- The Utility Solid Waste Activities Group - <http://www.uswag.org/publiccccp.htm>

In addition, please feel free to contact Jim Roewer directly at (202) 508-5645.

## A brief synopsis of the Tennessee Valley Authority (TVA) Kingston Fossil Plant Pond Failure

On December 22, 2008, the Tennessee Valley Authority (TVA) Kingston Fossil Plant's retention pond failed. Unfortunately, water retained in the pond, which was mixed with coal ash, washed into a nearby neighborhood. Several homes were destroyed and a major gas line was ruptured. It is estimated that approximately 5.4 million cubic yards of fly ash and water were released onto land adjacent to the plant and into the nearby Clinch and Emory Rivers.

USEPA responded to the spill, and initiated a sampling program on December 23, 2008. This sampling program included water sampling in the Rivers – over an area approximately one mile upstream of the release area on the Clinch River, to a point five miles downstream (the City of Kingston, TN main water intake). All sample results indicate drinking water continues to be safe.

The sampling program also included the collection of coal ash samples at the point of release. These results, along with results from all the sampling programs, will be posted to the following link when available: <http://epa.gov/region4/kingston/index.html>

Concurrent with the sampling program, other government agencies were responding to the spill:

- The Tennessee Department of Environment and Conservation (TDEC) worked to ensure the interim and permanent disposal of the coal ash material was conducted in a safe and appropriate manner.
- A hotline for health effects information was established by the Tennessee Department of Health, in consultation with the Agency for Toxic Substances and Disease Registry at (800) 404-3006. More information can be found here: <http://epa.gov/region4/kingston/index.html>

Environmental Protection Agency and TVA air monitoring systems have been placed around the impact area from the TVA release to measure air borne particulate. Neither system has detected exceedances of the National Ambient Air Quality Standards for particulate matter. The National Ambient Air Quality Standards are 150 micrograms per cubic meter of air ( $\mu\text{g}/\text{m}^3$ ) for coarse particulates (10 microns in size) and 35  $\mu\text{g}/\text{m}^3$  for fine particulates (2.5 microns in size). These are maximum limits over a 24 hour period. For more information on the Standards: <http://www.epa.gov/air/criteria.html>