

# **Coal Ash Leaching Behavior in Acid Mine Drainage: Comparison of Laboratory and Field Studies**

**Paul F. Ziemkiewicz**

West Virginia Water Research Institute, West Virginia University, Morgantown,  
West Virginia, 26506, USA. Email: [Paul.Ziemkiewicz@mail.wvu.edu](mailto:Paul.Ziemkiewicz@mail.wvu.edu)

**KEYWORDS:** Fluidized Bed Combustion (FBC) Ash, Acid Mine Drainage, Ash  
Leaching Procedure, Prediction of Field Leachate

## **ABSTRACT**

Strongly alkaline fluidized bed combustion (FBC) ash is commonly used to control acid mine drainage (AMD) in West Virginia coal mines. Objectives include acid neutralization and immobilization of the primary AMD pollutants: iron, aluminum and manganese. The process has been successful in controlling AMD though doubts remain regarding mobilization of other toxic elements present in the ash. In addition, AMD contains many toxic elements in low concentrations. And, each mine produces AMD of widely varying quality. So, predicting the effect of a particular ash on a given coal mine's drainage quality is of particular interest. In this chapter we compare the results of a site-specific ash leaching procedure with two large-scale field applications of FBC ash. The results suggested a high degree of predictability for roughly half of the 25 chemical parameters and poor predictability for the remainder. Of these, seven parameters were successfully predicted on both sites: acidity, Al, B, Ba, Fe, Ni and Zn while electrical conductivity, Ca, Cd, SO<sub>4</sub>, Pb and Sb were not successfully predicted on either site. Trends for the remaining elements: As, Ag, Be, Cu, Cr, Hg, Mg, Mn, pH, Se, Tl and V were successfully predicted on one but not both mine sites.

Submitted for presentation in the OSM Forum in the 2005 World of Coal Ash,  
April 11-15, 2005, Lexington, Kentucky, USA.