

Potential Massive Use of Coal Ash to Restore Disturbed Hydrogeology

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KEYWORDS: ground surface subsidence, deep mines, coal ash, aquifer restoration, Karst areas

ABSTRACT

Deep mining activities in Western Maryland have been ongoing since the late 1800s, with many deep mine complexes long abandoned. Ground surface subsidence has occurred in many areas, and recent building construction in the Frostburg area required the grouting of underlying abandoned mine shafts. Acid mine drainage (AMD) has adversely impacted most streams in deep mine areas. Deep mining has severely disturbed the area's hydrogeology, with mining shafts intercepting and channeling groundwater flow from the water table and other aquifers. Groundwater discharge from deep abandoned mines artificially contributes high flow rates into streams, typically of high acid content. The natural flow regimen and inherent water quality of these deep mine areas has been severely impacted by the disturbed hydrogeology.

Over half of the tonnage of coal used in Maryland for power production becomes coal ash. This massive, continuous source of coal ash could be returned to deep mines to fill the networks of mine tunnels and eliminate groundwater interception. With the coal ash fills acting as low permeability strata of an alkaline nature, aquifer restoration may be accomplished and return groundwater levels to pre-mining conditions. AMD could be significantly reduced through reduced mine discharges and the neutralization of acid.

Karst areas affected by the activities of man could also benefit from the use of coal ash/cement admixtures to seal underground drainage channels. Land use activities that would dewater sediments in known Karst areas could benefit from the placement of coal ash/cement grout curtains prior to construction and dewatering activities.

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