

Injection of Alkaline Ashes Into Underground Coal Mines for Acid Mine Drainage Abatement. William W. Aljoe.

Abstract: The injection of fly ash, scrubber sludge, fluidized-bed combustion (FBC) ash, and other alkaline waste materials into abandoned underground coal mines for acid mine drainage (AMD) abatement has obvious conceptual appeal. This report describes three ongoing projects -- one each in West Virginia, Maryland, and Ohio -- where field demonstrations of the technique are being pursued in cooperative efforts among State and Federal agencies and/or private companies. The West Virginia site produces AMD that is causing the State to incur very high treatment costs and operational problems, especially in the storage and disposal of metal hydroxide sludges that result from treatment. In an attempt to achieve a more cost-effective long-term remediation scheme, the State is working with local coal companies and power generators on a plan to fill part or all of the mine voids with slurries of fly ash and/or FBC ash. At the Maryland site, the goal is to demonstrate the feasibility of completely filling a very small underground mine with an FBC ash slurry. The information gained here will determine whether large-scale AMD remediation can be achieved if deep mine disposal of ash is incorporated into the design of a new FBC power plant. In Ohio, it is believed that sealing and complete flooding of a relatively small mine will be able to curtail its AMD production. In order to accelerate the flooding process and insure that alkaline conditions will prevail in the mine, a waste slurry of calcium hydroxide from a nearby source will be injected into the mine voids in conjunction with mine sealing.

Additional Key Words: mine hydrology, site characterization

Closure of the Brewer Gold Mine by Pit Backfilling. Anne Lewis-Russ (1), John F. Lupo (1), Jon M. Bronson (2), Joe M. Flynn (2) and B. G. "Bud" Long (3). [(1) Titan Environmental Corporation, Englewood, CO, USA; (2) Titan Environmental Corporation, Tempe, AZ, USA; (3) Brewer Gold Company, Jefferson, SC, USA].

Abstract: Brewer Gold Mine, located in north-central South Carolina, is implementing an innovative reclamation plan that includes backfilling the main Brewer open pit with mine waste. The primary goals of the closure are to reduce acid rock drainage and minimize or eliminate long-term operation and maintenance requirements by restoring the site property to approximate pre-mining topography. The plan calls for consolidation of approximately 200 acres of waste into approximately 20 hectares (50 acres). Much of the material to be backfilled into the pit, including spent heap leach material and waste rock, has acid-generating potential. Therefore, the backfill design integrated geochemical properties of the backfill materials with expected post-closure conditions. A prime consideration was the final position of the water table. Since mining at the site started in the early 1800's, no records exist of the original groundwater levels. Therefore, the design incorporates a large anoxic limestone drain to control the final groundwater level. Additional amendments are to be placed in targeted areas of the backfill to maximize their utilization. A low-permeability cap system that includes a geosynthetic clay liner has been designed to limit infiltration into the backfill.