Use of a CCP Grout to Reduce the Formation of Acid Mine Drainage: 10-Year Update on the Winding Ridge Project

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ABSTRACT

The Maryland Department of Natural Resources Power Plant Research Program (PPRP) and the Maryland Department of the Environment (MDE) have formed a partnership with private industry to demonstrate the beneficial application of CCPs as flowable, self-cementing, environmentally benign grouts to abate AMD. Through this partnership, the Winding Ridge Project was initiated as a practical demonstration of AMD abatement. In 1996, 5,600 cubic yards of CCP grout was injected into a small, abandoned, deep coal mine in Garrett County, MD. Post-injection monitoring has continued since that time and has included analysis of mine discharge water quality and testing of grout stability. This paper presents a ten-year update of the data for the Winding Ridge Project.

The post-injection monitoring results indicate that the water quality of the mine discharge has improved since injection of the CCP grout and that the grout remains stable within the mine tunnels. Concentrations of iron, magnesium, sulfate, aluminum, manganese, zinc, cobalt, copper, nickel, and acidity in mine discharge have decreased below pre-injection concentrations. The pH of mine discharge has increased by one pH unit, and the estimated rate of acid production in the mine has decreased by approximately 80%. Grout cores collected one and seven years after injection show that the grout has maintained high strength and low permeability within the tunnels.

This Project represents one of very few sites with such an extensive monitoring history. The extensive database of water quality data provides valuable information concerning the geochemical processes responsible for the water quality trends observed.

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