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Development and Demonstration of a Modeling Framework for Assessing the Efficacy of Using Mine Water for Thermoelectric Power Generation

Project No. WV-232
Recipient: West Virginia University
Principal Investigator: Richard Herd, Program Coordinator
West Virginia Water Research Institute
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Project Description: This project developed a model for assessing the efficacy of using abandoned mine water for power generation. The project builds upon the research conducted by WVWRI that evaluated the availability and cost-effectiveness of using mine pool water from the Pittsburgh coal seam in northern WV and SW Pa. as well as the potential environmental impacts resulting from mine pool flooding in the Monongahela, Pittsburgh, Irwin and Ohio geologic basins. The model was developed concurrently with design and construction of the 300 megawatt Beech Hollow Power Project waste coal to energy plant in Robinson Township, Washington County, Pa approximately 12 miles southwest of Pittsburgh. The plant is projected to use between 2,000-3,000 gallons per minute.

The project objective is to provide a framework that energy developers can use to assess mine water availability, its cost, and the technical and regulatory aspects and environmental benefits of such use. In the United States thermoelectric generation is second only to agriculture in terms of total water use. Increasing demand for adequate, reliable and economical electrical energy is placing increasing demand on freshwater resources potentially resulting in water use conflicts with other water users. This framework will facilitate the use of mine water for power generation and other large industrial users thereby reducing demand on freshwater resources while abating mine discharges the primary cause of water quality impairment throughout the region.

Project Significance: The project will help address two societal issues: The increasing demand for power generation and its effect on freshwater resources and the potential environmental impacts that can result from mine pool breakouts. Utilizing an impaired resource such as polluted mine pool water is a win-win for both the economy and environment.