ELECTROLYTIC CONTROL OF AMD

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ABSTRACT

Many abandoned underground mines in West Virginia experience continuing challenges in the control of acid mine drainage (AMD). once an underground mine is completed the company is left with few options in the event that AMD becomes a problem. The general solution is to institute an AMD neutralization program consisting of the addition of an alkaline agent such as ammonia, caustic or calcium hydroxide coupled with a sedimentation pond to capture the resulting flocs (yellowboy). These systems are expensive to operate and the duration of treatment is indefinite. The less expensive neutralization agents such as calcium hydroxide require large capital intensive treatment plants while expensive agents such as caustic and ammonia can operate on inexpensive capital facilities. Costa in the range of $5,000 to $20,000 per month are not uncommon for mid scale AMD neutralization systems. An electrolytic process has been developed at the Chemical Engineering Department of West Virginia University as an alternative to chemical neutralization. It is known as the AMD-CELL SYSTEM. This proposal describes its application to an AMD discharge at Beth Energy's operations near Buckhannon, West Virginia. Electrolytic processes have been attempted in the past but have usually failed to operate economically due to their high current consumption. The proposed technology operates on a low current (< 2 amps) format and has been developed and run successfully as a lab bench demonstration unit. The object of this project is to evaluate, in a joint effort with Beth Energy, the scale-up potential of the technology, its effectiveness and practicality under operational field conditions.