

Preventing Acid Rock Drainage Can Source Control Really Be Successful?¹

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Abstract: Acid rock drainage is one of the mining industries' most serious environmental problems. Although the ability to predict problematic drainage has improved, a method to prevent its' formation has been elusive. If the natural acid neutralization potential of the waste exceeds the acid production potential, the drainage should be net neutral. Adding alkaline material appeared to be an easy way to adjust neutralization potential in waste storage areas. While this approach was effective in laboratory tests, large scale implementation had generally been ineffective. Borrowing an addition technique from the gold industry, a small scale pilot was conducted with an acid producing Archean Greenstone which had a sulfur content of 0.63% and an NP/AP ratio of 0.4. Magnesium rich limestone (dolostone) was added to increase the NP/AP ratio. Two addition rates were used which increased the NP/AP ratio to 1.4 and 3.4. After about 3 years the pH in the control tank dropped precipitously from around 7 to less than 5.5 over the course of the summer. The pH continued to drop and currently appears relatively stable at around 4.0. In contrast, both treated tanks continue to have pH > 7 after 15 years after treatment.

Additional Key Words: alkaline addition, sulfate, pH control, mitigation

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