

STATUS OF MINE DRAINAGE TECHNOLOGY

by
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The problem of pollution of water by "mine water" is at least as old as the mining industry itself.(1, 2)* Research on the formation, composition, treatment and abatement of mine water is a relatively recent historical event. The earliest attempts to do something about the problem of mine drainage pollution were, in fact, diagnostic rather than remedial, home remedies rather than application of scientific principles.

I. FORMATION AND CHARACTERISTICS OF MINE DRAINAGE

A. Source of Mine Drainage - Acidic Water:-Acid mine drainage results from the dissolution of oxidation products of pyrite in normally alkaline ground water and the subsequent dissolution of other minerals in the resulting acidic solution.

Pyrite is a mineral having the molecular composition FeS_2 . It is metallic in luster, hard, and is usually found imbedded in coal seams and associated strata. Pyrite changes readily by oxidation to limonite, hydrous iron oxides of the formula $\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$.(3) The oxidation products of pyrite also include soluble salts such as FeSO_4 , $\text{Fe}_2(\text{SO}_4)_3$, H_2SO_4 , SO_2 , and probably others.

The actual mechanism of pyrite oxidation in bituminous coal mines has been studied by many investigators; that chemical oxidation plays an important role in acid water formation cannot be disputed. The essential elements for reaction are

* Numbers in parentheses refer to literature listed at end.