

# "OVERBREAK CONTROL IN THE WHITE PINE UNDERGROUND MINE"

Larry R. Fletcher<sup>1</sup>, Matthew N. Plis<sup>2</sup>, and Virgil J. Stachura<sup>~3</sup>  
1Mining Engineering Technician. 2Mining Engineer. 3Geophysicist  
Twin Cities Research Center Bureau of Mines  
Minneapolis, MN.

The use of brand names is for identification purposes only and does not imply product endorsement by the Bureau of Mines.

## ABSTRACT

Falls of ground remain a leading cause of fatalities and injuries in underground mines. In response to this situation, the Bureau of Mines conducted a series of experiments in the White Pine room-and-pillar copper mine which resulted in smoother, safer ribs due to a reduction in the amount of overbreak caused by blasting. The tests evaluated the effects of changes in the loading of the rib holes of the mine's 20- by 28-ft drift round driven in shale and sandstone. The relative integrity of the ribs remaining after the blasts was measured using both photographic and seismic refraction techniques.

Four variations of the mine's standard- blast design were examined. Comparisons were made between rounds with rib holes having fully coupled and decoupled powder columns that were initiated by millisecond and half-second delay caps. The results showed that the smoothest and most stable ribs were produced by rounds whose rib holes had decoupled powder columns initiated by millisecond delay caps.