

ADVANTAGES AND DISADVANTAGES OF DOWN-THE-HOLE HAMMER BLASTHOLE DRILLING vs. ROTARY DRILLING IN LARGE SCALE OPEN PIT SURFACE MINING

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ABSTRACT

Until fairly recently, Down-The-Hole (DTH or DHD) hammer drilling was never really a factor in large scale open pit surface mining. It was a method confined to water well drillers, aggregate quarries and limestone mines where the hole size rarely exceeded 6-1/2" (165 mm). Also it was somewhat limited to the harder rock areas such as the North East and South East United States. The trend in the big mining pits for coal, copper, gold and iron, was for the big rotary drill rigs with lots of muscle in pulldown, bitload and rotary torque.

In recent years, improved technology in air compressors and hammer design has challenged the rotary concept in larger diameter blastholes in certain situations. Along with this technology has come a need for better ore selectivity, better fragmentation and environmental considerations such as blasting vibration and air blast control. Also, in some mature pit operations, much of the softer material has been mined, leaving ore and waste materials of increasing hardness and compressive strength. The downhole drill now merits consideration in some major mining applications.

The authors' intention is to explore some of the advantages and disadvantages of both DHD hammer and rotary drilling in order to help today's mine operator make a decision regarding if and when the percussive drill has a place in the mine. There are some computer programs that can relate comparative production and costs between the two methods, which will be demonstrated. Final conclusions are up to the individual based on logic gleaned from an analysis of the situation and the use of common sense, weighing the advantages of each method.