

BRC Chalcocite Processing – Recovery Improvements

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ABSTRACT

Copper is a mineral that plays a part in our everyday lives. From the electrical equipment we use through to the quest for a greener, more sustainable future. Maximising the recovery of secondary copper mineral orebodies is becoming more and more critical. This research reviews the copper recovery of the BRC orebody located at the Mount Isa Mine to maximise copper production and the economics of the operation as feed grades continue to decline. The processing performance of the orebody was reviewed from the 1960's, through to recent test work conducted in 2020, and current test work delivered in 2023. Various pulp densities, reagents and feed blend changes were investigated and referenced to previous research to assist in understanding the complex interactions taking place.

The key results from the study illustrated that the BRC orebody has four main copper departments (Chalcocite, Covellite, Chalcopyrite and Cuprite) and three main gangue counterparts (Quartz, pyrite and kaolinite). The thionocarbamate collector and DSP009 demonstrated significant improvement to copper recoveries of +4% compared to sodium isobutyl xanthate (SIBX) alone. Additional BRC copper recovery and concentrate grade improvements may also be expected by dosing the F100 biopolymer to reduce quartz and kaolinite slimes, negatively impacting copper recovery and concentrate grades. The annualised benefit for the Auxiliary Mill circuit is calculated to be approximately 800t of additional copper and a reduction in operating costs in the order of A\$1m.