Reduced Development through improved Up-hole Rise and Widening Firings using Orica WebGen™ at Ernest Henry Mine

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ABSTRACT

Historically, production from sub levels of the Ernest Henry Mine (EHM) started from blind uphole rises at the end of transverse slot drives. Where previous investigations considered removing these slot drives and starting production with independent ore drives, any development savings were consumed when drives were extended to minimise ore loss.

Since 2017, EHM and Orica have been investigating opportunities to optimise drill and blast practices by implementing Orica's Wireless Electronic Blasting System. To reduce ore drive development metres, a novel design was proposed utilising the WebGen™ 100 system to combine a rise with pre-charged widening firings.

Initially these new rise and widening firings achieved results similar to previous EHM designs, achieving on average 81 percent of design height and width. Due to poor performance of the fourth trial firing a significant re-design was required. Modifications included drillhole re-positioning, in-hole primer relocation and initiation delay adjustments. Since the re-design a step change in rise performance has been observed – all rise and pre-charged widening shots have achieved 100 percent of the design height and width.

With rise and widening performance exceeding expectations, the removal of slot drives has allowed for a substantial reduction in lateral development. Development savings of 192 m and 120 m from the RL1325 and RL1300 levels has been achieved. Primary draw and ore recovery has also increased due to the later addition of pre charged forward stripping rings.

Level design changes have also significantly improved the mining cycle with increased development efficiencies due to optimised ground support design, improved secondary ventilation, a reduction of critical path development, simpler production scheduling and less wear and tear on machinery.

Future mine level designs now incorporate key learnings and are proving beneficial to a variety of scenarios including changing orebody dimensions with increasing depth.