



Customer

Macmahon, a leading specialist mining contractor, commenced a drilling optimisation project at one of their clients' underground gold operations. The six-month project delivered improvements in drilling accuracy and consistency, resulting in a significant reduction in slashing. The increase in drilling quality and reduced time spent slashing resulted in improved stope performance and a faster stope completion rate.

Drilling Optimisation Project

Slashing (secondary drill and blast) is drilling that is required to remediate poor blasting outcomes—such as bridging, hang-ups and oversized material—that are often the result of poor drilling. The aim of the project was to reduce the frequency of poor blasting outcomes that required slashing, by increasing drilling quality in order to provide improved stope performance outcomes for Macmahon's client. The Production Optimiser was implemented to address deficiencies in the existing production drilling process, delivering an immediate improvement in drilling quality, and ultimately a material reduction in slashing as a percentage of production drill metres. The reduced slashing also assisted Macmahon's client in turning over more stopes during the period, increasing overall mine output.

Issues on Site

Macmahon implemented the Production Optimiser system to address the challenges and variables associated with the existing production drilling process, to optimise their drilling and deliver improved blasting outcomes for the client. Over a six-month period, Macmahon analysed the impact the system had against their objectives. In this case study, we take a look at the results.

By eliminating the impact of variables/tolerances that influence the effectiveness of the existing production drilling process, such as alignment to the ring facing direction, survey markup, rig levelling, mechanical complexity and driller skill/experience, Macmahon was able to achieve significant improvements in drilling accuracy and consistency.

This enabled Macmahon to deliver to their client improved stope performance as well as increased stope turnover, directly impacting annual output and margin per stope for their client.

Solution

The Production Optimiser is a system that combines hardware, software and data analytics to deliver increased drilling accuracy and consistency for underground production drills. This increase in drilling quality drives improved stope performance (reduced over/under break), increased output through less re-work and provides the opportunity to further optimise stope designs with fewer holes and/or narrower stope widths.

The Production Optimiser system eliminates variables that impact the effectiveness of the existing drilling process, delivering increased drilling accuracy and consistency. The system delivers a more accurate setup because it is not reliant on tolerances such as laser line mark-up, multiple onboard sensors and rig leveling. The system is mechanically less complex than the existing process, which increases reliability and reduces the burden on site-based maintenance teams.

Integrated into the system is the industry-leading software platform CORE (Client Online Reporting Engine), which features digital drill plans/plods and allows for seamless integration with drill and blast design software for easy digital transfer of drill designs. Data produced via CORE guarantees consistency between drillers by providing a means of holding operators accountable for setting up to design as well as producing powerful productivity reporting/benchmarking down to the performance of individual drillers and drills.

Results

Improved metres and increased grade of tonnes mined

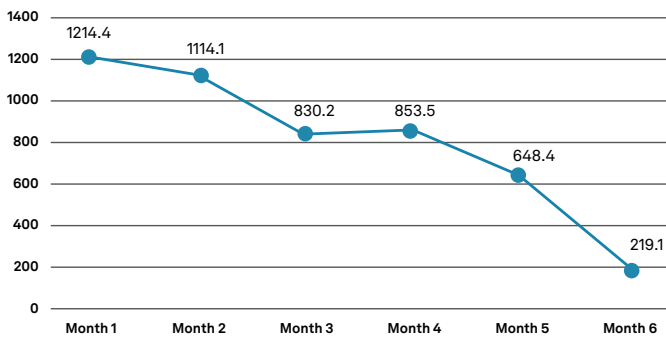
By addressing the variables that impact the effectiveness of existing production drilling practices, the Production Optimiser increased overall drilling quality. In turn, this increased total drilled stoping metres over the six-month period of analysis. This improvement in quality allowed Macmahon’s client to further improve average grades of tonnes mined across the operation by reducing mining widths.

Reduced slashing

Slashing (secondary drill and blast) as a percentage of production drilling declined by 87% over the period of analysis, from 15% in the first month to just 2% in the sixth month. This reduction and corresponding increase in stoping metres allowed for more effective and profitable use of Macmahon’s drills. Increased drilling productivity resulted in a faster completion rate for stopes, delivering Macmahon’s client increased mine output.

The Production Optimiser was implemented to address deficiencies in the existing production drilling process, delivering an immediate improvement in drilling quality, and ultimately a material reduction in slashing as a percentage of production drill metres.

Slashing (m)



Month	Slashing (% of Prod Drilling)
Month 1	15%
Month 2	12%
Month 3	7%
Month 4	7%
Month 5	5%
Month 6	2%

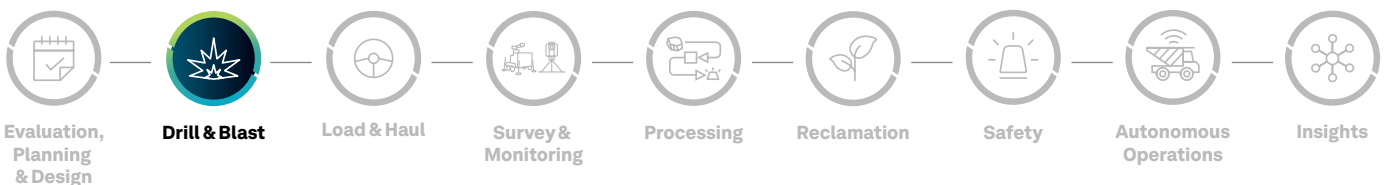
INCREASED GRADE OF TONNES MINES THROUGH REDUCED DESIGN WIDTH

REDUCED SLASHING FROM 15% TO 2%

Integrated life-of-mine solutions

Having one technology partner for the life of your mine is a superpower in the face of modern mining challenges. Our integrated, data-driven solutions help eliminate the need for disparate products across workflows within mine planning, fleet management, monitoring, safety and beyond. With Hexagon, you gain a trusted partner backed by over 50 years of expertise who remains focussed on an autonomous future both above and underground.

This offering includes solutions to support:



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