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## Evolution of Rock Fill Consolidation at Pajingo Gold Mine

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### ABSTRACT

The Pajingo gold operation is in Queensland, approximately 50km south of Charters Towers and 134km south-west of Townsville. The resource was discovered in 1983 and first gold production commenced in 1986 from open pit mines. The Pajingo gold operation is forecast to produce an annual average of more than 60,000 ounces during 2018 and 2019 from both open pit and underground.

The mine has traditionally employed a bottom-up sequence with a combination of modified and traditional Avoca methods with run-of-mine waste backfill. As a result, over time many high-grade sill pillars were left in place. In recent years these sill pillars have been extracted with the use of injection grouting of rockfill to facilitate blind up-hole open stoping. To date 14 separate injection campaigns have been completed to varying degrees of success.

Many of the technical difficulties were centred around achieving and maintaining a consistent high-quality ground consolidation of the rock fill material, and control of the drill and blast practices. This control is essential to promote both 100% extraction and maximum stability. Throughout mining the technical performance of the consolidated rock fill has been recorded to both verify the design and identify improvement. Continual improvements incorporated into the injection grouting design and operational procedures include the development of rapid strength-gain grout with enhanced ground penetration performance.

The optimisation of consolidated rock fill has led to several quantifiable benefits to the mine including:

- Profitable extraction of previously sterilised sill pillars (increased ore reserves and production profile).
- Improvement to stability of grouted stope crowns reducing safety and production related risks associated with open up-hole stopes.
- Reduction of cost and time constraints with respect to the grouting of loose fill.
- Reduction in curing time from 14 days to 8 days.

This paper is a case study of the evolution and optimisation of the blind up-hole open stoping underground mining method and is discussed using key mining outcomes.