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## A Geotechnical Risk Assessment Tool for Underground Mine Drives

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### **ABSTRACT**

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Rockfalls or significant deterioration of mine openings can have significant safety and financial impacts for mining operations. The failure of drives in underground mines sometimes highlight deficiencies in the mine risk management systems in detecting geotechnical hazards and to prevent events that can have significant impact. Consequences from these failures includes fatalities, injuries, loss of revenue, additional cost, and potentially a loss in ore reserves. Where the impacts are severe, it also affects families and communities linked to the operation. The assessment of underground excavations requires consideration of the full range and spectrum of geomechanical hazards, design aspects, ground support, layouts and sequences. Where the assessment of these are insufficient or incorrect, it can result in drive failures. Care must be taken that meeting production targets and personnel pressures do not result in a situation where production take preference over a proper risk-based assessment of the drives to be mined.

The risk management approach is now widely accepted in the mining industry for the control and management of risks in underground mines. Codes of Practices (COP's), Ground Control Management Plans (GCMP), Principal Hazard Manage Plans (PHMP's) and technical guidance documents has become the norm for describing the mines main hazards, risk levels and intimating controls for safe passage of vehicles and mine personnel.

However, where there is a disconnect between these documents and what is actually being done at the mine site, the COP's and/or Management plans become ineffective. This disconnect may occur due to the actual content of these documents, a lack of resources, or a lack of understanding about the implementation.

There is therefore a need for sites to have a documented and implemented risk-based approach for assessing underground mine development. This approach or system needs to identify all hazards and other factors affecting mine development stability early on in the design process, and outline the risk classification and controls required. This paper presents an amalgamation and modification of previous processes for a Geotechnical Risk Management System for Underground Mine Development.