**Implementation of a First Principles Approach to Mine Scheduling at Caijiaying Underground Mine, China: A Case Study**

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# ABSTRACT

This paper examines the application of a first principles approach to underground mine scheduling at the Caijiaying Underground Mine in China. The mine operates with both modern mechanised and traditional handheld mining techniques, creating a highly complex scheduling environment. By leveraging first principles scheduling, the mine was able to model detailed equipment and crew driven processes, accommodating the unique constraints of each level, orebody, and crew. Although the system has not been in place long enough to deliver a body of operational outcome metrics, the plans developed thus far have demonstrated that this approach is capable of modelling highly detailed and complex constraints, reducing the number of assumptions and so far, is proving to generate realistic and achievable forecasts. This case study demonstrates how a first principles approach allows for precise modelling of constraints and variability, providing a robust platform for mine planning and operational execution. The schedule model builds were completed in Micromine Advance Planner.