

SCHEDULING OPTIMIZATION UNDER UNCERTAINTY

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ABSTRACT

The production scheduling of open pit mines deals with the quest for the most profitable mining sequence over the mine's life. The dynamics of mining ore and waste and interactions with spatial grade uncertainty make the prediction of the optimum mining sequence a challenging task. This paper examines an optimization approach to open pit production scheduling based on the effective management of waste mining to maximize NPV and in relation to the presence of grade uncertainty. The approach considers an economic model, the specific mine set-up, mining and processing specifics including production equipment, as well as the development of a combinatorial optimization formulation that integrates multiple grade realizations of the deposit. The efficient use of grade uncertainty and mining rates leads to schedules that are risk-resilient. A case study from a gold mine demonstrates the approach.