

Dynamic grade control modelling processes at the Waihi Underground Gold Mine

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ABSTRACT

With traditional grade control processes, geological models are created by geologists at the completion of the data collection stage and wireframe construction is closed off at a set date to allow for time to complete the estimation process. Any issues identified at earlier stages or the addition of new data requires the estimation process to be started again. Alternative interpretations are explored only if time allows and often in a limited fashion.

A workflow has been developed at the Waihi Underground Gold Mine utilising Leapfrog Edge and Seequent Central. Geological and grade control models are created, dynamically linked, and saved as separate branches. A project geologist is able to work on the grade control model and a mine geologist on the geological model simultaneously. This allows for a non-linear modelling workflow with continual review and feedback. The introduction of new data can occur right up to the model due date, with data collection, validation, alternate interpretation, and review happening incrementally.

Models are categorised and stored in Seequent Central according to project status. An approved version of the geological model and grade control estimate are uploaded at the time of release and transparently capture all data used at a point in time, as well as the review process.

Dynamically updating models for grade control has reduced turnaround time while increasing accuracy and quality. Estimates of individual domains are vastly improved from being able to rapidly evaluate the effects of model parameter changes in real time and 3D.

Development and stope design directly benefit from these streamlined processes, with higher quality, timely production occurring as a result.