Transforming Geoscience through Live Implicit Modelling at Olympic Dam — Innovative Solutions in Data Dense Environments

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Abstract:

Effective use of live data informing real-time decision making is becoming increasingly prevalent within the mining industry, as users seek to leverage more value from their investment in geological data collection. This remains the core of the ongoing project to modernize the data handling and modelling processes at Olympic Dam. This paper describes the innovative transformation of the Olympic Dam geological model from sound practice to leading edge, enabled by industry leading model management and database solutions.

Traditionally holistic model updates of Olympic Dam were problematic due to the size of the deposit and the vast quantity of historical data. Explicit modelling methods were inflexible and time intensive, leading to delays in model releases. However, initial implementations of implicit modelling methods were hampered by computational limitations in processing of the very large data sets. A new approach to allow data segregation and manageable data handling was required.

The key enabling solution was dividing Olympic Dam into ten geologically distinct structural domains each forming sub-models. This ultimately reduced the processing time required for implicit models and simplified data import/export. Each of these sub-models can be worked on independently, with the sub-models dynamically recombined through Leapfrog Central to produce a single integrated model for planning and resource estimation.

The value driver for BHP Olympic Dam is the development of the first fully integrated, live geological model defining lithology, alteration, structural domains and mineralization. Near real-time updates to critical geological models will ensure robust geological domains inform the resource model. Moreover, implicit modelling also enables the rapid generation of a greater range of quality geological products supporting better informed safety, productivity and improvement opportunity decisions by geoscience customers. (e.g. geometallurgy, geotechnical, mine design, mine planning and production).