Embracing Step-Changes in Geoscientific Inputs for Effective Implementation of Geometallurgy

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Geometallurgy aims to improve mining project value through the generation and use of spatial models of orebody characteristics that impact on mining and metallurgical processes. These models have until recently been constrained by the spatial coverage and representivity of relevant data.

The revolution in the diversity and volume of data and computational power that is now becoming available for integrated geoscientific modeling of orebodies is set to accelerate. By embracing the emergence of "big data," geoscientists (collectively, geologists, geometallurgists, mineralogists, geochemists, and geophysicists) will lead a transformation in the way the mining value chain, from orebody to recovery, can be conceived, evaluated, and operated.

The emerging capability to process large numbers of stochastic images of the mineralized system—each characterized by rich multivariate information—will allow better decision-making on alternative value chain selection, configuration, and operation in the face of uncertainty. While this robust approach to decision-making has obvious implications for capital decisions in large and long-life mining projects, it has equally dramatic possibilities for real-time optimization of existing operations.

The advent of more flexible, highly configurable and, in many instances, automated and intelligent approaches to mining and mineral processing is perfectly timed to facilitate the use of "big data" inputs and deliver step-changes in value.