

Geometallurgical Services

A Strategic Approach to Geometallurgy

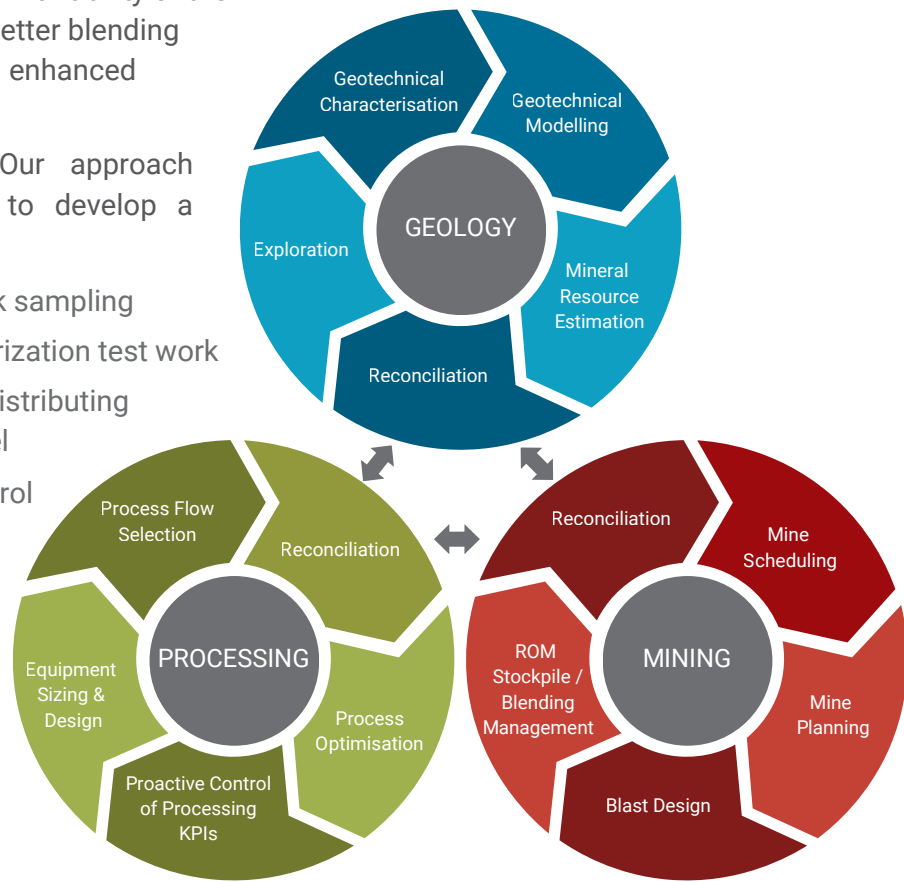
At VBKOM, our focus is on optimizing mineral extraction and creating value for our clients through innovative and practical engineering solutions. Geometallurgy is a key part of this approach, combining the expertise of a multidisciplinary team to create a 3D model that provides a wealth of information about a resource.

This improves the understanding of the spatial variability of the deposits, which leads to improved planning, better blending strategies, more efficient process design, and enhanced process efficiencies.

Geometallurgy is an iterative process. Our approach involves a multi-disciplinary collaboration to develop a performance-predicting model by:

- › Ensuring representative drillcore and bulk sampling
- › Conducting comprehensive ore characterization test work
- › Performing geo-statistical analysis and distributing data spatially into a resource block model
- › Enabling estimation factors that control recovery on a block-by-block basis

Historically, geometallurgical models included only geological and metallurgical data. Today, VBKOM's models also incorporate mining, geotechnical, mineral economics, and geo-environmental data to maximize the economic value of a mining project, reduce risk, and build operational resilience.



Geometallurgy's Impact Across the Mining Value Chain

Geometallurgy impacts the entire mining value chain, from early-stage exploration through to mine operations. The aim is to bridge the gap between geology and metallurgy to optimize the extraction of valuable minerals. As mines face increasingly complex and variable orebodies and more stringent environmental laws, geometallurgy provides a proactive solution to optimize cost across the value chain.

The Progression of a Geometallurgical Study

The development of a reliable geometallurgical model relies on accurate sampling and metallurgical test work. The type and accuracy of the input data improve the model's capabilities as the study progresses through different phases.

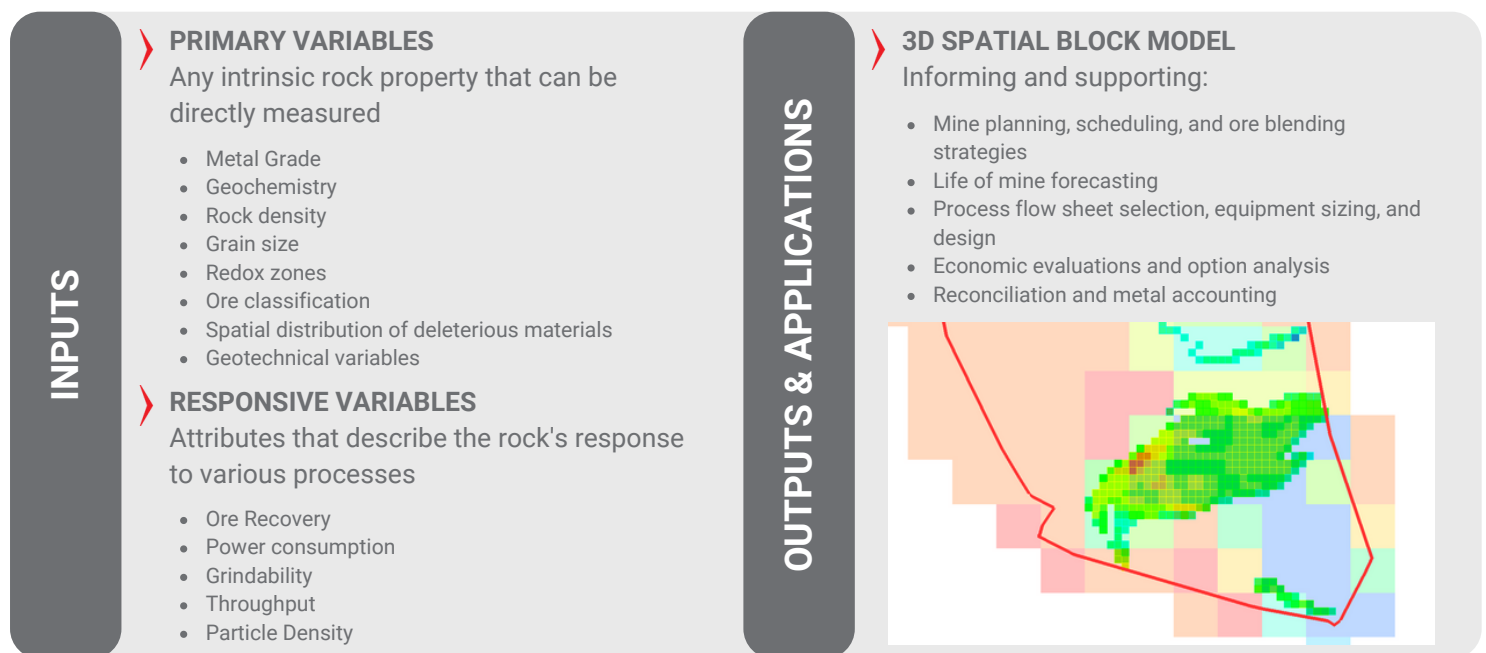


- > **Early Evaluation (Scoping Study):** Models are predictive, relying on characterization data. Activities focus on developing orebody knowledge, drilling, and sampling.
- > **Resource and Reserve Definition Drilling (Pre-Feasibility & Feasibility Studies):** Data analysis and modeling begin. The database is expanded, and preliminary mine plans and process designs are developed.
- > **Production:** The model becomes dynamic through the integration of feedback loops from actual operations. This continuous updating ensures the model remains relevant.

The level of confidence and accuracy of the model increases with each phase, while the risk and cost decrease as the number of samples increases.

Inputs and Outputs of a Geometallurgical Model

The inputs for a geometallurgical model consist of primary and responsive variables. These variables are obtained from the analysis of samples and metallurgical test work and are modeled on a block-by-block basis. The output is a 3D spatial block model with attributes and features at each drill core sample location, informing and supporting key activities.



Our Value Proposition

VBKOM's team is highly capable and experienced in providing geometallurgical services. Our goal is to provide quantitative predictions of the variability of the ore, concentrate, and tailings to ensure better utilization of the resource. Our multidisciplinary expertise allows us to serve as a one-stop shop for clients in the mining and other capital-intensive industries.

We are committed to adding value through innovative, practical, and trustworthy engineering solutions. We challenge ourselves to use fresh thinking, experience, and technology to pioneer forward-thinking solutions. We work as part of the owner's team to protect their interests and provide independent solutions without inherent conflicts of interest. Our technical expertise, backed by cutting-edge technology and advanced computer modeling, has earned us the trust of prestigious mineral resource companies worldwide.



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