From the Core Shed… To the Project Bottom Line

Collection and Application of Mineral Exploration Data

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ABSTRACT

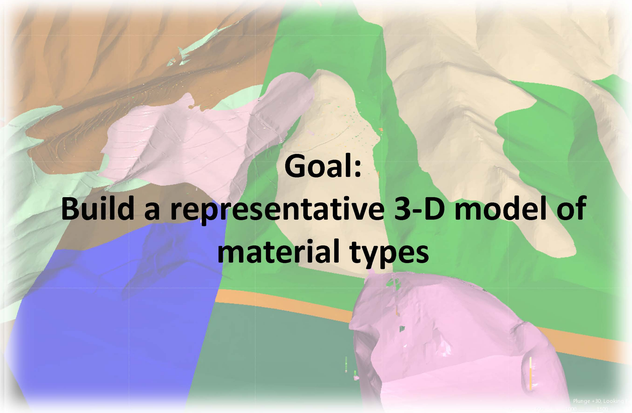
Efficient data collection adds value over the life of a mining project, especially when the end purposes of the database are fully considered at the beginning of the exploration stage. The process starts with optimizing entry forms and configuring a database to readily import and organize observations and analytical results.

Development of a representative geological model is one of the main goals of the exploration process. This model's foundation is accurate and complete data collection from field observations, converted to a usable digital format. Logging of drill core or chips to generate a sub-surface data set is the emphasis, but the principles are also applicable to mapping. The modeling process starts with an effective database design, including input forms that facilitate both quantitative data collection and geological interpretation. Material types in a deposit are the result of many geological processes acting on a rock mass. Geological modeling, and therefore, data collection, is most efficient with a process-based approach.

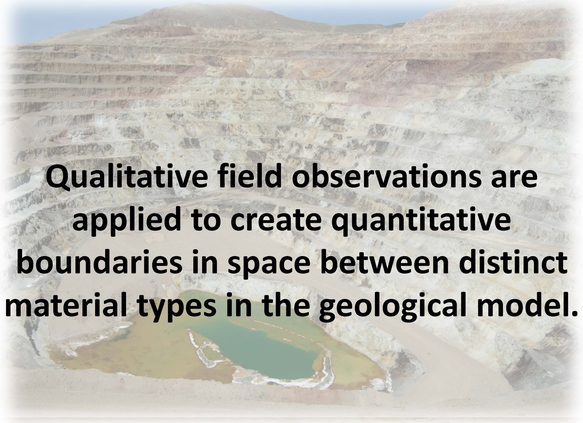
Initially, the model will depict lithological and other geological contacts and, where mineralized, grade domain boundaries. As a project advances to the development stage, the data set should allow delineation of material types leading to metallurgical, waste rock, and geotechnical characterization.

Many observations, commonly overlooked by exploration geologists, can help define material properties required for designing metallurgical process and mine design. A wide array of mining applications should be considered at the beginning of an exploration program to fully define the data elements to be captured, interpreted and modeled. A complete and consistent data set adds value to the project and reduces risk to future development.

Keywords: Logging, data collection, database, material types, geological modeling



Goal:
Build a representative 3-D model of material types

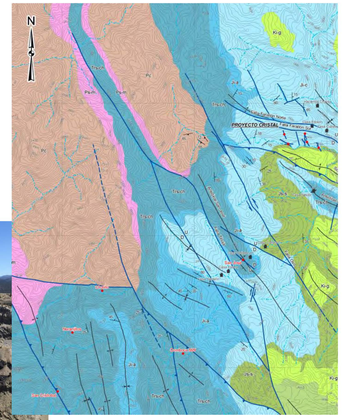


Qualitative field observations are applied to create quantitative boundaries in space between distinct material types in the geological model.

Geological Data Applications: Beyond Exploration

Attribute	Hydrogeology	Metallurgy and Mineral Processing	Mine Engineering	Environmental Geochemistry	Geotechnical Engineering
Lithology	*	*	*	*	*
Oxidation	*	*	*	*	*
Alteration	*	*	*	*	*
Mineralogy	*	*		*	
Rock Quality	*	*	*		*
Structure	*		*		*

Geological Data Sources



The details of every deposit are unique, but these basic material properties should be characterized:

- Lithology
- Alteration
- Oxidation
- Mineralogy
- Structure

Data Collection Workflow – Maximize the Added Value

- Observations of Material Properties
- Geological Logging
- Microscopy
- Mapping
- Database of Observations and Measurements
- Drillhole Logs
- Digital Data Tables
- Photographs
- Maps
- Application of Data to Working Model
- Updated Interpretation
- Updated 3-D Model
- New Exploration Targets
- Mineral Resource Estimate
- Geological Model Applications
- Rock Quality: Geotech Engineering, Hydrogeology
- Mineralogy: Metallurgy, Mineral Processing, Mine Closure
- Lithology and Alteration: Applicable to All Aspects of Resource Development… To Find More!

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