EXPLORATION MINERALOGY (EXPLOMIN™)

Developed by SGS, EXPLOMIN™ is a trademarked suite of packages which provide rapid, automated mineralogy for exploration and early project development purposes. EXPLOMIN™ is your link between mineralogy, domain definition, metallurgy and geometallurgy. The value of EXPLOMIN™ lies in its ability to acquire and process vast amounts of extremely detailed mineralogy data efficiently and economically.

There are two reporting styles, imaging options and data output formats to choose from. Each provides a consistent digital format that can be used for 3-D mapping and manipulation. The EXPLOMIN™ suite of deliverables is shown below.

THE VALUE OF EXPLOMIN™

EXPLOMIN™ allows the direct quantification of mineralogy and may provide textural information for Imaging. Data can be easily graphed and assessed. Such digital data has many uses during the life of a project.

EXPLOMIN™ data can be used to

- Determine the mineralogy of a large number of samples rapidly and accurately.
- Identify variations in modal mineralogy across or down into mineral deposits or within soil or till horizons.
- Identify textural variation (i.e. degree of replacement). (Imaging)
- Interpret rock textures in a sample (petrography). (Imaging custom add-on)
- Quantify the mineralogy of core, rocks, rejects or pulps.
- Compare the actual mineralogy of a drill interval with the geochemistry of that same interval.

	EXPLOMIN™ STANDARD	EXPLOMIN™ IMAGING
DELIVERABLES	Mineral identification Modal mineralogy Downhole logplot showing modal mineralogy, geochem*, field parameters**	Mineral identification Modal mineralogy Digital image Scale Legend / Mineral List
FORMAT	EXCEL file, containing tabulated numerical data.	JPEG or Bitmap
APPROPRIATE SAMPLE TYPES	Pulp (-0.105 mm)	Rock chip or core slice (Assay reject -1.7 mm if needed)
DATA TRANSMISSION	Via email attachment	Via email attachment
TYPICAL APPLICATIONS	Vector to Ore Domain Definition Compositing	Petrographic assessments
CUSTOMIZABLES	Additional deportments available.	

Packages can be customized to suit the specific needs of the project.

* Data handling charges do not apply if data is from SGS lab.

** Data handling charges may apply depending on data formatting issues

EXPLOMIN™ can contribute to exploration projects in the following ways:

Early Exploration:

- Provide documentation of progressive replacement textures or the presence of pathfinder minerals to verify exploration models and help "vector-to-ore". (Imaging)
- Provide detailed paragenetic information that highlights the sequence of ore formation. (Imaging)
- Provide data suitable to create bedrock maps.
- Highlight the relationship of ore formation to structural events (only true for the Imaging option, not the standard product).
- Classify metamorphic domains.
- Identify and map indicator mineral distributions and assemblages.

Project development:

- Delineate or classify alteration or weathering zones within a deposit. For instance:
- the oxide zone, the transition zone and the sulphide zone,
- sericitic, chloritic and talc alteration zones,
- porphyry copper alteration zones,
- skarn alteration halos,
- high phosphorus zones around IOCG deposits.

SGS

EXPLOMIN™ AND THE GEOMETALLURGICAL FRAMEWORK

Geometallurgy identifies the variation in mineralogy and texture across an ore body. It uses a variety of parameters to map grindability and metallurgical performance. Geometallurgical data is used to generate a block model for process modeling and forecasting purposes. An EXPLOMIN™ ore characterization program provides the mineralogical data required for the Geometallurgical Framework. EXPLOMIN™ provides input into the following stages of the Geometallurgical Framework:
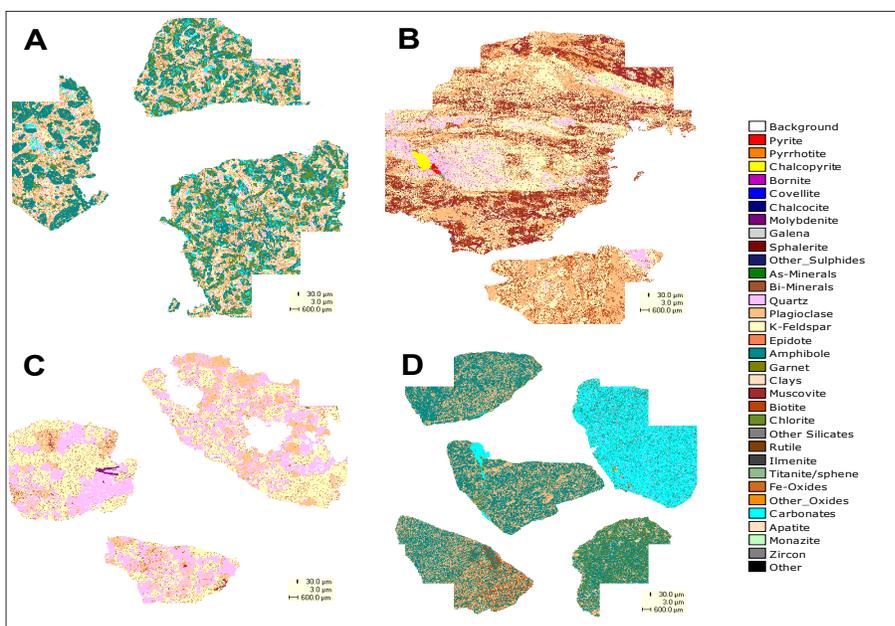
THE EXPLOMIN™ APPROACH

MEASUREMENT PROCEDURES

EXPLOMIN™ data is generated by QEMSCAN on polished sections of core or crushed material. Approximately 0.5 gram of sample (core chunk or granular material) is epoxy-mounted in a "puck". About 40,000 - 60,000 points are analyzed per sample.

SAMPLE TYPES

EXPLOMIN™ can be done on drill core fragments, RC drill chips, rock chips from channel or trench samples, geochem rejects or geochem pulps. EXPLOMIN™ is done on "whole rock" samples. There is no screening, mineral separation or size classification involved.

GEOMET FRAMEWORK	EXPLOMIN™ SUITE	APPLICATION OF DATA
DOMAIN DEFINITION	EXPLOMIN™ STANDARD (Modal mineralogy)	Data combines with field and geochem data in integrated and extended database for multivariate statistical analysis
SAMPLE SELECTION	EXPLOMIN™ STANDARD	Creates optimal composites.
PARAMETER DEFINITION OR TESTING	EXPLOMIN™ STANDARD	Yields starting parameters to facilitate metallurgical testing and flowsheet development.
MODEL DEFINITION	EXPLOMIN™ STANDARD	Use as proxies to develop functions that relate mineralogy to process.
SPATIAL MODEL GENERATION		Populate the block model.
JOINT MINING AND MINERAL PROCESSING OPTIMIZATION		

EXPLOMIN™ V2

SGS released Version 1 of EXPLOMIN™ in Q1 of 2008. The V2 release further includes:

- Ability to collate mineralogy with geochem data by using the analytical pulp (preferred) or the analytical reject (possible if necessary),
- A la carte selection of add-on deliverables,
- Better data reporting graphics (if appropriate),
- More refined product offering, priced to meet market requirements,
- Procedural improvements to speed up data gathering and reporting.

SUMMARY

The value of EXPLOMIN™ lies in its ability to provide objective mineralogy efficiently and economically. EXPLOMIN™ analysis is done on a QEMSCAN, using scanning electron microscopy (SEM) and energy dispersive spectra (EDS) technology. EXPLOMIN™ is backed by the expertise of SGS Minerals Services' metallurgical group, who have 50 years of process mineralogy experience and 10 years of experience with High Definition Mineralogy.

Data acquired during EXPLOMIN™ permits robust statistical comparisons and manipulation in 3-D allowing you to:

- Validate exploration models and use mineralogy to vector-to-ore.
- Realize the value locked in legacy core by providing a fast and reliable way to benchmark the mineralogy in the old core with that which is generated by current drilling.
- Define project-specific geologic domains for use with the Geometallurgical Framework.
- Accurately map deleterious and advantageous minerals with acid generating capabilities or neutralizing potential, for use in the support of continuing environmental investigation and due diligence proceedings.
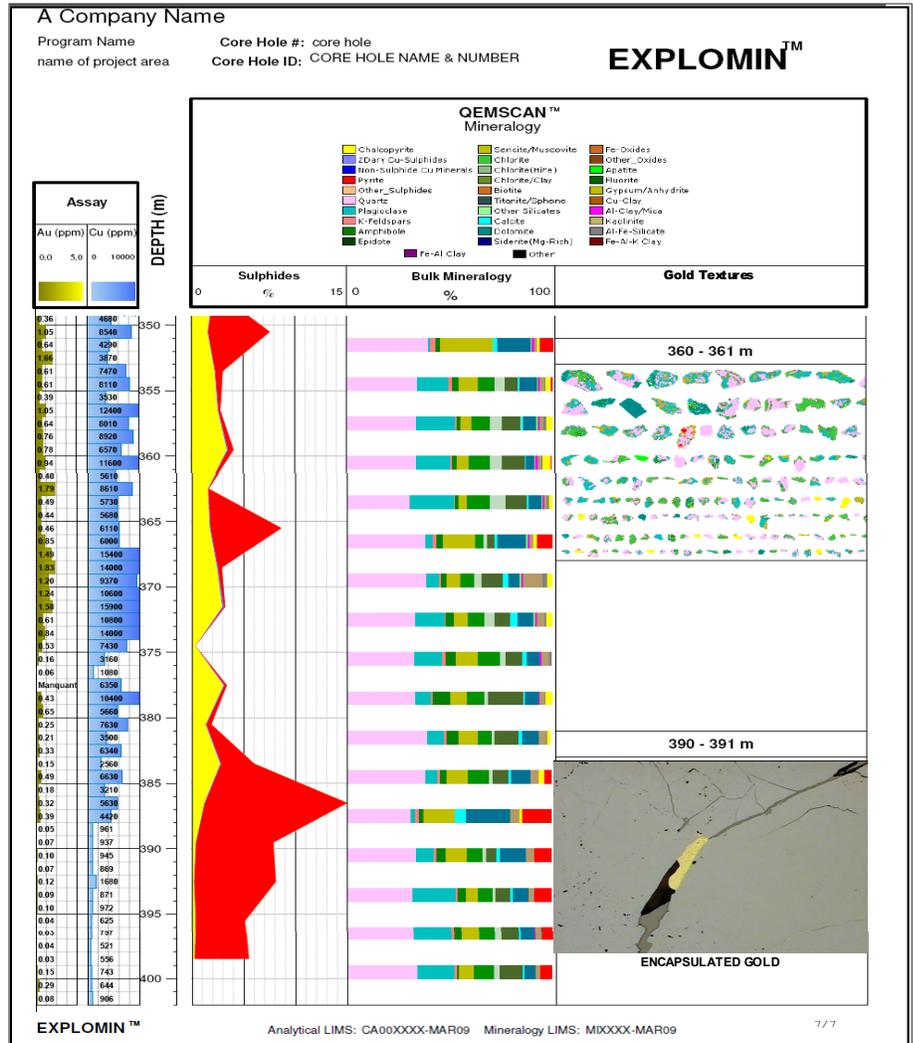
EXPLOMIN™ is your tool for mineralogy and domain definition. This powerful automated procedure, capable of acquiring and processing vast amounts of mineralogical data, will prove especially useful to those in the resource development, conceptual and pre-feasibility phases of their projects.

CONTACT INFORMATION

Email us at minerals@sgs.com
www.sgs.com/mining

WHEN YOU NEED TO BE SURE