

MINING GEOCHEMISTRY SERVICES



AGAT Laboratories

Service Beyond Analysis

AGAT Laboratories is a highly specialized, Canadian-based company that provides analytical laboratory services worldwide. We offer services to the Environmental, Energy, Mining, Industrial, Transportation, Agri-Food and Life Science sectors. With world-class facilities and state-of-the-art instrumentation, our qualified personnel adhere to our mission statement, delivering "Service Beyond Analysis".



MINING GEOCHEMISTRY SERVICES

AGAT Laboratories offers services to support mining and mineral exploration companies in all stages of the mining process, from exploration and development to environmental monitoring and restoration. Geological and mining data is available through sub-ppb detection for geological mapping, per cent level analysis in mineralization grade studies and in analysis for your final metals product purity.

AGAT Laboratories also offers Acid-Base Accounting (ABA) and kinetic cell testing on all sample types, including rock overburden. These tests provide important information on the potential of sites to produce or consume acid. As a result, these tests are extremely important when making decisions for mine sites and their design.

AGAT Laboratories also offers complete environmental chemistry packages for environmental monitoring and the restoration of mine sites. Additionally, our Tribology Preventative Maintenance Division provides solutions for the monitoring and failure analysis of heavy operations equipment.

Commitment to Quality

Our laboratories understand how critical quality control is to the overall success of a project. As a result, our Quality Assurance Division utilizes a sophisticated *Laboratory Information Management System (LIMS)* to monitor the progress of a samples' analysis throughout the laboratory process. Working with the Quality Assurance Division, our Sample Preparation department obtains random samples to ensure proper grain size. By inserting blind duplicate samples into our laboratory stream, they are able to track process control and generate routine control charts of all certified reference materials.

Accreditation

AGAT Laboratories is accredited or approved for specific analyses by the following agencies:

- The Standards Council of Canada (SCC)
- Canadian Association for Laboratory Accreditation (CALA)
- Canadian Council of Ministers of the Environment (CCME)

AGAT Laboratories is accredited to the following international standards:

- International Standards Organization ISO 9001:2008
- International Standards Organization ISO/IEC 17025:2005

Sample Preparation

AGAT Laboratories has long recognized the critical nature of sample preparation in the assaying process. Our team understands that the quality and accuracy of any analysis is dependent on the quality of the sample's preparation. For this reason, our Sample Preparation department implements intense quality control measures, selecting the most homogenous sub samples for analysis. Standardised sample preparation procedures are followed across Canada and each of our Mining Geochemistry labs utilizes standardised preparation equipment and procedures. This ensures that no matter which location receives the sample, the sample preparation and analysis procedures will be the same.

DID YOU KNOW?

Our Sample Preparation department can customize services such as the drying, crushing, pulverizing and screening of samples to fit each project's specific needs.

Geochemical Assay

We offer a variety of geochemical approaches, packages and customized analysis based on the elemental detection required. Analyses are initiated with a digestion or decomposition technique and then finished using state-of-the-art instrumentation for the most accurate results.

We offer the following geochemical services:

- Precious Metals Analysis
- Base Metal Analysis
- Geochemistry Spectroscopy
- Selective Leaches
- Lanthanide Analysis
- Lithogeochemistry
- Sulfide/Laterite Analysis
- Classical Assays

Sample Decomposition

In order to break-down solid samples for instrumental analysis, AGAT Laboratories offers a number of techniques including:

- **Acid Digestion:** During Aqua-regia or multi-acid digestion, samples are exposed to hot, concentrated acids in order to solubilise the target elements.
- **Fusion:** Lithium borate or sodium peroxide fusions provide a more vigorous means of decomposition as they completely break down the samples as well as the difficult-to-dissolve minerals into a molten flux.
- **Selective Leaches:** Selective leaching techniques are more effective in dissolving specific trace elements and are useful in determining anomalies that may be missed when using more aggressive digestions.



Advanced Instrumentation

AGAT Laboratories uses leading-edge instrumentation to report the highest number of elements at the lowest detection limits in the industry. Once these elements of interest have been solubilised, they may be analyzed using Mass Spectroscopy, Emission Spectroscopy or Atomic Absorption. Inductively Coupled Plasma and Flame Atomic Absorption instrumentation are fully automated to provide timely and cost-effective choices in multi-elemental trace analysis. We also offer cold vapour atomic absorption for mercury (Hg) analysis, and classical wet techniques for high precision mineralization assays.



Specialty Services

Leach Technology

We offer a wide range of selective and sequential leaches to allow our clients to select the analysis that is most applicable to their geological field sampling environment. We offer non-proprietary methods that include cold and hot hydroxylamine hydrochloride, sodium pyrophosphate, sodium acetate and EDTA leaches. By focusing on powerful technology, we offer unparalleled detection limits and results free of common interferences. This can be crucial when requiring Cu and Cr in sodium pyrophosphate leaches, and As and Se in hydroxylamine hydrochloride leaches.

Lanthanide Analysis

This testing is ideal for the increasing interest in lanthanide analysis. Following two different digestions, Rare Earth Elements (REE) are determined using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS), based on the specified requirements. A four-acid digestion can be used for most sample types, or a lithium borate fusion for a more aggressive approach.

WebMINING | webmining.agatlabs.com

AGAT Laboratories' *WebMINING* is a web-based software system specially designed for our Mining Geochemistry clients. This program enables clients to view their analytical results online as they are completed, giving our clients secure access to necessary analytical information for their operations. *WebMINING* works with our *Laboratory Information Management System (LIMS)* which integrates; data capture, real-time statistical control, standard and custom report generation and data integrity checking. It can be securely accessed via the internet using an approved username and password.



WebMINING includes some of the following features and capabilities:

- View/print signed certificates of analysis.
- Search historical data by various criteria.
- Compare results from multiple samples and work orders.
- Export results to Microsoft Excel and other spreadsheet and database formats.
- Graph trends related to specific concentrations and elements.

