Mining Division

AGAT Laboratories

Mining Geochemistry Manual

AGAT Laboratories

AGAT Laboratories is a highly specialized, Canadian-based company that provides laboratory services worldwide. With over 40 years of experience, AGAT Laboratories is the most geographically and technically diversified laboratory in Canada. Our scientists are highly skilled and specialized in the fields of chemistry, biochemistry, microbiology, geology, engineering and specialty analysis. Committed to local communities, AGAT Laboratories aims to maintain our mission of "Service Beyond Analysis".

AGAT Laboratories' operations encompass 13 scientific divisions to offer full-service solutions to multiple industry types within the Environmental, Energy, Resources & Renewables, Minerals & Metals, Industrial, Transportation, Agri-Food, Life Sciences and Forensics sectors.

AGAT Laboratories specializes in the following scientific areas:

- Environmental Chemistry
- Ultra-trace and Toxicology
- Agricultural Analysis
- Food Testing
- Geology and Petrology
- Reservoir Characterization
- Air Quality Monitoring
- Petroleum Testing Services
- Oil Sands Analysis
- Advanced Rock Properties
- Core & Materials Testing
- Mining Geochemistry
- Lubricants Testing Services
- Geotechnical Testing Services

Core Values

- **Integrity –** We do the right thing for the right reason, upholding our ethics no matter the outcome, putting quality above all.
- **Accountability –** We admit when we are wrong and take ownership of our actions.
- **Respect –** We value personal diversity while treating all people with dignity.
- **Unity –** We support one another, share a common direction, lift each other up and celebrate our achievements as one.
- **Innovation –** We push the boundaries of science and technology to provide uniqueness in our processes, culture, and scientific advancements.
- **Passion –** We exude enthusiasm in all that we do, valuing the fun and enjoyable environment that we exist in while embracing every challenge along the way.

Our Purpose

To provide "**Service Beyond Analysis**" to three key pillars: **Our People**, **Our Clients** and **Our Communities**

Service Overview

AGAT Laboratories is a highly specialized Canadian-based company that provides analytical services worldwide. With over 40+ years of experience, coast to coast locations, and over 1,200 employees Canada-wide, AGAT Laboratories is the most geographically and technically diversified laboratory in Canada. It includes multiple scientific divisions across the Mining, Environmental, Energy, Industrial, Transportation, Life Sciences and Agri-Food sectors. Our scientists are highly skilled and specialized in the fields of geology, engineering, chemistry, biochemistry, microbiology and specialty analysis.

AGAT Laboratories' Mining Division provides comprehensive services for exploration and mining development and offers various monitoring programs. Full-service solutions are provided for the following divisions:

- **Mining Geochemistry:** Geochemical data acquisition to determine elemental concentrations, mineralization pathways and grades that support mapping and mining or refinement activities.
- **Geology:** Geological and petrographic data acquisition to determine mineral composition, assemblage and distribution to support exploration, drilling, excavation and mining activities.
- **Organic fluids/oils:** Analytical testing of coolants, lubricants, hydraulic and transmission fluids for mechanical diagnosis of engines and operational equipment as well a full oil quality assessment profiling.
- **Environmental Chemistry:** Organic and inorganic chemical analysis of water, groundwater, wastewater, soil, sediment sludge and solid waste to assist environmental assessments, monitoring, disposal and treatment.
- **Air Quality Monitoring:** Ambient or passive air monitoring, and meteorological monitoring for health, safety and environmental industrial/occupational hygiene purposes.

AGAT Laboratories' network of laboratory locations provides clients with cost-effective and timely analysis in which the most up-to-date technical standards are met. AGAT Laboratories is proud to set the standard for the laboratory industry, ensuring validity and accuracy of methodologies through our extensive quality assurance and quality control programs. With world-class facilities and instrumentation, our qualified personnel adhere to AGAT Laboratories' mission statement, delivering **"Service Beyond Analysis"**.

AGAT Laboratories' Mining Division supports companies in their mining and mineral activities throughout all stages of exploration, mining, and development, including environmental monitoring and restoration efforts.

State-of-the-art instrumentation (AAS, ICP-OES, ICP-MS, XRD and XRF) and expertise (chemists, mineralogists, geologists, environmental chemists) deliver routine and special services including geochemical analysis using leach technology, multi- acid and Aqua-Regia digestions, sodium peroxide and lithium borate fusions, and fire assay techniques.

Experience Excellence

AGAT Laboratories operates under the philosophy of continuous advancement and is constantly strengthening all aspects of our business to provide service excellence to our clients while contributing to innovations of science and technology. We work closely with our clients under the Laboratory Partnership Program to develop new methodology and analytical services and offer cost effective and timely analysis while meeting up-to-date standards.

The following are some benefits our clients gain from partnering with AGAT Laboratories.

Commitment to Quality

AGAT Laboratories recognizes how critical quality control is to the overall success of a project. Our Quality Control department utilizes an integrated Laboratory Information Management System (LIMS) that monitors every step of the laboratory process. and our Quality Management System is officially recognized to meet international standards ISO 17025:2017. Certified reference and standard samples, sample duplicates and blind duplicates are routinely utilized in our laboratory stream to quality check sample preparation, sample quality, instrument precision, and data accuracy.

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

- **The Standards Council of Canada (SCC)**
- **Association of Professional Engineers and Geoscientists of Alberta (APEGA)**
- **The Canadian Association for Laboratory Accreditation (CALA)**
- **Ontario Ministry of the Environment**
- **Ontario Ministry of Environment Drinking Water Testing License**
- **Ministère du Développement Durable, de l'Environnement, de la Faune et des Parcs (MDDEFP)**
- **Nova Scotia Environment**
- **Alberta and British Columbia Drinking Water (EWQA)**

AGAT Laboratories is accredited to the following international standards:

- **International Standards Organization ISO/IEC 17025:2017**

Accreditation can be found at *http://palcan.scc.ca/specs/pdf/859_e.pdf*

Experience

AGAT Laboratories has over 40+ years of laboratory experience and has proven a long-term commitment to investing in Canadian research and technology.

Our laboratories offer a diverse array of services allowing our personnel to draw on the technical expertise and experience of scientists including; Assayers, Geologists, Engineers, Petrophysicists, Environmental Analysts, Microbiologists, Biochemists, Chemists and Agronomists.

Efficiency

AGAT Laboratories is highly efficient at anticipating and responding to our clients' needs. Our Client Project Managers closely monitor each project to ensure it is completed on time and within budget. AGAT Laboratories will complete all mineral analysis and reports upon the receipt of the samples at any one of our facilities. Rush turn-around times are available upon request at an additional cost.

Health, Safety and Environment

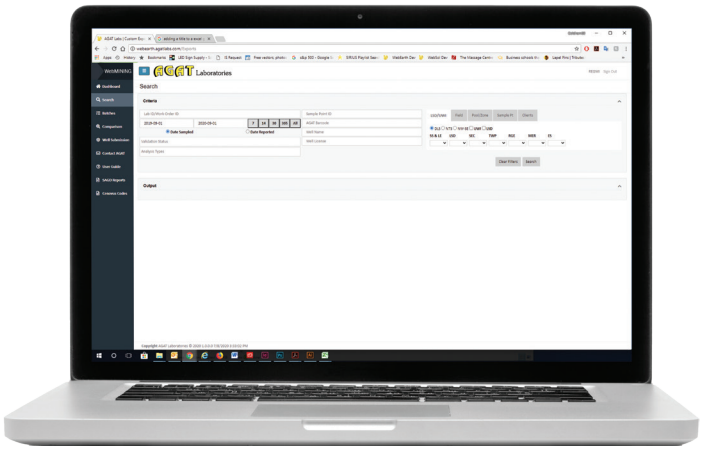
AGAT Laboratories is committed to practicing and promoting professional integrity, safety, and environmental awareness in all aspects of our business and personal activities. Our goal is to enable our clients to make the best business decisions possible. Across all laboratories, the in place environmental management systems monitor air, liquid and solid pollutants and AGAT Laboratories strives to exceed regulatory guidelines where applicable.

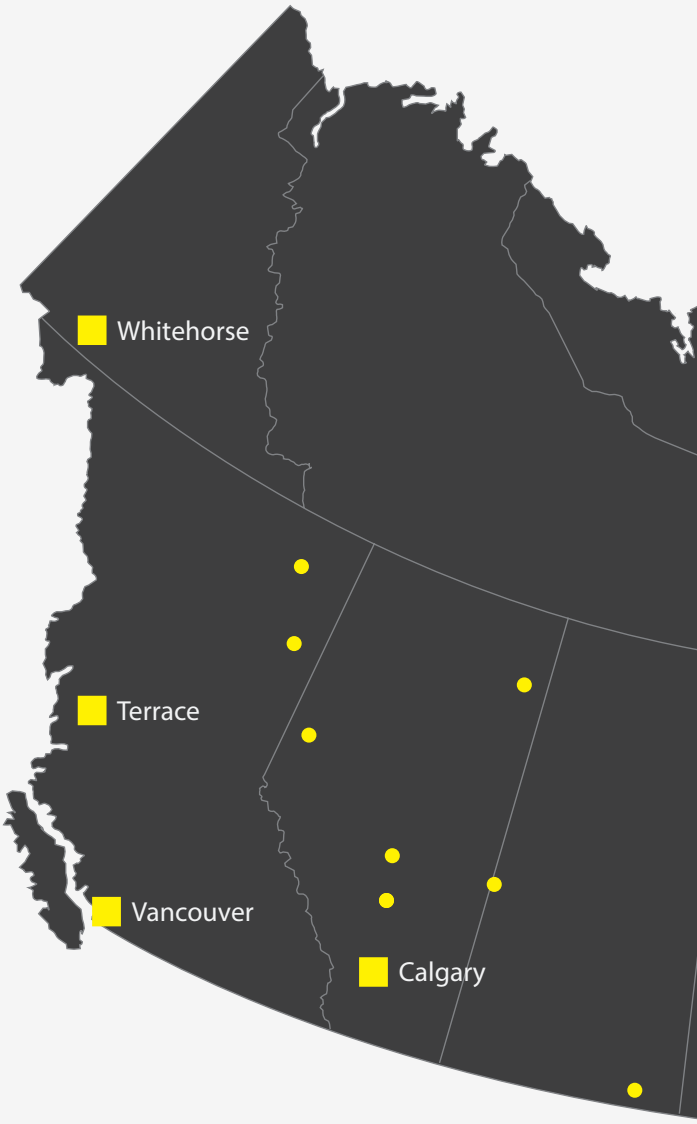
Information Technology

AGAT Laboratories has custom software programs for our clients that allow ease of data access and management to improve performance and productivity.

webMINING is our interactive web database designed for mineral exploration. This software package provides clients with real-time access to data with integrated features such as historical data, data trending, guideline comparisons, quality control and customizable export functions.

Ask your Business Development Representative for a demonstration.





Legend

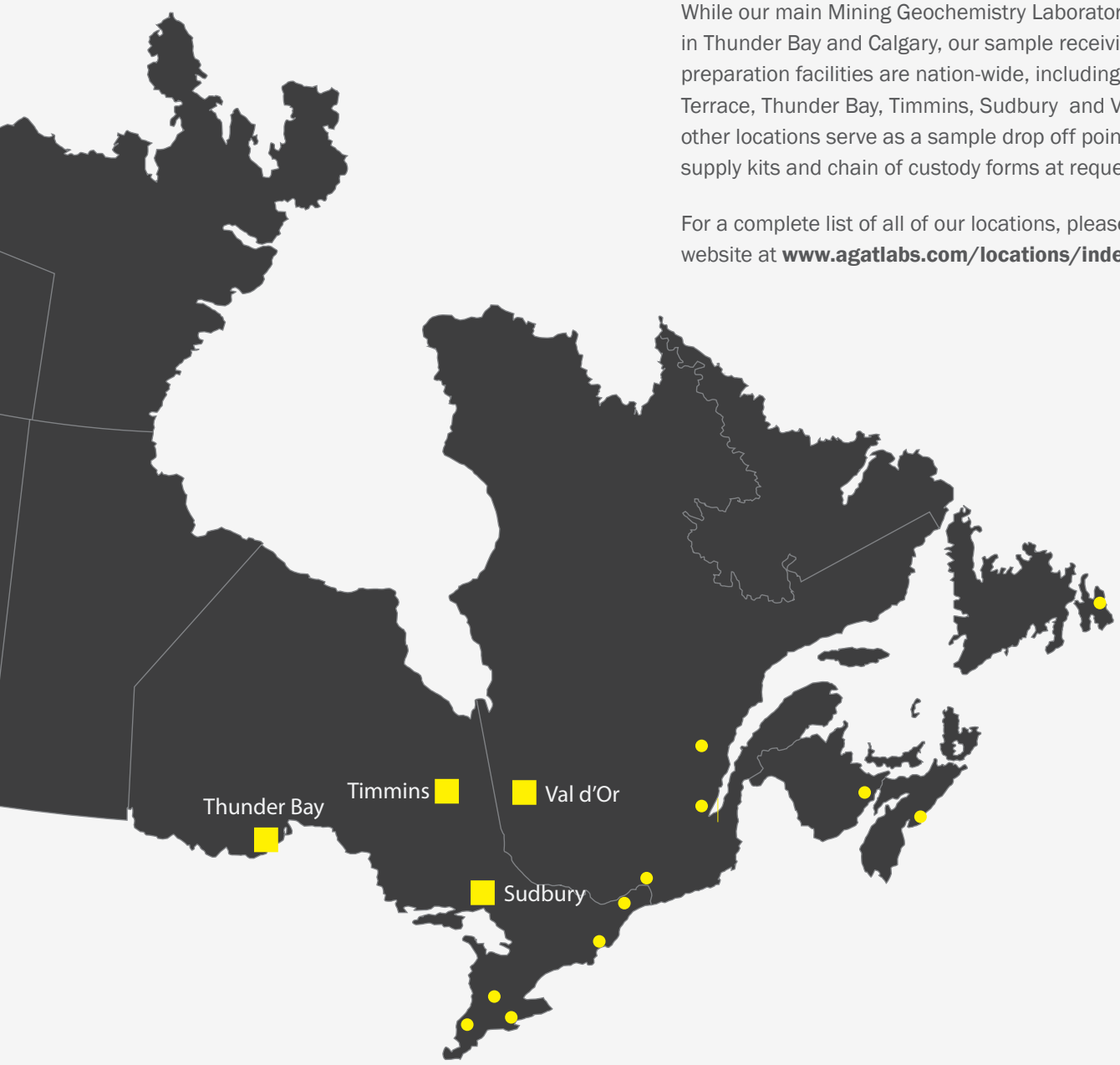
AGAT Labs' Mining Location
AGAT Labs' Locations

Canada's Mining Exploration Laboratory

Laboratory Locations

AGAT Laboratories has full-service locations from coast to coast across Canada which house the most comprehensive state-of-the-art technologies available within industry. While our main Mining Geochemistry Laboratory is located in Thunder Bay and Calgary, our sample receiving and preparation facilities are nation-wide, including Whitehorse, Terrace, Thunder Bay, Timmins, Sudbury and Val d'Or. All other locations serve as a sample drop off points and carrying supply kits and chain of custody forms at request.

For a complete list of all of our locations, please visit our website at **www.agatlabs.com/locations/index.cfm**



Core Processing and Sample Preparation

Core Handling and Processing

AGAT Laboratories professionally handles core and cuttings material and has automated core cutting saws for high precision preparation and sampling while maintaining optimum safety and productivity. AGAT offers secure storage for archiving core samples which can be retrieved and viewed at a later date. Key geological, structural, mineral and geochemical data can be determined through core description, petrography and mineral/ geochemical analyses.

Core slabbing provides representatives halves for both archive and testing material. Through our Advanced Exploration Services, we also offer high resolution core photography combined with proprietary software for viewing core as a continuous down-hole image and strip-log. These are used for log/core depth-corrections and illustrating key geological data directly on the images.

Sample Preparation

All samples received are carefully assessed and processed through our Sample Preparation Department. The quality of all analyses is contingent on sample selection and preparation. Our quality control in sample preparation ensures homogeneous sub-sample for analysis. We tailor sample preparation for your specific project requirements.

Depending on type and size of sample, common preparation procedures may include drying, crushing, milling or screening of the samples. Please consult with our specialists when choosing the best possible sample preparation for analysis. Sample mass or particle sizing can be assessed along the analytical pathway.

Sample Preparation Packages

Drying
Dry samples 105°C
Dry samples 60°C
Dry samples, room temperature
Dry excessively wet samples (as determined by Sample Preparation Department protocols)
Crushing
Crush to 75% passing 2mm
Crush to 90% passing 2mm
Coarse Pre-Crush of Drill Core and Oversize Rock Samples
Crushing can be performed to client required specifications
Splitting
Split by riffle or rotary sample divider
Split by rotary sample divider
Screening
Dry, Screen soils or stream sediments to -80 mesh
Dry, Screen soils or stream sediments to -80 mesh, >1kg (per kg rate)
Pulverize
Pulverize in Cr steel to 85% passing 75 microns
Pulverize in Cr steel to 90% passing 75 microns
Pulverize in Cr steel to 95% passing 75 microns
Pulverize in Cr steel to 85% passing 105 microns
Pulverize in Cr steel to 90% passing 105 microns
Pulverize in Cr steel to 95% passing 105 microns
*Non Cr Steel bowls are available – please inquire with your local AGAT representatives if requires
Core Handling
Core Slabbing/meter
Slab Boxes with Foam Insert/meter
Core boxes cardboard/box
Sandblasting to remove surface contaminants/meter
Core layout and handling/hourly
Slab boxing and handling/meter
Core Boxes Wood/box
Storage
Monthly storage of pulps after 90 days
Monthly storage of rejects after 45 days
Particle Size Quality Assurance
Particle Size Distribution by Laser Diffraction
Complete Dry - 9 intervals 18 to 325 (18, 35, 60, 80, 120, 170, 230, 325, <325)
Particle Size Distribution Light Scattering (Laser Deflection Method)
Combined Wet - Dry (wet through 325 mesh, then complete dry)
Fines only (wet through 325)
3-point Hydrometer

Geochemical Analysis

AGAT Laboratories offers a variety of geochemical approaches and packages that can be customized to meet client requirements. Sample digestion, decomposition, pressed powder, or fusion techniques provide the basis for investigating different suites of elements and the techniques should be chosen based on the required detection levels of the elements of interest and consulted with our trained analytical team.

Chemical Preparation of Sample Material

In order to decompose solid rock samples, a number of acid dissolution, fusion or leaching techniques are available. Acid digestion, exposes samples to hot concentrated acids to solubilize target elements. Fusion is a more vigorous method, completely breaking down samples and creating a homogenous molten flux. Selective leaching techniques are more effective in dissolving specific trace elements and are useful in determining anomalies that can occur when using aggressive acid digestion methods. The following decomposition techniques are important when deciding the right package for the desired elemental coverage:

- Aqua-Regia Digestion
- Lithium Borate Fusion
- Sodium Peroxide Fusion
- Multi-acid Digestion
- Selective Leaches

Advanced Technology

AGAT Laboratories operates leading edge instrumentation to detect and determine any level of elemental concentrations within the samples. Our state-of-the-art instruments are regularly maintained and checked for data accuracy and reproducibility. Depending on elemental detection requirements by the client, instrumentations such as x-ray fluorescence, inductively-coupled plasma (ICP) mass spectroscopy (MS), emission spectroscopy (OES) or atomic absorption spectroscopy (AAS) are selected for analysis. ICP instrumentation is 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 titration techniques for high precision mineralization assays.

Instrumentation

- Inductively Coupled Plasma - Mass Spectroscopy (ICP-MS)
- Inductively Coupled Plasma - Optical Emission Spectroscopy (ICP-OES)
- Flame Atomic Absorption Spectroscopy (AAS)
- X-Ray Fluorescence (XRF)
- LECO Carbon / Sulfur Analyzer
- Hydride Generation System
- Pycnometer
- Davis Tube

Precious Metals Analysis

Many techniques can be used for precious metal analysis. Whether the requirement is for ore-grade analysis or high-volume baseline fire assay gold exploration work, customers enjoy the advantage of AGAT Laboratories' vast expertise in silver, gold, and PGE determinations. Procedures for precious metal analysis include a combination of lead collection fire assay and either ICP-OES, ICP-MS, AAS, or gravimetric finish.

Gold Analysis

Trace Levels		
Description	Weight	Range (ppm)
Au by Fire Assay, AAS Finish	30g	0.002 - 10
Au by Fire Assay, AAS Finish	50g	0.002 - 10
Au by Fire Assay, ICP-OES Finish	30g	0.001 - 10
Au by Fire Assay, ICP-OES Finish	50g	0.001 - 10
Au by Fire Assay, ICP-MS Finish*	30g	0.001 - 1
Au by Fire Assay, ICP-MS Finish*	50g	0.001 - 1
Ore Grade		
Au by Fire Assay, AAS Finish	30g	0.01 - 100
Au by Fire Assay, ICP-OES Finish	30g	0.01 - 100
Screen Metallic		
Au by Metallic Screen, Fire Assay Finish	500g	-
Au by Metallic Screen, Fire Assay Finish	1000g	-
Au by Metallic Screen, Fire Assay Finish	Entire Sample	-

** Please contact a customer service representative to confirm test availability*

Gold, Platinum, Palladium and Rhodium Analysis Packages

Trace Levels			
Description	Weight	Analyte	Range (ppm)
Au, Pt, Pd by Fire Assay, ICP-OES Finish	30g	Au	0.001 - 10
		Pt	0.005 - 10
		Pd	0.001 - 10
Au, Pt, Pd by Fire Assay, ICP-OES Finish	50g	Au	0.001 - 10
		Pt	0.005 - 10
		Pd	0.001 - 10
Au, Pt, Pd by Fire Assay, ICP-MS Finish*	30g	Au	0.001 - 1
		Pt	0.005 - 1
		Pd	0.001 - 1
Au, Pt, Pd by Fire Assay, ICP-MS Finish*	50g	Au	0.001 - 1
		Pt	0.005 - 1
		Pd	0.001 - 1
Au, Pt, Pd and Rh by Nickel Sulphide collection fire assay and ICP-MS Finish*	30g	Au	0.001 - 1
		Pt	0.005 - 1
		Pd	0.001 - 1
		Rh	
Au, Pt, Pd and Rh by Nickel Sulphide collection fire assay and ICP-MS Finish*	50g	Au	0.001 - 1
		Pt	0.005 - 1
		Pd	0.001 - 1
		Rh	

Ore Grade			
Description	Weight	Analyte	Range (ppm)
Au, Pt, Pd by Fire Assay, ICP-OES Finish	30g	Au	0.001 - 100
		Pt	0.005 - 100
		Pd	0.001 - 100

Ore Grade			
Description	Weight	Analyte	Range (ppm)
Silver by Fire Assay Collection, ICP –OES Finish*	30g	Au	0.001 - 100
		Pt	0.005 - 100
		Pd	0.001 - 100

** Please contact a customer service representative to confirm test availability*

Gravimetric Analysis		
Description	Weight	Detection Limit (ppm)
Au by Fire Assay, Gravimetric Finish	30g	0.5
Au by Fire Assay, Gravimetric Finish	50g	0.5
Ag by Fire Assay, Gravimetric Finish*	30g	10
Ag by Fire Assay, Gravimetric Finish*	50g	10
Au concentrate by Fire Assay, Gravimetric Finish	1-5g	10
Ag Concentrate by Fire Assay, Gravimetric Finish*	1-5g	10

** Please contact a customer service representative to confirm test availability*

Aqua Regia Digest Packages

Aqua Regia Digestion is a powerful, partial leach consisting of a 3:1 hot mixture of hydrochloric and nitric acids. Aqua Regia is an effective digestion for most sulphate, oxide, and carbonate minerals and the rapid oxidizing properties make it an excellent option for the breakdown of sulphide minerals. The cost-effective packages are initiated with an Aqua Regia digestion, followed by either ICP-OES or ICP/ICP-MS finish. For base metal results that are over the reporting limits, we also offer base metal over limit packages using ICP-OES.

** Au Determination by this method is semi-quantitative due to small sample size*

Trace Packages

- 201-073: Metals Package by Aqua Regia Digest, ICP-OES Finish
- 201-074: Metals Package by Aqua Regia Digest, ICP-OES/ICP-MS Finish
- 201-075: Base Metal Overlimit by Aqua Regia Digest, ICP-OES Finish
- 201-173: Metals Package by Aqua Regia Digest, ICP-OES Finish (larger weight digestion) up to 25g
- 201-174: Metals Package by Aqua Regia Digest, ICP-OES/ ICP-MS Finish (larger weight digestion) up to 25g

Aqua Regia Multi-Elemental Scan Ranges (ppm)					
Analyte	ICP-OES	ICP-OES/ ICP-MS	Analyte	ICP-OES	ICP-OES/ ICP-MS
Ag	0.2 - 100	0.01 - 100	Mn	1 - 50,000	1 - 50,000
Al	0.01 - 25%	0.01 - 25%	Mo	0.5 - 10,000	0.05 - 10,000
As	1 - 10,000	0.1 - 10,000	Na	0.01 - 10%	0.01 - 10%
Au*	-	0.005 - 25	Nb	-	0.05 - 500
B	5 - 10,000	5 - 10,000	Ni	0.5 - 10,000	0.5 - 10,000
Ba	1 - 10,000	1 - 10,000	P	10 - 10,000	10 - 10,000
Be	0.5 - 1,000	0.05 - 1,000	Pb	0.5 - 10,000	0.1 - 10,000
Bi	1 - 10,000	0.01 - 10,000	Rb	-	0.1 - 10,000
Ca	0.01 - 25%	0.01 - 25%	Re	-	0.001 - 50
Cd	0.5 - 1,000	0.01 - 1,000	S	0.01 - 10%	0.01 - 10%
Ce	-	0.01 - 1,000	Sb	1 - 10,000	0.05 - 10,000
Co	0.5 - 10,000	0.1 - 10,000	Sc	0.5 - 10,000	0.1 - 10,000
Cr	0.5 - 10,000	0.5 - 10,000	Se	-	0.2 - 1,000
Cs	-	0.05 - 1,000	Sn	-	0.2 - 1,000
Cu	0.5 - 10,000	0.5 - 10,000	Sr	0.5 - 10,000	0.2 - 10,000
Fe	0.01 - 50%	0.01 - 50%	Ta	-	0.01 - 1,000
Ga	5 - 10,000	0.05 - 10,000	Te	-	0.01 - 1,000
Ge	-	0.05 - 500	Th	5 - 10,000	0.1 - 10,000
Hf	-	0.02 - 500	Ti	0.01 - 10%	0.01 - 10%
Hg	1 - 10,000	0.01 - 10,000	Tl	5 - 10,000	0.01 - 10,000
In	-	0.005 - 1,000	U	5 - 10,000	0.05 - 10,000
K	0.01 - 10%	0.01 - 10%	V	0.5 - 10,000	0.5 - 10,000
La	1 - 10,000	0.1 - 10,000	W	1 - 10,000	0.05 - 10,000
Li	1 - 10,000	0.1 - 10,000	Y	-	0.05 - 1,000
Mg	0.01 - 25%	0.01 - 25%	Zn	0.5 - 10,000	0.5 - 10,000
			Zr	-	0.5 - 1,000

Multi-Acid Digestion Packages

A multi-acid digestion approach is one of the most aggressive acid digestion used in geochemistry and utilizes hydrochloric, nitric, perchloric and hydrofluoric acids. It is commonly referred to as a near-total digestion since it is very effective in dissolving a wide range of mineral species, particularly silicate minerals. The analysis uses either ICP-OES or ICP/ICP-MS instrumentation and the techniques quantify nearly all elements of geological materials. As mercury is not available in multi-acid digestions, AGAT Laboratories offers packages that include Inductively Coupled Plasma - Mass Spectroscopy (ICP-MS) analysis for mercury.

Trace Packages

- 201-070: Metals Package by 4 Acid Digest, ICP-OES Finish
- 201-071: Metals Package by 4 Acid Digest, ICP-OES/ ICP-MS Finish
- 201-470: Base Metal Overlimit by 4 Acid Digest, ICP-OES Finish

Multi Acid Digest Multi-Elemental Scan Ranges (ppm)					
Analyte	ICP-OES	ICP-OES/ ICP-MS	Analyte	ICP-OES	ICP-OES/ ICP-MS
Ag	0.5 - 100	0.01 - 100	Na	0.01 - 10%	0.01 - 10%
Al	0.01 - 50%	0.01 - 50%	Nb	-	0.1 - 500
As	1 - 10,000	0.2 - 10,000	Ni	0.5 - 10,000	0.5 - 10,000
Ba	1 - 10,000	1 - 10,000	P	10 - 10,000	10 - 10,000
Be	0.5 - 1,000	0.05 - 1,000	Pb	1 - 10,000	0.1 - 10,000
Bi	1 - 10,000	0.01 - 10,000	Rb	-	0.1 - 10,000
Ca	0.01 - 50%	0.01 - 50%	Re	-	0.002 - 50
Cd	0.5 - 1,000	0.02 - 1,000	S	0.01 - 10%	0.01 - 10%
Ce	-	0.01 - 1,000	Sb	1 - 10,000	0.05 - 10,000
Co	1 - 10,000	0.05 - 10,000	Sc	1 - 10,000	0.1 - 10,000
Cr	1 - 10,000	0.5 - 10,000	Se	-	0.5 - 1,000
Cs	-	0.01 - 1,000	Sn	-	0.2 - 1,000
Cu	0.5 - 10,000	0.5 - 10,000	Sr	1 - 10,000	0.2 - 10,000
Fe	0.01 - 50%	0.01 - 50%	Ta	-	0.05 - 1,000
Ga	5 - 10,000	0.05 - 10,000	Te	-	0.01 - 1,000
Ge	-	0.05 - 500	Th	5 - 10,000	0.1 - 10,000
Hf	-	0.1 - 500	Ti	0.01 - 10%	0.01 - 10%
In	-	0.005 - 1,000	Tl	5 - 10,000	0.01 - 10,000
K	0.01 - 10%	0.01 - 10%	U	5 - 10,000	0.05 - 10,000
La	2 - 10,000	0.5 - 10,000	V	0.5 - 10,000	0.5 - 10,000
Li	1 - 10,000	0.1 - 10,000	W	1 - 10,000	0.1 - 10,000
Mg	0.01 - 50%	0.01 - 50%	Y	-	0.1 - 10,000
Mn	1 - 100,000	1 - 100,000	Zn	0.5 - 10,000	0.5 - 10,000
Mo	0.5- 10,000	0.05- 10,000	Zr	-	0.5 - 1,000

Ore Grade Packages

- 201-270: Ore Grade Metals Package by 4Acid Digestion, followed by dilution and OES with extended calibration
- 201-271: Ore Grade Metals Package by 4Acid Digestion, followed by dilution and ICP OES/MS with extended calibration

4AD Multi-Elemental scan Ranges (ppm)					
Analyte	ICP-OES	ICP-OES/ ICP-MS	Analyte	ICP-OES	ICP-OES/ ICP-MS
Ag	2.5 - 500	0.25 - 500	Na	0.05% - 20%	0.05 - 20%
Al	0.05% - 50%	0.05% - 50%	Nb	-	0.5 - 2,500
As	5 - 50,000	1 - 50,000	Ni	2.5 - 50,000	2.5 - 50,000
Ba	5 - 50,000	5 - 50,000	P	50 - 50,000	50 - 50,000
Be	2.5 - 5,000	0.25 - 5,000	Pb	5 - 50,000	0.5 - 50,000
Bi	5 - 50,000	0.05 - 50,000	Rb	-	0.5 - 50,000
Ca	0.05% - 50%	0.05% - 50%	Re	-	0.01 - 250
Cd	2.5 - 5,000	0.1 - 5,000	S	0.05% - 20%	0.05% - 20%
Ce	-	0.05 - 5,000	Sb	5 - 50,000	0.25 - 50,000
Co	2.5 - 50,000	0.25 - 50,000	Sc	5 - 50,000	0.5 - 50,000
Cr	2.5 - 50,000	2.5 - 50,000	Se	-	2.5 - 5,000
Cs	-	0.05 - 5,000	Sn	-	1 - 5,000
Cu	2.5 - 50,000	2.5 - 50,000	Sr	5 - 50,000	1 - 50,000
Fe	0.05% - 50%	0.05% - 50%	Ta	-	0.25 - 5,000
Ga	25 - 50,000	0.2 - 50,000	Te	-	0.05 - 5,000
Ge	-	0.2 - 2,500	Th	25 - 50,000	0.5 - 50,000
Hf	-	0.5 - 2,500	Ti	0.05% - 20%	0.05% - 20%
In	-	0.02 - 5,000	Tl	25 - 50,000	0.05 - 50,000
K	0.05% - 20%	0.05 - 20%	U	25 - 50,000	0.25 - 50,000
La	10 - 50,000	2 - 50,000	V	2.5 - 50,000	2.5 - 50,000
Li	5 - 50,000	0.5 - 50,000	W	5 - 50,000	0.5 - 50,000
Mg	0.05% - 50%	0.05% - 50%	Y	-	0.5 - 5,000
Mn	5 - 500,000	5 - 500,000	Zn	2.5 - 50,000	2.5 - 50,000
Mo	2.5 - 50,000	0.25 - 50,000	Zr	-	2 - 5,000

Hydrogeochemistry – Industrial Water Scan

- 283-085 Industrial water analysis – Dissolved metals with ICP-OES/ICP -MS Finish
- 283-086 Rare Earth Elements – Dissolved (Add on)

Analytes and RDL, ppb							283-085
Ag	0.005	Cu	10	Nb	0.005	Sn	0.02
Al	20	Fe	10	Ni	10	Sr	10
As	0.05	Ga	0.01	P	20	Ta	0.005
B	1	Ge	0.01	Pb	0.01	Te	0.01
Ba	10	Hf	0.005	Pd	0.005	Th	0.005
Be	0.05	Hg	0.01	Pt	0.005	Ti	10
Bi	0.005	In	0.005	Rb	0.01	Tl	0.002
Ca	20	K	50	Re	0.002	U	0.002
Cd	0.002	La	0.005	S	100	V	10
Ce	0.005	Li	10	Sb	0.01	W	0.01
Co	0.005	Mg	10	Sc	0.01	Y	0.005
Cr	10	Mn	10	Se	0.05	Zn	10
Cs	0.005	Mo	0.05	Si	50	Zr	0.01

Analytes and RDL, ppb							283-086
Dy	0.005	Gd	0.005	Nd	0.005	Tb	0.005
Er	0.005	Ho	0.005	Pr	0.005	Tm	0.005
Eu	0.005	Lu	0.005	Sm	0.005	Yb	0.005

Hydride Package

- 201-508: 4 Acid followed by Hydride AAS

Analyte	Range
Se	0.2 - 300 ppm
Te	0.1 - 300 ppm

- 201-400: Sodium Peroxide Fusion followed by Hydride AAS*

Analyte	Range
Bi	0.5 - 300 ppm
Sb	0.5 - 300 ppm
As	0.5 - 300 ppm

** Please contact a customer service representative to confirm test availability*

Sample Fusion

Sample fusion with fluxes uses oxidized sample material and dissolves it in the molten flux at elevated temperatures (~600 - 950°C). We offer both lithium borate and sodium peroxide fusion techniques. Additionally, other fusions or sinters can be performed if requested by the client

Fusion techniques are effective in dissolving high grade sulphides, laterites, ceramics, glasses, and other resistant minerals.

- 201-079: Metals Package by Sodium Peroxide Fusion, ICP-OES Finish
- 201-179: Sodium Peroxide Fusion, ICP-OES Finish - overlimit analysis
- 201-378: Metals Package by Sodium Peroxide Fusion,ICP OES/ICP-MS Finish
- 201-380 Metals Package by Sodium Peroxide Fusion,ICP OES/ICP-MS Finish, glassy carbon crucible

Analytes and Ranges , ppm							201-079
Al	0.01 – 25%	Cu	10 – 50,000	Ni	10 – 100,000	Sr	10 – 10,000
As	30 – 100,000	Fe	0.01 – 25%	P	0.01 – 25%	Ti	0.01 – 20%
Ba	10 – 50,000	K	0.05 – 25%	Pb	20 – 100,000	V	10 – 50,000
Be	20 – 25,000	La	10 – 50,000	S	0.01 – 25%	W	50 – 40,000
Ca	0.01 - 25%	Li	10 – 50,000	Sb	20 – 50,000	Y	10 – 25,000
Cd	10 – 50,000	Mg	0.01 – 25%	Sc	10 – 50,000	Zn	10 – 50,000
Co	20 – 50,000	Mn	10 – 100,000	Si	0.1 – 30%		
Cr	20 - 50,000	Mo	10 – 50,000	Sn	50 – 50,000		

Analytes and Ranges, ppm							201-378
Al	0.01% - 25%	Eu	0.05 - 1000	Nd	1 - 10,000	Tb	0.05 - 10,000
As	5 - 100,000	Fe	0.01% - 25%	Ni	10 - 100,000	Te	5 - 1000
B	20 - 10,000	Ga	0.5 - 1000	P	0.01% - 25%	Th	0.1 - 1000
Ba	10 - 50,000	Gd	0.05 - 1000	Pb	1 - 10,000	Ti	0.1% - 20%
Be	5 – 25,000	Ge	1 - 1000	Pr	0.05 - 1000	Tl	0.5 - 1000
Bi	0.1 - 1000	Ho	0.05 - 1000	Rb	2 - 10,000	Tm	0.05 - 1000
Ca	0.01% - 25%	In	0.2 - 1000	S	0.01% - 25%	U	0.5 - 1000
Cd	5 - 10,000	K	0.05% - 25%	Sb	1 - 10,000	V	10 - 50,000
Ce	0.1 - 10,000	La	0.1 - 10,000	Sc	10 - 10,000	W	5 - 10,000
Co	1 - 10,000	Li	10 - 50,000	Se	5 - 1000	Y	0.5 – 10,000
Cr	20 – 50,000	Lu	0.05 - 1000	Si	0.1% - 30%	Yb	0.1 - 1000
Cs	0.1 - 10,000	Mg	0.01% - 25%	Sm	0.1 - 1000	Zn	10 - 50,000
Cu	10 - 50,000	Mn	10 - 100,000	Sn	2 - 10,000		
Dy	0.05 - 1000	Mo	2 - 10.000	Sr	10 - 10,000		
Er	0.05 - 1000	Nb	5 - 10,000	Ta	0.5 - 10,000		

Analytes and Ranges, ppm							201-380
Al	0.01% - 25%	Eu	0.05 - 1000	Nb	5 - 10,000	Ta	0.5 - 10,000
As	5 - 100,000	Fe	0.01% - 25%	Nd	1 - 10,000	Tb	0.05 - 10,000
B	20 - 10,000	Ga	0.5 - 1,000	Ni	10 - 100,000	Te	5 - 1000
Ba	10 - 50,000	Gd	0.05 - 1,000	P	0.01% - 25%	Th	0.1 - 1000
Be	5 – 25,000	Ge	1 - 1,000	Pb	1 - 10,000	Ti	0.1% - 20%
Bi	0.1 - 1000	Hf	1 - 10,000	Pr	0.05 - 1000	Tl	0.5 - 1000
Ca	0.01% - 25%	Ho	0.05 - 1,000	Rb	2 - 10,000	Tm	0.05 - 1000
Cd	5 - 10,000	In	0.2 - 1,000	S	0.01% - 25%	U	0.5 - 1000
Ce	0.1 - 10,000	K	0.05 - 25%	Sb	1 - 10,000	V	10 - 50,000
Co	1 - 10,000	La	0.1 - 10,000	Sc	10 - 10,000	W	5 - 10,000
Cr	20 – 50,000	Li	10 - 50,000	Se	5 - 1000	Y	0.5 – 10,000
Cs	0.1 - 10,000	Lu	0.05 - 1,000	Si	0.1% - 30%	Yb	0.1 - 1000
Cu	10 - 50,000	Mg	0.01 - 25%	Sm	0.1 - 1000	Zn	10 - 50,000
Dy	0.05 - 1000	Mn	10 - 100,000	Sn	2 - 10,000	Zr	5 - 10,000
Er	0.05 - 1000	Mo	2 - 10,000	Sr	10 - 10,000		

Borate Fusion Techniques

Lithium borate fusion is a quantitative method for rare earth elements (REE) and trace metals characterization as well as whole rock analysis (WRA).

- 201-076 Lithium borate fusion, whole rock analysis, ICP OES finish
- 201-078: Metals + Rare Earth Elements Package by Lithium Borate Fusion, ICP-MS Finish
- 201-381 Lithium Borate Fusion with ICP-OES and ICP-MS finish

Analytes and Ranges, %			201-076
Analyte	Range (%)	Analye	Range (%)
Al_2O_3	0.01 - 50	MnO	0.01 - 10
BaO	0.01 - 10	Na_2O	0.01 - 30
CaO	0.01 - 50	P_2O_5	0.01 - 25
Cr_2O_3	0.01 - 30	SiO_2	0.01 - 50
Fe_2O_3	0.01 - 50	SrO	0.01 - 10
K_2O	0.01 - 30	TIO_2	0.01 - 30
MgO	0.01 - 30	LOI	0.01 - 100

Analytes and Ranges							201-078
Ba	2 - 10,000	Gd	0.1 - 1000	Ni	5 - 10,000	Tl	0.05 - 1000
Ce	0.1 – 10,000	Ge	1 - 1000	Pr	0.1 - 1000	Tm	0.05 - 1000
Co	0.5 - 10,000	Hf	0.1 - 10,000	Rb	0.2 - 10,000	U	0.05 - 10,000
Cr	5 – 10,000	Ho	0.05 - 1000	Sc	0.5 - 1,000	V	5 - 10,000
Cs	0.1 - 10,000	In	0.2 - 1000	Sm	0.1 - 1000	W	0.5 - 10,000
Cu	5 - 10,000	La	0.1 - 10,000	Sn	1 - 10,000	Y	0.5 – 10,000
Dy	0.05 - 1000	Lu	0.05 - 1000	Sr	0.5 - 10,000	Yb	0.05 - 1000
Er	0.05 - 1000	Mo	2 - 10.000	Ta	0.5 - 10,000	Zr	0.5 - 10,000
Eu	0.05 - 1000	Nb	0.1 - 10,000	Tb	0.1 - 1,000		
Ga	0.1 - 1000	Nd	0.1 - 10,000	Th	0.05 - 1000		

Analytes and Ranges							201-381
Al	0.01% - 50%	Gd	0.1 - 1000	Nd	0.1 - 10,000	Ti	0.01% - 30%
Ba	2 - 10,000	Ge	1 - 1000	Ni	5 - 10,000	Tl	0.05 - 1000
Ca	0.01% - 50%	Hf	0.1 - 10,000	P	0.01% - 25%	Tm	0.05 - 1000
Ce	0.1 - 10,000	Ho	0.05 - 1000	Pr	0.1 - 1000	U	0.05 - 10,000
Co	0.5 - 10,000	In	0.2 - 1000	Rb	0.2 - 10,000	V	5 - 10,000
Cr	5 - 10,000	K	0.01% - 30%	Sc	0.5 - 1000	W	0.5 - 10,000
Cs	0.1 - 10,000	La	0.1 - 10,000	Si	0.01% - 50%	Y	0.5 - 10,000
Cu	5 -10,000	Lu	0.05 - 1000	Sm	0.1 - 1000	Yb	0.05 - 1000
Dy	0.05- -1000	Mg	0.01% - 30%	Sn	1 - 10,000	Zn	5 - 10,000
Er	0.05 - 1000	Mn	10 - 10,000	Sr	0.5 - 10,000	Zr	0.5 - 10,000
Eu	0.05 - 1000	Mo	2 - 10,000	Ta	0.5 - 10,000		
Fe	0.01% - 50%	Na	0.01% - 30%	Tb	0.1- 1,000		
Ga	0.1 - 1000	Nb	0.1 - 10,000	Th	0.05 - 1000		

XRF Analysis

- 10-371: Lithium borate fusion, whole rock analysis, XRF finish
- 10-373 Lithium Borate Fusion whole rock analysis – extended package XRF finish
- 10-372: Ore grade context, XRF finish

Whole-Rock Analysis - XRF			10-371
Analyte	Range (%)	Analye	Range (%)
Al_2O_3	0.01 - 100	Na_2O	0.01 - 100
BaO	0.01 - 100	P_2O_5	0.01 - 100
CaO	0.01 - 100	SiO_2	0.01 - 100
Cr_2O_3	0.01 - 100	SrO	0.01 - 100
Fe_2O_3	0.01 - 100	TIO_2	0.01 - 100
K_2O	0.01 - 100	V_2O_5	0.01 - 100
MgO	0.01 - 100	LOI	0.01 - 100

Whole-Rock Analysis – Extended Package XRF			10-373
Analyte	Range (%)	Analye	Range (%)
Al_2O_3	0.01 - 100	Na_2O	0.01 - 100
BaO	0.01 - 100	P_2O_5	0.01 - 100
CaO	0.01 - 100	SiO_2	0.01 - 100
Cr_2O_3	0.01 - 100	SrO	0.01 - 100
Fe_2O_3	0.01 - 100	TIO_2	0.01 - 100
K_2O	0.01 - 100	V_2O_5	0.01 - 100
MgO	0.01 - 100	LOI	0.01 - 100

Ore Grade - XRF			10-372
Analyte	Range (%)	Analye	Range (%)
Ba	0.01 - 50	Th	0.01 - 15
Nb	0.01 - 50	U	0.01 - 15
Sb	0.01 - 50	W	0.01 - 50
Sn	0.01 - 60	Zr	0.01 - 50
Ta	0.01 - 50		

Sulphur/Carbon/Graphitic Carbon Analysis

AGAT Laboratories operates leading edge combustion and resistive furnace instrumentation which combines combustion and infrared technology to deliver high precision results. Carbon and sulphur analysis can easily be added to the lithogeochemical analysis.

Selective and Sequential Leaches

AGAT Laboratories offer a wide range of selective and sequential leaches to allow our clients to select the analysis which is most applicable to their geological field sampling environment. We offer non-proprietary methods that include, but are not limited to, cold and hot hydroxylamine hydrochloride, sodium pyrophosphate, sodium acetate and EDTA leaches. By focusing on powerful technology AGAT offers low detection limits and results free of common interferences. This can be crucial when requiring Cu and Cr in sodium pyrophosphate leaches or As and Se in hydroxylamine hydrochloride digestions.

- 201-YYY: DI Water leach with ICP-MS Finish
- 201-080: Cold hydroxylamine hydrochloride leach with ICP-MS finish
- 201-081: Hot hydroxylamine hydrochloride leach with ICP-MS finish
- 201-082: Sodium pyrophosphate leach with ICP-MS finish
- 201-083: Sodium Acetate/Ammonium Acetate leach with ICP-MS Finish
- 201-084: EDTA leach with ICP-MS finish
- 201-094: Aqua Regia Leach with ICP-MS Finish
- 201-095: Multi Acid Digestion Leach with ICP-MS Finish

** Please contact a customer service representative to confirm test availability*

Analytes and Lower Reporting Limits (ppm)							
Ag	0.002	Dy	0.005	Na	10	Sr	0.05
Al	1	Er	0.005	Mg	1	Ta	0.05
As	0.01	Eu	0.005	Mn	0.1	Tb	0.005
Au	0.05	Fe	5	Mo	0.005	Te	0.01
B	2	Ga	0.05	Nb	0.01	Th	0.01
Ba	0.05	Gd	0.005	Nd	0.005	Ti	1
Be	0.05	Ge	0.1	Ni	0.005	Tl	0.005
Bi	0.005	Hf	0.01	P	0.5	Tm	0.005
Br	2	Hg	0.1	Pb	0.05	U	0.001
Ca	10	Ho	0.005	Pr	0.005	V	0.05
Cd	0.01	I	0.1	Rb	0.005	W	0.01
Ce	0.005	In	0.005	Re	0.001	Y	0.005
Co	0.01	K	5	Sb	0.001	Yb	0.005
Cr	0.005	La	0.005	Se	0.005	Zn	0.1
Cs	0.005	Li	0.05	Sm	0.5	Zr	0.05
Cu	0.005	Lu	0.005	Sn	0.005	pH	0.01 - 14

Miscellaneous Techniques and Additional Analytes

Analyte	Range	Description
SO_4^{2-}	0.01%	Gravimetric
S^{2-}	0.1%	By difference
F^-	50 ppm	ISE
Cl^-	50 ppm	ISE
Hg	0.01 - 100 ppm	CVAA
pH (1:1)	0.01 - 14	pH
Specific Gravity	-	Pycnometer
Core Density	-	Wet Immersion
% Fe_3O_4	-	Satmagan 135
% Magnetic	-	AGAT Davis Tube
Ashing	-	Muffle Furnace
Moisture (H_2O-minus) H_2O+	-	Gravimetric

Thermal Decomposition Methods

Analyte	Range	Description
Moisture (H_2O^-)	0.01 - 100%	Gravimetric
Structual water (H_2O^+)	0.1 - 100%	Gravimetric (Penfield method)
Dry ashing (550°C)	-	Muffle Furnace
Loss-on-ignition (550°C)	0.01 - 100%	Gravimetric
Loss-on-ignition (950°C)	0.01 - 100%	Gravimetric

** Temperature and duration of thermal decomposition can be modified according to client requirements*

Enhanced Exploration Services

Enhanced Exploration Services

AGAT Laboratories' 40+ years of experience in rock mechanics and geological services allows us to offer our mining exploration clients with a unique advantage for enhanced exploration through our Rock Properties Division. We offer the following geological and core imaging services.

High Resolution Digital Imaging

AGAT Laboratories offers high resolution digital imaging in colour under both ambient and ultra-violet lighting conditions. Photo images are acquired using full-frame digital cameras. Final core images display well name, location, cored interval, core number, recovery, sample numbers, scale and core top and bottom intervals. Photo images are uploaded on our secure FTP site for instant viewing from any location.

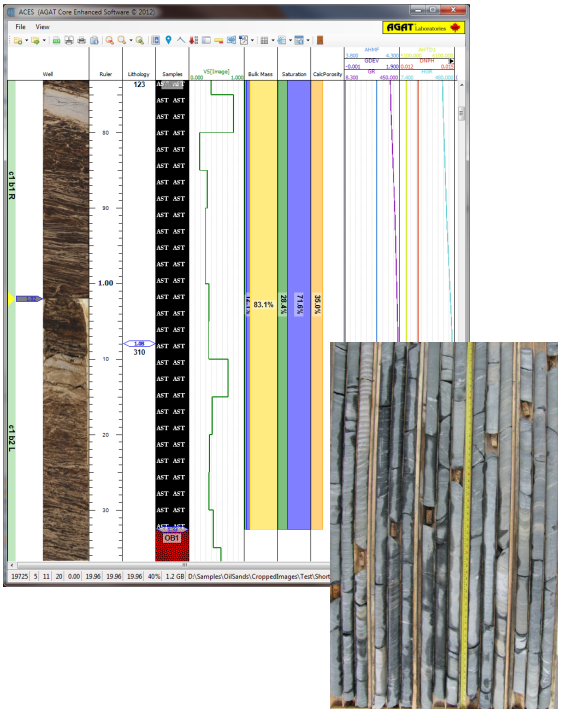
- 04-106: Digital Imaging/meter
- 04-410: CD Media/well
- 02-408: 360 Degree Color Photo/hour

Digital Imaging
Digital Imaging – color 81/2" x 11" – First Prints/print
Digital Imaging - colour 8 1/2" x 11" - additional prints
Digital Imaging – UV 81/2" x 11" – first prints/print
Digital Imaging – UV 81/2" x 11" – additional prints/print
CD Media
Photo images scanned onto CD, per image

ACES: AGAT Laboratories' Enhanced Core Software

AGAT Laboratories has developed a powerful software suite for core description and data management. The ACES software gives geologists the ability to import field data (drill recovery, DDH orientation data, and other tool logs), and takes advantage of AGAT's high quality core photography to allow depth-registration of core photos. Once core images are on-depth, geological features (lithology, structures, mineralization indices, etc.) and rock descriptions can be added, and sample intervals can be selected alongside photos. Ensuing analytical results can be imported and displayed alongside the core and geological data. Annotated core photos, sample location information, geologic strip logs, and raw data can all be exported in various ways to provide concise and clear geological drillhole descriptions which suit your exploration requirements.

Ask your Business Development Representative for a demonstration today.

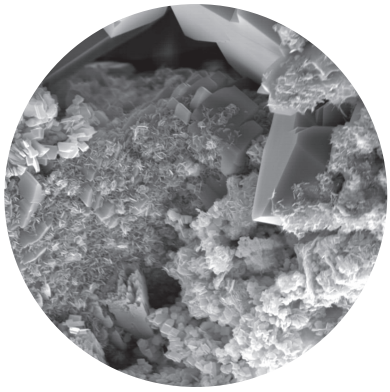


X-Ray Diffraction (XRD) Analysis

XRD analysis identifies the crystalline mineral phases of rocks, sediments and soils based on characteristic crystal diffraction patterns. Diffractogram data are compared with the current ICDD (International Centre for Diffraction Data) database that provides access to >300,000 international reference patterns. In multi-phase materials, XRD patterns are utilized to quantify mineral phases through Rietveld Refinement methods (bulk fraction). For specific grain fraction analysis, particle size separation and mineral speciation are also performed. For clay minerals, the clay size is isolated and pattern analysis using the Relative Intensity Ratio method provides semi-quantification of clay mineralogy.

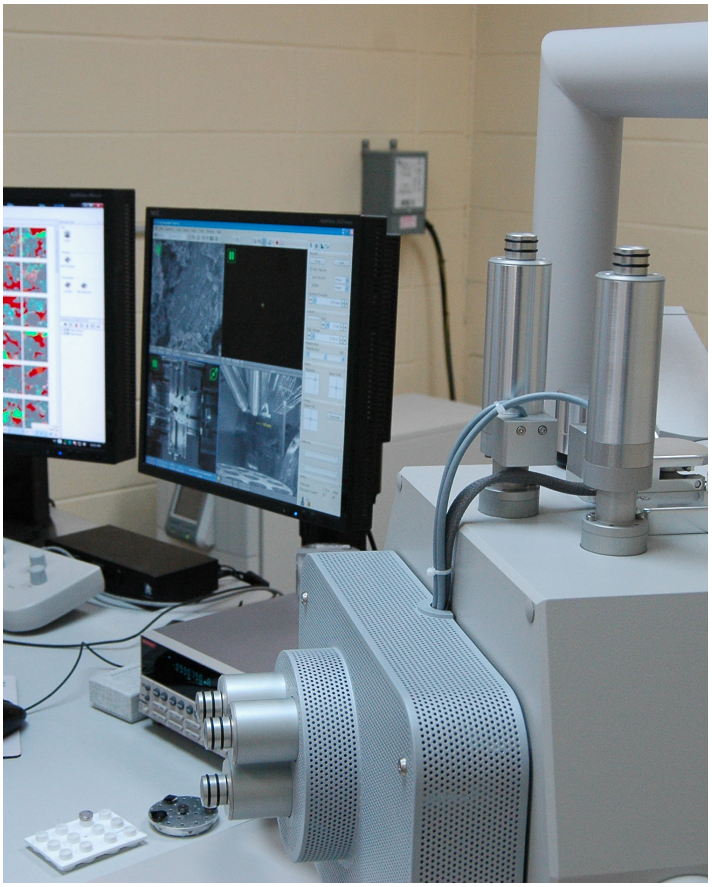
- 11-200: Bulk XRD Analysis/sample
- 11-202: Combined XRD Analysis/sample

Scanning Electron Microscopy (SEM) and Environmental SEM (ESEM)



SEM analysis allows examinations of mineral textures and morphology at a microscopic level (magnifications >1000x). SEM analysis allows the investigation of rocks, minerals, biological specimens, and artificial materials from the sub-micrometer to centimeter scale. Sample preparation can be minimal (no preparation) to polished surfaces in order to achieve the objectives of the investigations. Polished rock/mineral surfaces assist in quantifying mineral composition, size, and zoning as well as mineral deportment and elemental associations. When combined with petrographic light microscopy data, SEM provides key information regarding composition, origin, and alteration of rocks and minerals.

- 11-500: Detailed SEM Examination, Including Interpretation/sample
- 11-502: SEM Examination & Photomicroscopy/sample

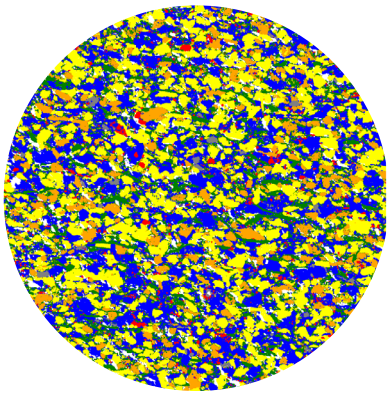


Energy Dispersive X-ray Spectrometry (EDS, or XES)

AGAT's SEM units are equipped with EDS systems in order to identify and quantify geochemical compositions of sample constituents and minerals. In samples with high amorphous material present, an EDS can assist in identifying elemental composition of non-crystalline materials, complementing crystalline mineral analysis by XRD.

- 11-504: X-Ray energy spectrometry (XES/sample)

QEMSCAN



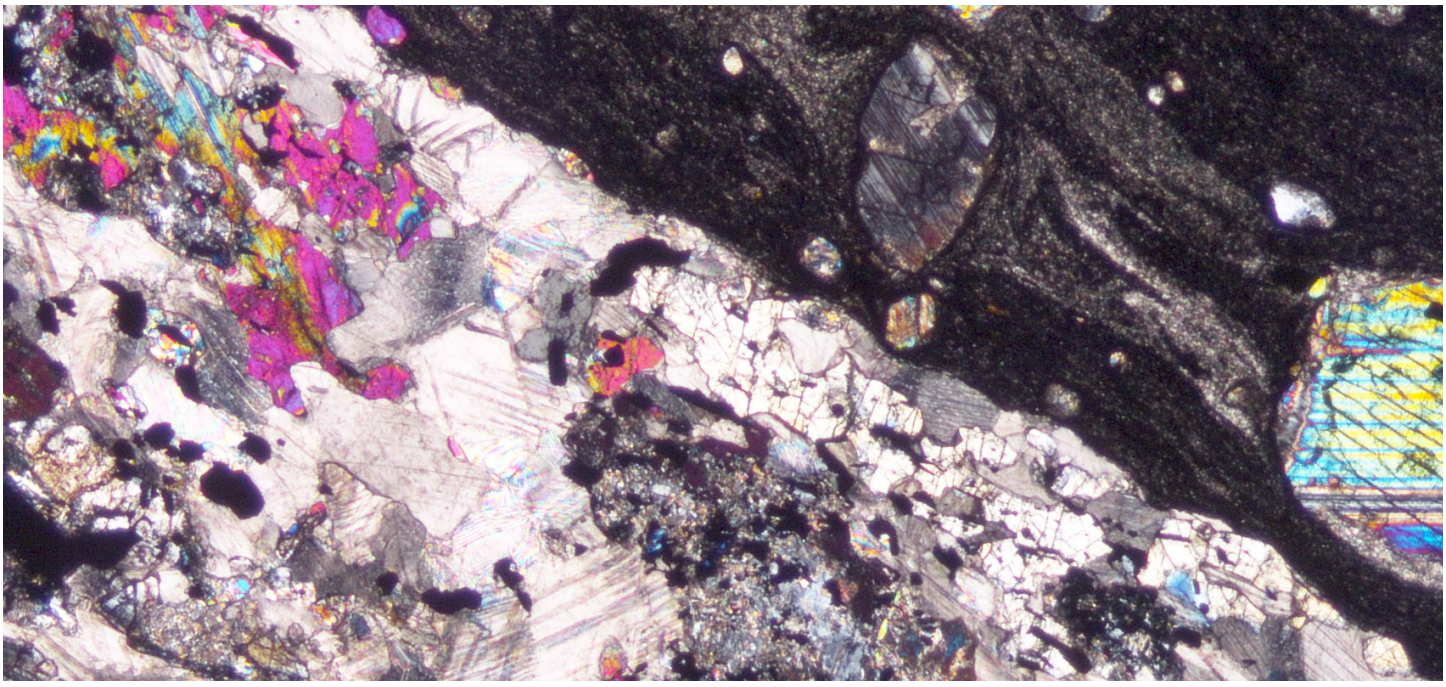
Geochemical, mineralogical and microscopic textures can be evaluated utilizing AGAT's FEI Quanta 650 QEMSCAN equipped with dual Bruker SSD EDS detectors. This equipment is advantageous over conventional SEM systems as it has a user-defined raster-scan pattern for backscatter electron and elemental composition area scan modes from which mineral phase assemblage, quantity, distribution and grain texture parameters can be derived immediately. Thin sections and polished pellets of core, chip, channel, or hand samples provide the basis for high-resolution geochemical, mineralogical and textural attributes, providing mineral association and liberation data crucial for beneficiation analysis.

- 11-713: BMA (Bulk Mineral Analysis)
- 11-714: PMA (Particle Mineral Analysis)
- 11-715: Advanced PMA with Mineral Liberation Analysis
- 11-718: Field Scan and Mapping (Field image capture of polished section + frame stitching)

Thin Section Preparation and Petrography

Microscopic petrographic analysis is an accurate, fast and repeatable mean of evaluating rock texture, particle aggregates, mineral assemblages and pore system of rock/soil samples. AGAT operates a comprehensive thin section preparation lab and pride ourselves on the high quality sections we prepare. Sections can be covered or polished, have mineral staining applied, and are viewed under plane-polarized, cross-polarized, reflected, and/or ultra-violet light. AGAT's diverse team of geologists are experienced in a wide range of rock types and resource plays, and build detailed reports incorporating petrography, SEM, XRD, and routine analysis data to provide the best possible interpretation of geologic history, metamorphism and alteration, ore mineralization, and practical implications for extraction and beneficiation.

- 11-100: Thin Section Preparation (Regular Sections)/sample
- 11-102: Thin Section Preparation (Large Sections)/sample
- 11-300: Detailed Thin Section Petrography, Including Thin Section Prep, Point Counting & Interpretation/sample



Acid Rock Drainage Services

Acid Rock Drainage Services

Acid Rock Drainage (ARD) occurs when sulphide minerals (i.e. pyrite or chalcopyrite) from tailing deposits, rock waste and mine rock piles oxidize and deleterious products (acid and dissolved metals) leach into the environment.

Static Tests are used to quickly determine the likelihood of these reactions occurring at a site. The information gathered from these analyses can lead to a more in-depth examination involving Kinetic Testing.

Static Testing

The ARD potential is often investigated by determining the neutralization potential of rock waste material (i.e. the likelihood of a sample to exhibit characteristics of generating acids).

Acid-Base Accounting (ABA) is the analytical cornerstone for static test predictions of ARD potential. ABA methods estimate the amount of acid-bearing material by measuring either total sulfur or sulfide-sulfur. Based on this information, AGAT Laboratories reports Neutralization Potential (NP), Acid Producing Potential (APP) and Net Neutralization Potential (NNP).

Shake Flask Extractions (SFE) can be used as a rapid means for obtaining leached elements of interest in a sample. Using ICP-MS technology, leached elements such as arsenic, selenium and mercury can be quickly obtained.

Kinetic Testing

Kinetic Cells, also known as “Humidity Cells”, involves a longer process after the initial determination of samples of interest using ABA and/or SFE analysis. Kinetic tests attempt to mimic natural oxidation during weathering conditions using a much larger sample contained in a cell and require a longer time for completion. Each cell provides detailed information on acid production and drainage water quality, which are reported on a weekly basis.

ABA - Acid Base Accounting
Sample Prep [Dry <1kg, crush to 80% passing ¼ inch, split 500 g and pulverize to 85% passing 200 mesh (75 um)]
Standard Sobek ABA Package (includes Paste pH, Fizz test, NP & Total S)
Modified ABA Package (includes Paste pH, Fizz test, NP & Total S)
Single Addition NAG MEND method
Metals Package by Aqua Regia (ICP OES/MS)
Metals Package by 4 Acid Digestion (ICP-MS)
Sulphate Sulphur- HCl Leach (sulphide sulphur by difference)
Sulphur Spec. (Sulphate-S, Sulphide-S & Insoluble-S; ASTM 2492-02 method)
TIC by Leco IR Combustion
Screening for <2mm for Rinse-pH from as-rec'd material or crushed sample

ShakeFlask (Static)
Sample Prep [Dry <1kg, crush to 80% passing ¼ inch, split 500 g and pulverize to 85% passing 200 mesh (75 um)]
Shakeflask Extraction (SFE; MEND method; water extraction) - plus cost of analyses on extract
ICP-MS Scan Humidity Cell/Shake Flask Extraction/NAG Extraction
Anion Scan (Chloride, Fluoride, Bromide, Nitrate, Nitrite, Sulphate)
Alkalinity
pH
EC
Acidity
Individual Anion

Humidity Cell (Kinetic)
Sample Prep [Dry <1kg, crush to 80% passing ¼ inch, split 500 g and pulverize to 85% passing 200 mesh (75 um)]
Humidity Cell Testing by MEND method
Humidity Cell Testing by ASTM Method
ICP-MS Scan Humidity Cell/Shake Flask Extraction
Weekly Acidity
Weekly Alkalinity
Weekly EC
Weekly pH
Weekly SO4
Weekly ORP
Weekly Sampling

Notes:

Notes:

AGAT Laboratories

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