

TESTING AND CALIBRATION LABORATORY ACCREDITATION PROGRAM (LAP)

Scope of Accreditation

Accredited Laboratory No. 958

Legal Name of Accredited Laboratory: **AGAT Laboratories Ltd.**

Location Name or Operating as (if applicable): AGAT Mining Geochemistry Testing Services

Contact Name: Belinda B. Lacuata

Address: 3 - 2215 27th Ave NE, Calgary AB T2E 7M4

Telephone: 403-291-4685

Fax: 403-291-4688

Website: www.agatlabs.com

Email: lacuata@agatlabs.com

SCC File Number:	151266
Accreditation Standard(s):	ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories
Fields of Testing:	Chemical/Physical
Program Specialty Area:	Mineral Analysis
Initial Accreditation:	2021-09-03
Most Recent Accreditation:	2021-11-26
Accreditation Valid to:	2025-09-03

SCC Group Accreditation:

This laboratory is a part of a Group Accreditation with the following facilities in accordance with SCC's policy on Group Accreditation documented in the Accreditation Services Accreditation Program Overview.

AGAT Laboratories Ltd, Mississauga, ON, Accredited Laboratory No. 665

AGAT Laboratories Ltd., Thunder Bay, ON, Accredited Laboratory No. 875

The physical sample preparation involving accredited test methods as listed on the scope of accreditation may be performed at off-site physical sample preparation locations that are monitored regularly for quality control and quality assurance practices. These locations are listed under the following scopes of accreditation:

- AGAT Laboratories Ltd., Mississauga, Accredited laboratory 665, and
- AGAT Laboratories Ltd., Thunder Bay, Accredited Laboratory 875.

Lead collection-fire assay sample preparations are conducted at AGAT laboratories listed above located at 5616 McAdam Road, Mississauga, ON, L4Z 1P1 and 1046 Gorham St., Thunder Bay, Ontario P7B 5X5.

Sample preparations for Acid Rock Drainage (ARD) samples are performed at AGAT laboratory located at Unit 120, 8600 Glenlyon Parkway, Burnaby, British Columbia V5J 0B6.

METALLIC ORES AND PRODUCTS

Mineral Analysis Testing:

(Geotechnical Testing, Mineral Assaying)

MIN-283-12001	Determination of Total Carbon and Sulphur in Geological Samples Using Infrared Combustion Furnace (Modified ASTM E1915, ASTM E1019, ASTM D5373)
MIN-283-12002	Determination of Graphitic Carbon in Geological Samples Using Carbon Determinator (Modified ASTM E1915)
MIN-283-12003	Extraction of Acid Soluble Sulphate (SO ₄ ²⁻) in Mineralogical and Acid Rock Drainage Samples by Hydrochloric Acid Digestion followed by ICP-OES (Modified ASTM C114)
MIN-283-12004	Extraction of Rare Elements and Oxides in Mineralogical Samples Using Lithium Borate Fusion and ICP-OES and/or ICP-MS (Modified from Sulcek, et. al. Decomposition in Inorganic Analysis, 1989) - ICP-OES: SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , CaO, MgO, Na ₂ O, K ₂ O, Cr ₂ O ₃ , TiO ₂ , MnO, P ₂ O ₅ , SrO, BaO; - ICP-MS: Ce, La, Y, Dy, Er, Eu, Gd, Ho, Lu, Tb, Tm, Yb, Nd, Pr, Sm, Th, U
MIN-283-12005	Determination of Loss on Ignition in Mineralogical Testing Samples (Sulcek, et. al. Decomposition in Inorganic Analysis, 1989)

MIN-283-12006	<p>Extraction of Major and Trace Elements and Metals in Geological Samples Using Sodium Peroxide Fusion for ICP-OES and ICP-MS Finishes (Modified from Bozic, et.al. Rapid Procedure for the Dissolution of a Wide Variety of Ore and Smelter Samples prior to Analysis by ICP-AES, Analyst, 1989)</p> <ul style="list-style-type: none"> - ICP-OES: Cu, Ni, Co, Fe, Mg, Pb, Si, Ca, Al, Mn, Zn, Cr, Sn, As, Mo; - ICP-OES and ICP-MS: Ag, Al, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ge, Hf, Ho, In, K, La, Li, Lu, Mg, Mn, Mo, Nb, Nd, Ni, P, Pb, Pr, Rb, Sb, Sc, Se, Si, Sm, Sn, Sr, Ta, Tb, Te, Th, Ti, Tl, Tm, U, V, W, Y, Yb, Zn, Zr
MIN-283-12008	<p>Extraction of Major and Trace Elements and Metals in Geological Samples by Four Acid Digestion followed by ICP-OES and/ or ICP-MS (Fletcher. Handbook of Exploration Geochemistry. Volume 1 – Analytical Methods in Geochemical Prospecting. 1981)</p> <ul style="list-style-type: none"> - ICP-OES: Ag, Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, In, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zr, Zn; - ICP-OES and ICP-MS: Ag, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Ga, Ge, Hf, In, La, Li, Mn, Mo, Ni, Nb, P, Pb, Re, Rb, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Tl, U, V, W, Y, Zn, Zr
MIN-283-12010	<p>Determination of Metals in Geological and Mineralogical Samples by Aqua Regia (Nitric and Hydrochloric Acid) Digestion followed by ICP-OES and/or ICP-MS (Fletcher. Handbook of Exploration Geochemistry. Volume 1 – Analytical Methods in Geochemical Prospecting. 1981)</p> <ul style="list-style-type: none"> - ICP-OES: Ag, Al, As, B, Ba, Be, Bi, Fe, Ga, Hg, In, K, La, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Rb, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zr, Zn; - ICP-OES and ICP-MS: Ag, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Ga, Ge, Hf, Hg, In, La, Li, Mn, Mo, Ni, Nb, P, Pb, Re, Rb, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Tl, U, V, W, Y, Zn, Zr
MIN-283-12015	<p>Determination of Gold (Au) in Gold Bead Samples from Lead Fusion Fire Assay Using Gravimetric Method (Bugbee. Textbook of Fire Assaying. 1991; Shepard, et.al. Fire Assaying. 2008; Johnston, et.al Rock and Mineral Analysis. 1989)</p>
MIN-283-12016	<p>Extraction of Gold (Au), Platinum (Pt) and Palladium (Pd) in Gold Bead Samples from Lead Fusion Fire Assay Process using Inductively Coupled Plasma – Optical Emission Spectroscopy (ICP-OES) Finish (Bugbee. Textbook of Fire Assaying. 1991; Shepard, et.al. Fire Assaying. 2008; Johnston, et.al Rock and Mineral Analysis. 1989)</p>
MIN-283-12017	<p>Determination of Gold (Au) in Gold Bead Samples from Lead Fusion Fire Assay Procedure using Atomic Absorption Spectroscopy (AAS) (Bugbee. Textbook of Fire Assaying. 1991; Fletcher. Handbook of Exploration Geochemistry. Volume 1 – Analytical Methods in Geochemical Prospecting. 1981; Beaty, et. al. Concepts, Instrumentation and Techniques in Atomic Absorption Spectrophotometry. 1993)</p>

MIN-283-12025	Determination of Major, Trace and Rare Earth Elements Including Metals and Oxides in Geological, Soil and Ore Samples Following Various Laboratory Extraction and Acid Digestion Methods Using Inductively Coupled Plasma – Optical Emission Spectroscopy (ICP-OES) (In-House): see MIN-283-12003, MIN-283-12004, MIN-283-12006, MIN-283-12008, MIN-283-12010 and MIN-283-12016
MIN-283-12026	Determination of Major, Trace and Rare Earth Elements in Geological, Soil and Ore Samples Following Various Laboratory Extraction and Acid Digestion Methods Using Inductively Coupled Plasma – Mass Spectroscopy (ICP-MS) (In-House): see MIN-283-12004, MIN-283-12006, MIN-283-12008 and MIN-283-12010
*ROCK-10-26000	Determination of Oxide Content in Mineral Samples by Lithium Borate Fusion and Wavelength Disperse X-Ray Fluorescence Spectroscopy (In-House): Al ₂ O ₃ , BaO, CaO, Cr ₂ O ₃ , CuO, Fe ₂ O ₃ , HfO ₂ , K ₂ O, MgO, MnO, Na ₂ O, NiO, P ₂ O ₅ , PbO, SiO ₂ , SO ₃ , SrO, TiO ₂ , V ₂ O ₅ , ZnO, ZrO ₂ , %LOI
*ROCK-10-26001	Preparation and Determination of Base Metals and Rare Earth Elements in Mineralogical Samples by Wavelength Dispersive X-Ray Fluorescence (XRF) Spectroscopy (In-House): As, Ba, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Ho, La, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tm, U, V, W, Y, Yb, Zn, Zr
*ROCK-10-26002	Preparation and Determination of Specific Gravity Using Gas Pycnometry (Modified API40, ASTM D5550)

ENVIRONMENTAL AND OCCUPATIONAL HEALTH AND SAFETY

Environmental

(Leachates, Wastewater)

ARD-283-18011	Determination of pH in Aqueous Extracts and Leachates Using a Manual pH Meter (Eaton, A. D., Clesceri, L. S., Rice, E. W. and A. E. Greenberg (Eds). 2012. 4500-H+ pH Value in Standard Methods for the Examination of Water and Wastewater, 23rd ed., American Public Health Association. Washington, D.C): pH
ARD-283-18012	Determination of Electric Conductivity (EC) in Aqueous Extracts and Leachates Using Manual EC Meter (Eaton, A. D., Clesceri, L. S., Rice, E. W. and A. E. Greenberg (Eds). 2012. 2510 Conductivity in Standard Methods for the Examination of Water and Wastewater, 23rd ed., American Public Health Association. Washington, D.C.): Conductivity (25 °C)

ARD-283-18013	Determination of Oxidation Reduction Potential (Eh) in Aqueous Extracts & Leachates Using ORP Meter (Eaton, A.D., Clesceri, L. S., Rice, E.W. and A.E. Greenberg (Eds). 2580 B Oxidation-Reduction Potential Measurement in Clean Water in Standard Methods for the Examination of Water and Wastewater, 23rd ed., American Public Health Association, Washington, D.C.): Oxidation Reduction Potential
---------------	--

Tailings, Waste Rock, Soil & Ore

ARD-283-18000	Determination of the Neutralization Potential of Acid Rock Drainage (ARD) Samples by the Modified Acid-Base Accounting (ABA) Procedure (Lawrence, R. W., Poling, G.P. and Marchant, P.B., 1989. Investigation of Predictive Techniques for Acid Mine Drainage. Report on DSS Contract No. 23440-7-9178/01-SQ, Energy Mines and Resources, Canada, MEND Report 1.16.1 (a). (Lawrence Back Titration to pH 8.3, 1989 Method; Mend Project 1.16.1b, 1991 Method): Neutralization Potential as kg CaCO ₃ /tonne
ARD-283-18003	Determination of Saturated Paste pH of Acid Rock Drainage (ARD) Samples Using a Manual pH Meter (Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M., Field and Laboratory Method Applicable to Overburden and Minesoils, Report EPA-600/2-78-054, U.S. National Technical Information Service Report PB-280 495 p 45-47, March 1978.): Paste pH

Number of Scope Listings: 21

Notes:

*Tests marked with asterisk are performed at Unit #106 & #110, 2730 39 Ave NE, Calgary, AB T1Y 7H6.

ASTM: ASTM International, formerly American Society of Testing and Materials

API: American Petroleum Institute

LOI: Loss on ignition



This document forms part of the Certificate of Accreditation issued by the Standards Council of Canada (SCC). The original version is available in the Directory of Accredited Laboratories on the SCC website at www.scc.ca.

Elias Rafoul
Vice-President, Accreditation Services
Published on: 2021-11-26