



CARE COMMITMENT PERFORMANCE



09/10



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Since inception in 1971, Acme labs has been recognized as one of the leading geochemical and assaying laboratories to geologists and stock exchanges world wide.

Acme started as a family operated private business. For many years Acme remained a small but very successful business. Acme has always been known for innovation and quickly embracing new technology. This, along with a strong commitment to providing analytical methods tailored to exploration geochemistry assured Acme's success.

Today Acme has grown into an employee owned business operating 19 offices in 11 countries. Our employee ownership reflects a very high level of personal commitment from our staff to our customers and our product. It is this care and commitment that makes Acme unique and strong. We have now incorporated this into our company slogan "Care, Commitment, Performance," to convey how we approach our work, our company, and our customers. You will begin to see this slogan on all Acme Certificates, Invoices and emails.

Over the past year Acme has completed some important milestones.

- In August, 2009 Acme acquired Global Discovery Labs (GDL). This laboratory has been providing excellent analytical services to Teck Resources as well as many other exploration and mining companies for over 30 years. This acquisition allows Acme to provide new services including XRay Fluorescence and XRay Diffraction (for Mineralogy) to our customers. More importantly however, this acquisition brings us a group of very experienced mineral analysis personnel.
- In Vancouver, we completed a new laboratory for sample preparation and fire assay. This laboratory is state of the art, and provides excellent work spaces for our staff, greatly improved efficiencies and triples our capacity for preparation and analysis;
- Our ICP/ICPMS laboratory has also been expanded so that it is one of the largest in the world, with additional capacity for test tube, large beaker, and fusion digestions;
- In Chile, we have completed a large renovation and expansion to add analytical capacity and improved efficiency;
- Acme has added offices in Guyana, Colombia and Dominican Republic and expanded or improved many of our existing sample preparation offices;
- Acme has completed the installation of our new Laboratory Information Management System (LIMS). This is a powerful sample tracking and analytical reporting system that forms the core of all laboratory operations. This provides a high level of traceability for us and our customers;
- We have completed our new Acme Access web services for our customers to access their data at any time via the internet. This powerful tool gives our customers unprecedented access to information.

All of these investments are made so we can serve you better.

Care, Commitment, Performance. We will continue to exceed your expectations.

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Sample Preparation, Storage & Disposal

Sample Preparation

Code	Description	Cdn
SS80	Dry at 60°C, sieve (up to) 100g to –80 mesh, up to ½ kg	\$2.25
	Sieve large samples: 80 mesh per ½ kg	+\$1.00
YKSS	Sieve soil or sediment samples in Yellowknife, NWT Prep lab	+\$2.65
S230	Dry at 60°C, sieve (up to) 100g to –230 mesh, up to ½ kg	\$3.00
	Sieve large samples: 230 mesh, per ½ kg	+\$1.50
SSXX	Further sieving to other mesh sizes, per ½ kg	\$1.50
SP100	Pulverize soils to –100 mesh ASTM in mild-steel pulverizer, per 100g	\$3.00
SCP100	Pulverize soils to –100 mesh ASTM in ceramic pulverizer, per 100g	\$7.85
RJSV	Saving all or part of reject fraction	\$2.00
CLSP	Clay separation per 250g	\$10.00

Special Handling

ADRY	Air Dry sample (<40°C), per 2 kg	\$2.30
HAND	Handling special projects, rejects and pulp retrieval, per hour	\$50.00
RIFL	Split by riffle splitter material up to 5 kg	\$2.10
WGHT	Weigh sample	\$0.60
XWSH	Extra wash with glass between each sample in pulverizer	\$1.25
SPLP	Sorting, labelling and boxing samples received as pulps	\$0.30

Sample Storage & Disposal Fees

RTRN	Return of all reject portions and/or pulps (British Columbia only)	at cost
DISP2	Incineration of soil, sediment and vegetation samples, per sample	\$0.45
STOR-PLP	Monthly storage of pulps after 90 days, per sample	\$0.16
STOR3	Monthly storage of soil rejects, per sample	\$0.35

No soil, till or sediment pulps or rejects (excluding those from BC Mainland, Alberta, Yukon and NWT) can be returned and must be incinerated upon disposal. A disposal fee (DISP2) is charged for these samples. Soils will be discarded following analysis unless specific instructions are indicated on sample submittal forms. Soil rejects are discarded immediately after preparation.

Note: Importation regulations may apply; contact lab prior to shipment.

Note: Batch charge for sample submissions of less than 20 samples: \$50.00

Soil, Till & Sediment

Soil, till and sediment have long been the interest of geochemists and geologists as a means of tracing mineralization to their sources. This could be sediment overlying bedrock which must be analysed and interpreted as to the underlying deposit or the means of tracing glacially dispersed elements or drainage systems back to their sources of mineralization. This interest has created an industry demand for new technology in laboratories, ever lower detection levels and a very stringent quality system to provide confidence in the results produced.

The most important factors for assessing methods for geochem samples are precision and sensitivity. This is the ability of the method to detect subtle anomalies above baseline or background levels. At Acme Labs, we are at the forefront of this technology and innovation and we take pride in being the first choice for this type of survey by industry, academia and governments from all over the world.

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Sample Preparation, Storage & Disposal

Preparation

Code	Description	Cdn
R200–250	Crush 1 kg to 80% passing 10 mesh, split 250g and pulverize to 85% passing 200 mesh	\$6.85
R200–500	Crush 1 kg to 80% passing 10 mesh, split 500g and pulverize to 85% passing 200 mesh	\$7.85
R200–1000	Crush 1 kg to 80% passing 10 mesh, split 1000g and pulverize to 85% passing 200 mesh	\$8.85
	Extra crushing and saving rejects over 1 kg, per kg	+\$1.55
YKRP	Crush 1 kg and split 250g in Yellowknife, NWT Prep Lab, ship to Vancouver Lab	\$3.85
P200	Dry (60°C) and pulverize only to 85% passing 200 mesh, per 250g	\$3.50
	Extra pulverizing over 250g, per 250g	+\$1.85
PSCB	Pulverizing by Ceramic Box, per 100g	\$9.25
M150	Crush, pulverize, sieve 500g, save +150 and –150 mesh fractions for metallics analysis	\$9.75
M200	Same as M150 but sieving to 200 mesh	\$13.90
MXXX	Extra M150 or M200 pulverizing and screening, per 250g	+\$3.50

Special Handling

D105	Dry pulp samples at 105°C, per sample	\$0.55
HAND	Handling special projects, rejects and pulp retrieval, per hour	\$50.00
MIXP	Mixing of received pulps	\$0.60
MPCP	Compositing pulp, per 250g	\$3.00
MPMP	Mixing & pulverizing composite, per 250g	\$2.70
SPLT	Split large samples (>5 kg), per kg	\$0.50
RIFL	Split by riffle splitter material up to 5 kg	\$2.00
WGHT	Weigh sample	\$0.60
XWSH	Extra wash with glass between each sample in pulverizer	\$1.25
RPLP	Sorting, labelling and boxing samples received as pulp	\$0.30
RS01	Rotary split up to 5 kg	\$4.25

Sample Storage & Disposal Fees

All rock rejects are stored for 3 months at no charge. Clients may purchase additional storage time.

Note: a minimum charge of \$10/quarter (\$40/yr) will apply to all clients with rejects in storage after 90 days.

Code	Description	Cdn
RTRN	Return of all reject portions and/or pulps	at cost
DIS-RJT	Warehouse disposition of rejects	\$0.25
DIS-PLP	Warehouse disposition of pulps	\$0.10
STOR-RJT	Monthly storage of rejects after 90 days, per sample	\$0.35
STOR-PLP	Monthly storage of pulps after 90 days, per sample	\$0.16

Note: Concentrates and high NORM samples must be returned.

Note: Batch charge for sample submissions of less than 20 samples: \$50.00

Rock & Drill Core

Rock and core samples are the final truth in any exploration program. Care and attention begin prior to any sample collection. Rock and core samples are dried then prepared by particle size reduction to produce a homogeneous sub-sample which is representative of the original sample. For most analytical methods, this sub-sample will undergo some form of dissolution and decomposition. Each sample decomposition procedure has its own advantages and limitations. The final technique used for the determination of elements is dependant on the required detection levels of the elements of interest.

Acme Labs welcomes and encourages discussion with the geoscientist to determine the most appropriate analytical scheme of preparation, digestion and analysis to match the needs of their program. To this end, Acme Labs have developed mineral-deposit specific analytical packages for consideration.

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Geochemical Aqua Regia Digestion

Groups 1D, 1DX ICP-ES & ICP-MS

You can choose economically priced ICP-ES (Group 1D) or ICP-MS (Group 1DX) analysis to complement your exploration program.

Sample splits of 0.5g are leached in hot (95°C) Aqua Regia. Select a larger split size for more representative Au analysis. Refractory and graphitic samples can limit Au solubility.

Sample minimum 1g pulp.

Group 1D	Cdn
31 elements	\$8.50
‡Include Hg and Tl	+\$1.00

Code	Group 1DX	Cdn
1DX1	36 elements 0.5g	\$13.75
1DX2	36 elements 15g	\$18.25
1DX3	36 elements 30g	\$21.75
Include U by request		

	Group 1D Detection	Group 1DX Detection	Upper Limit
Ag*	0.3 ppm	0.1 ppm	100 ppm
Al*	0.01 %	0.01 %	10 %
As	2 ppm	0.5 ppm	10000 ppm
Au*	2 ppm	0.5 ppb	100 ppm
B*†	20 ppm	20 ppm	2000 ppm
Ba*	1 ppm	1 ppm	10000 ppm
Bi	3 ppm	0.1 ppm	2000 ppm
Ca*	0.01 %	0.01 %	40 %
Cd	0.5 ppm	0.1 ppm	2000 ppm
Co	1 ppm	0.1 ppm	2000 ppm
Cr*	1 ppm	1 ppm	10000 ppm
Cu	1 ppm	0.1 ppm	10000 ppm
Fe*	0.01 %	0.01 %	40 %
Ga*	–	1 ppm	1000 ppm
Hg‡	1 ppm	0.01 ppm	50 ppm
K*	0.01 %	0.01 %	10 %
La*	1 ppm	1 ppm	10000 ppm
Mg*	0.01 %	0.01 %	30 %
Mn*	2 ppm	1 ppm	10000 ppm
Mo	1 ppm	0.1 ppm	2000 ppm
Na*	0.01 %	0.001 %	5 %
Ni	1 ppm	0.1 ppm	10000 ppm
P*	0.001 %	0.001 %	5 %
Pb	3 ppm	0.1 ppm	10000 ppm
S*	0.05 %	0.05 %	10 %
Sb	3 ppm	0.1 ppm	2000 ppm
Sc	–	0.1 ppm	100 ppm
Se	–	0.5 ppm	100 ppm
Sr*	1 ppm	1 ppm	10000 ppm
Te	–	0.2 ppm	1000 ppm
Th*	2 ppm	0.1 ppm	2000 ppm
Ti*	0.01 %	0.001 %	5 %
Tl†	5 ppm	0.1 ppm	1000 ppm
V*	1 ppm	2 ppm	10000 ppm
W*	2 ppm	0.1 ppm	100 ppm
Zn	1 ppm	1 ppm	10000 ppm

*Solubility of some elements will be limited by mineral species present.

†Detection limit = 1 ppm for 15g / 30g analysis.



Geochemical

Ultratrace Aqua Regia Digestion

Group 1F-MS Ultratrace by ICP Mass Spec

ICP Mass Spec analysis of a 0.5, 15 or 30g sample after Aqua Regia digestion for low to ultra-low determinations on soils, sediments and lean rocks.

Larger splits (15 or 30g) give a more representative analysis of elements subject to nugget effect (e.g. Au). Au solubility can be limited in refractory and graphitic samples.

Sample minimum 1g pulp.

Acme Labs now offers analysis of Pb isotopes (Pb_{204} , Pb_{206} , Pb_{207} , Pb_{208}) suitable for geochemical exploration of U and other commodities where gross differences in natural to radiogenic Pb ratios, is a benefit. Isotope values can be reported in both concentrations and intensities.

Code	Group 1F-MS	Cdn
1F01	Basic Suite (37 elements) 0.5g	\$17.05
1F02	Basic Suite (37 elements) 15g	\$21.55
1F03	Basic Suite (37 elements) 30g	\$25.05
1F04	Full Suite (53 elements) 0.5g	\$20.20
1F05	Full Suite (53 elements) 15g	\$24.70
1F06	Full Suite (53 elements) 30g	\$28.20
+1F07	Lead isotope (add on)	\$12.00

*Some elements will report partial concentrations due to refractory minerals.

†Detection limit = 1 ppm for 15g / 30g analysis.

Full Suite

Basic Suite

	Group 1F Detection	Upper Limit
Au*	0.2 ppb	100 ppm
Ag*	2 ppb	100 ppm
Al*	0.01 %	10 %
As	0.1 ppm	10000 ppm
B*†	20 ppm	2000 ppm
Ba*	0.5 ppm	10000 ppm
Bi	0.02 ppm	2000 ppm
Ca*	0.01 %	40 %
Cd	0.01 ppm	2000 ppm
Co	0.1 ppm	2000 ppm
Cr*	0.5 ppm	10000 ppm
Cu	0.01 ppm	10000 ppm
Fe*	0.01 %	40 %
Ga*	0.1 ppm	1000 ppm
Hg	0.005 ppm	50 ppm
K*	0.01 %	10 %
La*	0.5 ppm	10000 ppm
Mg*	0.01 %	30 %
Mn*	1 ppm	10000 ppm
Mo	0.01 ppm	2000 ppm
Na*	0.001 %	5 %
Ni*	0.1 ppm	10000 ppm
P*	0.001 %	5 %
Pb	0.01 ppm	10000 ppm
S*	0.02 %	5 %
Sb	0.02 ppm	2000 ppm
Sc*	0.1 ppm	100 ppm
Se	0.1 ppm	100 ppm
Sr*	0.5 ppm	10000 ppm
Te	0.02 ppm	1000 ppm
Th*	0.1 ppm	2000 ppm
Ti*	0.001 %	5 %
Tl	0.02 ppm	1000 ppm
U*	0.05 ppm	2000 ppm
V*	2 ppm	10000 ppm
W*	0.05 ppm	100 ppm
Zn	0.1 ppm	10000 ppm
Be*	0.1 ppm	1000 ppm
Ce*	0.1 ppm	2000 ppm
Cs*	0.02 ppm	2000 ppm
Ge*	0.1 ppm	100 ppm
Hf*	0.02 ppm	1000 ppm
In	0.02 ppm	1000 ppm
Li*	0.1 ppm	2000 ppm
Nb*	0.02 ppm	2000 ppm
Rb*	0.1 ppm	2000 ppm
Re	1 ppb	1000 ppb
Sn*	0.1 ppm	100 ppm
Ta*	0.05 ppm	2000 ppm
Y*	0.01 ppm	2000 ppm
Zr*	0.1 ppm	2000 ppm
Pt*	2 ppb	100 ppm
Pd*	10 ppb	100 ppm



Geochemical 4-Acid Digestion

Groups 1E & 1EX ICP-ES & ICP-MS

Combines a strong 4-acid digestion that dissolves most minerals with a choice of either ICP-ES or ICP-MS analysis and you get highly cost-effective near-total determinations with low to very low detection limits.

A 0.25g split is heated in HNO₃-HClO₄-HF to fuming and taken to dryness. The residue is dissolved in HCl. Solutions are analysed by your choice of ICP-ES (Group 1E) or ICP-MS (Group 1EX).

Requires minimum 1g sample pulp.

Group 1E	Cdn
36 elements	\$12.00

Group 1EX	Cdn
41 elements	\$17.00

	Group 1E Detection	Group 1EX Detection	Upper Limit
Ag	0.5 ppm	0.1 ppm	200 ppm
Al*	0.01 %	0.01 %	20 %
As [†]	5 ppm	1 ppm	10000 ppm
Au [†]	4 ppm	0.1 ppm	200 ppm
Ba*	1 ppm	1 ppm	10000 ppm
Be*	1 ppm	1 ppm	1000 ppm
Bi	5 ppm	0.1 ppm	4000 ppm
Ca	0.01 %	0.01 %	40 %
Cd	0.4 ppm	0.1 ppm	4000 ppm
Ce	–	1 ppm	2000 ppm
Co	2 ppm	0.2 ppm	4000 ppm
Cr [†]	2 ppm	1 ppm	10000 ppm
Cu	2 ppm	0.1 ppm	10000 ppm
Fe*	0.01 %	0.01 %	60 %
Hf*	–	0.1 ppm	1000 ppm
K	0.01 %	0.01 %	10 %
La	2 ppm	0.1 ppm	2000 ppm
Li	–	0.1 ppm	2000 ppm
Mg*	0.01 %	0.01 %	30 %
Mn*	5 ppm	1 ppm	10000 ppm
Mo	2 ppm	0.1 ppm	4000 ppm
Na	0.01 %	0.001 %	10 %
Nb	2 ppm	0.1 ppm	2000 ppm
Ni	2 ppm	0.1 ppm	10000 ppm
P	0.002 %	0.001 %	5 %
Pb	5 ppm	0.1 ppm	10000 ppm
Rb	–	0.1 ppm	2000 ppm
S*	0.1 %	0.1 %	10 %
Sb [†]	5 ppm	0.1 ppm	4000 ppm
Sc	1 ppm	1 ppm	200 ppm
Sn*	2 ppm	0.1 ppm	2000 ppm
Sr	2 ppm	1 ppm	10000 ppm
Ta*	–	0.1 ppm	2000 ppm
Th	2 ppm	0.1 ppm	4000 ppm
Ti	0.01 %	0.001 %	10 %
U	20 ppm	0.1 ppm	4000 ppm
V	2 ppm	4 ppm	10000 ppm
W*	4 ppm	0.1 ppm	200 ppm
Y	2 ppm	0.1 ppm	2000 ppm
Zn	2 ppm	1 ppm	10000 ppm
Zr*	2 ppm	0.1 ppm	2000 ppm

*The digestion is only partial for some Cr and Ba minerals and some oxides of Al, Hf, Mn, Sn, Ta, Zr.

†Volatilization during fuming may result in some loss of As, Sb and Au.



Geochemical

Ultratrace 4-Acid Digestion

Group 1T-MS Ultratrace by ICP-MS

ICP Mass Spec analysis of a 4-acid digestion on a 0.25g split giving total to near total values for all elements.

Requires minimum 1g sample pulp.

Detection limits may change without notice due to the nature of some samples. Massive sulphide samples will cause elevated detection limits.

Group 1T-MS	Cdn
Full Suite (43 + REEs)	\$22.70

	Detection Limit	Upper Limit		Detection Limit	Upper Limit
Au[†]	0.1 ppm	200 ppm	V	1 ppm	10000 ppm
Ag	20 ppb	200 ppm	W*	0.1 ppm	200 ppm
Al*	0.02 %	20 %	Zn	0.2 ppm	10000 ppm
As[†]	0.2 ppm	10000 ppm	Be*	1 ppm	1000 ppm
Ba*	1 ppm	10000 ppm	Cs	0.1 ppm	2000 ppm
Bi	0.04 ppm	4000 ppm	Hf*	0.02 ppm	1000 ppm
Ca	0.02 %	40 %	Li	0.1 ppm	2000 ppm
Cd	0.02 ppm	4000 ppm	Nb	0.04 ppm	2000 ppm
Co	0.2 ppm	4000 ppm	Rb	0.1 ppm	2000 ppm
Cr	1 ppm	10000 ppm	Sn*	0.1 ppm	2000 ppm
Cu	0.02 ppm	10000 ppm	Ta*	0.1 ppm	2000 ppm
Fe*	0.02 %	60 %	Y	0.1 ppm	2000 ppm
Ga	0.02 ppm	100 ppm	Zr*	0.2 ppm	2000 ppm
K	0.02 %	10 %	La	0.1 ppm	2000 ppm
Mg*	0.02 %	30 %	Ce	0.02 ppm	2000 ppm
Mn*	2 ppm	10000 ppm	Pr	0.1 ppm	2000 ppm
Mo	0.05 ppm	4000 ppm	Nd	0.1 ppm	2000 ppm
Na	0.002 %	10 %	Sm	0.1 ppm	2000 ppm
Ni	0.1 ppm	10000 ppm	Eu	0.1 ppm	2000 ppm
P	0.001 %	5 %	Gd	0.1 ppm	2000 ppm
Pb	0.02 ppm	10000 ppm	Tb	0.1 ppm	2000 ppm
S	0.04 %	10 %	Dy	0.1 ppm	2000 ppm
Sb[†]	0.02 ppm	4000 ppm	Ho	0.1 ppm	2000 ppm
Sc	0.1 ppm	200 ppm	Er	0.1 ppm	2000 ppm
Sr	1 ppm	10000 ppm	Tm	0.1 ppm	2000 ppm
Th	0.1 ppm	2000 ppm	Yb	0.1 ppm	2000 ppm
Ti	0.001 %	10 %	Lu	0.1 ppm	2000 ppm
U	0.1 ppm	4000 ppm			

*The digestion is only partial for some Cr and Ba minerals and some oxides of Al, Fe, Hf, Mn, Sn, Ta, Zr.

†Volatilization during fuming may result in some loss of As, Sb and Au.



Geochemical Sequential Leaches

Group 1SL Sequential Leaches

Selective or sequential extractions can target elements held by a specific soil phase or range of phases thus allowing better interpretation of geochemical processes.

Used sequentially, the leaches can determine elements occurring in surface soils as salts or adsorbed ions on clays, organic compounds and amorphous Mn and Fe hydroxides. Used singularly, the stronger leaches are less selective. Contact our geochemist for further information.

Sample minimum 2.5g pulp per leach.

Group 1SLW A demineralized water leach for extracting the water-soluble component.

Group 1SLE 1 M ammonium acetate leach for exchangeable cations adsorbed by clay and elements co-precipitated with carbonates.

Group 1SLO 0.1 M sodium pyrophosphate leach for elements adsorbed by organic matter (humic and fulvic compounds).

Group 1SLM 0.1 M hydroxylamine leach for elements adsorbed by amorphous Mn hydroxide, often the most reactive soil phase for scavenging mobile elements.

Group 1SLF 0.25 M hydroxylamine leach for elements adsorbed by amorphous Fe hydroxide and more crystalline Mn hydroxide.

Group 1SL	Cdn
Separate, per leach	\$24.50
Sequential, per leach	\$31.20
Set up charge, first leach	\$330.00
Set up charge, additional	\$220.00

	Group 1SLW	Group 1SLE	Group 1SLO	Group 1SLM	Group 1SLF
Al	1000	1000	1000	1000	1000
Ca	5000	5000	5000	5000	5000
Fe	100	5000	5000	5000	5000
K	2000	5000	5000	5000	5000
Mn	50	50	50	50	50
Mg	100	1000	1000	1000	1000
Na	3000	–	–	–	–
P	100	5000	–	5000	5000
Ti	50	1000	1000	1000	1000
Au	1	1	1	1	1
Ag	0.5	3	3	3	3
As	5	100	100	100	100
Ba	10	50	50	50	50
Be	1	20	20	20	20
Bi	0.5	5	5	5	5
Br	10	–	–	–	–
Cd	0.5	20	20	20	20
Ce	1	5	5	5	5
Cl	2000	–	–	–	–
Co	1	20	20	20	20
Cs	0.5	5	5	5	5
Cu	5	20	20	20	20
Dy	0.1	5	5	5	5
Er	0.1	5	5	5	5
Eu	0.1	5	5	5	5
Ga	0.5	20	50	20	20
Gd	0.1	5	5	5	5
Ge	0.1	50	50	50	50
Hf	0.1	20	20	20	20
Hg	1	5	5	5	5
Ho	0.05	20	20	20	20
In	0.05	10	10	10	10

	Group 1SLW	Group 1SLE	Group 1SLO	Group 1SLM	Group 1SLF
La	2	5	5	5	5
Li	0.1	20	20	20	20
Lu	0.05	5	5	5	5
Mo	1	10	10	10	10
Nb	0.5	10	10	10	10
Nd	1	5	5	5	5
Ni	5	50	50	50	50
Pb	3	20	20	20	20
Pr	0.5	5	5	5	5
Rb	2	5	5	5	5
Re	0.05	2	2	2	2
S	10000	–	–	–	–
Sb	1	5	5	5	5
Sc	20	100	100	100	100
Se	5	200	200	200	200
Sm	0.5	5	5	5	5
Sn	1	20	20	20	20
Sr	10	20	20	20	20
Ta	0.5	20	20	20	20
Tb	0.05	5	5	5	5
Te	1	20	20	20	20
Th	2	20	20	20	20
Tl	0.2	5	5	5	5
Tm	0.05	5	5	5	5
U	0.1	5	5	5	5
V	50	50	50	50	50
W	2	10	10	10	10
Y	1	5	5	5	5
Yb	0.5	5	5	5	5
Zn	10	100	100	100	100
Zr	1	20	20	20	20

Note: All detection limits in ppb



Geochemical Single Elements

Group 2A Special Extraction

Sample minimum 2g pulp

Code	Element	Method	Detection	Cdn
2A01	B	Na ₂ O ₂ Fusion / ICP	3 ppm	\$10.00
2A04	F	Fusion, analysis by specific ion electrode	10 ppm	\$10.00
2A05	LOI	Loss on Ignition @ 1000°C (or 500°C)	0.1 %	\$5.00
2A06	pH	pH Electrode	0.1 unit	\$7.35
2A07	Conductivity	Conductivity Electrode	3 µS/cm	\$7.35

Group 2A Leco Analysis

Sample minimum 2g pulp

Code	Element	Method	Detection	Cdn
2A08	Total C	Leco (total as C or CO ₂)	0.02 %	\$12.10
2A09	Graphite C	Ignite 600°C, HCl leach, residue by Leco	0.02 %	\$16.40
2A10	Organic C	Total C minus graphite C and carbonate	0.02 %	\$27.30
2A11	Inorganic C	Direct CO ₂ evolution and Leco analysis	0.02 %	\$12.10
2A12	C & S	Both by Leco	0.02 %	\$13.40
2A13	Total S	Total S by Leco	0.02 %	\$12.10
		Surcharge on S > 20%, add		\$5.75
2A14	Sulphate	Leco after ignition at 800°C	0.05 %	\$16.40
2A15	Sulphide	Total S minus Sulphate S	0.05 %	\$17.85
2A16	HCl/S	HCl extractable Sulphur	0.02 %	\$16.40
2A17	HNO ₃ /S	HNO ₃ extractable Sulphur	0.02 %	\$16.40





Geochemical Single Elements

Group 2X XRF Minor Element Analyses

Pressed pellet

Group 2X	Cdn
First Element	\$8.00
Each Additional Element	\$2.00

Group 5A Neutron Activation

Analysis by affiliate laboratory.

Total determination of Au plus 34 elements by gamma ray analysis after nuclear irradiation. Requires 5 – 30g pulp.

Group 5A	Cdn
Full Suite	\$20.00

Element	Det. Limit
Ba	2 ppm
Ce	3 ppm
Cr	3 ppm
Cs	3 ppm
Hf	3 ppm
La	2 ppm
Nb	2 ppm
Nd	2 ppm
Mn	0.01 %
P ₂ O ₅	0.01 %
Rb	2 ppm
Sb	3 ppm
Se	2 ppm

Element	Det. Limit
Sm	2 ppm
Sn	2 ppm
Sr	2 ppm
Ta	2 ppm
Th	2 ppm
TiO ₂	0.01 %
U	2 ppm
V	2 ppm
W	3 ppm
Y	2 ppm
Yb	2 ppm
Zr	2 ppm

Element	Det. Limit
Au	2 ppb
Ag	5 ppm
As	0.5 ppm
Ba	50 ppm
Br	0.5 ppm
Ca	1 %
Ce	3 ppm
Co	1 ppm
Cr	5 ppm
Cs	1 ppm
Eu	0.2 ppm
Fe	0.01 %
Hf	1 ppm
Hg	1 ppm
Ir	5 ppb
La	0.5 ppm
Lu	0.05 ppm
Mo	1 ppm

Element	Det. Limit
Na	0.01 %
Nd	5 ppm
Ni	100 ppm
Rb	15 ppm
Sb	0.1 ppm
Sc	0.1 ppm
Se	3 ppm
Sm	0.1 ppm
Sn	0.01 %
Sr	0.05 %
Ta	0.5 ppm
Th	0.2 ppm
Tb	0.5 ppm
U	0.5 ppm
W	1 ppm
Yb	0.2 ppm
Zn	50 ppm

Geochemical Precious Metals

Group 3A Au by Wet Digestion

Recommended for soils, sediments, vegetation or reconnaissance rock samples. Samples are digested in Aqua Regia then analysed by ICP-Mass Spec.

Code	Element	Detection Limits	Upper Limits	Method	Cdn
3A01	Au	0.5 ppb	10 ppm	15g / Aqua Regia digestion / ICP-MS	\$9.50
+3A02				30g sample (add on)	+\$3.50
				Ignition for rocks*	+\$1.15

*Refractory, massive sulphide and graphitic samples can limit Au solubility. Rock samples are ignited at 550°C before Aqua Regia leaching.

Group 3B & 3B-MS Au & PGMs by Fire Geochem

A lead-collection fire-assay fusion for total sample decomposition, digestion of the Ag dore bead and ICP-ES (Group 3B) or ICP-MS (Group 3B-MS) analysis. Group 6 precious metals assay recommended for Au or PGMs over 1000 ppb.

Code	Package	Element	Detection Limits	Upper Limits	Method	Cdn
3B01	Group 3B	Au	2 ppb	10 ppm	30g / Ag in quart fire assay fusion / ICP-ES	\$13.75
3B02		Au Pt Pd	2 ppb 3 ppb 2 ppb	10 ppm 10 ppm 10 ppm	30g / Ag in quart fire assay fusion / ICP-ES or ICP-MS	\$16.00
3B03	Group 3B-MS	Au Pt Pd	1 ppb 0.1 ppb 0.5 ppb	10 ppm 10 ppm 10 ppm	30g / Ag in quart fire assay fusion / ICP-MS	\$19.00
+3B04					50g sample (add on)	+\$2.85

Note: Sulphide-rich samples require a 15g or smaller sample for proper fusion.



Lithochemical

Whole Rock Major & Trace Element Analysis

Group 4A Whole Rock by ICP

A cost-effective rock characterization package comprising four separate analytical tests.

Total abundances of the major oxides and several minor elements are reported on a 0.2g sample analysed by ICP-emission spectrometry following a Lithium metaborate/tetraborate fusion and dilute nitric digestion. Loss on ignition (LOI) is by weigh difference after ignition at 1000°C.

Unique to our lab is the addition of total carbon and sulphur analysis by Leco.

Code	Group 4A	Cdn
4A01	Any 1 element	\$14.60
4A02	Full Suite (21 parameters)	\$26.70
4A03	Extended Package* (Full Suite + Ce Co Cu Zn)	\$30.40

Group 4X Whole Rock by XRF

LiBO₂ fusion followed by XRF analysis for major oxides and LOI. X-ray fluorescence is a physical method that does not suffer from difficulties such as small sample size, incomplete dissolution, matrix effects and sample inhomogeneity found in "wet" methods.

Unique to our lab is the addition of total carbon and sulphur analysis by Leco.

Requires a 12g sample pulp.

Group 4X	Cdn
Full Suite	\$31.50

Group 4B Total Trace Elements by ICP-MS

This is the perfect addition to Group 4A. This package comprises two separate analyses. Rare earth and refractory elements are determined by ICP mass spectrometry following a Lithium metaborate / tetraborate fusion and nitric acid digestion of a 0.2g sample (same decomposition as Group 4A). In addition a separate 0.5g split is digested in Aqua Regia and analysed by ICP Mass Spectrometry to report the precious and base metals (in highlight). This is the same method as Group 1DX.

Prices are for routine geological samples. Acme may refuse to analyse or charge extra for non-geological materials.

Group 4A and 4B each require 5g for analysis, 10g for combined package (Group 4A-4B).

Code	Group 4B	Cdn
4B01	Any 1 element	\$17.00
4B02	Full Suite (45 elements)	\$36.40
4B03	Refractory and REEs only	\$26.70
4A4B	Group 4A – 4B	\$53.30
4X4B	Group 4X – 4B	\$54.60

	Group 4A Det. Limit	Group 4X Det. Limit	Upper Limit
SiO ₂	0.01 %	0.1 %	100 %
Al ₂ O ₃	0.01 %	0.01 %	100 %
Fe ₂ O ₃	0.04 %	0.01 %	100 %
CaO	0.01 %	0.01 %	100 %
MgO	0.01 %	0.01 %	100 %
Na ₂ O	0.01 %	0.01 %	100 %
K ₂ O	0.01 %	0.01 %	100 %
MnO	0.01 %	0.01 %	100 %
TiO ₂	0.01 %	0.01 %	100 %
P ₂ O ₅	0.01 %	0.01 %	100 %
Cr ₂ O ₃	0.002 %	–	100 %
Ba	5 ppm	0.01 %	100 %
LOI	0.1 %	0.1 %	100 %
C	0.01 %	0.01 %	100 %
S	0.02 %	0.02 %	100 %

	Group 4A Det. Limit	Group 4B Det. Limit	Upper Limit
Au	–	0.5 ppb	100 ppm
Ag	–	0.1 ppm	100 ppm
As	–	1 ppm	10000 ppm
Ba	5 ppm	1 ppm	50000 ppm
Be	–	1 ppm	10000 ppm
Bi	–	0.1 ppm	2000 ppm
Cd	–	0.1 ppm	2000 ppm
Co	20 ppm*	0.2 ppm	10000 ppm
Cs	–	0.1 ppm	10000 ppm
Cu	5 ppm*	0.1 ppm	10000 ppm
Ga	–	0.5 ppm	10000 ppm
Hf	–	0.1 ppm	10000 ppm
Hg	–	0.1 ppm	100 ppm
Mo	–	0.1 ppm	2000 ppm
Nb	5 ppm	0.1 ppm	50000 ppm
Ni	20 ppm	0.1 ppm	10000 ppm
Pb	–	0.1 ppm	10000 ppm
Rb	–	0.1 ppm	10000 ppm
Sb	–	0.1 ppm	2000 ppm
Sc	1 ppm	–	10000 ppm
Se	–	0.5 ppm	100 ppm
Sn	–	1 ppm	10000 ppm
Sr	2 ppm	0.5 ppm	50000 ppm
Ta	–	0.1 ppm	50000 ppm
Th	–	0.2 ppm	10000 ppm
Tl	–	0.1 ppm	1000 ppm
U	–	0.1 ppm	10000 ppm
V	–	8 ppm	10000 ppm
W	–	0.5 ppm	10000 ppm
Y	3 ppm	0.1 ppm	50000 ppm
Zn	5 ppm*	1 ppm	10000 ppm
Zr	5 ppm	0.1 ppm	50000 ppm
La	–	0.1 ppm	50000 ppm
Ce	30 ppm*	0.1 ppm	50000 ppm
Pr	–	0.02 ppm	10000 ppm
Nd	–	0.3 ppm	10000 ppm
Sm	–	0.05 ppm	10000 ppm
Eu	–	0.02 ppm	10000 ppm
Gd	–	0.05 ppm	10000 ppm
Tb	–	0.01 ppm	10000 ppm
Dy	–	0.05 ppm	10000 ppm
Ho	–	0.02 ppm	10000 ppm
Er	–	0.03 ppm	10000 ppm
Tm	–	0.01 ppm	10000 ppm
Yb	–	0.05 ppm	10000 ppm
Lu	–	0.01 ppm	10000 ppm

Note: Highlighted elements by Aqua Regia/
ICP-MS analysis in 4B package.



Lithochemical

Whole Rock Major & Trace Element Analysis

Group 4 NILAT For Nickel-Laterite

Exploration and evaluation of nickel laterite requires total determination and mass balance accounting of the major rock-forming elements and the commodity elements Ni, Cu and Co. Acme delivers these requirements with Group 4A-7TD that combines a cost effective whole-rock determination and a total-digestion, multi-element assay.

The package contains four separate analytical tests that report 23 parameters (11 major oxides, 10 minor and trace elements, loss on ignition and SUM). SUM is the sum total of these constituents that gives a mass balance close to 100% when all the major constituents are accurately determined and accounted for. The redundancy of two separate Ni determinations (Group 4A and Group 7TD) provides an additional check on accuracy.

Samples must be dried (prep method D105) prior to analysis.

Group 4 NILAT	Cdn
Full Suite 23 elements	\$30.00
C+S option	+\$6.00

Full Suite Elements	Detection Limit
SiO ₂	0.01 %
Al ₂ O ₃	0.01 %
Fe ₂ O ₃	0.04 %
CaO	0.01 %
MgO	0.01 %
Na ₂ O	0.01 %
K ₂ O	0.01 %
MnO	0.01 %
TiO ₂	0.01 %
P ₂ O ₅	0.01 %
Cr ₂ O ₃	0.002 %
LOI	0.01 %
SUM	0.01 %
Ba	5 ppm
Co	0.001 %
Cu	0.001 %
Nb	5 ppm
Ni	20 ppm
Ni	0.001 %
Sc	1 ppm
Sr	2 ppm
Y	3 ppm
Zr	5 ppm

Optional Elements	Detection Limit
C	0.02 %
S	0.02 %





Lithogeochemical Optical & Mineralogical Studies

Sample Preparation for Optical Studies

	Cdn
Thin sections: standard 27 x 46mm with/ without coverslip Other sizes upon request	\$20.00
Impregnation (where required), sample dependent	\$3.00
Casting (mill concentrates, drill chips, etc.)	\$6.00
Polished sections	\$25.00
Polished thin sections	\$40.00
K-feldspar staining (thin sections or off-cuts)	\$3.50
Slabbing, lapping, display polishing	hourly charge

Specialized Mineralogical Studies

Results are provided in report form, illustrated with photographs where appropriate.

Estimates available upon request.

	Cdn
Mineral identification by XRD – diffraction pattern/interpretation	\$80.00
Reflected and transmitted light microscopy	hourly charge
Photomicrography	
Scanning electron microscopy / energy dispersive x-ray analysis	
Alteration mineral studies	
Examination of alluvial concentrates	
Studies of metallurgical test products	



Assay

Precious Metals

Group 6 Fire Assay

Code	Element	Detection	Upper Limit	Method	Cdn
G601	Au	0.005 g/t	100 ppm	Fire Assay on 30g sample	\$15.25
G602				Metallics Fire Assay on 500g sample	\$26.00
G603	Au, Ag*	0.01 g/t	100 ppm	Fire Assay on 30g sample*	\$19.00
G604				Metallics Fire Assay on 500g sample	\$30.90
G605				Include all Group 7AR elements	+\$7.75
G606	Au, Pt, Pd	0.01 g/t	100 ppm	Fire Assay on 30g sample	\$18.50
G607				Metallics Fire Assay on 500g sample	\$30.30
G608	Au, Ag,* Pt, Pd	0.01 g/t	100 ppm	Fire Assay on 30g sample*	\$23.00
G609				Metallics Fire Assay on 500g sample	\$34.65
G613	Ag			Fire Assay on 30g sample Gravimetric	\$18.50
G614	Ag			Fire Assay on 50g sample Gravimetric	\$21.00
Add On Options					
+G610				50g sample	+\$2.50
+G611				Include all Group 7AR elements	+\$7.75
+G612				Gravimetric Finish (add on)	+\$3.25

*Ag by Group 7AR detection limit 2g/t to 300g/t



Assay Single Element

Group 8X XRF

Specific elements on a fusion.

Group 8X	Cdn
First Element	\$15.00
Each Additional Element	\$6.00

Element	LLD Detection Limit
Ba	0.01 %
Ce	0.01 %
La	0.01 %
Nb	0.01 %
Nd	0.01 %
Sn	0.01 %
Sr	0.01 %
Ta	0.01 %
Th	0.01 %
Ti	0.01 %
U	0.01 %
W	0.01 %
Y	0.01 %
Zr	0.01 %

Group 8 Single Element Assays

The following methods require a minimum of 1g of sample pulp except for precious-metal assays that require a minimum of 30g.

Code	Element		Cdn
G801	Copper – Non-Sulphide	CuO	\$15.75
G802	Molyoxide Leach	MoO	\$15.75
G803	Fluorine	F	\$16.40
G804	Gallium	Ga	\$16.40
G805	Germanium	Ge	\$13.00
G806	Iron – Ferrous	FeO	\$20.65
G807	Mercury	Hg	\$10.50
G808	Moisture (110°C)	H ₂ O ⁻	\$6.25
G809	Lattice Water (1500°C)*	H ₂ O ⁺	\$24.90
G810	Nickel sulphide	Ni	\$24.90
G812	Specific Gravity Pulp	SG	\$13.00
G813	Specific Gravity Core	SG	\$13.00
G814	Ba by Na ₂ CO ₃ / K ₂ CO ₃ fusion		\$25.00

*includes correction for FeO



Assay Multi-Element

Group 7 ICP & ICP-MS

The following multi-element assays provide optimum precision and accuracy for high-grade rock and drill core samples with a selection of digestion methods to best suit the ore type.

Groups 7AR, 7TD and 7PF report %-level concentrations as determined by ICP emission spectrometry.

Two new packages (Groups 7AX and 7TX) combine both ICP emission spectrometry and ICP mass spectrometry analysis to extend the lower detection limits and provide a broader spectrum of elements.

Group 7KP will provide total values for select elements.

Sample minimum 1g pulp.

Code	Group 7AR	Cdn
7AR1	Any element	\$10.10
7AR2	Full Suite	\$14.00
7AX1	Group 7AX	\$19.10

Code	Group 7TD	Cdn
7TD1	Any element	\$12.00
7TD2	Full Suite	\$16.00
7TX1	Group 7TX	\$23.10

Code	Group 7PF	Cdn
7PF1	Any element	\$18.20
7PF2	Full Suite	\$24.20

Code	Group 7KP	Cdn
7KP1	Any element	\$12.50
7KP2	Full suite	\$16.00



Group 7AR

Hot Aqua Regia digestion for base-metal sulphide and precious-metal ores. ICP-ES analysis.

Group 7AX

Same digestion as 7AR above but includes ICP-ES and ICP-MS analysis.

Group 7TD

Hot 4-Acid digestion for sulphide and silicate ores. ICP-ES analysis.

Group 7TX

Same digestion as 7TD above but includes ICP-ES and ICP-MS analysis.

Group 7PF

Sodium peroxide fusion for refractory-mineral ores.

Group 7KP

Phosphoric acid digestion for select elements.

	G7AR Det. Lim.	G7AX Det. Lim.	G7TD Det. Lim.	G7TX Det. Lim.	G7PF Det. Lim.	G7KP Det. Lim.
Ag	2 g/t	0.5 ppm	2 g/t	0.5 ppm	–	–
Al	0.01 %	0.01 %	0.01 %	0.01 %	–	–
As	0.01 %	5 ppm	0.02 %	5 ppm	–	–
B	–	–	–	–	0.01 %	–
Ba	–	5 ppm	–	5 ppm	–	–
Be	–	–	–	5 ppm	–	–
Bi	0.01 %	0.5 ppm	0.01 %	0.5 ppm	–	–
Ca	0.01 %	0.01 %	0.01 %	0.01 %	–	–
Cd	0.001 %	0.5 ppm	0.001 %	0.5 ppm	–	–
Ce	–	–	–	5 ppm	–	–
Co	0.001 %	0.5 ppm	0.001 %	1 ppm	–	–
Cr	0.001 %	0.5 ppm	0.001 %	1 ppm	0.01 %	–
Cu	0.001 %	0.5 ppm	0.001 %	0.5 ppm	0.01 %	–
Fe	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	–
Ga	–	5 ppm	–	–	–	–
Hf	–	–	–	0.5 ppm	–	–
Hg	0.001 %	0.05 ppm	–	–	–	–
K	0.01 %	0.01 %	0.01 %	0.01 %	–	–
La	–	0.5 ppm	–	0.5 ppm	–	–
Li	–	–	–	0.5 ppm	–	–
Mg	0.01 %	0.01 %	0.01 %	0.01 %	–	–
Mn	0.01 %	5 ppm	0.01 %	5 ppm	–	–
Mo	0.001 %	0.5 ppm	0.001 %	0.5 ppm	–	0.001 %
Na	0.01 %	0.01 %	0.01 %	0.01 %	–	–
Nb	–	–	–	0.5 ppm	0.01 %	0.001 %
Ni	0.001 %	0.5 ppm	0.001 %	0.5 ppm	0.01 %	–
P	0.001 %	0.001 %	0.01 %	0.01 %	–	–
Pb	0.01 %	0.5 ppm	0.02 %	0.5 ppm	–	–
Rb	–	–	–	0.5 ppm	–	–
S	0.05 %	0.05 %	0.05 %	0.05 %	–	–
Sb	0.001 %	0.5 ppm	0.01 %	0.5 ppm	–	–
Sc	–	0.5 ppm	–	1 ppm	–	–
Se	–	2 ppm	–	–	–	–
Sn	–	–	–	0.5 ppm	0.01 %	–
Sr	0.001 %	5 ppm	0.01 %	5 ppm	–	–
Ta	–	–	–	0.5 ppm	0.01 %	0.001 %
Th	–	0.5 ppm	–	0.5 ppm	–	–
Ti	–	0.001 %	–	0.001 %	–	–
Tl	–	0.5 ppm	–	–	–	–
U	–	0.5 ppm	–	0.5 ppm	–	0.001 %
V	–	10 ppm	–	10 ppm	–	–
W	0.001 %	0.5 ppm	0.01 %	0.5 ppm	0.01 %	0.005 %
Y	–	–	–	0.5 ppm	–	–
Zn	0.01 %	5 ppm	0.01 %	5 ppm	0.01 %	–
Zr	–	–	–	0.5 ppm	–	–

Note: Highlights in table indicate partial digestion if refractory minerals are present.



Analysis at Acme Labs Santiago, Chile

	Method	Element	Detection	Cdn\$ First Element	Cdn\$ Additional Element
Group 8AR	Aqua regia digestion ore grade / AAS	Ag	1-1000 ppm	\$10.50	\$3.50
		Cu	0.001-30 %		
		Mo	0.001-10 %		
		Fe	0.001-30 %		
		Zn	0.01-30 %		
		Pb	0.01-10 %		
		As	0.01-10 %		
Group 8TD	4 Acid digestion ore grade / AAS	Ag	1-1000 ppm	\$11.75	\$3.50
		Cu	0.001-30 %		
		Mo	0.001-10 %		
		Fe	0.001-30 %		
		Zn	0.01-30 %		
		Pb	0.01-10 %		
		As	0.01-10 %		

Group 9

Code	Method	Element	Detection	Cdn\$ First Element	Cdn\$ Additional Element
G901	CuS Citric Acid 1M / AAS	CuS	0.001-10 %	\$11.75	-
G902	CuS Sulfuric Acid 5% / AAS	CuSH	0.001-10 %	\$11.75	-
G903	CuS NaCN / AAS	CuCN	0.01-10 %	\$11.75	-
G904	Sequential Copper (CuSH, CuCN, CuR)	CuSeq		\$31.75	-
G905	BLEG, Cyanide leach for 12 hours Organic extraction / AAS	Au	0.1 ppb	\$23.50	\$2.35
		Ag	0.1 ppb		
		Cu	0.01 ppm		
		Zn	0.01 ppm		
G906	Bottle Roll Test, Cyanide leach on 500g pulp / ASS	Au	0.01 ppm	\$41.15	-
G907	Bottle Roll Test, Cyanide leach on 20g pulp / ASS	Au	0.01 ppm	\$17.65	\$5.85
		Cu	0.01 ppm		





Special Exploration Packages

Code	Description	Cdn
Geo1	Group 1D + Group 3A (with ignition for rock samples)	\$17.25
Geo2	Group 1DX (Aqua Regia/ICP-MS 0.5g) + Group 3B (fire geochem Au)	\$24.75
Geo3	Group 4A (Whole Rock Majors) + Group 4B (Trace Elements)	\$53.30
Geo4	Group 1D (30 element AR/ICP) + Group 3B (fire geochem Au, Pt, Pd)	\$23.00
Geo5	Group 1T + 7 (Au, As, Hg, Sb, Se, Te and Tl by 0.5g Aqua Regia/ICP-MS)	\$33.90
Geo6	Group 1EX (41 element 4-acid/ICP) + Group 3A (Au wet geochem)	\$23.85
Assay2	Group 7AR (multi-element assay by ICP) + Group 6 (Au & Ag Fire Assay)	\$26.75
Assay3	Group 1DX (Aqua Regia /ICP-MS 0.5g) + Group 6 (Au Fire Assay on 30g)	\$26.10



Water

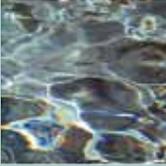
The mobility of water makes it an excellent exploration tool. As water contacts an ore deposit, major changes occur in its chemical composition. This can occur as rain causing weathering on rocks or flowing underground water. These water soluble weathering products and suspended matter can then be compared to background levels of chemical elements in the water to aid in determining the dispersion pattern.

The sensitivity of the ICP-Mass Spectrometers at Acme Labs provides the ultra low detection limits required to determine background and anomalous levels.

Note: Batch charge for sample submissions of less than 20 samples: CDN\$50.00.

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Sample Preparation & Preservation

Samples received by Acme Labs are run as received. In order to ensure the most accurate readings of samples submitted it is recommended that the following handling procedures be considered when planning your sampling and choosing a method of delivery for samples.

SAMPLING

In order to ensure a representative sample, samples should be collected in pre-cleaned, HDPE plastic bottles that have been rinsed with sample three times prior to use. Keep in mind that if dissolved metals are required the sample should be filtered through a 0.45 filter prior to acidification

PRESERVATION

If anions, pH alkalinity or conductivity are required samples should be kept refrigerated.

For metals analysis due to the problems of absorption or precipitation the sample should be acidified to pH <2 as soon as possible after collection with environmental grade (ultra pure) nitric acid. Pre-acidifying sample bottles before a sampling program is not recommended as this can result in leaching of metals from the bottle. Unacidified filtered samples can be acidified at the laboratory but must sit for seven days to dissolve any absorbed or precipitated metals.

Important: Acidified water samples can not be analysed for anions and a second unacidified sample should be sent if required.

The following table summarizes the BC Ministry of Water, Land and Air Protection's recommendations for sample preservation and holding times which should be considered when planning your sampling and choosing a method of delivery for samples.

Analyte	Recommended Preservation	Stability
F	None required	28 days
pH	Store cool 4C	72 hours
Conductivity	Store cool 4C	28 days
Alkalinity	Store cool 4C	72 hours
Anions	Store cool 4C	48 hours – 28 days
Metals	Nitric acid to pH<2	6 months – metal dependent

Geochemical Water Analysis

Group 2B Water Analysis

Sample minimum 50mL

Code	Parameter	Method	Detection	Cdn
2B01	F	Specific Ion Electrode	20 ppb	\$10.00
2B02	pH	pH Electrode	0.1 unit	\$6.70
2B03	Conductivity	Conductivity Electrode	3 μ S/cm	\$6.70
2B04	SO ₄	Analysis by ICP	0.1 ppm	\$16.60
2B05	TDS	Total Dissolved Solids – by meter	2 ppm	\$6.70
2B06	Alkalinity	Alkalinity by titration	1 ppm	\$9.70
2B07	Hg	Analysis by ICP-MS	0.1 ppb	\$11.60

Group 2B Anion Analysis

Analysis by ion chromatography

Code	Anions	Cdn
2B08	First 2 anions, each	\$13.90
2B09	Any 3 – 6 anions	\$40.40
	Batch Charge	+\$115.00

	Detection
Cl	0.2 ppm
SO ₄	0.1 ppm
Br	0.05 ppm
NO ₂	0.05 ppm
NO ₃	0.05 ppm
PO ₄	0.05 ppm



Geochemical Water Analysis

Groups 2C & 2D ICP-MS Analysis of Water

Sample minimum 50mL. Solutions are analysed as received.

Group 2C Natural Waters

Surface and groundwater surveys are an effective means of exploration for remote and blind ore deposits. ICP Mass Spec provides the low detection limits needed to define background and anomalous levels.

Group 2CA Standard ICP-ES/ICP-MS

	Cdn
Standard Suite (34 elements)*	\$22.00

Group 2CB Enhanced ICP-ES/ICP-MS

	Cdn
Full Suite (72 elements)	\$27.50

Group 2D High TDS Solutions

High TDS (Total Dissolved Solids) solutions such as brines, leachates, waste waters, etc. require additional treatment (dilutions) and analyses (ICP-ES). Package is the same as Group 2C Enhanced. Solutions submitted under Group 2C but found to contain > 0.1% TDS will be charged as Group 2D.

Group 2D Enhanced ICP-ES/ICP-MS

	Cdn
Full Suite (72 elements)	\$41.80*

* \$27.50 + \$14.30 surcharge

Detection Limit		Detection Limit	
Ag	0.05 ppb	Na	50 ppb
Al	1 ppb	Nb	0.01 ppb
As	0.5 ppb	Nd	0.01 ppb
Au	0.05 ppb	Ni	0.2 ppb
B	5 ppb	P	20 ppb
Ba	0.05 ppb	Pb	0.1 ppb
Be	0.05 ppb	Pd	0.2 ppb
Bi	0.05 ppb	Pr	0.01 ppb
Br	5 ppb	Pt	0.01 ppb
Ca	50 ppb	Rb	0.01 ppb
Cd	0.05 ppb	Re	0.01 ppb
Ce	0.01 ppb	Rh	0.01 ppb
Cl	1 ppm	Ru	0.05 ppb
Co	0.02 ppb	S	1 ppm
Cr	0.5 ppb	Sb	0.05 ppb
Cs	0.01 ppb	Sc	1 ppb
Cu	0.1 ppb	Se	0.5 ppb
Dy	0.01 ppb	Si	40 ppb
Er	0.01 ppb	Sm	0.02 ppb
Eu	0.01 ppb	Sn	0.05 ppb
Fe	10 ppb	Sr	0.01 ppb
Ga	0.05 ppb	Ta	0.02 ppb
Gd	0.01 ppb	Tb	0.01 ppb
Ge	0.05 ppb	Te	0.05 ppb
Hf	0.02 ppb	Th	0.05 ppb
Hg	0.1 ppb	Ti	10 ppb
Ho	0.01 ppb	Tl	0.01 ppb
In	0.01 ppb	Tm	0.01 ppb
K	50 ppb	U	0.02 ppb
La	0.01 ppb	V	0.2 ppb
Li	0.1 ppb	W	0.02 ppb
Lu	0.01 ppb	Y	0.01 ppb
Mg	50 ppb	Yb	0.01 ppb
Mn	0.05 ppb	Zn	0.5 ppb
Mo	0.1 ppb	Zr	0.02 ppb

* Highlights indicate standard suite (34 elements)

Vegetation

Plant sampling (biogeochemistry) is an effective method of exploration – called the Biogeochemical Method. Root systems of the plants collect the water which contain mineral rich nutrients. Depending on the size of the plant and particularly the size of its root system, this can provide the geologist with a significant geochemical signature. Factors to be considered include collecting a single species and sampling the same part of this species in order to compare “apples with apples”; also the same age of plant and same time of year.

Vegetation sampling in some instances can replace soil sampling in areas where obtaining a proper soil sample is not possible.

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Sample Preparation & Disposal

Sample Preparation

Code	Description	Cdn
VP100	Dry and pulverize vegetation to -100 mesh (mild steel), per 100g	\$8.00
VA475	Ashing up to 0.1 kg dry vegetation at 475°C	\$8.00
WWSH	Wash plant samples with Type-1 water, dry at 60°C, per 100g	\$2.65
RJSV	Saving all or part of reject fraction	\$2.00

Special Handling

Code	Description	Cdn
WGHT	Weigh sample	\$0.60

Sample Disposal Fees

Code	Description	Cdn
DISP2	Incineration of vegetation samples, per sample	\$0.45

No vegetation pulps (excluding those from British Columbia, Yukon and NWT) can be returned, and must be incinerated upon disposal. A disposal fee (DISP2) is charged for these samples.

Note: Importation regulations may apply; contact lab prior to shipment.

Note: Batch charge for sample submissions of less than 20 samples: CDN\$50.00.





Geochemical

Ultratrace Aqua Regia Digestion

Group 1VE-MS Ultratrace by ICP Mass Spec

ICP Mass Spec analysis of vegetation samples using a 0.5g split digested in HNO₃ then Aqua Regia and analysed by ICP-MS for ultralow detection limits.

Washing with de-mineralized water is recommended if samples are coated with inorganic material. (See WWSH under Sample Preparation.)

Acme Labs now offers analysis of Pb isotopes (Pb₂₀₄, Pb₂₀₆, Pb₂₀₇, Pb₂₀₈) suitable for geochemical exploration of U and other commodities where gross differences in natural to radiogenic Pb ratios, is a benefit. Isotope values can be reported in both concentrations and intensities.

Code		Cdn
1VE1	Basic Suite (37 elements)	\$22.40
1VE2	Full Suite (53 elements)	\$26.00
+1VE3	Lead Isotope (add on)	\$12.00

Group 1AV Add-on

This group analyses the vegetation ash of a 15g dry plant sample that has undergone controlled ignition to minimize volatilization (see VA475 under Sample Preparation).

Results are normalized to the dry plant weight giving lower detection limits and greater precision. Must be requested as an add-on to Group 1VE above.

Code		Cdn
+1VE4	18 elements (add-on)	+\$13.65

	Group 1VE Detection	Group 1AV Detection	Upper Limits
Au	0.2 ppb	0.05 ppb	100 ppm
Ag	2 ppb	–	100 ppm
Al*	0.01 %	–	10 %
As	0.1 ppm	0.02 ppm	10000 ppm
B*	1 ppm	–	2000 ppm
Ba*	0.1 ppm	–	10000 ppm
Bi	0.02 ppm	0.005 ppm	2000 ppm
Ca*	0.01 %	–	40 %
Cd	0.01 ppm	–	2000 ppm
Co	0.01 ppm	–	2000 ppm
Cr*	0.1 ppm	–	10000 ppm
Cu	0.01 ppm	–	10000 ppm
Fe*	0.001 %	–	40 %
Ga*	0.1 ppm	0.02 ppm	1000 ppm
Hg	1 ppb	–	100 ppm
K*	0.01 %	–	10 %
La*	0.01 ppm	–	10000 ppm
Mg*	0.001 %	–	30 %
Mn*	1 ppm	–	10000 ppm
Mo	0.01 ppm	–	2000 ppm
Na*	0.001 %	–	10 %
Ni*	0.1 ppm	–	10000 ppm
P*	0.001 %	–	5 %
Pb	0.01 ppm	–	10000 ppm
S*	0.01 %	–	10 %
Sb	0.02 ppm	0.005 ppm	2000 ppm
Sc*	0.1 ppm	–	100 ppm
Se	0.1 ppm	0.02 ppm	100 ppm
Sr*	0.5 ppm	–	10000 ppm
Te	0.02 ppm	0.005 ppm	1000 ppm
Th*	0.01 ppm	0.002 ppm	2000 ppm
Ti*	1 ppm	–	10 %
Tl	0.02 ppm	0.005 ppm	1000 ppm
U*	0.01 ppm	0.002 ppm	2000 ppm
V*	2 ppm	0.5 ppm	10000 ppm
W*	0.1 ppm	0.02 ppm	100 ppm
Zn	0.1 ppm	–	10000 ppm
Be*	0.1 ppm	0.02 ppm	1000 ppm
Ce*	0.01 ppm	–	2000 ppm
Cs*	0.005 ppm	–	2000 ppm
Ge*	0.01 ppm	0.002 ppm	100 ppm
Hf*	0.001 ppm	–	1000 ppm
In	0.02 ppm	0.005 ppm	1000 ppm
Li*	0.01 ppm	–	2000 ppm
Nb*	0.01 ppm	–	2000 ppm
Rb*	0.1 ppm	–	2000 ppm
Re	1 ppb	0.2 ppb	1000 ppb
Sn*	0.02 ppm	–	100 ppm
Ta*	0.001 ppm	–	2000 ppm
Y*	0.001 ppm	–	2000 ppm
Zr*	0.01 ppm	–	2000 ppm
Pt*	1 ppb	0.2 ppb	100 ppm
Pd*	2 ppb	0.5 ppb	100 ppm

Full Suite

Basic Suite

Requesting Analysis, Packaging & Shipping

SHIPMENTS WITHIN CANADA

Small packages can be sent by courier, larger packages by Greyhound or Pacific Coach Lines. For large drill programs use a freight service.

Samples should be addressed to:

Acme Analytical
Laboratories (Vancouver) Ltd.
1020 Cordova St. East
Vancouver, BC
Canada, V6A 4A3

All shipments should be labeled:

GEOLOGICAL ROCK/SOIL SAMPLES
FOR ANALYSIS ONLY
NO COMMERCIAL VALUE

U.S. SHIPMENTS

Ship via courier, air or ground to our US Sample Depot at:

ACME Labs
c/o Security Freight
880 Grant Ave.
Blaine, WA 98230

REQUESTING ANALYSIS

Each sample shipment must include an analytical request that specifies:

- Individual or company to be invoiced
- Contact person and phone number
- Method of analysis (analytical package) wanted
- Purchase order number or project name if required for invoicing
- Type, number of samples and sample sequence (optional)
- Any special instructions
- Mode of data transmittal (e-mail, website, diskette); a hard copy is always mailed
- Disposition of rejects and pulps (discard, returned or stored) after analysis

A copy of the Acme Requisition for Analytical Work form can be photocopied from this brochure or downloaded from the Acme website at www.acmelab.com and should be included with each shipment. Please state clearly the desired method of data delivery including a fax and/or e-mail address.

PACKAGING

Pack the samples securely, ensuring that each sample is clearly labeled with a sample number. Please identify any high grade samples – this helps us to reduce the risk of cross contamination.

SHIPPING SAMPLES

For expedient and assured delivery, do not mail your samples. Free pick-up service for samples delivered to the Vancouver airport, bus depot or our US sample depot in Blaine, WA. Shipping labels are available at no charge. Please prepay all courier and freight charges, otherwise a surcharge will be added to any collect shipping charges.

Soil samples must be shipped according to Canadian Food Inspection Agency regulations in a "sturdy leak-proof container." Environmentally hazardous material may require special handling; additional charges may apply.

In South America Acme Labs has existing agreements with local courier firms. Please contact the local manager in the relevant country for more information on expediting your samples to our laboratories.

INTERNATIONAL SHIPMENTS

- Please contact Acme Labs prior to sending the first shipment. Acme will provide a CFIA Permit needed to clear soil samples expeditiously through Canada Customs. Permits are specific for the country of sample shipment origin and valid for one year. A copy of the permit must accompany each shipment. Shipments cleared through Canada Customs for no charge.
- Use a major international airline or a courier service such as DHL, UPS or Federal Express.
- Mark the air waybill: Notify ACME at (604) 253-3158 upon arrival.
- Acme's customs broker is Cole International Inc.
- Label the shipment as: "Geological rock/soil samples for analysis only. No Commercial Value"

Account Payment & Data Transfer

PAYMENTS

Payments can be made by check, credit card (charges will be in Canadian dollars), bank draft or wire transfer to our bank. Please contact us for information.

CREDIT ACCOUNT

To establish a credit account with Acme, please call us or send your request by e-mail for a credit application form.

PAYMENT BY NEW CLIENTS

New clients must include payment with their samples, otherwise payment will be required before releasing results. Example of calculating costs for Canadian clients:

# of samples*	Assay	Unit Price	Cdn
20	Group 1DX (15g split)	\$18.25	\$365.00
20	Rock sample preparation	\$6.85	\$137.00
	GST Taxable (in Canada only)		\$502.00
	5% GST		\$25.10
	Total		\$527.10

*Note batch charge for submissions of less than 20 samples.

If you have any questions about calculating the charges for analysis or the status of your account, please call us toll free (within North America) at 1-800 990 2263 or 1-604 253 3158.

DATA TRANSFER

By Internet

Clients with Internet access can receive their data in digital format via e-mail. Call or send us an e-mail request to use this service. Our address is: acmeinfo@acmelab.com. Acme also welcomes your comments on how we can improve our service.

By Website Download

Acme provides a secure extranet site on the Acme Labs website (www.acmelab.com) from which a client can download their data 24 hours a day, 7 days a week. To set up your account, username and password, contact us by phone or email.

By Portable Storage Media

Upon request, data can be provided in digital format on CD ROM. Data formats supported include comma delimited ASCII (CSV) and Excel. Storage media and courier services at cost.

ADDITIONAL SERVICES

Information Bulletins

Information Bulletins are available should you desire additional information on analytical procedures, quality control methods or precision and accuracy estimates on specific analytical packages.

Conversions & Supplies

Oxides Conversion Factors

Element	Conversion Factor	Oxide
Al	1.889	Al ₂ O ₃
Ba	1.669	BaSO ₄
	1.116	BaO
Be	2.775	BeO
C	3.666	CO ₂
Ca	1.399	CaO
	2.497	CaCO ₃
Cr	1.461	Cr ₂ O ₃
F	2.055	CaF ₂
Fe	1.286	FeO
	1.430	Fe ₂ O ₃
K	1.205	K ₂ O
Mg	1.658	MgO
	3.468	MgCO ₃
Mn	1.291	MnO
Na	1.348	Na ₂ O
Nb	1.431	Nb ₂ O ₅
Ni	1.273	NiO
P	2.291	P ₂ O ₅
Rb	1.094	Rb ₂ O
Si	2.139	SiO ₂
Sn	1.270	SnO ₂
Sr	1.185	SrO
Ta	1.221	Ta ₂ O ₅
Th	1.138	ThO ₂
Ti	1.668	TiO ₂
U	1.179	U ₃ O ₈
V	1.785	V ₂ O ₅
W	1.261	WO ₃
Y	1.270	Y ₂ O ₃
Zr	1.351	ZrO ₂

Conversion for Weights

	Troy Oz.	Avoirdupois Oz.	Grams
1 Troy oz.	1	1.0971	31.104
1 Avoirdupois oz.	0.91146	1	28.35
1 Gram	0.03215	0.03527	1

1 Metric Tonne (MT) = 1000 kilograms = 2204.6 pounds

1 Short Ton (ST) = 907.2 kilograms = 2000 pounds

1 Long Ton (LT) = 1016 kilograms = 2240 pounds

Assay Valuations

Value	Parts per Million (ppm)	Troy Ounces Per		
		Metric Tonne	Short Ton	Long Ton
1 Gram / MT	1	0.03215	0.02917	0.03266
1 Troy oz / MT	31.104	1	0.9072	1.106
1 Troy oz / ST	34.286	1.1023	1	1.120
1 Troy oz / LT	30.612	0.9842	0.8929	1

Bags, Tags & Other Things

Description	Units	Cdn
2-Part and 3-Part Assay tags	50 / book	FREE
Shipping sacks (rice bags)	per bag	\$1.20
Plastic Bags – 4 mil 7" x 13"	per 100	\$18.50
Plastic Bags – 6 mil 12" X 20"	per 100	\$31.75
Twist ties	per 100	\$4.60
Tin-tie Bags	per 1000	\$196.00

Note: shipment costs may apply.

Terms & Conditions

PRICES

All prices contained herein are for the analysis of routine geological samples (water, plant, soil, sediment and rock both barren and mineralized) and are net local taxes. Discounts are available by contract, however a batch charge applies to each analytical package on batches of less than 20 samples. Prices for control assays (heads and tails), concentrates and metallurgical products are by contract. All prices are subject to change.

PAYMENT

Payment is upon receipt of invoice. All overdue payments are subject to an interest charge of 1.5% per month. New clients must include payment with their samples, otherwise payment will be required before releasing results. Payments can be made by check, credit card, bank draft or wire transfer to our bank. Credit card charges by Visa and Mastercard will be in either Canadian or US dollars. Payment by American Express can only be made in Canadian dollars. Please contact us for information or if you have any questions about calculating the charges for analysis or the status of your account. Dial toll free in North America at 1-800 990 2263 or dial 1-604 253 3158. To establish a credit account with Acme Labs, please call us or send your request by e-mail for a credit application form. Acme Labs reserves the right to limit the amount of credit to any client.

SAMPLE QUALITY

The Client bears the sole responsibility for the quality of samples as received by Acme Analytical Laboratories Ltd. Acme Labs shall not be responsible for the loss, degradation, contamination and/or tampering of samples whether intentional or unintentional by the Client, shipping company or any other third party prior to the arrival of these samples at our laboratories. Acme Labs is under no obligation to assess and report on the fitness of samples for the intended analysis.

STORAGE AND DISPOSAL

Unless otherwise directed by the Client, Acme Labs will discard all rejects from soil, sediment and vegetation samples immediately after sample preparation. Rock and core rejects are disposed of after 3 months. All pulps are retained for 3 months after which storage charges will apply unless the Client directs Acme Labs to either return or dispose of the pulps. Return of pulps will be charged at cost. Disposal or storage of rejects and/or pulps will be charged as specified in this price brochure. International soil samples cannot be returned and will be charged a disposal charge for incineration according to CFIA protocol.

STATEMENT OF LIABILITY

Acme Analytical Laboratories Ltd., including its subsidiaries, will undertake to conduct and report all analyses in accordance with generally accepted analytical laboratory principles and practices unless deemed necessary in the reasonable judgment of Acme Labs to vary from said principles and practices due to the nature or composition of the samples or to comply with regulatory requirements. Acme's total aggregate liability arising from professional acts, errors or omissions shall not exceed the total fees for the services rendered. There will be no other liability, obligation or responsibility of any kind for losses, costs, expenses or other damages (including without limitation special indirect, incidental or consequential damages) relating to services or results provided by Acme. All results are strictly for the use of the Client; Acme Labs is not responsible for any loss, damage or liability arising from any acts by the Client, its agents, staff or other consultants employed by the Client. All claims shall be deemed waived unless made in writing and received by Acme Labs within 2 years following completion of services.

DISCLAIMER

All results are the confidential property of the Client. Acme Labs assumes the following liabilities only: Actual cost of the analysis for errors attributable to Acme, and \$20.00 per sample for loss of samples during processing or during storage up to one month after analysis. Clients must retrieve samples they consider to be of value.

Computer Services

ACME ACCESS

Acme Access is a secure web interface for our customers to obtain direct access to Acme's laboratory database. Acme access is a fully compliant .NET application designed for Microsoft Internet Explorer. Using this system, our customers may gain access to their data any time of the day or night. In addition customers are provided access to:

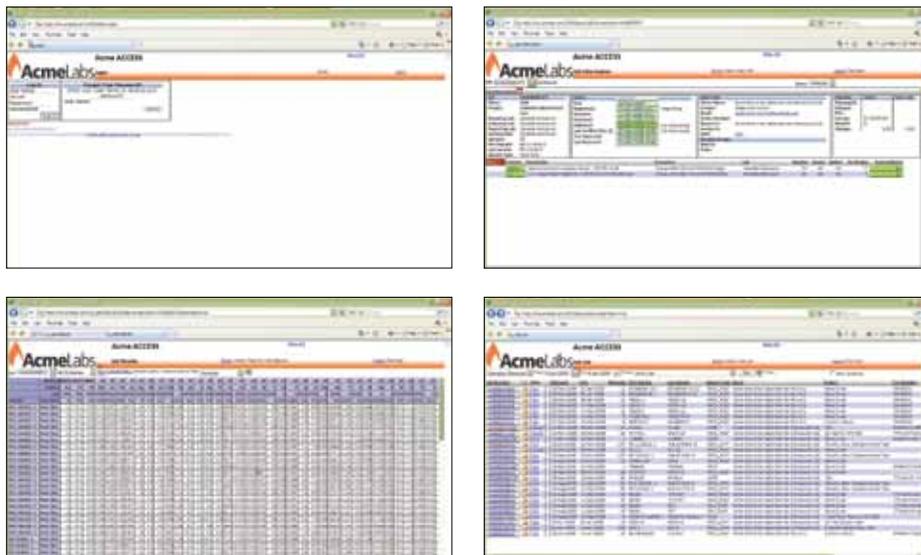
- All PDF documents pertaining to each sample submission such as the original sample submission form, certificates, invoices, and facturas (for Latin America);
- PDF documents that apply to the project such as the pricing quote and template submission forms;
- PDF documents that describe the analytical methods;
- Quality Control documents reviewing standard and replicate performance.

SAMPLE TRACKING SYSTEM

Acme uses a sophisticated LIMS (Laboratory Information Management System) to track the flow of every sample through each stage of sample handling and analysis. When received, each sample is bar coded and labeled. This unique barcode is used to build an audit trail that documents the complete history of work performed on each sample. This includes recording each and every person that has touched each sample and the work that they performed. This provides Acme with a very high level of control but also provides our clients with an unprecedented level of traceability and sample tracking.

BOX TRACKING SYSTEM

Each bar coded sample is allocated into a bar coded sample box, typically 36 samples per box, but this could be up to several hundred per box. This allows Acme to track each box as it moves from one laboratory to another and allows our clients to monitor the progress of their samples from a remote sample preparation facility to the main laboratory. More importantly, this system speeds the flow of the samples through the laboratory by utilizing bar coding to eliminate time consuming manual steps.



Requisition for Analysis



Acme Analytical Laboratories (Vancouver) Ltd.
1020 Cordova St. East, Vancouver, BC
Canada, V6A 4A3

acmeinfo@acmelab.com
www.acmelab.com
(604) 253 3158 / 1-800 990 2263

# of Parcels:	Waybill:	Acme Job Number:	
Carrier:	Date Received:		
CLIENT INFO	Project:	Shipment ID:	PO #:
Primary Client Contact (certificate will bear this name)		Invoice to: <input type="checkbox"/> Same as primary contact	
Company		Company	
Address		Address	
Attn:		Attn:	
Email:		Email:	
Phone:	Fax:	Phone:	Fax:

Additional Copies to:

Name	Company	Email	Data format (circle)		
			CSV	XLS	PDF

ANALYSES

Type of Sample	No of Samples	Sample Sequence From – To	Prep Code	Analytical Package or Elements Wanted	Rush (2 x list)
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
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		-			<input type="checkbox"/>
		-			<input type="checkbox"/>
		-			<input type="checkbox"/>

SPECIAL INSTRUCTIONS

STORAGE & DISPOSAL

Note: Rejects will be disposed of and pulps will be charged for storage after 3 months unless requested otherwise.

Rejects

- RTRN Return
- DISP-RJT Dispose after 3 months
- STOR-RJT Store after 3 months

Pulps

- RTRN Return
- DISP-PLP Dispose after 3 months
- STOR-PLP Store after 3 months

Return Address Pulps and Rejects returned at cost

Company _____

Address _____

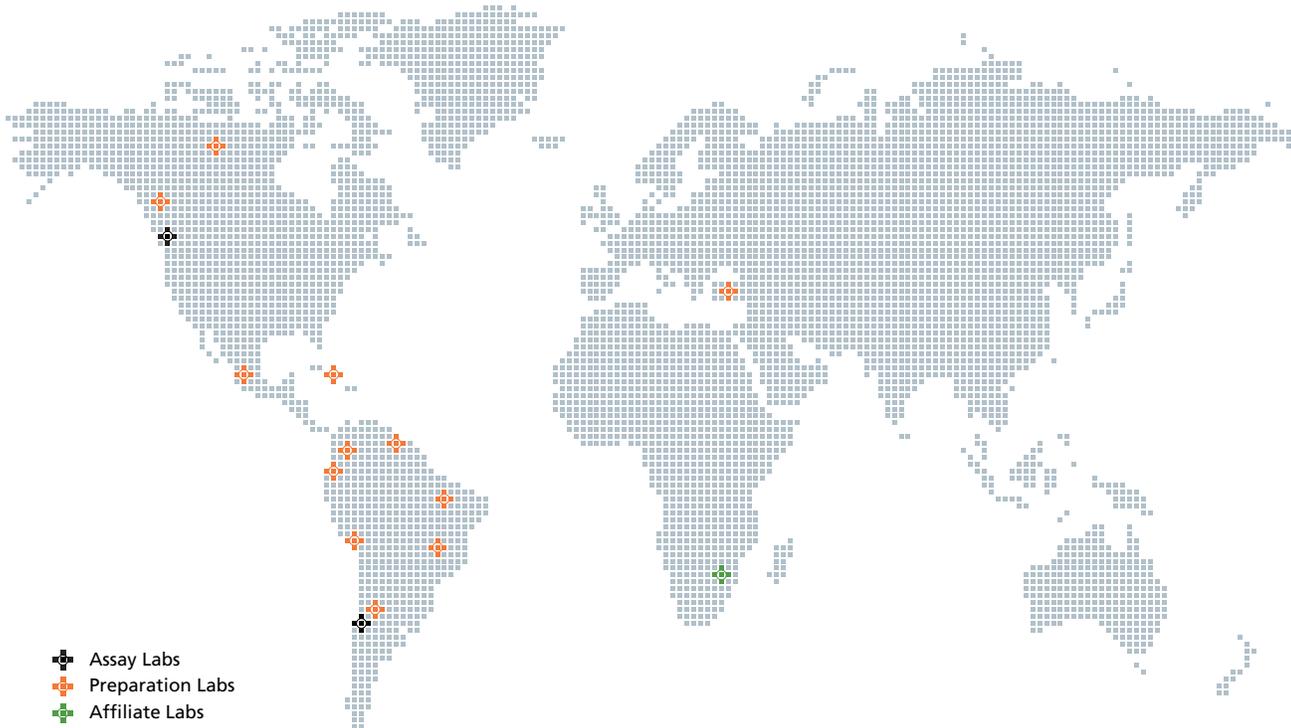
Charges will apply for disposal and/or storage of rejects and pulps

Attn: _____ Tel: _____

AUTHORIZATION

I hereby request Acme Analytical Laboratories (Vancouver) Ltd. to conduct the above specified analyses.

Signed _____
must be signed for analysis to start



-  Assay Labs
-  Preparation Labs
-  Affiliate Labs

HUB ANALYTICAL LABORATORIES

Acme Analytical Laboratories (Vancouver) Ltd.

1020 Cordova St. East
Vancouver BC V6A 4A3
Canada

and

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Vancouver BC V6A 1R6
Canada

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Chile

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E-mail: info.sa@acmelab.com

BRANCH PREPARATION FACILITIES

North America

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Yellowknife NT X1A 3X6
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3064A Highway 16
Smithers BC V0J 2N0
Canada

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Guyana

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Tel: +592 270 4393

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Perú

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Turkey

Tel: +90 312 394 5761

Fax: +90 312 394 5760

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