



Analytical Chemistry Services Laboratory

Environmental Sustainability and Strategic Policy Division

Knowledge Management Branch

PARTIAL PRICE LIST - Effective April 1, 2017

PLANT TISSUE Activity	Preparation Method	Analysis Method	Cost per Sample - Canadian \$			
			(1-10)	(11-50)	(51-100)	(> 100)
			Base	-10%	-15%	-20%
Basic handling charge (admin O/H, sample storage, disposal, return etc)		n/a	\$4.00	\$3.60	\$3.40	\$3.20
Oven Dry	Dry at 70 °C, 24 Hours	n/a	\$1.25	\$1.15	\$1.05	\$1.00
Freeze Dry (Temperature Sensitive Analyses)	Freeze at -80 °C, Lyophilize	n/a	\$5.75	\$5.20	\$4.90	\$4.60
Mill (Cyclotec) *	Tecator Cyclotec Cyclone Mill	n/a	\$2.75	\$2.75	\$2.75	\$2.75
Mill (Wiley) *	Wiley Intermediate Cutting Mill	n/a	\$3.50	\$3.50	\$3.50	\$3.50
Extra handling charge (Sorting, listing, organizing, etc.)	(If not done by submitter)	n/a	Billed at hourly rate (\$30/hour)			
Difficult Mill (Very large samples, branches, trees, etc.)	Chipper, Saw, Various Mills	n/a	Billed at hourly rate (\$30/hour)			
CHEMICAL TESTS						
Total C and N	Combustion elemental analysis	Elemental analyzer	\$11.00	\$9.90	\$9.35	\$8.80
Major elements, ie. Al, B, Ca, Cu, Fe, Mg, Mn, P, K, S, Zn, total	VHP closed vessel microwave acid digestion	ICP-OES (ppm to sub-ppm DLs)	\$15.75	\$14.20	\$13.40	\$12.60
Other and/or trace elements additional to above (up to 10)	with above	ICP-OES (ppm to sub-ppm DLs)	\$6.25	\$5.65	\$5.30	\$5.00
Major & trace metal elements in plants by ICP-MS (up to 30)	VHP closed vessel microwave acid digestion	ICP-MS (sub ppb to ppt DLs)	\$39.50	\$35.55	\$33.60	\$31.60
Closed vessel microwave digestion only (Ultrawave or MARS Xpress)	VHP closed vessel microwave acid digestion	None (digest analyzed elsewhere)	\$6.50	\$5.85	\$5.55	\$5.20
Active Iron (Fe)	Hydrochloric acid extraction	ICP-OES	\$9.00	\$8.10	\$7.65	\$7.20
Sulphate-sulphur (SO ₄ -S)	Weak hot hydrochloric acid extraction	IC	\$18.75	\$16.90	\$15.95	\$15.00
Chloride (Cl)	Hot water extraction	IC	\$18.75	\$16.90	\$15.95	\$15.00
Fluoride (Weak Acid Extractable)	Dilute perchloric acid extraction	pH/ion meter	\$6.25	\$5.65	\$5.30	\$5.00
Fluoride (Microwave Acid Digestion)	Concentrated nitric acid / Ultrawave	pH/ion meter	\$10.00	\$9.00	\$8.50	\$8.00
Oxalates (total of oxalic acid and oxalate salts)	Hot water or acid extraction	HPLC	\$18.00	\$16.20	\$15.30	\$14.40
Chlorophylls	N,N-dimethylformamide extraction	UV-Vis	\$11.50	\$10.35	\$9.80	\$9.20
Rhodoxanthin	Solvent extraction	HPLC	\$19.00	\$17.10	\$16.15	\$15.20
Acid Detergent Fibre	Acid detergent method	Gravimetric	\$28.50	\$25.65	\$24.25	\$22.80
Starch Assay (resistant/non-resistant starch) - Megazyme K-RSTAR	Enzyme Digestion / Assay	UV-Vis	\$13.75	\$12.40	\$11.70	\$11.00
Non-structural carbohydrates (reducing sugars, starch)	Total non-structural carbohydrate method	UV-Vis	\$34.75	\$31.30	\$29.55	\$27.80
Ethanol extractable saccharides (excluding starch)	80% ethanol extraction (anthrone colorimetric)	UV-Vis	\$20.00	\$18.00	\$17.00	\$16.00
Sugars (fructose, galactose, glucose, etc. up to 5)	Extraction/derivitization if required	HPLC	\$31.75	\$28.60	\$27.00	\$25.40
Other sugars additional to above (up to 5)	with above	HPLC	\$12.75	\$11.50	\$10.85	\$10.20
Polyamines (agmatine, putrescine, spermine, etc.)	Extraction	HPLC	\$34.75	\$31.30	\$29.55	\$27.80
Mono-terpenes (camphor, borneol, bornyl acetate, etc)	Extraction	GC-FID	\$22.50	\$20.25	\$19.15	\$18.00
Di-, Sesqui-terpenes	with above	GC-MS	\$22.00	\$19.80	\$18.70	\$17.60
Individual Phenolic Compounds (eg. Taxifolin, up to 5)	Extraction/derivitization if required	HPLC	\$20.75	\$18.70	\$17.65	\$16.60
Other phenolic compounds additional to above (up to 5)	with above	HPLC	\$8.25	\$7.45	\$7.00	\$6.60
Total Phenolic Compounds	Extraction/ Colorimetric Analysis	UV-Vis	\$10.75	\$9.70	\$9.15	\$8.60
Resin Acids - Diterpenes (eg. Abietic Acid, up to 5)	Extraction/derivitization if required	HPLC	\$18.75	\$16.90	\$15.95	\$15.00
Other diterpene compounds additional to above (up to 5)	with above	HPLC	\$7.50	\$6.75	\$6.40	\$6.00
Individual Amino Acids	Extraction/derivitization if required	HPLC	\$28.00	\$25.20	\$23.80	\$22.40
Total Amino Acids	Extraction/ Colorimetric Analysis	UV-Vis	\$15.75	\$14.20	\$13.40	\$12.60
Total Lipids (fats/oils as sum of fatty acids)	Extraction/derivitization to fatty acid esters	GC-FID	\$29.00	\$26.10	\$24.65	\$23.20
Total Protein Content (Hydrolysis)	Acid Hydrolysis / Colorimetric Analysis	UV-Vis	\$13.75	\$12.40	\$11.70	\$11.00
Ergosterol	Extraction	HPLC	\$31.75	\$28.60	\$27.00	\$25.40
PHYSIOLOGY / DENDROCHRONOLOGY TESTS						
100 needle weights *	Direct measurement	Gravimetric	\$14.50	\$14.50	\$14.50	\$14.50
Pollen Testing - Conductivity	100mg : 30 ml water	Conductivity Meter	\$8.00	\$7.20	\$6.80	\$6.40
Pollen Testing - Moisture Content	Direct measurement	Moisture Analyzer	\$7.00	\$6.30	\$5.95	\$5.60
Pollen Testing - Germination	Incubation at 25 °C / 48 hours	Microscope	\$17.50	\$15.75	\$14.90	\$14.00
Seed Lots - Filled Seed Count	Direct measurement	Xray Photography	\$13.50	\$12.15	\$11.50	\$10.80
Core Sample Prep and Ring Count and Widths *	Mounting/Sanding	Microscope / Windendro	\$11.75	\$11.75	\$11.75	\$11.75

SOIL Activity	Preparation Method	Analysis Method	Cost per Sample - Canadian \$			
			(1-10)	(11-50)	(51-100)	(> 100)
			Base	-10%	-15%	-20%
Basic handling charge (admin O/H, sample storage, disposal, return etc)		n/a	\$4.00	\$3.60	\$3.40	\$3.20
Air-drying & crushing/sieving (Mineral Soils) *	eg. Air-dry, crush, sieve to < 2mm	n/a	\$4.25	\$4.25	\$4.25	\$4.25
Air-drying & Milling (Forest Floor Soils) *	eg. Hammer mill to < 2mm	n/a	\$4.25	\$4.25	\$4.25	\$4.25
Extra handling charge (Sorting, listing, organizing, etc.)	(If not done by submitter)	n/a				
Difficult Prep (Very large, or tough samples)	Various Mills / Grinders / Splitters	n/a				
CHEMICAL TESTS			Billed at hourly rate (\$30/hour)			
Total C and N	Combustion elemental analysis	EA	\$12.25	\$11.05	\$10.40	\$9.80
Inorganic C (acid pre-treatment, includes Total C)	Combustion elemental analysis (x 2)	EA	\$21.50	\$19.35	\$18.30	\$17.20
Active Carbon	Permanganate Oxidation - Colourimetry	UV-Vis	\$7.00	\$6.30	\$5.95	\$5.60
pH (water)	1:1 for mineral soil or 1:2 for forest floor	pH/ion meter	\$4.25	\$3.85	\$3.60	\$3.40
pH (calcium chloride)	1:1 for mineral soil or 1:2 for forest floor	pH/ion meter	\$4.25	\$3.85	\$3.60	\$3.40
Phosphorus (PO ₄ -P), available	Bray P-1	UV-Vis	\$7.75	\$7.00	\$6.60	\$6.20
Phosphorus (Organic)	Ash, sulphuric acid extraction.	UV-Vis	\$14.50	\$13.05	\$12.35	\$11.60
Nitrogen (NH ₄ -N), mineralizable	Anaerobic incubation, 1N KCl extraction	Auto-analyzer	\$9.50	\$8.55	\$8.10	\$7.60
Cations Al, Ca, Fe, K, Mg, Mn, Na, and CEC, effective	0.1N Barium Chloride Extraction	ICP-OES	\$10.50	\$9.45	\$8.95	\$8.40
Exchangeable Acidity (for base saturation, lime requirement, etc.)	with above	Automatic Titrator	\$9.50	\$8.55	\$8.10	\$7.60
Cations Ca, K, Mg, Na and CEC (pH 7.0)	Neutral Ammonium Acetate	ICP-OES/Auto-analyzer	\$27.50	\$24.75	\$23.40	\$22.00
Sulphur (S), total	Combustion elemental analysis	EA	\$9.50	\$8.55	\$8.10	\$7.60
Extractable Sulphate-Sulphur (SO ₄ -S)	Water, dilute acid or weak salt extraction	IC	\$16.75	\$15.10	\$14.25	\$13.40
Extractable Chloride (Cl)	Water, dilute acid or weak salt extraction	IC	\$16.25	\$14.65	\$13.80	\$13.00
Ammonium (NH ₄ -N) and Nitrate (NO ₃ -N), available	Extraction with 2N KCl	Auto-analyzer	\$9.00	\$8.10	\$7.65	\$7.20
Conductivity - Saturated Paste	Saturated paste	Vacuum Extractor/Conductivity meter	\$9.25	\$8.35	\$7.85	\$7.40
Conductivity	1:1, 1:2 or 1:5 soil : water ratio	Conductivity meter	\$4.25	\$3.85	\$3.60	\$3.40
Al, B, Ca, Cu, Fe, K, Mg, Mn, Na, P, Zn, extractable	Mehlich III extraction	ICP-OES	\$13.00	\$11.70	\$11.05	\$10.40
Other and/or trace elements additional to above (up to 10)	with above	ICP-OES	\$5.25	\$4.75	\$4.45	\$4.20
Mehlich III extractable o -Phosphate (inorganic P)	Mehlich III extraction / colorimetry	UV-Vis	\$7.75	\$7.00	\$6.60	\$6.20
Major elements, ie. Al, B, Ca, Cu, Fe, Mg, Mn, P, K, S, Zn, total	VHP closed vessel microwave acid digestion	ICP-OES (ppm to sub-ppm DLs)	\$17.25	\$15.55	\$14.65	\$13.80
Other and/or trace elements additional to above (up to 10)	with above	ICP-OES (ppm to sub-ppm DLs)	\$7.00	\$6.30	\$5.95	\$5.60
Major and trace metals in soil by ICP-MS (up to 30)	VHP closed vessel microwave acid digestion	ICP-MS (sub ppb to ppt DLs)	\$41.25	\$37.15	\$35.05	\$33.00
Closed vessel microwave digestion only (Ultrawave or MARS Xpress)	VHP closed vessel microwave acid digestion	None (digests analyzed elsewhere)	\$7.75	\$7.00	\$6.60	\$6.20
Total Elemental Composition (up to 25 main elements)	High temperature fusion techniques (fluxer)	ICP-OES	\$34.00	\$30.60	\$28.90	\$27.20
DPTA extractable elements / trace elements	Extraction with DPTA	ICP-OES	\$11.75	\$10.60	\$10.00	\$9.40
Al, Fe, Mn, Si, extractable	Sodium pyrophosphate extraction	ICP-OES	\$10.50	\$9.45	\$8.95	\$8.40
Al, Fe, Mn, Si, extractable	Acid ammonium oxalate extraction	ICP-OES	\$10.50	\$9.45	\$8.95	\$8.40
Al, Fe, Mn, Si, extractable	Dithionite - citrate extraction	ICP-OES	\$10.50	\$9.45	\$8.95	\$8.40
Carbonate (CaCO ₃) Equivalent	Empirical - acid neutralization	Automatic Titrator	\$7.25	\$6.55	\$6.15	\$5.80
Ergosterol (Fungal Steroid)	Ethanol extraction	HPLC	\$32.50	\$29.25	\$27.65	\$26.00
Lignin-derived phenols in soil/sediment	Alkaline CuO oxidation	HPLC	\$40.25	\$36.25	\$34.20	\$32.20
Dissolved(soluble) organic carbon (DOC)	Salt Extraction (K ₂ SO ₄)	DOC Analyzer	\$17.50	\$15.75	\$14.90	\$14.00
Dissolved(soluble) organic carbon (DOC)	Salt Extraction (KCl)	DOC Analyzer	\$18.25	\$16.45	\$15.50	\$14.60
Total dissolved(soluble) amino acids by ninhydrin method	Water or salt extraction / colorimetry	UV-Vis	\$7.75	\$7.00	\$6.60	\$6.20
Low molecular weight organic acids (oxalic, citric, etc up to 5)	Water, dilute acid or weak salt extraction	HPLC	\$33.25	\$29.95	\$28.25	\$26.60
Total carbohydrates / saccharides (phenol-sulphuric method)	Strong acid hydrolysis / colorimetry	UV-Vis	\$14.25	\$12.85	\$12.10	\$11.40
Extractable sugars (reducing) - anthrone method	Water extraction / colorimetry	UV-Vis	\$19.25	\$17.35	\$16.35	\$15.40
Extractable glucose - o-dianisidine, glucose oxidase assay	Water extraction / colorimetry	UV-Vis	\$16.25	\$14.65	\$13.80	\$13.00
PHYSICAL TESTS			Billed at hourly rate (\$30/hour)			
Soil Moisture Correction (to report results on Odry Basis)	Oven Dry 105 °C	Gravimetric	\$3.00	\$2.70	\$2.55	\$2.40
Fresh / field moisture content determination	Wet weight / air dry weight (correct to Odry)	Gravimetric	\$3.00	\$2.70	\$2.55	\$2.40
Organic Matter (LOI)	Loss on ignition	Gravimetric	\$4.50	\$4.05	\$3.85	\$3.60
Water Retention Curve (6 point)	Pressure Plate Apparatus	Gravimetric	\$31.25	\$28.15	\$26.55	\$25.00
Aeration Porosity	Pressure Plate Apparatus	Gravimetric	\$19.25	\$17.35	\$16.35	\$15.40
Particle Density	Fluid Displacement	Gravimetric	\$12.50	\$11.25	\$10.65	\$10.00
Particle Size Analysis (% sand, silt, clay) *	Sedimentation Rate	Hydrometer	\$12.25	\$12.25	\$12.25	\$12.25
Particle Size Analysis (% fine sand, additional to above) *	Wet sieve / oven dry (with above)	Gravimetric	\$5.00	\$5.00	\$5.00	\$5.00
Particle Size Analysis (% sand, silt, clay) high organic/salt/carbonates	Sedimentation Rate (with required pre-treatment)	Hydrometer	\$25.00	\$25.00	\$25.00	\$25.00
Bulk Density	Oven Dry	Gravimetric	\$5.75	\$5.20	\$4.90	\$4.60

WATER and SOLUTIONS		Cost per Sample - Canadian \$				
Activity	Preparation Method	Analysis Method	(1-10)	(11-50)	(51-100)	(> 100)
CHEMICAL TESTS			Base	-10%	-15%	-20%
Basic handling charge (admin O/H, sample storage, disposal, return etc)		n/a	\$4.00	\$3.60	\$3.40	\$3.20
Freeze Dry (for analysis of dissolved and suspended matter)	Freeze at -80 °C, Lyophilize	Gravimetric	\$6.75	\$6.10	\$5.75	\$5.40
Al, B, Ca, Cu, Fe, Mg, Mn, P, K, Si, Sr, Na, S, Zn, element scan	Acidify/Dilution to analytical range (if required)	ICP-OES (ppm to sub-ppm DLs)	\$11.00	\$9.90	\$9.35	\$8.80
Basic water analysis - up to 14 major/minor elements by ICP-MS	Acidify/Dilution to analytical range (if required)	ICP-MS (sub ppb to ppt DLs)	\$34.00	\$30.60	\$28.90	\$27.20
Trace water analysis - up to 34 major/trace elements by ICP-MS	Acidify/Dilution to analytical range (if required)	ICP-MS (sub ppb to ppt DLs)	\$36.50	\$32.85	\$31.05	\$29.20
Br ⁻ , Cl ⁻ , F ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , PO ₄ ³⁻ , SO ₄ ²⁻ anion scan	Dilution to analytical range, microfiltration	Ion chromatography	\$16.25	\$14.65	\$13.80	\$13.00
Chloride in solution (potentiometric titration)	Dilution to analytical range (if required)	Automatic titrator	\$9.00	\$8.10	\$7.65	\$7.20
Ammonium-N (NH ₄ -N) and/or Nitrate-N (NO ₃ -N)	Dilution to analytical range (if required)	Auto-analyzer	\$7.75	\$7.00	\$6.60	\$6.20
Ammonium-N (NH ₄ N) - Colorimetric Method	Dilution to analytical range (if required)	UV-Vis (sub-ppm detection limits)	\$5.75	\$5.20	\$4.90	\$4.60
Ammonium-N (low level) Fluorescence Assay	<i>o</i> -phthalaldehyde reaction / standard additions	Fluorescence (ppb detection limits)	\$23.75	\$21.40	\$20.20	\$19.00
Nitrate-N (NO ₃ -N) and/or Phosphate-P (PO ₄ -P)	Direct measurement	Auto-analyzer	\$7.25	\$6.55	\$6.15	\$5.80
Total soluble Nitrogen and/or Phosphorus	Alkaline persulfate oxidation / colourimetry	Auto-analyzer	\$10.75	\$9.70	\$9.15	\$8.60
pH	Direct measurement	pH/ion meter	\$2.75	\$2.50	\$2.35	\$2.20
Conductivity	Direct measurement	Conductivity meter	\$3.00	\$2.70	\$2.55	\$2.40
Alkalinity (bicarbonate)	Dilution to analytical range (if required)	Automatic titrator	\$9.00	\$8.10	\$7.65	\$7.20
Acidity	Dilution to analytical range (if required)	Automatic titrator	\$9.00	\$8.10	\$7.65	\$7.20
Total Organic Carbon (Fresh water - low chloride samples)	UV-Persulfate or Combustion	DOC Analyzer	\$9.75	\$8.80	\$8.30	\$7.80
Total Organic Carbon (Marine water - high chloride samples)	UV-Persulfate or Combustion (dilution required)	DOC Analyzer	\$10.25	\$9.25	\$8.70	\$8.20
Total Suspended Solids (TSS)	Filtration	Gravimetric	\$8.00	\$7.20	\$6.80	\$6.40
Total Dissolved Solids (in conjunction with TSS)	Evaporation	Gravimetric	\$4.75	\$4.30	\$4.05	\$3.80

Contact Information		Fax: 250 952-4119		Glossary:	
Ministry of Environment and Climate Change Strategy				DL	Detection limit
Environmental Sustainability and Strategic Policy Division				DOC	Dissolved organic carbon
Knowledge Management Branch				EA	Elemental Analyzer
Analysis, Reporting and Knowledge Services (ARKS)		250 952-4133		FID	Flame Ionization Detection
Attn: Kristopher Beaudet (Head - Analytical Chemistry Services)		Kristopher.Beaudet@gov.bc.ca		GC	Gas Chromatograph
Ship to: 4300 North Road, Victoria, B.C. V8Z 5J3		(by Courier)		Gravimetric	Analytical Balance
Mail to: PO Box 9536 STN PROV GOVT, Victoria, B.C. V8W 9C4		(by Canada Post or USPS)		HPLC	High performance liquid chromatograph
General Laboratory Contact Information:		250 952 4134		ICP	Inductively coupled plasma
Website:		NRLAB@gov.bc.ca		IC	Ion chromatograph
Alternate Contacts:		Ministry of Environment and Climate Change Strategy - Analytical Lab		MS	Mass spectrometer
Amber Sadowy (Analytical Chemist)		Amber.Sadowy@gov.bc.ca		OES	Optical emission spectrometer
Joni Borges (Soils Analyst)		778 698 9115		UV-Vis	Ultraviolet visible spectrophotometer
Andre Bindon (Special Applications Chemist)		Joni.L.Borges@gov.bc.ca			
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