

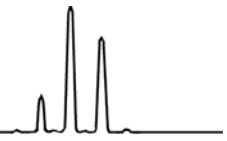
SRC Environmental Analytical Laboratories



P R I C E G U I D E

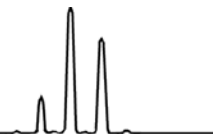
Effective January 1, 2010

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GENERAL INFORMATION



SRC Environmental Analytical Laboratories
422 Downey Road
Saskatoon, Saskatchewan
S7N 4N1

Phone: 306-933-6932
Toll Free: 1-800-240-8808
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e-mail: analytical@src.sk.ca
Web address: <http://analytical.src.sk.ca>

Hours of Operation 8:00 am to 5:00 pm, Monday through Friday

Corporate Overview:

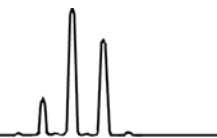
The SRC Environmental Analytical Laboratories (SRC Analytical) has been providing high quality analytical services for over 40 years. SRC Analytical consists of five laboratories- **Sample Preparation, Organics, Inorganics, ICP, and Radiochemistry (including a SLOWPOKE-2 nuclear reactor)**. We provide the widest ranges of services among environmental analytical labs in Canada. The main emphasis is on water quality, environmental and agricultural product testing markets. In addition, many **non-routine analyses** of manufactured chemicals, metals, alloys, coal, minerals and ores are performed. Clients include mining companies, chemical producers, consulting firms, manufacturers, federal, provincial and civic government agencies, small businesses and private individuals across Canada.

The laboratories are located at Innovation Place, in an up-to-date facility with state-of-the-art instruments, equipment and data management systems. All sample information and data are stored in a computerized Laboratory Information Management System (LIMS) which is used for sample tracking, reporting and invoicing. Clients may arrange to have their data made accessible by various electronic transfer modes.

SRC Analytical is accredited by CALA (Canadian Association for Laboratory Accreditation) for a large number of environmental tests and matrices. An extensive Quality Assurance Program and a comprehensive Laboratory Information Management System are in place to ensure the reliability, confidentiality and accountability of analytical data.

SRC Analytical welcomes your inquiries! Please feel free to contact us regarding your particular analysis requirements or if you have questions regarding the analytical services listed herein.

BILLING AND REPORTING INFORMATION



Turnaround Time Options:

Standard Turnaround: The rates in this price list are for standard turn-around time in reporting of results. For routine samples this is usually a maximum of 10 working days. In certain instances, quicker turnaround time is available without a surcharge.

Where expedited analysis is requested, please notify the laboratory in advance. Quicker turnaround time will vary depending on the analysis and number of samples.

Expedited Service: a surcharge of 25% may apply for less than standard turnaround time.

Rush Service: 1-4 working days depending on type of analysis and number of samples will be provided at a 75% surcharge.

Overtime Priority Rush Service for a 100% surcharge can be provided where analysis is done during non-regular working hours. When necessary, an hourly time charge may also apply.

Please indicate which service is required with sample submission. Discounts will not generally apply to rush analyses.

Fees: Published prices may be subject to change without prior notification. **GST** will be added to the invoice if applicable.

Late payment charges will be assessed after 30 days at a rate of 1.5% compounded monthly (19.6% annually).

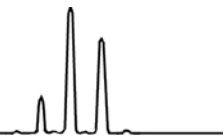
Minimum billing: A minimum charge may be applied to all analytical work orders.

Quotations and Proposals: Volume discounts can be discussed with us prior to undertaking work. **Quotes and proposals will include a quote number that must be referenced when samples are submitted.**

Reports: Results can be sent via fax or electronically or accessed on-line. A copy will also be sent through the mail.

TERMS AND CONDITIONS

1. **Provision of Services:** SRC shall carry out the services promptly, diligently and in a professional manner in accordance with generally accepted analytical laboratory principles and practices. SRC shall comply with all applicable federal, provincial and municipal laws in relation to the services. SRC will endeavor to provide results to the Customer within ten (10) business days of receipt of samples.
2. **Expedited Service:** Rush or expedited service is available for certain services. A surcharge of 75% will be applicable for services rendered within one to four (1-4) business days of receipt of samples. A surcharge of 100%, and, when deemed necessary by SRC, an hourly rate, will be applicable for services rendered outside normal business hours. Volume or other discounts do not apply to rush or expedited service.
3. **Sample Submission:** Samples should be stored and preserved by the Customer in accordance with the guidelines set out in SRC's current price guide. Failure to adhere to SRC's current guidelines for the storage and preservation of samples may mean that SRC is unable to provide the services. Samples must be submitted to SRC via prepaid delivery unless prior arrangements have been made. A completed and executed Chain of Custody Record/Analysis Request Form, Form for Saskatchewan Environment Regulated Water Supply or Form for Regional Health Authority Regulated Water Supply, as applicable, must accompany all samples. Failure to complete and execute such forms may result in delays in service.
4. **Sample Storage, Return and Disposal:** The Customer shall provide SRC with any specific instructions regarding the storage, return or disposal of samples upon submission of samples to SRC for services. Storage fees or other charges may be applicable. The following rules apply to the storage, return or disposal of samples unless alternate instructions are received by SRC from the Customer:
 - (a) All samples will be stored by SRC for thirty (30) calendar days following provision by SRC to the Customer of the report regarding the results of the services (the "Sample Storage Period"). Following the Sample Storage Period, samples will be disposed of at SRC's discretion.
 - (b) Samples that are classified by SRC as hazardous substances will either be disposed of by SRC or returned to the Customer following the Sample Storage Period and additional fees may apply.
5. **Payment Terms:** The Customer agrees to pay to SRC the applicable fees for all services the Customer has requested. A minimum fee for service may be applicable. Fees may be subject to change without notice. The Customer will pay all invoices in Canadian funds without any deduction or set off. Payment is due upon receipt of invoice. Interest will be charged at the rate of 1.5% per month (19.56% per annum) compounded monthly on all invoices overdue thirty (30) days or more from the invoice date. All applicable taxes, both federal and provincial, will be automatically added to invoices.
6. **Confidentiality:** All data, reports and other information relating to the services shall be treated by SRC as the confidential property of the Customer, and SRC will use its best efforts to ensure that its employees and agents will not disclose the same to any third party. The obligation of confidentiality set out in this section shall not apply to any information that: (i) is required by law to be disclosed; (ii) was in SRC's possession prior to receipt from the Customer; (iii) was lawfully obtained by SRC from a third party under no obligation of confidentiality to the Customer; or (iv) is or becomes part of the public domain through no act or failure of SRC.
7. **Reports:** All reports provided by SRC to the Customer regarding the results of the services are the confidential property of the Customer. SRC shall be entitled to retain a copy of all data and reports relating to the services provided always that the obligations of confidentiality set out in section 6 shall continue to apply for so long as SRC retains a copy of such data or reports.
8. **Use of SRC's Name:** The Customer shall not use SRC's name in any news release, public statement or announcement or in connection with any sale, offer for sale, advertisement or promotion of any article, product or company without the prior written consent of SRC.
9. **No Warranty:** SRC makes no representations or warranties, either express or implied, statutory or otherwise, as to any matter, including, but not limited to, the quality, merchantability or fitness for any purpose of any goods or products to be delivered pursuant to this Agreement. The Customer accepts the results of the services as is and acknowledges that any use or interpretation of the information contained in any report provided by SRC is at the Customer's own risk.
10. **Limitation of Liability:** Prior to acceptance of delivery by SRC, SRC shall not be responsible for the Customer's samples. In particular, SRC shall not be responsible for any consequences arising from the Customer's failure to properly collect, handle, store, preserve, transport, mark and/or identify a sample which is submitted to SRC for services. SRC's liability shall be limited to, at SRC's option, repayment of the amount paid by the Customer for the services that are proven to be defective or re-performance of the services claimed by the Customer to be defective. **IN NO EVENT SHALL SRC BE LIABLE TO THE CUSTOMER FOR LOST PROFITS, PUNITIVE DAMAGES OR OTHER INDIRECT OR CONSEQUENTIAL DAMAGES.**
11. **Force Majeure:** SRC shall not be liable to the Customer for any failure or delay in performance of its obligations caused by circumstances beyond its control, including, but not limited to, strike, lockout or other industrial dispute; act of a public enemy; war; blockade; public riot; lightning; fire; storm; tornado; flood; explosion; governmental restraint imposed by statute, regulation or policy; shortages of material or labour; delays in transportation; delays in or lack of telecommunication services; equipment failure; inability to obtain or maintain necessary regulatory licenses; or restraint imposed by decision of a competent tribunal or authority of Canada or any Province thereof.
12. **Termination:** This Agreement may be terminated by either party by giving two (2) days prior written notice, at which time any services completed to the date of termination will become due and payable together with any other costs incurred by SRC in respect of the services, including, but not limited to, the costs of any materials purchased specifically for the services.
13. **Governing Laws and Jurisdiction:** This Agreement shall be governed by, construed and interpreted in accordance with the laws of the Province of Saskatchewan and the laws of Canada applicable therein and the parties shall attorn to the exclusive jurisdiction of the Courts of the Province of Saskatchewan and all courts competent to hear appeals therefrom.
14. **Dispute Resolution:** If any dispute or difference should arise between the Customer and SRC, a party shall notify the other party in writing and provide details of the dispute. The parties shall first make all reasonable efforts to resolve their dispute through good faith negotiations. If they cannot settle the dispute through negotiation, then, unless otherwise agreed by the parties, the parties shall attempt to resolve the matter through the use of the services of a qualified mediator for the Province of Saskatchewan in accordance with mutually agreed upon procedures. If mediation is unsuccessful, and unless otherwise agreed by the parties, the parties shall arbitrate the dispute pursuant to the provisions of *The Arbitration Act, 1992* (Saskatchewan) or any similar legislation then in force and agree to the appointment of a single impartial expert arbitrator, qualified to arbitrate in the Province of Saskatchewan. Failing an agreement within fourteen (14) days as to the appointment of such arbitrator, either party may apply to the Court of Queen's Bench in the judicial centre of Saskatoon, Saskatchewan for the appointment of a single arbitrator. The parties shall equally share the cost of mediation and/or arbitration unless directed otherwise by the mediator and/or arbitrator. Mediation and/or arbitration shall take place in Saskatoon, Saskatchewan. The decision shall be rendered within seven (7) days of the close of the hearing.



SRC Analytical maintains an extensive *Quality Assurance Program* designed to ensure the reliability of analytical data. Key components of the Quality Assurance program are:

- Accreditation and Proficiency Testing by the Canadian Association for Laboratory Accreditation (CALA)
- Participation in interlaboratory performance assessment programs
- Comprehensive QC program
- Computerized sample management

Accreditation and Proficiency Testing by CALA

SRC Analytical is accredited by CALA for specific environmental tests. These tests are listed in the Scope of Accreditation found on the CALA website: www.cala.ca/cala_directories.html. The accreditation program consists of on-site assessments and proficiency testing. Accreditation ensures that laboratory facilities, procedures, and methods conform to ISO 17025, the internationally recognized standard.

Interlaboratory Performance Assessment

In addition to the proficiency testing program offered by CALA, SRC Analytical participates in several other interlaboratory performance assessment programs including (but not limited to):

- Environment Canada National Water Research Institute (NWRI)
- Environmental Resource Associates (ERA)
- Quality Assurance Services (QAS)
- Wibby Environmental
- International Atomic Energy Agency (IAEA)
- Health Canada.

Quality Control

A variety of techniques, such as the analysis of reference materials, control samples, duplicates, and spike recovery measurements, are used to ensure the validity of the analytical results. If a problem is identified, the samples are re-analyzed or other corrective action is taken to demonstrate that the analytical results are acceptable. If this is not possible, then the client is notified of the problem.

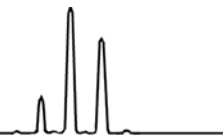
Computerized Sample Management

A computerized Laboratory Information Management System (LIMS) is used to uniquely identify samples, set up the analytes for each sample, monitor the workflow, and store the analytical results and quality control data. The LIMS is also used to prepare analytical reports and invoices. Quality control data can also be reported at the client's request.

Quality Assurance

Quality Assurance staff at SRC Analytical manage all aspects of the quality system. This includes reviews of quality control data, method validation, and quality audits.

SAMPLE PREPARATION CHARGES



Water

Filtration (0.45 or 3µm suction filter)	\$10
Filtration (pressure)	\$75
(additional charges may be applied for difficult or large samples)	
Acid digestion	\$15
Fusion (particulates in water for radionuclides)	\$50

Brine

Dilution	\$15
MIBK extraction for trace metals	\$200

Soil, Rock, Sediment

Strong Acid digestion (Aqua-regia/perchloric)	\$30
Total digestion (Aqua-regia/HF/perchloric)	\$50
Microwave digestion (low pressure)	\$45
Microwave digestion (high pressure)	\$60
Drying	\$7
Drying plus % moisture determination	\$12
Grinding	\$10
Grinding (radioactives)	\$20
Water leach & filtration	\$20
CGSB or TCLP Leachate Procedure	\$105
Distilled Water Leach Procedure	\$65
Compositing, per portion (\$20 minimum)	\$10

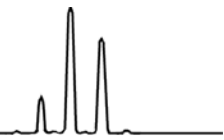
Vegetation

Drying	\$7
Drying plus % moisture determination	\$12
Microwave digestion for metals	\$45
Acid digestions: Nitric (multiple additions) /perchloric acids	\$80
Thermal ashing for radionuclides	\$40
Microwave digestion of ash for radionuclides (high pressure)	\$60

Petroleum Products, Oils, Crude

Microwave digestion for metals (high pressure)	\$60
Microwave digestion for Po	\$240
Thermal ashing/acid digest	\$60

SAMPLE PREPARATION CHARGES



Animal Tissue

Drying	\$7
Thermal ashing	\$40
Homogenization (Blending)	\$100
Additional charges apply for large sample sizes (>800g)	
Microwave digestion for metals (low pressure)	\$45
Microwave digestion for flesh (high pressure)	\$100
Microwave digestion for bone (high pressure)	\$100
Acid digestion of ash	\$30
Deboning (separation of meat from bone)	\$30

Special Preparations for Fish

Filleting per fish	\$30
Skinning per fish	\$30
Gutting	\$30
Preparation of fish for separate analysis of flesh and bone (fish is cooked, flesh and bone separated, and dried)	\$120
Compositing of whole fish for flesh and bone (price per additional fish)	\$60
Homogenization (Blending)	\$100
Additional charges apply for large sample sizes (>800g)	

Hi-Vol Filters

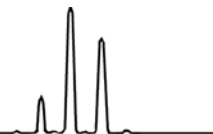
Compositing for up to 4 filters (add \$2 for each additional filter)	\$20
Acid digestion/filtration/concentration	\$65

Miscellaneous

Field Pressure Filtration: Lab supplied Prefilters, each	\$15
Field Pressure Filtration: Lab supplied Membrane Filters, each	\$15
Field Pressure Filtration: Lab supplied Support/Drain Discs, each	\$15

Urine

Preparation for trace metals	\$10
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Radiochemical Tests

Also, see listings under individual sample types.

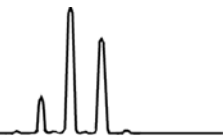
Uranium by DNC: solids and high-concentration liquids	\$30
Uranium by ICP-MS	\$55 **
Radium-226 by alpha spectroscopy	\$110
Radium-226 by emanation method	\$155
Radium-228 (Ra ²²⁸)	\$115
Thorium Isotopes (Th):	
Thorium-228, -230, -232 (any or all)	\$115
Thorium-232 (total Th) by mass on solids (NAA)	\$140
Thorium-232 (total Th) by mass (ICP-MS)	\$55 **
Lead-210 (Pb ²¹⁰)	\$105
Polonium-210 (Po ²¹⁰)	\$85
Gross Alpha or Gross Beta	\$50
Gross Alpha and Beta	\$60
Gamma Spectroscopy Scan (see page 9)	\$120
Radon-222 (Rn ²²²) fractional release	\$310
Radon-222 Emanation rate	\$150
Strontium-90 (Sr ⁹⁰)	\$430 (270ea for 2) (220 ea for >2)
Tritium	\$85
Nickel-63 (Ni ⁶³)	\$70
Carbon-14 (C ¹⁴)	\$70
Radon-222 in air (see page 10):	
Pico-Rad (for 48 hour spot-check)	\$50
Alpha Track (for long-term e.g. 3 month test)	\$50
E-Perm short term (2-7 days)	\$64
E-Perm long term (8-31 days)	\$80 (\$35 each additional month)
Radon in water	\$60

Uranium 235/238 ratio*

* Please contact the laboratory for current prices.

**** First ICP-MS element \$55, each additional \$5. See page 17 for complete scan.**

Sample preparation charges will be added when required.



Gamma Spectroscopy

\$120

This analytical technique can be used to determine some of the naturally occurring and man-made radionuclides in bulk samples of water, soil, sediment, vegetation, tailings, many other types of solids, and some liquids such as mill tailings. The detection limits vary for each isotope and are influenced by the total activity within the sample and the length of the counting period. For an environmental level (uncontaminated) sample and an overnight count, it is possible to detect 0.02 to 1 Bq/g amounts of the more sensitive gamma emitting isotopes such as lead-212, lead-214, bismuth-212, bismuth-214, radium-226, cesium-137 and cobalt-60. Other isotopes such as lead-210 and thorium-230, due to the lower rate and energy of their gamma emissions will have higher detection limits. Minimum sample sizes required are 20g for solids and oils, and 500 mL for water. The radionuclides which can be measured directly are listed below. Certain other radionuclides can be calculated or estimated from the measured values of the following:

Naturally Occurring Radionuclides

U-238 Series:

Thorium-234, Thorium-230, Radium-226, Bismuth 214, Lead-214, Lead-210

U-235 Series:

Uranium-235, Thorium-227, Radium-223, Radon-219, Lead-211

Th-232 Series

Actinium-228, Bismuth-212, Lead-212, Thallium-208

Other:

Potassium-40

Man-Made Radionuclides

A great number of man-made radionuclides can be detected by this method. Man-made radionuclides are associated with nuclear power plants, used as tracers (e.g. some oil well logging), and absorbed into vegetation (e.g. food grains) from the soil. Some man-made radionuclides are regulated as per table in the *Guidelines for Canadian Drinking Water Quality, 2008 Edition*.

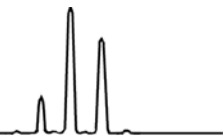
The above lists are a guide only. They do not represent standard packages. Contact the lab with your specific needs.

NORM (Naturally Occurring Radioactive Material)

NORM is a special classification defined as *Naturally Occurring Radioactive Material that is not associated with the nuclear fuel industry*. NORM is found naturally almost everywhere in low concentrations, including in oil and gas deposits. It can be transported along with gas and petroleum, or released during mineral extraction and processing. NORM concentrates in the waste streams of the petroleum, phosphogypsum, and fertilizer industries, among others. As such, this type of waste may have special considerations and restrictions for disposal. The *Canadian Guidelines for the Management of Radioactive Materials* were developed as a protocol for the safe handling and disposal of NORM.

It may be possible to determine whether waste materials meet or exceed the unconditional release limits for NORM by performing a gamma spectroscopy analysis for Pb-210, Ra-226, Ra-228, Th-228, Th-230, Th-234, and K-40. Additional tests (e.g. U-238 and Th-232 by ICP-MS, Pb-210 and Th-230 by more sensitive methods) may also be performed, if necessary, to conclusively quantify the material.

Contact the lab for further information.



Radon in Air

Radon-222 is a naturally occurring radioactive gas. It is produced from the decay of Radium-226, which is present in low levels in the ground. Radon is mobile and can seep into basements through cracks in the foundation or via floor drains. Health Canada's action level for Radon in indoor air is 200 Becquerels per cubic meter (Bq/m^3). The lab has radon detection devices available to determine the level of Radon in your home or other buildings.

Alpha-Track:

Cost per sample is \$50

Alpha-track detectors are designed to measure the average radon concentration in indoor air over a period of several months. 2 months is the minimum recommended exposure time, but the detectors can be exposed for six months or more. A longer exposure period evens out the day-to-day and seasonal variations in the radon level and provides the homeowner with an overall average exposure. The alpha-track detector is recommended by Health Canada.

Pico-Rad:

Cost per sample is \$50

Charcoal adsorption canisters are available which are to be exposed for 48 hours following which the average air concentration of radon-222 is determined by a liquid scintillation technique. This method is suitable for measuring radon-222 in homes and the workplace, and is recommended as an initial test when no previous radon determinations have been made. It is also used when a radon test is a condition of a real-estate transaction and a quick measurement is required.

E-Perm

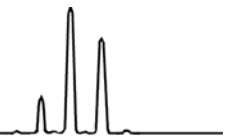
The E-Perm system uses an electrostatically charged plate to detect an average concentration of radon in air over a longer period of time. Two types are available - short term for 2-7 day exposure, and long term for 8 days to several months. Caution: high levels of radon can completely deplete the static charge over a long exposure period resulting in an inaccurate measurement. If radon levels are unknown or if you suspect high levels, it is recommended that a test using a Pico-Rad detector be done initially.

**Cost is: \$64 for 2-7 day exposure usage,
\$80 for long term usage: 8-31 days (\$35 for each additional month).**

Radon in Water

Cost per sample is \$60

Small water samples are collected in glass vials (40mL) and returned to the laboratory for sensitive liquid scintillation counting.



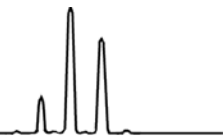
Other Radioactivity Measurements

Sealed Source Leak Testing

Sealed radioactive sources need to be leak tested on a regular basis and the leak test measurements must be conducted by an agency approved by the CNSC. SRC Analytical is approved by the CNSC for leak test measurements for Cs¹³⁷ and Ni⁶³, which are radioisotopes commonly used in sealed sources. Contact us to obtain the necessary leak test measurement kit.

Contamination Monitoring

Frequently, a contamination monitoring program is part of the licensing requirements. We can assist by providing measurement of wipes used to monitor for removable contamination.



Leachability Testing

Over the past 25 years SRC Analytical has performed a wide variety of leaching tests on ore, tailings and waste rock. These include dynamic column leaching, static leaching, humidity cell testing and standard EPA leach tests. All tests can be performed with natural or synthetic leach solutions under aerobic or anaerobic conditions. Please call the Radiochemistry Supervisor or Inorganics Supervisor to discuss your requirements.

K_d (Diffusion Coefficient) Determination

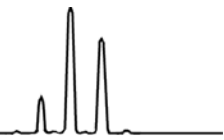
A variety of techniques are used to measure the K_d for various ionic constituents distributed between aqueous and solid phases. The test methods include batch, shaking tests, special diffusion cells and diffusion into specially prepared solid surfaces. Please call the Radiochemistry Supervisor or Inorganics Supervisor to discuss your requirements.

Acid/Base Accounting

\$144 per sample

These measurements are performed to determine the acid production potential or the acid consumption potential of ores and waste rock. The measurements include:

- Net acid generating potential (NAG)
- Acid neutralizing potential (AN)
- Acid producing potential (AP)
- Paste pH
- Sulfate sulfur
- Sulfide sulfur
- Total sulfur



Equilibrium Between Uranium and its Progenies

\$200

This procedure is used for the determination of the degree of equilibrium between radium-226 and uranium-238 in rocks, sediments, and ores. If gamma spectroscopy is used in the field to measure the amount of uranium in ore samples it is important that the degree of equilibrium between uranium and radium-226 is known. If dis-equilibrium exists, the apparent uranium content will be incorrectly determined because the primary gamma emitters are progenies of radium-226.

Radon Emanation Rate

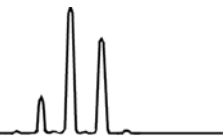
\$150

This measurement is performed to determine the amount of radon-222 that will be released from the surface of solid materials. It can be used to calculate the rate at which radon will diffuse from rock and ore into the surrounding air.

Radon Fractional Release Measurement

\$310

This procedure is used to determine the fraction of radon which escapes from rock, soil, sediment or ore samples. The rate of release of radon is calculated as a percentage of the total potential release.



Instrumental Neutron Activation Analysis (NAA)

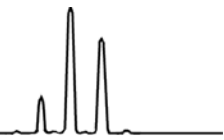
NAA is a non-destructive technique for specialized analysis of liquid and solid samples. Solid and liquid samples can be analyzed “as received” by NAA. This has the advantages of an elemental technique that is independent of the chemical form of the element and also of eliminating some sample preparation steps. Also, once the induced radioactivity of the sample has decayed to near background levels, the sample can be returned to its origin/owner, or used for further analyses. Approximately two-thirds of the elements in the periodic table can be determined to varying degrees of sensitivity by NAA. Some can be grouped together for analysis. Contact us to discuss your particular needs and obtain a cost estimate.

NAA can be used as a screening method to determine the presence or absence of halogenated organic compounds in soils, organic and aqueous liquids, and wastes. Organic compounds are isolated and tested by NAA for bromine, chlorine, and iodine. Fluorine cannot be detected by this method. While this test is not compound-specific, it is very useful as a screening tool to determine presence or absence of halogenated organic compounds.

Extractable Organic Halides (EOX) in solids or aqueous solutions	\$220
Total Organic Halides (TOX) in oils/solvents	\$185

Note: EOX, TOX – Results can be reported as chlorine, bromine and iodine individually or as total halogens, chlorine basis.
– Fluorine is not detectable in this procedure.

WATER (PACKAGES)



Major Ions Package

\$95

Applicable to potable water, groundwater and surface water:

- Ca, Mg, Na, K, Cl, SO₄, pH, Specific conductivity, NO₃, Alkalinity, Bicarbonate, Carbonate, Total hardness, Hydroxide, Sum of Ions

Water Quality Package (WQ)

\$105

Applicable to potable water, groundwater and surface water:

- Ca, Mg, Na, K, Cl, SO₄, pH, Specific conductivity, NO₃, Alkalinity, Bicarbonate, Carbonate, Total hardness Fe, Mn, Hydroxide, Sum of Ions

General Chemical Package (GC)

\$105

(Saskatchewan Municipal and Canadian Drinking Water Guidelines)

Applicable to potable water, groundwater and surface water:

- Ca, Mg, Na, K, Cl, SO₄, Sum of ions, pH, Specific conductivity, NO₃, Alkalinity, Bicarbonate, Carbonate, Hydroxide, Total hardness, TDS, F

Chemical Health & Toxicity Package (CHT)

\$105

(Saskatchewan Municipal and Canadian Drinking Water Guidelines)

Applicable to potable water, groundwater and surface water:

- B, Se, Al, As, Ba, Cd, Cr, Cu, Fe, Mn, Pb, Zn, U

** Communities >5000 may also require Mercury (\$39) and Cyanide (\$50)*

Water Potability Package (WP)

\$50

Applicable to potable water, groundwater and surface water:

- Total Coliforms
- Nitrates

Sewer Receiving Wastes (SRW)

\$213

- BOD, COD, Oil and grease, TSS, TKN

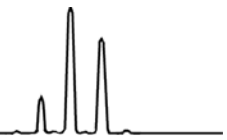
Livestock Package (LS)

\$55

- Sulphate, Salinity

Lagoon Packages (LP)

- **LP 1:** Specific cond., NO₃, Cl, Total coliform, e-coli **\$66**
- **LP 2:** TSS, VSS, FSS, c-BOD, Cl, Total coliform, e-coli **\$93**
- **LP 3:** TSS, VSS, FSS, c-BOD, Cl, Total coliform, e-coli, NH₃ **\$104**
- **LP 4:** TSS, VSS, FSS, c-BOD, Cl, Total coliform, e-coli, NH₃, TKN, NO₂+NO₃-N, Total N, P **\$144**
- **LP 5:** LP 4+ Alkalinity, Ca, K, Mg, Na, pH, SO₄, Spec. cond., TH, Sum of Ions **\$240**



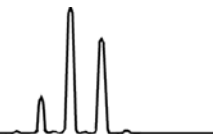
INORGANICS

Major Ions

Alkalinity, total	\$17	(\$0 with HCO ₃ /CO ₃)
Alkalinity, P	\$17	(\$0 with HCO ₃ /CO ₃)
Bicarbonate (HCO ₃)/Carbonate (CO ₃)/Hydroxide (OH)	\$17	(\$0 with alkalinity)
Calcium (Ca)	\$13	
Chloride (Cl)	\$17	
Magnesium (Mg)	\$13	
pH	\$7	
Potassium (K)	\$13	
Sodium (Na)	\$13	
Specific Conductivity	\$7	
Sulfate (SO ₄)	\$17	
Total Hardness	\$26	(\$0 with Ca and Mg)

Nutrients

Carbon:	Inorganic (TIC)	\$17	(\$0 with T. Alk.)
	Organic (TOC)	\$39	
	Total (TC)	\$56	(\$0 with IC and OC)
	Dissolved organic (DOC)	\$39	(Lab filtration, \$10)
Nitrogen:	Ammonia (NH ₃)	\$22	
	Nitrate (NO ₃)	\$22	
	Nitrite (NO ₂)	\$22	
	Nitrate + Nitrite as N	\$22	
	Total Kjeldahl Nitrogen (TKN)	\$35	
	Total Nitrogen (TN)	\$57	(\$0 with NO ₂ +NO ₃ +TKN)
Oxygen:	Biological Demand (5-day BOD)	\$55	
	cBOD	\$60	
	Chemical Demand (COD)	\$50	
	Dissolved	\$35	
Phosphorus:	Inorganic (IP)	\$35	
	ortho-Phosphate (o-PO ₄)	\$22	
	Total (TP)	\$13	
	Organic P (OP)	\$48	(\$0 with TP and IP)
	P, dissolved	\$13	(Lab filtration add \$10)



INORGANICS (Continued)

Physical Parameters

Color (apparent)	\$12	
Color (true)	\$12	(Lab filtration add \$10)
Odour (Threshold Odour Number)	\$30	
Solids, total suspended (TSS)	\$19	
Solids, volatile suspended (VSS)	\$21	(\$11 w/TSS)
Solids, fixed suspended (FSS=TSS - VSS)	\$21	(\$0 w/TSS and VSS)
Low level TSS	\$42	
Solids, total dissolved (TDS)	\$19	
Solids, volatile dissolved (VDS)	\$21	(\$11 w/TDS)
Solids, fixed dissolved (FDS=TDS-VDS)	\$21	(\$0 w/TDS and VDS)
Turbidity	\$14	

Trace Metals

ICP-Emission (ICP-AES)

-First element	\$40	
-each additional element	\$5	(to a maximum of \$75)

ICP-AES Trace Metals Scan \$75

Includes; Ag, Al, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni,
P, Pb, Si, Sr, Ti, V, Zn, Zr

ICP-Mass Spectrometry (ICP-MS)

-First element	\$55
-each additional element	\$5

ICP-MS Trace Metals Scan \$105

Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni,
Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

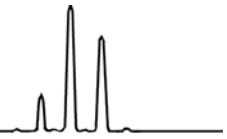
ICP-MS Rare Earths Scan \$125

Includes; Ce, Eu, La, Nd, Sm, Tb, Dy, Er, Gd, Ho, Pr, Tm, Yb, Lu

Other elements available by ICP-MS:

Li, Br, Rb, I, W, Bi, Th,

Mercury (Hg) \$39

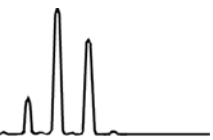


Microbiology (potable water/wastewater)

Total Coliforms and e-coli	\$31
Fecal Coliforms (membrane filtration)	\$35
Heterotrophic plate count	\$31
Fecal Streptococcus	\$35

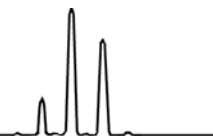
Sampling Information for Microbiological parameters:

1. Pick up a sterile sealed container from the SRC Analytical Laboratory.
2. Do not rinse the container. There is a powdered chemical that must stay in the container.
3. To preserve sterile conditions, do not touch the rim or inside of the container.
4. If sampling from a tap, remove the screen and allow the water to run for several minutes to clear the lines.
5. The water sample must not come into contact with any non-sterile surfaces or containers.
6. Water sample must go directly from the tap into the sterile container.
7. Fill the container to the 100 mL line.
7. Keep sample refrigerated until shipping. **Preferably hold samples at <10 °C during transit.**
8. **Sample must not be frozen.**
9. The sample should be sent to the lab as soon as possible after sampling, preferably received by the laboratory within 24 hours of sampling but must be received by the **lab within 48 hours** after sampling.
10. Put **(TIME CRITICAL)** label on the outside of the shipping container when returning the sample to the lab.



INORGANICS MISCELLANEOUS

Acidity	\$60	
Amine (colorimetric)	\$100	
Bromate	\$75	
Chlorine, residual	\$30	
Chlorine: free (available)	\$30	
combined (chloramines)	\$30	(\$5 with free/available)
Chloramines	\$30	(\$5 with free/available)
Chlorophyll (A, B, C)	\$41	(Lab filtration \$10)
Chlorate & chlorite	\$75	
Cr (VI) (hexavalent chromium)	\$50	
Cyanide total (SAD-strong acid dissociable)	\$50	
Cyanide (WAD-weak acid dissociable)	\$50	
eH (Oxidation-reduction potential of water)	\$40	
Fluoride	\$22	
Nitrilotriacetic Acid (NTA)(colorimetric)	\$65	
Oil and Grease	\$54	
Phenolics	\$42	
Specific Gravity (hydrometer)	\$12	
Sulfite	\$60	
Sulfide	\$40	
Surfactants (Methylene Blue Active Substances, MBAS)	\$75	
Tannin and Lignin	\$75	

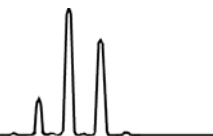


RADIOCHEMICAL PARAMETERS

Uranium by ICP-MS	\$55**	
Radium-226 by alpha spectroscopy	\$110	
Radium-226 by emanation method	\$155	
Radium-228 (Ra ²²⁸)	\$115	
Thorium Isotopes (Th):		
Thorium-228, -230, -232 (any or all)	\$115	
Thorium-232 (total Th) by mass on solids (NAA)	\$140	
Thorium-232 (total Th) by mass (ICP-MS)	\$55**	
Lead-210 (Pb ²¹⁰)	\$105	
Polonium-210 (Po ²¹⁰)	\$85	
Gross Alpha or Gross Beta	\$50	
Gross Alpha and Beta	\$60	
Gamma Spectroscopy Scan (see page 9)	\$120	
Strontium-90 (Sr ⁹⁰)	\$430	(\$270ea for 2) (\$220ea for >2)
Tritium	\$85	
Nickel-63 (Ni ⁶³)	\$70	
Carbon-14 (C ¹⁴)	\$70	
Radon in water	\$60	

**** First ICP-MS element \$55, each additional \$5. See page 17 for complete scan.**

Sample preparation charges will be added when required.



RADIOLOGICAL CANADIAN DRINKING WATER GUIDELINES

SRC Analytical tests drinking water for radiological parameters to verify compliance with the *Guidelines for Canadian Drinking Water Quality*. Please note that the term 'NORM' and the NORM guidelines do not pertain to drinking water.

Gross Alpha and Beta

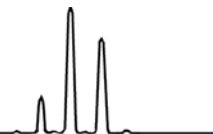
Water samples may be initially screened for radioactivity by measurement of gross alpha and beta activity. The *Guidelines for Canadian Drinking Water Quality* state that compliance may be inferred if the measurements for gross alpha and gross beta activity are less than 0.1 Bq/L and 1 Bq/L, respectively. If the measurements exceed the limits, additional testing may be required.

Primary List of Radionuclides

<u>Radionuclide</u>	<u>Type of Emission</u>	<u>MAC (Bq/L)</u>
<u>Natural Radionuclides</u>		
Lead-210	Beta	0.1
Radium-224	Alpha	2
Radium-226	Alpha	0.6
Radium-228	Beta	0.5
Thorium-228	Alpha	2
Thorium-230	Alpha	0.4
Thorium-232	Alpha	0.1
Thorium-234	Beta	20
Uranium-234	Alpha	4
Uranium-235	Alpha	4
Uranium-238	Alpha	4
<u>Artificial Radionuclides</u>		
Cesium-134	Beta	7
Cesium-137	Beta	10
Iodine-125	Beta	10
Iodine-131	Beta	6
Molybdenum-99	Beta	70
Strontium-90	Beta	5
Tritium	Beta	7000

All radionuclides on the primary list except Ra-224 can be determined at SRC.

Contact the lab for sample requirements and pricing.



ORGANICS

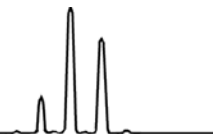
Petroleum Hydrocarbons

Total Petroleum Hydrocarbons (TPH) (Purgeable + Extractable Hydrocarbons)	\$150
Purgeable (C6-C10) Hydrocarbons & BTEX* (requested separately)	\$75
Extractable Hydrocarbons (C11-C36) (requested separately)	\$75
F1-BTEX*, BTEX*, F2, F3, F4	\$150
F1-BTEX*	\$75
F2, F3, F4	\$75

* BTEX = Benzene, toluene, ethylbenzene, xylenes

GC/MS (Gas Chromatography/Mass Spectrometry) (see Appendix 1)

Base/Neutrals/Acid Extractables	\$325
Base/Neutrals	\$260
Acid Extractables (phenols)	
Pentachlorophenol (PCP)	\$150
Di/Tri/Tetra/Penta chlorophenols	\$180
Chlorinated Phenols scan	\$200
Non-Chlorinated Phenols scan	\$200
Full Scan (Chlorinated and non-Chlorinated)	\$300
PAH (polynuclear aromatic hydrocarbons)	
PAH scan –open characterization	\$260
18 compound target list	\$185
Single compound	\$150
Organic volatiles scan, purgeables	\$260
Single volatile compound	\$160



ORGANICS (Cont'd)

Miscellaneous

Alcohols	\$110
Glycols	\$110
PCB (polychlorinated biphenyls)	\$175
Resin acids/Fatty acids (GC/MS)	\$300
Tri & Tetrachlorobenzene (TCB)/GC-ECD	\$165
Trihalomethanes (THM)	\$105
THM formation potential	\$260
Haloacetic Acids (HAA ₅)	\$250
Haloacetic Acids formation potential	\$360
Nonyl phenol and ethoxylates	\$250
Halogens, extractable organic (EOX) (by NAA on aqueous samples) (see note on page 14)	\$220

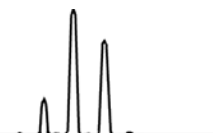
Herbicides and Pesticides

Phenoxy herbicides (PFBBR) (App.2, Group 1)	\$260
Single compound	\$180
Organo-chlorinated pesticides (OCP) (App.2, Group 2)	\$200
Neutral herbicides (App.2, Group 3)	\$200
Organo-phosphorus (App.2, Group 4)	\$200
Single compound from Groups 2,3,4	\$125
Soil sterilants (App.2, Group 5)	\$250
Carbamates (App.2, Group 6)	\$250
Single compound from Groups 5, 6	\$175
Packages: Appendix 2, Groups 2, 3 or 4	1 st group \$200
	\$150 per additional group
Groups 5 or 6	1 st group \$250
	\$200 per additional group

Saskatchewan Environment Guidelines for Municipal Water Quality
Organics (consult lab for complete list) \$1120

Contact lab for quotes on special requests.

SOIL TESTING SERVICES



Salinity Package

\$110

- Includes pH, EC (Electrical or Specific Conductivity), Sodium Absorption Ratio (SAR), % Saturation, Calcium, Magnesium, Sodium, Potassium, Sulfate, Chloride and Theoretical Gypsum Rate (TGR)
- Preparation charges such as drying and grinding are extra (see page 6)
A minimum of 500 grams of soil is required.

Additional Parameters to Salinity Package:

- Ammonia nitrogen \$22
- Nitrate+Nitrite nitrogen \$22
- Phosphorus \$13
- Alkalinity (carbonate and bicarbonate) \$17
- Cation exchange capacity (CEC) \$70
- SAR (sodium absorption ratio)
(calculated from Ca, Mg, Na) \$39
- Saturation paste \$20

Trace Metals

Sample preparation required for metal analysis of soil typically requires drying, grinding, determination of % moisture, as well as an appropriate digestion. For sample preparation charges see page 6

ICP-Emission (ICP-AES)

- First element \$40
- each additional element \$5 (to a maximum of \$75)

ICP-AES Trace Metals Scan \$75

Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

ICP-Mass Spectrometry (ICP-MS)

- First element \$55
- each additional element \$5

ICP-MS Trace Metals Scan \$105

Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

ICP-MS Rare Earths Scan \$125

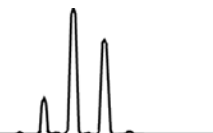
Includes; Ce, Eu, La, Nd, Sm, Tb, Dy, Er, Gd, Ho, Pr, Tm, Yb, Lu

Other elements available by ICP-MS:

Li, Br, Rb, I, W, Bi, Th,

Mercury (Hg)

\$50

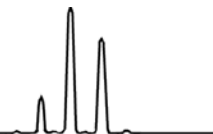


INORGANICS

ABA (Acid Base Accounting) see page 12	\$144	Includes AN, AP, NAG
Ash	\$24	
Carbon, total	\$14	**
Carbonate by back titration	65	
Carbon, organic	\$23	**
Carbon, organic, calculated	\$0	w/total and inorganic C
Cation Exchange Capacity (CEC)	\$70	
Chloride, water soluble	\$17	Water leach \$20
Chromium VI (hexavalent)	\$65	
Colour, odour	\$12	each
Cyanide	\$70	
Density	\$40	
Fluoride	\$72	
Loss on Ignition (550C.)	\$24	
Moisture	\$12	
Nitrogen, Ammonia	\$22	Water leach \$20
Nitrogen, NO ₂ +NO ₃	\$22	Water leach \$20
Nitrogen, total Kjeldahl	\$22	Acid digest \$30
Sieve analysis (Tyler mesh)	\$20	Per sieve
Oil and Grease	\$60	
pH	\$17	
Phenolics	\$70	
P, total	\$40*	Acid digest \$30
P, inorganic	\$40	Acid digest \$30
P, organic, calc.	\$0	w/total and inorganic P
Silica (gravimetric)	\$85	
Specific Conductivity	\$17	
Sulfate, acid soluble	\$70	
Sulfide	\$84	\$0 with total S and SO ₄
Sulfur, total	\$14	**

** Subcontracted to another lab within SRC. Price is current at time of printing but is subject to change by subcontracted lab.

* \$5 when other ICP metals requested.



INORGANICS (cont'd)

Trace Metals

Sample preparation required for metal analysis of soil typically requires drying, grinding, determination of % moisture, as well as an appropriate digestion. For sample preparation charges see page 6.

ICP-Emission (ICP-AES)

-First element	\$40	
-each additional element	\$5	(to a maximum of \$75)

ICP-AES Trace Metals Scan \$75

Includes: Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

ICP-Mass Spectrometry (ICP-MS)

-First element	\$55
-each additional element	\$5

ICP-MS Trace Metals Scan \$105

Includes: Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

ICP-MS Rare Earths Scan \$125

Includes: Ce, Eu, La, Nd, Sm, Tb, Dy, Er, Gd, Ho, Pr, Tm, Yb, Lu

Other elements available by ICP-MS:

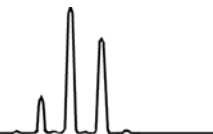
Li, Br, Rb, I, W, Bi, Th,

Mercury \$50

RADIONUCLIDES

Lead-210	\$105	Digest \$60*
Polonium-210	\$85	Digest \$60*
Radium-226 (alpha spectroscopy)	\$110	Digest \$60
Thorium-228, -230, -232 (any or all)	\$115	Digest \$60
Uranium by DNC	\$30	

*Lead-210 & Polonium-210 can be determined sequentially from a single digestion.

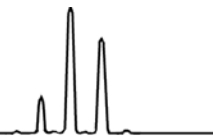


ORGANICS

CCME Total Petroleum Hydrocarbons in soil (ASE) [F1-BTEX*, BTEX*, F2, F3, F4]	\$150
F1-BTEX*, BTEX* (volatiles only)	\$75
F2, F3, F4 (extractables only)	\$75
F4G (gravimetric heavy hydrocarbons) (only when applicable)	\$60
F2, F3, F4, F4G	\$135
CCME PAHs target list on any given fraction (only when applicable)	\$180
Complete CCME PHC C6-C50 plus F4G (excluding PAHs)	\$210
* BTEX=benzene, toluene, ethylbenzene, xylenes Historical methods for hydrocarbons available upon request Special extraction techniques available, contact lab	
Petroleum products, qualitative identification	\$110

GC/MS (Gas Chromatography/Mass Spectrometry) (see Appendix 1)

Base/Neutrals/Acid Extractables (Semi-volatiles)	\$325
Base/Neutrals	\$260
Acid Extractables (phenols)	
Pentachlorophenol (PCP)	\$185
Di/Tri/Tetra/Penta chlorophenols	\$200
Chlorinated Phenols scan	\$220
Non-Chlorinated Phenols scan	\$220
Full Scan (Chlorinated and non-Chlorinated)	\$340
PAH (polynuclear aromatic hydrocarbons)	
PAH scan –open characterization	\$300
18 compound Target list	\$220
Single compound	\$185
Organic volatiles scan, purgeables	\$260
Single volatile compound	\$160



ORGANICS (cont'd)

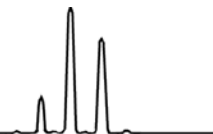
Herbicides & Pesticides

Phenoxy herbicides (PFBBR) (App.2, Group 1)	\$280
Single compound	\$185
Organo-chlorinated pesticides (OCP) (App.2, Group 2)	\$220
Neutral herbicides (App.2, Group 3)	\$220
Organo-phosphorus (App.2, Group 4)	\$220
Single compound from Groups 2,3,4	\$150
Soil sterilants (App.2, Group 5)	\$270
Carbamates (App.2, Group 6)	\$270
Single compound from Groups 5,6	\$180
Packages: Groups 2, 3 or 4	1 st group \$220
	\$175 per additional group
Groups 5 or 6	1 st group \$270
	\$230 per additional group

For quotes on Herbicide/pesticide formulations - Assay (%) or other special requests, please contact laboratory, Organics Section.

Miscellaneous Organics

Alcohols	\$120
Glycols	\$120
Creosote (GC/FID, no GC/MS confirmation)	\$140
Creosote (GC/MS, target PAH compounds)	\$220
Halogens (Extractable Organic Halogens, EOX)	\$220
PCB (polychlorinated biphenyls)	\$175
Nonyl phenol and ethoxylates	\$275



INORGANICS

	Analysis	Price	Preparation
Ash		\$40	
Chloride, water soluble		\$17	Water leach \$20
Moisture		\$12	
Sulfur, total		\$40	Microwave digestion \$45

Trace Metals

Normally a microwave digestion is used to prepare vegetation samples for metal analysis. Drying and determination of % moisture are also frequently required. For sample preparation charges see page 6.

ICP-Emission (ICP-AES)

- First element \$40
- each additional element \$5 (to a maximum of \$75)

ICP-AES Trace Metals Scan \$75

Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

ICP-Mass Spectrometry (ICP-MS)

- First element \$55
- each additional element \$5

ICP-MS Trace Metals Scan \$105

Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

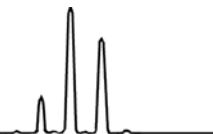
ICP-MS Rare Earths Scan \$125

Includes; Ce, Eu, La, Nd, Sm, Tb, Dy, Er, Gd, Ho, Pr, Tm, Yb, Lu

Other elements available by ICP-MS:

Li, Br, Rb, I, W, Bi, Th,

Mercury \$39 +Microwave \$45



RADIONUCLIDES

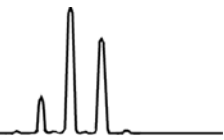
- The amount of wet sample necessary to obtain enough dry sample is dependent on the amount of moisture in the sample and the required radionuclide detection limits. 400-500g of dry sample is required to analyze for the complete radiochemical suite to the lowest possible detection limits, plus metals, arsenic, etc. If higher radionuclide detection limits are acceptable, less sample weight is needed. Please contact us to ensure that enough sample will be provided for all your analytical requirements.
- Approximately 1-2% of ash is obtained from dry lichen.
- Approximately 1-3% of ash is obtained from dry vegetation.

Vegetation is dried (\$7) for metals, lead-210 and polonium-210.

Vegetation is thermal ashed (\$40) for other radionuclides.

	Approximate minimum grams of dry vegetation	Price	Preparation
Lead-210	20g	\$105	Digestion \$80
Polonium-210	20g	\$85	Digestion \$80
Radium-226	(0.5g ash)	\$110	Digestion \$60
Thorium-228, -230, -232	(0.5g ash)	\$115	Digestion \$60
Uranium (DNC)	(1g ash)	\$30	

The above prices are a guide only. **In many cases, sample preparation can be shared for different analyses.** Preparation charges and methods are chosen for the best possible analytical results. All above prices are subject to sample type and composition. Contact the Radiochemistry Supervisor for additional information.



INORGANICS

Trace Metals

A microwave digestion is typically required to convert fish and tissue into an aqueous solution suitable for metal analysis. Other preparation such as homogenization or separation of flesh and bone may be required prior to analysis. For sample preparation charges see page 6.

ICP-Emission (ICP-AES)

- First element \$40
- each additional element \$5 (to a maximum of \$75)

ICP-AES Trace Metals Scan \$75

Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

ICP-Mass Spectrometry (ICP-MS)

- First element \$55
- each additional element \$5

ICP-MS Trace Metals Scan \$105

Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

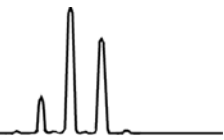
ICP-MS Rare Earths Scan \$125

Includes; Ce, Eu, La, Nd, Sm, Tb, Dy, Er, Gd, Ho, Pr, Tm, Yb, Lu

Other elements available by ICP-MS:

Li, Br, Rb, I, W, Bi, Th,

Mercury \$39 +Microwave \$45



RADIONUCLIDES

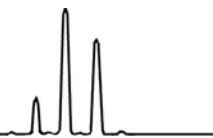
- Fish should be submitted skinned, gutted and frozen for separate analysis of flesh and bone. Skinning charge is \$30 per fish. For radionuclide analysis, whole fish are cooked, flesh and bone separated, dried (\$120 per fish; includes wet weight and dry weight). The price is based on one fish per sample. If compositing of two or more fish into one sample is required, a charge of \$60 will be added for each additional fish in the composite. Smaller fish may be composited to make one sample of sufficient weight, or individual small fish may be analyzed to higher detection limits. To attain the lowest detection limits, it is required that fish of at least 800g whole weight be submitted. Smaller fish can be submitted if higher detection limits are acceptable. Flesh and bone are considered two separate samples.
- Fish can be filleted by SRC for \$30 per fish.
- Approximately 1% ash can be obtained from flesh; 15% from bone.
- Approximately 10% dry sample can be obtained from flesh; 50% from bone.
- Thermal ashing is \$40 per sample.

Approximate minimum sample size

<u>Analysis</u>	<u>Bone</u>	<u>Flesh</u>	<u>Price</u>	<u>Preparation</u>
Lead-210	10g raw	20g raw	\$105	HP digest of raw \$100*
Polonium-210	10g raw	20g raw	\$85	HP digest of raw \$100*
Radium-226	1g ash	1g ash	\$110	Acid digest of ash \$30
Thorium-228, -230, -232	1g ash	1g ash	\$115	Acid digest of ash \$30
Uranium (DNC)	1-2g ash	1-2g ash	\$30	

* Lead-210 and Po-210 can be analyzed sequentially from the same High-Pressure microwave digest

WASTE MATERIALS



A variety of tests may be required in order to determine if a waste material needs to be classified as hazardous waste for purposes such as "Transport of Dangerous Goods".

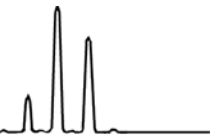
Analysis	Price	Preparation
CGSB or TCLP Leachate Analysis of leachate as required (see individual element tests)	\$105	
Acidity (nonaqueous)	\$100	
Flashpoint (Pensky Martin Closed Cup)	\$65	
ICP-Emission scan (aqueous)	\$75 *	Acid digest \$15
ICP-Emission scan (solids)	\$75	Acid digest \$30
ICP-Emission scan (oil/organic solvent)	\$75 *	Microwave Digest \$60
ICP-MS scan (aqueous)	\$105 **	Acid digest \$15
ICP-MS scan (solids)	\$105 **	Acid digest \$30
ICP-MS scan (oil/organic solvent)	\$105 **	Microwave digest \$60
Mercury	\$39	Microwave digest \$45
pH (aqueous)	\$7	
pH (solids)	\$17	
* ICP-Emission Trace metals scan (ICP-AES)	\$75	Matrix dependent
Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K		
First element	\$40	
each additional element	\$5 (to a maximum of \$75)	
** ICP-Mass Spectrometry Scan (ICP-MS)	\$105	Matrix dependent
Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U		
-First element	\$55	
-each additional element	\$5 (to a maximum of \$105)	

RADIONUCLIDES

Analysis	Price
Lead-210	\$105
Polonium-210	\$85
Radium-226 (alpha spectroscopy)	\$110
Thorium-228, -230, -232 (any or all)	\$115
Uranium by DNC	\$30

Preparation charges for radionuclides are dependent on the sample type.
Contact Radiochemistry Supervisor for details

WASTE MATERIALS

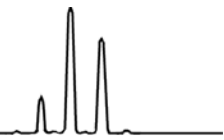


ORGANICS

PCBs (aqueous)	\$175
PCBs (solids)	\$175
PCBs (oil/solvent)	\$100
PCBs (cable/paper)	\$130
(Extra prep. charges may apply)	
Total Organic Halides (TOX) in oils/solvent	\$185
Water Content	
Karl Fischer (non-aqueous liquids)	\$60
Dean Stark (high water content)	\$80
Petroleum product qualitative identification (fuel type assessment)	\$110

URINE

Uranium (ICP-MS)	\$55 (prep. \$10)
ICP-Mass Spectrometry Scan (ICP-MS)	\$105 (prep. \$10)
Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U	
-First element	\$55 (+ prep.)
-each additional element	\$5 (to a maximum of \$105 + prep.)



Hi-Vol Filters

INORGANICS

We are able to carry out other NIOSH and OSHA analysis not listed below. Inquiries are welcome.

Analysis	Price	Preparation***
TDP [†]	\$18	
- VDP [†] when TDP pre/final also requested	\$10	
Final weighing only (TDP [†])	\$10	
Compositing for up to 4 filters (add \$2 for each additional filter)	\$20	
ICP-Emission scan	\$75 *	acid digest \$65
ICP-MS scan	\$105 **	acid digest \$65
* ICP-Emission Trace metals scan (ICP-AES)	\$75	
Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K		
First element	\$40	
each additional element	\$5	(to a maximum of \$75)
** ICP-Mass Spectrometry Scan (ICP-MS)	\$105	
Includes; Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U		
-First element	\$55	
-each additional element	\$5	(to a maximum of \$105)

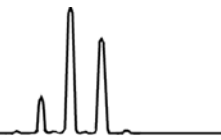
Note: many other elements can be analyzed by ICP-MS on request.

RADIONUCLIDES

Analysis	Price	Preparation
Lead-210	\$105	Acid digest \$65
Polonium-210	\$85	Acid digest \$65
Radium-226 (alpha spectroscopy)	\$110	Acid digest \$65
Thorium-228, -230, -232 (any or all)	\$115	Acid digest \$65
Uranium by DNC (whole 8 x 10 filter)	\$120	

*** One digestion charge may be sufficient for all requested metals and radionuclides.
If the sample cannot be completely dissolved by acid digestion, fusions may also be required.

[†] TDP - Total Deposited Particulate, VDP - Volatile Deposited Particulate



Dust Cassettes

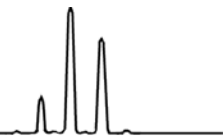
INORGANICS

Analysis	Price	Preparation*
Total Deposited Particulate (TDP):		
Pre and final weighing (filter supplied)	\$30	
Final weighing only or matched filters	\$15	
alpha-Quartz (SiO ₂) by infrared spectrometry	\$90	
Alkaline dusts	\$60	leach \$20
Cyanide	\$50	leach \$20
ICP-Emission scan (see page 35 for listing)	\$75	acid digest \$30
ICP-MS scan (see page 35 for listing)	\$105	acid digest \$30
Oil mist (IR)	\$100	

RADIONUCLIDES

Analysis	Price	Preparation*
Lead-210	\$105	acid digest \$30
Polonium-210	\$85	acid digest \$30
Radium-226 (alpha spectroscopy)	\$110	acid digest \$30
Thorium-228, -230, -232 (any or all)	\$115	acid digest \$30
Uranium by DNC	\$30	
Gross Alpha	\$50	
Gross Beta	\$50	
Gross Alpha and Beta	\$60	

* One digestion charge may be sufficient for more than one parameter.



Absorption Tubes

Inorganics

Inorganic acids by Ion Chromatography (IC) (HCl, HF, HNO ₃ , H ₃ PO ₄ , H ₂ SO ₄) -first IC parameter \$70, each additional \$12 to a maximum of \$100	\$100	
Ammonia	\$40	(add \$10 if Lab supplies Tube)

Organics

Volatile Hydrocarbons (charcoal tube, GC/FID)	\$130
Carbotrap thermal desorption tube (GC/MS) (can detect low levels of many organic compounds in air, indoor air quality)	\$250

Wipes and Swabs

Inorganics

Analysis	Price	Preparation
ICP-Emission scan (see page 35 for listing)	\$75	acid digest \$30
ICP-MS scan (see page 35 for listing)	\$105	acid digest \$30

Organics

PCBs, wipes and swabs	\$130
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Radionuclides

Gross Alpha or Beta	\$50
Gross Alpha and Beta	\$60

Dustfall Jars

Weighing of contents		
Total Deposited Particulate (TDP)(inc. filt/dry weight)	\$60	
Volatile Deposited Particulate (VDP)	\$70	(w/TDP \$20)

Impinger Solutions

- as per analyte determination on water/liquid

Sulfation plates

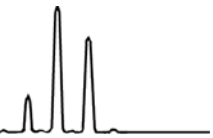
Total sulfur content (including plate)	\$65
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Gases

CO, CO ₂ , Methane, O ₂ , N ₂ , C ₂ gases	\$120
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Lead in Paint	\$70
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ALLOYS



Analysis or Preparation

Price

Filings, drillings

\$75/hour

Carbon

\$14**

Sulfur

\$14**

ICP-Emission trace metals scan

\$75 * microwave digestion \$45

Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo,
Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

-One ICP emission element

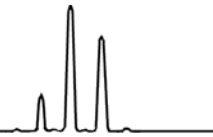
\$40

-each additional element

\$5 (to a maximum of \$75)

** Subcontracted to another lab within SRC. Price is current at time of printing but is subject to change by the subcontracted lab.

PAINT



% Pigment

\$80

Lead

\$70

Volatiles

\$40

Non-volatiles

\$40

ICP-Emission trace metals scan

\$75 * microwave digestion \$45

Includes; Ag, Al, As, Ba, Be, B, Cd, Co, Cr, Cu, Fe, Mn, Mo,
Ni, P, Pb, Se, Sr, Ti, V, Zn, Zr, Ca, Mg, Na, K

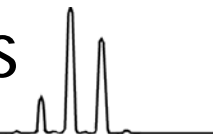
-One ICP emission element

\$40

-each additional element

\$5 (to a maximum of \$75)

POTASH, SODIUM SULFATE & OTHER SALTS



Note: In many cases, sample preparation can be shared between more than one analysis, but the preparation charges are listed separately below (e.g. , only 1 water leach/filtration is required for all water soluble parameters).

Major Constituents (water soluble)

Analysis	Price	Preparation
Calcium	\$13	Water leach/filtration \$20
Carbonate	\$17 (\$0 with HCO ₃)	Water leach/filtration \$20
Bicarbonate	\$17	Water leach/filtration \$20
Chloride	\$17	Water leach/filtration \$20
Magnesium	\$13	Water leach/filtration \$20
Potassium	\$13	Water leach/filtration \$20
Sodium	\$13	Water leach/filtration \$20
Sulfate	\$17	Water leach/filtration \$20
Water or Acid insolubles	\$44	
Moisture Content	\$12	

Metals:

Approximately 500g of sample is required for low level (ppb) soluble and insoluble metals.

Low level water soluble metals (Co,Cr,Cu,Fe,Mo,Ni,Pb,V,Zn) (detection limit approx 1 to 5 ppb)

Sample preparation:

Water leach	\$20
Filtration	\$10
MIBK Extraction	\$200

ICP emission scan \$75

-first element \$40, each additional \$5 to a maximum of \$75

Low level water insoluble metals (detection limit approx. 1 to 5 ppb)

Sample preparation:

Water leach	\$20
Filtration	\$10
Acid digest	\$30

ICP emission scan \$75

-first element \$40, each additional \$5 to a maximum of \$75

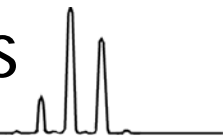
Total metals - approx. 10g of sample is required (detection limit approx. 1 to 5 ppm)

Sample preparation:

Acid digest \$30

ICP emission scan \$75

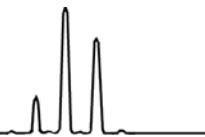
-first element \$40, each additional \$5 to a maximum of \$75



Miscellaneous

Analysis	Price	Preparation
pH	\$17	
Density	\$40	
Cyanide	\$50	Water leach \$20
Amine (colorimetric)	\$100	Water leach \$20
Fluoride (matrix matching procedure)	\$80	Water leach \$20
Sieve analysis	\$20	per sieve
Bromide (titration)	\$60	
Phthalate Esters Scan	\$330	

FOOD OILS, SUPPLEMENTS, GRAINS, & PLANT EXTRACTS



INORGANICS

ICP-Mass Spectrometry Scan (ICP-MS) **\$105** microwave digest \$45*

** Ag, Al, As, B, Ba, Be, Cd, Co, Cr, Cu, Fe, Mn, Mo, Ni, Pb, Sb, Se, Sn, Sr, Ti, Tl, V, Zn, U

-First element \$55
-each additional element \$5 (to a maximum of \$105)

Mercury **\$39** microwave digest \$45*

*Microwave digest can be shared between ICP-MS and Hg

Beta Glucan

First Sample \$250
Each additional sample \$100

ORGANICS

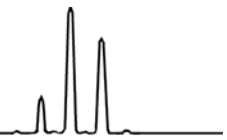
Herbicides and Pesticides

Phenoxy herbicides (PFBBR) (App.2, Group 1) \$280
Organo-chlorinated pesticides (OCP) (App.2, Group 2) \$220
Insecticides Scan in Honey (contact lab for compounds) \$525

Radionuclides

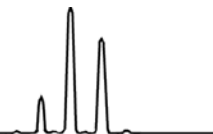
Gamma Spectroscopy analysis for radiochemical contaminants \$120
See page 9 for details

Contact lab for quotes on special requests.



Ethanol (CGSB-3.511)

Aromatics/Benzene	CGSB3.0/D5580	\$180.00
Chloride	D512	\$17.00
Copper	D1688	\$50.00
Methanol/Ethanol/Denat., %Volume	D5501	\$180.00
pHe	D6423	\$50.00
Solvent Washed Gum Content	D381	\$150.00
Sulfate Content, mg/kg	D5827	\$17.00
Sulfur, mg/kg	D5453	\$80.00
Total Acidity as Acetic Acid	D1613	\$60.00
Water Content, %Mass	E1064	\$60.00
Full Package		\$844.00



Acid Extractables

(1 Litre glass, Sulfuric Acid)

Chlorinated Phenols:

2-chlorophenol
2,4-dichlorophenol
2,6-dichlorophenol
2,4,6-trichlorophenol
2,3,4,6-tetrachlorophenol
trichlorophenol isomers
4-chloro-3-methylphenol
Pentachlorophenol

Non-Chlorinated Phenols:

2-nitrophenol
2,4-dimethylphenol
2,4-dinitrophenol
4-nitrophenol
4,6-dinitro-o-cresol
phenol

Trihalomethanes

(2 x 40 mL glass vials, sodium thiosulphate)

Chloroform
Dichlorobromomethane
Dibromochloromethane
Bromoform

Organic Volatiles Scan (partial list):

(2 x 40 mL glass vials, no preservative)

1,2-dichlorobenzene
1,2-dichloroethane
1,2,4-trimethylbenzene
1,4-dichlorobenzene
Acetone
Benzene
Carbon tetrachloride
Dichloromethane
Ethylbenzene
Gasoline
Hexane
Methylene chloride
Methyl ethyl ketone (MEK)
Chlorobenzene
Styrene
Tetrachloroethylene
Toluene
Trichloroethylene (TCE)
Trichloroethane (TCA)
Trichlorofluoromethane
Xylene

Alcohols

Methanol
Ethanol
Propanol
Butanol

Glycols

Ethylene glycol
Diethylene glycol
Propylene glycol
Triethylene glycol

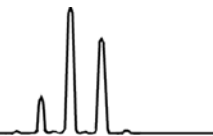
Polynuclear Aromatic Hydrocarbons (PAH)

(1 Litre glass, No preservative)

Acenaphthylene
Acenaphthene
Anthracene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Benzo(e)pyrene
Benzo(g,h,i)perylene
Benzo(k)fluoranthene
Chrysene
Dibenzo(a,h)anthracene
Fluoranthene
Fluorene
Indeno(1,2,3,c,d)pyrene
Naphthalene
Perylene
Phenanthrene
Pyrene

Base/Neutrals

PAH
Chlorinated Benzenes
Phthalate Esters
Haloethers
Nitrosamines
Organo-chlorinated pesticides



Group 1

Phenoxy Herbicides (PFBBBr)
(1 Litre glass, sulfuric acid)

2,4-D
2,4,5-T
2,4,5-TP (Silvex)
Buctril (Bromoxynil)
Dicamba (Banvel)
Hoe-grass (Diclofop-methyl)
MCPA
Picloram (Tordon)

Group 2

Pesticides (organo-chlorinated)
(1 Litre glass, no preservative)

Aldrin
Chlordane
Dieldrin
Endrin
Heptachlor Epoxide
Heptachlor
Methoxychlor
O,P'-DDD
O,P'-DDT
P,P'-DDD
P,P'-DDE
P,P'-DDT
PCB's
Toxaphene
alpha-BHC
beta-BHC
gamma-BHC (Lindane)

Group 3

Neutral Herbicides
(1 Litre glass, no preservative)

Mataven (Flamprop-methyl)
Propanil (Stampede)
Triallate (Avadex BW)
Trifluralin (Treflan)

Group 4

Pesticides (organophosphorus)
(1 Litre glass, no preservative)

Diazinon
Dimethoate (Cygon)
Fenitrothion
Lorsban (Chlorpyrifos)
Malathion
Methyl Parathion
Parathion

Group 5

Soil Sterilants
(1 Litre glass, no preservative)

Atrazine
Bromacil
Diuron
Linuron
Simazine
Tebuthiuron

Group 6

Carbamate Pesticides
(1 Litre glass, no preservative)

Carbaryl (Sevin)
Carbofuran (Furadan)

SAMPLING INFORMATION



Proper sample preservation is important for accurate analysis of water samples. Below is a list of routine analyses with recommended sample volumes, preservation holding times and type of containers. Please contact us for more information if necessary.

Parameter	Bottle	Preservative	Hold Time	Special instructions
Bacteria	100mL sterile	sodium thiosulfate	48 hours	Store at 4°C, one container for each bacteria type requested..
Biochemical Oxygen Demand	500mL plastic	none	24 – 48 hrs.	Store at 2 - 6°C, analyze within 48 hours of sampling.
Chemical Oxygen Demand	100mL plastic	2mL of 20% sulfuric acid	2 weeks	Can be analyzed from nutrients bottle.
Chemical Health & Toxicity	100mL plastic	2mL of 17.5% nitric acid	6 months	May also need to submit a sample for mercury and cyanide. Refer to requirements for mercury and cyanide
Chlorine	40mL glass	None	24 hours	Fill bottle to overflowing, no headspace. Store at 2 - 6°C
Chlorophenolics	1L amber glass	5mL of 20% sulfuric acid	2 weeks	Teflon lined cap. Store at 2 - 6°C
Cyanide	100mL plastic	0.2g sodium hydroxide, pH>12	2 weeks	
Dissolved Organic Carbon Field filtered	100mL plastic	2mL of 20% sulfuric acid	2 weeks	Filter sample before acidification.
Dissolved Organic Carbon Lab filtered	100mL plastic	Do not preserve sample before filtration	2 weeks	
Haloacetic Acids (HAA)	2 x 40 mL glass vial	10 mg of ammonium chloride	2 weeks	
Herbicides	1L amber glass	5mL of 20% sulfuric acid	2 weeks	Teflon lined cap. Store at 2 - 6°C
Inorganic (Major) ions	1L plastic	none	2 weeks	
Methylene Blue Active Substances (MBAS)	500mL plastic	none	2 weeks	
Metals	100mL plastic	1.5mL of 17.5% nitric acid	6 months	
Mercury (Hg)	100mL plastic	4mL of 17.5% nitric acid + 2mL 9% hydrochloric acid	2 weeks	
Nitrate/Nitrite	100mL plastic 250mL plastic	None or 2mL of 20% sulfuric acid	2 weeks 2 weeks	Can be analyzed from same bottle as inorganic (major) ions. Can be analyzed from same bottle as nutrients.

Parameter	Bottle	Preservative	Hold time	Special instructions
Nutrients: Ammonia, TKN, nitrates	250mL plastic	2mL of 20% sulfuric acid	2 weeks	Total P should be HNO ₃ preserved. Can be analyzed from the metals bottle. (unpreserved for Ortho-phosphate)
Odour	1L glass	none	ASAP	Fill bottle to overflowing (no headspace). Store at 2 - 6°C
Oil and Grease	1L glass	5mL of 20% sulfuric acid	2 weeks	Teflon lined cap
Ortho-Phosphate	100mL plastic	none	48 hours	Store at 2 - 6°C.
Organic Volatiles	2 x 40mL amber glass	none	7 days	Fill bottle to overflowing, no headspace. Store at 2 - 6°C.
PAHs	1L amber glass	none	2 weeks	Teflon lined cap. Store at 2 - 6°C
Benzo(a)pyrene	1L amber glass	none	2 weeks	Teflon lined cap. Store at 2 - 6°C
PCBs	1L amber glass	none	2 weeks	Teflon lined cap. Store at 2 - 6°C
PCP (Pentachlorophenol)	1L amber glass	5mL of 20% sulfuric acid	2 weeks	Teflon lined cap. Store at 2 - 6°C
Pesticides	1L amber glass	none	2 weeks	Teflon lined cap. Store at 2 - 6°C
Petroleum Hydrocarbons (extractable)	1L amber glass	none	2 weeks	Teflon lined cap. Store at 2 - 6°C
Phenolics	40mL amber glass	1mL of 20% sulfuric acid	2 weeks	Teflon lined cap.
Radon in water	2 x 40mL glass	none	8 days	Fill to overflowing, no headspace. Sample date/time required.
Radionuclides (Total)	1L for each parameter	10mL of 17.5% nitric acid	6 months	
Radionuclides (Dissolved)	1L for each parameter	10mL of 17.5% nitric acid	6 months	Field filtered (0.45um) before acidification
Sulfide/Mercaptan	250 mL plastic	Sodium hydroxide to pH>13	24 hours	Store at 2 - 6°C
Sulfide (low levels)	250mL plastic	10g sodium hydroxide + 5g ascorbic acid	24 hours	Store at 2 - 6°C
Trihalomethanes (THM)	2 x 40mL glass	10mg sodium thiosulfate	7 days	Fill to overflowing, no headspace, Store at 2 - 6°C
Uranium in water	100mL plastic	1.5mL of 17.5% nitric acid	6 months	Can be analyzed from the metals bottle.

Contact Information

SRC Analytical Laboratories
422 Downey Road
Saskatoon, SK Canada S7N 4N1

Phone: (306) 933-6932

(Toll Free Canada only)

1-800-240-8808

Fax: (306) 933-7922 • Email: analytical@src.sk.ca

SRC Analytical Laboratories offers a broad range of chemical analyses.

For details on our specific services, visit our website:

<http://analytical.src.sk.ca>

