



hydrogen 1 <b>H</b> 1.0079																	
lithium 3 <b>Li</b> 6.941	beryllium 4 <b>Be</b> 9.0122																
sodium 11 <b>Na</b> 22.990	magnesium 12 <b>Mg</b> 24.305																
potassium 19 <b>K</b> 39.098	calcium 20 <b>Ca</b> 40.078	scandium 21 <b>Sc</b> 44.956	titanium 22 <b>Ti</b> 47.867	vanadium 23 <b>V</b> 50.942	chromium 24 <b>Cr</b> 51.996	manganese 25 <b>Mn</b> 54.938											
rubidium 37 <b>Rb</b> 85.468	strontium 38 <b>Sr</b> 87.62	yttrium 39 <b>Y</b> 88.906	zirconium 40 <b>Zr</b> 91.224	niobium 41 <b>Nb</b> 92.906	niobylodum 42 <b>Mo</b> 95.96	technetium 43 <b>Tc</b> [98]											
cesium 55 <b>Cs</b> 132.91	barium 56 <b>Ba</b> 137.33	57-71		hafnium 72 <b>Hf</b> 178.49	tantalum 73 <b>Ta</b> 180.95	tungsten 74 <b>W</b> 183.85	rhenium 75 <b>Re</b> 186.21										
francium 87 <b>Fr</b>																	



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Page 1 of 8

## INTRODUCTION

This guide has been prepared to provide sampling and analysis information to individuals utilizing the Research and Productivity Council (RPC) for analytical services.

This reference will identify different analysis parameters as well as provide instruction on general sampling procedures, sample containers and handling information. The list of analysis parameters listed in this guide represent those most frequently requested. Analyses of additional parameters are available and may be obtained by contacting the laboratory (see contact information in Shipping and Inquiries section below).

The guide is divided into three sections based on the type of analyses performed:

- Microbiology
- Organic Chemistry
- Inorganic Chemistry

## BACKGROUND

RPC is a research and technology organization (RTO), with the core mission to harness science and technology in the service of innovation, and to build economic competitiveness. As a provincial crown corporation, RPC is New Brunswick's provincial research organization (PRO) offering contract R&D and technical services to business, academia and all three levels of government.

Headquartered in Fredericton, NB, RPC's complement of over 160 scientists, engineers and technologists are supported by a 13,000 sq. meter facility housing world-class analytical chemistry and material-testing laboratories, comprehensive life science, forensic and biotech laboratories, world class fish health services, extensive prototype design, manufacture and testing services and a wide variety of pilot facilities for the development and improvement of industrial and environmental processes and products.

## ACCREDITATION

RPC is an ISO 9001:2015 certified organization, and as such, we are dedicated to delivering what our clients expect: quality, value, and efficient service. Our clients know the difference quality makes and we set ourselves apart by offering an extensive collection of accredited services including a diverse ISO 17025 scope with the Standards Council of Canada (SCC). Success in accreditation programs assures our clients that our services can be relied upon to meet all essential standards of quality.

## SHIPPING AND INQUIRIES

Basic sampling protocol:

- Keep samples cool (pack with sufficient freezer packs to ensure samples are still cool upon arrival)
- Ship to the Lab as quickly as possible. Samples for Microbiology should arrive at the lab no later than 24 hours after sampling.
- If sampling materials (bottles, labels etc) are needed, RPC can provide them.

The laboratory shipping addresses:

### Fredericton Laboratory Location

RPC  
921 College Hill Road  
Fredericton, NB  
E3B 6Z9  
Telephone: (506) 452-1281

### Moncton Laboratory Location

RPC  
115A Harrisville Blvd.  
Moncton, NB  
E1H 3T3  
Telephone: (506) 855-6472

## SAMPLE SUBMISSION FORMS

A lab sample submission form must accompany the sample. Submission forms can be obtained from the laboratory or through our website at [www.rpc.ca](http://www.rpc.ca). It is found through the "Downloads" link in the upper right corner. Scroll down until you reach the "Forms" section and the document is named "Sample Submission Form - Chain of Custody Record (PDF)".

Note: Microbiology samples must include the time and date that the sample was taken.



## MICROBIOLOGY

RPC's Microbiology Laboratory has been providing diagnostic services to customers in the food, beverage, feed and environmental industry sectors for over 30 years.



### DRINKING WATER SAMPLE BOTTLE

125ml plastic bottle containing the preservative Sodium Thiosulphate. This bottle is used for drinking water samples.

NOTE: Total Coliforms/E. Coli (TC/EC) and Heterotrophic Plate Count (HPC) testing can come from the same bottle.



### WASTE WATER / ENVIRONMENTAL SAMPLE BOTTLE

250 mL sterile plastic bottle containing the preservative Sodium Thiosulphate. This bottle is used for waste water and environmental samples.

## SAMPLING INSTRUCTIONS

1. Collect samples only in the proper size and type of bottle as supplied by our laboratory.
2. Do not rinse the bottle(s).
3. Take care not to touch the inside lip of the bottle or the inside of the cap.
4. Remove screens, aerators, swivel sprayers, etc. from the tap before sampling.
5. Flush cold water tap for 5 minutes before sampling.
6. Fill the bottle(s) just above the mark indicated on the bottle (use cold water tap only).
7. Identify each bottle clearly using labels and waterproof ink or pencil.
8. Keep samples cool during storage and transport to the laboratory; but do not allow sample to freeze. Use a cooler and freezer packs for shipping. Note: More packs may be required in warmer weather.
9. Samples must be shipped immediately as they must be received at the lab within 24 hours of sampling.

## RESULTS

Depending on the analysis, results are provided in report format within 1-2 days upon receiving your sample.

NOTE: Reporting may be delayed by a day if sample is received in the late afternoon.

### Result Codes:

- P: Presence of bacteria in sample  
A: Absence of bacteria in sample

### Units:

- CFU: Number of colonies detected (Colony Forming units)  
NA: Not Applicable  
MPN: Most Probable Number

## ORGANIC CHEMISTRY

RPC's organic chemistry laboratory offers a wide scope of analytical testing parameters including environmental (soil, sediment, water, vegetation), and drinking water. This includes the provision all testing requirements associated with the site remediation and characterization for Petroleum Hydrocarbons. RPC's analytical labs are capable of analyzing for a broad range of persistent organic pollutants (POPs) such as PAHs, PCBs, organometallic compounds, and pesticides. RPC is equipped with the latest analytical tools capable of pushing the critical boundaries of detection and characterization of organic compounds. In addition to common testing parameters, RPC also offers specialized testing in routine and complex matrices (e.g. synthetic products, food stuffs, solid wastes, effluent, air, and biota).

RPC provides the highest level of service, technical excellence, and quality control.

### ORGANIC ANALYSIS

- Atlantic MUST - BTEX/TPH and MTBE (including low level detection for potable sites)
- TPH Fractionation
- Volatile and Semi-Volatile Organic Compounds (VOC/SVOC)
- Haloacetic Acids
- Taste and Odour
- PAH
- Pesticides and Herbicides
- Organometallic Compounds
- Glyphosate
- Alcohols and Glycols

### ORGANIC WATER TESTING

#### WATER/LIQUID SAMPLING INSTRUCTIONS FOR ORGANIC ANALYSIS

1. Collect samples only in the proper size and type of bottle as supplied by our laboratory.
2. Do not rinse the bottle(s).
3. Take care not to touch the inside of the bottle or cap.
4. If sampling from a tap, flush cold water tap for 5 minutes before sampling.
5. The vials used for the analysis of BTEX and VOC are to be collected with no headspace; this is to minimize the loss of volatile compounds. All other glass bottles should always have a headspace to prevent breakage caused by shifts in temperature.
6. Identify each bottle clearly using labels and waterproof ink or pencil.
7. Keep samples cool during storage and transport to the laboratory; but do not allow sample to freeze. Use a cooler and freezer packs for shipping. Wrap or pack glass bottles individually to avoid breakage.
8. Samples must arrive at the laboratory as soon as possible after sampling (preferably within 24 hours).

#### WATER/LIQUID BOTTLE REQUIREMENTS FOR ORGANIC ANALYSIS

ANALYSIS	CONTAINER	VOLUME	PRESERVATIVE	RECOMMENDED HOLDING TIME
BTEX/TPH (by Atlantic M.U.S.T.)	Amber Glass Vial	40ml (2)	Sodium bisulfate <sup>3</sup>	14 DAYS
	Clear Glass Bottle	250ml (2)	Sodium bisulfate	
BTEX/TPH (by Atlantic M.U.S.T.) for Potable Water	Amber Glass Vial	40ml (2)	Sodium bisulfate <sup>3</sup>	14 DAYS
	Amber Glass Bottle	1L (2)	Sodium bisulfate	
Polycyclic Aromatic Hydrocarbons (PAH)	Amber Glass Bottle	1L	With or without <sup>1</sup>	7 DAYS
Polychlorinated Biphenyl (PCB)	Amber Glass Bottle	1L	With or without <sup>1</sup>	7 DAYS
Drinking Water SVOC	Clear Glass Bottle	250ml (2)	Sodium bisulfate	7 DAYS
Volatile Organic Compounds (VOC)	Amber Glass Vial	40ml (2)	Sodium thiosulfate <sup>2,3</sup>	14 DAYS
Trihalomethanes (THMs)	Amber Glass Vial	40ml (2)	Sodium thiosulfate <sup>2,3</sup>	14 DAYS

<sup>1</sup> No preservative is required for PAH analysis; However, samples can be collected in bottles preserved with sodium bisulfate without compromising the integrity of the sample.

<sup>2</sup> The USEPA recommends preservation of water samples with sodium thiosulfate when free chlorine may be present.

<sup>3</sup> The vials used for the analysis of BTEX and VOC are to be collected with no headspace; this is to minimize the loss of volatile compounds. All other glass bottles should always have a headspace to prevent breakage caused by shifts in temperature.



**BTEX/TPH (ATLANTIC M.U.S.T.) - WATER**

Total Hydrocarbons Water (Atlantic M.U.S.T.) testing requires **2 x 250ml glass bottles containing sodium bisulfate** as a preservative and **2 x 40ml amber glass vials containing sodium bisulfate** as a preservative.

To prevent breakage, glass bottles require headspace, however, vials are to be filled to capacity with no headspace remaining. Samples are to be delivered to the laboratory for analysis as soon as possible after sampling.

Note: MTBE can be analyzed using same vials as provided for Total Hydrocarbons in Water (Atlantic M.U.S.T.).

**BTEX/TPH (ATLANTIC M.U.S.T.) - POTABLE WATER**

For low-level detection limits (potable water), **2 x 1L amber glass bottles containing sodium bisulfate** as a preservative and **2 x 40ml amber glass vials containing sodium bisulfate** as a preservative are required.

To prevent breakage, glass bottles require headspace, however, vials are to be filled to capacity with no headspace remaining. Samples are to be delivered to the laboratory for analysis as soon as possible after sampling.

Note: MTBE can be analyzed using same vials as provided for Total Hydrocarbons in Water (Atlantic M.U.S.T.).

**PAH and PCB - WATER**

Polycyclic Aromatic Hydrocarbons (PAH) and Polychlorinated Biphenyl (PCB) testing requires **1 x 1L glass amber bottle with or without preservative**.

The bottle is to be filled with headspace remaining. Sample is to be delivered to the laboratory for testing as soon as possible after sampling.

**CLEAN WATER ACT (VOC/SVOC)**

The Clean Water Act testing comprised of Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOC's), requires **2 x 250ml glass bottles containing sodium bisulfate** as a preservative and **2 x 40ml amber glass vials containing sodium thiosulfate** as a preservative.

To prevent breakage, glass bottles require headspace, however, vials are to be filled to capacity with no headspace remaining. Samples are to be delivered to the laboratory for analysis as soon as possible after sampling.

**TRIHALOMETHANES/VOC ONLY - WATER**

Trihalomethanes (THMs) and samples for Volatile Organic Compounds (VOC) only require **2 x 40ml amber glass vials with sodium thiosulfate** as a preservative.

Vials are to be filled to capacity with no headspace remaining. Samples are to be delivered to the laboratory for analysis as soon as possible after sampling.

## ORGANIC SOIL/SEDIMENT TESTING

Samples for organic parameters (BTEX/TPH, PAH, PCB, etc.) should be collected in 250 mL glass jars fitted with PTFE-lined lids.

Separate containers may not be required for each parameter – please contact us for details.

Unused portions of original samples and/or sample extracts will be retained for a minimum of one month from the date the final report is issued. Samples will be discarded after this time unless prior arrangements have been made.

### SOIL BOTTLE REQUIREMENTS FOR ORGANIC ANALYSIS

ANALYSIS	CONTAINER	VOLUME	PRESERVATIVE	RECOMMENDED HOLDING TIME
BTEX/TPH (by ATLANTIC M.U.S.T.)	Glass Jar	250ml	None	14 DAYS
	Glass Vial	40ml (2)	Methanol	28 DAYS
PAH	Glass Jar	250ml	None	14 DAYS
PCB	Glass Jar	250ml	None	14 DAYS



### BTEX/TPH (ATLANTIC M.U.S.T.), PAH, PCB, etc - SOIL

Total Hydrocarbons Soil (Atlantic M.U.S.T.) testing requires **1 x 250ml glass jar with no preservative** and **2 x 40ml glass vials containing methanol**.

- JAR:**
- Jar is to be filled as much as possible taking care to avoid rocks in the samples when possible.
- VIALS:**
- The 40ml clear vials containing methanol **MUST** be supplied by RPC. Analysis cannot be completed using vials from other suppliers.
  - Ensure methanol is at the level indicator mark on the vial.
  - Obtain a representative soil sample in the Terra-Core sampler. Terra-Core samplers can be supplied by RPC at cost.
  - Vial labels should be filled out in ink (not Sharpie marker). No extra labels, tape, etc can be added to vial as it will affect the weight.

## INORGANIC CHEMISTRY

RPC's Inorganic Chemistry Department offers a comprehensive selection of inorganic analytical services. We provide testing related to drinking water quality, surface and groundwater monitoring and industrial wastewater characterization. RPC also analyzes soils, sediments, vegetation, fish tissue and a variety of other sample matrices for a wide range of constituents.

### INORGANIC ANALYSIS

- General Inorganic Water Chemistry
- Trace Metals and Mercury analysis of various matrices (water, soil, tissue, etc)
- Arsenic Speciation in potable water
- Nutrient Analysis (water, wastewater, soil, compost, etc)
- Acid-base accounting (ABA) and Acid Rock Drainage
- Particle Size Analysis of soils and sediments
- Leachate Extraction and Analysis (TCLP, SPLP)
- Industrial Hygiene Analysis (elemental analysis of paint, dust, airborne particulates, etc)
- Characterization of Unknowns

### SAMPLE CONTAINERS AVAILABLE

- 500ml plastic bottle
- 250ml plastic bottle
- 250ml plastic labeled bottle "Sulfide" preserved with Zinc Acetate/NaOH
- 250ml plastic labeled bottle "Cyanide" preserved with NaOH
- 50ml metals tube
- 250ml amber glass bottle
- 125ml amber glass bottle
- 100ml plastic cups

## INORGANIC DRINKING WATER TESTING

### WATER/LIQUID SAMPLING INSTRUCTIONS FOR INORGANIC ANALYSIS

1. Collect samples only in the proper size and type of bottle as supplied by our laboratory.
2. Do not rinse the bottle(s).
3. Take care not to touch the inside of the bottle or cap.
4. Flush cold water tap for 5 minutes before sampling.
5. Carefully fill the bottle(s) to the shoulder and cap immediately (use cold water tap only).
6. Identify each bottle clearly using labels and waterproof ink or pencil.
7. Keep samples cool during storage and transport to the laboratory. Use a cooler and freezer packs for shipping. Pack sample bottles securely such that they are not at risk of breakage.
8. Samples must arrive at the laboratory as soon as possible after sampling (preferably within 24 hours).

### WATER/LIQUID BOTTLE REQUIREMENTS FOR INORGANIC ANALYSIS

ANALYSIS	CONTAINER	VOLUME	PRESERVATIVE	RECOMMENDED HOLDING TIME
DRINKING WATER PACKAGE (DWP), POTABLE WATER INORGANIC (PWI) or WATER CHARACTERIZATION PACKAGE (WCP)	Plastic Bottle/ Plastic Tube	250ml/ 50ml	Preservation Performed at Lab	VARIOUS
GENERAL CHEMISTRY PACKAGE	Plastic Bottle	250ml	None	VARIOUS
	Plastic Tube	50ml	See footnote <sup>1</sup>	6 MONTHS
TRACE METALS <sup>1</sup>	Plastic Tube	50ml	See footnote <sup>1</sup>	6 MONTHS
MERCURY <sup>1</sup>	Plastic Tube	50ml	See footnote <sup>1</sup>	28 DAYS
BOD	Plastic Bottle	250ml	None	24 HOURS
COD	Plastic Bottle	250ml	Preservation Performed at Lab	28 DAYS
SOLIDS – TSS/TDS	Plastic Bottle	250ml	None	7 DAYS
SULFIDE	Plastic Bottle	250ml	Zinc Acetate / NaOH	7 DAYS
TOTAL PHOSPHORUS or TKN	Plastic Bottle	250ml	Preservation Performed at Lab	7 DAYS
PHENOLICS - TOTAL	Amber Glass Bottle	125ml	Preservation Performed at Lab	28 DAYS
OIL & GREASE	Amber Glass Bottle	500ml	Preservation Performed at Lab	28 DAYS
CYANIDE	Plastic Bottle	250ml	NaOH	28 DAYS

<sup>1</sup>Filtration should be considered prior to sample preservation with nitric acid. If required, syringes and filters are available for an additional cost. It is preferable to acidify samples at the time of collection. Unpreserved samples will be acidified upon receipt.



### GENERAL CHEMISTRY, BOD, COD, TSS/TDS, TOTAL PHOSPHORUS, TKN - WATER

A 250ml plastic bottle or a 500ml plastic bottle (plus a 50 ml plastic tube for General Chemistry) may be adequate for the majority of inorganic testing. Determining which to use is based on the type of test being performed or how many tests to be performed (i.e. BOD and COD require their own 250ml bottle). Additional bottles may be required for additional analyses, please check with laboratory staff for specific bottle requirements.



### TRACE METALS and MERCURY - WATER

A 50ml red-capped metals tube should be provided if metals testing is required. If you do not have a metals tube at the time of sampling, the laboratory is able to pour off some sample from another bottle at the time of processing if submitted on the same day as sampling.



## SULFIDE, TOTAL OIL & GREASE, CYANIDE - WATER

Sulfide, Cyanide and Total Oil+Grease (or Mineral Oil+Grease) will also require specific bottles.

## INORGANIC SOIL/SEDIMENT TESTING

Samples for inorganic parameters (Trace Metals, Mercury, Nutrients, etc.) may be collected in plastic containers.

Separate containers may not be required for each parameter – please contact us for details.

Unused portions of original samples and/or sample extracts will be retained for a minimum of one month from the date the final report is issued. Samples will be discarded after this time unless prior arrangements have been made.



## INORGANIC ANALYSIS - SOIL/SEDIMENT

Soil/sediment samples for inorganic parameters require that samples be collected in plastic containers, such as the 100ml plastic container pictured to the left, or in Ziploc freezer bags. Clean wide-mouth glass bottles are also acceptable.

### DID YOU KNOW?

RPC also offers **air quality analyses**.

Contact us or visit [rpc.ca](http://rpc.ca) to learn more about these and RPC's other services.

## Contact Us

### RPC - Fredericton

921 College Hill Road, Fredericton, NB  
Canada E3B 6Z9

Tel: 506.452.1212

Fax: 506.452.1395

Toll Free: 1.800.563.0844

Email: [info@rpc.ca](mailto:info@rpc.ca)

Hours: Monday to Friday: 8:15am - 5:00pm

### RPC - Moncton

115A Harrisville Blvd., Moncton, NB  
Canada E1H 3T3

Tel: 506.855.6472

Email: [info@rpc.ca](mailto:info@rpc.ca)

Hours: Monday to Friday: 8:15am - 5:00pm

### BOTTLE ORDERS

To request sample bottles for your project please email: [bottleorders@rpc.ca](mailto:bottleorders@rpc.ca)

LabRefGuideEN

[rpc.ca](http://rpc.ca)