

**Standard Operating Procedure for Collecting Surface
Water Quality Samples**
For
The Parlee Beach Watershed Monitoring Assessment

Department of Environment and Local Government

July 2017

Purpose

In order to ensure the high quality and reliability of water quality results, a water quality sample must be collected in a manner that follows a standard procedure. Preparation and training are required to collect samples to accurately reflect the water quality at a particular site and to preserve the sample during handling and transportation to the laboratory. Subtle deviations may influence results that will be used in making decisions regarding public health. The guidance provided below must be followed with care each time.

The following overview describes important considerations for planning and preparation for a recreational water quality survey, and procedures to carry out the sample collection, preservation, handling, and submission for analysis.

Safety Considerations

- Always inform someone of your travel plans and times.
- **Please use your best judgment when determining if field conditions pose a safety hazard. Conditions such as high wave action and thunder and lightning storms may limit the amount of sampling that can be completed. If this occurs please note this in the comments section of the field observation sheet.**
- Since the sampler will be collecting samples where the depth of water is approximately 0.5 m, a life jacket must be worn and hip-waders are suggested.
- Before wading into the water, look for obstructions and take into consideration the current strength. Remember that hip-waders will become anchors if they fill up with water.
- For hygienic reasons, wash your hands thoroughly after collecting samples and before eating.
- Some safety equipment that you may want to include in your sampling trip is listed below:
 - o First aid kit
 - o Cellular phone
 - o Change of clothing

Preparation Prior to Sampling

The following points should be considered before the sampling event:

Equipment needed:

Ensure you have what you need in order to collect a sample:

- Life Jacket
- Field book and field observation data sheet
- A list and description (with GPS coordinates) of sampling locations
- Copy of sampling procedure
- Pens and permanent markers
- Sunscreen
- Extra clothing
- A backpack or suitable bag for carrying the samples

- Cooler
- Ice packs
- Sample Bottles
- GPS
- Hip waders
- Sampling pole Water Quality Meter
- Disposable sampling gloves
- Sample Submission Form

Sample Labelling

- Label each bottle with the appropriate field number and analysis package on a dry sample bottle with a permanent marker. Be sure that the field number on the sample bottles matches the field number in the field book and on the laboratory sample submission form.
- Please use the block of field numbers assigned by DELG for the Shediac Bay Watershed Association (17/17/04000-07/07/04999)
- Use one field number per station
- The field number always has a two digit prefix/ sampling year/and an assigned 5 digits number (Ex. 15/17/04000).
- Stations differ in the analysis package that is needed and thus a specific set of bottles will need to be used for sample collection. Please refer to the Sample Plan spreadsheet for more detailed information. All station locations are listed in Table 1. For the surface water package, one 500 ml bottle and one red capped 50ml tube will need to be collected (Figure 1). For stations that require bacteria samples, use two 200ml bacteria bottles and label one bottle as *E.coli* and the other as Enterococcus (Figure 2)

Table 1: List of Parlee Beach watershed monitoring locations. Refer to the sample plan spreadsheet for more detailed information on analysis required for each location. A map of the location is included in Appendix 1.

| Site code | Site name | Latitude | Longitude |
|--------------------------|---|-----------------|------------------|
| Stormwater Sites | | | |
| SW1 | Taits Brook discharging to Shediac Bay north of Shediac City Hall | 46.220387 | -64.549649 |
| SW2 | Calder St, Shediac | 46.223678 | -64.546681 |
| SW3 | Unnamed creek | 46.224236 | -64.528889 |
| SW4 | Unnamed creek | 46.227846 | -64.52132 |
| SW5 | Unnamed creek | 46.232984 | -64.512897 |
| SW6 | Ditch behind PB brook | 46.238904 | -64.511844 |
| SW7 | Unnamed creek | 46.231662 | -64.497722 |
| SW8 | Unnamed creek | 46.230477 | -64.494986 |
| Agriculture Sites | | | |
| AG1 | Unnamed creek, Gaunce Farm | 46.187219 | -64.555455 |
| AG2 | Unnamed creek, Connors Farm | 46.202568 | -64.553173 |
| AG3 | Unnamed creek, Cornwall road | 46.211653 | -64.558103 |

| Marine | | | |
|-------------------------|---------------------------------------|-----------|------------|
| M1 | Offshore from Parlee Beach | 46.242846 | -64.506296 |
| M2 | S of Pointe du Chene Wharf | 46.234176 | -64.530529 |
| M3 | Shediac Island W | 46.262675 | -64.555517 |
| M4 | Cap Bimet | 46.242468 | -64.458638 |
| M5 | Parlee Beach | 46.240809 | -64.509056 |
| Freshwater Sites | | | |
| FW1 | Unnamed creek | 46.225761 | -64.473311 |
| FW2 | Unnamed creek | 46.213045 | -64.564826 |
| FW3 | Unnamed creek | 46.222905 | -64.566184 |
| FW4 | Unnamed creek | 46.245372 | -64.568779 |
| FW5 | Scoudouc River | 46.147788 | -64.517315 |
| FW6 | Scoudouc River | 46.145092 | -64.564253 |
| FW7 | Scoudouc River | 46.194305 | -64.525205 |
| FW8 | Shediac River | 46.244998 | -64.665407 |
| FW9 | Batemans Brook | 46.231067 | -64.620244 |
| FW10 | Scoudouc River Estuary at Highway 133 | 46.21937 | -64.553704 |
| FW11 | Shediac River Estuary | 46.272547 | -64.575199 |



Figure 1: Example of labelled for the Surface Water (SW) Package

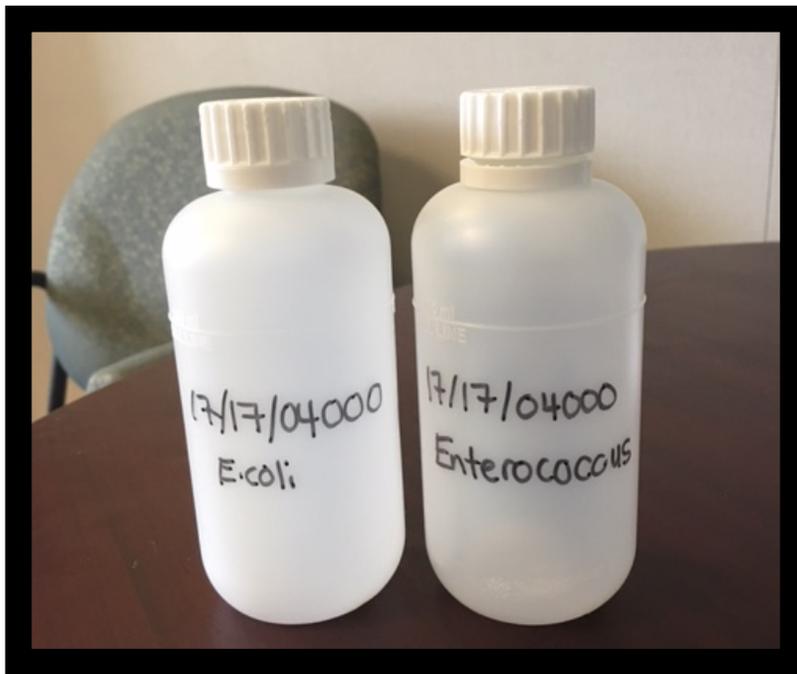


Figure 2: Example of labelled bottles for bacteria sampling

Sample Collection

- Samples must be collected every 2 -3 weeks at the specified sites for bacteria monitoring (see map in Appendix 1). See the sampling plan spreadsheet for other the frequency of other analysis and requirements in terms of sampling conditions such as monitoring after rainfall and tides.
- All field documentation and observations must be recorded in a field book and on field observation sheets before leaving the site (see Appendix 3 for field observation sheet). Please send the field observation sheets via email to Erin.douthwright@gnb.ca and Patricia.Holland@gnb.ca after each sampling event.
- The following information should be documented:
 - o Your name and the names of those who accompany you
 - o Date and time of sample collection
 - o Sample observations should be included as well and describes anything unusual about the water (dead fish, foam, odours, unusual water colour, debris, turbulence and presence of suspended sediment or surface matter).
- Each time a sample is taken the following steps should be followed in order to prevent contamination:
 - o The sampler's hands should be clean, free of grease, debris, or other substances.
 - o Do not smoke, eat or drink immediately before or during sampling.
 - o The caps must be kept on the sampling bottle until the sample is taken.
 - o Nothing should be placed inside the bottle except the water sample.
 - o Bacteria samples are sensitive to contamination and the inside of the bottles and the lids must not contact any surface during the course of sample collection.
 - o After removing the caps, they must be held so that the inside is not touching any surface at any time including your fingers. Do not set caps down so that the inside surfaces are touching any other surface.
- Enter the water to minimize sediment disturbance. For river sampling, stand downstream of sampling point. Carry bottles in a backpack as this will allow you to have two free hands while sampling.
- Bottles should be 6 inches below the water's surface (when possible) in small streams and at a minimum of 12 inches depth for larger streams.
- Bottles require no rinsing. Collect the bacterial sample first, filling to just above the line on the bottle. Fill all other bottles completely. Be careful when approaching high flowing water; avoid the water if the site is unsafe. Safety is the first priority.

Transportation/Shipping Instructions

Samples must be delivered to the laboratory within 24 hours of sampling. Travel plans must include sufficient time to reach laboratory and have analysis performed. Preservation of bacteria samples involves capping the bottles tightly, cooling the bottles immediately on ice, and keeping them cool until they reach laboratory.

- Keep samples at a temperature of 4°C. Efforts must be made to ensure that there is enough ice/ice packs to survive the travel time to the lab.

- Bacteria samples must be analyzed within 24 hours of sample collection.
- Request that RPC repack your cooler with bottles for your next sampling event.

Transportation Plan for Shipping Water Samples

- Options for transportation include:
 - 1. Driving samples directly to RPC Fredericton (921 College Hill Road)**
 - 2. Dropping off samples at RPC Moncton (150 Lutz Street). Samples need arrive before 2:30. If dropping the samples at the Moncton location please let them know that all samples need to be processed in Fredericton (even *E.coli*).**
 - 3. Shipping samples using Maritime Bus Moncton terminal (1240 Main Street). Buses for Fredericton leave Moncton at 11:50, 2:00 and 5:00. If you are going to use the bus then please notify RPC Sample Receiving (452-1281) that you are shipping samples up on the bus so they know to go pick them up.**
 - Specify that you want the samples shipped on the direct bus to Fredericton as there are days were the bus takes a longer route.
 - The name, address, and telephone number of the sender and recipient must be clearly indicated and legibly shown on all packages of the shipment. A warning that the contents of the cooler are perishable should also be attached.
 - **RPC mailing address:** 921 College Hill Road
Fredericton, New Brunswick E3B 6Z9
Tel: (506) 452-1212
 - Upon arrival at the Maritime Bus Terminal in Fredericton the samples will be picked up by RPC.

Sample Submission Forms

A sample submission sheet must accompany samples to the lab. Use a plastic zip-loc bag to protect the paperwork. An example of how to complete the paperwork is attached below and can be found Appendix 3. In addition to the Shediac Bay Watershed Association receiving the results from RPC, three additional emails need to be added to the sample submission form so they can receive the results as well. These include:

- Erin Douthwright (Erin.Douthwright@gnb.ca)
- Don Fox (Don.Fox@gnb.ca)
- Patricia Holland (Patricia.Holland@gnb.ca)

Photocopy or scan the sample submission form for your records as well as send a copy to Erin.Douthwright@gnb.ca and Patricia.Holland@gnb.ca.

Please note it is important to specify whether the samples are salt water or freshwater on the RPC sample submission form under the “Sample Matrix” section.

RPC sample submission forms can be downloaded here:

<http://www.rpc.ca/english/pdf/RPCSampleSubmissionForm.pdf>

The time for each sample must be noted on the form as well please sign and date the form within the “Chain of Custody” section.

Quality Assurance and Quality Control

- It is recommended that every 1 in 10 sampling trips should include a field and trip blank.
 - o Field blanks of distilled water need to be filled in the field. They can indicate contamination from handling or air contaminants. Field blanks are handled the same way a regular sample would be handled by exposing the distilled water to the air for the same the period of time the original sample was exposed.
 - o Trip blank bottles will be filled with distilled water prior to leaving on a sampling trip. Trip blanks are used to detect contamination from the sampling container or other sources during transportation and storage. Trip blanks remain unopened through the course of the sampling excursion. They are subjected to the same transportation and storage conditions as the rest of the samples and are submitted for analysis.
 - o Distilled water can be purchased at Walmart or Superstore.
- Field and trip blank will be submitted to RPC on the same sample submission sheets used for routine samples. Please record which field number is associated which QAQC sample in your field book and field observation sheets.
 - o Each set of QAQC samples need to use a new field number. For example the field blank will be given its own number (17/17/04000) and the trip blank will be given its own number (17/17/04001) and these numbers cannot be reused.
- Field blanks and trip blanks should not be identified as such on the sample submission sheet. They should only be identified with a field number.

Important Contacts:

RPC Fredericton: 452-1212 (reception), 452-1281 (sample receiving)

RPC Moncton: 855-6472

Questions related to sampling: Erin Douthwright 444-2053 or Patricia Holland 453-6703

DELG Manager of Water Quality and Quantity: Don Fox - 457-7257

Appendix 1: Map of sampling locations



Appendix 2: RPC Sample Submission Form for Parlee Beach Watershed Monitoring



Sample Submission Form

Chain of Custody Record - SS01.10

Fredericton: 921 College Hill Rd., Fredericton NB E3B 6Z9 T: 506.452.1212 F: 506.452.0594 Toll Free: 800.563.0844
 Moncton: 150 Lutz St., Moncton NB E1C 5E9 T: 506.855.6472 F: 506.855.8294

Report To Customer

Bill To Customer (if different)

Project/Submission Information

Company: Shediac Bay Watershed Association

Company: SNB AP - clo DELG

Site Location: Parlee Beach Watershed

Address: P.O. Box 6000, Fredericton NB

Project Number:

Contact: E3b 5H1 spending authority/ Don Fox

Submission Date:

Telephone: Contact: SNB Accounts Payable

Sampled by (print):

Fax: Telephone: 1-888-487-5050

Sampler's Initials:

E-mail: Fax:

Purchase Order #:

E-mail: invoices@snb.ca

RPC Quotation #:

LIMS #: Sample Matrix

Client Identification

Sample Date/Time

Analysis Required

Other Analyses/Comments

Salt Water 17/17/04000 M1

Freshwater 17/17/04002 FW1

I ✓ II ✓ III ✓ IV ✓ V ✓

Send Results to: Patricia.Holland@gnb.ca

Erin.Doutrivnght@gnb.ca

Don.Fox@gnb.ca

| Analysis Required (Description) | Preservatives | Documentation | Sample Volume |
|---------------------------------|---------------|---|--|
| I E.coli (MPN) | | <input type="checkbox"/> Documentation | <input type="checkbox"/> Sample Volume |
| II Enterococcus | | <input type="checkbox"/> Sample Containers | <input type="checkbox"/> Hold Time |
| III Surface Water package | | <input type="checkbox"/> Sample Temperature | Temperature = _____ |
| IV | | | |
| V | | | |

Sample Receiving Checklist

Label samples carefully and complete all parts of the form.

Please see reverse side for more information.

Chain of Custody

(1) Relinquished by: Date: (1) Received by: Date:

Company: Time: Company: Time:

(2) Relinquished by: Date: (2) Received by: Date:

Company: Time: Company: Time:

Date: Date:

Date: Date:

Shaded Areas for Lab

Submission

Turnaround

Routine:

Varies by analysis

Rush (surcharge apply)

24 Hours 48

3 Days 4

Specific Date Require

(do not use ASAP):

Appendix 3: Field Observation Form

Field Observation Form

NAME OF GROUP/COMPANY: _____

Station name: _____

DELG field number: _____ (unique number for this station for this day)

Date: _____ **Time (00:00-24:00):** _____

Sample collected by: _____

Weather: _____

Rainfall in the last 24 hours: _____ **None** _____ **Light** _____ **Heavy**

Water level: _____ **Low** _____ **Normal** _____ **High**

Water clarity/colour? _____

Algae? _____

Oil/film/foam on water? _____

Garbage in water or on shore? _____

Fish (dead or alive), aquatic insects? _____

Bank erosion / state of bank vegetation? _____

ATV crossings / cattle crossings? _____

Construction (e.g. road, bridge) upstream of sample site? _____

People fishing/swimming upstream? _____

Natural/man-made barriers (e.g. beaver dams) upstream/downstream? _____

Other general comments: _____

Water Temperature (°C): _____ **Dissolved Oxygen:** _____ (mg/L)

pH: _____ **Conductivity:** _____ (μ s/cm)