ESR
Science for Communities

Water sampling instructions for bacteriological tests

The Institute of Environmental Science and Research (ESR) Public Health Laboratory

These instructions (version 5) provide details for sampling a variety of potable and non-potable waters and sending those samples to ESR. Points 1 to 6 provide general guidance, points 7 to 10 contain details on packing and sending samples to ESR, then the following points cover instructions for different water types. Please contact the Public Health Laboratory (PHL) prior to sample collection for more specific guidance if needed. Contact details are at the end of this document.

1 General points

1. Samples for microbiological examination should be collected in clean, sterile, wide-mouth, nonreactive borosilicate glass or plastic bottles, with leak-free lids. These bottles should be large enough to collect the desired sample volume and still retain sufficient headspace to allow proper mixing of the sample in the bottle by shaking prior to analysis.

2. Collect sample volumes sufficient to carry out all tests required, check with the laboratory prior to sampling if unsure. For potable, surface, recreational, and wastewater samples, collect a minimum of 100 mL. Larger volumes are needed for some bacterial pathogen and molecular analyses.

3. Take precautions to avoid contaminating the sample. Wear clean disposable gloves when collecting the sample and avoid touching the inside of the bottle or cap with hands or anything other than the water sample itself.

4. Fill bottles once without rinsing or pouring out any collected water, and ensure the lid is replaced immediately and securely.

5. Ensure all samples are clearly identified and labelled on the body of the container, not the lid.

6. If sampling chlorinated water, use a sampling bottle containing sodium thiosulphate as a dechlorinating agent to prevent bactericidal action from continuing during transit of the sample. The PHL can provide sterile sample bottles with a sodium thiosulphate concentration equivalent to 100mg/L.

2 Sending samples to ESR

7. Record the time, date, weather conditions and the name of the sampling point onto the sample submission form. Try to fill in as much information as possible on the sample submission form about the sample point, and make sure each sample bottle is clearly

and uniquely identified. The sample submission form should be included in a plastic bag inside the chilly bin.\

8. Place the sample, and a temperature blank that is representative of the source water temperature, in a chilly bin cooled with frozen slikka pads or similar. Don't use loose ice as once melted it may contaminate the water sample. Make sure bottle lids are tight, the samples are upright and won't tip over during transport.

9. Samples should be kept in the dark and cold but unfrozen (<10 °C) during transport to the laboratory. The laboratory may reject any samples that show evidence of freezing.

10. For most accurate results, it is essential that the laboratory has the sample as soon as possible after sampling as organisms will die off within a few hours. The sample should be delivered to the laboratory within 6 hours if possible or at the very outside it must be delivered within 24 hours.

3 Sampling drinking water

11. It is recommended to take more sample bottles than you expect to use, so that in the event any concerns about the integrity of the sampling procedure, another sample can be collected.

12. Open the cold water tap and let the water run to waste for two to three minutes to flush through the system.

13. Reduce the water flow so the bottle can be filled without splashing. Collect a 'grab sample' by opening the sample bottle and collecting all the sample at once. Take care that the tap does not touch the inside of the bottle, and conduct no further manipulations, such as pouring off or adding to sample, because such activities could contaminate sample. Securely replace the bottle lid.

14. If something goes wrong with the collection of the sample, use a fresh sample bottle and start again. Do not pour out the whole sample and refill the bottle.

15. If tap cleanliness is questionable, choose another tap if possible. If a questionable tap has to be used, disinfect the faucet (inside and outside) by applying a sodium hypochlorite solution (100 mg/L NaOCl) to the faucet or wipe with an antibacterial wipe, and then let the water run at a steady consistent flow for another 2 to 3 min after treatment before collecting the sample. Make a note of the tap condition on the sample submission form.

4 Sampling non-potable / recreational water

16. Swimming pools / spa pools Collect samples during periods of maximum bather load. Collect samples by carefully removing the cap of a sterile sample bottle and holding the bottle near the base at an angle of 45°. Do not rinse the bottle. Fill in one slow sweep down through the water, with the mouth of the bottle always ahead of the hand. Avoid collecting floating debris. Replace the cap. For pools equipped with a filter, samples may be collected from sampling ports provided in the filter's return and discharge lines.

17. Marine water: Collect samples 0.3 m below the water surface in the areas of greatest bather load. Samples may be taken ankle deep (at ~0.075 m below water surface). In deeper waters, if desired, take another sample approximately 0.075 m below the water surface. This area may be somewhere between the knees and the chest, depending on

how deep the water is where the sample is taken. Collect samples by carefully removing the cap of a sterile sample bottle and holding the bottle near the base at an angle of 45°. Do not rinse the bottle. Fill in one slow sweep down through the water, with the mouth of the bottle always ahead of the hand. Avoid collecting floating debris. Replace the cap.

18. Rivers, streams, lakes, wastewater: Face the container upstream and submerge the container with the opening pointing straight down. At approximately 20 cm depth, gently turn the container into the flow of the water, allowing it to fill. Turn the container to face upright and remove it from the water. Pour off a small amount of water so there is about a 1 cm gap to the top of the lid. Replace lid taking care not to touch the inside of the container or underside of the lid.

If you have any problems with sampling please contact the Public Health Laboratory:

Telephone: 03 351 0053
E-mail: PHL.phlcsc@esr.cri.nz

Laboratory hours are from 8:30 am to 4:30 pm Monday to Friday. Please inform laboratory staff in advance if samples are likely to arrive after 4 pm.

Address: FAO Public Health Laboratory, ESR Christchurch Science Centre, 27 Creyke Road, Ilam 8041, Christchurch.

Amendment Record

Version number	Update
2.0	20/07/2006: Change to meet new 2005 Drinking Water Standard
2.0	Reviewed no Change
3.0	Reviewed. Change of approver. Minor text changes
4.0	Reviewed. Change of approver.
5.0	Reviewed and updated to include non-drinking water samples. Guidance allied with Standard Methods 9060 and 9213, and Taumata Arowai Drinking-Water Guidelines 2019, Chapter 6 section 6.4.