



Environmental Waters Standard Microbiological Water Sampling Technique

Environmental Health Guide

There are a number of important points to remember when taking environmental water samples. Aseptic techniques are essential to avoid contaminating the sample container and the water sample.

1. General Rules of Sampling

Take extra care to avoid contaminating the sample container and the water sample.

Do Not:

- ✗ Contaminate the bottle by touching the inside of the bottle.
- ✗ Contaminate the bottle lid by touching the inside rim.
- ✗ Put the bottle lid on the ground while sampling.
- ✗ Collect replicate samples from the exact same location, collect replicates several metres apart - this will prevent the sample being contaminated by disturbed sediments and the sampler etc.
- ✗ Rinse the bottle.
- ✗ Transport environmental water samples with other water samples, eg: effluent or drinking water.

Always:

- ✓ Collect microbiological samples *before* collecting other samples.
- ✓ Label the bottle before sampling.
- ✓ Discard damaged or contaminated bottles. If in doubt throw it out and take another sample in a new bottle.
- ✓ Wash your hands thoroughly before and after collecting samples suspected of containing faecal material.

Only remove the bottle from the plastic bag:

- ✗ To complete the label details.
- ✗ When it is time to sample.

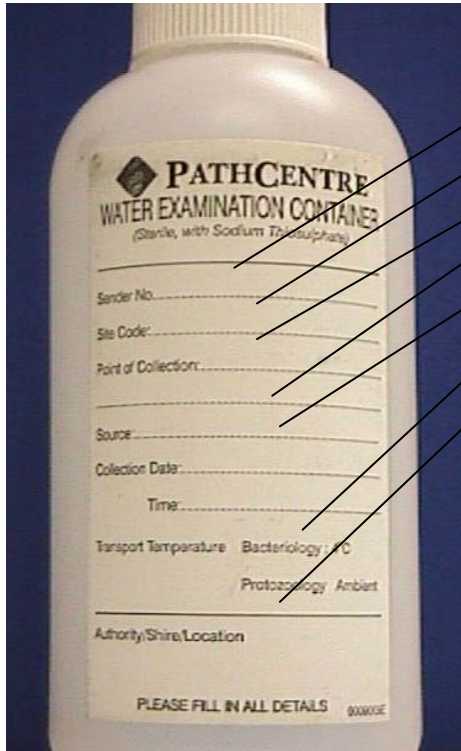
Also:

- ✗ If there is any reason to suspect that contamination has occurred during sampling, discard the sample and take another in a fresh bottle.



2. Sampling Bottle Labelling

Prior to taking a sample the following information should be provided on all sample bottles:



- Sender reference number
- Site code
- Point of Collection/Source - site description
- Site Location
- Date and time of collection
- Transport temperature (4C or ambient)
- Authority or Company Name

NOTE: Use a water proof pen when marking sample bottles so the information will not rub off in the water.

3. Sample Collection Procedure

1. Take a labelled sterile 250ml sample bottle. Make sure you keep the lid on the bottle until you are ready to collect the sample.
2. Move to the sample location and wade knee deep into the water, trying to avoid stirring up bottom sediment.
3. Hold the sterile bottle in one hand near the base, and carefully remove and hold the screw cap with the other hand. Be careful not to touch the inside of the screw-cap when sampling.
OR
Place the sampling bottle into the sampling pole, making sure it is securely clamped into position. Carefully remove and hold the screw cap with your free hand. Extend the pole out into the water.
4. Plunge the sample bottle neck downwards approximately 30 cm below the water surface, moving the bottle away from your body. This sample depth should be adhered to consistently.
5. Turn the bottle neck slightly upwards to allow air to exit, which allows the bottle to fill up. Move the bottle into the current, remembering to keep your hand away from the mouth of the bottle at all times. The current should fill the bottle to the rim. If there is no current, move the bottle horizontally through the water until it is full.
6. Once the bottle is full remove it from the water.
7. Tip enough of the water from the bottle to leave an air space of about 1-2 cm from the rim of the bottle. This air space is necessary to facilitate mixing of the sample by the laboratory.
8. Carefully replace the screw-cap immediately and tightly.



9. Place the bottle in the esky on ice or ice bricks for bacteriological samples.

OR

10. Place the bottle in an esky without ice bricks for protozoology samples.

Note: Use a sampling pole if it is not practical to wade into the water, if the water conditions are turbulent, or if you are unsure of the physical hazards in the water.

4. Sample Transportation

Samples should be kept in the dark and maintained as cool as possible within a chilled insulated container and returned to the laboratory promptly after collection.

TEMPERATURE

Microbiological

Microbiological samples should be collected preferably using pre-chilled bottles, and then stored immediately in a chilled insulation container (esky) between 1°C and 4°C. The chilled temperatures are used to prevent the multiplication of bacteria which may result in false bacterial counts.

To chill the insulated container use freezer ice bricks if available, or loose ice.

Amoeba

Water samples for amoebae analysis should be transported in a non-chilled insulated container at ambient temperature. The esky must not contain an ice-bricks as the chilling of the sample will kill any viable amoebae.

TIME

Samples should be transported in an esky with ice bricks with the aim of delivering the samples to the laboratory as soon as possible, or within 6 hours of commencing sampling, whilst keeping the sample bottle temperatures at 4°C ±2°C.

Under exceptional circumstances, the sampling and transport time may exceed 6 hours but should never exceed 24 hours.

5. Submitting Samples

It is essential that all samples be given a site code number before they are submitted for analysis. For more information regarding site code allocation refer to 'Site Code Identification System for Water Samples', published by the Department of Health.

The chain of custody documentation should be supplied by the analytical laboratory. This is used to ensure the details of the sampling can be traced at all times.



The person collecting the samples must fill out this form. Chain of custody forms will require information such as;

Company Name
Company Address
Sample Collection Date
Site Code
Samplers name & signature
Site Description
Time of Sample Collection

LABORATORY USE ONLY		SAMPLE DETAILS			TREATMENT				SAMPLE SUBMITTED (please tick)		LABORATORY USE ONLY	
Laboratory Number	Site Code	Description	Type Sampled	Type (CLSI 45)	ppm	Temp (°C)	pH	Bacteria (chilled)	Amoebae (ambient)	Bacteria set up by / Date	Amoebae set up by / Date	
Laboratory Comments			Authorized by		Date		Project Number					

Note: Always inform the laboratory if you suspect the samples are contaminated by faecal material.

6. Site Observation Details

It is important to take accurate records when conducting field sampling. Recording site details and environmental factors will help when interpreting the sample results later on. It is suggested that field notes include the following details;

- Date
- Time of sampling
- Site name/description
- Site codes

Record environmental factors such as;

- Rainfall in the past 24-48 hours
- Approximate number of bathers in the water
- Water clarity (visual clarity in the water)
- Weather conditions (temperature, cloud cover)
- Presence of animals (domestic and wild animals)
- Stormwater flow
- Presence of algae or algal blooms
- Surface Films (oils and petrochemicals)
- Wind strength
- Wind direction
- Other comments (e.g. number of bathers present, boats, anglers)



Further Information

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