

How to process a water sample for laboratory analysis

Key messages

- Processing water samples for laboratory analysis provides the most accurate way to measure nitrogen concentration.
- Water samples first need to be filtered in the field, refrigerated after collection, and frozen before being shipped to a laboratory for analysis.
- For accurate results it is important to follow protocols for sample collection, processing and transport. For more information see the Queensland Government's Monitoring and Sampling Manual 2018 or ask your local extension officer, Council or regional NRM body for assistance.

Introduction

Analysing surface water or groundwater samples in a laboratory provides the most accurate result for a given dissolved nitrogen compound (e.g., nitrate, nitrite, ammonium, dissolved organic nitrogen, etc.). Multiple forms of nitrogen can also be analysed, providing a more complete and accurate measure of dissolved nitrogen (compared to nitrate strips). Refer to “**2 How to monitor surface water quality on your farm**” and “**3 How to monitor groundwater quality on your farm**” for further information on collecting surface water and groundwater samples. Processing a sample for laboratory analysis involves filtering, refrigeration, and shipment to a laboratory.

Is processing a sample for laboratory analysis expensive?

There are several costs associated with processing a water sample for laboratory analysis:

Processing

Processing a sample is relatively cheap and requires a syringe, a 0.45 µm syringe filter and a 200 mL sampling bottle (≈ \$8).

Transport

Sending samples to a laboratory can be cheap if they can be delivered to a local laboratory. Otherwise, samples will need to be packaged and express-shipped so they can stay cool.

Laboratory analysis

Laboratory analysis fees are charged per sample, so costs will be significant if many samples are analysed. To get the best value for the cost incurred, you should process the samples correctly and carefully choose which samples to send for analysis. To keep costs down, you can also request just a nitrate analysis.

What do I need to process a water sample?

- permanent marker pen
- powderless gloves
- clean 200 mL sampling bottles
- 60 mL luer lock syringe
- wide-mouth container
- 0.45 µm luer-lock syringe filters (PTFE)
- 0.8 µm pre-filters for water with high organics and sediment content (optional)
- ice or ice brick
- esky
- deionised water (optional)

How do I process a water sample?

1. Use the marker pen to label the 200 mL sampling bottle with the site/farm name, collection date and time and sample code (e.g., the piezometer number or monitoring point code).
2. Wear powderless gloves.
3. Use the 60 mL luer lock syringe to suck the water from the wide-mouth container containing the sampled surface water or groundwater. Rinse the syringe with the sample water or deionised water before sucking the sample.
4. Connect the 0.45 µm syringe filter to the syringe (Figure 1). If the water is very dirty (full of sediment), a pre-filter (e.g., 0.8 µm syringe filter) can be used before the 0.45 µm filter.
5. Uncap the clean sampling bottle and push the sample in.
6. Push the syringe plunger to discharge the water sample into the sampling bottle (Figure 2). If the

water is very dirty, a few filters may be needed to fill a bottle.

7. Cap the sampling bottle and place it immediately inside a chilled esky (samples will degrade if not chilled).
8. Remove and dispose of the used filter.
9. Record the sampling information in Table 1.
10. At the end of the sampling round, freeze the samples.
11. Put the frozen samples in an esky with ice and send the samples to a laboratory as soon as possible, as frozen samples should be analysed within 28 days.

NOTE: During a sampling event, prevent cross-contamination by wearing gloves, not smoking, not sampling near car fumes, and not touching the ends of syringes and filters. You can reuse your syringe to collect other water samples to prevent excessive waste. However, the syringe must be rinsed thoroughly with deionised water or the water of the following sample to avoid cross-contamination.

This factsheet provides an overview of processing a sample. For accurate results, it is important to follow all the steps for sample collection, processing, transport, and quality control outlined in the [Queensland Government's Monitoring and Sampling Manual 2018](#). Talk to your local extension officer, Council or Regional NRM body for assistance with sample collection and processing.



Figure 1: Connect the 0.45 µm syringe filter to the syringe (photo: from DES. 2018. Monitoring and Sampling Manual: Environmental Protection (Water) Policy. Brisbane: Department of Environment and Science Government).



Figure 2: Discharge the water sample into the bottle (photo: from DES. 2018. Monitoring and Sampling Manual: Environmental Protection (Water) Policy. Brisbane: Department of Environment and Science Government).

