

Water Analysis using field kits

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Who to sample

Project in MRRD covering
Capacity Building and Institutional
Cooperation in the field of Hydrogeology
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Drikning Water Sampling

1. *Surface Water Sampling*
2. *Ground Water Sampling*

Surface Water Sampling

- Correct sampling procedures
- Safety aspects of sampling
- Where to take a sample
- Bottle labeling
- How to take a surface water sample
- Physical parameter sampling
- How to filter a sample
- How to store bottles for transport to the laboratory
- Filling out field observation forms and chain of custody forms
- Quality control samples
- Cleaning equipment

Correct sampling procedures

Considerable time and effort has been invested in the development of a standardized set of sampling procedures to ensure that data collected are useful, and comparable to other data, allowing us to draw accurate conclusions about what is actually happening in the environment. Use of standard procedures allows us to:

- avoid (or at least minimize) contamination of samples;
- compare between samples at different times, by different people and at different sites, and;
- draw meaningful conclusions from the data.



Safety aspect of sampling

All personnel must be trained in identification of potential hazards at a sampling site. This involves listing potential dangers to sampling personnel when at the sampling site, such as: collapse of stream bank; falling into the stream; contact with contaminated water from waterways; and exposure to heat, wind and rain.



Where to take the sample

Where you take a sample can potentially have a large impact on the results of analysis. Below are a number of images of situations that you may come across, which will require you to make a judgment call as to where to sample.

Backwater



Generally do not sample backwaters; the golden rule is that your sample should be representative of the waterway. Water in backwaters tends to be stagnant (even though it may be connected to a flowing water body) and as such is not representative of the waterway you are sampling.

● Confluence



The most important thing to remember is to allow adequate distance for mixing of the two water bodies downstream of the confluence; this may take several hundred meters. Also consider which waterway/catchment you want to sample; for example, if it were one of the two tributaries, ensure you are far enough upstream to avoid any influence from the other tributary, i.e. not right at the confluence.

● Weir



Again, consider what is representative of the catchment, and the parameters you are sampling. Sampling downstream of the weir, the water will be turbulent and mixed with air and sediment, resulting in non-representative physical and chemical samples. In this case, samples should be collected and/or measured as close to, or just above, the point where the water is flowing over the weir.

● Macrophytes



Try to find some open (clear) water, as sampling in the macrophytes will affect your samples. If there is no clear water then try to make a hole in the macrophytes in which to sample, as gently as possible, so as not to dislodge too much debris and detritus from the plants; and then sample once water is as clear as you think it will get. Remember to make a note on the field observation form that this is how you sampled.

- Floating macrophytes



As for macrophytes, sample in clear water if there is any. If not and plants cover the whole of the water's surface then gently make a small hole in the macrophytes through which to sample and make a note on the field observation form that this is the method you used to sample the water.

- Algal bloom



Again; sample in clear water if there is any. If not, and the bloom extends across the whole surface of the water body, then gently make a small hole in the algae through which to sample and make a note on the field observation form that this is the method you used to sample the water.

- Cattle crossing



Generally sample upstream of the crossing, as downstream will be contaminated by animal faeces and eroded sediment. Remember to select a site that is representative of the catchment as a whole.

- Riffle

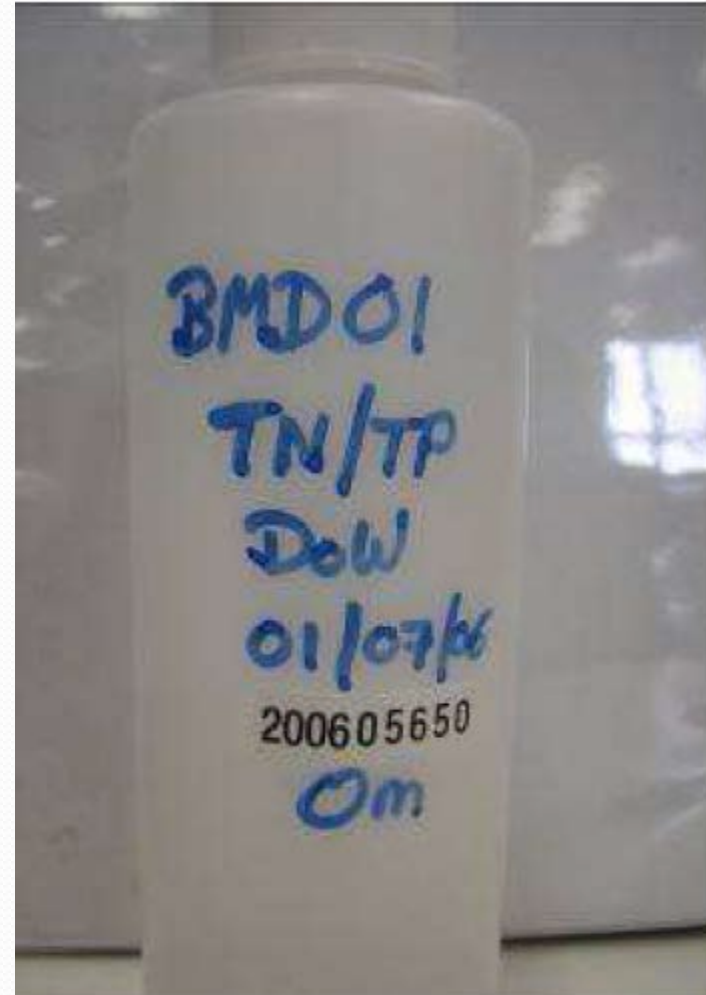


Again; be sure to select a section of water that represents the whole catchment. Generally do not sample in, or close to the riffle for the same reason as for the weir (turbulence and sediment mixing). Select an area above or below the riffle with smooth flow (fast is acceptable, just not turbulent and mixed).

Bottle labeling

Each bottle needs to be labelled with:

- The site code.
- The parameter(s) to be measured.
- The collection agency (the agency or group for which the sample was collected).
- The date of collection.
- A unique sample number.
- The depth at which sample was collected (zero (o) meters for surface waters).



How to Take A surface Water Sample

Surface water samples are collected from just below the surface, avoiding any surface scum and debris. Always remember that the order in which sampling is performed is important. You should always take samples in the following order:

- 1 Water samples for chemical analysis.
- 2 Measurement of physical parameters.
- 3 Any other samples (i.e. stream width measurements, macroinvertebrates etc).

Type of Surface Water Sampling

- Direct Sampling
- Grab polesampling
- Other sampling guide line

Physical parameters

- Instrument maintenance and calibration
- Instructions for physical parameter sampling

Sampling techniques

Representative sampling:

- Grap sampling
- Quick assessment of type of water
- Volume proportional
- When monitoring treatment standards
- When assessing total weight of pollutants and (i.e. kg/day discharge to rivers)

Time based sampling:

When keeping regular checks on key parameters, ie samples say every 15 minutes to check quality



Thanks