

Farm Surface Water Quality

Introduction

Farmers across all sectors are now using environmental plans, with the goal to minimise nutrient losses from their land to waterways. This may be due to regulatory requirement in some regions (or sensitive catchments), but is also commonly part of landowners drive towards sustainable farm practice.

Measurement forms part of any "plan to manage" and gathering data over time can help evaluate effectiveness of any change to farm management practices. Water is the transport mechanism for loss of nutrients, sediment and pathogens across the farm to waterways.

Surface runoff is the main transport pathway for phosphorus, sediment and pathogens; while leaching down through the soil profile is the main avenue for nitrate-N loss to waterways.

Regular testing of tile drains, open drains or streams on your property can help determine what impact your farming practices are having on water quality, particularly with respect to surface runoff.

Selecting the sampling site(s) is very important and it is recommended to take advice from an environmental consultant before starting to collect samples. Observations such as flow rate, water temperature, recent weather events, bank slumping, stock movements and nearby cultivation should always be recorded at the time of sampling to help "make sense" of the water test values.

What to order

To make it easy to gather surface water data, Hill Labs have created a Farm Surface Water Quality Profile (FarmSWQual) which includes tests for Nitrate-N, Total N, Total P, DRP, Turbidity and E.coli.

A sample kit is available which has the required containers, a sampling guide and return courier ticket. A schedule for supply of containers can be set up so that samples can be collected at different times over a period of a year to capture useful data. When requesting your quote, also ask that results be emailed with a csv format report for ease of data collation from regular sampling events.

Sampling

When taking the sample, it's very important to follow the instructions provided, especially for the E.coli test. This requires a sterile container (square plastic 400ml) and for the sample to be collected aseptically to make sure no contamination occurs. Also note the laboratory needs the samples back within 24 hours and at less than 10°C. For clients not within easy driving distance of the laboratory we suggest taking the sample in the early afternoon and sending it overnight to the laboratory.

Choose strategic sites which will provide you with the best information on how your farming practices are affecting nearby waterways. The sites which are most susceptible to poor water quality will supply the most useful information. Discharges where they enter water from the farm, such as a tile drain outflow, is a good place to start. Note site conditions at the time of sample collection and record these to help make sense of test results later.

The time and data of sampling must be recorded on the submission form sent with the samples.

A minimum of two samples per year is advised to obtain an understanding of relative nutrient content. Suggested periods might be autumn when drains begin to flow as well as late spring or early summer-avoiding any extremes of weather. Note that one-off grab sampling yields limited information and will be of little value.

Results

Results are reported in a tabular format without any interpretive comments, as any threshold values will be dependent on catchment or region. Recent environmental or farm management events will also impact on results, causing large variability in measurements between samplings from the same site. A mock-up tabular report is shown below, and results can be also presented in a spreadsheet or csv file format. Advice should be sought from an environmental consultant.

Example Report

Certificate of Analysis

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Client:		Lab No:	
Contact:		Date Received:	
		Date Reported:	
		Quote No:	
		Order No:	
		Client Reference:	
		Submitted By:	

SPv1

Sample Type: Aqueous

Sample Name:		
Lab Number:		
Turbidity	NTU	0.44
Total Nitrogen	g/m ³	3.8
Nitrite-N	g/m ³	0.012
Nitrate-N	g/m ³	3.4
Nitrate-N + Nitrite-N	g/m ³	3.5
Total Kjeldahl Nitrogen (TKN)	g/m ³	0.36
Dissolved Reactive Phosphorus	g/m ³	0.039
Total Phosphorus	g/m ³	0.050
Escherichia coli	cfu / 100mL	36