

	Nutrient Mitigation Procedure	Issue Date	February 2021
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		Issuer:	P Llewellyn
		Authorised By:	Colin Reed
		Function:	SHE
		Location:	Haverfordwest
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Nutrient Mitigation statement

The First Milk cooperative works in partnership with 33 of its farming members that supply the cheese processing plant in Haverfordwest, as part of the nutrient efficiency programme, to offset the nutrients from the Effluent Treatment plant at the creamery. They do so through employing a series of mitigation measures, combined with soil analysis and nutrient management plans. The impact of the diffuse pollution abatement actions undertaken on the farms, is assessed using the diffuse pollution modelling tool called Farmscoper V3 (Farmscoper).

The Effluent Treatment Plant for the dairy manufacturing site is regulated by Natural Resources Wales (NRW) in accordance with the Environment Permitting Regulation (EPR) permit. There is the requirement to “offset” the nutrient and sediment load discharged as final effluent by the dairy manufacturing site, in equal, or greater than, quantities. This is achieved by matching the final effluent load with the reduction in nutrient and sediment losses at the farms, within the milk field, that supply the processing plant. The three parameters considered are nitrate-N, phosphate and sediment.

Aims

The aim of the project is to monitor reductions in nutrient loading as a result of diffuse pollution mitigation methods deployed on 33 First Milk farms. The nutrient savings are offset against the nutrient and sediment loads as discharged through the First Milk waste water treatment plant.

The current permit (EPR/XP3830UR) condition 3.1.2 states the emission standards, including the relevant emission standards for Ammonia, Total Phosphates and Total suspended solids.

The standards as stated in Schedule 3 of the permit are:

Total Suspended Solids limit is 60 mg/l Absolute maximum and 30mg/l (95th percentile)

Ammonia limit is 10 mg/l Absolute maximum 3.5 mg/l (95th percentile)

Total phosphates is 5mg/l Absolute maximum and 3mg/l (95th percentile)

How the Offset is calculated

First Milk Ltd provide monitoring data for the final effluent discharge from the treatment plant. The data provided is daily flow in m3, ammonia (mg/l), total phosphorus (mg/l) and suspended solid (mg/l).

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The total annual load in kilograms (kg) is the sum of actual discharge load over a 12 month period. This is calculated using the following formula for the period 1st December 2019 to 30th November 2020:

Actual Daily flow in m³/day*actual load value mg/l*0.001

This provides the target offset values for Ammonium N, Total Phosphate and Suspended Solids for the 12 month period

The EPR permit stipulates BS EN 11732 as the analysis method and this analysis suite measures ammonium nitrogen (NH₄-N). The analysis of the effluent and subsequent reporting, undertaken by Severn Trent, from the treatment work is ammonium-N as per BS EN 11732.

The reduction in nutrient and suspended solid loads is achieved by the deployment of mitigation measures on the farms. The information gathered for each farm is entered into the diffuse pollution model called Farmscoper. The Farmscoper tool models the potential impact on the losses of nutrients and sediments to watercourses.

The Farmscoper tool assesses the impact of undertaking specified diffuse pollution interventions on a farm. For this study the farms have agreed during the initial phase of the project which diffuse pollution measures would be adopted voluntarily and contribute these savings as part of the offset scheme. The Farmscoper tool measures phosphorus, sediments and nitrates as Nitrate-N.

There are 100 ppm of ammonium-N per 100ppm of nitrate-N. There is no requirement for a conversion factor as there is a direct correlation between the nitrogen values.

Farmer engagement and records

All farmer members of the group hold a farm pack at their premises, containing records relating to mitigation methods employed. These packs may be held in hard or electronic format, or a combination of the two.

Farm Pack Content:

FP 1. Nutrient Losses report

FP 2. Field List

FP 3. Field Record sheet

FP 4. Farm Map

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FP 5. Farm Details

FP 6. Nutrient Management Plan

FP 7. Action Plans

FP 8. ADAS Reference Workbook

FP 9. Mitigation Method Baseline calculations

FP 10. ADAS Mitigation Method Guide

FP 11. Manure Management Plans

FP 12. Application of fertilisers, soil conditioners, manures & slurry

Technical Updates

Advice & Guidance

Partner Delivery organisations

First Milk contracts in the skills of partner organisations to ensure that the advice received by the farmers is credible and from an approved provider.

The key partner for delivery of the project is currently ADAS. ADAS originally wrote the mitigation measures and manage the farmscoper tool for DEFRA, so are best placed to gather relevant data, advise and monitor mitigation measure uptake, and calculate and report on offset achieved compared to outflow from the ETP. They will also provide advice and workshops to the farmer group on nutrient use and efficiency as appropriate.

Farming Connect approved providers may also be enlisted by the members involved for soil testing and nutrient management planning purposes, however these providers have no input to the mitigation measures being employed and the work that ADAS conduct.

Procedures employed by ADAS

An overview of the tasks are:

- For each farm, check that the mitigation measures, that have been agreed to be implemented, have remained in place

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- Identify the total reduction in losses of nutrient (nitrate-N, phosphorus) and sediment as a consequence of deploying agreed interventions, using the Farmscoper diffuse pollution tool
- Present a nutrient efficiency report for each farm
- Present a nutrient efficiency summary report for the group of 33 farms

The monitoring of mitigation measures, agreed to be undertaken at participating voluntary farms, is done through a combination of on-farm site visits and communication by phone.

The ADAS advisors represent an independent third party contractor. ADAS has been employed to set the baseline and monitor the deployment of specific diffuse pollution interventions. Each farm is allocated an ADAS advisor. As a result, there is often an ongoing dialogue, between the farmer and the advisor, throughout the year. This open communication is important as it helps to respond to any technical queries, forecast any potential changes and proactively implement contingency measures as required.

The First Milk treatment plant daily discharge monitoring is monitored by Severn Trent Business Water Services and provided to ADAS by First Milk.