

Focused visitors ate Constructed Wetland open day

A knowledge transfer open day focusing on constructed wetlands was held on 15 September 2010 at Greenmount Campus, CAFRE. The event was attended by farmers and growers and focused on how the technology could be adopted to treat dirty water on their farms.

Managing dirty water

Dirty water has minimal value as a source of fertiliser but it is a highly polluting waste with a BOD 5 to 6 times that of domestic sewage and must therefore be properly managed. The volumes produced can be large. On dairy farms, for example, run-off from yard areas contaminated by the daily movement of cattle, generate large volumes in addition to 'wash water' from milking parlours.

CAFRE constructed wetland

The Greenmount wetland consists of five ponds constructed and planted in 2004 and has been operational since late 2005. It treats dirty water from the Campus dairy unit with three main sources of dirty water, namely:

- dairy and milking parlour 'wash water'
- winter run-off from un-roofed silage clamps
- run-off from regularly scraped livestock yards and roadways

Results from the various wetland parameters analysed (Table 1) indicate that the treatment capacity of the wetlands is sufficient to meet the requirements for the discharge consent limit of 40 mg/l BOD set by NIEA. Nutrient retention within the wetland is also at a very high level. Phosphorus retention, considered a key criterion for dirty water treatment, is especially high.

	Inlet	Outlet	Percentage reduction
BOD (mg/litre)	1080	706	99
Total P (mg/litre)	46	1.2	97
NH₄ (mg/litre)	5.6	0.02	99
Total Coliform ('000 cfu/100ml)	830	<0.1	>99

Bacterial pathogen removal performance is consistently excellent, regardless of initial coliform concentrations or pond water levels. Both faecal and total coliforms are reduced to very low counts, equivalent to low background levels of natural wetlands as a result of plant breakdown and decay.

Wetland size

The ratio of wetland size to dirty yard area of approximately 2:1 is sufficient to meet the discharge consent BOD of 40 mg/l on all sampling occasions. However, the discharge concentrations of all contaminants from pond four were on average twice those of pond five, which indicates that any less than the five pond, 1.25 ha system to treat the dirty water would be unlikely to achieve acceptable results.

The constructed wetland is now an integrated part of the Greenmount Campus estate and any individual or group requiring further information should contact Martin Mulholland via e-mail at martin.mulholland@daera-ni.gov.uk or by telephone on 028 9442 6750.