

Nutrient Removal From Rural Drainage Systems Using Wetlands



Project Objectives:

1. To investigate the potential of reducing nutrients in irrigation drainage systems using in-line wetland technology and batter stabilisation.
2. To recommend further design and implementation of nutrient mitigation measures within the Shepparton Irrigation Region, with the potential to retrofit existing drains and modify design of new drains.
3. To determine the effectiveness of wetland technology with respect to:-
 - 3.1. Nutrient removal
 - 3.2. Construction and maintenance costs
 - 3.3. Impacts of measures on drain operation
 - 3.4. Other practical problems associated with construction and maintenance.

The Project

In 1996, the Goulburn-Broken Catchment Water Quality Strategy (GBCWQS) identified irrigation drainage as contributing 45% of the total catchment phosphorus loads to the Murray River each year. EPA Guidelines for managing the environmental impacts of construction projects, in this case controlling the mobilisation and transport of sediments in both new and old drainage systems, also highlighted the need for more appropriate drain construction and maintenance techniques.

In response to these issues, the D118 project, “Nutrient Removal from Rural Drainage Systems using Wetlands”, was commissioned by Goulburn-Murray Water to investigate the potential of reducing nutrients in irrigation drainage systems using in-line wetland technology and batter stabilisation.

The main trial site is a modified section of Goulburn-Murray Water Drain 6 located at Invergordon. The section is 1600m long and is divided into an 800m control section and an 800m trial section.

In the trial section the drain profile was modified and specific aquatic plants were planted in the bed, and riparian plants on the batters. The purpose of the vegetation is water treatment by sediment filtration and sedimentation, the uptake of nutrients, and drain stabilisation to prevent the drain itself contributing to poor water quality.

Flow monitoring stations have been installed upstream and downstream of each section to collect water quality data. Water samples are collected regularly and analysed for Total Phosphorous, Reactive Filterable Phosphorous, Total Nitrogen, Total Kjeldahl Nitrogen, Nitrates, Nitrites, Electrical Conductivity, Turbidity, Suspended Solids, pH, Temperature and Flow Rate (stage height).

The project budget over 4 years is estimated at \$460,000 and is co-funded by Goulburn-Murray Water, the SIR Implementation Committee, and Land & Water Australia. It is anticipated the trial will be concluded in March 2002.

While only two-thirds completed, the trial of introducing aquatic plants into drainage systems shows some potential for improving water quality. Further analysis and consideration of a number of issues raised throughout the trial will be undertaken following March next year, to determine the overall effectiveness of in-line wetland technology in drainage systems.

Partners: Shepparton Irrigation Region Implementation Committee
Land and Water Australia

Project Duration: 31 October 1998 to 31 October 2002

For Further Information Please Contact:

*Daryl Eaton
Goulburn-Murray Water
40 Casey St
Tatura, 3616
Ph. (03) 5833 5628 fx.(03) 5833 5506
email on daryle@g-mwater.com.au*