

MAKING THE CASE FOR REED BEDS

A briefing paper for the WFD Stakeholder Group Forum

Sewage and wastewater treatment

Reed beds can be used for the primary, secondary and tertiary stages of the sewage treatment process and have now been developed for the treatment of sludge.

At small rural works and individual dwellings the initial (or sometimes only) form of treatment is by means of a septic tank. As discharge standards have been made more stringent or where the local soil has insufficient permeability to accept the discharge from the septic tank, reed beds can provide an excellent, low cost treatment solution. Indeed, the use of primary treatment reed beds removes the need for any form of septic or settlement tank altogether.

At larger treatment facilities reed beds are often used to provide a high degree of tertiary sewage treatment: these plants are serving many thousands of people. NIRBC and its partner, ARM Ltd, have extensive capability and experience of designing and constructing natural treatment systems for anything from an individual dwelling to a community of 25,000 people. The systems work well and are very cost effective.

Industrial Effluent

Not all industrial effluents are suitable for reed bed treatment systems but many are. In addition to reducing BOD*, COD** and suspended solids levels in the effluent, reed beds can often reduce levels of other compounds such as metals, ammonia and hydrocarbons.

Often, the existing treatment facility simply needs a 'helping hand', having been built many years ago to meet less stringent discharge consent conditions than are required today. The addition of a reed bed treatment system can add years of life to an existing installation.

Agriculture

The Nitrates Directive is problematic for both farmers and DARD. The treatment of dirty water using reed beds can be effective in the substantial reduction of nitrates, BOD* and suspended solids. Reed beds reduce the need for slurry storage and the use of contractors on the farm. They can also increase the biodiversity.

*(Biochemical Oxygen Demand - A measure of the amount of oxygen necessary to decompose organic materials in a volume of water. As the amount of organic waste in water increases, more oxygen is used, resulting in a high BOD.)

** (Chemical Oxygen Demand - A measure for the pollution of waste water with chemically degradable substances.)

The Latest Developments in Reed Bed Technology

Compact Vertical Flow Reed Beds (Primary Treatment Beds)

These reed beds use vertical flow and a dosing technique to treat whole sewage without presettling. This technique is suitable for isolated sites, such as forest parks, golf clubs etc. The technology is similar to that used in sludge settlement reed beds, described later.

Sludge Settlement Reed Beds

These reed beds utilise vertical flow and dosing of screened, but unsettled sewage. The sewage is dewatered and mineralised to give a dry composted product. There are many such installations in Denmark serving up to 100000pe. NIRBC's partner, ARM Ltd, has exclusive rights to this design in the UK.

Floating Reed Beds

Development of floating reed beds has been ongoing in Belgium with good results. Benefits include effective treatment for storm overflows(CSO), forced sedimentation and easy recovery of suspended solids in watercourses, and low environmental impact.

Tidal Flow Reed Beds

Research at Queens University Belfast is producing encouraging results in treatment of high strength effluent. Although experimental at this stage, bench tests have proved that higher strength effluent can be effectively treated.

So why are reed beds not used more extensively in Northern Ireland?

Until recently, there has been little commercial incentive to develop the industry here. However, reed bed technology has developed substantially in the last ten years. The WFD and the Nitrates Directive have focussed sharply on the water quality and pollution problems we face. Much of the water pollution in Northern Ireland is diffuse, and there are many small point sources which are expensive and difficult to resolve, yet have a large impact on the water quality of our lakes and rivers.

Reed beds provide a cost-effective solution to many of the problems we face. The whole of life cost is low because the systems are easy to install, maintain and renovate. The robust nature of these systems means that they cope well with varying flows and strengths and they sit well in a rural environment.

If you would like to know more about reed beds and constructed wetlands, contact **William McBarnet** at **The Northern Ireland Reed Bed Company**.

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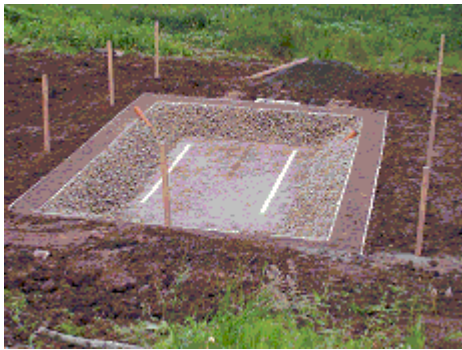
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NIRBC The Northern Ireland Reed Bed Company

Constructed Wetlands for Northern Ireland



Horizontal Flow Reed Bed



Horizontal Flow Reed Bed under construction in Cushendall Co Antrim(NIRBC)



Compact Vertical Flow Reed Bed under construction in Ballynure Co Antrim(NIRBC)