



Permeable Reactive Barriers

The Issue

Permeable Reactive Barriers (PRBs) are barriers which run from the surface of the ground down to the nearest impermeable underground stratum. It forms a barrier that traps groundwater up against it. This groundwater can subsequently be filtered through the barrier at a set rate determined by modeling, or filtered through “gates” in the wall. The “gates” clean any contaminants out of the groundwater before it is discharged through the wall back into the ground.

This is a proven technology used for the management of contaminated groundwater. While PRBs do not treat the source of contamination contained in the soils they are employed to reduce the groundwater contamination before it migrates either off site or in some cases on to a site.

In the remediation of brownfield sites, it is sometimes either impractical or not feasible to remove or treat the source of the contamination. In addition where source removal is undertaken, remnants of the contaminants may still be left in the ground, which over time continue to leach forming a contaminant plume.

The Objective

As part of EDSR's overall operation an assessment is made of each site so that the most appropriate technology can be utilised to meet the clients and regulators aspirations.

In the case of permeable reactive barriers a detailed site characterisation is necessary to ensure that the technique will achieve the necessary targets and be effective in the required timeframe. In some cases laboratory based studies are necessary to provide assurance to the client and regulators that the PRB is an effective solution. Also detailed groundwater modelling is used to ensure that the designed configuration will be effective. The works are all completed in accordance with documentation produced by the Environment Agency.

The EDSR Solution

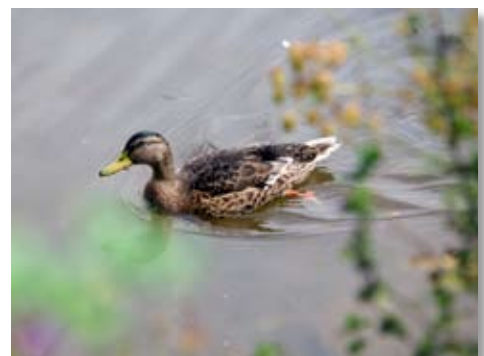
EDSR is at the forefront of PRB design and installation in the UK; to date the EDSR team has been involved in the majority of the PRBs installed in the UK.

PRBs have been used to treat a range of contaminants in groundwater such as chlorinated solvents e.g. tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), metals (for example, chromium and arsenic); nitrate, ammonia, and radio nuclides (uranium).

Once the site characterisation and modelling has been undertaken, the EDSR team will undertake the necessary negotiations with planners and regulators to gain approval for the PRB.

When approvals have been gained the team will install the cut-off barriers and gates in the designed configuration. EDSR will then undertake all necessary monitoring and maintenance of the system to the point at which compliance is achieved, at which stage the system can be decommissioned. The nature of a PRB is that the system can be installed and in operation for a number of years; the first UK barrier was installed in 1995 and is still operational utilising the same reactive medium.

PRBs are passive, sustainable, low maintenance long term solutions to groundwater problems. They allow a measurable, definable point of environmental transfer i.e. the quality of water being discharged back into the ground after it has either passed through the wall or a gate can be measured to prove that it meets environmentally acceptable standards. This solution has been successfully applied to a number of complex projects.



For more information please contact:

EDSR Group, Victory House, Quayside, Chatham Maritime, Kent ME4 4QU
 Innovate Office, 4100 Park Approach, Thorpe Park, Leeds LS15 8GB
 Telephone: 01634 525150 Fax: 01634 891102 Internet: www.edsr.co.uk