

What is a PRB?



A Permeable Reactive Barrier (PRB) is an engineered treatment zone placed in the ground to remediate contaminated groundwater as it flows through. PRBs offer an effective treatment of a wide variety of contaminants yet result in minimal above-ground disturbance and have negligible overall effect on groundwater behaviour.

PRBs can be designed in a variety of configurations, dependent upon the contaminants to be treated, the layout of the area requiring remediation and the requirements of the land user(s). Although the detailed design will vary from site to site, two basic types of PRB can be recognised:

- Funnel and gate: contaminated groundwater is directed to a permeable reactive zone by impermeable barriers
- Continuous wall: a reactive treatment zone is placed in the subsurface across the complete flow path of the contaminated groundwater.

The use of different reactive media within the reactive zone of a PRB allows the treatment of a wide variety of groundwater contaminants, either alone or in combination, including chlorinated solvents, carbon disulphide, petroleum hydrocarbons, including polycyclic aromatic hydrocarbons (PAHs), phenols, cyanide, nitrate and heavy metals.

Reactive media can include granular elemental iron, activated carbon and materials to support and enhance biological degradation.

Due to their long history of operation in the USA, UK, mainland Europe and elsewhere in

the world, PRBs are recognised by regulatory authorities as an effective groundwater treatment technology. Their installation and use is underpinned by regulatory guidance in many locations, including the UK.

PRBs can offer many advantages as a remediation technology, including:

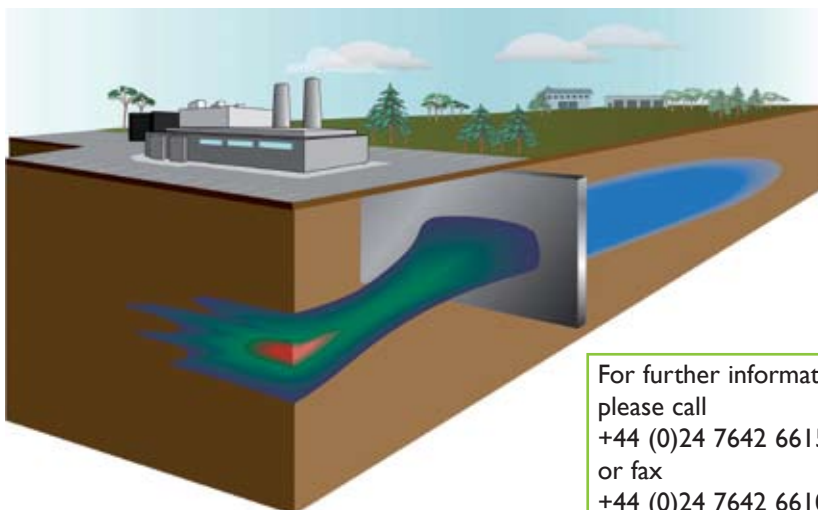
- technically effective
- generation of innocuous end products
- easy to maintain
- easy to monitor
- low intensity
- no pumping or active management of groundwater required: contaminated groundwater flows through the reactive media
- passive, requiring no or minimal consumption of energy and consumables
- sustainable, long-term treatment can be achieved
- minimal operating costs
- easily decommissionable, if required
- insignificant overall effect on site groundwater levels and continued access to groundwater source(s)
- compatible with other treatment technologies as part of a wider remediation programme.

Due to their low surface impact, flexible design and easy maintenance, PRBs can be used for the treatment of groundwater at:

- legacy (brownfield) sites
- operating facilities
- land undergoing redevelopment.

The partners in Terrsula have extensive experience in the application of PRBs, including full integration of the process with the long-term development and operation of sites. Terrsula offers the full range of services required to implement and operate PRB technologies for the full range of contaminants, including treatability studies, process design, detailed design and implementation, commissioning and monitoring/maintenance, and is able to warrant performance, providing appropriate laboratory evaluation and engineering design is undertaken.

We are grateful to Environmental Technologies Inc. for the use of their image



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