

Battelle Number(s):

11827-E

Patent(s) Issued

Available for licensing in all fields

Available Technologies

Rechargeable Reactive Barriers

SUMMARY

This patented technology is designed to intercept the flow of contaminated groundwater moving under a natural gradient. The intercepted groundwater passes through a permeable and reactive zone (the “barrier”) that has been modified with a reactive agent. The reactive agent decreases contaminant concentration or toxicity by:

- * modifying the naturally existing geological material or introduced solid materials or
- * directly interacting with targeted contaminant.

A variety of reactant liquids, gases or colloids, could be supplied to the reactive zone to treat a range of wide contaminants. The reactant would be introduced to the distribution lines under the influence of gravity or under pressure. The only energy input required to operate the technology is the periodic re-supply of the reactant to the supply reservoir making this technology a “semi-passive barrier.”

The feeder lines could be placed either horizontally or vertically in the reactive zone. Horizontal lines could be placed in excavations, or threaded through the subsurface using directional drilling. Vertically placed feeder lines would be in the form of a well, constructed to allow infiltration of the fluid. If the contaminated water was very near the surface, the reactant could be supplied at or just below the land surface similar to “soaker hoses”. Installation could also take the form of a geotextile (permeable fabric). The fabric would be constructed of hollow “threads” (fabric mesh of tubing) that would allow the diffusion or emission of the reactant to the subsurface.

Proof of principle demonstrated via laboratory experiments.

ADVANTAGES

- * Passive System: Reactants diffuse under low pressure (hydrostatic or gas cylinder pressures).
- * Ability to maintain and recharge the “reactivity” of the barrier.
- * Ability to target subsurface layers for more efficient delivery.
- * Better mixing of reactant with contaminant plume by limiting density or phase difference as compared to sparging or direct injection of reactants.
- * Less disturbance of subsurface matrix: no trapped gas to lower effective permeability.

Patents & Intellectual Property

- » Patent # 6,726,406
- » Patent #: 6,416,250

Technology Portfolio(s)

- » Remediation

Potential Industry Applications

- » Agriculture & Mining
- » Chemicals
- » Oil & Gas
- » Recycling & Waste Management

Dave L. Greenslade
Pacific Northwest National Laboratory
(509) 375-6555
david.greenslade@pnnl.gov
<http://availabletechnologies.pnnl.gov>



Proudly Operated by **Battelle** Since 1965