



**PHOSPHEX™ –
Treatment and Removal of Phosphorous from
Water**

Background

Phosphorous contamination that enters streams, rivers, and groundwater aquifers and which eventually concentrates in lakes, represents an essential nutrient in the growth cycle of algae. Excess levels of phosphorous contamination contributes to excess algae bloom growth and to eventual lake eutrophication, which negatively impacts on the ability of aquatic life to survive. Phosphorous contamination of lakes is primarily due to the domestic household use of detergents, which are not removed from conventional septic tank treatment systems, and/or the agricultural use of phosphate containing fertilizers. In many phosphate sensitive regions, plans for future residential or commercial land development has been curtailed due to the necessity to comply with strict government phosphorous loading criteria approvals designed to ensure that the contamination problem is not worsened.

Description of the invention

In recognition of both the negative environmental and land development impacts of phosphate contamination, a passive phosphorous removal system has been developed. The University of Waterloo has developed Phosphex™ technology which can be installed as a horizontal reactive barrier below a septic system tile field, as a vertical barrier located in the pathway of horizontally flowing contaminated water sources, or within an enclosed treatment container. The Phosphex™ technology can be installed as a separate treatment unit after the septic tank or it may be integrated with Waterloo's Nitrex™ denitrification technology to provide both nitrate and phosphate nutrient remediation capabilities. The Phosphex™ technology may also be used to kill undesirable bacteria (e.g. E-coli) and to remediate groundwater contaminated with certain metals, such as arsenic. Compared to other phosphate\bacteria\metals remediation technologies, the Phosphex™ technology is a low cost and easily installed passive reactive system that does not require any pumping or chemical addition equipment and that does not require any maintenance for many years after the installation.

Stage of development

Small and large scale (80,000 litres/day) septic system phosphate remediation applications have been installed. The Phosphex™ technology is installed and being evaluated at the Massachusetts Alternative Wastewater Treatment Technology Centre. The Phosphex™ has been licensed by Dupont Inc. for the full-scale remediation of an arsenic contaminated site.

Reference

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Patent status

U.S. # 5,876,606, Canada # 2,190,033, and U.K. # 2,306,954 patents have been issued. The technology is available for licensing in Canada and the U.K. The technology is licensed in the U.S to Lombardo Associates Inc. (www.lombardoassociates.com)

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