

Category III – Water Quality

Development of an Autonomous O₂ Delivery System for In-Situ Aerobic Bioremediation

Principal Investigator:

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Executive Summary:

Groundwater contamination with organic compounds such as gasoline is a widespread problem. The present tendency as far as treatment is concerned is to allow natural attenuation when it is feasible, because of the lower costs. However, natural attenuation can be slow, and oxygen depletion and anaerobic conditions are the rule rather than the exception. Anaerobic conditions result in expanding plume sizes and slow remediation. In many instances, a corrective action has to be taken and oxygen has to be supplied to the aquifer. This is usually done by sparging the aquifer with air or with pure oxygen, or by injection of liquid or solid peroxide which will slowly release oxygen in-situ. Delivering oxygen to a contaminated aquifer is expensive. In the present proposal, we propose to develop a new system for the delivery of oxygen to contaminated aquifers. The proposed new system is confidential but preliminary evaluation revealed that it could be extremely cost-competitive when compared to other techniques presently used. A two-year research program consisting of a laboratory proof of concept, detailed system design testing and optimization, and field demonstration was developed. If successful, the project is expected to have a significant impact on the field of in-situ bioremediation.