



AquaTane *In-Situ* Bio-Stimulation

AquaTane is a patented bio-stimulant for use *in-situ* to remediate groundwater contaminated with a variety of chemical compounds, such as polycyclic aromatic hydrocarbons (PAHs), BTEX, and chlorinated solvents. AquaTane is a liquid bi-stimulant that can be released continuously into the groundwater using simple, low-cost infrastructure.

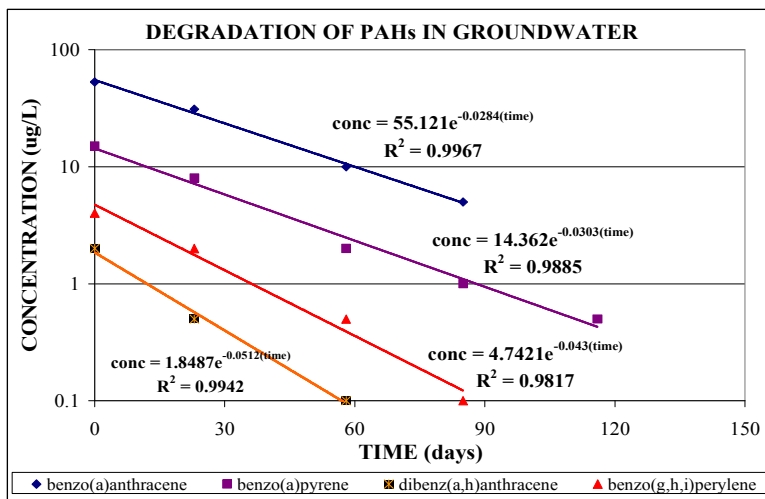
<u>PAHs</u>	<u>BTEX</u>	<u>Chlorinated Solvents</u>
Napthalene	Benzene	Perchloroetheylene (PCE)
Benzo(a)Pyrene	Tolulene	Trichloroetheylene (TCE)
Flourene	Ethylbenzene	Dichloroetheylene (DCE)
Pyrene	Xylenes	Vinyl Chloride (VC)

This process is designed to be a site-specific enhancement of aerobic microorganisms. A low molecular weight hydrocarbon, an oxygen source, and nutrients are utilized to stimulate microorganisms already present in the groundwater. As aerobic microorganisms are enhanced, they can effectively degrade even the most complex organic compounds into nontoxic compounds such as organic acids and eventually into carbon dioxide and water.

Site-specific bench-scale and pilot-scale field studies of AquaTane’s effectiveness for treatment of these constituents have been performed in Indiana, Tennessee, Texas, and Pennsylvania. Full-scale implementation has been conducted at sites in Tennessee and Pennsylvania.

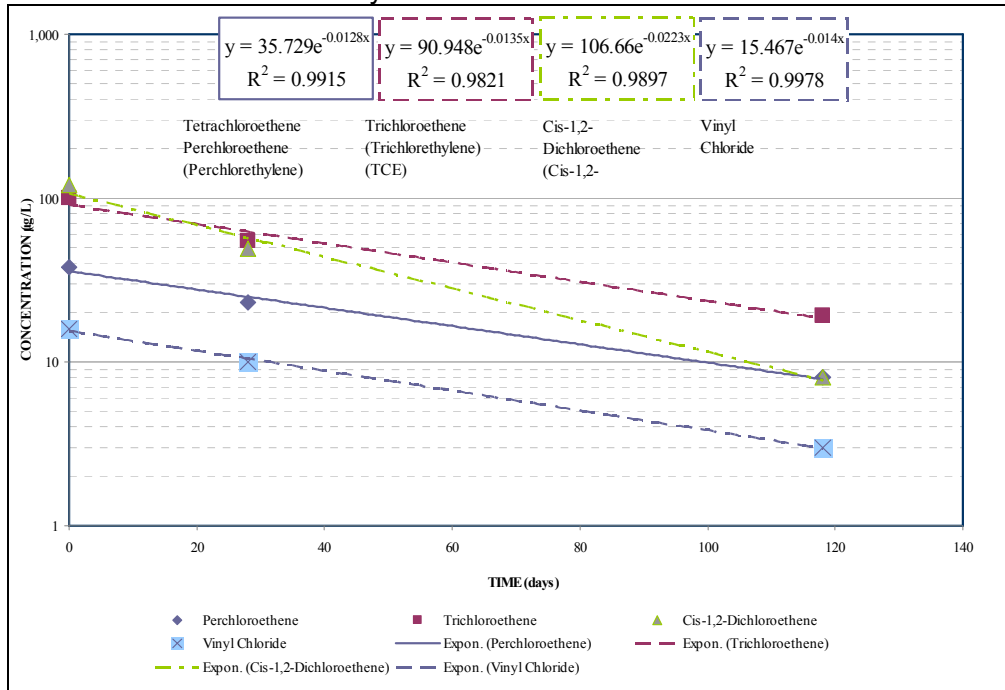
For BTEX and PAH constituents, this treatment process simultaneously degrades each component to the nontoxic compounds mentioned above. For chlorinated solvent compounds, this treatment process bypasses the anaerobic pathway, preventing the formation of vinyl chloride (VC).

The treatment quantities required for this process are much less than the requirements for other *in-situ* methods being used today, substantially reducing the overall cost of this treatment. Results of treatment at one of our pilot study sites are presented in the figure below.





Field Study Results - Chlorinated Solvents



Field Study Results - Toluene, Ethylbenzene, Xylenes

