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## **Natural Bugs, a Green Solution to MTBE Groundwater Contamination**

PETALUMA, Calif., July 18, 2006 -- Although half of the states in the U.S. have banned MTBE - methyl tertiary butyl ether - in gasoline because it contaminates groundwater, past spills and underground storage tank leaks will continue to impair groundwater quality in parts of the country for years or decades to come.

Helping to address this problem are bioreactors from Environmental Resolutions Inc (ERI), now being used at dozens of locations, which show that naturally occurring microorganisms concentrated in state-of-the-art bioreactors can effectively clean contaminated groundwater sites. Microorganisms have been used more and more in groundwater remediation in recent years as water industry practitioners learn more about the microorganisms' vast treatment capabilities, said Joe O'Connell, President of ERI. He added that bioreactors are more frequently being embraced by water industry officials as a treatment tool since bioreactors can clean both MTBE and related chemicals such as TBA, - tertiary butyl alcohol- and other gasoline components.

ERI worked with Drs. Edward Schroeder, Daniel Chang and Kate Scow at the University of California at Davis to develop a compact, practical, and effective bioreactor technology to treat groundwater. Bioreactor-based water treatment involves pumping groundwater out of the ground, mixing it with active microorganisms in a bioreactor system, and discharging the newly treated water. The discharge is either sent back into the ground, to a municipal sewer system, or into surface water.

The bioreactor groundwater treatment technology developed by ERI and UC Davis includes an aboveground tank containing trillions of microorganisms, primarily bacteria that attach themselves to the surfaces of fine grains of sand. The grains are distributed throughout the tank by the upward flow of the water passing through the tank for treatment. As the contaminated water mixes with them, the microorganisms consume MTBE and other dissolved gasoline components as food. During the water's 20-minute journey through the bioreactor, the microorganisms destroy the gasoline chemicals, converting them to carbon dioxide and water, thus eliminating the contamination.

ERI bioreactors can treat a wide range of contaminant concentrations because of the way their distinct water recycle loop dilutes water coming out of the ground. ERI's bioreactors have handled extremely high concentrations (up to a million parts per billion of gasoline constituents), reducing them to non-detectable levels. Laboratory analyses of water samples leaving ERI bioreactors are able to detect little if any MTBE or other gasoline traces.

Microorganisms, like people, require oxygen and essential nutrients to survive, grow and multiply. Bioreactors have systems that provide these essential materials to the microorganisms as they treat the contaminated water. Microorganisms in a bioreactor ecosystem have the ability to adapt to changes in water temperature, water flow rate and contaminant concentrations, which often fluctuate over time.

ERI bioreactors have been deployed at over 30 MTBE sites. The bioreactors are quiet and odor-free and can be efficiently moved - along with their microbial communities - to new treatment sites.

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