

**Resolving Problems Associated with the Biological Treatment of
MTBE Contaminated Ground Water**

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As a consequence of its use in gasoline, MTBE has become a widespread groundwater contaminant. MTBE has complicated the remediation of gasoline contaminated sites. Biological treatment has been the preferred method for treatment for gasoline contaminated groundwater, but biological treatment of MTBE is unreliable. Data from field and laboratory studies will be presented that explain why MTBE treatment is unpredictable. It is proposed that the manipulation of specific MTBE degrading bacteria can be used to increase the reliability of MTBE biotreatment. Using a series of field studies in fluidized-bed biological reactors treating MTBE contaminated groundwater, the root causes of poor MTBE treatment have been determined. Major problems are that MTBE-degrading bacteria do not establish themselves well in reactors and are subject to inhibition by gasoline hydrocarbons. These characteristics are not optimal for the start-up and maintenance of biological treatment under field conditions. Bacterial cultures grown on *iso*-pentane, a component of gasoline, consistently co-metabolize MTBE. It can be demonstrated that these bacteria can be used for MTBE treatment in field and laboratory reactors. It is proposed that application of co-metabolic degradation processes to MTBE treatment will resolve many of the limitations of biological treatment under field conditions. The application of the lessons learned in *ex situ* treatment to *in situ* treatment will be discussed.