

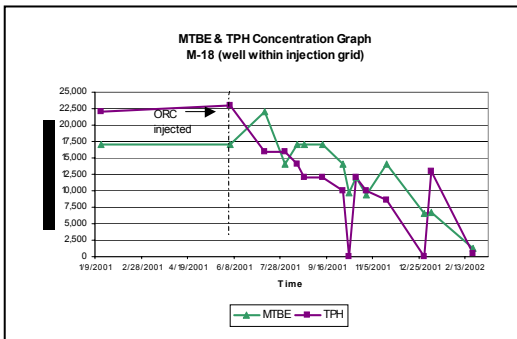
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REGENESIS' ORC® TECHNOLOGY GAINS GROUND AS TREATMENT OF CHOICE FOR MTBE CLEANUPS

SAN CLEMENTE, CA, July 15, 2002 – The widely used gasoline additive methyl *tert* butyl ether (MTBE) has become a major nationwide environmental issue, due to fears that the chemical may cause adverse health impacts if it enters drinking water supplies. Unfortunately, eliminating MTBE from groundwater with conventional technologies can be a long and costly process. Recently, however, environmental engineers and scientists have been getting cost-effective results with a method, known as “accelerated natural attenuation,” that relies upon the ability of certain naturally occurring species of subsurface aerobic microorganisms to digest and eliminate MTBE. The key is providing the microorganisms with the oxygen they need, as a lack of it can limit their ability to effectively degrade contaminants. This is accomplished using Oxygen Release Compound (ORC®) a proprietary formulation of magnesium peroxide, developed by RegenesiS (San Clemente, California) and widely used for many years in the treatment of common gasoline components in groundwater. ORC is

designed to be directly injected into contaminated groundwater, where it slowly releases a steady supply of oxygen over a six to twelve month period and sometimes even longer. With the added oxygen, microbial populations can flourish rapidly and destroy the MTBE at the molecular level, transforming it into harmless substances such as water and carbon dioxide.



Test well sampling showed ORC® application cut MTBE at Prunedale, CA, site from 16,500 ppb to under 400 ppb after 264 days.

reduced sharply, from 23,000 ppb to 530 ppb. Comparable results have been reported in numerous commercial applications across the country where ORC was used to remove MTBE. Among other examples:

- A Coast Guard facility in North Carolina was contaminated with MTBE because of leaks in an underground storage tank and transfer lines. Injection with ORC completely eliminated dissolved MTBE from the water within three months, while MTBE content in the soil was also reduced, from as high as 510 ppb to “below quantifiable limits.”
- A leaking storage tank at a Lake Geneva, Wisconsin, service station introduced as much as 800 ppb of MTBE into the soil and groundwater. Nine months after injection of ORC, MTBE concentrations had fallen to less than 2 ppb, and the site was submitted to the Wisconsin Department of Natural Resources for closure.

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- At a South Carolina gas station, a leaking underground storage tank (UST) introduced as much as 2,230 ppb of MTBE into the groundwater. After a one-time application of ORC, MTBE, concentration in monitoring wells had fallen to below detection limits within approximately seven months.

In the 1990s, MTBE was widely adopted as an answer to air pollution problems because it helps gasoline burn more cleanly by raising its oxygen content. It is still used for this purpose in 17 states and the District of Columbia. In some regions, particularly the northeast, MTBE was also used for many years as an octane booster. Government studies have found MTBE contamination of ground and surface water to be on the rise due to leaky tanks and pipelines as well as cross-contamination of pipes and tanker trucks. Ridding a site of MTBE is difficult because it pervades soils very quickly, degrades very slowly, and is highly soluble in water. Taste and odor thresholds for MTBE can be as low as 35 ppb and although the toxicity and carcinogenicity have not yet been established, the potential health risks of chronic MTBE ingestion may range from nausea to kidney or liver damage or even cancer.

ORC has been used on more than 7,500 sites worldwide, primarily on sites impacted with petroleum-based fuels and fuel constituents such as gasoline, diesel, kerosene, and the “BTEX” chemicals—benzene, toluene, ethylbenzene, and xylene. Since its commercial introduction in 1995, ORC has become recognized as a versatile and highly cost-effective tool for the remediation of groundwater contamination through accelerated bioattenuation. As early as 1994, researchers at Regenesis observed that MTBE concentrations appeared to decrease in aquifers enriched with oxygen, apparently as a result of enhanced biological degradation. Laboratory experiments suggested that oxygen released from ORC may facilitate the aerobic bioremediation of MTBE, a concept that has since been verified in studies at the University of California, the United States Geological Survey, and elsewhere.

Long-standing studies by Regenesis indicate that ORC’s efficacy in remediating MTBE may be affected by the presence or absence of other gasoline components. Dr. Stephen Koenigsberg, the company’s Vice President of Research & Development, said, “If other aerobically degradable compounds, especially the BTEX components, are present at a site they must also be remediated or they may slow the biodegradation of MTBE. We call this ‘competitive inhibition.’ When organisms have a choice between the compounds that are more easily degraded (BTEX) and those that are more difficult (MTBE), they will opt for the easier ones first. Clearly, any treatment that can remediate both competing “factions” offers an advantage.”

Incorporated in 1994, Regenesis is the world’s leading developer and distributor of products used to restore contaminated groundwater and soil through accelerated natural attenuation or “enhanced bioremediation.” Regenesis’ products, Oxygen Release Compound (ORC) and Hydrogen Release Compound (HRC), have been used to remove a wide range of groundwater contaminants, ranging from gasoline, MTBE, and chlorinated solvents to nitroaromatic explosives and heavy metals, across the U.S. and around the world. Readers are invited to call Regenesis at 949-366-8000 or visit their website at www.regenesis.com to arrange a free site evaluation for the application of ORC and/or HRC.

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