542F04021

Technologies for Treating MtBE and Other Fuel Oxygenates

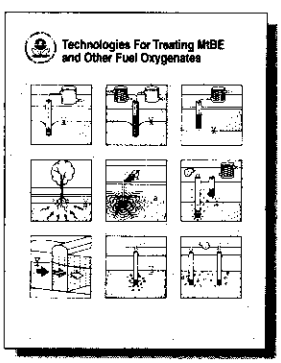
Fact Sheet and Order Information

Introduction

Fuel oxygenates, including methyl tert-butyl ether (MtBE), have been widely used in the U.S. for the past several decades as an additive to gasoline intended to either boost octane ratings or to reduce air pollution. The gasoline containing these oxygenates has been stored in aboveground and underground storage tanks at many facilities, including refineries, terminals, service stations, and by end users; and gasoline has been transported throughout the U.S. via pipeline, barge, rail, and truck. As a result of leaks and spills, MtBE, other fuel oxygenates, and other gasoline components have been found in soil and groundwater at these sites. In some cases, drinking water sources have been contaminated.

Recently, more sites are being evaluated for the presence of MtBE and other ethers and alcohols used as fuel additives. These chemicals include ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), diisopropyl ether (DIPE), and tert-amyl ethyl ether (TAEE), as well as alcohol compounds such as tert-butyl alcohol (TBA), tert-amyl alcohol (TAA), ethanol, and methanol. Regulators and others involved in cleanups and affected drinking water systems need more information on remediation alternatives for fuel oxygenates, and how they differ from those for fuel components addressed in the past, primarily benzene, toluene, ethylbenzene, and xylene (BTEX). EPA has prepared the following report to provide information on ways to treat oxygenates in soil, groundwater, and drinking water.

Contents of Report



Technologies for Treating MtBE and Other Fuel Oxygenates provides an overview of the treatment technologies used to address groundwater, soil, and drinking water contaminated with MtBE and other fuel oxygenates. The treatment methods discussed include:

- Air Sparging
- Soil Vapor Extraction
- Multi-Phase Extraction
- *In situ* Bioremediation
- *In situ* Chemical Oxidation
- Pump-and-Treat and Drinking Water Treatment
- Permeable Reactive Barriers
- Phytoremediation
- *In situ* Thermal Treatment

Information in the report can be used to help evaluate technologies based on their effectiveness at specific sites. The report summarizes available performance and cost information for these technologies, examples of where each has been used, and additional sources of information.

Related Efforts

In addition, EPA has prepared an online database of profiles for remediation and drinking water sites that are addressing MtBE and other fuel oxygenates. The MtBE Treatment Profiles are accessible at *www.cluin.org/products/mtbe*. As of August 2004, the website contained 390 project profiles. Profiles contain data on completed and ongoing treatment projects. Each profile contains the following information:

- Project information (e.g., site background and setting)
- Technology design and operation
- Cost and performance information
- Point(s) of contact
- References

EPA invites project managers, site owners, and technology vendors to update existing MtBE treatment profiles or add new profiles to this website.

Additional EPA resources about MtBE are available at *www.epa.gov/swerust1/mtbe* and *www.epa.gov/mtbe*.

Order Information

To order *Technologies for Treating MtBE and Other Fuel Oxygenates* (EPA 542-R-04-009), please call 1-800-490-9198. The report can be ordered online at *www.epa.gov/ncepihom*, or downloaded at *www.cluin.org*.

For additional information, please contact Linda Fiedler, EPA Office of Superfund Remediation and Technology Innovation, at fiedler.linda@epa.gov or (703) 603-7194.

Solid Waste and
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