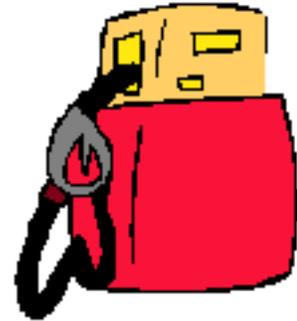


# *Methyl Tertiary-Butyl Ether* *(MTBE)*

## **Methyl Tertiary-Butyl Ether (MTBE)**

Methyl tertiary-butyl ether (MTBE) is a chemical compound made from a chemical reaction of methanol and isobutylene. MTBE is produced in very large quantities and is used almost exclusively as a fuel additive in gasoline. At room temperature, MTBE is a volatile, flammable, colorless liquid that dissolves easily in water.



## **Why is MTBE used as a fuel additive?**

MTBE replaced lead as an octane enhancer to help prevent the engine from "knocking." MTBE is known as an oxygenate because it raises the oxygen content of gasoline. Oxygen helps gasoline burn more completely, thereby reducing harmful tailpipe emissions from motor vehicles. Most refiners have used MTBE in higher concentrations over other oxygenates primarily for its blending characteristics to fulfill some requirements set by Congress in the 1990 Clean Air Act Amendments. MTBE became more prevalently used in the Baltimore-Washington Metropolitan region since 1995 when the Clean Air Act required areas with the worst ground-level ozone air pollution to reduce emissions of pollutants that form ground-level ozone by using reformulated, or oxygenated, gasoline.

## **Why is MTBE an environmental concern?**

MTBE is more soluble and mobile in water, has a smaller molecular size, and is less biodegradable than other gasoline components. MTBE can become introduced into the environment, particularly water, from leaking underground and aboveground petroleum storage tanks. Other sources of MTBE include atmospheric deposition, stormwater runoff, watercraft and residential usage of fuels.

## **Is MTBE a health concern?**

The U.S. Environmental Protection Agency (EPA) reviewed all available information and concluded that there was insufficient data to quantify health risks from low-level MTBE exposures in drinking water. EPA's health advisory, issued in December 1997, states that levels of contamination at or below 20 to 40 parts per billion (ppb) provides a large margin of safety from toxic effects and that water would not have an unpleasant taste and odor. In 1999, an EPA Panel investigated concerns about MTBE in drinking water supplies. The Panel recommended that EPA work with Congress and the states to implement reforms to protect drinking water supplies from MTBE while maintaining air pollution reductions. Specific Panel recommendations include:

- Substantially reduce the use of MTBE while ensuring no loss in air quality benefits
- Enhance public drinking water monitoring, assessment and protection programs
- Enhance enforcement of underground storage tank upgrade or replacement programs
- Enhance programs for public education and clean-up of gasoline spills

## **Have the waters of Maryland been impacted?**

Since 1995 MDE has been periodically sampling community and non-transient, non-community public water systems for MTBE. Of the 1,203 public water systems tested, MTBE was detected in 116 systems, of which only 13 systems had levels above 20 ppb. MDE is sampling for MTBE contamination at all leaking underground storage tank (LUST) sites with groundwater impacts. Data from all such LUST sites indicated that 338 domestic wells have been impacted by MTBE to date. Carbon filtration was installed to remove contamination.

## **What is MDE doing about MTBE contamination?**

The main goal is to define the extent of MTBE contamination in groundwater. For water supplies used to provide public drinking water, sampling frequency increases when MTBE is detected and contamination levels over 10 ppb trigger an investigation for the contamination source. For private wells, treatment is recommended for wells with levels above 20 ppb at the point of use. However, at higher levels well replacement may be needed. Follow-up action has included providing alternative sources of water, adding treatment, conducting additional monitoring, and changing remediation strategies. MDE

is also assisting local governments to develop wellhead protection programs to reduce the risk of contaminating public supplies. Local government water sampling programs have started to include MTBE since the potential presence of MTBE has become more widely known. MDE is also gathering additional information from major oil companies and other sources and assessing the potential health risks from MTBE.

**Other developments:**

- EPA announced in March 24, 2000 Federal Register an advance notice of intent to initiate rulemaking under Toxic Substances Control Act to eliminate or limit the use of MTBE as a fuel additive in gasoline.
- On May 11, 2000 the Governor signed an emergency bill that created a Task Force charged with determining and addressing the environmental and health risks associated with ground and surface water MTBE contamination, examining national and regional efforts on MTBE contamination, recommending a plan to minimize and counteract MTBE risks, and exploring alternatives to MTBE. The Task Force has published its findings in Preliminary and Final Reports
- The Preliminary Report by the Task Force became available by December 2000
- The Final Report by the Task Force became available by December 2001.

For more information, please contact MDE's Oil Control Program at (410) 537-3386, and if you have questions concerning the presence of MTBE in public water supplies, contact MDE's Water Supply Program at (410) 537-3714.



Maryland Department of the Environment  
1800 Washington Blvd  
Baltimore, MD 21230  
410-537-3000 • 1-800-633-6101