



What is MTBE?

Methyl tertiary-butyl ether (MTBE) is a synthetic organic chemical that is added to gasoline to increase the octane level and to reduce the amount of carbon monoxide and benzene in vehicle exhaust. In 2000, about 9% of gasoline sold in British Columbia contained MTBE, at concentrations up to 15%. MTBE was used mostly in the Lower Mainland, as well as parts of Vancouver Island and the Interior. MTBE in gasoline improves air quality by reducing benzene and carbon monoxide emissions, but if spilled or leaked, it can contaminate our valuable groundwater supplies. As of late 2000, MTBE use in British Columbia was discontinued.

What are the Environmental Health concerns?

MTBE is a volatile, flammable, colourless liquid at room temperature, and it smells like turpentine. MTBE mixes with gasoline and will also dissolve in water. If spilled on land, MTBE is highly mobile in soil and can move into groundwater. Once in groundwater, MTBE resists breakdown compared to other gasoline components like benzene. MTBE is not expected to bioaccumulate in aquatic organisms if it gets into lakes or streams.

The Water Quality Guideline for MTBE in drinking water sources in British Columbia is 0.020 mg/L (milligrams per litre). The Water Quality Guideline was set based on taste and odour. An important fact to be aware of is that MTBE has such a strong taste and odour that most people would find water with MTBE unsuitable to drink at concentrations well below those posing any health risks.

What are the Common Sources of MTBE?

- Leaking underground storage tanks;
- Spills at gasoline storage sites; and
- Stormwater runoff from roads and parking lots.

Along with MTBE, other hydrocarbon contaminants such as benzene would be associated with those sources. Shallow groundwater sources in urbanized areas likely face the most risk.

Is there MTBE in our groundwater?

The occurrence of MTBE in British Columbia's groundwater is not well known at this time. In 2000/2001, the Ministry of Environment, Lands and Parks (now Ministry of Water, Land and Air Protection) sampled a total of 58 wells in 16 highly vulnerable aquifers in the Lower Mainland, the east coast of Vancouver Island, and communities in the Interior to check for MTBE in ambient groundwater (see map). Many of these sampling sites have been monitored for general water quality on an on-going basis over the years.

Results of sampling (Hodge, 2001) showed only one well in the Lower Mainland had MTBE (concentration of 0.002 mg/L) just above the laboratory's detection limit of 0.001 mg/L; all other wells sampled did not contain MTBE. Follow-up sampling and site inspection suggest the source of MTBE may be from spills near a residential fuel storage tank. The Ministry will continue to sample for MTBE in ambient groundwater at up to 18 locations in 2001/2002.



What can well owners do to better safeguard their well supply?

Well owners should protect their water source from contamination by inspecting the immediate area around their well and pump house and relocating or safeguarding any potential contaminant sources such as gasoline storage tanks a safe distance from their water source. Spill containment and leak detection measures should be utilized at these installations. Regularly monitor your well water quality to ensure it is safe to drink; consult with your local health authority regarding the risk of your drinking water source and the parameters or constituents to sample for, including MTBE, if necessary. For community well owners, the *Well Protection Toolkit* is available from your local health authority (or on the internet at: http://wlapwww.gov.bc.ca/wat/gws/well_protection/wellprotect.html). The *Toolkit* is designed to help water purveyors to develop and implement protection measures in the source recharge area (e.g., spill response procedures, land use zoning, public education) to safeguard the quality of their community well water source.

Further information on MTBE

For further information on MTBE, please contact the Ministry of Health Services (250-952-1572) or Ministry of Water, Land and Air Protection (250-356-5062). These numbers can also be accessed toll free through Enquiry BC at 1-800-663-7867. Below are some useful references on MTBE:

- Hodge, W. S., 2001. *A Preliminary Survey of Methyl Tertiary – Butyl Ether (MTBE) in Groundwater at Selected Well Sites in British Columbia, Canada*. Ministry of Water, Lands and Air Protection, Groundwater Section.
- Overview report on ambient water quality guidelines for methyl tertiary-butyl ether (MTBE) for British Columbia (<http://wlapwww.gov.bc.ca/wat/wq/BCguidelines/mtbe.html>)
- USEPA fact sheet on MTBE (<http://www.epa.gov/OST/drinking/mtbe.html>)
- US Geological Survey factsheet on MTBE (<http://wwwsd.cr.usgs.gov/nawqa/pubs/factsheet/fs114.95/fact.html>)