Division of Drinking and Ground Waters
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Environmental Protection Agency

Disinfection Byproducts in Public Drinking Water

THIS POLICY IS NOT LAW

What are disinfection byproducts?

Most drinking water must be treated with disinfectants in order to kill germs. Disinfection byproducts (DBPs) form when disinfectants such as chlorine, chlorine dioxide or ozone react with organic and inorganic substances present in the raw water. The primary organic DBP precursors are derived from terrestrial and aquatic plants. Bromide ion is the main inorganic precursor for DBPs.

Which disinfection byproducts are regulated?

There are hundreds of different DBPs that can be formed in drinking water. The type and quantity depend in part on the source water quality, type of disinfectant and distribution system operation. The following DBPs are regulated with a monitoring requirement and a maximum contaminant level (MCL):

- Chlorite
- Bromate
- Five Haloacetic Acids (HAA5)
- Total Trihalomethanes (TTHM)

What levels of disinfection byproducts are allowed in drinking water?

There are four MCLs for DBPs: TTHM shall not exceed 0.080 milligrams per liter (mg/L); HAA5 at 0.060 mg/L; bromate at 0.010 mg/L; and chlorite at 1.0 mg/L. Compliance with the TTHM and HAA5 MCLs is based on Locational Running Annual Averages for each contaminant at each location sampled. Compliance with the chlorite and bromate MCLs is based on sampling frequency.

How often is monitoring required?

The frequency of monitoring varies depending on the public water system's (PWSs) population size, source type and type of disinfectant used. Past levels of DBPs may also result in either an increase or decrease in monitoring. Monitoring may be required daily, monthly, quarterly, or annually depending on the contaminant.

What happens when the MCL is exceeded?

A MCL violation is issued to any PWS that exceeds the MCL for one or more DBPs. The PWS is required to issue a public notice and take steps to reduce the levels of DBPs. Failure to reduce these levels may result in an enforcement action by Ohio EPA.

What are the health effects of disinfection byproducts?

There have been many studies on the health effects of exposure to DBPs. Although some studies indicate the potential for both short- and long-term adverse health effects, others do not. Some potential health effects include cancer, as well as reproductive and developmental disorders. Individuals with specific health concerns, should contact their physician.

Can drinking water be treated to remove disinfection byproducts?

Yes. There are a variety of treatments available to PWSs to reduce the level of DBPs in drinking water. Treatment is typically one of two types:

- reduction in the levels of compounds that cause DBPs; or
- the removal of already formed byproducts.

Contact

For more information, call Ohio EPA's Division of Drinking and Ground Waters at (614) 644-2752.