# *Trihalomethanes (THMs)* in Manitoba Water Supplies

## What are trihalomethanes?

All drinking water sources have potential to contain micro-organisms, such as bacteria, viruses and protozoa,that may cause serious illnesses. Drinking water is disinfected to destroy or inactivate those micro-organisms.

Chlorine is the most common disinfectant added to drinking water in the world. It is an effective disinfectant. However, when it is added to water with organic matter (ex: decaying plants and algae), by-products can form. Trihalomethanes (THMs) are the most common type of by-product.

## Why is chlorine added to drinking water?

Chlorine has been added to drinking water to get rid of harmful micro-organisms since the early 1900s. If harmful bacteria, viruses or protozoa are distributed through a drinking water supply, a lot of people can get sick very quickly. Using chlorine has greatly reduced the number of waterborne disease outbreaks (illnesses caused by micro-organisms in water) for over a century.

While there are other disinfectants, chlorine is used the most to disinfect water because it works, it's low cost and it's easy to use. It also helps in keeping the pipes that carry water to communities free of harmful micro-organisms that can get into the water after it leaves the treatment plant. Other disinfectants (ex: ozone or ultraviolet (UV) light) can't help protect water after it leaves the treatment plant.

## What water sources are most likely to have THMs?

Water with high organic content will generally form more THMs than water with low organic content. Water sources with higher organic content include:

- surface water (ex: lakes, reservoirs, rivers, streams)
- shallow or poorly-built wells or springs that may be at risk of contamination from surface water

Filtering water before adding chlorine helps reduce the organic content and THMs.

Groundwater from deeper wells usually has lower organic content and less THMs.

## What is the standard for THMs in drinking water?

The current Canadian guideline is 100 micrograms per litre (µg/L) or 0.1 milligrams per litre (0.1 mg/L) based on an annual average of four tests a year from the point in the distribution system where THMs are likely to be the highest. This guideline is the same as the standard for water systems in Manitoba, set by the regulations under *The Drinking Water Safety Act.*

## What health problems are linked to THMs?

While there is not enough evidence to indicate that THMs cause cancer in people, cancers have been detected in some studies in which animals (mice and rats) were exposed to high doses. Further study is needed. As a precautionary measure, drinking water guidelines are set to ensure a very low level of potential health risk over a typical lifetime of exposure (70 years). Short-term use of drinking water that exceeds the guidelines is unlikely to have an impact on human health.

## How could I be exposed to THMs?

Drinking tap water containing THMs, showering, bathing and using water for recreation (ex: swimming, hot tubs) can all increase THM exposure. THMs can be absorbed through skin or inhaled by breathing water vapour when showering, bathing, etc. Exposure from a 10-minute shower or 30-minute bath is about the same as drinking two and a half litres of cold water. All of these types of exposures and normal daily activities were considered when setting the Canadian guideline and the Manitoba standard for THMs in drinking water.

## Are THMs monitored in Manitoba water supplies?

Water systems that rely on surface water sources, or groundwater sources that can be affected by surface water, test for THMs regularly. Most surface water systems have

to measure THMs four times a year, every other year. Larger surface water systems measure THMs four times a year, every year.

Samples must be taken four times a year because water quality changes over the year - THMs are usually higher in the summer and lower in the winter. The average THM value for the year must be below the provincial standard.

## What can be done to reduce THMs in community water supplies?

THMs can be reduced by removing organics from the water source before adding chlorine. This is done by:

- allowing the organics to settle out
- filtering the organics out
- using some other type of advanced water treatment

Once the organics are removed, chlorine can be added to disinfect the water without forming high THM levels. If water suppliers have difficulty meeting the THM standard, it is usually because there is no water treatment process to remove organics before adding chlorine or their water treatment process is not removing enough organics.

## How do I know if my water has high THMs?

For details on the THM levels in your water system, contact your water supplier or the drinking water officer in your region. Large, public water suppliers must make annual reports available to the public, and post a copy of those reports on the Internet.

## How can I reduce my exposure to THMs?

You can lower your THM exposure by using a home water treatment system, such as a filter. This can be a point-of-use (POU) filter at the kitchen tap or a point-of-entry (POE) filter, where the water enters the house. Treatment systems range from water pitchers with a carbon filter to whole-house treatment units. Taking shorter showers and baths can also reduce THM exposure.

If you buy a home treatment system, look for filters or equipment that have been certified by an accredited organization to remove THMs. Certification standards help ensure the safety and performance of retail products for drinking water.

The THM removal standards are set by NSF International (NSF) or the American National Standards Institute (ANSI). Certification organizations make sure the treatment filters and equipment meet these standards. Accredited certification organizations include:

- NSF International (NSF)
- Canadian Standards Association (CSA)
- Underwriters Laboratories Incorporated (UL)
- Water Quality Association (WQA)
- Quality Auditing Institute
- International Association of Plumbing and Mechanical Officials (IAPMO)

Always follow the manufacturer's instructions on how to use and maintain any home water treatment filters or equipment.

## Where can I get more information?

For health related questions on THMs, call Health Links at 204-788-8200 or toll free at 1-888-315-9257 or your local public health office.

For information on home water treatment, call NSF International's toll free hotline at 1-877-867-3435; or go to: www.nsf.org. Health Canada also has information on home water treatment equipment on their website at: www.hc-sc.gc.ca.

For details on Health Canada's THMs guideline, go to: www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/trihalomethanes/index-eng.php.

For more information on chlorine in drinking water, go to: www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/chlor-eng.php.

For more information about drinking water in Manitoba, contact Manitoba Water Stewardship's Office of Drinking Water at 204-945-5762, or refer to the website at www.manitoba.ca/drinkingwater to find a local office near you.

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