



Recent developments in drinking water research have identified the formation of disinfection byproducts when a strong disinfectant like chlorine reacts with organic matter that may be present in water. Disinfection byproducts like Trihalomethanes (THMs) have been linked with Cancer. Formation of disinfection byproducts is more amplified in long distribution piping where chlorine is in contact with organic material for a long time before water reaches consumers.

Drinking water distribution systems are becoming more extensive to serve growing populations. As a result, water is taking longer to reach consumers living far away from treatment plants. With hundreds of kilometers of pipelines being constructed, it becomes more important to preserve the quality of water as much as possible till it reaches consumer taps. Chlorine has been traditionally used to keep water disinfected in distribution piping. However, chlorine reacts quickly and loses its disinfection properties in long distribution piping.

Municipalities and water regulatory agencies have been developing strategies to reduce the formation of disinfection byproducts while maintaining adequate secondary disinfection in distribution piping. Chloramines have been identified as a suitable secondary disinfectant than chlorine.

Chloramination offers enhanced secondary disinfection compared to chlorine due to its lower reactivity. Health Canada recognizes chloramination as a safe secondary disinfectant that reduces the formation of disinfectant byproducts like THMs. The maximum acceptable concentration of chloramines in drinking water set by Health Canada is 3 mg/L (based on monochloramines only as it is the common form of chloramines in water).

According to Health Canada, Canada's most populated regions use chloramines in drinking water supplies. Municipalities located away from treatment plants and rely on water supplies from other jurisdictions generally use chloramination in their water supplies. For example, York Region in the Greater Toronto Area receives its drinking water supplies from the City of Toronto and the Region of Peel through servicing agreements since York has no major water body in close proximity. Drinking water travels from Lake Ontario to York Region through a long and extensive distribution piping system.

The Town of Sydenham located north of Kingston, Ontario, is another municipality that utilizes chloramines to control disinfection byproducts. The town relies on groundwater supplies that

are high in dissolved organic material. The town used to use chlorination for disinfection. However, due to high organic material in water, they had high levels of THMs above the Ontario Drinking Water Regulations standards. Switching to chloramination helped the Town of Sydenham reduce the levels of THMs to acceptable levels.

In the future, it is anticipated that more municipalities across Canada will switch from chlorination to chloramination. Chloramination will become more prominent as water distribution piping becomes more extensive and more communities develop away from major water bodies.