



Chlorine and Water Disinfection

Chlorine-based disinfection provides a broad defense against microorganisms that can cause water-borne illnesses such as cholera, hepatitis and typhoid. It is an affordable option that most communities can use for water treatment. It is one of the few disinfectants that provide lasting residual protection from the treatment plant, through the distribution system and on to the consumer's tap.

When properly used, chlorine improves overall drinking water quality. It can remove unpleasant tastes and odours that are sometimes present in raw water and it controls microorganisms such as bacteria, mold, algae and fungi that may otherwise grow on the distribution system pipes. Most importantly, chlorine can help ensure that drinking water is free of many disease-causing organisms.

Generally, waterworks regulated by the Water Security Agency (WSA) are required to maintain a level of 0.1 milligram per litre (mg/l) free chlorine or 0.5 mg/l total chlorine in water distribution systems for long lasting protection.

Although chlorine disinfects drinking water, it also reacts with traces of other materials, particles, and organic matter such as decaying trees and leaves, and forms trace amounts of substances known as disinfection by-products. The most common of these are trihalomethanes (THMs). The benefits of disinfection with chlorine far outweigh the possible health risks of disinfection by-products (THMs) or the risks of ineffective or absent treatment. Individuals concerned about disinfection by-products, and specifically THMs, should note that water that meets Saskatchewan's drinking water quality standards does not need further treatment by the consumer to be safe. See our single fact sheet on THMs.

Alternatives to using chlorine for disinfection include ozone and ultraviolet light, but these alternatives cannot provide residual disinfection or lasting protection. All disinfection alternatives produce some type of by-products, even if not THMs. If a disinfection alternative such as ultraviolet light is used, a secondary disinfectant that provides lasting protection is still required.

Although it is effective against many types of microorganisms, chlorine disinfection is not practical for controlling protozoa such as *Cryptosporidium* and *Giardia*. Other treatments and processes are used to remove or inactivate these types of organisms. However, without disinfection, infectious microorganisms would be much more common in our drinking water. Disinfection is essential in order for waterworks owners to provide good quality and safe drinking water.