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# Adding Chlorine to Public Water Systems

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**Note:** This fact sheet deals with the practice of continuously adding chlorine to water, known as continuous chlorination. This differs from “shock chlorination” which is a one-time addition of a higher amount of chlorine typically to disinfect a small water system following the occurrence of a bacteria problem or as a precautionary measure when work is done on a public water system.

## Why do public water systems continuously add chlorine to their water?

Many public water systems add low levels of chlorine (bleach) to their water supply for the purpose of killing or inactivating harmful microorganisms which can cause illnesses. This is also known as “chlorination” or “disinfection”. Sometimes, public water systems use chlorine to control taste and odor or to help with removing iron and manganese. Iron and manganese can cause water to become a different color which is why public water systems remove them. Chlorine can also stop microorganisms from growing in in wells, water pipes and storage tanks.

Chlorine is also added for its “residual” properties. Chlorine remaining in the water supply, or added after disinfection is first done, is available to fight against potential contamination (making water not pure) in water pipes and storage tanks that might enter through leaks and pipe breakages. This is called “secondary disinfection.”

## Why is water chlorination important?

The primary reason for adding chlorine to water is to make it safe to drink by killing or inactivating harmful microorganisms that cause diseases such as stomach bugs. People who work in public health consider the chlorination of water as one of the most important advances in the field of public health protection. Chlorination of drinking water has saved millions of lives.

## Does chlorination result in harmful compounds?

When chlorine is added to water, it reacts with organic matter that occurs naturally in the water. The compounds formed are called “disinfection byproducts (DBPs).” The amount formed depends on the amount of chlorine used and contact time between the organic substances and the chlorine. DBP levels are expected to be low for most groundwater systems (served by wells). All small public water systems in Connecticut are served by groundwater.

## **Reducing Exposure to Disinfection Byproducts (DBP's)**

Most groundwater in Connecticut, have low levels of organic matter so the formation of DBPs is not a serious health concern. All surface supplies in Connecticut are filtered which reduces the level of organic matter that can react with chlorine to form DBPs. In addition, public water systems are required to monitor at worst case scenario locations (where customers may be exposed to highest levels of DBPs based on a study of their distribution system) therefore most customers are likely to be exposed to DBPs levels much lower than the applicable limits. Consumers who are still concerned can reduce their exposure to DBPs by installing a carbon filter on their kitchen tap. It is important that these filters be changed in accordance with their instructions to avoid buildup of bacteria in the filter.

## **Where to get more information**

More information is available for customers of community public water systems in the Consumer Confidence Reports (CCR) that are prepared by the water system every year. You can contact your water system to locate the most recent copy of your CCR.

## **Other disinfectants or methods of disinfection**

There are other methods used to kill microorganisms in drinking water. These include adding other disinfecting chemicals such as chloramines, chlorine dioxide or ozone. Ultraviolet light can also be used to disinfect water.

All disinfectants have advantages and disadvantages in how well they work and whether a residual is provided. The first three chemical disinfectants are more likely to be used at larger public water systems in Connecticut because they are harder to use. Ultraviolet is more commonly found at smaller public water systems because it is easier to use. Ultraviolet does not provide a residual. This means ultraviolet does not provide the additional benefits of “secondary disinfection”.

## **Is chlorination right for your water system?**

The reason your water system chlorinates depends upon the needs of the water system. Most public water systems in Connecticut use groundwater exclusively. Disinfection alone is sufficient treatment against bacteria and viruses if adequate contact time is provided. When you consider everything – the use of liquid chlorine is a good choice of disinfectant for most water systems.

## **Helpful websites and contact information**

Please visit the following websites for additional information:

Connecticut Department of Public Health Drinking Water Section: [www.ct.gov/dph/publicdrinkingwater](http://www.ct.gov/dph/publicdrinkingwater)

U.S. Environmental Protection Agency: <http://www.epa.gov/>

Center for Disease Control: <http://www.cdc.gov/>