

## Chloramines in Pool Make-Up Water

Minnesota pool code requires combined chlorine (chloramines) to be no higher than 0.5 parts per million (ppm). The level of combined chlorine in safe drinking water may be higher than 0.5 ppm. If this is true for your pool make-up water, what do you do?

### Best management practices

Each pool design and situation is unique. Consider reaching out to a professional commercial pool company for advice. They can give customized advice to manage high combined chlorine levels at your pool.

Research and development on treatment options for combined chlorine in pools is ongoing. One, or a combination of these current best management practices, may work well for you and your pool:

- Super chlorination *plus* an effective indoor air handling system.
- Ultraviolet light (UV) secondary treatment.

### Why is high combined chlorine a problem in pool water?

Pool test kits measure the concentrations of free chlorine (hypochlorous acid) and combined chlorine in pool water. The combined chlorine measurement includes both chloramines in the make-up water and chloramines formed in the pool as a result of bather activity.

To help protect swimmers' health, the concentration of free chlorine should be higher than the concentration of combined chlorine.

When the concentration of combined chlorine is too high, it can cause:

- Skin, eye, and lung irritation.
- The recognizable smell commonly associated with pools.

### Chloramines in make-up water

Some drinking water treatment plants use chloramines to treat drinking water by adding chlorine and ammonia to the water. In these cases, the level of combined chlorine in the water added to the pool can result in levels that exceed the limit allowed by the Minnesota pool code.

If you have questions about chloramines in your water supply, contact your public water system.

### Formation of chloramines in swimming pools

Adding chlorine to water causes a chemical reaction forming free chlorine (hypochlorous acid). Swimmers introduce ammonia into pools, primarily through urine and sweat. This causes chemical reactions between free chlorine and ammonia forming combined chlorine (chloramines).

Further chemical reactions can and do occur in pool water. This can cause the problems described above.

## Resources

### Public Swimming Pools

<https://www.health.state.mn.us/communities/environment/recreation/pools/index.html>

### Disinfection and Disinfection Byproducts

<https://www.health.state.mn.us/communities/environment/water/factsheet/ddbp.html>

### Drinking Water Chlorination: Frequently Asked Questions

<https://www.health.state.mn.us/communities/environment/water/factsheet/chlorination.html>

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