

An Important Change to Pinery's Water in March

Chloramine Conversion Project

The Pinery Water District is scheduled to convert its water disinfection process to a chloramine treatment process March 2018. This conversion is necessitated by the District's participation in the WISE project. WISE, which stands for Water, Infrastructure and Supply Efficiency, is a regional partnership that provides renewable water to ten South Metro water providers by combining unused capacities in Aurora's infrastructure with unused water supplies from Denver and Aurora. During the years Denver and Aurora don't need all of that water, and when excess capacity is available in Aurora's infrastructure, the South Metro water providers are able to purchase the unused water to help reduce their reliance on nonrenewable groundwater.

Currently, the District's water is supplied from Cherry Creek, a renewable source, and the Denver Basin aquifers, a non-renewable source. The Denver Basin aquifers are being depleted and recovery costs increase as water levels decline and deeper wells are required. Supplementing our water supply through the addition of WISE water will insure future water availability.

Just as now, the District's chloraminated drinking water will be perfectly safe for drinking, cooking, bathing, and all other daily water uses. There are a few uses of water, such as for fish aquariums or in-home kidney dialysis that require the removal of any and all types of chlorine, including chloramines. Those who use water for these types of zero-chlorine-tolerance uses should review their chlorine removal treatments to ensure that those treatments are effective in removing chloramines. Anyone with concerns or any health-related questions are encouraged to contact their doctor for more information. To ensure continuous water quality, the District regularly monitors, inspects and conducts water quality testing programs of its water supply, and routinely reports the results to the Colorado Department of Public Health and Environment and its customers. The most recent consumer confidence report can be found on the District's website.

The District offers residents the following FAQ information for review:

What is the current drinking water disinfection method? The current method of disinfection used by the District is chlorination. In this process, free chlorine is added to drinking water at a controlled level. Chlorination is an effective way to kill many kinds of bacteria and other germs that may be harmful to your health.

What is chloramination? Chloramine, which is a mixture of both chlorine and ammonia, is another type of chlorine disinfectant routinely used in drinking water systems to remove bacteria and viruses. In the chloramination process, ammonia and chlorine are added to the water at carefully controlled levels. The chlorine and ammonia react chemically to produce

chloramines. Chloramination is as effective as chlorine in killing many kinds of bacteria and other germs that may be harmful to personal health. Chloramine is more stable than chlorine and keeps the water safer for a longer period than chlorine.

Why convert from chlorine to chloramines? Chloramination reduces the level of certain byproducts of the chlorination process. These byproducts, called Total Trihalomethanes (TIHM) and Haloacetic Acids (HAAs), result from the reaction of chlorine with small amounts of naturally occurring organic substances in drinking water.

Converting to chloramines:

- Reduces the levels of TIHMs and HAAs in drinking water
- Complies with more stringent standards implemented by the Environmental Protection Agency
- Continues to supply water customers with safe and aesthetically pleasing water
- Should improve the taste and odor of the drinking water

Is chloramination safe? Yes. Chloraminated drinking water is perfectly safe for drinking, cooking, bathing and other daily water uses. However, as with any chlorinated water, there are some users who need to take special precaution with chloraminated water, such as those who use drinking water for kidney dialysis machines, specialized industries and fish owners.

How are kidney dialysis patients affected by chloramines and what precautions should they take? Chloramines are harmful when they go directly into the bloodstream. In the dialysis process, the water mixes with blood across a permeable membrane. For this reason, both chloramines and chlorine are toxic in dialysis water and must be removed from water used in dialysis machines. Medical centers that perform dialysis are responsible for purifying water used in their dialysis machines. **Customers with home dialysis equipment should contact their physicians and check with equipment manufacturers for more information.** See *Information for Kidney Dialysis Patients* section further on in the article.

How are fish affected by chloramines and what precautions should fish owners take? Fish also take chloramines directly into their bloodstream. Therefore, chloramines should be removed from water used in aquariums, fish tanks and ponds. Individuals or businesses that keep fish or other animals in tanks, aquariums or ponds should ask a pet supply company about removing chloramines. (More information is included further on in the section entitled *Chloramines and Aquariums*). Customers who use drinking water for aquaculture purposes (growing plants in water tanks or ponds) should get expert advice regarding the need to and procedures for neutralizing or removing chloramines.

Is it safe to wash open wounds with chloraminated water? Yes. Chloraminated water is completely safe to use on cuts and wounds. Water cannot enter the bloodstream through an open cut.

Will chloramination affect household water uses? No. It will not affect routine water uses, including food preparation, household laundering, dish washing, watering plants, etc. Chloramines are normally removed by the high-chlorine demand in soil, so they have no effect on plants.

Will chloramines affect the use of swimming pools? No. Swimming pool managers and owners will still need a free-chlorine residual to retard algae and bacterial growth. Contact your local pool suppliers for specific details.

Information For Kidney Dialysis Patients

Why do kidney dialysis patients have to take special precautions? Kidney Dialysis patients can safely drink, cook and bathe in chloraminated water, however, just as with chlorine, chloramine can harm kidney dialysis patients during the dialysis if it is not removed before water mixes with the bloodstream. To protect dialysis patients during the dialysis process, chloramines must be removed before they enter the bloodstream. Kidney dialysis patients can safely drink chloraminated water because the digestive process neutralizes the chloramine before it enters the bloodstream.

How can people with home dialysis machines remove chloramines? There are two ways to remove chloramines – either by adding ascorbic acid or using granular activated carbon treatment. You should first check with your physician who will probably recommend the appropriate type of water treatment. Often, home dialysis service companies can make the needed modification but you should check with your physician to be certain.

How are chloramines removed before the dialysis process? Dialysis equipment may need to be upgraded to remove chloramines. To accomplish this, either add a dechlorinating chemical or use a granular activated carbon filter. Dialysis facility operators can find assistance from physicians, dialysis equipment service companies and the Colorado Department of Public Health and Environment.

Chloramines and Aquariums

A combination of ammonia and chlorine forms chloramines. These are toxic to fish at levels as low as 0.1 milligrams per litre. As a result, you should remove them from tap water before use in fish aquariums or ponds. Some free ammonia may also be present in chloraminated water. Ammonia can be toxic to fish, but may be present in fish aquariums as a natural waste product.

Removing Chloramines

Exposure to sunlight can remove chlorine within several hours. For chloramines, it may take weeks to completely break down. Chloramines are generally removed by a de-chlorinating agent (usually sodium thiosulphate). This can be found in aquarium water conditioning agents, or by filtration through high-quality granular activated carbon.

If using chloramines, you can ensure particular care through the following:

- When using a commercial aquarium water conditioning agent, use two to three times the recommended dosage. This will help remove the high levels of chloramines in treated water.
- You may prefer to use pure sodium thiosulphate. Most de-chlorinating agents contain other additives for slime protection and water ageing. These may be harmful in higher dosages. When using pure sodium thiosulphate, the recommended dosage is 10 milligrams for every 1 milligram of chloramines (or chlorine) per litre. For example, you will need 30 milligrams for 3 milligrams per litre of chloramine.
- De-chlorinating agents remove chlorine, but will leave ammonia. You should either control or remove the ammonia, as detailed further below.

Granular activated carbon works well when removing chloramines. Its useful life depends on the size and type of carbon used, and conditions such as pH, flow rate and contact time. Careful monitoring using a test kit is necessary to ensure satisfactory results. The use of the carbon may be particularly suitable for outdoor ponds.

Removal and Control of Ammonia

Some ammonia will be present in chloraminated tap water. The use of carbon will produce ammonia, as will de-chlorinating agents when removing chloramines.

You can remove or control ammonia using the following methods:

- *Nitrifying bacteria*: In a pH neutral tank, nitrifying bacteria removes the ammonia. This can be produced from fish waste and from the breakdown of protein in uneaten fish food. These bacteria grow on solid surfaces such as gravel, sand or filter material. This method is not suitable for new aquariums as it could take up to six weeks for the bacteria to function.

- *pH control:* Keeping the pH to 7.5 or lower can control the toxic effects of ammonia. It is important to keep checking levels. pH test kits and correction chemicals are available from aquarium retailers. This method is unsuitable for certain aquarium fish, such as marine species that need a high pH.
- *Ammonia removal resins:* Placing these inside a box or canister filters in a tank can reduce ammonia levels. Again, this will need two to three times the recommended dosage. The resins will remove high levels of ammonia. This method is not suitable for salt water.

Important Things to Consider

- You should neutralize chloraminated tap water before it's used in fish aquariums.
- It is good practice to make smaller, more frequent, water changes. This minimizes the risks involved when using tap water containing chloramines.
- Recommended dosages may not be enough when removing chloramines and ammonia from drinking water.
- Some treatments are not effective, such as boiling the water and letting it stand outside for a day or two. This also includes using chemicals that only remove chlorine, or using a reverse-osmosis filter.