



# Water Treatment

## **How is water treated?**

Water is collected from lakes, ponds, rivers or wells. In order for this water to be drinkable, it is treated to be safe and economically suited for its intended uses. The water treatment process is listed below.

Long-period storage is when water is held longer than one month in reservoirs or settling basins. This is where the water flows before it is treated and when suspended bacteria and sediment are reduced. This method is not used by Fargo or Moorhead to treat their water.

Aeration is the mixing of air and water. It is done to reduce tastes and odors, and corrosiveness by eliminating carbon dioxide, and to eliminate iron and manganese. Aerators can be contact bed, spray cascade, multiple-tray or air-injection.

Coagulation is the process where compounds are added such as alum, sodium aluminate, ferrous sulfate with lime, chlorinated copperas, ferric chloride and ferric sulfate. It causes the colloidal, color and mineral particles to gather into a floc, which is then able to settle. There are two stages to this process. The *first* is rapid mixing of coagulant with water and the *second* is a slow mixing to form floc.

Softening removes calcium and magnesium by using chemical precipitation or ion exchange. In the most commonly used method, lime and soda ash are added to cause calcium carbonate and magnesium hydroxide precipitation, sedimentation and stabilization by recarbonation. It also reduces bacteria, turbidity, tastes and odors, iron and manganese.

Filtration can occur through *slow sand* filtration, where water with low turbidity passes over beds of fine sand on top of gravel and a drainage system. This removes the suspended matter. The more common method, however, is *rapid sand* filtration in which the water flows through sand of a larger grain at a faster rate.

Microstaining removes algae and other microparticles before rapid sand filtration. This process uses a rotating filter drum covered in stainless steel mesh with micron sized holes.

Disinfection can include chlorine, UV radiation or ozone. It is done before filtration and just before distribution. Chlorine is often used to destroy bacteria, inactivate viruses and reduce tastes and odors.

## **What is ozone?**

is like a lightning storm in that lightning during a thunderstorm creates an electrical charge making ozone, which reacts with air. This is why there is a clean, fresh smell outside after a thunderstorm.

## **The Moorhead Water Treatment Plant**

Moorhead's new plant, which opened in February of 1995 is capable of treating 10-million-gallons of water a day. As of now, it is the only plant in Minnesota using ozone to treat its water. The old plant, built in 1960, has been remodeled and together, the old and new plants produce 16 million gallons of water a day. Usually over 90 percent of Moorhead's water comes from the Red River. The river pump is located three miles from the plant and it takes two hours for the water to reach the plant. This is when the water treatment process begins.

## **The Fargo Water Treatment Plant**

Fargo's new water plant was completed early in 1997 and can easily be expanded to include more basins and filters. In the past, there have been problems with turbidity (dirtiness), taste and odor problems with water from the Red and Sheyenne Rivers. Along with ozone and deep-bed, dual-media filters, there is a two-stage softening process for more efficient and economical hardness removal.

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## **For more information:**

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