



Ozone

...at a glance

Overview

The Metropolitan Water District has identified the ozonation process as the most beneficial and cost-effective way to protect the Southland's drinking water quality.

Ozone is a colorless gas that smells like the air after a big thunderstorm. It is a form of oxygen and present in low concentrations throughout the earth's atmosphere. Ozone in the upper atmosphere filters potentially damaging ultraviolet light from reaching the earth's surface. It has many industrial and consumer applications and is an excellent drinking water disinfectant with fewer byproducts than those generated during the chlorination process. During water treatment, ozone is gently bubbled through the water to disinfect it and any unused ozone is converted back to oxygen before being returned to nature.

All five of Metropolitan Water District's water treatment plants are being upgraded with ozonation equipment. The Henry J. Mills Water Treatment Plant in Riverside and the Joseph P. Jensen Water Treatment Plant in Granada Hills have already been converted. The Robert A. Skinner Water Treatment Plant near Temecula is slated for completion in 2009, followed by the Robert B. Diemer Water Treatment Plant in Yorba Linda and the F. E. Weymouth facility in La Verne.



Ozone, first used for treating water in Europe in the late 1800s, is considered to be one of the most effective disinfecting agents.



Construction and Cost

Upgrades to the water treatment process at the Mills and Jensen plants have required new building construction and equipment totaling \$234 million. Costs for the 42-month Skinner Treatment Plant upgrade will be \$260 million.

Regulatory Background

The 1996 Congressional Safe Drinking Water Act Amendments required the U.S. Environmental Protection Agency to develop improved drinking water regulations. One new rule, called the Disinfectants/Disinfection Byproducts Rule, addressed concerns related to byproducts from the disinfection process.

The rule called for reduced levels of disinfection byproducts, including trihalomethanes. Trihalomethanes, also known as THMs, are formed when water high in organic materials (dissolved, decayed vegetation or peat) and bromide (a salt originating from seawater) are treated with chlorine.

The traditional chlorination water treatment process with its potential for THM byproducts could not meet the new standards. Metropolitan selected ozone, which has been used as a water disinfectant in Europe and parts of the U.S. for more than a century, as the best approach to effectively comply with the new standards and protect drinking water quality.



Ozone generators

The Ozonation Process

About Ozone

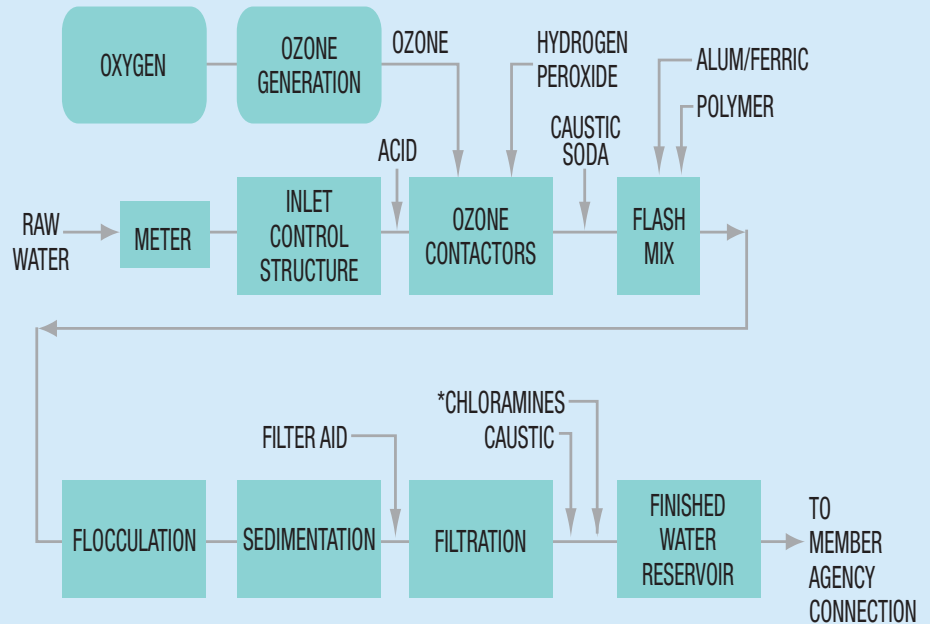
- Ozone is a three-atom form of oxygen whereas oxygen in air is a two-atom form.
- Ozone is formed when oxygen gas is passed through an electrical field in a specially designed generator. A small portion of the oxygen (less than 10%) is converted to ozone.
- Ozone gas cannot be stored effectively and is immediately bubbled into the water.
- Metropolitan's ozone process is self-contained, and no ozone is released into the atmosphere.
- Generating ozone is about four times more costly than traditional chlorine disinfection, primarily due to electricity and oxygen needed in the process.

Advantages

- Ozone is able to destroy a wider range of organisms in drinking water than chlorine.
- It requires less contact time with the water than chlorine.
- Ozone produces fewer potentially harmful disinfection byproducts in drinking water than chlorination. **Although it can result in the formation of bromate, another potentially harmful byproduct, this compound can be effectively controlled by depressing the pH in the process.**
- It is effective at removing objectionable tastes and odors from the water. (e.g., the taste and odor compounds formed by natural algae in the source waters).

* Chloramines, a combination of chlorine and ammonia, is added to the treated water to maintain quality for the sometimes lengthy period between leaving the plant and flowing from homeowners' faucets.

PROCESS FLOW DIAGRAM



About Metropolitan

The Metropolitan Water District of Southern California is a state-chartered cooperative of 26 member agencies—cities and public water agencies—that serve about 18 million people in six counties. Metropolitan imports water from the Colorado River and Northern California to supplement local supplies, and helps its members to develop increased water conservation, recycling, storage and other resource-management programs.

Mission Statement

The mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way.

The Metropolitan Water District
of Southern California
P.O. Box 54153
Los Angeles, CA 90054-0153

700 N. Alameda St.
Los Angeles, CA 90012

(213) 217-6485
(800) CALL MWD

www.mwdh2o.com
www.bewaterwise.com

