

# Chlorine Dioxide Reduces THMs, Improves Taste for Arkansas Water Treatment Plant

## Challenge

The 1.8 MGD Greenwood Water Treatment Plant was built in 1964 and upgraded in 1992. The facility provides drinking water to a population of more than 7,000 and, like many small towns, Greenwood has faced major decisions about how to remain in compliance with the Safe Drinking Water Act. Because its water supply is provided by a very shallow lake (less than 10-feet deep), sourcewater quality can vary widely. “We often get a lot of organics, and this had brought about high trihalomethanes (THMs) in our finished water when we prechlorinated,” says Greenwood Water Superintendent, Mack Cochran. THMs were running more than 115 mg/l and as high as 175 mg/l.

In addition, the high organic levels in the sourcewater were causing problems with taste and odor. In the late 1990s, Greenwood started looking for ways to reduce THMs as well as improve taste and odor in its finished water.

## Solution

The plant installed a Wallace & Tiernan Series 85-250 Chlorine Dioxide System.

- Chlorine dioxide (ClO<sub>2</sub>) is a powerful disinfectant and oxidizing agent applied in treatment plants for controlling tastes and odors, disinfection, oxidation of iron and manganese, and controlling THM formation.
- Chlorine dioxide does not react with ammonia to form less-active chloramines and will not form THMs.

## Results

The Chlorine Dioxide System makes up ClO<sub>2</sub> on a continuous batch process. Chlorine gas, sodium chlorite liquid, and water are combined to produce a 2 percent solution of chlorine dioxide in 25-gallon batches. “Everything is automatic,” says Cochran. “It automatically batches again

when our 25-gallon reservoir drops.” Level probes in the chlorine dioxide holding tank monitor the stored solution level and start and stop the batch cycles.

- The system uses manually set feed rates of sodium chlorite and a high concentration of chlorine solution to completely convert the sodium chlorite to chlorine dioxide (the system converts 96 to 98 percent of sodium chlorite to chlorine dioxide).
- The system at the Greenwood facility has a capacity of 80 pounds of chlorine dioxide per day. The plant treats an average of 850 gallons per minute using eight to 10 gallons a day of concentrated chlorine dioxide. The dosage rate is set at 0.55 ppm.
- The chlorination equipment with the system includes a switch-over type of vacuum regulator so the system operation will continue when one of the chlorine cylinders is empty, and a fume -evacuation injector in the vent line from the holding tank controls any off-gassing during generation. Following the adoption of chlorine dioxide feed and the elimination of prechlorination, THMs have been significantly reduced, according to Cochran. Taste and odor have also improved significantly.
- Since switching to chlorine dioxide, twice the plant won two “Best Tasting Water” competitions sponsored by the Arkansas Water Works And Water Environment Association.
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Courtesy by : Siemens