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Case study

Wedeco PDO Ozone System in Salt Lake City, UT

Ozone disinfection system lowers turbidity, boosts filter run times, and eliminates taste and odor issues in drinking water

A $250 million capital program by the Metropolitan Water District of Salt Lake & Sandy (MWDSLS) has equipped the wholesale water utility to produce improved water quality and to meet projected demand through and beyond 2025.

Scope

By 2025 Salt Lake City expects to gain additional 100,000 residents, and the city of Sandy expects to gain another 30,000. The accelerating growth of the MWDSLS customer agencies along with the need for system reliability and redundancy spurred the proactive capital improvements.

The Little Cottonwood Water Treatment Plant (LCWTP) was the cornerstone of the MWDSLS' capital improvement program. The facility draws raw water from Little Cottonwood Creek and Deer Creek Reservoir. LCWTP operated as a conventional 100-million gallons per day (MGD) facility employing gravity sedimentation, granular media filtration and chlorine disinfection. Powdered activated carbon was added to suppress seasonal taste and odor (T&O) issues but had limitations, according to Eric Sorensen, environmental services specialist II with the utility.

Solution

Taking these factors into account, the MWDSLS' initiative involved producing a 30-MGD treatment increase at LCWTP and replacing chlorine with environmentally friendly Wedeco ozone disinfection.

By using ozone with side stream injection, the site was able to eliminate construction of deep, fine-bubble diffusion contact chambers in favor of converting the plant's two 470 foot by 13 foot by 14 foot open aeration basins into parallel ozone contact chambers. The retrofit required seismic upgrades and the addition of an 8-inch-thick, segmental precast concrete lid to enclose them. The water receives the gas via a reconstructed, 84-inch diameter

Aerial view of the Little Cottonwood Water Treatment Plant

End user:	Salt Lake City, UT
Client:	Metropolitan Water District of Salt Lake & Sandy
Order date:	2013
Completion:	2013

raw water line using four axial dispersion tubes. A new calcium thiosulfate chemical feed system quenches any residual ozone. To establish a decay curve, dosage, appropriate ozone concentration, and contact time, five sampling points were incorporated along the lengths.

The two Wedeco PDO 7000 ozone generators, sized at 3,750 pounds per day (ppd), offer significantly more capacity than initially needed. The system is designed to dose up to 3.5 parts per million (ppm) ozone during T&O events, but the utility typically doses 1 ppm ozone during normal operations.

Result

The design consultant applied computational fluid dynamic modeling in developing a solution for the LCWTP retrofit. The methodology eliminated some new construction at the site and estimates are that these design initiatives utilizing Wedeco high performance technologies saved the MWDSLS more than $5 million. This would not have been possible without the efficient operation offered by the Wedeco equipment with up to 20 percent less power being used and 30 times less oxygen.

"The system has consistently exceeded state requirements since the Wedeco ozone system came online," Sorensen added, "and has allowed a one-third reduction in the plant's chlorine dosage."

The plant uses ozone to achieve the required additional 0.5 log removal/inactivation of Giardia. In 2011 this goal was met 85 percent of the time. Chlorine is used downstream to meet any additional removal/inactivation requirement. The inclusion of ozone in the plant retrofit has also lowered finished water turbidities, boosted filter run times, and provided a high degree of flexibility when selecting gas suppliers.

Construction of the ozone contact chambers

One of the two Wedeco Ozone generators

Xylem, Inc.
14125 South Bridge Circle
Charlotte, NC 28273
Tel 704.409.9700
Fax 704.295.9080
855-XYL-H2O1 (855-995-4661)
www.xyleminc.com

www.youtube.com/wedecous