Case Study
USGARW-46.001

Raw Water Manganese and Cyanobacteria Control

Customer experiences long-term success with SolarBee® Lake Circulators

Topics: cyanobacteria, taste & odor, organics mitigation, hypolimnetic oxygenation, Mn / Fe control, treatment savings

As of June 2022, these SolarBee Lake Circulators have been improving water quality at this location for over 17 years!

Reservoir Overview: Man-made source water reservoir.

Surface Area: 48 acres (0.19 square kilometers)
Average Depth: 10 feet (3.1 meters)
Max Depth: 14 feet (4.3 meters)
Outflow to Plant: 0.3 MGD (757 cubic meters)
Hydraulic Detention Time: 774 days

Pre-Deployment Conditions: This reservoir had a history of cyanobacteria (blue-green algae) blooms, as well as high manganese (Mn) and iron (Fe) concentrations, both of which caused taste and odor problems. Typical Mn entering the plant during the summer was around 7 mg/L and as high as 20 mg/L.

Project Objectives:

- Reduce levels of Fe and Mn entering the plant
- Reduce / eliminate chemical treatments to control cyanobacteria blooms
- Improve digestion of organics in the reservoir for long-term DBP improvement (THM, HAA)

Solution: Two (2) SolarBee® Lake Circulators (2005). The first unit was placed centrally for cyanobacteria control (circulation setting just above the thermocline). The second unit was placed near the WTP water intake for Mn control (circulation setting deep near bottom).

Results: During the first summer in 2005, Mn concentrations coming in to the WTP dropped from approximately 3 mg/L to about 0.3 mg/L. After fine-tuning intake hose depths, Mn concentrations dropped even further to < 0.1 mg/L which eliminated the need to add potassium permanganate for mitigation. They have never seen Mn concentrations so low in the 20 years since the superintendent has been at the WTP.

Cyanobacteria bloom control has also been achieved with excellent results. This includes the absence of taste and odor complaints as well as eliminating the need for costly toxic chemical applications or power intensive aeration.

The City is very satisfied with their investment in SolarBees. The superintendent very much appreciates the improved water quality and more stable consistency of raw water entering the WTP.

Update (Aug 2015): Per the Customer, they are happy with the SolarBees. They have stopped using chemicals and have had very low or no manganese issues for a long time.

Update (Jun 2019): Per the Customer, "The SolarBees are doing a great job for our water source so far." They also noted organic levels are currently low and very manageable.

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