

Algae Control in Rainbow Lake

BY ERIC DUTROW, MRWA CIRCUIT RIDER II

The Town of Emmitsburg, Maryland in Northern Frederick County has historically had treatment issues in the warm weather months caused by algae in their raw water source. One of the town's sources of water is Rainbow Lake, an 11-acre reservoir approximately one mile from the treatment plant.

During much of the year, especially the summer months, the town has issues with algae in the lake. Much higher amounts of chemicals are needed to treat the water when the algae are present. Filter run times are reduced and a high percentage of water is needed for backwashing. The algae have historically not contributed to taste and odor issues in the water.

The town had been using Copper Sulfate (CuSO_4) to control algae in the lake, but due to a change in their permit this was discontinued. Plant Superintendent Dan Fissel tried other methods to control the algae, but found that alternative chemicals did not perform well.

Dan originally considered adding a clarifier basin to the treatment plant to help alleviate this problem, but found it to be cost prohibitive.

Dan set goals for an alternative treatment method that would reduce backwash rates, reduce the amount of chemical used, and reduce associated overtime costs.

Dan looked into ultrasonic algae control as a cost-efficient alternative. This technology is used in not only water and wastewater, but also aquaculture, in recreational lakes and ponds. This technology is safe for fish, plants, zooplankton and insects, and only targets algae. After careful consideration, the town opted to use the LG Sonic MPC-buoy supplied by Kershner Environmental.

The LG Sonic MPC-buoy uses ultrasonic sound waves to attack algae cells. The ultrasonic sound waves rupture the gas vesicles in blue-green algae, and break down the cell walls in green algae. The ultrasonic sound barrier prevents the algae from rising to the surface and absorbing light for photosynthesis, thus keeping the algae from growing. The algae sink to the bottom of the lake and are degraded by bacteria.

The MPC-buoy used at Rainbow Lake was installed and put into operation on April 11, 2017.

As it is in a remote location, it is a solar-powered unit. It continually monitors algae indicators such as Chlorophyll-a and Phycocyanin, and water quality parameters such as DO, pH, and temperature. The ultrasonic frequencies are varied to control different types of algae. The MPC-buoy uses satellite remote sensing to send real-time data to the manufacturer, where the frequencies are changed to target different types of algae.

Initial results of the ultrasonic algae control system are promising. Coagulant use and backwash water usage are both down. According to an article in the *Catoctin Banner*, "town staff have received multiple comments from fisherman using the lake that the water is noticeably clearer." Town staff are continuing to fine-tune the system for optimal algae control. Dan was hoping for good results in August and September, when they typically have the largest algae growth.

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