Harmful Algal Bloom Remediation and Prevention in Lake Minneola Using BlueGreen U.S. Water Technologies Inc.’s Lake Guard® Technology

Frequently Asked Questions

What are algae?

“Algae” is a generic term associated with a large group of photosynthetic organisms, either unicellular plants or “cyanobacteria.” The term "algal blooms" describes a population explosion of microscopic organisms (often plants or cyanobacteria) in waterbodies. Algal blooms happen when billions of cells clump together to float on the water surface and eventually cover the surface with a greenish, often slimy film. This phenomenon often results in biodiversity loss and the reduction of beneficial algal species in the water body. Also, a few species of algae can contain toxins and pose serious health risks to humans and animals. Blooms can impact the local economy, from tourism and recreational activities to devaluation of property around the lake.

Does Lake Minneola experience algal blooms regularly?

Harmful algal blooms (HABs) fluctuate in frequency and in severity from year to year. Algal blooms have been documented in Lake Minneola for several years, including March to June 2020. Even with no visible scum, cyanobacteria are still present at levels that may adversely impact humans and animals. Figure 2 shows intensifying cyanobacterial levels as of late June 2020 compared to the previous month, and the trend of increasing cyanobacterial levels is expected to continue with the warming water temperature.

Fig. 2. True-color satellite images of Lake Minneola, left panels, and processed images with the Lake Guard® View to quantify cyanobacterial intensity levels in the lake, right panels. The true-color and processed images are from May 28, 2020, (top) and from June 22, 2020 (bottom).

The processed images depict cyanobacterial intensity levels as a heatmap scaled from undetectable/low levels (cold colors, blue), to high levels (warm colors, red). Gray or no color indicates missing data due to cloud coverage.

Cyanobacterial level intensity increased significantly from May to June of this year. This trend of increased intensity is expected to continue throughout the summer.
What does the Lake Minneola Harmful Algal Bloom Remediation and Prevention Project encompass?

Blue Green Water Technologies’ (BGWT) Lake Guard® is a targeted treatment against blue-green algae. The process selectively eliminates and prevents toxic algae blooms in lakes, regardless of lake size or shape, using a proprietary new formulation of potent algaecides that allows the granular product to float and time-release the active ingredient on the water surface, while targeting cyanobacterial mats as they drift in the water.

What is the project’s goal?

The project seeks to control cyanobacterial levels, rejuvenate healthy conditions and prevent algal blooms from occurring in Lake Minneola throughout the project’s duration. The project seeks to rehabilitate the aquatic ecosystem by reducing potentially harmful cyanobacteria and rejuvenating the biodiversity of beneficial green algae that will serve as the lake’s “immune system” against cyanobacterial resurgence. A thriving green algae population draws important nutrients (phosphorus and nitrogen) away from cyanobacteria and prevents them from reestablishing themselves in high numbers in the water.

Is the treatment safe for the environment?

Yes. The Lake Guard® Oxy selectively targets cyanobacteria, not beneficial green algae that are much less sensitive to oxidative stress. The Lake Guard® Oxy does not persist or accumulate in the environment. The dose rates of the Lake Guard® products are extremely low, and the time-release mechanism allows only a fraction of the total dose of hydrogen peroxide in the product to be released into the water over a few hours. This limits the effective concentration of the hydrogen peroxide at any given moment to extremely low levels. For reference, the levels of hydrogen peroxide concentration in Lake Minneola during the treatment application will be a tiny fraction of the concentration in a standard mouth wash.

Is the treatment safe for people and pets?

Yes, the treatment is safe to people and pets. Due to the unique formulation of the Lake Guard® products, all its ingredients will dissolve completely after a few hours from application. This eco-friendly product does not persist or accumulate in the environment, and the active ingredient decomposes quickly to water and oxygen.

Must recreational activities in the lake be suspended during the treatment application process?

Boating activities can take place any time. However, out of an abundance of caution, BGWT recommends following swimming advisories issued by local authorities during times of high concentrations of cyanobacteria. Regardless of the product’s application, the existing high concentrations of cyanobacteria make swimming an activity to be avoided for the duration of these local advisories.
How long will the treatment application process take?

The initial interventional treatment application for Lake Minneola takes several hours to complete. The Lake Guard® Oxy will be broadcasted from a moving boat in predetermined, limited drop zones. Oftentimes, after the initial treatment, the treatment application will be limited to a specific area, and a spot treatment will take less than an hour to complete.

When will the treatment results be apparent?

Treatment results will be apparent within 24-48 hours, and the lake’s condition will continue to improve over several days.

How long does a single treatment last?

Treatment results will last for several weeks to several months. The treatment longevity depends on multiple factors, including the source of lake’s water, geological factors, nearby vegetation, source of contamination (if any), initial diversity of fauna and flora, history of treatments (e.g. herbicides) and more.

Will the water be monitored for cyanotoxins?

BGWT will track any evolving cyanobacterial outbreaks and respond to them immediately in order to sustain a healthy, biodiverse environment. BGWT will monitor the lake condition continuously, using remote sensing, in-situ digital measurements and water sampling. Water testing for cyanotoxins will be processed by an independent, certified laboratory in Florida.

How was the project selected?

Among various recommendations from the Blue-Green Algae Task Force, and with support from Gov. DeSantis, the Florida Legislature appropriated grant funding for “innovative technology” projects throughout the state to test new and innovative processes for dealing with water quality challenges. Several grants were awarded for innovative projects across Florida, including this one. Lake Minneola, which has been plagued with cyanobacterial infections, is a prime candidate for a pilot remediation project to combat harmful algal blooms. The St. Johns River Water Management District’s (SJRWMD) grant agreement with the Florida Department of Environmental Protection (FDEP) provides the support for contracting BGWT to test its technology’s ability to control and manage algal concentrations in the lake.