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## MEMO

**TO:** Nine Mile Creek Watershed District Board of Managers

**FROM:** Randy Anhorn

**DATE:** July 29, 2020

**RE:** Cyanobacteria and Cyanotoxin Monitoring and Analysis

### Background

The District currently monitors the lakes within its boundaries on a rotating basis (every 4-5 years where there has been a baseline established) to track water quality and analyze potential trends. During these monitoring years the District is out on the lakes roughly every three weeks for six events per year unless monitoring frequency on a specific lake is increased due to an upcoming study or to evaluate results of implemented projects.

While out monitoring Lake Cornelia on a couple occasions in 2016 and 2017, monitoring staff observed algal scum that was identified as a potential blue-green (cyanobacteria) algal bloom on a few dates (this was also the case on one occasion on Glen Lake in 2017). Cyanobacteria produce neuro and liver toxins that are poisonous to livestock, wildlife and humans if ingested.

In an effort to identify if the bloom may exceed thresholds to be identified as a harmful algal bloom (HAB), staff collected an algae sample, brought it back to the lab and immediately examined it under a microscope for species identification and enumeration. Because blue-green algal levels greater than World Health Organization (WHO) thresholds for moderate health risk (100,000 units/ML) were found, staff notified the city of the potential health hazard (where the city and the watershed both posted this information on their websites, on social media and in newsletters/press releases—as well as the city posting signs on park property).

On these occasions, staff also prepared additional samples to be sent to an out-state lab to be analyzed for cyanotoxins (there are no labs doing the analysis in Minnesota). In one case in 2016 and one in 2017, the analyses came back showing toxin levels above public health advisory thresholds (additionally, one sample in 2017 had levels below public health threshold levels). While in each case the District and the city took precautions to notify the public of the potential health hazard, it took about a week and a half to two weeks to get results back from the lab to actually determine if the blooms had toxins above public health thresholds or not. So, by the time we truly knew of the health risk, it was likely gone. In each case, where toxins were determined to be above public health levels, follow-up monitoring and analysis found levels below public health thresholds. Due to changing lake conditions the presence of cyanotoxins are unpredictable (e.g., being present on one side of a lake during a bloom and not on the other and present one moment and not the next).

Because of the delay in receiving lab results, it prevents the District to truly inform the public if the water is safe for bodily contact or not in a timely manner. For this reason, staff finds that the best precaution if a potential blue-green bloom is observed during the District's routine monitoring, is to take a sample for species identification and enumeration. Then, if the analysis finds unit/ML counts for blue-greens above WHO thresholds, to notify the city and jointly post the lake for a potential HAB and promote the Minnesota Department of Health suggestion of "when in doubt, stay out."

At its November 13, 2018 Board meeting, the Board discussed a request from the City of Edina and the Lake Cornelia Lake association to regularly monitor cyanobacteria toxicity on Lake Cornelia. Following discussion, it was the consensus of the Board that they did not see the need to, nor the value of, annually monitoring any of our lakes for potential HABs outside of our routine monitoring program (rotating the lakes that are annually monitored). In addition, if the District changes the current monitoring program for one lake, a change would likely need to be made to include all of the District lakes, and again, the Board didn't see the cost/benefit in such a switch. The Board thought our main role is to identify and implement projects to reduce nutrient loading to receiving water resources to ultimately reduce the frequency of algal blooms.

This has led to our current protocol of monitoring for potential HABs through our normal rotating lake monitoring program; whenever we observe a potential blue-green algal bloom on a lake we are currently monitoring, and we determine if blue-green numbers exceed WHO thresholds we will notify the proper entities and post the notices as we have done previously but because of the lag time in receiving results we have not (until recently) prepared a sample to be analyzed for toxins.

In discussions with neighboring watersheds, municipalities and other entities, they do not prepare samples to be analyzed for cyanotoxins and if they suspect a blue-green algal bloom they would with partners to jointly post the lake for a potential HAB and promote the Minnesota Department of Health suggestion of "when in doubt, stay out."

## **Request**

To promote discussion.

## **Questions**

- What to do after a lake in our routine monitoring program has blue-green algal counts above WHO moderate risk thresholds
  - Post "when in doubt stay out"?
  - Prepare sample to send to lab to test for cyanotoxins although results may show toxins for the date sampled, but may well be gone once results are know
    - If positive, what is the next steps? Re-monitor at next scheduled event or immediately after notification of cyanotoxin results exceeding public health advisory thresholds
- A hybrid option could be to check a lake once, if over WHO thresholds, to confirm the potential for cyanotoxins above health limits?
- What to do if a concerned citizen calls about what they perceive as a potential blue-green algal bloom on a lake that we are not currently monitoring?

## NMCWD's Role in Blue-Green Algal Bloom and Cyanotoxin Monitoring & Analysis

