

## Memorandum

**To:** Ms. Colleen Conover, Lake Hopatcong Commission

**From:** Patrick Rose, Princeton Hydro

**CC:** Fred Lubnow, Ph.D., Princeton Hydro

**Date:** 4 August 2021

**RE:** 6 July 2021 – Cyanotoxin Testing – Lake Hopatcong

**Pages:** 7

---

Princeton Hydro conducted the first of two 2021 cyanobacteria / cyanotoxin testing events at Lake Hopatcong on 6 July 2021. The data collected as part of this effort are provided below.

### *Methodology*

Princeton Hydro sampled at eight (8) stations on 6 July 2021. At each station, plankton grab samples were collected, preserved with Lugol's, and the cyanobacteria community was identified to genus by Princeton Hydro; densities were quantified as cells / mLs. In addition, at each site samples were collected in glass vials and analyzed the same day for the cyanotoxins microcystin, cylindrospermopsin, and anatoxin-a utilizing Abraxis Algal Toxin Test Strip Kits and read with an Abraxis Field Meter. It should be noted that this analytical methodology is not NJ-State certified and cannot be used in a regulatory capacity. However, the resulting data can be used for informational and management purposes. *In-situ* monitoring was also conducted at each station utilizing an In-Situ AquaTROLL 500 water quality meter which was calibrated prior to use; Princeton Hydro is State certified in its use of field meters ( NJDEP: #10006). *In-situ* phycocyanin concentrations were also measured at each station with a Turner fluoroprobe. The locations of the sample stations are shown in the figure attached to the end of this memo. Please note that only stations B1-B8 were sampled during this event, as B9 and B10 were supplemental stations monitored in past years. Photos of the sampling stations are also attached at the end of this memo.

### *Results*

The results of the sampling effort are listed in the following tables (Tables 1 through 4).



Table 1: Cyanotoxin Data

Station	Microcystin (ppb)	Cylindrospermopsin (ppb)	Anatoxin (ppb)
B1	Negative	Negative	Negative
B2	Negative	Negative	Negative
B3	Negative	Negative	Negative
B4	Negative	Negative	Negative
B5	Negative	Negative	Negative
B6	Negative	Negative	Negative
B7	Negative	Negative	Negative
B8	Negative	Negative	Negative

Table 2: *In-situ* Data

In-Situ Data 7/6/21							Notes
Station	Secchi (m)	Temperature °C	Specific Conductance mS/cm	Dissolved Oxygen		pH	
				mg/L	% Sat.	S.U.	
B1	1.0	25.95	0.367	7.29	92.4	7.40	Slightly clouded/some particulates, yellow-brown, some floating Eurasian watermilfoil (EWM) and <i>Vallisneria</i>
B2	1.0	25.84	0.398	7.88	100.1	7.33	Slightly clouded/some particulates, yellow-brown, some floating EWM and <i>Vallisneria</i> . Naiad sp. and <i>Vallisneria</i> rooted
B3	0.5	25.67	1.023	14.59	194.6	9.00	Dense EWM and mat algae present, clear to bottom, slight green tint
B4	0.9	25.01	1.159	9.40	117.8	7.85	Slight green tint with particulates, EWM present, patches of mat algae along swim line
B5	2.0	25.41	0.434	9.09	114.3	8.14	Clear, slightly green, Coontail and <i>Vallisneria</i> noted, trace EWM
B6/Outlet	1.4	25.46	0.433	7.09	89.2	7.46	Yellow brown hue, some partic
B7	-	26.07	0.431	7.68	97.7	7.54	clear
B8	1.9	25.13	0.427	8.73	109.2	7.86	Clear, slight green tint

Table 3: Phycocyanin Concentrations

Station	Phycocyanin (ppb)
B1	13
B2	12
B3	6
B4	9
B5	6
B6	8
B7	7
B8	6

Table 4: Plankton Data

Cyanobacteria Community Composition Analysis								
Sampling Location: Lake Hopatcong	Sampling Date: 7/6/21				Examination Date: 7/26/21			
Phytoplankton								
Cyanophyta (Blue-Green Algae)	B1	B2	B3	B4	B5	B6	B7	B8
<i>Aphanizomenon</i>						1,735		1,698
<i>Dolichospermum</i>		684	550	746	14,474	1,084	15,765	17,547
<i>Aphanocapsa</i>	9,968	6,153						5,189
<i>Pseudanabaena</i>	3,204	5,332		1,119				
<i>Chroococcus</i>	2,314	273	659		1,034			377
<i>Microcystis</i>	2,314	8,203						
<i>Coelosphaerium</i>					4,265			6,321
Sites:	B1	B2	B3	B4	B5	B6	B7	B8
<b>Total Cyanobacteria Cells/mL</b>	17800	20645	1209	1865	19773	2819	15765	31132

**Summary:**

A total of seven cyanobacteria genera were identified in the near-shore samples. Cyanobacteria densities were generally low throughout the lake and only two stations had cyanobacteria cell counts that exceeded 20,000 cells/mL. Stations B2 and B8 would fall under the “Watch” HAB Alert Level while none of the remaining six stations would be classified under any NJDEP HAB Alert Tier. Cyanobacteria cell counts ranged from a minimum of 1,209 cells/mL at B3 to a maximum of 31,132 cells/mL at B8. The dominant genus varied by station and included *Aphanocapsa*, *Microcystis*, and *Dolichospermum*. Phycocyanin concentrations were relatively low and did not exceed 13 ppb at any station. Based on these results, no significant surface cyanobacteria blooms were present at any of these stations during the monitoring event.

Cylindrospermopsin values were negative at all eight stations, meaning concentrations were well below 0.5 ppb or absent from the sample. Microcystins were negative at all eight stations, indicating that concentrations were absent or well below the detection limit for these tests (<1 ppb). Anatoxin-a values were also negative at all eight stations, indicating concentrations were absent or below 0.4 ppb. As such, all of these values remained below the draft recreational health advisories set by the NJDEP for each of the cyanotoxins tested (Microcystin: 3 ppb; Cylindrospermopsin: 8 ppb; Anatoxin: 27 ppb). Based on these results, no HABs were present during the time of sampling.

Finally, all of the near-shore sampling sites appeared to be visually acceptable, with mostly clear water adjacent to the beach, with slightly cloudier or green tints farther out. No stations exhibited any signs of significant cyanobacteria blooms. Photos of all stations can be found at the end of this document.

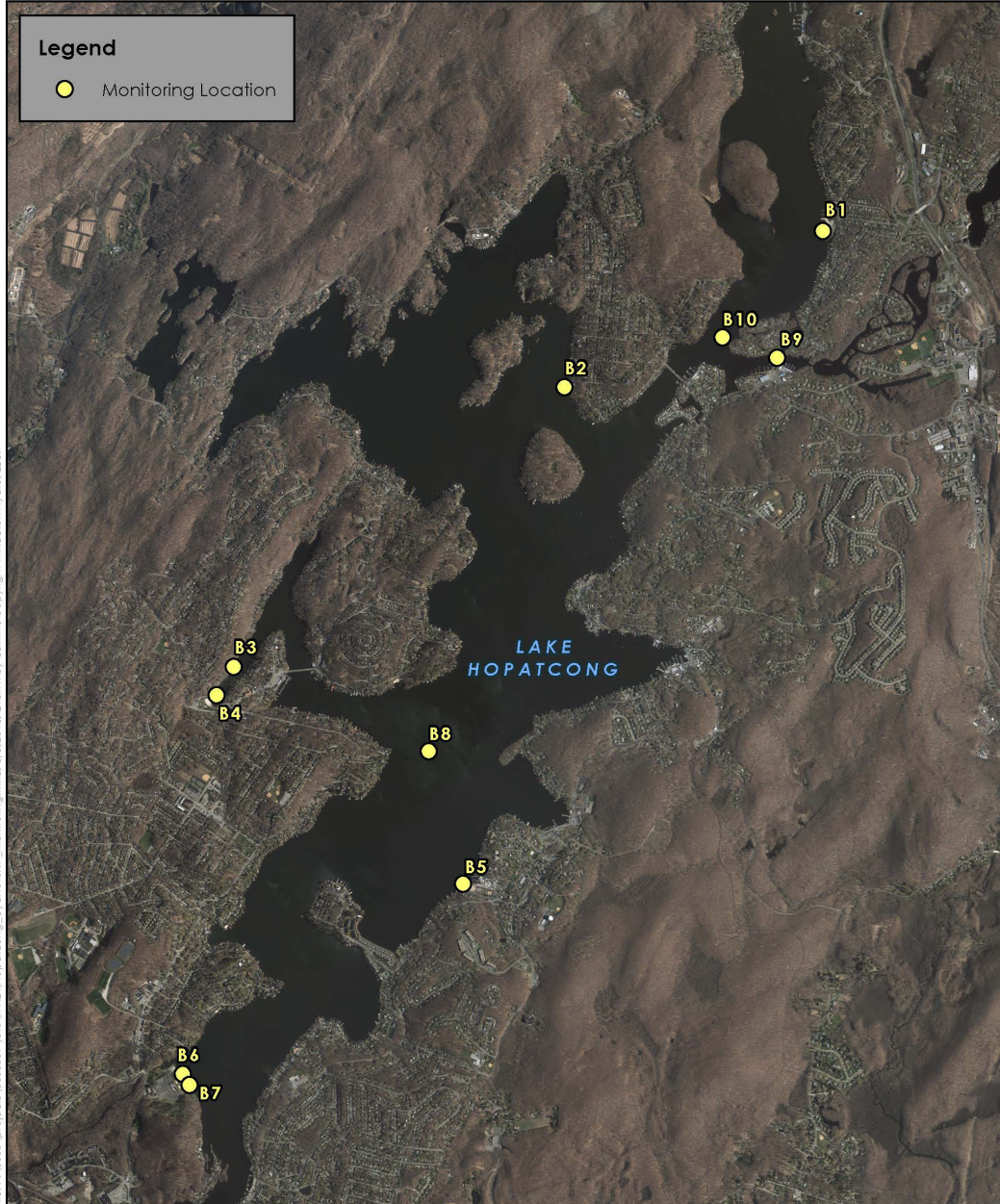
Thank you for your review of this brief summary. Please feel free to contact me or Dr. Fred Lubnow with any questions or concerns.

Sincerely,

Patrick Rose  
Staff Scientist  
Princeton Hydro, LLC



Site Location Map



File: P:\0003\projects\000302\GIS\MXD\Hopatcong\_Cyanotoxin\_Monitoring.mxd, 8/8/2018, Drawn by:benifly, Copyright Princeton Hydro, LLC.

NOTES:  
1. Monitoring locations are approximate.  
2. 2015 orthoimagery obtained from NJ Office of Information Technology (NJ/OIT), Office of Geographic Information Systems (OGIS).

0 2,000 4,000 Feet  
Map Projection: NAD 1983 StatePlane New Jersey FIPS 2900 Feet

**CYANOTOXIN MONITORING  
LOCATION MAP**

LAKE HOPATCONG  
MORRIS AND SUSSEX COUNTIES  
NEW JERSEY



[www.PrincetonHydro.com](http://www.PrincetonHydro.com)



Photographs of Near-Shore Sampling Sites

