Cyanobacteria Monitoring Program 2020 Report

Summer-Fall 2020

Rhode Island Department of Environmental Management

Office of Water Resources

235 Promenade Street

Providence, Rhode Island 02908

Barney Pond – August 2020

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Introduction

Cyanobacteria (blue-green algae) are microscopic, photosynthetic bacteria naturally found in waterbodies. These organisms either attach to a substrate or float in the water column as individual cells or within colonies. There are many factors that may cause cyanobacteria to experience rapid growth events known as blooms. Such factors include the duration and intensity of sunlight to surface waters, water temperature, excess nutrient load (phosphorus in particular), and other influxes of polluted storm water runoff. Most cyanobacteria produce intracellular toxins which are released into waters when the cells die or are ruptured. This can potentially cause health risks for wildlife, pets, livestock, as well as humans.

The Rhode Island Department of Health (HEALTH) and the Rhode Island Department of Environmental Management (RIDEM) work cooperatively to monitor for the presence of cyanobacteria blooms, evaluate the potential risks to the public, and issue health advisories notifying the public of health concerns. The agencies jointly issue health/recreational advisories when any of the following three guidelines are met:

- Evidence of a visible cyanobacteria scum or mat or lake/pond-wide cyanobacteria bloom.
- Cyanobacteria cell count exceeding 70,000 cells/mL.
- Toxin (Microcystin-LR) level of lysed cells meeting or exceeding 4 ppb (µg/L).

Health advisories recommend that individuals avoid all contact with the affected waterbody, including recreational activities such as swimming, boating, or fishing. People are also advised to not eat fish from the affected waterbody or to allow pets to wade in, swim in, or drink untreated water from the affected waters. Health advisories remain in effect for the remainder of what is considered to be the recreation season (until November 1st), unless follow-up sampling by a city, town, third party or RIDEM indicate that the advisory can be lifted. However, due to the prolonged warm weather into the fall and winter seasons, all health advisories placed over the summer have remained in place past the normal November 1st lifting date.

Health advisories may be lifted after two successive and representative sampling rounds two weeks apart demonstrate no evidence of a cyanobacterial scum or mat, and testing results find cyanobacteria cell counts and toxin levels to be below threshold concentrations. This year, visual surveys were conducted after the end of the recreation season to lift the remaining advisories, but local residents were still advised to exercise caution around these waters.

RIDEM's Office of Water Resources (OWR) receives reports annually about nuisance algal conditions and cyanobacteria blooms from municipal staff, lake and watershed associations, as well as the broader public. From 2011 to 2020, 44 waterbodies have had recreational/health advisories issued with an average of approximately 15 waterbodies per year. Twelve of the 44 waterbodies are public drinking water supplies and nearly all the remaining waterbodies have a public boat/canoe launch, are routinely used for recreational activities, or have a well-known public access point.

In 2017 and 2018, RIDEM OWR received an EPA Multi-Purpose Grant allowing for biweekly cyanobacteria monitoring of 32 waterbodies throughout the state during the field seasons. While

this funding was not available for 2019, RIDEM OWR was able to once again secure the grant for 2020 and continue monitoring 21 waterbodies. This report provides a summary of the results of the 2020 cyanobacteria monitoring program.

Methods

RIDEM's Quality Assurance Project Plan (QAPP) describes in detail the field and analytical methods and quality assurance/quality control procedures related to this sampling program. The QAPP ("Rhode Island Freshwater Harmful Algal Bloom Monitoring") is available at DEM's Providence office.

In 2020, RIDEM OWR conducted routine biweekly cyanobacteria monitoring of 21 waterbodies from early June to late November (Table 1). These waterbodies were selected for monitoring at the start of the 2020 season due to having a history of frequent cyanobacteria blooms in previous years. Additional monitoring was done in response to calls from the public, municipal staff, watershed associations, or other RIDEM staff about potential cyanobacteria blooms.

During each visit a fieldsheet was filled out and photographs were taken, regardless of whether or not a bloom was observed. The fieldsheet documented information about location, extent and physical appearance of the bloom, weather conditions, and any active recreation occuring at the waterbody.

If a bloom was observed during a visit, one or more samples were collected following the procedure outlined in the QAPP. Samples were collected from the shoreline with the aid of a sampling stick from the densest portion of the bloom. Typically, monitoring and sample collection occurred at public access points on each pond. If no public access was available, monitoring and sample collection were done from a secondary access location or through permission of a private owner. Monitoring and sampling locations for each waterbody are listed in Table 1.

Samples were sent to the Rhode Island State Health Laboratory for cyanotoxin analysis and identification/enumeration by colony count of cyanobacteria genera. The cyanotoxins identified by the lab are listed in Table 2, and the cyanobacteria genera are listed in Table 3, along with the thresholds for issuing an advisory. RIDEM OWR staff estimated cyanobacteria cell counts from colony counts using conversion factors provided in Hartman and Graffius (1960). Cyanotoxin concentration, colony count, cell count estimation, and visual appearance were evaluated by RIDEM OWR and HEALTH and an advisory was issued if any of the previously mentioned thresholds were met. If an advisory was issued for a waterbody as a result of a response visit, the waterbody was subsequently added to the routine biweekly monitoring schedule. Follow-up sampling to lift advisories was conducted when possible.

Table 1. List of Waterbodies Evaluated for Cyanobacteria Blooms**.**

Sampling Program	Name	Town	Waterbody ID	Primary Access
Screening Level	Almy Pond	Newport	RI0010047L-01	Access off Coggeshell Ave on South side
	Blackamore Pond	Cranston	RI0006018L-06	Access off Winter Ave
	Carbuncle Pond	Coventry	RI0005011L-01	Access via state entrance off Plainfield Pike
	Cunliff Lake-RWP	Providence	RI0006017L-05	Access at Trailhead parking area
	Deep Spring Lake-RWP	Providence	RI0006017L-05	Access across road from parking area at Cunliff
	Edgewood lake-RWP	Providence	RI0006017L-05	Access on east side of FC Greene Memorial Blvd
	Elm Lake- RWP	Providence	RI0006017L-05	Access on South side of FC Greene Memorial Blvd
	J.L. Curran Reservoir	Cranston	RI0006016L-02	Access area off Seven Mile Rd (boat Launch area)
	Mashapaug Pond	Providence	RI0006017L-06	Access from boat launch near baseball field at end of Access Rd or Providence Boating Center
	Melville Ponds	Portsmouth	RI0007029R-04	Access near elementary school at fishing dock
	Omega Pond	East Providence	RI0004009L-03	Access from private home off of Roger Williams Ave
	Pleasure Lake- RWP	Providence	RI0006017L-05	Access off Natural History Ave
	Polo Lake-RWP	Providence	RI0006017L-05	Access from North side of FC Greene Memorial Blvd
	Roosevelt Lake-RWP	Providence	RI0006017L-05	Access off FC Greene Memorial Blvd
	Slack Reservoir	Smithfield-Johnston	RI0002007L-03	Access at public beach off Green Lake Dr or Terrace Dr

	Spectacle Pond	Cranston	RI0006017L-07	Access at end of Midwood St on south end of pond
	Stafford Pond	Tiverton	RI0007037L-01	Access at DEM Boat Ramp or Pelletier Ln
	Ten Mile River	East Providence	RI0004009R-01B	Access at Turner Reservoir Loop Trailhead parking lot
	Turner Reservoir	Rumford	RI0004009L-01B	Access off of Newman Ave (route 152) bridge or along Bridgham Farm walking area off of Bridgham Farm Rd
	Warwick Pond	Warwick	RI0007024L-02	Access at boat launch or park off of Edgehill Rd on east side of pond
	Willow Lake- RWP	Providence	RI0006017L-05	Access near bridge or paddle boat rentals
Response Level	Barber Pond	South Kingstown	RI0008039L-14	Access from boat ramp off of Barbers Pond Rd
	Barney Pond	Lincoln	RI0003008L-02	Access off Grandview Ave
	Barrington Pond – 95L	Barrington	None [Private Pond]	
	Carls Pond	Cumberland	RI0001006L-08	Access from Jencks Rd
	Bleachery Pond	East Greenwich	None	Access from Kenyon Ave
	Butterfly Pond	Lincoln	None	Access from Great Rd
	Georgiaville Pond	Smithfield	RI0002007L-02	Access from public beach off of Stillwater Rd
	Hawkins Pond	Greenville	RI0002007L-01	Access off Winsor Ave
	Johnson's Pond	Coventry	RI0006013L-01	Access off Old Flat River Road, Indian Trail, and Waters Edge Family Campground
	Little Pond	Warwick	RI0007024L-01	Access behind Warwick Veterans Junior High School, off of Albert Rd
	Westerly Pond [Private Pond]	Westerly	None	Access from private residence on Littlebrook Rd

	Little Wash Pond	South Kingstown	RI0010043L-06	Access off rt. 1 near Hale House
	Scott Pond	Lincoln	RI0001003L-01	Access behind Saylesville Fire Station off Chapel Ln
	Sylvestre Pond	Woonsocket	None	Access from John R. Deon Athletic Field off RI-122
	Wenscott Reservoir	North Providence	None	Access across from the Twin Rivers Building off Douglas Pike

Table 2: List of cyanotoxins analyzed and advisory threshold level.

Toxin	Threshold for Issuance of Advisory
Total Microcystins*	4.0 µg/L
Cylindrospermopsin	None Defined
Anatoxin	
Nodularin	

*: Most common toxin found in samples.

Table 3: List of cyanobacteria genera identified by the State Health Laboratory.

Genera	Threshold for Issuance of Advisory
*Anabaena**	70,000 cells/mL (total cyanobacteria)
Aphanizonmenon	
Chlorella	
Cylindrospermopsis	
*Microcystis**	
Nodularia	
*Planktothrix**	
Woronichina	

*: Most common genera found in samples.

Results

Routine cyanobacteria monitoring occurred biweekly from June through October, resulting in approximately 8 visits to each of the pre-chosen waterbodies. Additional visits were conducted on 15 occasions in response to calls from citizens, town managers, environmental organizations, or other RIDEM field staff about potential blooms (Table 4). Starting in November, sampling ceased, except for visual surveys that were conducted to lift advisories still in effect at the end of the recreational season.

Table 4: 2020 Response Visits

Waterbody	Date	Source of call	# of Samples collected	Advisory Issued
Barber Pond	9/2/2020	Resident	1	Yes: 9/4/2020
Barney Pond	7/30/2020	DEM Intern	1	No
Barney Pond	8/19/2020	Resident	1	Yes: 8/21/2020
Barrington – 95L Drive (Private Pond)	7/10/2020	Resident	1	Informal – Residents Warned
Bleachery Pond	7/30/2020	DEM Intern	1	No
Butterfly Pond	8/25/2020	Resident	1	No
Carls Pond	9/15/2020	Resident	1	No
Hawkins Pond	8/4/2020	Resident	1	No
Johnson's Pond	6/18/2020	Resident	1	No
Littlebrook Road (Private Pond)	7/10/2020	Resident	1	Informal – Residents Warned
Little Pond [Westerly]	9/2/2020	Resident	1	No
Little Wash Pond	8/25/2020	Resident	1	No
Little Wash Pond	9/29/2020	Resident	1	Informal – Signage Posted
Scott Pond	8/25/2020	Resident	1	No
Stirling Drive – North Scituate (Private Pond)	8/31/2020	Resident	2	No
Sylvestre Pond	8/7/2020	Resident	1	No
Wenscott Reservoir	10/16/2020	DEM Intern	1	Yes: 10/19/2020

The field visits led to the issuance of 19 recreational advisories for cyanobacteria blooms, 16 of which were a result of routine monitoring (Table 5). Response visits resulted in the issuance of 3 advisories. The majority of the advisories were issued based on visual appearance and exceedance of the cell count threshold.

A total of 88 cyanobacteria samples were collected from 36 waterbodies throughout the state. Of the 88 samples, 72 were collected to support initial issuance of an advisory while 16 were collected as follow-up samples in an effort to lift the advisories. Requirements to lift an advisory were met for Barber Pond, Barney Pond, Georgiaville Pond, Slack Reservoir, and Stafford Pond, in which 2 samples collected 2 weeks apart exhibited toxin levels and cell counts below the advisory thresholds.

Table 5: List of confirmed cyanobacteria blooms throughout the 2020 monitoring season.

Waterbody	Town	Date Advisory Posted	Date Advisory Lifted	Basis for Advisory	Screening or Response Visit
Almy Pond	Newport	6/24/2020	12/31/2020	Cell Count	Screening
Barber Pond	South Kingstown	9/4/2020	11/25/2020	Visual/Cell Count	Response
Barney Pond	Lincoln	8/21/2020	11/10/2020	Visual/Cell Count	Response
Blackamore Pond	Cranston	9/4/2020	12/07/2020	Visual/Cell Count	Screening
Edgewood Lake - RWP	Providence	9/25/2020	12/07/2020	Cell Count	Screening
Elm Lake - RWP	Providence	9/10/2020	12/07/2020	Visual/Cell Count	Screening
Georgiaville Pond	Smithfield	7/8/2020	9/2/2020	Cell Count	Screening
J.L. Curran Reservoir [Upper Section]	Cranston	7/24/2020	12/07/2020	Cell Count	Screening
Mashapaug Pond	Providence	9/28/2020	12/31/2020	Visual	Screening/ Response
Melville Pond (Upper)	Portsmouth	8/20/2020	12/31/2020	Toxin Levels/Cell Count	Screening
Melville Pond (Lower)	Portsmouth	10/22/2020	12/31/2020	Visual	Screening
Pleasure Lake - RWP	Providence	9/25/2020	12/07/2020	Visual	Screening
Polo Lake - RWP	Providence	10/9/2020	12/07/2020	Toxin Levels/Cell Count	Screening
Roosevelt Lake - RWP	Providence	10/9/2020	12/31/2020	Cell Count	Screening
Slack Reservoir	Smithfield/Johnston	8/14/2020	9/18/2020	Toxin Levels/Cell Count	Screening
Spectacle Pond	Cranston	9/10/2020	12/07/2020	Visual/Toxin Levels/Cell Count	Screening
Stafford Pond	Tiverton	7/16/2020	8/20/2020	Cell Count	Screening
Willow Lake - RWP	Providence	6/25/2020	12/07/2020	Cell Count	Screening
Wenscott Reservoir	North Providence	10/19/2020	12/07/2020	Cell Count	Response

The lowest detected cyanobacteria colony count was 230 colonies/mL in Carbuncle Pond and the highest detected colony count was 3,976,000 colonies/mL in Wenscott Reservoir. The cell count threshold was exceeded in 26 samples from 22 different waterbodies (Table 6).

Most samples had a total microcystin concentration less than the reporting limit (1.0 ug/L), while six samples had total microcystin concentrations that exceeded the threshold for issuing an advisory. These samples were collected from Barrington Pond (360 ug/L), Littlebrook Road Pond (71 ug/L), Upper Melville Pond (6.3 ug/L), Slack Reservoir (260 ug/L), Spectacle Pond (14 ug/L), and Westerly Pond (71 ug/L), all of which resulted in recreational advisories. Potentially toxigenic species, *Anabaena, Aphanizomenon, Microcystis, Planktothrix, and Woronichina* were identified in 69 of the 88 samples collected.

Table 6. Distribution of Total microcystin concentration in samples

	Total Microcystin concentration (ug/L)		
	Non-detect (< 1.0)	**1.0 - 4.0**	**≥ 4.0**
# of samples	77	5	**6***

* Barrington Pond 95L [Private], Westerly Pong [Private – Littlebrook Road], Polo Lake [RWP], Upper Melville Pond, Slack Reservoir, and Spectacle Pond.

Table 7. Cell count distribution in samples

	Cell Count Estimation (cells/mL)		
	Non-detect (< 1.0)	**1 - 69,999**	**≥ 70,000**
# of samples	18	44	**26**

Conclusions

The results for 2020 demonstrate the importance of conducting continued cyanobacteria monitoring throughout the recreational season as 16 of the 19 advisories in 2020 resulted from routine monitoring efforts. Prior to 2017, RIDEM only conducted cyanobacteria field visits in response to calls from the public. Public involvement and awareness are still crucial to identifying problematic cyanobacteria blooms, but relying solely on the public to report blooms would result in many blooms going undetected which would increase the potential for cyanobacteria-related illnesses in local residents.

Follow-up sampling conducted this season for the purpose of lifting advisories highlights the complicated nature of cyanobacteria blooms. On some ponds, blooms subsided then re-emerged over periods of days or weeks. On some occasions cell counts remained elevated after the visual appearance of the bloom had subsided. Consequently, only five sets of follow up samples from Barber Pond, Barney Pond, Georgiaville Pond, Stafford Pond, and Slack Reservoir resulted in the lifting of advisories in 2020.

Estimation of cell counts from colony counts using conversion factors from Hartmann and Graffius (1960) was used for issuing advisories in 2020, with 19 advisories issued solely on cell count estimations exceeding the threshold. Since there is no criteria for issuing an advisory based on colony counts, estimating cell counts from colony counts allows for more thorough identification of potentially harmful blooms.

There are several differences in the monitoring results from 2019 to 2020, which partially reflects the increased funding received this year compared to 2019. In 2019, 7.9% (3 out of 38) of samples exceeded the total microcystin threshold, compared to 6.8% (6 out of 88) in 2020 (Figure 1). In both years, Slack Reservoir had the highest total microcystin concentration of all samples, however it was substantially higher in 2020 at 260 ug/L compared to 50 ug/L in 2019.

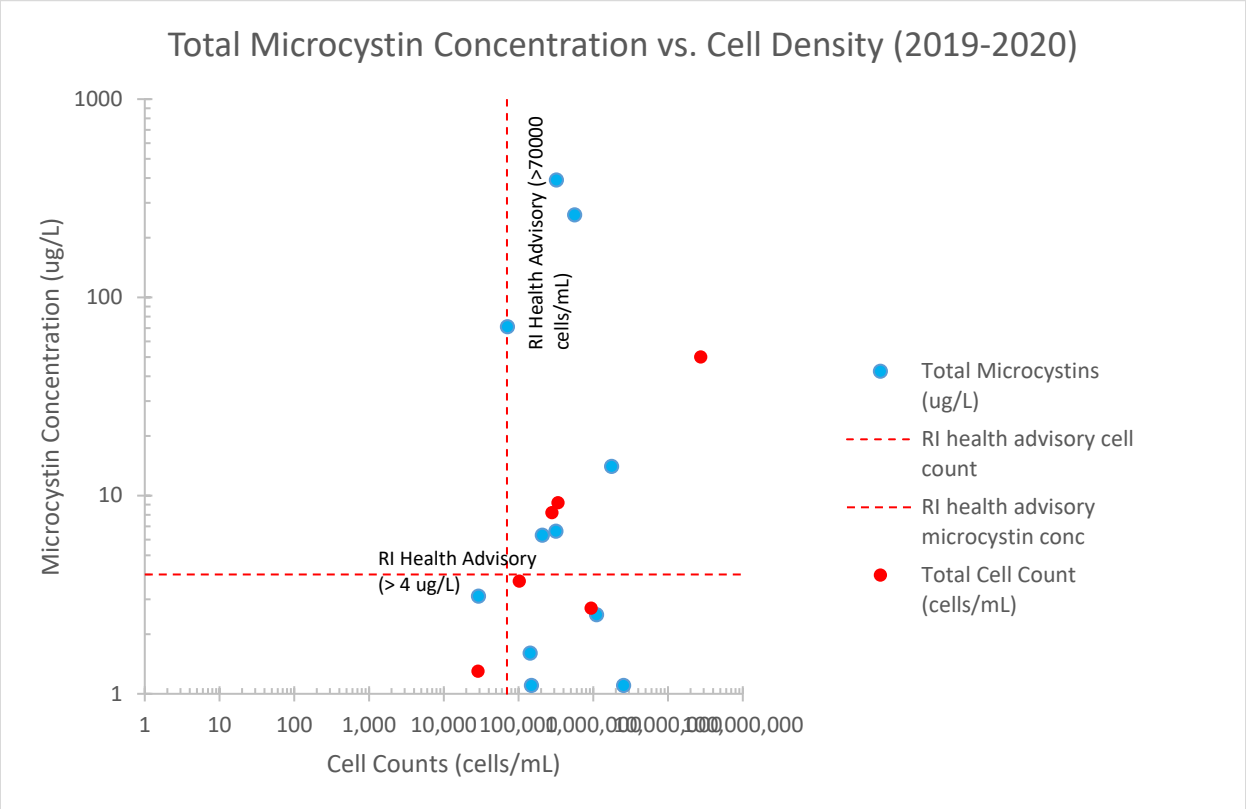


Figure 1: Total microcystin concentration vs. cell density estimations in 2017-2020. Non-detect data not included.

Woronichina was the predominant genera of cyanobacteria across all sampling results in both 2019 and 2020 (Figures 2 and 3). *Anabaena* was the second highest genera in 2020 at 28% of the total.

In 2020, RIDOH started making the distinction between single filament, and bundled *Aphanizomenon,* which is important to note due to the different conversion factors that come with each. This is an important distinction because the difference in these conversion factors could make the difference between issuing or not issuing an advisory These results demonstrate the degree of variation in cyanobacteria blooms from year to year and the difficulties associated with predicting blooms.

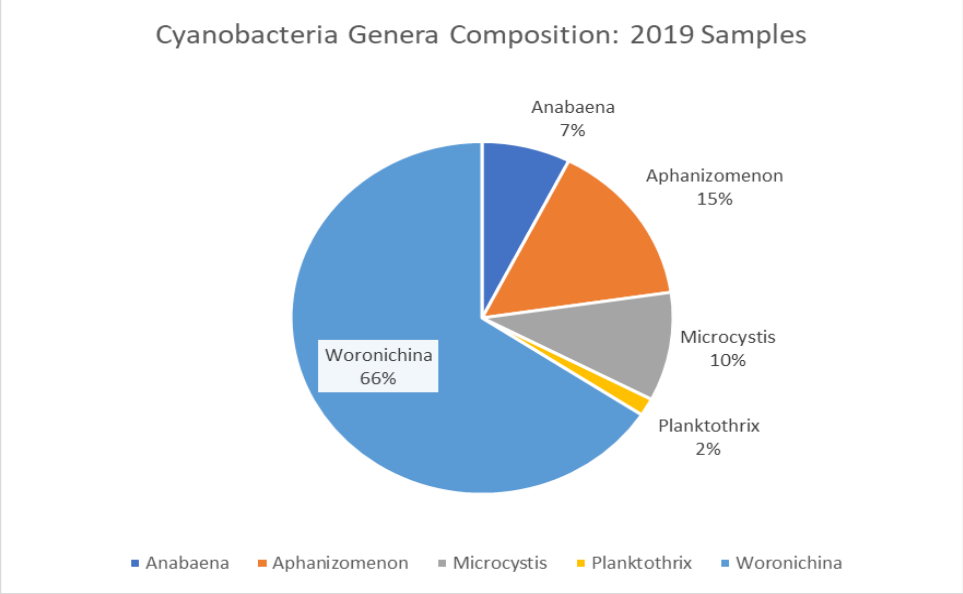


Figure 2. Percentage of each genera of cyanobacteria based on all samples analyzed.

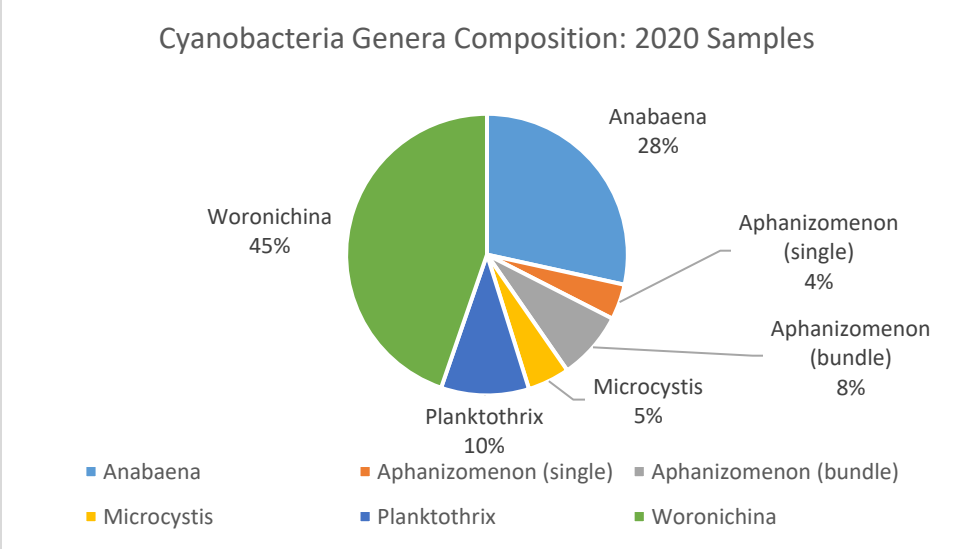


Figure 3. Percentage of each genera of cyanobacteria based on all samples analyzed.

References

Hartman RT, Graffius JH (1960) Quantitative seasonal changes in the phytoplankton communities of Pymatuning Reservoir. Ecology 41(2): 334-340

Appendix A

Table 1: Results for cyanobacteria monitoring of Almy Pond in 2020.

Almy Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: June 23rd, 2020**
06/23/20*	Green discoloration/bubbles. High turbidity. Exceed cell count possible.	All < 1	Anabaena: 9800 Aphanizomenon: 2200 Microcystis: 30	Anabaena: 225,400 Aphanizomenon: 616,000 Microcystis: 4,200 **Total: 845,600**	
07/08/20	New access found.	Anatoxin: 16 Total Microcystins: <1	Anabaena: 8000 Aphanizomenon: 7400 Microcystis: 100	Anabaena: 184,000 Aphanizomenon: 2,072,000 Microcystis: 4200 **Total: 2,270,000**	
07/22/20	Checked river outflow to private beach.	No Sample Taken	No Sample Taken	No Sample Taken	
08/17/20	No sample taken as bloom appeared to have no visible change from last site visit.	No Sample Taken	No Sample Taken	No Sample Taken	
08/25/20	No visible improvement from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Advisory still in place, no improvement in conditions. Bloom appears worse from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/22/20	Slight improvement from last visit. Surface mat dissipated, water still very green.	No Sample Taken	No Sample Taken	No Sample Taken	
10/6/2020	No improvement in water conditions. Surface mat has reappeared from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	

10/21/2020	Surface scum reappeared, highly pervasive across entire pond, much worse from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/2020 [Outfall to Spouting Rock Beach]	Water flowing from Almy into outfall, into the beach. Sample collected to see if any toxins may be washing into the beach.	All < 1	No Colonies Detected	No Colonies Detected	
12/02/2020	Surface scum has dissipated, turbidity high, green hue to water has cleared. Overall significant improvement in conditions	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	
01/04/2021	Great reduction in green coloration of water. Turbidity high, but no signs of major cyano bloom.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold.

Table 2: Results for cyanobacteria monitoring of Barber Pond in 2020.

Barber Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 2nd, 2020**
09/02/20*	People fishing from canoes/kayaks.	All < 1	Woronichinia: 10 Planktothrix: 100,000	Planktothrix: 2,800,000 Woronichinia: 2500 **Total: 2,802,500**	
11/09/2020	Water appeared very clear.	All < 1	Planktothrix: 10	Planktothrix: 280 **Total: 280**	
11/24/2020	Water appeared clear	All < 1	No Colonies Detected	No Colonies Detected	

*: Health Advisory Issued; Exceedance of Threshold

Table 3: Results for cyanobacteria monitoring of Barrington Pond – 95L (Private) in 2020.

Barrington Pond – 95L					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
07/10/20*	Response visit. Bloom present along shore, extending into center of pond. Strong odor.	Anatoxin: < 1 Total Microcystins: **390**	Microcystins : 2300	Microcystins: 322,000 **Total: 322,000**	

*: Exceedance of Threshold

Table 4: Results for cyanobacteria monitoring of Barney Pond in 2020.

Barney Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 19th, 2020**
07/30/20	-	All < 1	Anabaena: 1800	Anabaena: 41,400 **Total: 41,400**	
08/19/20*	Entirety of pond has pea-soup green appearance, with large quantities of algae present on surface along shoreline.	Anatoxin: < 1 Total Microcystins: 1.6	Anabaena: 5000 Microcystis: 80 Woronichina: 70	Anabaena: 115,000 Planktothrix: 11,200 Woronichina: 17,500 **Total: 143,700**	
10/28/20	Water appeared clear.	All < 1	No Colonies Detected	No Colonies Detected	
11/09/2020	Slight turbidity/green hue to water. Watermeal floating on surface.	All < 1	No Colonies Detected	No Colonies Detected	

*: Health Advisory Issued; Exceedance of Threshold.

Table 5: Results for cyanobacteria monitoring of Blackamore Pond in 2020.

Blackamore Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 8th, 2020**
06/24/20	Clear water, some lily pads on surface.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	No blooms near access.	No Sample Taken	No Sample Taken	No Sample Taken	
07/21/20	-	No Sample Taken	No Sample Taken	No Sample Taken	
08/12/20	Water clear, no bloom visible on pond.	No Sample Taken	No Sample Taken	No Sample Taken	
08/26/20	-	No Sample Taken	No Sample Taken	No Sample Taken	
09/02/20*	-	All < 1	Anabaena: 140 Microcystis: 150 Woronchina: 180 Aphanizomenon: 4700	Anabaena: 3,220 Aphanizomenon: 131,600 Microcystis: 21,000 Woronichina: 45,000 **Total: 200,820**	
09/08/20	No improvement noticed.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	Surface mat reduced, pea-soup coloration still highly green.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/2020	Surface mat dissipated, water still green.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Slight, subtle streaks on surface, some oily/shiny surface coloration.	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Bloom appears gone. Water clarity clear.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold

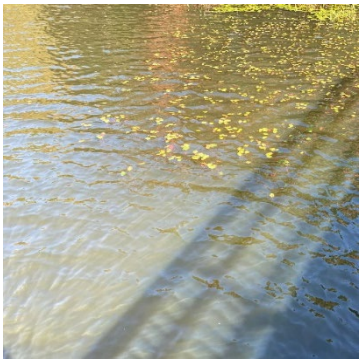
Table 6: Results for cyanobacteria of Bleachery Pond in 2020.

Bleachery Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: July 30th, 2020**
07/30/20	Sample taken from end of pond, near mill past Walker st.	All < 1	No colonies detected	No colonies detected	

Table 7: Results for cyanobacteria of Butterfly Pond in 2020.

Butterfly Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
08/25/20	Unsure if green vegetation is plant or algae.	All < 1	No colonies detected.	No colonies detected.	

Table 8: Results for cyanobacteria monitoring of Carbuncle Pond in 2020.

Carbuncle Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 7th, 2020**
06/24/20	Some floating leaves. Water clear for a few feet.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Fish swimming, mostly clear. Some green algae.	All < 1	Anabaena: 10	Anabaena: 230 **Total: 230**	
07/21/20	Fishing dock, boating ramp, beach area.	No Sample Taken	No Sample Taken	No Sample Taken	
08/12/20	Water was clear at both the state boat ramp, and fishing dock.	No Sample Taken	No Sample Taken	No Sample Taken	
08/26/20	Water appeared clear.	No Sample Taken	No Sample Taken	No Sample Taken	

09/08/20	Pea-soup appearance was light, but overall turbidity of water noticeably worse from last visit.	All < 1	Aphanizomenon: 660	Aphanizomenon: 18,480 **Total: 18,480**	
09/23/20	Water slightly turbid, but no indication of cyano bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Water mostly clear, slight turbidity.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 9: Results for cyanobacteria monitoring of Central Pond in 2020.

Central Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 13th, 2020**
06/23/20	-	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Surface green algae.	No Sample Taken	No Sample Taken	No Sample Taken	
07/22/20	Duckweed/watermeal concentrated near shore.	No Sample Taken	No Sample Taken	No Sample Taken	
08/13/20	Water clear with clusters of watermmeal floating on surface near shore.	No Sample Taken	No Sample Taken	No Sample Taken	
08/13/20 [North Cove]	Water was a cloudy green hue.	All < 1	No colonies detected.	No colonies detected.	
08/13/20 [Northeast Cove]	-	All < 1	No colonies detected.	No colonies detected.	
08/25/20	Water clear w/ presence of vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Water appeared clear w/ some	No Sample Taken	No Sample Taken	No Sample Taken	

	surface vegetation present.				
09/22/20	Water clear, sizable green algae bloom off bridge.	No Sample Taken	No Sample Taken	No Sample Taken	
10/06/20	Water clear, some duckweed on water's surface.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/2020	Large quantities of water meal on surface, water slightly turbid.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 10: Results for cyanobacteria monitoring of Carls Pond in 2020.

Carls Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
09/15/20	Sample taken for analysis in OWR sample center, will be given to DOH if deemed necessary.	Sample not given to DOH.	Sample not given to DOH. No cyano seen under microscope.	Sample not given to DOH. No cyano seen under microscope.	

Table 11: Results for cyanobacteria monitoring of Cunliff Lake (RWP) in 2020.

Cunliff Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 26th 2020**
07/21/20	Clear water, submerged vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
08/26/20	Pea-soup green appearance seems worse from last visit.	All < 1	Anabaena: 190 Aphanizomenon (bundle): 30 Microcystis: 30 Planktothrix: 600 Aphanizomenon (single): 340	Anabaena: 4,370 Aphanizomenon (single): 9,520 Aphanizomenon (bundle): 8,400 Microcystis: 4,200 Planktothrix: 16,800	

				Total: 43,290	
09/08/20	Water improved from last visit. Color improved as well as clarity.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	Water turbid, no green appearance/surface mat visible.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	No change from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 12: Results for cyanobacteria monitoring of Deep Spring Lake (RWP) in 2020.

Deep Spring Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 26th, 2020**
07/21/20	Turbidity, submerged vegetation.	All < 1	Anabaena: 80 Aphanizomenon (bundle): 60 Microcystis: 10	Anabaena: 1,840 Aphanizomenon (bundle): 16,800 Microcystis: 1,400 **Total: 20,040**	
09/08/20	Water appeared free from blooms. Same turbidity, but no discoloration indicating cyano bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	Pea-soup appearance worse from last visit.	All < 1	Microcystis: 30 Aphanizomenon: 20	Aphanizomenon (single): 560 Microcystis: 4,200 **Total: 4,760**	
10/07/20	No change from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 13: Results for cyanobacteria monitoring of Edgewood Lake (RWP) in 2020.

Edgewood Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 23rd, 2020**
07/21/20	Looks murky with high turbidity.	All < 1	Anabaena: 270 Aphanizomenon (bundle): 180 Microcystis: 10	Anabaena: 6,210 Aphanizomenon: 50,400 Microcystis: 1,400 **Total: 58,010**	
08/26/20	No visible change from prev. visit. Pea-soup appearance still present.	No Sample Taken	No Sample Taken	No Sample Taken	
09/08/20	Noticable surface scum present in addition to pea-soup color.	All < 1	Anabaena: 120 Planktothrix: 80 Aphanizomenon: 60	Anabaena: 2,760 Aphanizomenon (single): 1,680 Planktothrix: 2,240 **Total: 6,680**	
09/23/20*	Pea-soup green appearance, prevelant throughout. Surface mat visible near shoreline.	Anatoxin: < 1 Total Microcystins: 1.1	Anabaena: 100,000 Aphanizomenon (bundle): 70 Microcystis: 1400 Aphanizomenon: 1,230	Anabaena: 2,300,000 Aphanizomenon (single): 34,440 Aphanizomenon (bundle): 19,600 Microcystis: 196,000 **Total: 2,550,040**	
10/07/20	Improvement in conditions from last visit, no visible bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Water mostly clear, some turbidity.	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Bloom appears to have cleared. Coloration	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

	normal, no surface scum.				

*: Health Advisory Issued; Exceedance of Threshold

Table 14: Results for cyanobacteria monitoring of Elm Lake (RWP) in 2020.

Elm Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 8th, 2020**
07/21/20	Turbidity + pea-soup green.	All < 1	Anabaena: 400 Aphanizomenon (bundle): 360	Anabaena: 9,200 Aphanizomenon (bundle): 100,800 **Total: 110,00**	
08/26/20	-	All < 1	Anabaena: 350 Aphanizomenon (bundle): 100 Aphanizomenon (single): 470 Planktothrix: 200	Anabaena: 8,050 Aphanizomenon (single): 13,160 Aphanizomenon (bundle): 28,000 Planktothrix: 5,600 **Total: 54,810**	
09/08/20*	Conditions much worse from prev. visit.	All < 1	Anabaena: 1300 Aphanizomenon (bundle): 10 Microcystis: 620 Woronichina: 60 Planktothrix: 250 Aphanizomenon (single): 1290	Anabaena: 29,900 Aphanizomemon (single): 36,120 Aphanizomenon (bundle): 2,800 Microsystis: 86,800 Planktothrix: 7,000 Woronichina: 15,000 **Total: 177,620**	
09/23/20	Surface mat dissipated, water still highly green.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	Advisory already in place. No major improvement from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Water slightly turbid.	No Sample Taken	No Sample Taken	No Sample Taken	

12/02/2020	Water appeared highly clear, low turbidity, no evidence of bloom.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold

Table 15: Results for cyanobacteria monitoring of Georgiaville Pond in 2020.

Georgiaville Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: July 21st, 2020**
06/24/20	Submerged vegetation, clear water + fish swimming.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20*	Spoke w kayaker – said it was pondwide, and seemed like it was getting worse over past couple days.	All < 1	Anabaena: 30 Microcystis: 10 Woronichina: 50 Planktothrix: 28,000	Anabaena: 690 Microcystis: 1,400 Planktothrix: 784,000 Woronichina: 12,500 **Total: 798,500**	
07/21/20	Already advisory.	No Sample Taken	No Sample Taken	No Sample Taken	
08/17/20	Water appeared clear despite advisory. Sample taken to check status of toxin concentrations.	All < 1	No Colonies Detected	No Colonies Detected	
08/26/20	Taking second follow-up sample to see if advisory can be lifted. Sample taken on 8/17 showed no presence of toxins.	All < 1	No Colonies Detected	No Colonies Detected	
09/08/20	Water still appears clear, several people swimming.	No Sample Taken	No Sample Taken	No Sample Taken	

	Advisory signs removed.				
09/23/20	Small amount of cyano found next to beach, not enough visual evidence to warrant sample.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	Water appeared clear, low tide, cyano present in small quantities along water line.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Streaks present along shoreline from boat ramp to beach, with more cyano washed up on beach itself.	All < 1	No Colonies Detected	No Colonies Detected	

*Health Advisory Issued; Exceedance of Threshold.

Table 16: Results for cyanobacteria monitoring of Hawkins Pond in 2020.

Hawkins Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 4th, 2020**
08/04/20	Received complain w/ pictures of cyano bloom. Pics appeared to be similar to planktothrix. Wind appeared to dissipate/break up bloom.	All < 1	No Colonies Detected	No Colonies Detected.	

Table 17: Results for cyanobacteria monitoring of J.L. Curran Reservoir in 2020.

J.L. Curran Reservoir					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 26th, 2020**
06/24/20	No blooms. Clear for a few feet. Fish alive + swimming. Submerged vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Submerged vegetation. No sign of bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
07/21/20*	Pea-soup green color, very dilute.	All < 1	Anabaena: 150 Aphanizomenon (bundle): 2,450	Anabaena: 3,450 Aphanizomenon (bundle): 686,000 **Total: 689,450**	
08/17/20	No visible change in water color/quality from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
08/26/20	No visible change.	No Sample Taken	No Sample Taken	No Sample Taken	
09/08/20	Advisory still in place/no improvement so no sample taken.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	No improvement in pea-soup condition of water. Water level dropped significantly.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	No improvement from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Substantial improvement in conditions, but could be due to rain.	No Sample Taken	No Sample Taken	No Sample Taken.	

12/02/2020	Bloom appears to have dissipated. Pea-soup green coloration gone, but turbidity high. Likely due to sediment washing into reservoir	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold

Table 18: Results for cyanobacteria monitoring of Johnson's Pond in 2020.

Johnson's Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
06/18/20	Visit in response to sick animal (dog) prior day.	All < 1	No Colonies Detected	No Colonies Detected	

Table 19: Results for cyanobacteria monitoring of Little Pond in 2020.

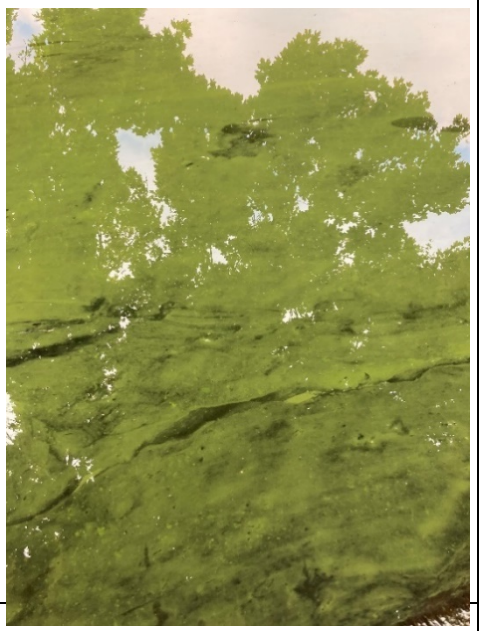
Little Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 2nd, 2020**
08/04/20	No evidence of bloom. Excellent water clarity.	No Sample Taken	No Sample Taken	No Sample Taken	
09/02/20	-	All < 1	Anabaena: 1,660 Planktothrix: 10 Aphanizomenon (single): 30	Anabaena: 38,180 Aphanizomenon: 840 Planktothrix: 280 **Total: 39,300**	

Table 20: Results for cyanobacteria monitoring of Little Wash Pond in 2020.

Little Wash Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 29th, 2020**
08/25/20	Water level has dropped ~6'. Notified of bloom ~ 2 weeks ago.	All < 1	Anabaena: 1,200 Microcystis: 10 Woronichina: 20	Anabaena: 27,600 Microcystis: 1,400 Woronichina: 5,000 **Total: 34,000**	
09/29/20*	Lake level down ~8'. Strong odor, visible animal tracks along shoreline.	All < 1	Anabaena: 4,600	Anabaena: 105,800 **Total: 105,800**	

*: Exceedance of Threshold

Table 21: Results for cyanobacteria monitoring of Mashapaug Pond in 2020.

Mashapaug Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 26th, 2020**
06/24/20	Submerged vegetation/no discoloration. Could see a couple feet below surface.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Some algae w/ discoloration. Some turbidity.	All < 1	Anabaena: 50 Aphanizomenon (bundle): 190	Anabaena: 1,150 Aphanizomenon: 53,200 **Total: 54,350**	
07/21/20	Some turbidity/pea-soup green.	All < 1	Anabaena: 540 Aphanizomenon (bundle): 790 Microcystis: 20	Anabaena: 12,420 Aphanizomenon (bundle): 221,200 Microcystis: 2,800 **Total: 236,420**	
08/12/20	No visible change from last visit. Watermeal present next to	No Sample Taken	No Sample Taken	No Sample Taken	

	boat ramp, but no visible bloom.				
08/26/20	Pea-soup appearance appeared worse from last visit.	All < 1	Anabaena: 110 Aphanizomenon (bundle): 20 Microcystis: 80 Woronichina: 20 Planktothrix: 50 Aphanizomenon: 1,290	Anabaena: 2,530 Aphanizomenon (single): 36,120 Aphanizomenon (bundle): 5,600 Microcystis: 11,200 Planktothrix: 1,400 Woronichina: 5,000 **Total: 61,850**	
09/08/20	Last sampled 9/3/20.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	Pea-soup green appearance much worse from previous visits.	All < 1	Anabaena: 500 Aphanizomenon (bundle): 100 Microcystis: 20 Aphanizomenon (single): 570	Anabaena: 11,500 Aphanizomenon (single): 15,960 Aphanizomenon (bundle): 28,000 Microcystis: 2,800 **Total: 58,260**	
09/28/20* [Crescent Drive]	Homeowner allowed access. Initial report had pcitures showing sizeable surface mat which has since dissipated, but pea-soup green coloration still severe.	All < 1	Anabaena: 350 Aphanizomenon (bundle): 50 Microcystis: 20 Woronichina: 50 Aphanizomenon (single): 620	Anabaena: 8,050 Aphanizomenon (single): 17,360 Aphanizomenon (bundle): 14,000 Microcystis: 2,800 Woronichina: 12,500 **Total: 54,710**	
10/07/20	No improvement in quality.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/2020	Substantial deterioration from last visit, Surface mat has re-appeared in large quantity, pea-soup green	No Sample Taken	No Sample Taken	No Sample Taken	

	coloration significant.				
12/02/2020	No evidence of surface scum. Pea-soup green coloration still strong.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	
01/04/2021	Improvement in coloration from previous visit. Some particles suspended in water. Moderate turbidity.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Visual

Table 22: Results for cyanobacteria monitoring of Upper Melville Pond in 2020.

Upper Melville Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 25th, 2020**
06/23/20	-	All < 1	Anabaena: 80 Aphanizomenon (bundle): 10 Woronichina: 110	Anabaena: 1,840 Aphanizomenon (bundle): 2,800 Woronichina: 27,500 **Total: 32,140**	
07/08/20	-	All < 1	Anabaena: 340 Aphanizomenon (bundle): 50 Woronichina: 10	Anabaena: 7,820 Aphanizomenon (bundle): 14,000 Woronichina: 2,500 **Total: 24,320**	
07/22/20	Western side by floating dock also checked. Same observations as eastern side applicable. Poor water clarity, pea-	All < 1	Anabaena: 150 Aphanizomenon (bundle): 2,450	Anabaena: 3,450 Aphanizomenon (bundle): 686,000 **Total: 689,450**	

	soup green color present.				
08/17/20*	Pea-soup green coloration persistant throughout pond with much more visible blooming on surface present compared to prev. visits.	Anatoxin: 3.5 Total Microcystins: **6.3**	Anabaena: 20 Aphanizomenon (bundle): 150 Microcystis: 470 Woronichina: 130 Aphanizomenon (single) 2,450	Anabaena: 460 Aphanizomenon (single): 68,600 Aphanizomenon (bundle): 42,000 Microcystis: 65,800 Woronichina: 32,500 **Total: 209,360**	
08/25/20	Pea-soup green appearance the same from last visitm but surface algae appeared worse.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	No sample taken. Advisory in place and no visible improvement in conditions.	No Sample Taken	No Sample Taken	No Sample Taken	
09/22/20	Surface mat has dissipated, but pond still extremely green. Overall slight improvement.	No Sample Taken	No Sample Taken	No Sample Taken	
10/06/20	No improvement in conditions.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/20	Surface scum still highly prevalent	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Significant improvement in Upper Melville pond. Surface scum has dissipated, slight green hue to water,	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

	turbidity not bad.				
01/04/2021	Upper portion still clear. Coloration normal, no scum or signs of cyano.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

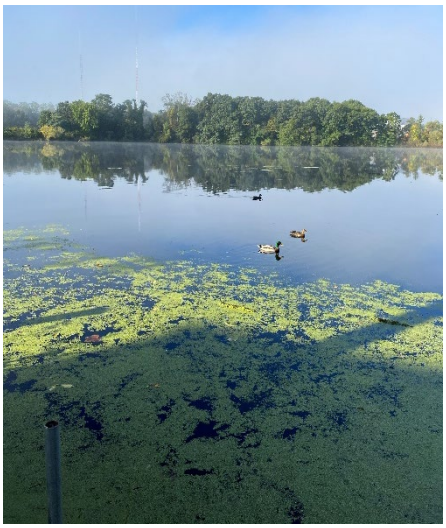
*: Health Advisory Issued; Exceedance of Threshold

Table 23: Results for cyanobacteria monitoring of Lower Melville Pond in 2020.

Lower Melville Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: June 23rd, 2020**
06/23/20	Stream inlet had some green algae with brown discoloration.	All < 1	Anabaena: 190 Woronichina: 20	Anabaena: 4,370 Woronichina: 5,000 **Total: 9,370**	
07/22/20	No notable change from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
08/17/20	Green pea-soup coloration appears more significant from last visit.	All < 1	Anabaena: 200 Aphanizomenon (bundle): 40 Aphanizomenon (single): 420	Anabaena: 4,600 Aphanizomenon (single): 11,760 Aphanizomenon (bundle): 11,200 **Total: 27,560**	
08/25/20	Pea-soup appearance unchanged. Still large quantities of watermeal/duckweed on surface	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Conditions words from last visit. Noticable bloom on surface.	Anatoxin: < 1 Total Microcystins: 3.1	Anabaena: 300 Microcystis: 150 Aphanizomenon (single): 50	Anabaena: 6,900 Aphanizomenon (single): 1,400 Microcystis: 21,000 **Total: 29,300**	
09/22/20	Slight improvement in quality from last visit. No sample warranted.	No Sample Taken	No Sample Taken	No Sample Taken	
10/06/20	No change in conditions.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/2020*	Surface scum has reached the lower section. Advisory	No Sample Taken	No Sample Taken	No Sample Taken	

	issued based on visual evidence.				
12/02/2020	Some cyano streaks near shore of Lower Melville, but overall improvement from last visit.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	
01/04/2021	Streaks in lower portion from previous visit are now gone. Both reaches appear clear of cyano.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

Table 24: Results for cyanobacteria monitoring of Omega Pond in 2020.

Omega Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 6th, 2020**
06/23/20	Some algae growth, looks like duckweed. Can see a few feet below surface.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Looks like duckweed green floating algae.	No Sample Taken	No Sample Taken	No Sample Taken	
07/22/20	Duckweed/water meal concentrated along shore.	No Sample Taken	No Sample Taken	No Sample Taken	
08/13/20	Very large quantities of watermeal present across pond/shoreline. Water itself appeared clear.	No Sample Taken	No Sample Taken	No Sample Taken	
08/25/20	Water clear, with very high quantities of watermeal/duck weed on surface.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Large quantities of surface vegetation, no sign of algae bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
09/22/20	Water appeared clear. Green algae bloom	No Sample Taken	No Sample Taken	No Sample Taken	

	present but subsiding. Duckweed/water meal cover dissipating.				
10/6/20	Water clear, small amounts of duckweed.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/20	Water meal largely dissipated off surface, water clear.	No Sample Taken	No Sample Taken	No Sample Taken	

*: Health Advisory Issued

Table 25: Results for cyanobacteria monitoring of Pleasure Lake (RWP) in 2020.

Pleasure Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 23rd, 2020**
09/02/20	Pea-soup appearance seemed concentrated to part of lake sampled.	All < 1	Anabaena: 10 Aphanizomenon (single): 460	Anabaena: 230 Aphanizomenon (single): 12,880 **Total: 13,110**	
09/08/20	No improvement from last sampling last week. Conditions appear worse.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20*	Pea-soup appearance and surface mat worse from last visit. Surface mat pervasive.	All < 1	Anabaena: 1,700 Woronichina: 20 Aphanizomenon: 370	Anabaena: 39,100 Aphanizomenon (single): 10,360 Woronichina: 5,000 **Total: 54,460**	
10/07/20	-	All < 1	Anabaena: 4,000 Aphanizomenon (bundle): 60 Microcystis: 500 Woronichina: 330 Aphanizomenon (single): 940	Anabaena: 92,000 Aphanizomenon (single): 26,320 Aphanizomenon (bundle): 16,800 Microcystis: 70,000 Woronichina: 82,500	

				Total: 287,620	
10/20/2020	Pea-soup coloration present	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Bloom appears cleared. Surface mat gone, coloration normal.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold

Table 26: Results for cyanobacteria monitoring of Polo Lake (RWP) in 2020.

Polo Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 7th, 2020**
06/25/20	Doesn't look as bad as others but appear to be cyano-HAB.	All < 1	Anabaena: 540 Woronichina: 10	Anabaena: 12,420 Woronichina: 2,500 **Total: 14,920**	
07/21/20	-	No Sample Taken	No Sample Taken	No Sample Taken	
08/26/20	Water appeared clear.	No Sample Taken	No Sample Taken	No Sample Taken	
09/02/20	Sample collected following report of bloom on shore.	All < 1	Anabaena: 260 Woronichina: 20	Anabaena: 5,980 Woronichina: 5,000 **Total: 10,980**	
09/23/20	Water was turbid, but not pea-soup green.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20*	Surface mat worse from last visit.	Anatoxin: < 1 Total Microcystins: **6.6**	Anabaena: 2300 Microcystis: 950 Woronichina: 480 Aphanizomenon (single): 420	Anabaena: 52,900 Aphanizomenon (single): 11,760 Microcystis: 133,000 Woronichina: 120,000 **Total: 317,660**	

10/20/20	Pea-soup soloration still present	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Water clear, no surface scum, bloom appears to have cleared.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold.

Table 27: Results for cyanobacteria monitoring of Pond in Westerly (Littlebrook Rd) in 2020.

Private Pond in Westerly (Littlebrook Rd.)					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
07/10/20*	-	Anatoxin: < 1 Total microcystins: **71**	Microcystis: 510	Microcystis: 71,400 **Total: 71,400**	

*: Exceedance of Threshold

Table 28: Results for cyanobacteria monitoring of Private Pond North Scituate (40 Stirling Drive) in 2020.

Private Pond in North Scituate (Stirling Drive)					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph:**
08/31/20	Unsure if green scum on surface is cyano or watermeal. Water level dropped significantly, which may affect sample. Sample not taken to DOH. Analyzed under scope in DEM sample center. No cyano found in samples taken.	No Data Available; sample not analyzed in lab	No Data Available; sample not analyzed in lab	No Data Available; sample not analyzed in lab	

Table 29: Results for cyanobacteria monitoring of Roosevelt Lake (RWP) in 2020.

Roosevelt Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 7th, 2020**
06/25/20	Many streaks. Definitely looks like cyano-HAB.	All < 1	Anabaena: 170 Microcystis: 150 Woronichina: 120	Anabaena: 3,910 Microcystis: 21,000 Woronichina: 30,000 **Total: 54,910**	
07/21/20	-	All < 1	Anabaena: 170 Aphanizomenon (bundle) 180 Microcystis: 60	Anabaena: 3,910 Aphanizomenon (bundle): 50,400 Microcystis: 8,400 **Total: 62,710**	
08/26/20	Water appeared more clear from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/08/20	Conditions appear worse from previous visit.	All < 1	Anabaena: 20 Microcystis: 40 Aphanizomenon (single): 30	Anabaena: 460 Aphanizomenon (single): 840 Microcystis: 5,600 **Total: 6,900**	
09/23/20	Water level appears to have dropped significantly. Pea-soup appearance throughout. Upperportion (above retaining wall) seems the worst.	All < 1	Anabaena: 470 Aphanizomenon (bundle): 10 Microcystis: 130 Woronichina: 30 Aphanizomenon (single): 200	Anabaena: 10,810 Aphanizomenon (single): 5,600 Aphanizomenon (bundle): 2,800 Microcystis: 18,200 Woronichina: 7,500 **Total: 44,910**	
10/07/20*	Bloom worse from last visit. Substaintial surface mat present.	Anatoxin: < 1 Total Microcystins: 2.5	Anabaena: 14000 Aphanizomenon (bundle): 330 Microcystis: 650 Woronichina: 1800 Aphanizomenon (single): 5570	Anabaena: 322,000 Aphanizomenon (single): 155,960 Aphanizomenon (bundle): 92,400 Microcystis: 91,000	

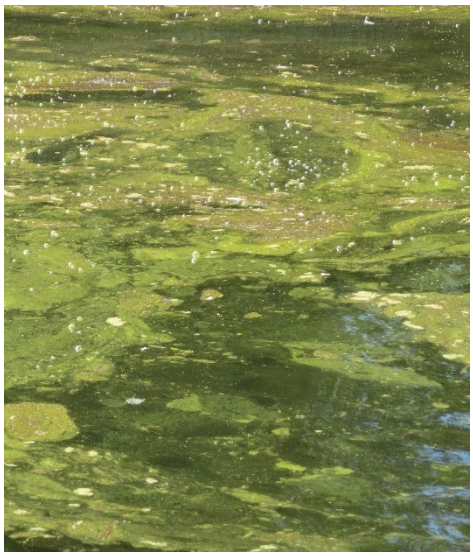
				Woronichina: 450,000 **Total: 1,111,360**	
10/20/20	Pea-soup green coloration, surface mat dissipated.	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Surface scum dissipated, greenish hue to water persists, some floating particulate matter.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	
01/04/2021	Greenish hue to water less from last visit, but there is still some minor discoloration.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold

Table 30: Results for cyanobacteria monitoring of Scott Pond in 2020.

Scott Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 25th, 2020**
08/25/20	Pea-soup appearance strong. Many Residences w/ access to pond.	All < 1	Anabaena: 50 Woronichina: 10 Aphanizomenon (single): 920	Anabaena: 1,150 Aphanizomenon (single): 25,760 Woronichina: 2,500 **Total: 29,410**	

Table 31: Results for cyanobacteria monitoring of Slack Reservoir in 2020.

Slack Reservoir					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 8th, 2020**
06/24/20	No bloom, water clear.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Clear water, fish swimming. Submerged vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
07/20/20	Checked pond beach + little beach. Clear w/ fish.	No Sample Taken	No Sample Taken	No Sample Taken	
08/12/20* [Green Lake Beach]	Water mostly clear, but few visible streaks of light green algae along shore.	Anatoxin: < 1 Total Microcystins: **260**	Anabaena: 330 Microcystis: 2860 Woronichina: 620 Aphanizomenon (single): 50	Anabaena: 7,590 Aphanizomenon (single): 1,400 Microcystis: 400,400 Woronichina: 155,000 **Total: 564,390**	
08/12/20 [44 Lake Shore Drive]	Water was cloudy and there were particles suspended throughout water. No sign of larger bloom.	All < 1	Anabaena: 20 Microcystis: 10 Woronichina: 10	Anabaena: 460 Microcystis: 1,400 Woronichina: 2,500 **Total: 4,360**	
09/01/20 [EPA sample site S5]	-	All < 1	Woronichina: 20 Planktothrix: 20	Planktothrix: 560 Woronichina: 5,000 **Total: 5,560**	
09/01/20 [Green Lake Beach]	-	All < 1	Woronichina: 20	Woronichina: 5,000 **Total: 5,000**	
09/16/20	Sample taken to see if advisory can be lifted. Sampled from same spot as 8/12 (beach area).	All < 1	No Colonies Detected	No Colonies Detected	
09/28/20	Noticeable surface mat and	Anatoxin: < 1	Anabaena: 40 Microcystis: 240	Anabaena: 920	

	green coloration to water present.	Total Microcystins: 1.1	Woronichina: 460	Microcystis: 33,600 Woronichina: 115,000 **Total: 149,520**	
10/14/20	Sample taken off west coast of town beach.	All < 1	Microcystis: 10	Microcystis: 2,500 **Total: 2,500**	
10/22/20 [Cove near 55 Green Lake Drive]	Streaks present throughout majority of northern portion of reservoir.	All < 1	No Colonies Detected	No Colonies Detected	
10/22/20 [Open water]	Sample taken in middle of reservoir, between town beach and opposite shoreline.	All < 1	Microcystis: 80 Woronichina: 10	Microcystis: 11,200 Woronichina: 2,500 **Total: 13,700**	
10/27/2020 [Green Lake Beach]		All < 1	Anabaena: 20	Anabaena: 460 **Total: 460**	

*: Health Advisory Issued; Exceedance of Threshold

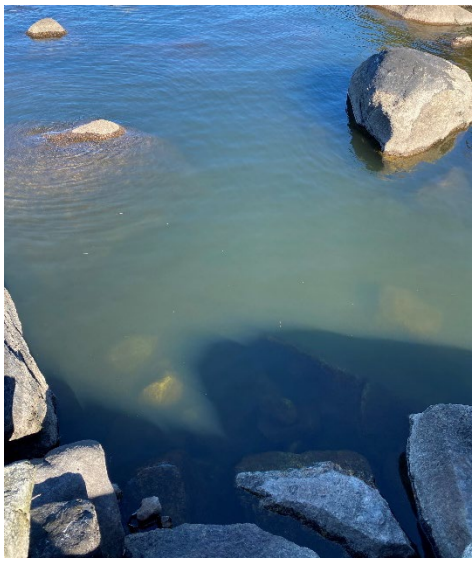
Table 32: Results for cyanobacteria monitoring of Spectacle Pond in 2020.

Spectacle Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 8th, 2020**
06/24/20	Clear for a few feet. A little green algae on surface.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Some green algae + turbidity.	No Sample Taken	No Sample Taken	No Sample Taken	
07/21/20	Went to location behind baseball field. No sign of algae. Tried 2 Parham st. but poison ivy.	No Sample Taken	No Sample Taken	No Sample Taken	
08/12/20	Water murky but not pea-soup green.	No Sample Taken	No Sample Taken	No Sample Taken	

	Found easier access at 94 Sabra St. behind truck loading bay of Twin Oaks.				
08/26/20	Water appeared cloudy; no visible change from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/08/20*	-	Anatoxin: < 1 Total Microcystins: **14**	Anabaena: 14,800 Microcystis: 500 Woronichina: 5,200 Aphanizomenon (single): 2000	Anabaena: 340,400 Aphanizomenon (single): 56,000 Microcystis: 70,000 Woronichina: 1,300,000 **1,766,400**	
09/23/20	Surface mat has subsided, green coloration still pervasive.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	No improvement in water quality.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/20	Sizeable surface mat, extreme pea-soup coloration.	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Bloom appears clear, pea-soup coloration gone.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

*: Health Advisory Issued; Exceedance of Threshold.

Table 33: Results for cyanobacteria monitoring of Stafford Pond in 2020.

Stafford Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 10th, 2020**
06/23/20	State fishing ramp.	No Sample Taken	No Sample Taken	No Sample Taken	
07/14/20* [Pelletier Ln]	108 Pelletier. Ducks swimming in it. Looks like cyano but not a thick bloom.	All < 1	Anabaena: 100000	Anabaena: 2,300,000 **Total: 2,300,000**	
07/14/20 [Boat Ramp]	Clear water at boat ramp.	No Sample Taken	No Sample Taken	No Sample Taken	
07/22/20	Checked boat ramp and Pelletier lane. No evidence of cyano bloom. Water was clear at both locations. Advisory sign present at boat ramp kiosk.	No Sample Taken	No Sample Taken	No Sample Taken	
08/04/20	Sample collected off end of pelletier ln for purpose of lifting advisory (1st sample).	All < 1	No Colonies Detected	No Colonies Detected	
08/17/20	Water appeared slightly cloudy at Pelletier Ln access, no pea soup green coloration present. Water looked very clear by the boat ramp access, so sample taken.	All < 1	Anabaena: 20 Aphanizomenon (single): 250	Anabaena: 460 Aphanizomenon (single): 7,000 **Total: 7,460**	
08/25/20	Water appeared clear, no visible change from last visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	-	All < 1	Anabaena: 380 Aphanizomenon (single): 60	Anabaena: 8,740 Aphanizomenon (single): 1,680	

				Total: 10,420	
09/22/20	Water had slight turbidity, but appeared clear overall. No decrease in quality from last visit, so no sample taken.	No Sample Taken	No Sample Taken	No Sample Taken	
09/28/20	Responding to resident report of potential bloom. Water had green tint, but did not appear prevalent.	All < 1	Anabaena: 20	Anabaena: 460 **Total: 460**	
10/06/20	Water turbidity higher from last visit, but no sign of cyano bloom.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/20	Water turbidity high, but no signs of cyano bloom.	No Sample Taken	No Sample Taken	No Sample Taken	

*: Health Advisory Issued; Exceedance of Threshold

Table 34: Results for cyanobacteria monitoring of Sylvestre Pond in 2020.

Sylvestre Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 7th, 2020**
08/07/20	There were quarter sized bright green patches covering the entire southern end of the pond.	Sample analyzed in sample center. Not brought to DOH.	Sample analyzed in sample center. Not brought to DOH.	Sample analyzed in sample center. Not brought to DOH.	

Table 35: Results for cyanobacteria monitoring of Ten Mile River in 2020.

Ten Mile River					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: September 9th, 2020**
06/23/20	Submerged grass weeds green/yellow.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Thick, submerged vegetation. Green.	No Sample Taken	No Sample Taken	No Sample Taken	
07/22/20	Duckweed and watermeal floating downstream.	No Sample Taken	No Sample Taken	No Sample Taken	
08/13/20	Large quantities of watermeal present along shore. Water appeared clear.	No Sample Taken	No Sample Taken	No Sample Taken	
08/25/20	Water clear vegetation present on surface.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Water appeared very clear.	No Sample Taken	No Sample Taken	No Sample Taken	
09/22/20	Water was clear.	No Sample Taken	No Sample Taken	No Sample Taken	
10/06/20	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/20	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 36: Results for cyanobacteria monitoring of Turner Reservoir 2020.

Turner Reservoir					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 13th, 2020**
06/23/20	Brownish color. ~3' visibility.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	Submerged vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
07/22/20	Duckweed / watermeal concentrated near shore.	No Sample Taken	No Sample Taken	No Sample Taken	
08/13/20	Water clear, small quantities of water meal floating on surface near shore.	No Sample Taken	No Sample Taken	No Sample Taken	
08/25/20	Water clear w/ presence of vegetation.	No Sample Taken	No Sample Taken	No Sample Taken	
09/09/20	Water appeared clear w/ some surface vegetation present.	No Sample Taken	No Sample Taken	No Sample Taken	
09/22/20	Water clear, some green algae present.	No Sample Taken	No Sample Taken	No Sample Taken	
10/06/20	Water clear, duckweed present on surface.	No Sample Taken	No Sample Taken	No Sample Taken	
10/21/20	Water slightly turbid, some water meal on surface.	No Sample Taken	No Sample Taken	No Sample Taken	

Table 37: Results for cyanobacteria monitoring of Warwick Pond in 2020.

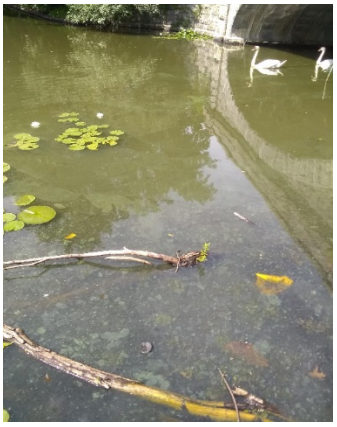
Warwick Pond					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: August 12th, 2020**
06/24/20	No algae but some turbidity.	No Sample Taken	No Sample Taken	No Sample Taken	
07/07/20	-	No Sample Taken	No Sample Taken	No Sample Taken	
07/20/20	Also checked park + boat ramp but they were clear.	All < 1	Aphanizomenon (bundle): 390	Aphanizomenon (bundle): 109,200 **Total: 109,200**	
08/04/20	No evidence of bloom. Spoke w/ kayaker who had been paddling on pond – confirmed clarity.	No Sample Taken	No Sample Taken	No Sample Taken	
08/12/20	Water looked mostly clear, with pea soup green coloring present along shoreline.	All < 1	Anabaena: 310 Aphanizomenon (single): 10	Anabaena: 7,130 Aphanizomenon (single): 280 **Total: 7,410**	
08/19/20	Appeared brown, resident allowed access to backyard. This visit was a follow up from report made by resident.	All < 1	Anabaena: 130 Microcystis: 10 Aphanizomenon (single): 50	Anabaena: 2,990 Aphanizomenon (single): 1,400 Microcystis: 1,400 **Total: 5,790**	
08/26/20	Water appeared clear. Better from prev. visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/08/20	Water appeared clear. No visible decrease in quality from prev. visit.	No Sample Taken	No Sample Taken	No Sample Taken	
09/23/20	Water very clear. Water level dropped noticeably.	No Sample Taken	No Sample Taken	No Sample Taken	

10/07/20	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/20	Water clear. Water level rose significantly.				

Table 38: Results for cyanobacteria monitoring of Wenscott Reservoir in 2020.

Wenscott Reservoir					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: October 16th, 2020**
10/19/2020	Pervasive, dense surface scum. Appears limited to eastern side of RI-7	All < 1	Microcystis: 8,400 Aphanizomenon (single): > 100,000	Aphanizomenon (single): 2,800,000 Microcystis: 1,176,000 **Total: 3,976,000**	
12/02/2020	Dense surface scum no longer present on either side of RI-7. Water looks clear.	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	No Sample Taken; Visual Survey	

Table 39: Results for cyanobacteria monitoring of Willow Lake (RWP) in 2020.

Willow Lake					
Date	**Observations**	**Toxin Levels (ug/L)**	**Colony Count (colonies/mL)**	**Cell Count Conversion (cells/mL)**	**Photograph: Little Beach, June 5th, 2020**
06/25/20*	Looks like cyano-HAB.	All < 1	Anabaena: 1800 Microcystis: 50 Woronichina: 170	Anabaena: 41,400 Microcystis: 7,000 Woronichina: 42,500 **Total: 90,900**	
08/26/20	Water quality appeared improved. Slightly turbid but not pea-soup green.	All < 1	Planktothrix: 50 Aphanizomenon (single): 120	Aphanizomenon (single): 3,360 Planktothrix: 1,400 **Total: 4,760**	
09/08/20	Follow up sampling from prev. visit to lift advisory potentially.	All < 1	Anabaena: 30 Microcystis: 40 Aphanizomenon (single): 170	Anabaena: 690 Aphanizomenon (single): 4,760 Microscystis: 5,600 **Total: 11,050**	
09/23/20	Conditions appear worse from last visit, so no sample taken since advisory still in effect.	No Sample Taken	No Sample Taken	No Sample Taken	
10/07/20	Water clear.	No Sample Taken	No Sample Taken	No Sample Taken	
10/20/20	Pea-Soup coloration	No Sample Taken	No Sample Taken	No Sample Taken	
12/02/2020	Greenish hue to water persists, no major evidence of bloom present.				

*: Health Advisory Issued; Exceedance of Threshold.

Links to waterbody access points on Google Maps:

Northern RI ponds: https://goo.gl/maps/Fn2LbwQLLZT2

Newport ponds: https://goo.gl/maps/M6fS7V47eNH2

Cranston area ponds: https://goo.gl/maps/1Y8njpdWCHG2