

Algae Identification/Cyanotoxin Report

Company: Painted Hills Lakes

Water body Name: **Holiday and Nebo**

Address: **4364 Rembrandt Dr.**

Surface Area: **107 (Holiday), 39 (Nebo)**

Martinsville, IN 46151

Contact Person: **Ms. Tina Thrasher**

Average Depth: **18 feet**

Phone: **812-650-2979**

Date Sample Collected: **4/27/2018**

Email: **tthrasher6264@gmail.com**

Analysis Performed: **Algae ID, Enumeration and Colorimetric Cyanotoxin detection (Microcystin)**

Algae Identification Results (5 most prevalent Species)

Identification	Classification	Growth Form Description	Density (Cells/mL)
<i>Aphanizomenon</i>	Cyanophyta (blue-green algae)	Planktonic	4,153
<i>Centrics</i>	Diatom	Planktonic	3,105
<i>Pseudanabaena</i>	Cyanophyta (blue-green algae)	Planktonic	564
<i>Dinobryon</i>	Chrysophyta	Planktonic	190
<i>Planktothrix</i>	Cyanophyta (blue-green algae)	Planktonic /mat-former	108



From Left to Right: Aphanizomenon, Centric Diatoms, Pseudanabaena, Dinobryon, Planktothrix

Toxin Analysis Results

Analysis	Site	Concentration (ppb)	IDEM Risk Level
Colorimetric test for Microcystin	Holiday 1 (boat launch)	0.0	1: low/no risk
Colorimetric test for Microcystin	Holiday 2 (club house)	0.0	1: low/no risk
Colorimetric test for Microcystin	Nebo 1 (boat launch)	0.0	1: low/no risk

Summary of Results

Algae ID and Density

In addition to water being tested for microcystin, water samples were also screened through an IFCB (Imaging Flow CytoBot) for algae identification and enumeration. In January of 2018, Planktothrix reached nuisance and toxic levels with a density of almost 2 millions cells per milliliter (mL) of water. As part of the consultation service being provided, algae are being identified to monitor presence and densities of known toxin or odor producing algae. The 5 most prevalent species are reported in the beginning on this document. IFCB analysis identified 10 species of algae present with a total density of 8,427 cells/mL. There were 5 dominant species that accounted for 96% of the total algal density. Those algae are Aphanizomenon, Centric diatoms, Pseudanabaena, Dinobryon and Planktothrix.

Of the 5 dominant species, 3 (Aphanizomenon, Pseudanabaena, and Planktothrix) make up 60% of the density and are known to be capable of producing microcystin. The other two (centric diatoms and dinobryon) do not produce toxins, but may produce compounds that give water a musty, fishy or spicy odor or taste. These compounds are 2-methylisoborneol (MIB) and Geosmin.

Algal Toxin Test

At the time of initial identification (January 24, 2018) microcystin was detected at 80-100ppb in Holiday Lake. These levels significantly exceeded recreational exposure guidelines from both the World Health Organization (WHO) and Indiana Department of Environmental Management (IDEM). On February 19, 2018, two samples were collected from both Holiday and Nebo Lakes by Aquatic Control. Holiday samples were collected at the boat launch where some remnant algae was observed and from a site downwind near the clubhouse. These sites were selected on the likelihood of being able to detect presence of the toxin. Samples at Nebo were collected at the boat ramp and a protected cove in the North end of the lake. Samples were sent to Phycotech for analysis. All 4 samples tested negative (0.0ppb) for Microcystin. This new testing places the water in both lakes under IDEM recreational use risk category 1 (<4ppb, low or no risk of exposure).

Continued toxin monitoring is being done through the remainder of 2018. Samples collected on April 27th tested negative for microcystin meaning the water use classifies for low/no risk by IDEM guidelines.

Recommendations

Precautions

At this time the results of toxin monitoring indicate that no water use restrictions need to be observed. Residents should remain observant if a bloom occurs. Monitoring will continue through December 2018 and changes to water use precautions will be reported after each sampling event.

Algae Management

With algae densities below 10,000 cells/mL, an immediate treatment is not needed, but may be desired to reduce the risk of toxin production by the previously mentioned cyanobacteria. Cell densities of 15,000 are considered hypereutrophic and should be treated, however treating prior to this density (around 10,000 cells/mL) is recommended to prevent issues from occurring. Painted Hills Staff had scheduled an algae treatment within a week after the samples were collected. This treatment should help further reduce cell density and possibility of toxin production in significant concentrations. Scheduling treatment events around sampling event results or on a regular interval will help to best manage the presence and density of toxin producing cyanobacteria as well as reduce the likelihood of imposing recreational water use restrictions