EVIDENTIARY ANALYSIS: JULY 9, 2026,

WATER CHEMISTRY BASELINE vs. HERBICIDE-INDUCED CYANOBACTERIA BLOOM

Location: Great Hill Pond, Portland, CT (WorkID / Sample Location: 54 Lake Road)

Laboratory: State of Connecticut Department of Public Health Laboratory (Workorder: 1379506)

Date Collected: July 9, 2026 (1:21 PM)

Client / Collector: Chatham Health District (Russell S. Melmed)

EXECUTIVE SUMMARY & PURPOSE

The official State of Connecticut Department of Public Health laboratory test report from July 9, 2026, provides an empirical, certified baseline of Great Hill Pond's surface water chemistry prior to significant plant decay. The chemical and nutrient parameters confirm that the pond was in a nutrient-limited, limnologically stable condition with low phosphorus, non-detect nitrogen, and low turbidity. This laboratory data refutes any claim that a severe, pond-wide cyanobacteria (Microcystis) bloom was primed to happen naturally and provides clear scientific evidence of herbicide-induced nutrient release.

2. OFFICIAL PRE-TREATMENT LABORATORY FINDINGS (JULY 9, 2026) Low Total Phosphorus: 0.014 mg/L (14 ppb)

Analytical Method: EPA 365.1 (Reporting Limit: 0.005 mg/L)

Limnological Context: Total phosphorus at 0.014 mg/L places the water column on the low mesotrophic boundary. Cyanobacteria blooms (specifically Microcystis aeruginosa) generally require ambient phosphorus concentrations exceeding 0.025 to 0.030 mg/L (25–30 ppb) to fuel rapid exponential proliferation. The ambient water column was phosphorus limited.

Non-Detect Inorganic & Organic Nitrogen Fractions: Nitrate (as N): < 0.20 mg/L (Non-Detect) Nitrite (as N): < 0.20 mg/L (Non-Detect) Ammonia (as N): < 0.10 mg/L (Non-Detect) Total Kjeldahl Nitrogen (TKN): < 0.60 mg/L (Non-Detect) Organic Nitrogen: < 0.60 mg/L (Non-Detect) Limnological

Context: Every major fraction of dissolved and bioavailable nitrogen in the water column was below certified laboratory reporting thresholds. Open water possessed no excess dissolved nitrogen pool to sustain spontaneous algal or cyanobacterial outbreaks.

Low Turbidity & Suspended Solids: Turbidity: 1.2 NTU (Reporting Limit: 0.30 NTU)

Total Suspended Solids (TSS): < 4 mg/L (Non-Detect)

Limnological Context: Natural water column clarity was high, with virtually no suspended cellular matter or particulate loading in the water column.

Low Organic Decomposition: Chemical Oxygen Demand (COD): < 20 mg/L

(Non-Detect) Limnological Context: The non-detect COD reading confirms that there was minimal decomposing organic material suspended within the lake water on July 9.

3. THE CAUSAL MECHANISM: HERBICIDE INDUCED INTERNAL NUTRIENT RELEASE Pre-Treatment Baseline Stability (July 9, 2026):

The pond operated in a clear, nutrient-limited state where living vascular macrophytes (native pondweeds and lily pads) actively sequestered nutrients into their tissue, locking them away from planktonic cyanobacteria.

Chemical Application & Mass Plant Mortality:

The targeted application of aquatic herbicides caused rapid, widespread mortality of macrophyte beds across the littoral zone.

Internal Phosphorus & Nitrogen Spike (Biomass Decay):

Tons of treated vegetative biomass collapsed to the lake sediment simultaneously. Microorganisms decomposing this plant tissue consumed bottom dissolved oxygen and rapidly released bioavailable orthophosphate and ammonia directly from decaying cell walls into the shallow water column.

Cyanobacterial Exploitation & Bloom Trigger:

Fast-growing, gas-vacuolated cyanobacteria (Microcystis aeruginosa) scavenged the sudden, concentrated pulse of internal nutrients. Using positive buoyancy mechanisms, the cyanobacteria migrated to the surface photic zone, creating the dense surface scums and whole-lake turbidity observed in late August.

4. CONCLUSION The certified July 9, 2026, State Public Health Laboratory report establishes that Great Hill Pond was not chemically or biologically primed to experience a spontaneous cyanobacteria bloom. The primary driver of the late-summer bloom was the massive, artificial release of bioavailable nutrients caused by herbicide-induced macrophyte decomposition

~jim steffman