



INFORMATION SUPPORTING SELECTION OF PRINCETON HYDRO AS OUR LAKE ADVISOR

Why the Lake Water Quality Committee Sought to Select a Professional Lake Advisor:

The water quality committee worked diligently for several months to fully understand the many issues facing our lake and over time came to recognize that there are a large number of potential lake management actions that might work to help prevent, mitigate or treat our most pressing current problem, blue-green algae blooms. Some such options include:

- Whole lake chemical treatment targeting blue green algae
- Treatment devices in the tributary streams to capture nutrients
- Watershed best management practices to reduce nutrient loads
- Treatments to bind phosphorous at the bottom of the lake (e.g., alum treatment)
- Aeration to improve dissolved oxygen, increase microbial activity, and prevent phosphorous availability
- Introduction of biological organisms and/or enzymes to digest the muck at the bottom of the lake
- Sonic devices to interfere with the rise and decent of algae between the surface and the bottom of the lake
- Barley straw placement (suspended) throughout the lake
- Direct injection of oxidative materials like hydrogen peroxide or ozone as another means to increase oxygen, especially at depth, to reduce plant-available phosphorous

However, these various options work better to address eutrophication in some lake systems than others, based on many factors, not the least of which are the sources of excess nutrients that cause algal blooms. Lakes are extremely complex systems with many water quality influencers that change with the season, sunlight, rainfall, temperature, land use, agricultural practices and numerous other factors. We as a committee heard horror stories of lake managers/Boards spending 10's or 100's of thousands of dollars implementing treatments that ultimately were never suited to the lake being managed. A good example is a lake where their Board elected to spend several hundred thousand dollars on an alum treatment to lock or bind the phosphorous that was present in the sediments, but the treatment did not deliver positive results. After this huge fail, experts from Princeton Hydro were consulted. They quickly determined the vast majority of the nutrient loading problem was coming from tributary inflows versus lake sediments and the alum expenditures were a predictable complete waste of

resources. One has to assume the Board that proceeded with an expensive alum treatment had some explaining to do to the angry lake residents. Had experts been consulted prior to such a large expenditure, this massive waste of money would have been prevented and tributary source treatments could have been pursued with the funds wasted.

The LLPOA Board has criticized the most recent EnviroScience report it purchased because it presented watershed and lake water quality data and a broad list of potential treatment options, but lacked a definitive short- and long-term treatment plan (prescription to make the lake better). We can argue as to whether or not their scope of services and associated price actually should have produced a prescriptive lake management plan, but the disappointment on the part of the Board demonstrates that we must have an ability to go from visual and physical observations and water quality data to an effective, implementable lake management strategy. The ultimate deliverable must be an actionable Lake Management Plan.

So from a fiduciary standpoint, the Board should be excited that the Water Quality Committee has undertaken a search for a professional lake advisor to guide future management actions, to ensure every action undertaken is appropriate for our lake, cost-effective, and will deliver the desired end results. What the Board is getting, and the Water Quality Committee as an extension of the Board will receive is **UNBIASED EXPERTISE FROM A PROFESSIONAL ADVISOR WHO DOES NOT SELL TREATMENT PRODUCTS OR EQUIPMENT WHO WILL WORK TO HELP US MANGAGE THE LAKE PROPERLY AT THE LEAST COST.** Yes, the LLPOA will have to pay for these professional advisory services. However, using a professional advisor to guide future lake management decisions is the best way to ensure LLPOA funds are spent as prudently as possible and the lake is returned to health, supportive of the multitude of uses it is intended to provide for our community. **The Board simply cannot afford trial and error as a management approach.**

The WQC's Advisor Screening Process:

During the WQC's investigatory process, we identified a few individuals who were not closely tied to a particular treatment technology or vendor. Recognizing that independence from a manufacturer, supplier, vendor or technology is vital to receive unbiased advice, the WQC focused on identifying a short list of potential unbiased advisors and solicited, via a formal Request for Proposal (RFP), proposals from four relatively independent firms. All four responded in some manner to our RFP, although one provided no pricing (Aqua Link, Doylestown, PA). Two of the firms provided proposals that largely incorporated prior proposals they generated following discussions with the WQC, but without the benefit of a formal RFP that spelled out the services we need to procure. A fourth firm was identified as part of our RFP process itself, and provided a complete proposal that stood on its own, without referencing any prior efforts. It should be noted that one of the proposers intended to use Aqua Doc for field data collection and analysis to support its advisory tasks. Its initial (pre-RFP) proposal actually had Aqua Doc in the lead and was submitted on Aqua Doc letterhead. Recent concerns with Aqua Doc's past performance and recent regulatory compliance issues weighed heavily in

our screening process and eventually was a contributor to this proposal being viewed negatively and subsequently cast aside (Vertex Aquatic Solutions, Pompano Beach, FL).

So from four RFPs sent, we ended up with two viable candidate advisor firms: Princeton Hydro (Exton, PA) and Restorative Lake Services (Spring Lake, Michigan). Both firms generally addressed the specific services outlined in our RFP, which permitted the WQC to evaluate these two proposals and have members vote on which of the remaining two firms to recommend to the Board. The majority of the committee members (71% of those who voted) recommended the Board engage Princeton Hydro as our Lake Advisor.

Given that the Board has questioned what the community will get for the recommended advisor service expenditures, other than the valuable expertise needed to help the Board make better informed, cost-effective, and viable management decisions with respect to the lake and better meet their fiduciary responsibilities, the services sought via the RFP were directed at the following short- and long-term goals developed by the WQC:

Short Range/2020 Recreational Season Goals

- Reduce Harmful Algal Blooms (HABs; extent, duration, frequency)
- Improve water clarity by reducing silt and HABs

Long Range - 2021 and Beyond

- Eliminate HABs
- Improve dissolved oxygen throughout the lake
- Reduce eutrophication nutrients from all sources, especially phosphorous
- Achieve consistent water quality supportive of the range of uses (swimming, water skiing, boating, fishing, etc.)
- Achieve and maintain a healthy aquatic community (aquatic plant and animal assemblages) with a food chain and habitat to sustain fish throughout their lifecycle
- Reduce the use of chemicals to control algae

The specific services the WQC sought via the RFP, stressing independence from manufacturers, vendors, specific technologies etc. follow:

- Review and provide a critical summary of historical treatments, previously collected water quality data and associated reports.
- Identify data gaps and additional data needed to fully assess water conditions, the relative significance of nutrient sources, and management options that will correct water quality issues.
- Recommend and establish with the WQC an appropriate data collection timeline and long-range monitoring regimen. Advise and enforce proper sampling, analytical and reporting methods with appropriate method detection limits.

- Assist with Request for Proposal (RFP) generation and evaluation for specific tasks identified. Identify and vet competent candidates to respond to RFP requests
- Prepare a schedule and action plan that has one-year, two-year, and five-year objectives (key milestone deliverables, tasks, implementation of BMPs, and associated key lake characteristic targets).
- Establish SMART (Specific, Measurable, Achievable, Realistic, and Timely) targets to achieve the LLPOA short- and long-range water quality goals.
- Identify all relevant tasks necessary to develop an effective and sustainable Lake Management Plan that will serve as a roadmap for the current and future Board of Directors.
- Provide materials to educate and inform the WQC, Board of Directors and membership.
- Generate Quarterly Summary/Progress Reports.
- Participate in quarterly LLPOA Board of Directors meetings to review summary reports and progress.
- Participate in the preparation and presentation of materials at annual Community meetings.
- Recommend and support development of community outreach and information tools.

The intent of the RFP was to specify activities that require expert independent thought and analysis (**high-level advisory services**), versus more mundane or routine activities (**commodity services**) such as sampling, analytical testing, application of chemical treatments, or installation of mechanical treatment systems. The Board needs to think of this procurement in terms of accessing expert analysis and advice that informs future Board decisions, versus commodity services that are prescribed by the Board with assistance from the WQC and a professional advisor.

Here are the specific tasks that Princeton Hydro will perform to help us in an ADVISORY ROLE. In addition to advisory services, we requested and received additional information on the commodity services Princeton Hydro, or another third-party contracted via future RFPs, could provide if asked. Given that sampling should be done monthly during the summer when oxygen level are most depressed and algal blooms typically occur, there was no time to seek additional sampling-only proposals and Princeton Hydro gave a very thorough proposal for these services; therefore, the WQC recommends that these additional services be made part of the contract. Specific tasks Princeton Hydro proposed per our RFP are listed below:

Princeton Hydro Tasks
1. Review of Historical Treatments, Data, and Reports
2. Provide Educational Materials
3. Data Gap Analysis
4. Conduct Water Quality Monitoring (5 events)
5. Pollutant and Hydrologic Loading
6. Trophic State and Mass Balance Modeling

Princeton Hydro Tasks
7. Establish SMART Goals
8. Prepare Action Plan and Schedule
9. Develop Lake Management Plan
10. Prepare and Evaluate RFPs (was \$5,400)
11. Generate Quarterly Progress Reports
12. Participate in Quarterly BOD Meetings
13. Annual Presentation (with travel)
14. Recommend and Support Community Outreach Tools
15. On-call Services as Authorized by LLPOA (Note – This was added to allow time-sensitive future out-of-scope consultation if/as needed)

The suite of sampling and analytical testing services identified in Task 4 is quite extensive and includes the following:

- Five (5) monthly sampling events from May through September
- Three (3) in-lake stations, two (2) inlet tributary stations, and one (1) outlet stream station (6 total stations).
- *In-situ* monitoring of temperature, specific conductance, pH, and dissolved oxygen in profile, at 1 m intervals throughout the water column, at the lake stations and mid-stream sample at the tributary stations. Secchi depth clarity at lake stations.
- Discrete lab analysis would be conducted by Environmental Compliance Monitoring (ECM) of Hillsborough, NJ. Princeton Hydro has worked with this lab for 20+ years as this lab can meet the low limits of detection necessary for limnological analysis, utilizes EPA approved standard methods, and integrates rigorous quality assurance measures. Discrete lab measures would be conducted as follows:
 - Lake inlet area: Surface – total phosphorus (TP), soluble reactive phosphorus (SRP), total suspended solids (TSS), and chlorophyll *a* (chl *a*). Deep – same as surface with exclusion of chl *a*.
 - Mid-lake area: Surface – TP, SRP, TSS, and Chl *a*. Deep – same as surface with exclusion of chl *a*.
 - Dam area: Surface – TP, SRP, TSS, Chl *a*, nitrate (NO₃), and ammonia (NH₃). Mid – Same as surface. Deep – Same as surface and mid with exclusion of chl *a*.
 - Inlet Tributaries (2) and Outlet tributary: TP, SRP, and TSS
- Plankton
 - Phytoplankton: Identification and enumeration (cells/ml) at surface and mid-depth of dam station and beach area (3 samples).
 - Zooplankton: Identification and enumeration (organisms/ml) at surface and depth appropriate deep area of dam station (dependent on oxygen distribution) (2 samples).
 - Plankton identification and enumeration would be conducted by Princeton Hydro at our biological laboratory.

- Cyanotoxins
 - Abraxis ELISA-based test kit analysis of total microcystins and cylindrospermopsin at beach during each event.

A full analysis of the data would be summarized in figures, tables, and narrative form as part of the Lake Management Plan (Task 9) prepared by Princeton Hydro. This analysis would fully describe each parameter and evaluate trends on a temporal and spatial basis. Data would also be compared to local weather (temperature and precipitation data) as derived from CLIMOD. Princeton Hydro would compute Carlson’s Trophic State Index (TSI) for the lake. Parameters would be compared to State, Federal, or standard limnological thresholds.

The *Deliverable* associated with Task 4 will be a complete and scientifically objective water quality assessment of Lake Latonka. This assessment will be utilized to inform the current trophic state of the lake, in order to understand the spatial and temporal extent of anoxia and internal P loading, to develop realistic water quality goals, and to inform lake management recommendations.

Contractual Concerns Raised by the Board:

The WQC assumes the Board will see the value in basing all future lake management decisions on a thorough scientific review of the multitude of factors contributing to lake water quality, and wants to follow a Lake Management Plan prepared by a professional with requisite experience. To move forward, the next steps would be to notify Princeton Hydro that their proposal is being tentatively accepted, pending review of their Professional Services Agreement and associated Standard Terms and Conditions, and subsequent negotiation of any provisions deemed inappropriate for this project. Likewise, if we wish to add, delete, or modify any tasks, we would communicate such desires to pH.

Typically contractual documents from consultants state what will be done (the scope of services gets attached), the price for the services to be performed, and the schedule. In addition they typically cover indemnification, how disputes are handled, force majeure, termination for convenience, termination for cause, payment terms, progress payments, final payment if services are terminated by either party, non-disclosure, contract modifications, invoicing, confidentiality of information etc. We would have the opportunity to review and comment on these documents, attempt to reach agreement with Princeton Hydro if contractual changes are requested, and execute a contract once the agreement and terms are acceptable, with any scope changes we would deem beneficial to LLPOA

Direct Comparison of Princeton Hydro vs. Restorative Lake Services Proposals

Unfortunately the RLS proposal is in a sense two proposals, one submitted on April 15 based solely on discussions with the WQC (prior to issuance of a formal RFP) and a second proposal dated May 4, 2020 in response to the Lake Advisor RFP we issued. Their response to the RFP essentially parroted back our RFP language with introductory statements that “RLS is

responding to Section 3.01” or other RFP sections (3.02 or 3.03). It is difficult to ascertain, between the two proposals, if RLS is performing all the services required by the RFP, plus services not requested (e.g., commodity water sampling and analysis services). However, if one assumes that their initial proposal and second cross-referenced proposal in response to the RFP fully address the RFP requirements, we can compare the RLS proposal to the Princeton Hydro proposal. The WQC found that the RLS proposal was about 7% lower in cost, but the number of water sampling events and discrete sampling points was far below what pH was proposing.

Specifically, RLS proposed only two tributary sampling events versus five events for pH. RLS proposed only one in-lake sampling event at the 3 deepest basins; whereas pH proposed five events at 3 in-lake stations. pH proposed 2.5 times as many sampling events for tributaries and 5 times as many sampling events in the lake than RLS. Given the much more thorough sampling and analysis pH proposed to perform, and the quality of the analytical laboratory they will use, the pH proposal clearly offered the most value to LLPOA, plus their proposal offered absolute clarity on the services they will perform and the deliverables they will generate. This made Princeton Hydro the lake advisor of choice.