

## A Solar Solution for Algae and Eurasian watermilfoil

By Michael Lipparelli, US East Regional Manager  
SolarBee - Pump Systems, Inc.

When lake managers and residents discuss their biggest water quality issues, algae blooms and nuisance plants often top the list. There's no question that these are two of the major causes of declining recreational and aesthetic value in many lakes around the country.

Additionally, owners of shoreline property suffer financial loss from poor water quality. A study by researchers at Bemidji State University in Minnesota, highlighted in the summer 2003 issue of *On Tap*, published by the National Drinking Water Clearinghouse, showed a direct correlation between water quality and property values. In one example cited by researchers—a lake with water clarity to ten feet—it was found that property values would drop by as much as \$594 per frontage foot if clarity was reduced by more than three feet. In other words, a 40-foot lakefront lot would lose almost \$24,000 in value. Conversely, a three-foot *increase* in water clarity would add almost \$17,000 to that same property's value.

Efforts to control water quality problems often require significant on-going costs, are labor intensive and may even harm the environment if not applied properly.

However, a recently completed case study showing the positive impact of solar-powered circulation in a reservoir in New York State is catching the attention of professionals and homeowners around the country.

The raw water reservoir, one of five supplying the Highland Water District in the Town of Lloyd, had long-standing problems that made it virtually useless to the town. Summer algae blooms and a dense crop of Eurasian watermilfoil were an annual occurrence, and falling leaves from

shoreline trees added to the organic buildup on the reservoir's bottom. A long hydraulic residence time and the thick layer of decaying humic substances kept the reservoir anoxic.

According to John Jankiewicz, Water and Sewer Administrator for the district, the water quality was so poor that taste and odor in the treated supply was unacceptable even when diluted at a 1:20 ratio with water from other sources. Faced with increasing demands and unable to utilize the 1.4 million gallons in the 7.5 acre reservoir, the district was forced to draw water from the Hudson River at an additional expense to meet their needs.

Unwilling to enter into a never-ending cycle of chemical treatments, and hoping to avoid the on-going energy costs of typical mechanical aeration devices, Jankiewicz began searching for a more environment-friendly solution. What he found was a floating, solar-powered reservoir circulator called the SolarBee, manufactured in North Dakota by Pump Systems, Inc. (PSI).

Jankiewicz and his engineers were intrigued by the SolarBee's method of operation --gently drawing water near the bottom of the reservoir and spreading it across the surface via laminar flow. In their mind, it had the potential for supplying the circulation and oxygen that weren't occurring naturally. They studied other applications of the unit, in both fresh water and wastewater ponds, and discussed their particular problems with company representatives.

According to PSI President Joel Bleth, the solar-powered circulators increase dissolved oxygen (DO) levels in the water column, first through surface renewal, then by enhancing the distribution of beneficial algae and the pure photosyn-

thetic DO it produces. "The Solar Bee circulates up to 10,000 gallons per minute over the surface of a reservoir, and then brings it gently across the silt layer, enhancing the biochemical reactions to increase organic digestion," states Bleth. "The higher pH water increases reactions to increase the formation of hydroxyapatite (the rocklike substance created by the bonding of soluble phosphorous with calcium. Locking up phosphorous prevents its availability as a nutrient for blue-green algae and nuisance macrophytes."

The district decided to try the circulators in Reservoir #5. A key factor in their decision, Jankiewicz explained, was the company's "rent-to-own" program. It allowed the town the opportunity to test the units prior to making a final purchase decision, with the majority of rental payments applied to a later purchase. If they weren't satisfied, the units could be returned at the company's expense.

*"The Highland Water District is happy to report that our two SolarBee units are performing well in drinking water Reservoir #5, not only eliminating our algae bloom this year but also the Eurasian watermilfoil infestation that has plagued us in recent years. We have increased the water we draw from Reservoir #5 and have a better water quality than we have seen in years. I believe our investment will be returned for many years to come."*

*John Jankiewicz  
Water & Sewer Administrator*

improve," he recounts, and the taste and odor problems were diminishing.

By mid-summer, when the reservoir was typically covered with blue-green algae and milfoil, Jankiewicz found only excellent clarity throughout. In fact, he was now able to draw the maximum amount of water from the reservoir without negative impact on the treated water quality, eliminating the district's dependence on the Hudson River.

In a July 2003 letter to PSI, Jankiewicz praised the SolarBee's performance for "not only eliminating our algae bloom this year but also the Eurasian watermilfoil infestation that has plagued us in recent years." Bleth explains that tying up phosphorous is the key to reversing eutrophication and cleaning up lakes and reservoirs. "Reducing the excess nutrients in the water column is a more natural and consistent method of controlling algae blooms and non-

Although one SolarBee is capable of treating up to 2000 acre-feet of water, two machines were recommended due to the lake's shape - - basically two open areas separated by a channel.

When the factory installation team arrived in July of 2002, the milfoil had already overtaken the entire reservoir. The machines were placed in the center of each open area and anchored with concrete mooring blocks. Although the district's employees had to initially keep the machines free of loose milfoil, within two months they were working as expected.

In January of 2003, Jankiewicz declared the test a success and converted their rental to a purchase. He reported the ability to use water from the reservoir for the first time in his 20 years with the district. "Water clarity had already begun to



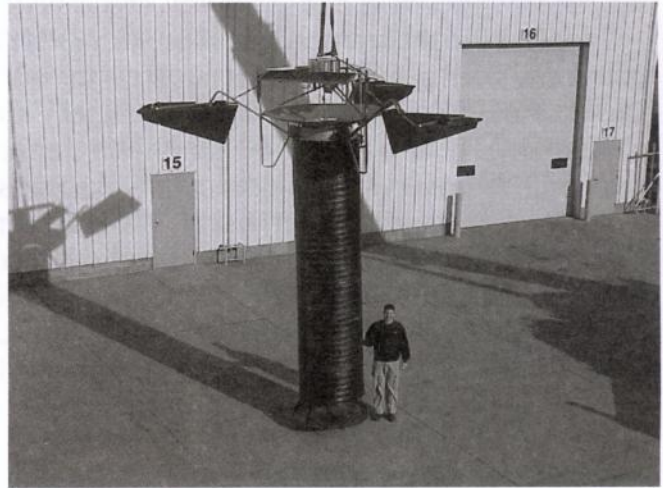
*Highland Reservoir, Town of Lloyd, NY*

native species of plants," he stated.

Jankiewicz was especially pleased with PSI's knowledge of pond biology and chemistry. "Although the bottom line is that it works," he continued, "having an understanding of how it works is useful."

The fact that SolarBees utilize the power of the sun, require very little maintenance, and have a 25-year expected life span makes Jankiewicz believe that their investment will be returned for many years to come. He still finds it somewhat difficult to believe, however, that the two machines in his reservoir have had such a major impact. "I am still amazed," he exclaims, "at how much water those things move!"

John Jankiewicz can be reached at (845)691-2400. Information on the SolarBee can be found on the Internet at [www.SolarBee.com](http://www.SolarBee.com), or by calling (800) 437-8076.



Mark Your Calendars NOW!

NYSFOLA 21st Annual  
Meeting and Conference



April 30 - May 2, 2004  
White Eagle Conference Center  
Hamilton, NY

Draft Agenda and Registration information in your next  
issue of WATERWORKS!