



Devils Lake Water Improvement District

Lake Conservation Aeration Project

2 Year Update

1. Project Background, History, and Timelines

Long-standing concerns in the watershed that affect Devils Lake continue to be ongoing inputs of creek-borne, E-coli bacteria from Thompson and Rock Creeks, historical and on-going lake-wide inputs of nitrogen and phosphorus from residential septic systems, increasing sedimentation, erosion, storm water inputs, intermittent cyanobacteria blooms, and the threat of the return of nuisance aquatic plants.

The Devils Lake Water Improvement District, after a lengthy period of research and committee/board discussion, agreed to fund an updated and comprehensive study to characterize the quality of Devils Lake as a primary source of habitat and recreational opportunity.

In November of 2014, a request for proposals was issued nationally to some 60 firms that exhibited broad expertise in lake water quality study, design, and improvement. In February of 2015, a bid opening was conducted with no proposal responses. In March of 2015, DLWID approved a direct appointed concept, pursuant to State of Oregon, Sole Source policies, rules and law.

In July of 2015, DLWID received a proposal from Alex Horne and Associates (AHA) of California to study and report the past and current state of Devils Lake, provide options for lake water quality improvement, and narrow the options to a recommended solution.

The July 2015 proposal cost was, through negotiation, reduced sufficiently to allow the DLWID Board in February 2016 to approve the amended proposal and enter a contract with AHA and their design team subcontractors. The AHA Phase 1 Report was completed in mid-April 2016. This level of completed work provided the complete scientific study portion, a solution menu of 17 options, and once oxygenation by aeration was selected as the appropriate course of action.

2. Project Design Solution

a. The total area of diffuser array proposed was 41 acres within the deepest and center portion of Devils Lake, adjacent to Sand Point.

b. The projected area of maximum circulation/aeration impact is 106 acres.

c. The project turnover rate is 1960 acre-feet per day or 26.6 million gallons per hour

3. Construction Project Bidding Sequence

Proposals were received from EP Aerations, Innovative Pond Solutions, and EverBlue Lakes. A proposal scoring matrix was developed based on compressors, diffusers, airlines, turnover rates, influence zones, and costs. Lake Savers scored highest in the process by a significant margin and was subsequently selected as the installation contractor. The primary reasons for selecting **Everblue Lakes** included type and size of compressor, type and effectiveness of diffusers, and most importantly combined, turnover rate and influence zone.

4. Contractors Information and Primary Contact

Everblue Lakes

269-383-3400

John Tucci, President

jtucci@lake-savers.com

6. Aerial Photo of Diffuser Array In Operation

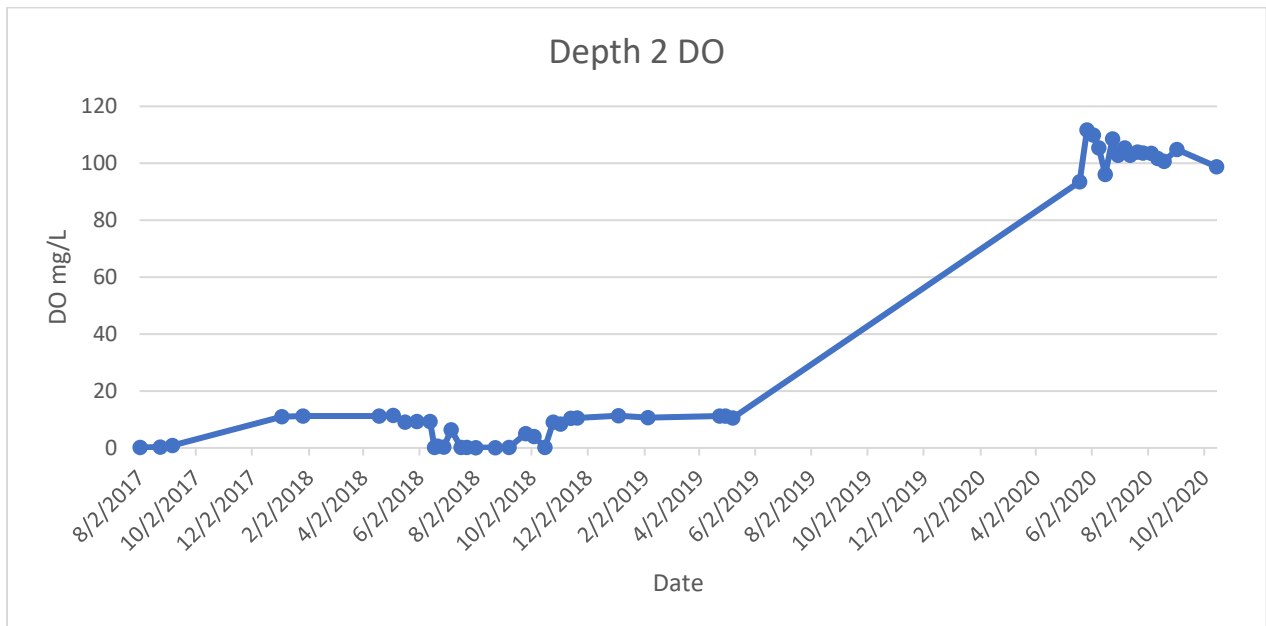


7. Project Testing, Measurement, and Diagnosis

a. In support of the installed aeration project, data gathering has continued from its installation in November 2018 in multiple lake locations. The DLWID testing plan includes weekly water quality observation and weekly in water testing weather permitting. Results include temperature, turbidity, nitrate, algae, dissolved oxygen, ph, and conductivity. This extended water quality testing period was initiated to record the effects of the operating aeration system.

b. The water quality measurement equipment (EXO sonde) has several quality assurance requirements:

- (1) Regular calibration and maintenance to OEM specifications
- (2) Equipment cleaning and decontamination protocol used after each deployment
- (3) Battery and overall system operations check prior to each use
- (4) Yearly service and calibration performed by equipment manufacturer



8. Results

a. Since the installation of the aeration system in November of 2018, Devils Lake has experienced dramatically increased Dissolved Oxygen Levels in its lower waters. The normal summer eutrophic cycle appears to have been interrupted by the introduction of dissolved oxygen via lake bottom air diffusers. As an effect, the lake has had much higher clarity and significantly reduced algal presence especially during the warmer summer months.

Due to a more hospitable environment, more native plants have established and have begun developing a healthier shoreline and habitat for wildlife. Native fish populations are benefiting from the healthier waters in the lake as well.



Devils Lake 2015

Devils Lake 2020



Photo: Paul Christiansen/The NewsGuard

Photo: DLWID Staff