LONG LIVE MEAD LAKE

"What is the personal impact that lake water quality has to your enjoyment of Mead Lake?"

This question was presented to attendees at the Mead Lake Water Quality Seminar and other Mead Lake property owners. Their responses varied from "I could not go swimming because greenies triggered allergies". "I was denied a simple pleasure of watching my grandkids having fun swimming due to greenies." "I get a gag reflex due to foul odors." "A dog died due to ingesting blue green algae." "I feel dirty after swimming." "I do not come to the lake during algae blooms." "I could not access a fishing spot due to mats of floating algae / duck weed snagging my lures." And the big one **"My property value declines if no one likes being on the lake."**

Why does this happen: Algae is the cause for the loss of people's enjoyment of the lake. Mead Lake is considered nutrient-rich, eutrophic *(the bottom of a lake status rating)* and therefore impaired. Algae blooms are common in the summer months along with other harmful algae blooms, commonly known as blue-green algae or cyanobacteria.
The Mead Lake Fact Sheet 2023 provided details on how these conditions occur due to non-point pollutants (phosphorus and sediment runoff) entering the lake from the South Fork of the Eau Claire River watershed.
The Mead Lake Management Plan published in 2010, lists the number one goal for lake improvement as *"Improve water quality and decrease frequency and intensity of algae blooms by decreasing sediment and phosphorus inputs to the lake."* Clark County, having the responsibility, has a remediation plan to address the goal with an objective to reduce pollutants input by 30%. However, neither the goal or the objective address rehabilitation needs of the lake from damage created by watershed pollution.
Clean up and rehabilitation efforts of Mead Lake are the responsibility of the Mead Lake District.

Our common thread – A cleaner Mead Lake makes all forms of recreation on the lake more enjoyable, people and pets are healthier, fishing is improved and property values remain high. Everyone believes they will feel better, enjoy and value their time on Mead Lake even more when it has visibly cleaner water, reduced algae, no foul odors and an improved habitat for all species of life. The Mead Lake District board shares this same belief. It is time for our Mead Lake District to implement a strategy to start cleaning up our lake.

What can the Mead Lake District do to ensure a more enjoyable Mead Lake?
Starting at the annual meeting June 15, 2024, the Mead Lake District Board is proposing a project of lake rehabilitation called **Long Live Mead Lake.** The project is a multi-year, two part proactive strategy to identify aeration technology which can positively impact efforts to clean up and rehabilitate Mead Lake. Mead Lake District electors who attend the June 15, 2024 annual meeting will have opportunity to vote a direction on this initiative.

Where do we start: Muck, having accumulated in various bays and lake bottom over the years, is a contributing factor to the summertime algae blooms and foul odors. Muck is a type of sediment buildup consisting of decomposing plant material, algae, and other organic matter. Muck also contains phosphorus and other nutrients from the watershed. Compounding our challenge is that less surface water spills over the closed dam gates in the hot summer months. Water in various bays and shallow areas stagnates. Dissolved oxygen in the lake water becomes inadequate to promote normal decomposition of organic materials; thereby, increasing the potential and intensity of algae blooms.
Long Live Mead Lake starts with a proof-of-concept test evaluating a natural, non-chemical, aeration technology. This will increase dissolved oxygen in the water to promote the natural decomposition process of muck. Similar to composting, the increase of dissolved oxygen in the water promotes decay of organic material by the good bacteria in the lake. More dissolved oxygen also produces oxidative effects that break down excessive nutrient levels (e.g. phosphorus, nitrogen) by reducing the phosphorus laden muck. In other words, good bacteria eats the muck.

Details on project **Long Live Mead Lake** are:
Our Goal: Mead Lake moves up to mesotrophic status (search: *InterpretiveGuideToCLMNWaterQualityReport* dnr.wi.gov*)*

Our Objective: Improve lake water quality by reducing potential and intensity of algae blooms to bring Mead Lake out from an impaired / eutrophic status (lowest status) to an improved mesotrophic status.

How we will reach the goal: Part one; A proof-of-concept evaluation of aeration technology commonly called NanoBubbles would start in summer 2024. Nanobubbles are microscopic bubbles of air, 2500 times smaller than a grain of salt. A shore-based NanoBubbles system *(42"L x 27"W x 42"H)*, pulls in lake water, injects increased oxygen in the form of NanoBubbles into the water and returns that water back to the lake.

Critical to this effort is monitoring of water quality changes before and continuing with operation of aeration technology. Quantifiable data on any change to water quality is required for direction of future plans and consideration for future financial grants.

A proven aeration technology will result in reduced levels of phosphorus, chlorophyl ll A, proper pH and less muck. Dissolved oxygen will be higher and water clarity will be measurably deeper.

Part Two of the strategy will continue in 2025 with recommendation to implement a proven aeration concept. Subsequent plans in years 2026, 2027 and 2028 will include initiatives for maintaining a healthy fishery, prevent expansion of invasive species, education for control of shoreline erosion from runoff and ensure safe and diverse recreational activities for all.

What is the proof-of-concept budget: Balance of FY24 $14,800 *(does not require additional assessment at this time)*

What grants are available to offset cost: Wisconsin currently does not offer grants for NanoBubble aeration at this time.

What other options were considered: Four common alternatives were considered.

- Alum treatment (Aluminum Sulphate / Aluminum Hydroxide) was researched and determined not feasible by WI DNR. Water flow characteristics of Mead Lake would wash away any treatment in a high water, dam open event. The estimated cost of Alum treatments can exceed $400,000 over 3 years. If treating 106 acres or only 1/3 of Mead Lake, the additional per property assessment is estimated to be $956 annually.
- Biologic treatments do not address the main problem of inadequate dissolved oxygen in the water. Water flow characteristics of Mead Lake would wash away any treatment in a high water, dam open event. Treatment to 100 acres of Mead Lake would require estimated 5000 lbs. (166, 5 gal. buckets) of product per month, be applied over a four month period.
- Dredging is already known to have annual expense of $425,000 per year on Lake Altoona. Mead Lake would incur an estimated assessment of $3057 per property in a dredging initiative. There are no grants available from the state to offset this expense.
- Other forms of aeration technology - MicroBubbles and fine bubbles (fish aquariums), are not as effective because the larger bubbles rise to the surface and do not infiltrate the muck to promote organic decay.

A NanoBubbles aeration concept test this summer is anticipated to deliver measurable and positive changes with quantified information for future plans and financial grants to rehabilitate our lake. NanoBubbles technology also offers a significant lower cost alternative to alum and dredging. NanoBubbles aeration has proven effective in reducing muck and cleaning the waters in many other lakes which have algae bloom issues similar to Mead Lake. Two recent examples in Wisconsin are:

- Late last summer 2023 testing on a small bay on Lake Arrowhead in the Tri Lakes District, Nekoosa, WI showed significant improvement in water quality and clarity. They will be implementing a larger scale NanoBubbles aeration project this summer.
- Balsam Lake Protection and Rehabilitation District in Polk County, Wi, is expected to start a custom NanoBubbles aeration project in summer 2024. Their confidence in the technology resulted in reallocating a $95,000 dredging budget plus purchase of a dredging machine into a 3 year NanoBubbles project.

The Mead Lake District board is highly confident that by the fall season of 2024, we will have identified a viable and low cost solution to rehabilitate our lake. We will rely on what the water quality data tells us before jumping all-in in future years. We must manage expectations plus maintain a disciplined scientific approach. Every lake is different and will exhibit different changes because "lakes work on lake time." (Buzz Sorge)

Your support is needed to approve the budget for Long Live Mead Lake.
The final result is: all forms of recreation on Mead Lake become more enjoyable, with a thriving fishery, an improved eco system for all forms of lake life and all of our property values remain high.