

Phosphorus drives plan to help lake

Carstens stays on target for work to clean water

By Mary Thomsen

Carstens Lake remains a project in motion as it heads toward an innovative method of removing a key contaminant. About two dozen people, many living near the lake, heard an update on plans to remove phosphorus from the water during a Manitowoc County Lakes Association meeting at the Newton Town Hall last Thursday.

Working on the project are Lakeshore Natural Resource Partnership, the University of Wisconsin-Stevens Point and the contractor, Stantec. The plan is to construct a sedimentation basin at Pine Creek, which empties into Carstens Lake, to lessen the impact of high water flow during storms and wet periods and allow solids and nutrients in the lake to settle out.

The project would use a technology called "sorption" to remove dissolved phosphorus, an element that in high concentrations causes algae to bloom on lakes and can lead to fish die-offs and other negative effects. That portion of the plan is still in the research phase at UW-Stevens Point, having been developed by Kyle Herrman, a professor in the school's natural resources department.

People attending the meeting brought up several questions that the presenters plan to review and share with the researchers at the university.

The project dates back to 2012, when a three-year study was launched by the county lakes association and found high levels of phosphorus in the lake. That led to a comprehensive management plan being published in 2018 that recommended offline structures along the creek to treat the water and led to the current project being started.

Jim Kettler, director of projects for the LNRP, led off the meeting, explaining that his organization is dedicated to protecting and cleaning up water throughout the lakeshore area near Lake Michigan.

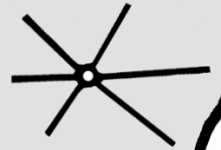
"You all know phosphorus levels on Carstens Lake are high and always have been," Kettler said. "There's a legacy component there that is very, very difficult to remove."

He explained that the state Department of Natural Resources awarded a planning grant that funded the lake management plan and a second grant for implementation, which will partially fund the restoration and sorption project. More funds will have to be raised, which will be decided by the Carstens Lake and county lake associations, he explained, and the total cost has not yet been determined, nor has the final design.

the Valders Journal

Vol. 82 No. 47
Subscription \$32 Per Year

Thursday, July 7, 2022
Single Copy \$1



He said that diverting the water is one way to manage the problem, but noted that just "sends it downstream." For that reason, ways to "harvest" the phosphorus were discussed, which led to the partnership with Herrman and UWSP.

A decade of data from water sampling is helping with the project's direction, Kettler noted, and more is planned. The DNR is calling for large reductions in sediment and phosphorus throughout the Lake Michigan watershed, which are challenging to obtain, he added. Sarah Majerus, an environmental scientist from Stantec, discussed work to design the project and get required permits.

"We are trying to remove total suspended solids and phosphorus from the system," she explained. "...We want to try to harvest these nutrients so we aren't sending them downstream. Phosphorus is really great to have on the land and we want to keep it there and figure out a way to harvest it and maybe reuse it someday."

She said the Carstens Lake project would be the first field application of Herrman's research, which uses steel furnace slag, a waste product of steel production.

"We have to make sure it's safe, so we've also been working with the DNR on ecotoxicity testing to make sure there won't be any harmful effects on the environment."

If the system goes forward, she said the entire four acres in the affected area near Pine Creek will be restored to its native habitat, with wetland enhancement.

Christian Burnson, a Stantec civil engineer working on the project, outlined the preliminary project design.

"I underline it's preliminary," he stressed before going over a schematic of the possible project, which includes a culvert to divert water from the north side of Carstens Road into two sediment basins.

The storm water runoff then would be allowed to still so solids can settle out, Burnson said. But that does not easily catch the dissolved phosphorus in the water, which brings in the sorption treatment with the slag, which would clean much of the element out of the water before it goes back into Pine Creek and to Carstens Lake. Kettler said most of

the phosphorus comes from a handful of heavy rains, so the culverts would be high enough to catch the extra water. Burnson noted that DNR permits must be heeded because Pine Creek is considered a navigable waterway by the agency's standards, which affects the ability to modify the system.

The preliminary idea to de-sign the sorption system would use concrete boxes that divert water using a zigzag design to give more time for the slag to do its job.

As shown by the university research, the slag would be placed in vinyl mesh bags suspended in the water to catch the phosphorus, Majerus said. The hope is that the bags, weighing around 30 pounds when wet, would only need to be changed annually, depending on the amount of rain and snowfall.

Joe Kopplinger, a resident of the lake, asked several questions about the work needed to maintain the slag bags and the cost to the residents.

"Carstens Lake doesn't have a lot of people and there is almost no young people," he said.

Kettler said the bags would be designed to be removed easily and accessed with a skid steer or ATV, and cost is still to be determined, although slag can be obtained for free, other than the cost of packaging and hauling.

Majerus said the slag might be useful for soil improvement or as fertilizer, but that must be confirmed by the two-year research study being run now, along with many other details and questions, including costs and responsibility for paying for the upkeep.

Kopplinger expressed concern about the longterm viability of getting people to help with the maintenance, even if the project works out well, along with the cost.

"It's just a tough sell, especially on a small lake," he said, later calling for caution with the plans until there are enough answers. Kettler said the DNR will not be able to provide staff for the maintenance work, noting that it has been cutting staff for several years. Construction would not start until all the questions are answered, Kettler and Majerus both said. The tentative construction start date is this winter, depending on water testing and the lab research.

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