

Planning for Sustainable Brownfield Redevelopment

CONVERTING WASTE LAGOONS INTO FISH PRODUCTION SPACE

MILLE LACS BAND OF OJIBWE, MILLE LACS, MINNESOTA, EPA REGION 5

The Mille Lacs Band of Ojibwe, Public Works Department operates wastewater treatment lagoons on its Onamia, Minnesota, Reservation. In 2004, a new wastewater treatment facility serving the Garrison, Kathio, West Mille Lacs

Lake Sanitary District began operating. With the additional capacity and treatment capabilities made available by this new facility, the older wastewater treatment facility and lagoons were closed.

The closed wastewater treatment facility is located on a site of approximately 45-acres. The closed facility includes three smaller lagoons that occupy the northeast portion of the site. The smaller lagoons were installed between 1965 and 1991 to manage wastewater from nearby residences. The closed facility also includes three larger lagoons that were installed in 1996 to manage larger volumes of wastewater produced by the Grand Casino and other buildings east of the site.

Over the last several years, the Mille Lacs Band and the State of Minnesota have studied potential causes of a prolonged decline of the walleye population in Mille Lacs Lake, as well as ways to replenish the walleye stock. In 2015, the Mille Lacs Band requested technical assistance from EPA's Land Revitalization Team to investigate the feasibility of converting the closed wastewater treatment lagoons into a fish hatchery that could be operated by the Band to spawn and produce walleye and other select species. A fish hatchery could support the Band's socioeconomic goals such as intern programs, cultural use, education, and employment, as well as help restore the local walleye population.

EPA's Land Revitalization Team analyzed the requirements for and feasibility of renovating the former wastewater treatment complex into a fish hatchery. Although producing several fish species would be possible, the Team's analysis focused primarily on walleye and the required components necessary to maximize the available pond space provided by the former treatment lagoons.

The Land Revitalization Team found that the Mille Lacs Band property could support the proposed fish hatchery if the site:

- Had a dedicated water supply via a pathogen-free well(s);
- Had site piping installed to supply water from the well to the proposed building and ponds;
- Had a hatchery building with dedicated space for egg hardening, disinfection, and incubation and tanks for habituation, research, or grow-out;
- Had the lagoons renovated in preparation for fish rearing; and
- Included an effluent treatment area to treat hatchery waste prior to discharge.

While not all of the former lagoons were deemed useable, the team concluded that the proposed renovation of the site and construction of a new hatchery building would provide the capacity to produce over one million 1.5" walleye fingerlings within the existing 45 acres occupied by the wastewater treatment operation. The Land Revitalization Team's analysis, estimates of probable construction costs, and draft concepts will be utilized by the Band to advance their project concept and seek funding to build the facility.

For more information, please contact Kyle Rogers, EPA Region 5, at rogers.kyle@epa.gov.

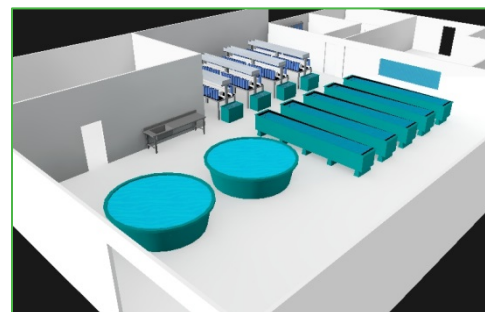


Figure 1. Rendering of the proposed hatchery building egg incubation and tank space.

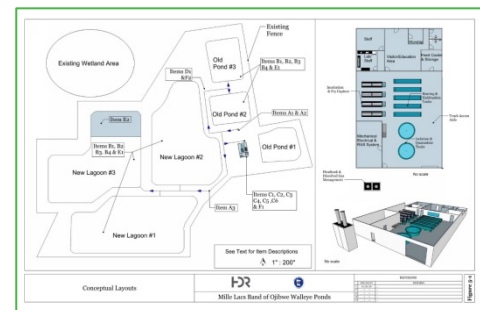


Figure 2. Illustrations of proposed improvements and additions at the former treatment lagoon location.

LESSONS LEARNED

- Creating fish production space by utilizing existing wastewater treatment lagoons can help restore sport fishing and enhance community natural amenities.
- Reclaimed lagoons can be a cost-effective and safe location for fish production after the units are cleaned up.

RECOMMENDED POST-TECHNICAL ASSISTANCE ACTIVITIES

- Complete an investigation into well water availability and address impacts to other wells at the property.
- Complete a preliminary design to narrow the possibilities to a formalized set of design criteria matched to the project budget.
- Review combinations of funding sources to complete renovations and construction of the new fish hatchery building.