Town of Algoma
Bellhaven HOA Annual Meeting
McM No: A0018-09-22-00615
December 4, 2023

McMAHON ENGINEERS ARCHITECTS

PROJECT UPDATES

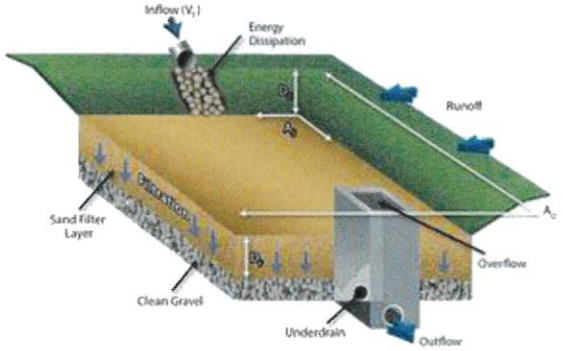
1. BELLHAVEN LANE STORMWATER FACILITY

This project was previously presented to the Bellhaven HOA in August 2022. The project initially included converting the existing dry pond at the intersection of Bellhaven Lane & Ravine Way to a wet detention pond to improve water quality within the Lake Butte des Morts Sub-Watershed. The Town formally received an UNPS&SW Construction Grant from the WDNR in November 2022 to assist with funding the project. In anticipation of the project, the Bellhaven HOA deeded over the pond parcel to the Town during 2023.

After receiving the Geotechnical Report back in early 2023, it was noted that the seasonally high groundwater elevation was observed within 7-8 feet below existing grade. The wet detention pond would require excavations that would extend to these depths, so there is concern about needing a costly dewatering system to construct the pond and clay liner. In addition, the contributing watershed to the pond is approximately 23 acres and consists of single-family residential lots with rural road sections. There is some concern about stagnation issues with the pond's permanent pool of water and the watershed's ability to keep the wet pond refreshed. There were also residents who live next to the pond who expressed some concern over the permanent pool of water due to safety, mosquitoes, etc. at the 2022 public informational meeting.

Shortly after the Geotechnical Report was received in 2023, the WDNR started developing a new Technical Design Standard for an Iron Enhanced Sand Filter. The Iron Enhanced Sand Filter Technical Design Standard is anticipated to be completed in early 2024. Iron Enhanced Sand Filters are stormwater facilities that incorporate filtration media (sand) mixed with iron filings to enhance treatment performance. Finely-ground cast iron recycled from scrap iron (5-8% by weight) is mixed with the sand prior to placement of the iron-media mixture in the filtration bed. The primary advantage of iron-enhanced filtration is that it aids in removing phosphorus, which is the primary pollutant of concern for the Lake Butte des Morts Sub-Watershed. Below is a picture of the iron filings that are used in these types of facilities, as well as a schematic of the facility:

Iron Filings (courtesy of GMP Connelly)



Sand Filter Schematic

Iron Enhanced Sand Filters typically include 18-inches of the iron-sand mixture. There is typically a 12-inch layer of open-graded gravel under the iron-sand mixture, including 6-inch diameter perforated underdrains, that convey filtered and treated stormwater to the outfall structure and out of the facility. As such, an Iron Enhanced Sand Filter would require excavations of 2.5 feet (30") below existing grade. This will provide approximately 4.5-5 feet of separation from the seasonally high groundwater elevation and should minimize the need for a costly dewatering system. Below is a picture of a completed Iron Enhanced Sand Filter in Maplewood, MN

Iron Enhanced Sand Filter-Maplewood, MN