



MEMORANDUM

To: MCWD Board of Managers
From: Becky Christopher, Policy Planning Manager
Date: February 25, 2019
Re: Taft-Legion Project Update

Purpose:

At the February 28, 2019 Board Meeting, staff will provide an update on the Taft-Legion Lake Improvement Project, including progress that has been made in addressing performance issues, next steps for improving performance, and implications for future District projects.

Background:

Project Background

During the 2010 distribution of the District's Capital Improvement Plan, the City of Richfield requested that an improvement project for Taft and Legion Lakes be included. A project proposal was developed that outlined details of a partnership between MCWD and the City of Richfield to improve water quality in the two lakes through a combination of project elements:

- Infiltration systems that draw water from Taft Lake and the forebay draining to Legion Lake and direct it to underground infiltration systems in the adjacent park land
- A flocculation treatment system that treats water withdrawn from Taft Lake, removing dissolved phosphorus loads, before it is discharged back into the lake
- Native lakeshore buffers established in select areas surrounding Legion Lake
- Pre-treatment of runoff to Legion Lake by redirecting pipes to expanded sedimentation ponds to remove pollutant loads prior to being discharged into Legion Lake

In September 2012, the Board ordered the project and authorized staff to enter into a cooperative agreement with the City of Richfield under which the City would construct, maintain, and finance the project, and the MCWD would make payments to the City on a 20-year payment

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schedule to cover the costs of design, construction, bond issuance, and interest. The total storm water utility charges payable by the MCWD are summarized below.

| | |
|--------------------------|---------------------------|
| Design and Construction: | not to exceed \$2,700,000 |
| Bond Issuance Costs: | \$61,462 |
| Interest: | \$704,662 |

Annual District payments are approximately \$169,000-\$177,000 and began on February 1, 2014.

Project Performance

The City completed construction of the project in fall of 2016. Since that time, the City has been operating and monitoring the performance of the systems and providing annual reports to the District by June 30 each year, as required under the cooperative agreement.

To date, the project has been significantly underperforming as compared to the performance standards established in the feasibility report and cooperative agreement. The project was intended to achieve a total phosphorus load reduction of 167-413 lbs/year and a volume reduction of 134-280 acre-ft/year. During the first full year of operation in 2017, the systems removed only 22.3 lbs and 40.3 acre-ft. The 2018 report has not yet been submitted.

The City has identified a range of issues affecting or limiting the performance of the system, which can be generally categorized as follows:

- Nutrient concentrations
 - **Limited water quality data** – The in-lake nutrient concentrations that were used to establish the original performance estimates were based on limited monitoring data. The City has reported lower nutrient concentrations in recent years than were used in the feasibility study, resulting in lower removal rates.
 - **Monitoring locations** – Prior to 2017, the City was using monitoring data from Legion Lake rather than the forebay to estimate load reductions, resulting in lower than actual removal estimates. Based on recent review of the City’s monitoring reports, it also appears that the City may not be using the appropriate sampling location and depth to estimate load reductions for the Taft systems.
 - **Water source** – The Taft Lake system has both a deep and shallow water intake. Prior to 2017, the City was using both intakes. They have now switched to using only the deep intake based on it having higher nutrient concentrations.
- Volume of water treated
 - **Effective days in operation** – The feasibility report assumed that the systems would operate 180 days per year. Due to various mechanical issues (e.g. mice in the equipment, electrical shorts) the systems have had fewer days in operation.

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- **Pump capacity** – Actual flow rates have been lower than assumed and do not appear to be meeting specifications. Also, for the Taft system, the pump must either alternate between the flocculation and infiltration systems or can run both simultaneously at a lower flow rate.
- **Permit limitations** – The DNR appropriations permit limits the volume of water that can be pumped and the operating season. This includes the water pumped to the flocculation system even though it is immediately returned to the lake after treatment.
- **Saturated soils** - One of the infiltration zones at Legion Lake is frequently too wet to pump additional water to and has resulted in path flooding.
- **BMP treatment efficacy**
 - **Chemical selection and dosing** – The City needed to change chemicals to one that does not contain chloride due to chloride impairments. Changing of chemicals resulted in some issues obtaining adequate removal.
 - **Filter capacity** – The system is rated for 400 gallons per minute, however, the filter has limited flow to around 150 gpm. Higher flow rates resulted in overflowing and backwashing.

District and City staff met on February 13, 2018 to discuss the various issues and limitations affecting performance. At that meeting, the District requested that the City develop a plan to comprehensively assess the issues and describe actions the City will take to improve performance. No such plan has been developed, though the City has reported progress in some areas throughout 2018.

The City hired a consultant in May 2018 to help improve performance for the flocculation system, focusing primarily on optimizing the chemical feed. The City conducted bench testing to dial in the chemicals and dosage and were able to achieve 80-90% removals (up from less than 50% in 2017), resulting in an annual load reduction of 32 lbs from that system for 2018.

The City has also developed a preventative maintenance program to address some of the mechanical issues and reduce downtime. The City has also had conversations with the DNR about removing appropriation permit limitations for the flocculation system, but these discussions have not been successful.

Next Steps:

While some level of learning operational characteristics and troubleshooting is to be expected with a new system, and some efforts are being taken by the City to improve performance, staff is concerned that the City has not taken sufficient action to understand and address performance

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issues in a timely manner and has not communicated effectively with the District about its efforts.

For these reasons, staff is requesting that the City work with the District to establish a framework and clear expectations for the mutual effort to identify and evaluate feasible actions to address performance issues, and for the City to implement these actions.

The District has analyzed the City's monitoring reports, plans, and as-builts and has assembled its understanding of the various issues as well as what the District believes are reasonable actions and timelines for addressing the issues. These actions include evaluation of structural changes such as adding pumps, relocating the water intake for the Taft system, and relocating infiltration areas.

The District will be sending this draft framework to the City in the next week and requesting that they respond within 30 days with their assessment of whether the requested actions and timelines can be met, or if the City wishes to suggest any alternative solutions for District consideration. Staff is also requesting monthly progress updates and a walk-through of the system this spring to get a more detailed understanding of the operations. If the City is not responsive to staff's requests, staff will request authorization for a communication from the Board.

February 28, 2019 Board Meeting:

At the February 28, 2019 Board Meeting, staff will provide a brief overview of the information outlined in this memo and answer any questions. Based on questions raised by the Managers at the January 10, 2019 Board Meeting, staff will also describe actions the District plans to take to avoid or mitigate similar performance issues with the proposed Halsted Bay alum injection system.

If there are questions in advance of the meeting, please contact: Becky Christopher at (952) 641-4512 or bchristopher@minnehahacreek.org.

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