

COMMISSION FILE NO: 25-134-10 **DATE INTRODUCED:** October 13, 2025

INTRODUCED BY: Executive Director (Signature on File in the Office of the Commission)

REFERRED BY COMMISSION CHAIRPERSON TO: Operations Committee

RELATING TO: Restore the Executive Director's Original Delegated Authority, Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility Primary Clarification Upgrade

SUMMARY:

The Commission is requested to restore the Executive Director's original delegated change order authority on Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility (SSWRF) Primary Clarification Upgrade, with Black & Veatch, Inc. (B&V).

Primary clarification is a key unit process used to remove biological oxygen demand (BOD) and total suspended solids from the influent wastewater stream. The existing primary clarification system consists of 16 rectangular primary clarifiers, sludge removal equipment, scum removal system, scum pumping equipment, and associated controls.

The purpose of this project is to improve the reliability and performance of the primary clarifier system both in the near term and to meet future primary clarifier performance goals as outlined in the 2050 Facilities Plan (FP). The primary clarifiers originally went into service in 1968. Equipment has been replaced since then, with most equipment being installed over 20 years ago. This equipment is nearing the end of its useful life. The existing equipment has experienced warped scum beaches, warped and misaligned longitudinal and transverse collectors, and corroded drives.

To ensure long term plant performance under projected future loadings, the FP evaluated ways to achieve plant performance goals. For the primary clarification process, the FP recommended achieving a 50% BOD removal rate in the primary treatment process using chemically enhanced primary treatment (CEPT). The existing BOD removal rate averages 40% and is highly variable. While the FP recommended CEPT, there are other technologies available that can achieve the 50% BOD removal rate and do so in a consistent manner.

ATTACHMENTS: **BACKGROUND** ☐ **KEY ISSUES** ☐ **RESOLUTION** ☒
FISCAL NOTE ☒ **S/W/MBE** ☐ **OTHER** ☐ _____

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SUMMARY (Cont'd)

Restore the Executive Director's Original Delegated Authority, Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility Primary Clarification Upgrade

In March 2021, the Commission authorized the Executive Director to enter into Contract S01013D01 with B&V in the amount of \$1,619,093. The scope of the project included:

- Evaluating process alternatives, including CEPT and all other technologies, to achieve the 50% BOD reduction goal.
- Identifying necessary modifications and improvements.
- Designing improvements and developing contract plans and specifications.
- Bid and award services.
- Engineering services during construction.
- Developing operation and maintenance manuals, training, and startup.
- Applications engineering.

The process alternatives analysis evaluated seven different technologies and used multiple criteria to determine the optimal technology. Through this alternative analysis, it was determined that converting from primary clarification to primary filtration technology is the most efficient, sustainable, cost effective way to achieve the project's goal of 50% BOD removal.

Primary filtration is an emerging technology for primary wastewater treatment and has limited full scale operations in the United States. The wastewater treatment facilities using primary filtration in the United States are not at the same scale as SSWRF. Two viable systems are currently available – Proteus by Tomorrow Water (Proteus) and AquaPrime by Aqua Aerobic Systems (AquaPrime). While both fall under the category of primary filtration, they utilize different treatment approaches, each with advantages and limitations in terms of performance, operations, and maintenance.

Given the innovative nature of this technology and the substantial capital investment required to implement it at SSWRF, District staff recommend a large scale pilot test prior to final system selection. A pilot test will allow the District to evaluate technology performance under site-specific conditions, quantify treatment efficiency and reliability, and identify potential operational and maintenance requirements. It will also generate data on long-term costs and resource needs that cannot be fully determined from vendor data alone. The results of the pilot will inform a final decision between the Proteus and AquaPrime systems and guide the basis of design, construction, and ongoing operations and maintenance. Staff anticipates a two-year pilot testing program to ensure that performance can be evaluated across a range of seasonal and loading conditions.

SUMMARY (Cont'd)

Restore the Executive Director's Original Delegated Authority, Contract S01013D01,
Engineering Services – South Shore Water Reclamation Facility
Primary Clarification Upgrade

To perform the pilot test at this scale, it is necessary to construct a pilot testing facility. B&V identified and evaluated several different sizes and configurations of pilot testing facilities, ranging from temporary systems to a variety of permanent structures, including a permanent research facility. The District has committed to designing a permanent research facility structure that consists of the following:

- 9,500-square-foot two-story facility.
- Space for pilot facilities.
- Office and lab space.
- Building mechanicals and electricals.
- Process piping connections.

Initially, staff will use this building for the proposed primary filtration pilot test and to perform optimization testing after a system is implemented.

Long term, staff and other outside entities can use the facility to perform wastewater treatment research, including bench scale testing, skid mounted pilots, testing new technologies, and process optimization in a controlled, safe-to-fail environment at a cost effective yet representative scale.

The decision to perform large scale pilot testing and design and construct a long-term research facility occurred in July 2024, when the Commission authorized a change order to B&V's engineering contract. That change order added the design and associated engineering services for the research facility and pilot testing.

SUMMARY (Cont'd)

Restore the Executive Director's Original Delegated Authority, Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility Primary Clarification Upgrade

As the contract has progressed, several change orders have been executed that address scope revisions and additions necessary to complete the project. The following is a summary of the change orders executed under the Executive Director's change order authority:

- Additional in-depth life cycle cost investigation comparing primary filtration to other alternatives that were evaluated.
- Development of implementation alternatives for the construction of the primary filtration systems, which lead to the decision to proceed with a permanent research facility for pilot testing primary filtration technology.
- Design services for primary filtration pilot technologies and the permanent research facility including:
 - Changing the format of research facility bid documents to use B&V's technical specifications and Engineers Joint Contract Documents Committee (EJCDC) C-700 Standard General Conditions instead of using the District's standard bid document to attract more bidders familiar with the industry standard EJCDC documents.
- Design pilot testing of thickening technologies for primary filtration backwash.
- Design green infrastructure within the permanent research facility's construction area.
- Asbestos and lead inspections within the permanent research facility construction area.
- Design energy conservation strategies agreed upon by Focus on Energy and District into the permanent research facility specifications and construction plans.
- Conduct geological and environmental investigations of the soil that will be excavated during construction of the permanent research facility to ensure proper disposal.

The following change orders were authorized by Commission action and have since been executed to provide design services for the primary filtration pilot technologies and the permanent research facility. These services include:

- Engineering services during construction.
- Preparation of building operation and maintenance manuals, training, and start-up support.
- Applications engineering.
- Technical support required under project grants.

SUMMARY (Cont'd)

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For engineering service contracts greater than or equal to \$500,000, the Commission has delegated to the Executive Director the authority to make changes up to \$200,000 or 10% of the original contract price, whichever is less. For this contract, a limit of \$161,909 prevails. To date, the Executive Director has utilized \$150,218 of this authority, leaving a balance of \$11,691. The request to restore the Executive Director's authority is in case any other additional services are needed. Without this restored authority, work may need to stop while staff obtains necessary change order authority from the Commission.

The District is separately procuring the Proteus and AquaPrime filtration pilot systems. B&V is preparing bid and construction contract documents for the permanent research facility. The contractor who will build the research facility will also install and connect the District procured filtration pilot systems. Each of these contract awards will require Commission action within the next six months.

RESOLUTION

Restore the Executive Director's Original Delegated Authority, Contract S01013D01,
Engineering Services – South Shore Water Reclamation Facility
Primary Clarification Upgrade

RESOLVED, by the Milwaukee Metropolitan Sewerage Commission, that the Executive Director's original delegated change order authority is restored on Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility Primary Clarification Upgrade, with Black & Veatch, Inc.