MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

Item 6

COMMISSION FILE NO: 24-099-7 **DATE INTRODUCED:** July 8, 2024

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

REFERRED BY COMMISSION CHAIRPERSON TO: Operations Committee

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

SUMMARY:

The Commission is requested to authorize the Executive Director to execute a change order to Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility (SSWRF) Primary Clarification Upgrade, with Black & Veatch, Inc., (B&V) in an amount not to exceed $516,293 and to restore the Executive Director's original delegated authority.

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 loadings and 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 nearly 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.

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

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COMMITTEE ACTION: ______________________ **DATE:** ____________

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SUMMARY (Cont'd)

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

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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.

In March 2021, the District entered Contract S01013D01 with B&V in an amount not to exceed $1,619,093. This scope of this contract includes:

- 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 using primary filtration technology is the most efficient, sustainable, and cost effective way to achieve the project's goal of 50% BOD removal.

Primary filtration is an emerging technology for primary wastewater treatment. This technology is not currently installed at any wastewater treatment plant in the United States at the scale required at SSWRF. Currently, there are two different and viable primary filtration technologies from two different suppliers: Proteus by Tomorrow Water and AquaPrime by Aqua Aerobics. While they are both primary filtration technologies, they perform the filtering in very different ways.

Because of the innovative nature of this technology and the significant costs to implement the technology at SSWRF, District staff recommend conducting a large scale pilot test of the primary filtration technology. Such a pilot test would provide performance data representative of a full-scale primary filtration system at SSWRF and help identify operational and maintenance needs and costs. The pilot test results will aid District staff in making the final decision to move forward with the primary filtration technology and will determine if both the Proteus and AquaPrime systems are viable for SSWRF. Staff currently anticipates a two-year long pilot test.

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. District staff recommends that the District design and construct a permanent structure that consists of the following:

- 5,000-square-foot single story facility, primarily at grade.
- Space for pilot facilities.
- Office and lab space.
- Building mechanicals and electricals.
- Process piping connections.

Initially, staff will use this building to house 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.

Neither design of a pilot test nor a permanent test facility was included in B&V's original scope of services. Under the proposed change order, B&V will provide engineering services specifically for the design, construction, and implementation of the pilot facility and for the pilot testing itself. This change order scope consists of:

1. Project management.
2. Design services for the primary filtration pilot technologies and the permanent research facility.
3. Developing the primary filtration pilot test plan.
4. Bid and award services.
5. Engineering services during construction.
6. Developing building operation and maintenance manuals, training, and start-up
7. Applications engineering.
8. Technical support as required by project grants.

To expedite the project's progress, in April 2024, the Executive Director authorized a change order under his delegated change order authority to allow B&V to begin performing the above scope of services. The requested change order covers the remaining scope.

SUMMARY (Cont'd)

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

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As the contract progressed, several other change orders were executed under the Executive Director's change order authority. The change orders addressed scope revisions and additional scope items necessary to complete the project. The following is a summary of the work performed under the change orders:

- 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 at-grade research facility for pilot testing primary filtration technology.

The total cost of the primary filtration pilot testing is being partially offset by two separate grants: a U.S. Department of Energy grant in the amount of $1,201,034 and a U.S. Environmental Protection Agency grant in the amount of $3,920,000.

CONTRACT COST CHANGES

	AMOUNT	PERCENTAGE INCREASE OVER ORIGINAL CONTRACT	AUTHORIZED BY	SWMBE
Original Contract	$1,619,093		Commission	25.3%
Previous Change Orders	$161,909	10.0%	Executive Director	0.0%
Requested Change Order	$516,293	31.9%	Request of Commission	20.4%
Total Change Orders	$678,202	41.9%		15.5%
TOTAL	**$2,297,295**			**22.4%**

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 $161,909 of this authority, leaving a balance of $0. The request to restore the Executive Director's authority is in case any other additional services are needed.

After design work is complete, the District will publicly bid the construction of the permanent research facility and installation of the pilot test skids from Proteus and Aqua Aerobics.

In conjunction with the District and Veolia Water Milwaukee, B&V will develop a test plan for the pilot. Since B&V's role in the pilot test has not yet been determined, the proposed scope does not include funding for their future role. This may require future Commission authorization.

RESOLUTION

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

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RESOLVED, by the Milwaukee Metropolitan Sewerage Commission, that the Executive Director is authorized to execute a change order to Contract S01013D01, Engineering Services – South Shore Water Reclamation Facility Primary Clarification Upgrade, with Black & Veatch, Inc., in an amount not to exceed $516,293, and that the Executive Director’s original delegated authority is restored.