Item 6

COMMISSION FILE NO: 25-035-3 **DATE INTRODUCED:** March 10, 2025

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

REFERRED BY COMMISSION CHAIRPERSON TO: Operations Committee

RELATING TO: Award of Contract S02018C01, Return Activated Sludge Pump Improvements at South Shore Water Reclamation Facility

SUMMARY:

The Commission is requested to award and to direct the Executive Director to execute on behalf of the District Contract S02018C01, Return Activated Sludge (RAS) Pump Improvements at South Shore Water Reclamation Facility (SSWRF), to J.F. Ahern Co. (Ahern) in the amount of $4,219,500. Ahern was the lowest responsible, responsive bidder between two bids received.

The main biological treatment process used at SSWRF takes place in 28 large aeration basins that contain living microorganisms. The aeration basins are supplied with air as an oxygen source, allowing the microorganisms to metabolize and remove pollutants from wastewater. The population of microorganisms in the aeration basins is commonly referred to as activated sludge. After the microorganisms have consumed the wastewater pollutants, the activated sludge is separated from the treated water by gravity in 24 secondary clarifiers. Most microorganisms that settle to the bottom of the clarifiers are returned to the beginning of the biological treatment process as RAS. The remainder of the microorganisms are pumped to Jones Island Water Reclamation Facility as waste activated sludge (WAS) to make Milorganite®.

A system of RAS piping, control valves, wet wells, and pumps convey RAS from the secondary clarifiers to the aeration basins for biological treatment. The 28 aeration basins are split into four batteries, with each battery served by either two or three 150-horsepower RAS pumps (10 total RAS pumps). Eight RAS pumps were installed in 1984. Three of these pumps were rebuilt in 2017. Two pumps were added in 2019 for redundancy. The speed and output of each RAS pump is controlled using a variable frequency drive (VFD). RAS from the wet wells is connected to the RAS pumps via suction header piping. The RAS pumps distribute the RAS back to the aeration basins via discharge header piping.

ATTACHMENTS: **BACKGROUND** ☐ **KEY ISSUES** ☐ **RESOLUTION** ☒

FISCAL NOTE ☒ **S/W/MBE** ☒ **OTHER** ☐ ____

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The RAS pumping and piping system is critical to achieve proper biological treatment. Failure of one or more RAS pumps may affect treatment capacity, effluent quality, and the ability to meet the District's Wisconsin Pollutant Discharge Elimination System effluent permit limits.

The RAS pumping system must operate under a wide variety of conditions. Plant conditions and RAS flow demands change, as do the number of operating basins and pumps. Under normal operating conditions, this system operates without issue; however, under extreme operating conditions, the existing RAS pumps are near or outside of their allowable operating range. This can result in premature pump and motor wear and the inability to pump desired flow rates.

The purpose of the project is to restore the reliability and improve the efficiency of the RAS pumping system. The existing RAS pumps were installed or rebuilt at different times. Five pumps have reached the end of their useful lives and do not operate as efficiently as originally designed. The RAS pumping system also consumes significant energy. Optimizing the system via pump type and sizing, controls, and piping will result in reduced energy consumption. Staff estimates that this project will reduce RAS pumping system energy consumption and greenhouse gas emissions by approximately 11%.

This project will also provide building improvements to comply with National Fire Protection Association (NFPA) 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities. NFPA 820 establishes standards for construction, ventilation, and electrical installation in wastewater facilities for protection against fire and explosion hazards. Improvements consist of separating the utility tunnel system from the buildings with new masonry walls and doors.

Under Contract S02018C01, Ahern will:

- Replace the following equipment:
    - Eight RAS pumps and motors with new style pumps that allow for improved performance over a wider range of operating conditions.
    - RAS pump instrumentation and transmitters.
    - Pump motors, switchboard breakers, and VFD's.
- Make improvements to piping systems adjacent to the pumps.
- Install two RAS pump monitoring panels.
- Construct associated electrical and control conduits and wiring.
- Construct masonry walls and doors to comply with NFPA 820.

The contract duration is 970 days. Staff will decrease the total project cost for Project S02018, RAS Pumps Replacement, by $4,677,800, because the low bid is less than budgeted.

RESOLUTION

Award of Contract S02018C01, Return Activated Sludge Pump Improvements at South Shore Water Reclamation Facility

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RESOLVED, by the Milwaukee Metropolitan Sewerage Commission, that Contract S02018C01, Return Activated Sludge Pump Improvements at South Shore Water Reclamation Facility, is awarded to J.F. Ahern Co. in the amount of $4,219,500, and that the Executive Director is directed to execute a contract on behalf of the District.