Item 3

**COMMISSION FILE NO:** 25-058-5 **DATE INTRODUCED:** May 5, 2025

**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 J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility, and Restore the Executive Director's Original Delegated Authority

**SUMMARY:**

The Commission is requested to authorize the Executive Director to execute a change order to Contract J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility (JIWRF), with Donohue & Associates, Inc., (Donohue) in an amount not to exceed $342,909 and to restore the Executive Director's original delegated authority.

The main biological treatment process at JIWRF takes place in large aeration basins that contain a mix of living microorganisms and wastewater. Within the aeration basins, diffused air is used to keep the microorganisms in suspension and supply them with air as an oxygen source. The oxygen allows the microorganisms to consume organic materials in the wastewater. The mixture within the aeration basin is commonly referred to as mixed liquor. The aeration basins are fed mixed liquor from channels through a flow control box, and the treated aerated effluent from the aeration basins is discharged to aerated effluent channels. Both types of channels use diffused air to keep the microorganisms in suspension.

At JIWRF, four process air compressor (PAC) units located in Building 225 supply the air for the aeration basins and for channel mixing. PAC number 1 is a 4,500-horsepower unit that went into service in 2015. PAC numbers 2, 3, and 4 are 5,500-horsepower units that went into service in 1972.

The PAC system is critical to achieve proper biological treatment. Failures within the PAC system could reduce treatment capacity, effluent quality, and the ability to meet the District's Wisconsin Pollutant Discharge Elimination System effluent permit limits.

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



**COMMITTEE ACTION:** _____ **DATE:** _____

**COMMISSION ACTION:** _____ **DATE:** _____

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Three of the existing PAC units are over 50 years old and routinely require corrective maintenance. It is generally more difficult to find replacement parts for these older PAC units. In addition, some of the ancillary support systems were installed in 1972 and are reaching the end of their useful service life. The PAC cooling water piping system is corroding and needs repairs. The cooling water system lacks isolation valves such that the entire PAC system would need to be shut down to make cooling water system repairs. Many components of the PAC motor air cooling system, blowoff air system, electric power supply, and control system were also installed in 1972. District staff is concerned with the condition of these systems.

When four PAC units were originally installed in the 1970's, waste loadings and resultant air demand were higher than current and projected air demands. Even while accounting for necessary PAC redundancy, it is possible to reduce the number of units by one, resulting in reduced operation and maintenance (O&M) costs while maintaining a reliable PAC system. The PAC system also consumes significant energy, currently about 30% of JIWRF's electricity use. Newer PAC technology provides an opportunity for significant energy savings, which will help the District to achieve its energy and greenhouse gas reduction goals.

The purpose of this project is to increase overall reliability and efficiency of the JIWRF PAC system, while reducing energy costs, O&M costs, and the District's carbon footprint.

In July 2023, the Commission authorized the Executive Director to enter into Contract J02016D01 with Donohue to:

- Develop and evaluate alternatives to upgrade the PAC system.
- Identify the most cost effective and energy efficient combination of PAC unit replacement, rehabilitation, and removal to meet current and future air demands and increase system reliability.
- Assess the existing condition of ancillary systems and recommend any improvements.
- Perform lead and asbestos inspection and testing.
- Identify construction sequencing to minimize disruption of facility operations.
- Complete final design, including preparation of bid and construction documents.
- Provide engineering services during construction.
- Prepare startup plans, updates to facility O&M manuals, O&M staff training, and post-startup assistance.
- Perform applications engineering.

## SUMMARY (Cont'd)

Change Order Request, Contract J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility, and Restore the Executive Director's Original Delegated Authority

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The preliminary design under Contract J02016D01 considered several alternatives to replace the PAC units. District staff selected an alternative with a new PAC technology that maximizes energy savings and reduces energy use by an estimated 26% when compared to the existing system. The selected alternative requires a new 1,800-square-foot building adjacent to Building 225 to house electrical equipment associated with the new PAC technology.

The preliminary design evaluation indicated the existing PAC air intake openings into Building 225 and the inlet ducts from the air filter system to the existing PAC units are undersized relative to current design standards. This results in higher air velocities at the intakes and within the inlet ducts. Higher velocities at the intakes can entrain excess moisture and snow into the air filter system. Higher velocities within the inlet ducts reduce PAC efficiency due to friction and heat.

The new PAC technology not only requires a new building but also reconfiguration of the interior of the Building 225. As staff evaluated the extent of this reconfiguration, they reviewed the condition of the existing heating, ventilation and air conditioning (HVAC) system in Building 225. This system is 36 years old and has exceeded its expected useful service life. Given the age of the existing system, need for building reconfiguration, and the opportunity for HVAC energy savings, staff recommends replacing the HVAC system.

The scope of the requested change order includes engineering design services for the new building, HVAC system replacement, and intake hood and inlet duct modifications. The major tasks associated with these items include:

- Project management.
- Performing geotechnical borings and evaluations for the building addition.
- Performing final engineering design.
- Developing final plans, specifications, and bid documents.
- Providing bid and construction contract award services.
- Performing engineering services during construction.

As this contract progressed, change orders were previously executed under the Executive Director's authority for the following engineering services:

- Finalizing process air demand calculations and memo drafted by District staff.
- Preliminary design evaluations for PAC intake air and PAC building HVAC.
- Additional work to evaluate preliminary design alternatives.

## SUMMARY (Cont'd)

Change Order Request, Contract J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility, and Restore the Executive Director's Original Delegated Authority

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| | AMOUNT | PERCENTAGE INCREASE OVER ORIGINAL CONTRACT | AUTHORIZED BY | SWMBE |
|---|---|---|---|---|
| Original Contract | $658,039 | | Commission | 24.5% |
| Previous Change Orders | $54,811 | 8.3% | Executive Director | 0% |
| Requested Change Order | $342,909 | 52.1% | Request of Commission | 37.5% |
| Total Change Orders | $397,720 | 60.4% | | 32.4% |
| **TOTAL** | **$1,055,759** | | | **27.5%** |

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 $65,804 prevails. The Executive Director has utilized $54,811 of this authority, leaving a balance of $10,993. The request to restore the Executive Director's authority is in case any additional engineering services changes are required beyond the remaining Executive Director's authority. Without this restored authority, work may need to stop while staff obtains necessary change order authority from the Commission.

The existing Total Project Cost (TPC) for Project J02016 does not include the cost for the additional project scope, nor has staff yet estimated associated costs. Staff will adjust the TPC to account for the additional costs as part of the 2026 Capital Budget process.

## RESOLUTION

Change Order Request, Contract J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility, and Restore the Executive Director's Original Delegated 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 J02016D01, Engineering Services – Process Air Compressor System Upgrade at Jones Island Water Reclamation Facility, with Donohue & Associates, Inc., in an amount not to exceed $342,909, and that the Executive Director's original delegated authority is restored.