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## Capital Project #2579 – WWT – Digester Tank 4 Budget Adjustment

### Recommendation

That City Council approve a budget adjustment in the amount of \$10,600,000 to Capital Project #2579 – WWT – Digester Tank 4, funded from the Wastewater Treatment Capital Reserve.

### Topic and Purpose

The purpose of this report is to request City Council approval for a budget adjustment to Capital Project #2579 – WWT – Digester Tank 4.

### Report Highlights

1. The Wastewater Treatment Plant (WWTP) Digester and Heating Upgrades project involves the construction of a fourth digester which will address digester capacity concerns, and a fully redundant heating system to deliver heat to the digesters for operation.
2. A budget adjustment is being requested from the Wastewater Treatment Capital Reserve to fund Capital Project #2579 – WWT Digester – Tank 4.

### Strategic Goals

This report supports the Strategic Goal of Asset and Financial Sustainability through planning and budgeting of lifecycle maintenance and upgrades to existing equipment. This report also supports the Strategic Goal of Quality of Life by ensuring that treatment regulatory standards are met while minimizing effects on surrounding citizens.

### Background

The WWTP is a designated Class 4 treatment facility, the highest level of certification in Canada, and provides transmission and treatment services to Saskatoon residents and businesses. It currently processes, on average, 90 million litres of wastewater per day. The WWTP was constructed in 1971 and was comprised of two digester tanks. A third digester was constructed in 1991. Since 2000, the WWTP has undergone facility improvements, including anaerobic digester mixing improvements, to facilitate operation of the existing primary digestion process.

In 2012, the WWTP Long Term Capital Development and Expansion Plan (Development and Expansion Plan), prepared by Stantec Consulting Ltd., was completed. The goal of the Development and Expansion Plan was to provide the City of Saskatoon (City) with a forecast of expected upgrades and expansions required to meet the projected treatment objectives over a 30-year planning period. The Development and Expansion Plan recommended a digester assessment be done in 2016 as digester capacity may be nearing its limit.

In 2016, the report entitled Wastewater Treatment Plant Heating System Study, prepared by Associated Engineering (Sask.) Ltd., provided a condition assessment of heating equipment at the WWTP. The report presented a comprehensive listing of upgrades required to ensure that the heating systems at the WWTP are of a design and condition to meet current and future plant heating requirements identified in the Development and Expansion Plan.

At its meeting held on June 26, 2017, City Council awarded the WWTP Digester and Heating Upgrades engineering contract to Jacobs Engineering Group Inc. (Jacobs), formerly CH2M HILL Canada Ltd.

On October 19, 2018, the Digester and Heating Upgrades project was approved by City Council to be submitted for government funding to a maximum of \$9,500,000 from the Government of Canada, and a maximum of \$9,500,000 from the Province of Saskatchewan through the Provincial Territorial Infrastructure Component – National and Regional Projects of the New Building Canada Fund (New Building Fund). The New Building Fund program runs until March 2024. If successful, the City's strategy would be to utilize the New Building Fund for the submitted project, but to re-allocate from the already approved City funding an amount equal to the funding received. This strategy enables the City to provide funding to other priority projects through a redistribution as explained in the report to City Council on April 25, 2016, and has been used to fund critical City initiatives such as the Enterprise Resource Planning System, Saskatoon Transit Bus Renewal, and McOrmond Drive Sound Walls.

## **Report**

### **Digester and Heating Upgrades**

The primary objective of the WWTP Digester and Heating Upgrades project is the construction of a fourth digester and required ancillary equipment which will improve capacity for solids and gas. The WWTP is currently at capacity for the volume of gas produced. Operational requirements may increase digester gas production causing uncontrolled release of methane gas to the atmosphere which can pose a safety risk to employees working within the vicinity of the digesters and would greatly increase the odour levels encountered by surrounding residents. The WWTP is also at capacity for solids when a digester is taken out of service for cleaning. Digesters are isolated and cleaned approximately every six years which means that one of the three existing digesters must be taken out of service every two years. The reduced capacity puts the WWTP at risk of being non-compliant with their Permit to Operate. The addition of a fourth digester will allow for a digester to be taken out of service while ensuring that the standards set out in the Permit to Operate are maintained. The WWTP Digester and Heating Upgrades project also includes the capturing of biogas from the digesters, cleaning it, and using it to fuel an upgraded heating system to provide the required heat for all four digesters.

### **Budget Increase**

Following the completion of the Conceptual Design in April 2018, a Class 5 Estimate was provided by Jacobs which indicated that the cost to construct this project would be \$30,414,500 (excluding taxes). A Class 5 Estimate, as defined by AACE International, is a concept screening cost estimate which is completed when the design is less than

2% complete, and has an accuracy range of +100% to -50%. This Class 5 Estimate was used for capital budgeting purposes.

Following the completion of the Detailed Design, which utilized the same scope of work as outlined during Conceptual Design, a Class 1 Estimate was provided by Jacobs on April 15, 2019, which indicated that an additional \$10,600,000 of funding may be required to procure the construction of this project. A Class 1 Estimate is a definitive cost estimate which is completed once the design is at least 65% complete and has an accuracy range of +15% to -10%.

During the design process, Jacobs and Saskatoon Water undertook a value engineering exercise to ensure a cost effective design by reducing or eliminating portions of the design while still meeting key objectives of the project.

### Options to the Recommendation

An option would be to not approve the budget adjustment, defer the project, and include the additional funding required in the 2020 Capital Budget for City Council approval. This decision would result in deferring the potential New Building Fund funding by one year which may affect the City's funding strategy and would require notification of the delay to the government funding partners. This would still allow enough time to complete the 38-month scheduled project in advance of the March, 2024 deadline for receiving the New Building Fund funding.

### Financial Implications

The project currently has \$33,420,000 in the 2019 Capital Plan. After the remaining engineering fees are paid to Jacobs, the approved funding balance will be \$31,999,616. The Class 1 Estimate provided by Jacobs indicated that the net cost to the City is estimated to be as follows:

Estimated Contract Price	\$38,273,984.00
City Construction Contingency (5%)	<u>1,913,699.00</u>
Subtotal	\$40,187,683.00
PST (6%)	2,411,261.00
GST (5% of Subtotal)	<u>2,009,384.00</u>
Total Upset Fee	\$44,608,328.00
GST Rebate	<u>(2,009,384.00)</u>
Net Cost to City	<u>\$42,598,944.00</u>

The net cost to the City for this project, assuming the New Building Fund funding is successful, is estimated to be \$23,598,911. The New Building Fund funding would be paid to the City as construction progresses. Based on the cost estimate provided by Jacobs and the approved funding currently available for construction, a budget adjustment of \$10,600,000 is required to proceed with this project. The funding is available in the Wastewater Treatment Capital Reserve, which has a balance of \$10,964,532 as of April 30, 2019.

### **Environmental Implications**

The addition of a fourth digester tank will significantly increase capacity and reliability of the wastewater treatment process. Construction, operation, and maintenance of the new digester will include the use of natural resources and the generation of greenhouse gas emissions; however, these impacts are not known at this time. There will be efficiencies gained through the upgrade of the heating system which will result in reduced natural gas resource consumption during the life of the project, when compared to natural gas consumption of the present heating system arrangement. Natural gas consumption will be further reduced as a result of the biogas scrubbing equipment that will be constructed, which will allow biogas to be used to power the heating system.

### **Other Considerations/Implications**

There are no policy, public and/or stakeholder engagement, privacy, communication, or CPTED implications or considerations.

### **Due Date for Follow-up and/or Project Completion**

This project has an estimated construction phase of 38 months and is expected to be completed by November, 2022, pending approval of the budget adjustment.

### **Public Notice**

Public Notice pursuant to Section 3 of Policy No. C01-021, Public Notice Policy, is not required.

### **Report Approval**

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Reid Corbett, Director of Saskatoon Water

Approved by: Trevor Bell, Interim General Manager, Utilities & Environment Department