



Staff Report

Operations Department

Report To: Committee of the Whole
Meeting Date: February 11, 2020
Report Number: CSOPS.20.002
Subject: Request for Budget Increase - Thornbury Wastewater Treatment Plant Headworks Upgrade
Prepared by: Shawn Carey, Director of Operations

A. Recommendations

THAT Council receive Staff Report CSOPS.20.002, entitled "Request for Budget Increase - Thornbury Wastewater Treatment Plant Headworks Upgrade";

AND THAT Council approve an increase in the budget of \$997,700 from \$3,047,500 to \$4,045,200

AND THAT Council approve an additional \$259,000 in funding from the Wastewater Asset Replacement Reserve Fund and \$738,700 from the Thornbury Sewer Capacity Development Charge Reserve Fund.

B. Overview

The purpose of this report is to request additional budget for the construction of the Thornbury Wastewater Treatment Plant Headworks Upgrades.

The project has completed all engineering and has received tenders for the construction phase of this project. The overall construction budget was underestimated for this project.

C. Background

The Town is undertaking required upgrades to the Thornbury Wastewater Treatment Plant Headworks (the "Project") to ensure grit, rags and detritus debris is removed from the influent sewage before it reaches the treatment process. The current headworks equipment is at the end of its life and is now non-operational. The failed headworks is now causing additional operational problems in the plant. This poses both a health and safety concern for the wastewater operators and the natural environment.

When the influent flow reaches the peak capacity of the plant a significant volume of the influent is diverted to the lagoon system because the current headworks are unable to direct the flow into the mechanical treatment plant. The additional volume to the lagoon system

during high flows can exasperate operational challenges. It is noted that the most recent operational challenge at the plant was an overflow of the lagoon system which occurred in part due to the lack of a fully functional headworks.

Additional challenges include the deposition of grit in the aeration basins and debris collecting on the UV disinfection lamps. Increased operator time is needed to manage the plant. The Thornbury Wastewater Treatment Plant recently has had challenges achieving regulatory effluent criteria. This challenge will be increasingly difficult as the flow rates increase, with additional users and heavy rain events. The headworks are not functioning as designed.

In July 2018, The Town retained J.L Richards & Associates Ltd. (JLR) through a competitive procurement process to prepare the preliminary design, final design and undertake the contract administration for the project based on the concepts proposed within the Preliminary Design Report.

On July 15, 2019, Council approved increasing the Engineering Services Agreement with JLR for the Project by an upset limit of \$100,000 from \$211,755.75 to \$311,755.75 for the expansion of the headworks building to house headworks equipment per the terms and conditions outlined in Staff Report CSPW.19.036.

In October 2019, the Town, along with JLR completed a pre-qualification of general contractors for the construction at the Thornbury Wastewater Treatment Plant headworks upgrades. Four contractors were short listed during this process.

In December 2019, the final construction tender was released to the four pre-qualified contractors. The headworks construction tender closed on January 23, 2020. The lowest bid was received from H2Ontario for \$3,735,200.

Please refer to Attachment 1 for an overview of the Thornbury Wastewater Treatment Plant, as well as the design drawings.

D. Analysis

The existing Thornbury Wastewater Treatment Plant headworks (i.e. screening and grit removal) is known to be inadequate in hydraulic capacity and the equipment and other components are at the end of their intended service life and have failed.

The construction of new headworks has been scheduled for the 2020 construction season, with an anticipated completion date of December 2020. Following the completion of the headworks, staff are intending on moving ahead with the capacity expansion of the treatment plant. Delaying the headworks construction will delay the expansion as well.

Construction of new headworks is critical in order for the Town to achieve the Thornbury Wastewater Treatment Plant's effluent criteria and remain in compliance with provincial regulations. In addition, if these upgrades don't occur the Town will not be able to add any additional units to the wastewater system which will result in un-serviced properties/developments in The Town of The Blue Mountains.

The 2019 budget for this project was based on the JLR Opinion of Probable Cost (OPC) estimate, Class B of \$2,519,214 for construction, plus \$331,000 for engineering and \$197,000 for additional costs to the Town to execute this project. A Class B OPC is provided at a 60% design. Although this was a substantive estimate there were still significant unknowns for this project including geotechnical, the complexity of the siteworks, the electrical and instrumentation design and the by-pass around the works to facilitate construction.

At 100% design, JLR's Class A OPC estimate was \$3,464,182. Although the estimate significantly exceeded the approved budget, staff made the decision to move ahead with tendering the work and evaluate the bids that were submitted. The bids the Town received ranged from \$3,735,200 to \$4,087,400. The lowest tender bid is approximately 7% higher than the OPC. It is noted that the differences are partially attributed to assignment of materials and labour in different divisions of the tender. Industry standards considers a 5 to 10% variance on the Class A OPC acceptable.

Staff have thoroughly looked for opportunities to reduce the cost of this project, including identifying any unknowns in the work to be able to provide a more fulsome tender document which allows the contractors the ability to provide a better tender price.

Below is a breakdown of the over budget items in the tender:

Project Activities that Contributed to Cost Increase	
General Contractor Overheads	\$128,000
Electrical & Instrumentation	\$366,000
Site Works	\$295,000
Temporary by-pass	\$105,000
Additional Key contract Services – Town Responsibilities	
• Sewage Haulage during headworks bypass	\$25,000
Senior Infrastructure Capital Project Coordinator	\$40,000
Total	\$959,000

Option 1 – Approve budget increase and award contract. This option ensures the headworks construction upgrades moves forward for 2020 construction.

Option 2 – Re-Engineering Phase which includes a review of the design and project execution opportunities. Any re-design phase will likely delay the project for an additional calendar year. Re-design phase would have to identify opportunities and then explore these opportunities to quantify the cost saving. The town has limited resources so it can be expected there will be additional project costs for 3rd party resources during this phase.

This option would require re-issuing the contract services tender in either late 2020 or early 2021 with completion in fall of 2021. There is no certainty that significant over-project cost savings would be achieved.

E. The Blue Mountains Strategic Plan

- Goal #5: Ensure Our Infrastructure is Sustainable
- Objective #1 Develop a Long-Term Asset Management Plan for the Maintenance, Renewal and Replacement of Existing Infrastructure
- Objective #2 Avoid Unexpected Infrastructure Failure and Associated Costs and Liability
- Objective #3 Implement Best Practices in Sustainable Infrastructure
- Objective #4 Ensure that Infrastructure is Available to Support Development

F. Environmental Impacts

Efficient and effective headworks are a critical component of the treatment process. Upgrades to the headworks are critical to maintaining an effect treatment system to protect the natural environment and public health.

In 2019 there were 229 objective exceedances at the Thornbury Wastewater Treatment Plant. In addition to the objective exceedance, in the spring of 2019 the excessive inflows into the treatment plant resulted in the flow being diverted to the lagoon system, which overflowed to the natural environment. This was a reportable event.

G. Financial Impact

The chart below outlines the 2019 Approved Capital Budget versus 2020 Forecasted Costs.

Expense Item	2019 Approved Budget	2020 Tender Costs	Difference
Engineering	\$100,000	\$100,000	\$0
Construction	\$2,697,500	\$3,635,200	\$937,700
Contingency	\$250,000	\$100,000	(\$150,000)
Other Costs	\$0	\$210,000	\$210,000
Total Expenses	\$3,047,500	\$4,045,200	\$997,700
Funding			
Wastewater Asset Replacement Reserve Fund	\$807,400	\$1,066,400	\$259,000
Thornbury Sewer Capacity Development Charges	\$2,240,100	\$2,978,800	\$738,700
Total Funding	\$3,047,500	\$4,045,200	\$997,700

The Other Costs included in the chart above will fund items such as sewage haulage and programming, as necessary, as well as staff salaries and benefits. One of the Town's Senior Infrastructure Capital Project Coordinators is the Project Lead and therefore are funded through this project. The Wastewater Asset Replacement Reserve Fund is forecasted to end 2019 with a balance of \$15.7M, even with a number of large capital projects included in the five year capital plan the reserve fund can fund the \$259,000 overage.

The Thornbury Sewer Capacity Development Charge Reserve Fund is forecasted to end 2019 with a balance of \$5.8M, this reserve fund will also be funding the Thornbury Wastewater Treatment Plant Expansion and is projected to go into a negative balance. Development Charge Reserve Funds are allowed to go into a negative position as long as the total of all the reserve funds stays positive. Even with this overage the Town will have a positive Development Charge Reserve Fund balance.

H. In Consultation With

Shawn Everitt, CAO

Allison Kershaw, Manager Water and Wastewater Services

Brent Rolufs, Senior Infrastructure Capital Project Coordinator

Maurice Dempster, Wastewater Supervisor

Sam Dinsmore, Deputy Treasurer/Manager of Accounting and Budgets

Ruth Prince, Director of Finance and IT Services/Treasurer

I. Public Engagement

The topic of this Staff Report has not been subject to a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. Comments regarding this report should be submitted to Shawn Carey, directorops@thebluemountains.ca.

J. Attached

Attachment 1 - Image of Thornbury Wastewater Treatment Plant and proposed works

Respectfully submitted,

Shawn Carey
Director of Operations

For more information, please contact:
Shawn Carey
directorops@thebluemountains.ca
519-599-3131 extension 260



Image 1: Ariel Image of Thornbury Wastewater Treatment Plant and Lagoon System



Image 2: Ariel Image of Thornbury Wastewater Treatment Plant, Mechanical System

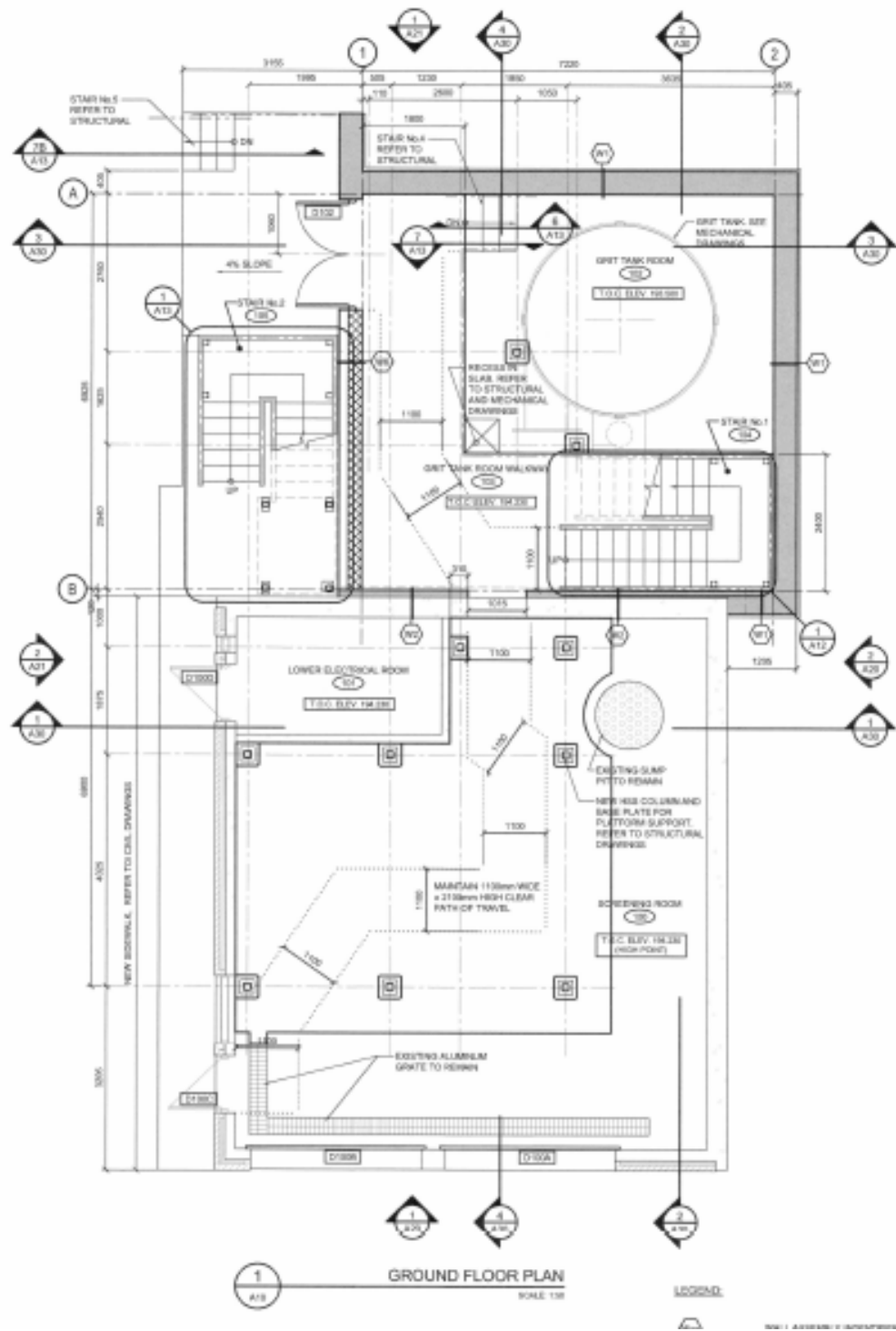


Image 3: Proposed Works Ground Floor

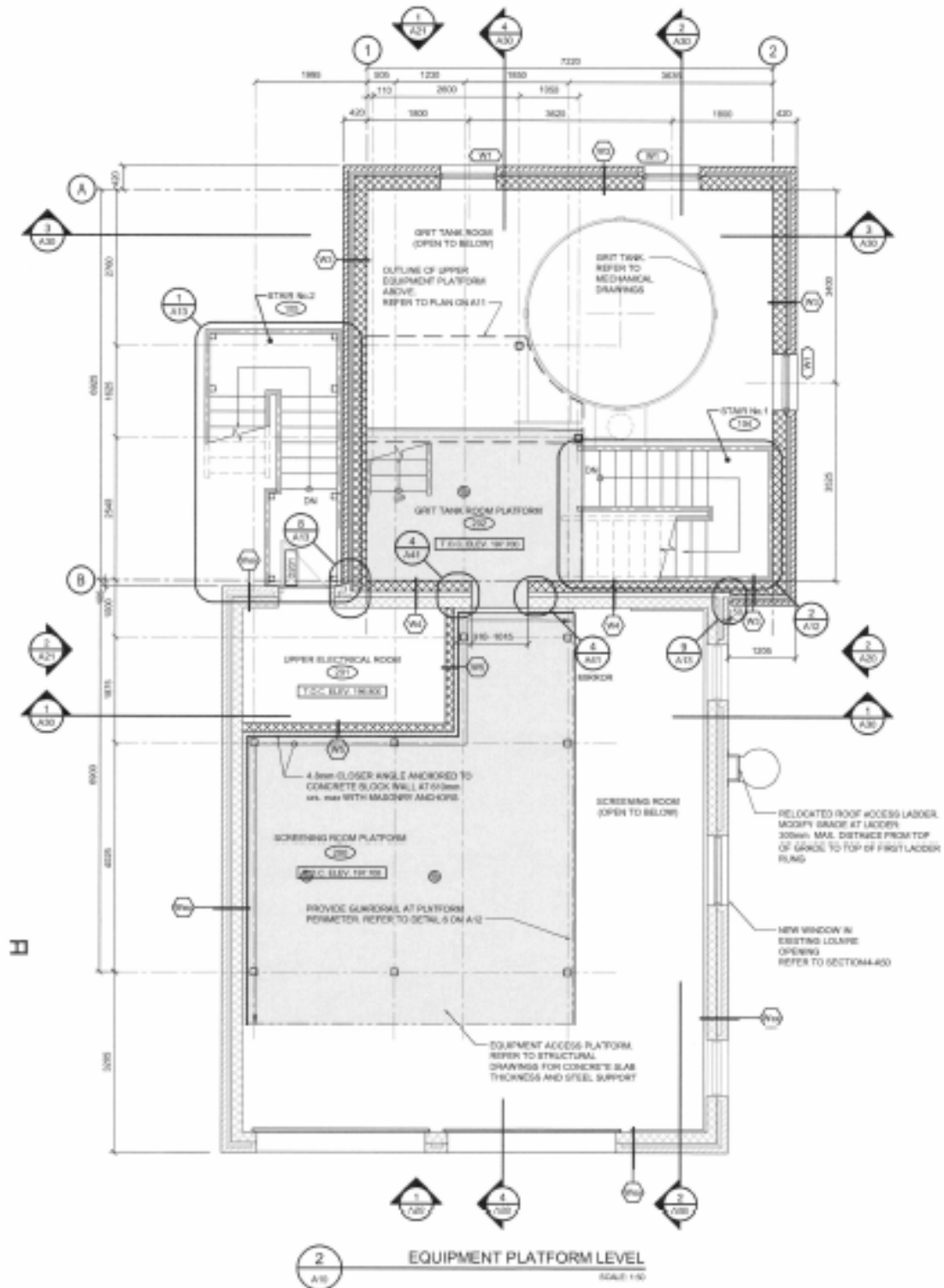


Image 4: Proposed Works Equipment Platform Level