

STAFF REPORT

THE CORPORATION OF THE TOWN OF COBOURG



Report to:	Mayor and Council Members	Priority:	<input checked="" type="checkbox"/> High <input type="checkbox"/> Low
Submitted by:	Bill Peeples, Manager Environmental Services bpeeples@cobourg.ca	Meeting Type:	Open Session <input checked="" type="checkbox"/> Closed Session <input type="checkbox"/>
Meeting Date:	July 11, 2022		
Report No.:	Public Works-126-22		
Submit comments to Council			

Subject/Title: Approval of Revised Sequence Batch Reactor Capital Budget

RECOMMENDATION:

THAT Council approve the revised budget for the Sequence Batch Reactor in the amount of \$7,400,000 including non-refundable HST to be funded from the sanitary sewer reserve and reimbursed by the revenue generated from the treatment of leachate and septage.

1. STRATEGIC PLAN

N/A

2. PUBLIC ENGAGEMENT

N/A

3. PURPOSE

To request funding from the sanitary sewer reserve for unforeseen process control omissions and price escalation charges for the SBR Upgrade at Plant #2.

4. ORIGIN AND LEGISLATION

2021 Capital Budget (Sanitary Sewer Reserve)

5. BACKGROUND

6. ANALYSIS

The final tender pricing approved by Council for this project was negotiated in June 2021. This project was being completed under a Design-Build process, which encompasses a Consultant/Contractor team approach. This type of contractor is useful for a more simple capital project where there are not a lot of design options/variables to consider and the finished product is very predictable. The budget for this project was very tight upon award due to the already escalating price of supplies which left minimal contingency however given the necessity of a replacement septage receiving station as well as a redundant SBR, it was determined that this revenue generating asset was still a worthy risk to proceed with despite the close proximity to budget upset.

The design is now essentially complete and the permitting process is well underway however there have now been three significant cost implications that require Council approval for a budget increase. Upon consideration of the additional costs, Staff have contemplated other areas of the project that could be altered to save in costs or scope reductions to maintain the existing budget. The components associated with this contract are actually quite simple and are compartmentalized so much that it is not possible to eliminate items without losing the entire function. For example:

- The receiving station is a standalone building with a holding tank and machinery that screens out rags/debris from septage before it reaches the treatment process. The building simply houses the machinery and electrical controls.
- The SBR is a large concrete tank with air diffusers that are powered by blowers.
- The site works involved include driveway modifications to allow large tanker trucks to drive through the site and stop to unload at the receiving station.

The existing receiving station was meant to be a temporary set up, nearly 20 years ago, and is the highest priority for replacement.

Deferring the second SBR to be constructed at a later date would then require for the existing SBR to be taken offline and refurbished as it is 20 years old. The diffusers need to be upgraded to fine bubble to make it more efficient. This project was intended to be conducted after the new SBR was operational since it requires the SBR to be offline for approximately 4 months. Without this asset functioning, the Town loses \$65,870 monthly in revenue (i.e. Based on average monthly processing of leachate and septic waste over the past 5 years) and several municipalities and septic companies, including Northumberland County, are subject to environmental risk whereby they must find another location to dispose of their landfill leachate. The haulage costs to transport these highly toxic liquids is substantial as not very many wastewater treatment plants have the capacity to accept the waste for treatment due to its very high potency.

In summary, Staff are recommending that all works proceed to construction as planned as there is no guarantee that supply and/or oil costs will be reduced significantly enough to realize enough savings by deferring the project and restarting it again in the next several years.

The following is a description of the additional costs to be incurred:

Geotechnical:

As a result of the geotechnical investigations at the site, it was determined that the existing footing of the existing Return Activated Sludge wet well foundation will require shoring to protect it from being undermined during the construction of the new SBR. This shoring includes drilled concrete caissons along with I-beams and lagging. Since the as-built drawings for the existing building did not clearly show the existing footings, the contractor was not able to show this pricing in their original bid. This type of additional work is called an 'omission' whereby the circumstances were unforeseen, and the costs associated with the work would have been required regardless if the information was available at the time of the bid or not. Omissions such as this (typical of geotechnical investigations) is why there are contingencies built into budgets. This project already had minimal contingency due to the price escalation factors that we were experiencing at the time of award (prior to the fuel price escalation).

Process Design Efficiencies Realized:

During the design process there were several process components that were not included in the original scope of work that were either identified as a process improvement opportunity or determined to be of best value to conduct during this contract rather than conducted at a later date.

These additional process improvements are as follows:

- Waste Activated Sludge (WAS) Piping re-engineered to correct design flaw in original system that frequently allowed sludge to overflow into SBR Control Room.
- Addition of a Defoaming System that sprays a concentrated surfactant to control the potential foam in the SBR. Foam can develop occasionally depending upon the type of waste delivered. Visual monitoring of the process inside the Aeration Cell is critical to the proper operation of the SBR. The use of concentrated surfactant is much more cost effective than potable water.
- Demolition of the existing septage receiving station was not included in the original contract and was expected to be completed as a separate contract after construction. Removal of the existing station within the current contract will save the Town in mobilization, disposal and restoration costs.
- Upgrading the blower air piping to allow for additional flexibility to aerating both the SBR and Plant Aeration Tanks. This modification will reduce the operational costs of the system, as a single, high-efficiency blower can be used to aerate both the SBR and Aeration Tanks rather than the current two,

lower-efficiency blowers. Staff were made aware of this value added opportunity during the design process.

- Rock Trap on the septage inlet to remove rocks upstream of the screen which will improve the life of the screen and pumps.
- Addition of fencing to isolate the SBR and holding tank from the septage receiving system, this additional fencing will isolate the septage receiving area from the rest of the plant. This will then allow leachate and septage to be received when the Town staff are not present at the plant, making the system more attractive to haulers as septage and leachate can be received during off hours.
- Addition of a second exterior washdown hose to help keep the receiving area cleaner.
- Upgrading the blowers to a more efficient newer model type of blowers that were not available at the time of the original bid.
- The addition of an odour control system for the SBR.
- Modification of the control programming for the new SBR to allow for the control of the SBR through the main SCADA system rather than just locally at the SBR control panel.

Completing these works while the new receiving station and SBR are being constructed is the only way to implement these valued improvements in the most cost effective manner.

Price Escalation:

During the time it has taken to complete the design phase, there have been substantial, pandemic-induced, price escalations beyond that which the Contractor can be reasonably expected to absorb.

The cost of steel, aluminum, copper, aggregates, fuel and other such construction materials continue to trend upward. Suppliers who would normally guarantee pricing for several months, are now only able to hold pricing for days or sometimes weeks.

7. FINANCIAL IMPLICATIONS/BUDGET IMPACTS

The Contractor has included budgetary costs for Council approval. The costs to the Town will be the actual cost of the change and Staff would only be putting forward a request to Council to accept the costs if they were considered reasonable and provided enough benefit to the Town.

A summary of the budget and additional costs is illustrated below. Included in the final cost estimate is a 5% contingency. Now that the design is over 90% completed including the geotechnical field work, upon Council approval the contractor can be authorized to order materials and lock in the quoted prices to avoid any further price escalations.

Budget Summary

Approved Budget	\$6,300,000
Awarded Bid Price (HIRA/Cima)	\$6,054,300
Project Management/Contract Administration (Stantec)	\$75,000
Omission: Shoring	\$175,208
Additional Scope: Value Added Process Improvements	\$323,040
Material Price Escalation	\$281,801.50
Subtotal	\$6,909,349.50
Contingency (5%)	\$362,663.08
Total (excluding taxes)	\$7,272,012.58
Non-Refundable HST	\$127,987.42
Total Revised Budget	\$7,400,000

In order to estimate the payback period for this capital investment, the following assumptions were made:

1. Annual combined processing volumes of 51,594 m³/yr:
 - Septic Waste Volume: 14,000 m³
 - Leachate Volume: 37,594 m³
2. Processing Rate of \$14.08/m³ (2022 rates)
3. Payback period:
 - (A) No additional revenue gains from either septic or leachate sources
 - (B) 40% additional revenue gain through increased rates and volumes
4. 10 year debenture period @ 2.5%

Budget Version	Budget Amount	Total Debenture (Inc. Interest)	Payback Period (A)	Payback Period (B)
Original	\$6.3M	\$7.9M	10.9 years	7.7 years
Revised	\$7.4M	\$9.25M	12.7 years	9.1 years

8. CONCLUSION

THAT Council approve the revised budget for the Sequence Batch Reactor in the amount of \$7,400,000 including non-refundable HST to be funded from the sanitary sewer reserve and reimbursed by the revenue generated from the treatment of leachate and septage.

Report Approval Details

Document Title:	SBR Expansion Project - Price Escalation - Public Works-126-22.docx
Attachments:	- SBR Expansion Project - Plant 2 - Public Works-032-21.pdf - CR SBR Expansion (Dec 11, 2020).pdf
Final Approval Date:	Jun 29, 2022

This report and all of its attachments were approved and signed as outlined below:

No Signature found

Ian Davey, Treasurer / Director of Corporate Services - Jun 28, 2022 - 12:46 PM

Laurie Wills, Director of Public Works - Jun 29, 2022 - 4:43 PM

Tracey Vaughan, Chief Administrative Officer - Jun 29, 2022 - 4:47 PM