



Staff Report

Operations – Capital Projects Division

Report To: COW-Operations_Planning_and_Development_Services
Meeting Date: September 17, 2024
Report Number: CSOPS.24.058
Title: Arrowhead and Camperdown BPS Engineering Scope Change and Budget Increase
Prepared by: Emily Yeo, Senior Infrastructure Capital Project Coordinator

A. Recommendations

THAT Council receive Staff Report CSOPS.24.058, entitled “Arrowhead and Camperdown BPS Engineering Scope Change and Budget Increase”;

AND THAT Council approve increasing the contract value with Arcadis Professional Services (Canada) Inc. related to the Engineering Services for Arrowhead and Camperdown Booster Pumping Station Upgrades, from \$732,013.88 to \$864,792.38 to cover the additional works outlined in this report;

AND THAT Council approve increasing the engineering budget for the Arrowhead Booster Pumping Station Upgrades from \$275,000.00 to a total budget of \$295,000.00, to be funded from the Water Asset Replacement Reserve Fund.

B. Overview

Town Staff are requesting an increase in contract value for the Engineering Services provided by Arcadis Professional Services (Canada) Inc. for the Arrowhead and Camperdown Booster Pumping Station (BPS) Upgrades. This increase in contract value is being requested as a result of an increase in the scope of work to the original scope of work for Arrowhead and Camperdown BPS Upgrades.

Town Staff are also requesting an increase in the engineering budget for the Arrowhead BPS Upgrades, as a result of the increase in the scope of work.

C. Background

In 2019, the Town completed a Town-Wide Water Distribution Master Plan, identifying several near and long-term system deficiencies including treated water supply, and storage deficiencies throughout the Town. The resulting report recommended the pumping capacity at Arrowhead

BPS be increased in order to meet the 20-year demands of the service area east of Arrowhead BPS.

In 2022, the Town and consultant J. L. Richards and Associates (JLR) completed a Schedule B Municipal Class Environmental Assessment (MCEA) to address the deficiencies outlined in the western pressure zones, encompassing Lora Bay, Thornbury, Clarksburg, and Camperdown. The Westside MCEA identified the Upper Camperdown BPS has insufficient pumping capacities to meet future growth (20-year build-out) of the service area inside Zone 3. The Westside MCEA Preliminary Design Report for Camperdown BPS, completed by JLR, provided recommendations to address the wide range of flow requirements under existing and future conditions, suggesting that two separate sets of pumps will be used to achieve Low Flow and High Flow Pumping requirements.

In 2023, the Town retained Arcadis to address the deficiencies identified in the Town-Wide Water Distribution Master Plan and Westside MCEA Preliminary Design Report, complete a review of the long-term pump station capacity requirements, and complete preliminary and detailed design at both Arrowhead and Camperdown BPS.

D. Analysis

Arrowhead BPS Scope Changes

Standby Generator Load Analysis

A load analysis was required to be completed to confirm the loads proposed to be connected to the emergency standby generator, and based on the load, confirm the size of the required generator. The original anticipated cost of this task was \$9,000, while the effort completed by Arcadis to perform the work was valued at \$9,594.38.

Updating Operation Manual

Updates to the existing Operational Manual are required to include all upgrades to be completed, design criteria, operating range, setpoints, etc. to provide the Town's operating staff with information for successful operation of the facility. The original anticipated cost of this task was \$10,000, while the effort expected for Arcadis to complete the work is valued at \$13,896.75. This additional effort is due to the lack of an existing operational manual for Arrowhead BPS; thus, a manual will need to be created from scratch.

Sodium Hypochlorite Dosage Pump Sizing Review

As the pumping capacity of the Arrowhead BPS is increased to meet the 20-year demand, the existing chemical feed system must be reviewed to confirm that it is able to accommodate the new and higher flow requirements. The additional effort for Arcadis to review if the existing chemical dosing pumps could accommodate the required increase in dosage rates has been completed and is valued at an additional cost of \$6,063.75.

Topographic Survey

Arcadis has advised the Town that conducting a topographic survey of the project site would be beneficial to identify existing above-ground features and to identify a location for the

emergency generator where it will be accessible for Town Operators while minimizing the impact on the existing buried utilities and landscaping. This survey would be completed using a total station; identifying all existing property bars, limits and types of traveled road surfaces and shoulders, entrances, elevations of existing sidewalks, door sills, and the location of all above-ground utilities. This survey would be an addition to the original project scope and is valued at \$11,487.00.

Camperdown BPS Scope Changes

Emergency Standby Generator Load Analysis

A load analysis was required to be completed to confirm the loads proposed to be connected to the emergency standby generator, and based on the load, confirm the size of the required generator. The original anticipated cost of this task was \$9,000, while the effort completed by Arcadis to perform the work is valued at \$9,594.38.

Replacement of the Existing Emergency Standby Generator

In the original scope of work for Camperdown BPS, the existing emergency generator was not identified for replacement. Following the review of the new electrical loads associated with the pump upgrades, Arcadis determined that the size of the existing generator was insufficient to accommodate the new loads of the BPS. As a result, the replacement of the existing emergency generator with a new outdoor, pad mounted, emergency standby generator is required to safely accommodate the new electrical loads associated with the upgrades to the BPS. The efforts completed by Arcadis to incorporate a new outdoor generator in the Camperdown BPS design upgrades is valued at \$27,615.00.

New Distribution Panel Design

The preliminary design report prepared by JLR provided two recommendations for the location of the new distribution panel at Camperdown BPS. A review of the options was conducted by Arcadis, examining the capital costs as well as any construction sequencing challenges, and a final recommendation for the preferred location of the new distribution panel has been proposed to the Town. The original anticipated cost of this task was \$10,000, while the effort completed by Arcadis to perform this work is valued at \$13,282.50.

Updating Operation Manual

Updates to the existing Operational Manual are required to include all upgrades to be completed, design criteria, operating range, setpoints, etc. to provide the Town's operating staff with information for successful operation of the facility. The original anticipated cost of this task was \$10,000, while the effort expected for Arcadis to complete the work is valued at \$13,088.25. This additional effort is due to the substantial revisions required to make the existing copy of the Training Documentation – Operation Manual prepared by NLS Engineering in June of 2018 a comprehensive manual for the new upgrades to the Camperdown BPS.

Sodium Hypochlorite Dosage Pump Sizing Review

As the pumping capacity of the Camperdown BPS is increased to meet the 20-year demand, the existing chemical feed system must be reviewed to confirm that it is able to accommodate the new and higher flow requirements. The additional effort for Arcadis to review if the existing

chemical dosing pumps could accommodate the required increase in dosage rates has been completed and is valued at an additional cost of \$8,452.50.

Monorail and Hoist Modifications

As the layout of the new equipment for the BPS has been reviewed and finalized, Arcadis had determined that the existing monorail arrangement does not align with the layout of the new equipment. As a result, a new monorail and hoist system is needed to accommodate the removal and/or maintenance of the new pumps and associated equipment. As this work was not indicated in the original project scope, an additional effort with the value of \$28,728.00 will be required from Arcadis.

MDD + Fire Capacity Analysis and Pump Selection to Address Increased Flow Criteria

The proposed flow data provided by the Town at the time of the RFP process differed from the current flow data and expected growth in the Camperdown BPS service area. Arcadis conducted process design and hydraulic modelling to justify the revised design criteria and confirm the design pumping rates required for the BPS upgrades. The new design flows recommended by Arcadis based on the hydraulic modelling was set at 27 L/s for low-flow pumps, and 165 L/s for high-flow pumps, fire flow requirements, and the maximum day demand. The additional engineering effort performed by Arcadis to confirm the design flows was not included in the original project scope and is valued at \$18,768.75.

Topographic Survey

Arcadis has advised the Town that conducting a topographic survey of the project site would be beneficial to identify existing above-ground features and to identify a location for the emergency generator where it will be accessible for Town Operators while minimizing the impact on the existing buried utilities and landscaping. This survey would be completed using a total station; identifying all existing property bars, limits and types of traveled road surfaces and shoulders, entrances, elevations of existing sidewalks, door sills, and the location of all above-ground utilities. This survey would be an addition to the original project scope and is valued at \$12,222.00.

Transformer Replacement

A hydro loading analysis was conducted by Arcadis to determine the size of the transformer required for the upgrades to Camperdown BPS. After reviewing the new loads for the BPS, Arcadis determined that the existing Hydro One transformer was too small to provide power to the BPS, and thus a new larger transformer is required. In order to replace and upgrade the transformer for Camperdown BPS, an additional effort valued at \$26,596.50 will be required from Arcadis to coordinate with utility, apply for an upgraded service with Hydro One, coordinate all details of the new service with Hydro One, and provide a new site servicing plan.

Recommendation

Staff are recommending that Council increase the Arrowhead and Camperdown BPS Upgrades contract value with Arcadis by \$132,778.50, increasing the contract value from \$732,013.88 to a total upset limit of \$864,792.38. An additional \$20,000.00 is also recommended to be added to the Arrowhead BPS Upgrades engineering budget, increasing the budget from \$275,000.00

to \$295,000.00. This increase in budget is to be funded from the Water Asset Replacement Reserve Fund.

The upgrades proposed to Arrowhead BPS and Camperdown BPS are a result of the Town-Wide Water Distribution Master Plan (2019) and Westside MCEA (2022) initiated to address near and long-term deficiencies in the treated water supply and storage throughout the Town. If these deficiencies are not addressed, the Town will be limited to the amount of development that can be allocated to the current Thornbury WTP, water storage, and linear infrastructure capacity.

E. Strategic Priorities

2. Organizational Excellence

We will continually seek out ways to improve the internal organization of Town Staff and the management of Town assets.

3. Community

We will protect and enhance the community feel and the character of the Town, while ensuring the responsible use of resources and restoration of nature.

4. Quality of Life

We will foster a high quality of life for full-time and part-time residents of all ages and stages, while welcoming visitors.

F. Environmental Impacts

At this time there are no environmental impacts known or anticipated with the proposed addition of scope and increase in contract value for the Arrowhead and Camperdown BPS Upgrades, or the resulting increase in budget for the Arrowhead BPS Upgrades, outlined in this report.

G. Financial Impacts

An additional \$132,778.50 is proposed to be added to the Arrowhead and Camperdown BPS Upgrades contract value, increasing the value of the contract from \$732,013.88 to \$864,792.38. An additional \$20,000.00 is also proposed to be added to the Arrowhead BPS Upgrades budget, increasing the budget from \$275,000.00 to \$295,000.00. This increase in budget is to be funded from the Water Asset Replacement Reserve Fund.

Arrowhead BPS Proposed Scope Change	Additional Fee
Standby Generator Load Analysis	\$594.38
Updating Operation Manual	\$3,896.75
Sodium Hypochlorite Dosage Pump Sizing Review	\$6,063.75
Topographic Survey	\$11,487.00
Scope Change Value	\$14,468.75

Camperdown BPS Proposed Scope Change	Additional Fee
Emergency Standby Generator Load Analysis	\$594.38
Replacement of the Existing Emergency Standby Generator	\$27,615.00
New Distribution Panel Design	\$3,282.50
Updating Operation Manual	\$3,088.25
Sodium Hypochlorite Dosage Pump Sizing Review	\$8,452.50
Monorail and Hoist Modifications	\$28,728.00
MDD + Fire Capacity Analysis and Pump Selection to Address Increased Flow Criteria	\$18,768.75
Topographic Survey	\$12,222.00
Transformer Replacement	\$26,596.50
Scope Change Value	\$118,309.75

Arrowhead BPS Scope Change Total	\$14,468.75
Camperdown BPS Scope Change Total	\$118,309.75
Total Scope Change Value	\$132,778.50

Town Staff also anticipate an increase in the construction budget for the Arrowhead Road Booster Pumping Station Re-Build will be required after the project has been tendered.

H. In Consultation With

Allison Kershaw, Manager of Water and Wastewater

Vicky Bouwman, Acting Manager of Budgets and Accounting

Michael Switzer, Deputy Treasurer / Manager of Budgets & Accounting

Jason Petznick, Communication Coordinator

Serena Wilgress, Manager of Purchasing and Risk Management.

I. Public Engagement

The topic of this Staff Report has not been the subject of a Public Meeting and/or a Public Information Centre as neither a Public Meeting nor a Public Information Centre are required. However, any comments regarding this report should be submitted to Emily Yeo, Senior Infrastructure Capital Project Coordinator icpc@thebluemountains.ca.

J. Attached

No attachments.

Respectfully submitted,

Emily Yeo
Senior Infrastructure Capital Project Coordinator

Pruthvi Desai
Manager of Capital Projects

Alan Pacheco
Director Operations

For more information, please contact:
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Report Approval Details

Document Title:	CSOPS.24.058 Arrowhead and Camperdown BPS Engineering Scope Change and Budget Increase.docx
Attachments:	
Final Approval Date:	Sep 3, 2024

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

No Signature found

Pruthvi Desai - Sep 3, 2024 - 2:11 PM

Alan Pacheco - Sep 3, 2024 - 3:57 PM