ITEM # 5.1

HRWC Board

March 26, 2020

TO: Craig MacMullin, MBA, CPA, CGA, Chair, and Members of the Halifax Regional Water Commission Board

SUBMITTED BY: Jamie Hannam

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Jamie Hannam, P.Eng.,
Director, Engineering & Information Services

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Cathie O'Toole, MBA, FCPA, FCGA, ICD.D, General Manager

DATE: March 10, 2020

SUBJECT: **Lake Major Dam Replacement – Additional Funding**

ORIGIN

The 2016/17 and the 2017/18 Capital Budgets

RECOMMENDATION

The Halifax Regional Water Commission Board approve $1,330,000 in additional funding for the Lake Major Dam Replacement Project for a total estimated project cost of approximately $9,120,000.

BACKGROUND

On April 10, 2017, the Nova Scotia Utility and Review Board approved the Lake Major Dam replacement project with an estimated gross total cost of $7,789,391. The project was successful in obtaining funding under the CWWF program from federal and provincial partners in the amount of $3,388,287. Halifax Water obtained capital funding through four separate requests to the Halifax Regional Water Commission Board and NSUARB as outlined on the attached total project cost estimate. The total net approved funding from Halifax Water was $4,401,104.

DISCUSSION

Project Timeline:

Concept design for the Lake Major Dam replacement started in September 2014 with a summary report finalized in July 2016. The Concept Design explored design options and suitable locations for the replacement structure.

During the concept design process, a project approval application was filed with Department of Fisheries and Oceans (DFO) on December 15, 2015. The application was filed to start negotiations with DFO and Nova Scotia Environment (NSE) on environmental flow requirements to start the detailed design of the fish ladder and sluice gate structures. The DFO application involved further study and evaluation of low flows on aquatic habitat in the Little Salmon River. On a parallel path, a preliminary application for project approval was submitted to NSE on December 15, 2015. This application was to determine additional information NSE required to approve the project. Halifax Water was advised by NSE, on July 6, 2016, that the application required an Environmental Assessment. The Environmental Assessment process was started immediately and completed by February 9, 2017.

Detailed design started in September 2016 after the decision was made to proceed with a labyrinth concrete spillway option. Detailed design was completed in March 2017. The project was issued for public tender on April 14, 2017 and closed on May 16, 2017. Construction approval from NSE was not received until May 28, 2018 and construction started shortly thereafter.

During construction, approval from NSE was obtained to work on the project through the Winter 2018 into Spring 2019. The contractor obtained substantial completion of the work on October 1, 2019. The project is currently in the warranty period with minor deficiencies to complete onsite when weather permits.

Project Outcome:

The Lake Major dam replacement project met the required project deliverables following key objectives of Halifax Water's Dam Management Program:

1. Replacement of the existing timber dam asset that was at the end of its useful service life and a risk to public safety.
2. The replacement structure includes a passively designed labyrinth spillway which reduces the operating costs of the structure over its service life.
3. The replacement structure increased water storage in Lake Major which will add resiliency to the water supply and help offset periods of reduced rainfall.

4. A new fish ladder was included in the replacement dam which provides a long-term solution to fish passage and eliminates the need to continue the solution that was developed to pump fish over the old structure.

Project Costs:

The project incurred additional cost that exceeded the original funding allotment in the amount of $1,330,000 (rounded total). There are several factors which attributed to the project requiring additional funding which include:

1. Original NSUARB submission included a concept cost estimate for a concrete dam with Ogee spillway and gates. Early in the detailed design process, the dam was redesigned to be a labyrinth spillway with sluicegates to be a more passively operated structure. This resulted in additional design fees and a higher capital cost than previously estimated.
2. The dam replacement project had an extensive Nova Scotia Environment and Department of Fisheries regulatory review process, which included an Environmental Assessment, Wetland Delineation, Wetted Perimeter study for Little Salmon River, and development of an Environmental Protection Plan. The construction approval from Nova Scotia Environment involved multiple submissions of requested information from the consulting team before receiving approval on May 28, 2018. Best efforts with NSE were made to determine the scope of regulatory approvals during the concept design stage, but the larger scope of this process evolved after the project cost estimate was submitted to NSUARB.
3. The initial requirement of the Federal/Provincial CWWF funding approval for the project included a substantial completion date of March 31, 2018. To meet this deadline, the construction contract portion of the project was publicly tendered and closed on May 16, 2017. The Environmental Assessment approval was received from Nova Scotia Environment on February 9, 2017. It was anticipated that construction approval would follow within a reasonable time after this approval. Construction Approval was not received from Nova Scotia Environment until May 28, 2018, and construction started shortly after. This 15-month delay resulted in a negotiated change order with the General Contractor, which increased the contract price by $299,700.
4. The earth embankment saddle dyke was tendered to be constructed ‘in the wet’ consistent with best practice construction methods and appropriate erosion and sedimentation controls. In the construction approval, Nova Scotia Environment applied a condition to the project that the saddle dyke must be constructed ‘in the dry’, which resulted in a change order for the Contractor to construct a cofferdam and dewater the saddle dyke area for this phase of the project. This resulted in a change order with the General Contractor that increased the contract price by $372,000.

5. During Phase 1 construction the General Contractor encountered an unforeseen condition in the lake bed which caused additional infiltration into the cofferdam work area. This resulted in the General Contractor requiring additional pumping to dewater the work area and project delays. This resulted in a negotiated change order with the General Contractor that increased the contract price by $545,913.
6. The fee for engineering consultant construction services was over the budgeted amount. The original estimate at the detailed design stage for construction duration provided by the consultant was 6 months. The project took 18 months to fully construct and commission.

BUDGET IMPLICATIONS

The required funding of $1,330,000 is available in unused funds in the Capital Budget under the *heading 3.465 JD-Kline Low Lift Pump Replacements* (2019/20 Capital Budget - $1,000,000 and 20/21 Capital Budget - $330,000).

This project was initially scoped as a major upgrade of the JD Kline Low Lift Pumping and power supply systems. Work on the project had been paused until the Plant Optimization study had an opportunity to assess the overall Low Lift Station. Based on Plant Operations' input, the current immediate need is for a straight replacement of Pump # 3 which has failed. Staff is proceeding with the reduced scope of work (replacement of Pump #3). This straight replacement allows for the deferral of costs and decisions on major upgrades pending the findings and recommendations of the Optimization Study. Therefore, unused funding in the amount of $1,330,000 is available for reallocation

ALTERNATIVES

None

ATTACHMENTS

Attachment 1: Halifax Water – Lake Major Dam Replacement – Total Project Cost Estimate – February 11, 2020

Report Prepared By: *Original Signed By:*

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