

Date: February 11, 2025
To: Anthony Haddad, City Manager
From: Kristen Dixon, GM of Infrastructure
Subject: Ellis 4 Dam Upgrades – Budget Amendment

Staff Recommendation

THAT Council approve the budget amendment for the Ellis 4 Dam Upgrades to provide a total budget of \$18M, with \$11.0M to be funded through external debt financing;

AND THAT Council direct staff to prepare the appropriate loan authorization bylaw for the Ellis 4 Dam Upgrades project;

AND THAT the 2025-2029 Financial Plan be amended accordingly.

Strategic priority objective

Safe & Resilient: The City of Penticton will enhance and protect the safety of all residents and visitors to Penticton.

Livable & Accessible: The City of Penticton will proactively plan for deliberate growth, focusing on creating an inclusive, healthy, and vibrant community.

Background

The Ellis 4 Dam spans 520m and is rated as a high consequence dam with regards to the Dam Safety Regulations. The dam does not meet the current regulations, and in the event of a major storm under the worst case conditions, the spillway may not safely pass the incoming flows resulting in overtopping of the dam. The City began planning the upgrade of this Dam starting in 2022, completed the detail design in 2023, with construction scheduled through 2024. One of the challenges with upgrading this Dam was the limited construction time frame available, to ensure irrigation flows could be provided, allow staff to draw down the dam (reduce storage), and maintain operations during freshet.

Figure 1: Ellis 4 Dam



The upgrades to the Ellis 4 Dam are now well underway, with construction completion anticipated in the spring of 2025. The current approved budget for this project is \$10.5M, which includes a \$7.1M grant, supplemented with \$3.4M from the Water Capital Reserve. However, since the project commenced last fall, the project has experienced a series of challenges which have significantly impacted the costs to date, as well as the forecasted cost to complete.

The total forecasted project costs are now \$17.5M. The \$7M overage is largely due to the unexpected soil conditions that were encountered during construction. Originally, boreholes were strategically drilled throughout the existing dam structure to obtain a sampling of expected soil conditions. This was the basis for the original budget and the awarded construction project. The original budget anticipated that 67,000 cubic meters of excavation and backfill would be required. However, as the project progressed, the suitable soil foundation levels were much deeper than what was represented in the sampling. This meant that an additional 8,000 cubic meters of excavation, and subsequent importing of backfill materials, was required, or roughly a 12% increase in quantities. This additional work also required more clearing around the site to allow for suitable stock piling of materials. The financial impact of this quantity change is roughly \$3.0M.

Figure 2: Site during Winter Construction



In addition, the effort and resources required to navigate required Ministry approvals and processes were also higher than anticipated, compounded by the Chilcotin River Landslide (which absorbed limited Ministry resources), resulting in delays to the construction schedule and higher than anticipated consulting costs. Through this regulatory process, the City was required to hire an independent engineer on behalf of the Ministry, in addition to the professional engineer that the City had already hired to complete the design and manage the construction. With the contractor already mobilized to site and preparatory works complete, the delays also resulted in standby time for the contractor as they were unable to commence further aspects of the work. The combination of additional consulting costs, and contractor standby time, amounts to roughly \$1.0M of the overage.

Finally, the total schedule delay resulting from both the additional excavation and backfill work and the Ministry approvals amounted to roughly 8 weeks of delay. This delay resulted in significant cost increases for construction as critical weather sensitive activities were pushed into winter conditions. These costs include things like heating and hording of aggregate and concrete materials, site maintenance including snow clearing, and site office rental due to a longer construction duration. It is also compounded by slower production rates in winter conditions. Staff did consider the option to pause the project and resume in the spring, however, given the potential risks to the Community if the dam were not operational in advance of the 2025 freshet (both flow control in Ellis Creek as well as ability to service the South Irrigation System demands), the decision was made to proceed despite these difficult and more expensive construction conditions. The additional costs due to delay and winter conditions amount to roughly \$3.0M. The project is anticipated to be completed in February.

Financial implication

The overall total forecasted project costs are now estimated to be \$17.5M, with an increase of \$7.5M for the \$7.0M known shortfall and an additional \$500k contingency to address any future issues during the remaining project phases. The current approved budget of \$10.5M is being funded by a grant received for \$7.1M and a \$3.4M draw from Water Capital Reserve. The Water Capital Reserve had a balance of \$12M as of December 31, 2023, however the bulk of this funding is committed, including projects such as the Penticton Ave PRV and Ridgedale Reservoir projects, and is unable to bear the additional required funds as the balance of the reserve would be overcommitted beyond the minimum levels set out in Council's Reserve Policy.

Staff are recommending to change the funding strategy for this project and externally borrow up to \$11.0M, for the cost increases of \$7.5M as well as the previously budgeted \$3.4M that was to be drawn from Water Capital reserve. This option allows the City to preserve the limited Water Capital reserve for other critical infrastructure commitments while ensuring the timely completion of this essential project. Debt payments would be funded by the Water operating fund annually and are approximately \$880k based on a 20-year term and a 4.46% interest rate, which will be incorporated into the 2026 user rates.

Options on the borrowing term length will be presented to Council for decision as part of the loan authorization bylaw.

Staff did also reach out to the grant funders to determine if additional funds could be accessed to address the funding shortage, to no avail.

Analysis

The Ellis 4 Dam has been an extremely challenging project, both from the initiation and assumptions made in preparing the detail design deviating significantly from what has been experienced through construction, and also in navigating the various Ministry approval processes and corresponding consulting needs. This, combined with winter working conditions and a limited construction window have all resulted in significantly higher than expected construction costs. However, the Ellis 4 Dam is a critical piece of City infrastructure that has extremely high consequences of failure, which leaves the City with little option other than completion.

Alternate Recommendations

THAT Council approve the budget amendment for the Ellis 4 Dam Upgrades to provide a total budget of \$18M, with \$7.5M to be funded through external debt financing;

AND THAT Council direct staff to prepare the appropriate loan authorization bylaw for the Ellis 4 Dam Upgrades project.

AND THAT the 2025-2029 Financial Plan be amended accordingly.

Respectfully submitted,

Kristen Dixon, P.Eng, MBA
GM of Infrastructure

Concurrence

Director of Finance and Administration amc	City Manager AH
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