CITY OF NANAIMO
THE HARBOUR CITY

Staff Report for Decision

DATE OF MEETING FEBRUARY 16, 2022

AUTHORED BY MIKE SQUIRE, MANAGER, WATER RESOURUCES

SUBJECT **DUKE POINT WATER SUPPLY MAIN – YORK CREEK DRAINAGE CROSSING**

OVERVIEW

Purpose of Report

To seek Council's authorization to protect the Duke Point water supply main crossing York Creek and reduce the potential of future flooding of York Lake, upstream of MacMillan Road in Cedar.

Recommendation

That the Finance and Audit Committee recommend that Council direct Staff to install a pipe bridge on the Duke Point water supply main over York Creek, and add a project to 2022 for $400,000 funded from the Water Reserve to complete this work.

BACKGROUND

The Duke Point water supply main provides a critical supply link to Snuneymuxw First Nation – Nanaimo River No. 4, and numerous industrial properties in Duke Point. There is currently no redundant system that can efficiently operate as a backup during summer peak water demands to supply water to these areas.

The Duke Point water supply system was installed in 1982 prior to the construction of the Duke Point Highway in 1996. As a result of the Duke Point Highway construction, many drainage culverts were installed directly downstream of the Duke Point water supply main, crossing York Creek. Over time, the Ministry of Transportation and Infrastructure (MoTI) culverts under the Duke Point Highway have been plugged with built up sediment and beaver activity, which has backed water up to the Duke Point water supply main cross culverts and into York Lake. Subsequently, the cross culverts under the City of Nanaimo's (City) water supply main have either collapsed or been plugged as a result of upstream debris mobilized from recent storm events and beaver activity. The resulting flood inundation upstream of the City's water supply main has flooded several residents along Walsh Road and MacMillan Road in Cedar and has been closed to vehicles since mid November last year. MoTI's contractor (Mainroad Mid-Island Contracting Ltd.) spent several days trying to clear their culverts and managed to free up debris in the culvert under the Duke Point Highway, however, flows are still being restricted. At the same time, the City attempted to open the culverts under the watermain, but they are deeply submerged – upstream by York Lake, and downstream by the backed-up Duke Point Highway and Harmac Road culverts.

In an effort to drop York Lake level to alleviate further flooding, the City installed two large culverts closer to the surface. Operations Staff continue to monitor these temporary culverts to keep them clear and free of beaver activity. MoTI and Mainroad Mid-Island Contracting Ltd. have plans to investigate the hydrology of the York Creek system and look into further maintenance and cleaning of their culverts. The location of the culverts is shown on Appendix A.

Flood levels upstream of MacMillan Road are decreasing as a result of these efforts but further storm events will continue to impact the area without further improvements.

DISCUSSION

The level of risk to the Duke Point water supply is high as a result of the flooding and inability to keep drainage moving. Given that this area is outside of the City boundaries and not in the City's jurisdiction for drainage control, it is recommended that the City mitigate the drainage system under the Duke Point water supply main this year. To alleviate this risk, it is proposed to install a pipe bridge over the York Creek section and remove all existing City drainage infrastructure in the area. Installing a pipe bridge over York Creek will eliminate the current risk and avoid any future drainage responsibility on the City's behalf.

The best opportunity to install the pipe bridge is in the next several months when the water supply demands are low, as this work may require a temporary shut-down of the Duke Point water supply main.

Having a dedicated budget available this year will allow early engagement of engineering and construction support to complete this project prior to next winter.

FINANCIAL CONSIDERATIONS

The cost of risk mitigation is anticipated to be between $350,000 and $400,000 based on initial cost estimates. The projected balance in the Water Reserve is sufficient to fund the required work.

OPTIONS

1. That the Finance and Audit Committee recommend that Council direct Staff to install a pipe bridge on the Duke Point water supply main over York Creek, and add a project to 2022 for $400,000 funded from the Water Reserve to complete this work

    - Adding the pipe bridge on the Duke Point water supply main over York Creek will eliminate the risk to the critical water supply pipeline.
    - Removing all City of Nanaimo drainage infrastructure will allow proper attention from the Ministry of Transportation and Infrastructure and Mainroad Mid-Island Contracting Ltd. to manage and maintain this drainage course within their jurisdiction.
    - The cost of the risk mitigation is expected to be between $350,000 and $400,000 that would be taken from the Water Reserve, leaving less funding available for other needs.

- The 2022-2026 Financial Plan will be amended for Final Budget to include the project.

2. That Council provide alternative direction.

SUMMARY POINTS

- Annual flooding on MacMillan Road, and to residential properties on Walsh Road in Cedar, is progressively getting worse.
- As a result of last fall's rainfall events, it was found that beaver activity, partially blocked culverts and failing infrastructure owned by the City and the Ministry of Transportation and Infrastructure are contributing to flow restrictions draining York Creek.
- To mitigate the risk and the City's responsibility of drainage control outside the City's jurisdiction, it is recommended that the City remove all drainage infrastructure and build a pipe bridge on the Duke Point water supply main over York Creek.

Appendix A – Duke Point Supply Main Site Map

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