

City of White Rock

Environment Advisory Committee

Memo: Storm Water Management – **Columbia Avenue Storm Diversion Project**

From: Jeff Holm, PEng, FEC, EAC member

Date: April 19, 2022

Summary

1. The Environment Advisory Committee (EAC) should review the CWR 5yr Asset Improvement Program for major capital project concepts relating to planned transportation, solid waste, drainage, sanitary sewer and water utility work. The EAC should be knowledgeable to advise City council on proposed capital works projects as they relate to the protection of the environment.
2. The proposed Columbia Street Storm Diversion project is estimated to cost \$18M with the CWR contribution at \$4.8M for phase 1 & 2. The EAC should review this project concept with City staff to seek assurance that environmental objectives for water quality discharge are optimized.

Introduction

One of the areas of concern for the EAC is storm water management (SWM). The overall concern is the quality of the storm water that is collected from upstream urban areas then discharged into the receiving marine water of Semiamoo Bay. This stormwater is largely untreated and is suspected of discharging a variety of contaminants including hydrocarbons, suspended and dissolved solids, bacteria and metals.

The last Integrated Storm Water Management Plan (ISMP) was prepared by Urban Systems Ltd. (USL) in April 2010, <https://www.whiterockcity.ca/DocumentCenter/View/363/Final-ISMP-PDF?bidId=>

The ISMP is primarily concerned with the collection of the stormwater and does not address treatment of discharge to the environment in any detail.

Of particular concern for this report is the proposed Columbia Avenue Storm Diversion Project. This is described as follows from the corporate report of March 9, 2020:

Columbia Avenue Storm Diversion Project; commit to the City's share (\$1,333,500) of the project. There are issues with White Rock's storm water discharges including erosion, flooding and poor stormwater quality contributing to environmental conditions in Semiahmoo Bay negatively affecting the Regional ecosystem and preventing the harvesting of shellfish. These conditions are exacerbated by the increased frequency and intensity of storms resulting from Climate Change. It is intended to divert stormwater from erosion prone locations and fish spawning areas and to develop an upgraded conveyance system incorporating treatment

facilities to reduce oil, grit and other deleterious materials in the stormwater before discharge to the Bay. This diversion will also enable the removal of stormwater and encroachments from Semiahmoo First Nation (SFN) lands. Regional benefits include mitigation of flood waters and erosion in fish spawning areas, improvements to Semiahmoo Bay water quality and the removal/restoration of encroachments on SFN lands. This application is for Phase 1 (\$5M) design and construction of a new stormwater outfall west of Finlay Street, habitat enhancement infrastructure and restoration, diversion piping and stormwater treatment. Phase 2 includes installation of new storm mains on Stayte Road and Columbia Avenue to divert flow from the City of Surrey and Semiahmoo First Nation Lands to the new outfall west of Finlay. The total project cost (for the above noted Phase 1) is \$5,025,000, of which \$5M represents grant program eligible costs. Grant funding is available for up to 73.33% of eligible project costs (40% Government of Canada, 33.33% Province of British Columbia), leaving \$1,333,500 in eligible costs to be funded by the City. The 2020 to 2024 Financial Plan reflects the previous plan to replace the Habgood Pump Station. Now that this drainage project scope has been modified, an amendment to the 2020 to 2024 Financial Plan is required. Sufficient funding for the City's portion (\$1,333,500 or 26.67%) is available through a re-allocation of project funding, and the 2020 to 2024 Financial Plan will be amended accordingly in April 2020. Phase 2 of this project is estimated to cost in the range of \$13M. Based on the 2020 to 2024 Financial Plan, enough City funding is available to contribute \$3.46M (26.67%) towards Phase 2. However another grant in the amount of \$9.5M (73.33%) is required before Phase 2 can proceed. This project will divert stormwater from low lying and erosion prone areas that will become more vulnerable to environmental damage due to increasingly intense storms related to climate change and due to increased sea levels.

I was unable to find any project brief for the Columbia Avenue Storm Diversion project beyond the above corporate report.

Proposed Project Description




It is inferred that phase 1 of this project will collect water from catchment #14 (fig 2 below) that is currently discharged south across SFN land to the river via the Habgood pump station at high water. The implication is that C#14 stormwater will now be collected west along Marine Drive and discharged/pumped through a new facility to be constructed west of Finlay Street. There is some mention of improved treatment to reduce deleterious materials before discharge to the marine environment. The major objective appears to be avoiding discharge across SFN land to the Little Campbell River.

Phase 2 appears to collect storm water from Catchments #16, 17 & 18 which is currently discharged east through Surrey to McNalley Creek around 162/163 street and then south to the little Campbell River. This storm water will now be conveyed south along Stayte Street then west along a new Columbia Avenue diversion to be discharged west of Finlay Street through the phase 1 facility.



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Legend

-  Outfall
-  Catchment Boundary
-  General Catchment Outflow Direction

Catchment #	Hectares
1	16.45
2	31.65
3	20.60
4	11.08
5	7.90
6	26.50
7	30.89
8	6.72
9	55.78
10	8.40
11	18.08
12	63.30
13	4.66
14	13.63
15	24.95
16	23.70
17	44.72
18	63.65

**Integrated Stormwater
Management Plan**

**Catchment
Boundaries**

Figure 2

Alternative Solutions to the Project

There is insufficient information available to evaluate any alternative solutions that may have been considered for stormwater collection and discharge to Semiahmoo Bay. There is no apparent description of proposed treatment to reduce deleterious materials prior to discharge.

Collection System Upgrades

Insufficient information is available to fully comment. However, it appears that the new stormwater collection system and discharge will be sized to accommodate a peak design flow event. 'Big pipe' systems are designed to get peak runoff directly to the receiving water as quickly as possible. This typically does not optimize local infiltration to the aquifer or for reduction of deleterious substances before discharge to the marine environment. It is generally preferable to treat and infiltrate first flow and low rates of stormwater through local facilities rather than conveying all stormwater to the marine. This can be difficult to accomplish in established neighbourhoods but can be started by requiring new construction to retain and infiltrate first flow and low volumes on site for local infiltration before discharging excess flow.

Phase 1 – Catchment #14 west to Finlay St. Discharge

This area between Columbia and Marine Dr. and Stayte to Finlay currently drains south to the Habgood Pump Station. It is assumed that when the tide is high, the pump station assists in discharge to the Little Campbell River. There is no apparent treatment before discharge. This facility is located on SFN land and appears to be politically contentious.

An alternative solution might be to lease land from the SFN and construct an off-line wetland to treat low and first flush storm water from this area. This wetland could likely be sized to capture, bio-treat and then infiltrate treated discharge to the river. Deleterious materials such as hydrocarbons, tire dust, solids and metals would be captured before discharge and this area could be monitored on an ongoing basis. Natural bio-retention would likely provide sufficient treatment prior to discharge but captured material could be remediated in the future if required.

Politically, this project could be promoted as a more economical solution that improves the overall environment. The SFN and CWR could promote this as a demonstration project to enhance the water quality of the Little Campbell River and Semiahmoo Bay. If successful, similar treatment could be initiated elsewhere in the watershed.

Phase 2 – Catchments 16, 17 & 18

It appears that the general motivation for this phase is to avoid routing CWR storm water through Surrey approximately 400/500m east to McNally Creek. The advantage is that CWR stormwater collection and discharge will then be entirely under CWR jurisdiction and control. The disadvantage might be significant loss of low base flow to McNally Creek as well as natural treatment and infiltration opportunities in McNally Creek. The City of Surrey has grassed detention basins adjacent to McNally Creek at 11th and 10th ave. With ongoing development in this area, Surrey may have capacity issues

developing. However, it may make more sense for the CWR to retain stormwater discharge through Surrey and contribute to enhanced detention and treatment facilities located adjacent to McNally Creek as opposed to a separate collection and treatment system down Stayte to Columbia.

Conclusion

The Environment Advisory Committee should consider the following resolutions to advise White Rock City Council:

1. The Environment Advisory Committee (EAC) should review the CWR 5yr Asset Improvement Program for major capital project concepts relating to planned transportation, solid waste, drainage, sanitary sewer and water utility work. The EAC should be knowledgeable to advise City council on proposed capital works projects as they relate to the protection of the environment.
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