

Original signed by: Byron Johnson, CAO

City Staff Report

Report Date: December 10, 2020**Meeting Date:** December 15, 2020**To:** Mayor & Council**From:** City Manager Byron Johnson**Subject:** Baker Creek Freshet response plan

Purpose

The purpose of this report is to outline to Council the response plan resulting from the damages caused during the Baker Creek freshet of 2020. This plan will result in a sewer mainline which will have a much lower risk of future damage and lower risk of potential environmental damage from future breaks. Unfortunately this will also have an impact on properties which are located on the Baker Creek waterfront.

Summary

Damage Summary

The freshet event at Baker Creek had the following impacts between April 20th and 30th:

- Significant erosion and washing away of the City's sanitary sewer line, with 145m of sewer main washed away. The City has diverted the Sanitary Sewer through temporary piping and pumping that will need to continue until such time that the sewer services are restored. For the winter, the sewer volume is being trucked due to less volume than the summer.
- Erosion to the sewer main access route (formerly located on the river bank below Hutchcroft Street and Baker Drive).
- A significant portion of the riverbank below Hutchcroft Street was washed away. Now the top of the Baker Creek escarpment is directly adjacent to a shop built on the closest residential property.
- At the East end of Beaubien Ave the end of the road was washed away (approx. 50 m² of road was lost, leaving the storm water pipe exposed).
- The Riverfront Trail downstream of Beaubien Ave was damaged when the riverbank below the trail was washed away, approx. 35m of trail was damaged.
- Over the whole alert area on the river banks, many trees (in particular lots of large trees) were lost into the river due to erosion at their root systems, destabilizing the area further. In addition, these trees presented and some continue to present risks for the Baker Creek Bridge on Anderson Drive.

Recovery Options –

- In most cases the response required, although extensive and expensive, is self evident. Roads and trails will be rebuilt. Other infrastructure such as piping will be armoured with localized riprap where it has been exposed. Trees have been removed, or trimmed to a smaller size to enable them to wash downstream easier.



- The challenge with working in or near a river in a non-emergency time are getting the approvals needed from various governmental agencies, and the narrow window where work in the creek is allowed.
- Any time the flow of water is changed due to obstacles falling into the river, or emergency interventions, it can have unintended downstream impacts on other sections of riverbank.
- For this recovery, the biggest component is the Sewer main rebuild. Given the large amount of damage to the Sewer mainline, it is appropriate to question whether having the line adjacent to Baker Creek is the best option. Fundamentally there are two repair options:
 - Repair and replace the existing infrastructure at its original location, essentially with this option, the damaged infrastructure would be replaced as it was; or,
 - Relocate the Sewer Main away from Baker Creek, installing a lift station because the line will no longer be a gravity line.
- Based on staff experience, engineering advice, and in conjunction with discussions with the Disaster Financial Assistance (DFA) personnel, the City will proceed with relocation of the sewer line away from Baker Creek. This has the following benefits:
 - The sewer mainline will be relocated away from Baker Creek, eliminating the potential for damage due to water erosion (for the section moved!)
 - There are no purchases of lands required, or access agreements needed with property owners. This can be costly and time consuming, and ultimately unsuccessful. The old sewer main down at the creek level was in trespass for long sections of it.
 - This proposal allows for greater cost certainty than the re-establishment of the old line, with a higher proportion of eligible (recoverable) costs. Land purchases would not be an eligible expenditure.
 - There are less concerns about working in the creek with this approach, reducing the regulatory approval needed.

Impact on Residential Properties

- **By choosing the relocation option, by default, it means that the old sewer main route will not be rebuilt. The old pathway along Baker Creek in which the pipe was formerly placed will not be rebuilt either. This pathway served as a buffer to protect the properties adjacent to it from high water erosion. Without this protection, some properties on Hutchcroft Street may be at a higher risk than they were previously.**
- The DFA will only fund the option for repairing the sewer line that is selected, they will not pay for the sewer mainline relocation project and then pay to protect homeowner properties along the river from future damage. The mandate of the DFA is to assist local governments in getting their infrastructure functional again not presumptive protection works.
- Based on their own parameters, the DFA may pay homeowners compensation if they are forced from their homes because they become too damaged to safely reside in. This is not a definite payout, and any payout is based on the assessed value of the home only, not the land, or any land that has been lost, nor any other improvements. Residents probably feel that this represents a low level of compensation relative to the value that they have lost.
- Some of the residences on Hutchcroft Street are located above a bend in the river, they will always be at a higher risk from water erosion. The unknown factor is the time frame of that risk, if next year is a wet spring, or if there are unfavourable snowmelt conditions, there could be further erosion, putting residences at risk. Alternately, it may be years before there is any further damage. A series of ortho photos is included in the background section below showing the



progression of Baker Creek over the last 10 years. It should be noted that 20+ years ago, a house on a nearby property on Hutchcroft was lost due to bank erosion.

- The cost of armouring the section of Baker Creek where there was the most erosion is very significant. An order of magnitude estimate of the cost is up to \$1 million. This number is based on a very rough estimate, to develop a better estimate and/or work plan would need outside engineering assistance and funding set aside to pay for it. The geotechnical issues with approach are very difficult, it would be an expensive study to determine an effective solution to try and protect the properties in question.
- As Council is aware, we have been getting a number of inquiries from residents on both side of Baker Creek asking what the City is doing to protect their properties in order to be ready for the next freshet. This topic is explored more fully as a Policy discussion below, however the short answer is that the City will not protect private properties where City infrastructure is not imminently at risk.
 - City staff recently met with a homeowner on Hutchcroft who lives immediately above the area with the most bank erosion. This resident was evacuated from her property for months last year as a precautionary measure. Staff informed her to get ready for the next freshet season by being prepared to evacuate her home as soon as the water rises, and to empty her shed by the bank of all belongings.

Future Risk from Baker Creek to City Infrastructure

- The approach being taken with Baker Creek is based on the assumption that once the sewer mainline is relocated, the imminent risk to City infrastructure is reduced. This assumption could be challenged based on the unpredictable nature of river erosion, and the impact that changing climatic conditions have had on the freshet levels. There are a lot of unknowns. It is interesting to note, that 2020 was not the highest freshet level for Baker Creek that has been experienced in the recent past, but the creek did the most damage.
- The future risk to City infrastructure is discussed more fully in the Background section of this report.

Recommendation

This report has been prepared for Council and community informational purposes.

Staff has made the assumption that Council should not be involved in the selection of the sewer mainline rebuilding option, due to the highly technical nature of the decision. The DFA funder must also concur with the solution selected by the City. When this discussion was held with the Executive Committee, they agreed with this determination.

Because a resolution of Council may be useful from a future liability perspective, staff suggests the following:

THAT Council approves the staff recommendation that the Sewer Mainline that was damaged in the Baker Creek 2020 freshet be relocated;

AND THAT Council directs staff to inform the potentially impacted residents about the existing policies related to City works on private property, specifically that the City will not fund those works.



Council Policy

Emergency Response Work done under a State of Local Emergency

The level of response by City forces is decided on a policy basis. During an emergency situation is occurring, the response is based on the policies as set by Emergency Management BC (EMBC). In that case, staff get pre-approval of the response plans and a commitment regarding resources required to fund the response. During these times of response, the priorities for EMBC include protecting infrastructure (bridges, roads, utilities, etc) and residential properties. Work can be done in the streams and riparian areas to meet those priorities, including placing riprap on stream banks, removing trees from the waterway, and removing danger trees from the river banks. These fixes are quick responses to protect local priorities from immediate danger, they are not long-term solutions.

Long Term Recovery Work

When the City infrastructure has suffered significant damage as a result of an emergency situation, we will apply to Disaster Financial Assistance (DFA) funding. Between this external federal funding, and our own reserves, the City will repair infrastructure damages and mitigate future damages where possible. However, it is important to note that the City will not spend money on mitigative measures unless City infrastructure is at imminent risk. In this particular situation, there is no City infrastructure at imminent risk because the relocation of the mainline reduces that risk, in the opinion of City staff.

The City has a Local Services Policy, whereby property owners can request that the City performs works or services, and charge the cost of those services back to homeowners in the benefitting area over a period of time. The policy, specifically states that for Riverbank protection, where no City infrastructure is present, that the owners petitioning the City to do the work will have to pay 100% of the cost. If the impacted homeowners want to pay for repairs, the first step for this would be for the property owners to request a local service, if there was enough interest among the benefitting properties, the engineering work discussed above could be done. Based on the very rough cost estimate of up to \$1,000,000 and a small number of directly benefitting properties, the expectation is that the cost per property owner would be prohibitive.

Another policy type question is whether the City should be applying for grants to help individual property owners with mitigation type work in cases where there is no City infrastructure present. While it may seem politically expedient to apply for a grant to help certain homeowners, the problem is how to choose which projects should be the winner to get the grant funding. At any given time, there are enough properties within City limits which are subject to river erosion, or land slippage issues that there would be not nearly enough funding to complete them all. The staff recommendation on this issue would be that the City does not apply for funding to mitigate natural issues unless there is City infrastructure to protect, or the benefit is widespread, such as with a diking program, not just for a few properties.

Financial Implications

In the 2021 capital plan we have the following projects related to Baker Creek:

- Replacement of Sewer Line - \$2,000,000 - \$1,400,000 funded by DFA
- Repair or Storm/Trails - \$200,000 - \$160,000 funded by DFA

To date we have spent just over \$500,000 in emergency response costs due to the Baker Creek event and will continue to incur costs until the new sewer line is built. The majority of these costs have been covered by EMBC.

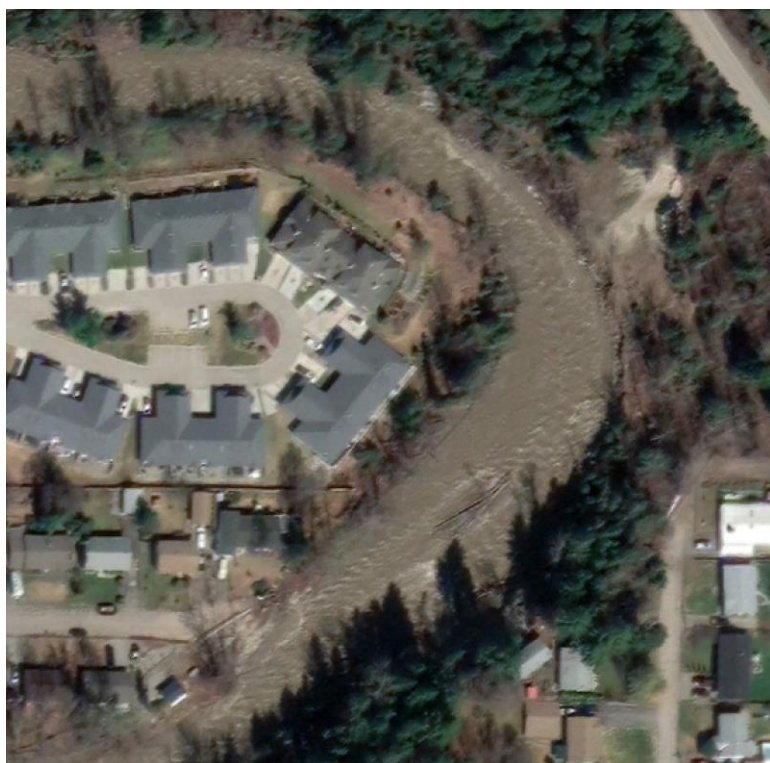


Background

Ortho Photos showing the Baker Creek over a 10 year period



September 30, 2020



April 30, 2020



September 28, 2019



July 29, 2010

All photos from Google Earth



Future Risk at Hutchcroft Location to City Infrastructure

Staff feel that it is a fair statement that no City infrastructure is at imminent risk if the sewer mainline is relocated. We cannot even begin to predict how long could take until the most northern house on Hutchcroft, address 494, would be at risk. The water pipe is not looped around that corner and the issue is that the water and sewer services to that house would need to remain until such time that this house is at risk – if it ever does become at risk. After that time the pipes could just be capped off outside of the risk area. See the photo below, with the water line in blue, and sewer in orange.

If the water service for that house comes from the lane along the north and the sewer is from the rear lot then the house would be at risk before City services. Of course sustaining access to the front of that house would likely be at risk before the house, but at least rear lot access would remain.

Baker Dr. and the watermain on that road might eventually be at risk, but that slope does not seem to be progressing with failure like it is immediate downstream on the corner. Also, protecting that bit of Baker Dr. – sometime many years in the future – is a smaller project compared to protecting all the way around the corner.

