



Public Submission

City Clerk's Office

Please use this form to send your comments relating to matters, or other Council and Committee matters, to the City Clerk's Office. In accordance with sections 43 through 45 of Procedure Bylaw 35M2017, as amended. The information provided may be included in written record for Council and Council Committee meetings which are publicly available through www.calgary.ca/ph. Comments that are disrespectful or do not contain required information may not be included.

FREEDOM OF INFORMATION AND PROTECTION OF PRIVACY ACT

Personal information provided in submissions relating to Matters before Council or Council Committees is collected under the authority of Bylaw 35M2017 and Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act of Alberta, and/or the Municipal Government Act (MGA) Section 636, for the purpose of receiving public participation in municipal decision-making. Your name, contact information and comments will be made publicly available in the Council Agenda. If you have questions regarding the collection and use of your personal information, please contact City Clerk's Legislative Coordinator at 403-268-5861, or City Clerk's Office, 700 Macleod Trail S.E., P.O. Box 2100, Postal Station 'M' 8007, Calgary, Alberta, T2P 2M5.

* I have read and understand that my name, contact information and comments will be made publicly available in the Council Agenda.

* First name	Jean
* Last name	Woeller
Email	jwoeller@shaw.ca
Phone	403-606-7100
* Subject	Written submission for consideration as part of Apr 15 Annual Flood Mitigation Update to SPC-UCS
* Comments - please refrain from providing personal information in this field (maximum 2500 characters)	Please accept the attached letter from the Bowness Responsible Flood Mitigation Society (BRFM) to be included in the public record as part of the Water Services Annual Flood Mitigation Update to SPC-Utilities & Corporate Services on April 15, 2020. Please forward to council committee members.



Bowness Responsible Flood Mitigation Society

April 8, 2020

City Clerk's Office
via online Public Submission Form

RE: Water Services Annual Flood Mitigation Update to SPC-UCS April 15 2020

Dear Members of the SPC-UCS,

Please accept this letter from the Bowness Responsible Flood Mitigation Society (BRFM) to be included in the public record as part of the Water Services Annual Flood Mitigation Update to SPC-UCS on April 15, 2020.

The Bowness Responsible Flood Mitigation Society

BRFM is an advocacy organization that promotes responsible and effective flood mitigation measures on the Bow River, upstream of Calgary. Information about BRFM's efforts to advocate for upstream flood mitigation can be found at www.bownessrfm.ca

Following are BRFM's comments regarding Water Services plan to construct overland flood barriers in the Community of Bowness along the Bow River ("the project").

The project is ill-conceived

BRFM believes that the project, at this time, is ill-conceived. After careful consideration of the reports that have been commissioned by the City (e.g. Flood Mitigation Measures Assessment report, 2017 ("the FMMA"); City of Calgary Permanent Flood Barrier Protection Assessment, April 2018, "the AE Report") and Province of Alberta (e.g. Advice to Government on Water Management on the Bow River, May 2017) as well as attending City information sessions and one-on-one sites visits for property owners, we believe that the City has decided to undertake a project that will do little to mitigate against flooding of Bowness homes and will be destructive to the natural river environment and general enjoyment of private property.

First we believe the Project is premature. The FMMA states: *"The Assessment confirmed that to provide an equitable level of service on the Bow as on the Elbow, a new reservoir on the Bow River upstream of Calgary is recommended, along with complementary barriers in select communities and continuation of the Provincial TransAlta operational agreement."*

Based on its own report, the minimum conditions to make the proposed berm on the Bow River appropriate are not present. Most importantly, an optimistic estimate of when construction could be completed, by the Province is 12 or more years. The City's FMMA provided that *"if a new Bow Reservoir is not built, fortification of the Bow River by barriers is not desirable, as it would require higher barriers with large footprints along the length of the Bow River within Calgary, resulting in dramatic impacts on the community"*.

Further, the evidence is that the Project will not work. The AE Report provides a general assessment of groundwater flooding potential and uses average inputs for their groundwater flood modelling; for example, the study assumes a standard subsurface for all community berms planned along the Bow River. Bow Crescent residents who have rebuilt their homes have found deep deposits of gravel, 30-40 feet or more, when driving piles into the bedrock.



The AE report shows through flood modelling (using its conservative inputs) that groundwater flooding for a 1:20 year event with a berm in place will do very little to protect homes in the area from groundwater flooding. Figure 1 and 2 show that even with the berm in place (the red line), extensive groundwater flooding will occur in Bowness. The dark blue areas of the map in figure 2 show that very few homes would not experience groundwater flooding.



FIGURE 1 - BOWNESS NORTH

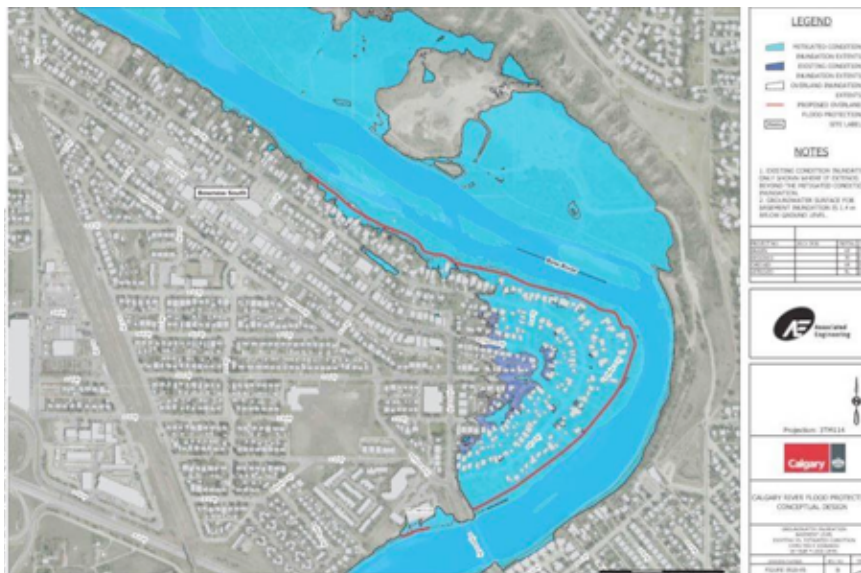


FIGURE 2 - BOWNESS SOUTH



Equality of protection

BRFM expects the protection in Bowness to meet or exceed the 1:100 year flood risk. As per the FMMA all communities are to be have equality of protection. The BRFM’s request is simple, provide damage protection to Bowness which is afforded other communities. BRFM expects the City to mitigate to that risk in their design and to advocate with the Province of Alberta for increased upstream mitigation to limit peak flow rates to 800 m3/sec as the City’s own evidence supports (see later discussion for details).

This means if the residents in Elbow park are not expected to have basement flooding during a 1:75 year flood, then Bowness residents should not be expected to be flooded by a 1:75 year flood, regardless of if that is overland or by groundwater

We are requesting the committee direct Water Services to provide this as a minimum requirement of any design options.

Project costs are grossly underestimated

After the “conceptual design” phase, Water Services estimates the cost to construct the 3-4 km flood barrier to be \$24.7 million (a Class 5 estimate). The City’s cost estimate for land acquisition and flood protection (construction) appear to be grossly underestimated. Only **\$4.4 million has been estimated for direct costs constructing** the flood barrier and \$13.5 million for land acquisition (see table 1 - taken from the 2017 Alberta Community Resilience Program application).

TABLE 1 - COST ESTIMATE SUMMARY (OVERLAND PROTECTION)

Item	Amount (\$ 000s)
<i>General</i>	1,010.0
<i>Removals and Site Demolition</i>	382.3
<i>Property Acquisition</i>	13,425.0
<i>Flood Protection</i>	4,410.0
<i>Site Restoration</i>	1,371.1
Subtotal	20,598.4
<i>Engineering</i>	717.4
<i>Material Testing</i>	358.7
<i>Permitting</i>	100.0
<i>Contingency</i>	2,875.5
Total	24,650.0

Contrast these cost estimates to that of Bragg Creek where there are plans to construct a flood barrier of similar length in a rural setting. The project website (<https://www.rockyview.ca/BuildingPlanning/PlansUnderReview/BraggCreekFloodMitigation.aspx#LatestNews>) explains that the total budget was assigned to two stages: stage 1 - \$16.8 million for planning, design, land acquisition & regulatory approvals; stage 2 - **\$16 million for construction and 3rd party services**. In October 2019 Rocky View County closed their tender for construction of the flood barrier and the lowest bid exceeded the construction budget allocated by the Province.

We would expect that the Bragg Creek berm should be less costly to build than the Bowness berm for the following reasons: (i) it has no storm water management system requirements; (ii) construction will occur



in a rural setting so the land acquisition costs are expected to be lower; and iii) physical access to the river bank is expected to be easier than it will be in Bowness.

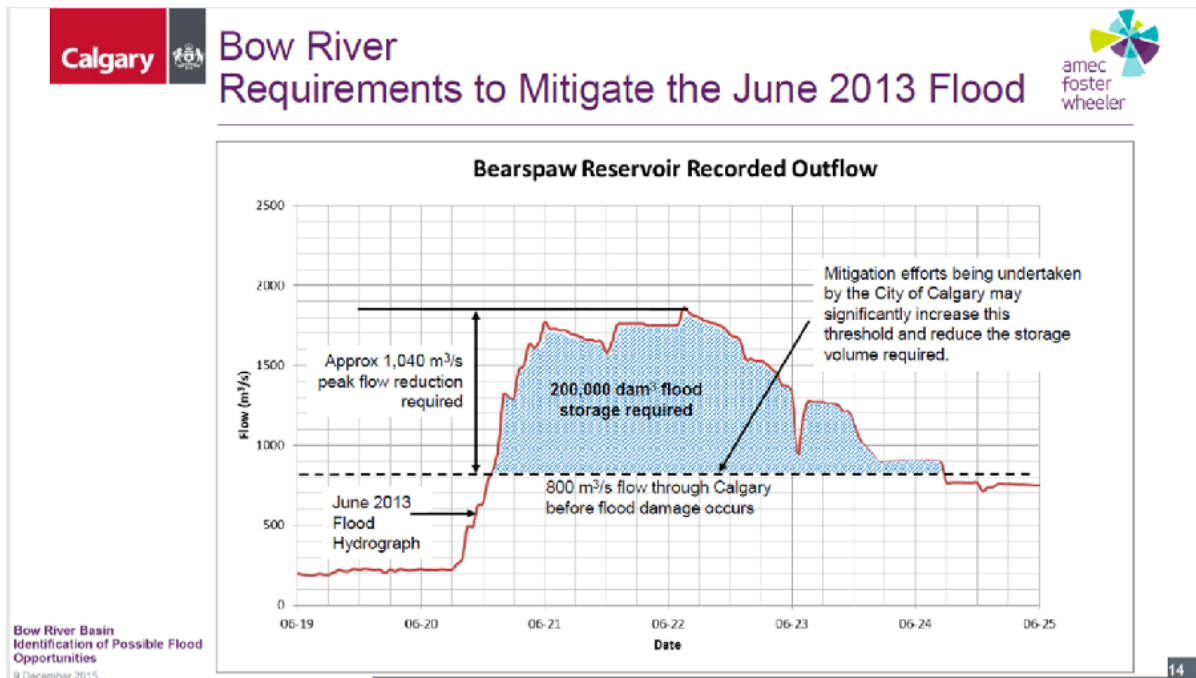
BRFM believes that the City’s estimate for land acquisition is wildly underestimated at \$13.2 million. The estimate is based on the expectation that the City will negotiate easements with all 100 - 130 property owners whose land is required for the project. The majority of property owners do not support the project and therefore the City will incur additional costs in legal fees and as a result of expropriation.

Given that the community will still experience flooding from groundwater, despite the barrier, and the expectation that project costs will escalate, BRFM is of the opinion that the project is irresponsible and a complete waste of taxpayers money.

Flooding is best addressed through effective upstream mitigation

The overarching premise of the FMMA is that effective flood mitigation is a combination of upstream, community level and property level mitigation. We support this strategy. However as the FMMA relates to the Bow River, we conclude that the implementation of this strategy over emphasizes the potential benefit of community mitigation and under emphasizes the optimal contribution from upstream mitigation.

The graphic below is taken from a City of Calgary presentation from 2015.



This graphic speaks to the compromise. The conclusion stated here is that based on current conditions, peak flow rates over 800 m3/sec on the Bow River can be managed before significant flood damage occurs. The experience of river front residents in Bowness, is aligned with this threshold.

In 2015, the City postulated that community-based mitigation projects, such as the Bowness Barrier may significantly increase the peak flow threshold and reduce the volume required for upstream storage. Although unproven and untested at the time, this aspiration led to the apparent understanding between the Province of Alberta and the City of Calgary that the Province of Alberta would be responsible for the development of upstream mitigation to control peak flow rates to 1200 m3/sec and the city would develop community barriers that will protect these communities from flood damage at flow rates up to 1200 m3/sec. In the 5 years since this presentation, through BRFM, affected Bowness property owners



have asked for but have not been provided objective evidence that the development of the Bowness Barrier will safely permit an increased peak flow rate above 800 m³/sec.

During the last annual flood mitigation update in May 2019 property owners were assured that a barrier design and alignment would be provided within 6 months. A year later this has not been delivered, nor has any further technical evidence been provided to support the assertion that the barrier will increase this peak flow rate. A number of technical reports including the already referenced AE Report, the personal experience of residents and analysis supports that with this flood mitigation strategy, residents will continue to experience significant damage as flow rates exceed 800 m³/sec and at 1200 m³/sec, damage comparable to 2013.

A survey of river front residents, conducted by BRFM, concluded that about 85% of the property damage that occurred during the 2013 flood was caused by groundwater flooding and/or sewer backup. Discussions with residents reveal that even if overland flooding had not occurred, groundwater flooding preceded or would have resulted in the same level of damage.

This same conclusion was cited for the Elbow River Communities by the University of Calgary geoscience paper in 2018 that has been quoted by a number of technical studies done for the City of Calgary. They state: *“A survey of 189 homes along the Elbow River in Calgary examined the basement flooding water characteristics and the initial route of floodwater entry. In homes where the initial route of entry was known, 88% were initially flooded by groundwater, and 12% reported exclusively groundwater flooding.”*

It's likely that this conclusion strongly contributed to the flood mitigation plan for the Elbow River that relies 100% on upstream mitigation, delivering a controlled peak flow rate of 160 m³/sec for a 200-year return period flood event. At this flow rate, Elbow River communities are given effective protection from overland and groundwater damage and can remain living in their homes with fully functioning services (water, electricity, gas, stormwater and sanitary systems). The peak rate of 160 – 180 m³/sec was set as a design criterion for upstream mitigation based on ensuring the system would deliver groundwater protection. As already stated, Bowness expects equitable protection as enshrined as a principle within the FMMA, however residents have received no evidence that this protection will be provided by the proposed barrier. In order to deliver this equitable level of protection for Bow River Communities, upstream storage capacity would need to be increased, reducing peak flow rates to 800 m³/sec or the barrier would need to be designed to control groundwater ingress into the community, which BRFM believes to be technically not feasible for Bowness.

BRFM has been actively engaged with the Province of Alberta's Bow Basin Water Management Options Conceptual Assessment to evaluate upstream reservoir options. Through our engagement we have advocated for a level of upstream mitigation that will control peak flow rates in Calgary to below 800 m³/sec as we have no evidence from the city of Calgary that the Bowness Barrier will protect our community from flood damage at flow rates exceeding that rate. We note that there are single reservoir options that can provide this level of flood mitigation (storage in excess of 200,000 dam³) being considered in this study in addition to the Benchlands Dam option that BRFM has developed as an option to reduce the peak flow rate¹. In response to our advocacy for this higher level of upstream mitigation, the Province has stated that the City of Calgary has committed to provide flood protection up to 1200 m³/sec and therefore the upstream mitigation need not be developed to a lower target peak flow rate.

In making the commitment to protect Bowness from flood damage up to 1200 m³/sec, the City of Calgary administration has overstated what can be reasonably achieved through community barriers. In order to provide effective and equitable protection, the cost and complexity of the Bowness Barrier will significantly escalate well above the financial capacity of the City of Calgary.

¹ the Benchlands Dam option was presented at the last year's annual flood mitigation update



The Province has denied funding for the Bowness barrier project under the Alberta Community Resilience Program (ACRP). Their decision could be viewed as the prioritization of upstream flood and drought mitigation above with community barriers. The City of Calgary should also acknowledge that they cannot deliver effective and efficient flood mitigation for the Bow River communities up to 1200 m³/sec and advocate with the Province for increased upstream mitigation to limit peak flow rates to 800 m³/sec, as the City's own evidence supports.

Thank you for the opportunity to share our position on the ill-conceived, costly and ineffective Bowness Barrier Project.

Sincerely,

Jean Woeller
Chair, Bowness Responsible Flood Mitigation Society
jwoeller@shaw.ca
403-606-7100