OPINION: FLOOD MITIGATION

THE IMPORTANCE OF FLOWRATE CONTROL THROUGH BOWNESS

Flowrate is the volume of water passing a given point in a set period of time, and is expressed in cubic meters per second (m3/s, or 'cms'). Factors which affect this are the rate of snowpack melt and much more importantly, the intensity of rainfall in the Bow River basin. Dams lower flowrates downstream by intercepting water, releasing it slowly later when the flood event is over ('upstream mitigation'). The Province currently has an agreement with TransAlta to lower the Ghost reservoir level during the flood season in order to maximize the amount of available space to contain flood waters. For example, if this agreement had been in place in 2005, this flood could have been a non-event in Bowness. The 2005 flowrate, just under 800 m3/s, is the threshold at which limited basement (groundwater) and overland flooding begin in Bowness.

For comparison, normal maximum spring flowrates have rarely exceeded 500 m3/s (7 times since 1932), and even more rarely 800 m3/s (twice since 1932), while the 2013 flood rate was 1840 m3/s. The 'base' flow in winter is dominated by groundwater, which enters the Bow locally both from the Paskapoo slopes and Silver Springs all year long.

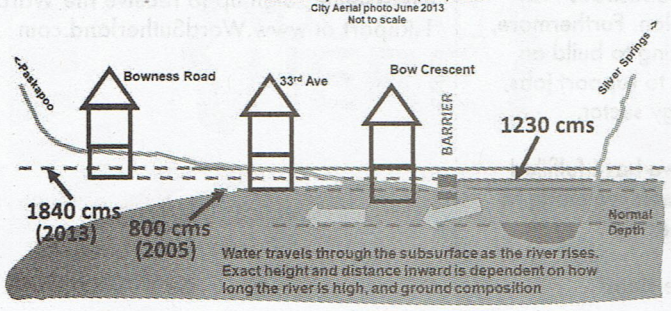
The City plans to flow up to 1230 m3/s with the proposed barrier in place. Engineering studies done thus far for The City suggest widespread basement flooding at 1230 m3/s, with potential overland flooding via seepage to surface behind the barrier. Both problems become more likely and widespread the longer the flowrate is held at this level. A '2013 equivalent' flow rate (1840 m3/s) will overtop the berm. Sump pumps may be of little use under these conditions given the apparent high permeability of local gravels under the ground.
The City has indicated providing barriers to bedrock to prevent groundwater flooding is not economically feasible. Providing upstream mitigation, as is being proposed for the Elbow, is then the only viable option to protect residents from both groundwater and overland flood damages. Residents in Bowness should accept nothing less than the same protection that is being planned for Elbow Park, Mission, and Roxboro communities.

This article was written and submitted on behalf of the Bow River Flood Mitigation Committee. For more information on flood mitigation contact info@bownessrfm.ca or visit bownessrfm.ca.

Flood mitigation information can also be found on the City of Calgary website.

BOWNESS WATER DEPTHS AT VARIOUS FLOWRATES

Sources: City commissioned report April 2018
City Aerial photo June 2013
Not to scale



PROPOSED BOWNESS FLOOD BARRIER – EXPLORING GROUNDWATER MITIGATION

Over the summer, one of the questions we've received from Bownesians is, "How deep will the flood barrier extend into the ground to stop groundwater flooding?"

Groundwater protection is still being considered for the community of Bowness, but before we can determine the proposed depth of the barrier, first we need to understand the groundwater situation more in Bowness.

More research is needed to understand how groundwater and the river interact. That's why we started geotechnical investigations and a groundwater study in January 2019 with current plans to monitor groundwater levels for at least a year. The results from this study will help us understand what mitigation options are available and whether they are feasible.

We're using the same approach on all community flood mitigation projects. First, we need to understand how groundwater moves from and to the river and then we explore what potential options are available and feasible to minimize the risk of groundwater.

How are past conceptual designs being used?

The conceptual design that was completed in the past is not being used or referenced in the design work that is happening now. Those concepts were only used to help calculate the rough costs and benefits associated with a flood barrier. It was also to see if barriers in these general locations was technically feasible.

Since detailed technical studies, for example, geotechnical and groundwater studies, were not a part of the scope of the conceptual design, it has limited applicability into the design options that are currently being explored.

At this point, the project team is working on barrier design options that are based on the studies that are currently underway along with the feedback we've gathered from riverfront residents during one-on-one visits we've completed this past year.

We know from talking to the community, that residents have lots of legitimate questions about the barrier. We hear you and they will be addressed. But at this point, most studies are not complete, so it's still too early to answer many questions that relate to possible design options.

What's coming up?

Our goal at the end of the *Phase 1 – community engagement and studies* is to understand whether a flood barrier is feasible and what it can achieve.

After the studies are complete, the barrier design options will be shared with the riverfront property owners for input and study results will also be shared with the community.

No decisions have been made on what the next steps will be. We're continuing to proceed in phases and are working closely with the community and riverfront residents along the way to gather their input so that we can develop a solution that works for them but also fits within the overall flood mitigation plan for Calgary. Please visit Calgary.ca/bownessbarrier for more details about the timeline.

Do you have a question about the proposed flood barrier? Email us at bownessbarrier@calgary.ca