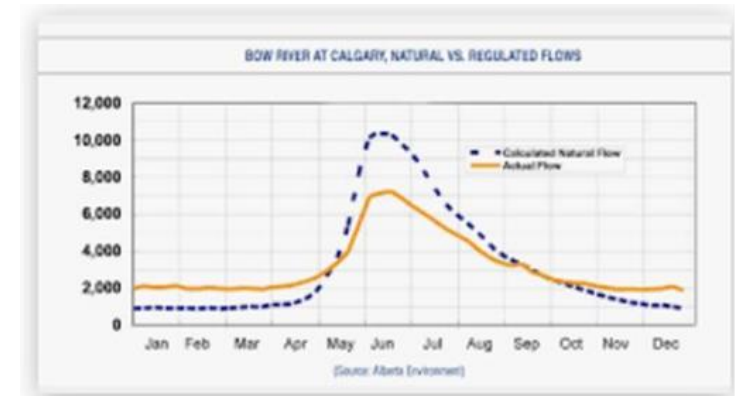


Bowness Responsible Flood Mitigation - BRFM

Advocating for Effective and Equitable Flood Mitigation for Bowness

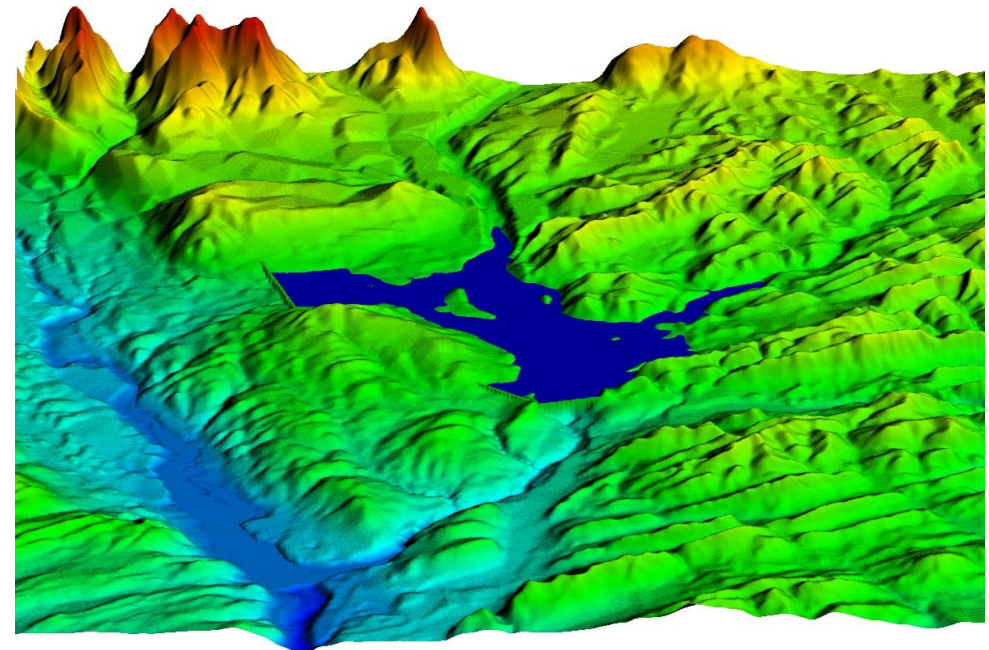
- BRFM formed 6 years ago to advocate for Bowness residents. Our organization seeks a collaborative solutions-oriented relationship with the City of Calgary and GoA
- We have employed technical expertise to review and verify the proposed flood mitigation designs
- City of Calgary Groundwater Study demonstrates that in order to achieve effective and equitable protection, maximum controlled flow rate needs to be less than 800 m³/s.
- Effective climate adaptation strategies will require focus on increasing upstream reservoir size
 - Existing upstream reservoirs on the Bow River have been effective for stabilizing the flow on the Bow River through Calgary;
 - Significantly decrease in spring flow rates (flood control), as demonstrated by flood history; and
 - Maintains stable fall/winter flow rates enhancing fish habitat and hydro-power generation.



BRFM Proposed Water Management Solution

A response to City of Calgary declaration of Climate Emergency

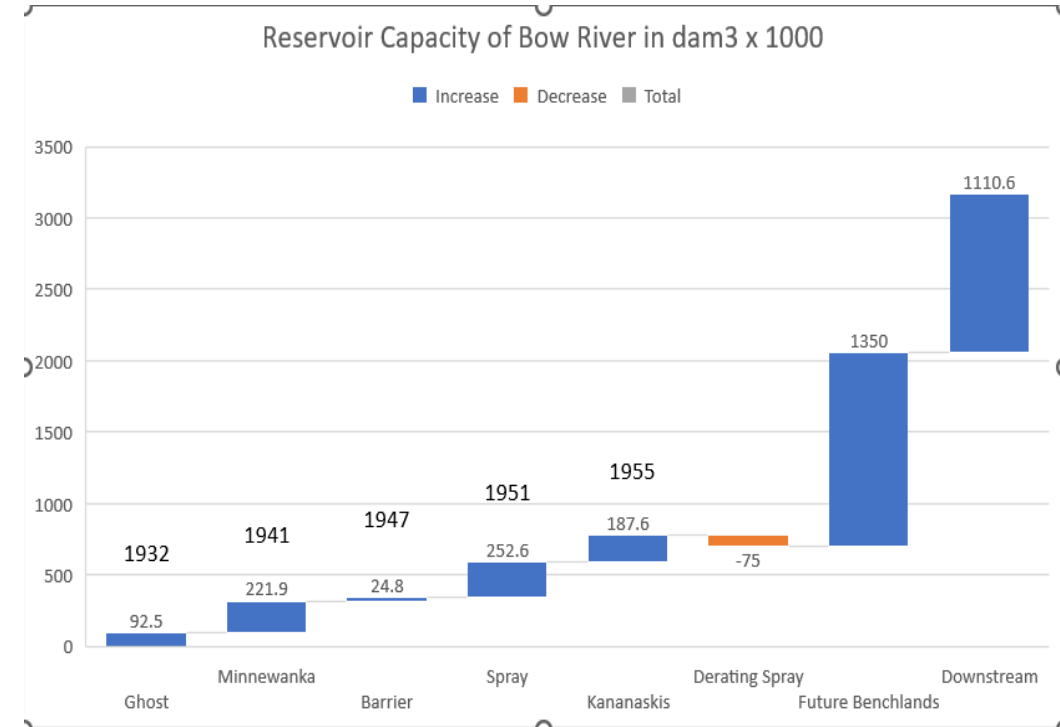
- **Benchlands Hydro-Storage Project is a Climate Adaptation Project**
- Massive Drought Mitigation/Water Security up to 1,350 MM m³
 - More than doubles the current Bow River water storage upstream of Calgary
 - Increases total irrigation water storage on Bow River by over 75%
- Massive Grid Level Green Power Storage with
 - Hydro Storage with capacity of ~1000 MW and +30,000 MWh
 - Provide reliable backup power and storage for intermittent renewable power
 - Could power Calgary for ~1.5 days independent of other power sources.
- Attenuates peak flow rate in both the 100 and 200 year flood to less than 800 m³/s (Current damage threshold and equitable protection with SW communities) with only a single new reservoir.



Benchlands Project Provides Massive Water Security

Water is essential for Calgary/Alberta Economy

- Annual flow of Bow River is about 3MM m³/year. Global warming will increase this to about 3.5MM by 2050
 - More water, but increased drought and flood periods
- **No new dams or reservoir capacity has been added in 70 years – Capacity has been lost over time.**
- Irrigation contributes \$5.4B to Alberta economy. Irrigated land produces 4.5 times higher yield than dryland
- Global warming is increasing frost free growing season and time/temperature days
 - Water is essential to increase food production
 - We export water through food



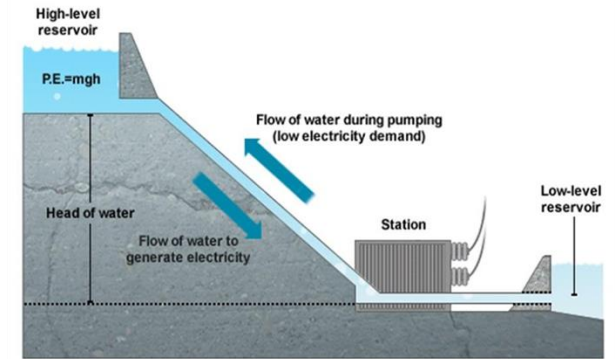
- Proposed Benchlands Reservoir is optimally located
 - Water can be diverted to any downstream reservoir and irrigation can be extended north
 - Evaporation is reduced
 - Maintains stable flow in Calgary for fish habitat

Benchlands Provides Reliable Green Power

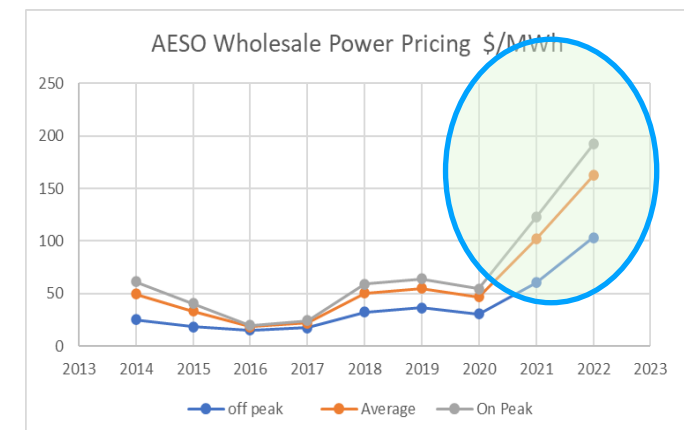
Project Delivers 1000 MW of Hydro Power Storage – 5.5% of Alberta Total Generating Capacity

Enough to power Calgary for ~1.5 days

- Hydro storage is cost effective and proven method of storing grid level power
- Storage is needed as Alberta transitions to interruptible wind and solar power. In 2022 AESO had 7 grid alerts - AESO not able to provide contingency reserve
- High electricity bills are due in large part to the lack of power storage. Spread between off peak and on peak price is widening with increased renewables
- Transition to nuclear or CCS technology will not lessen need for storage
- Benchlands involves no new or unproven technology
- Large hydro storage projects are attractive to private sector with investments of \$3-4B for similar size
 - TC Energy moving forward with similar sized project in Ontario and smaller project in Hinton
 - TransAlta has proposed a similar sized project for Brazeau Dam
 - Market based power trading system integrates power storage



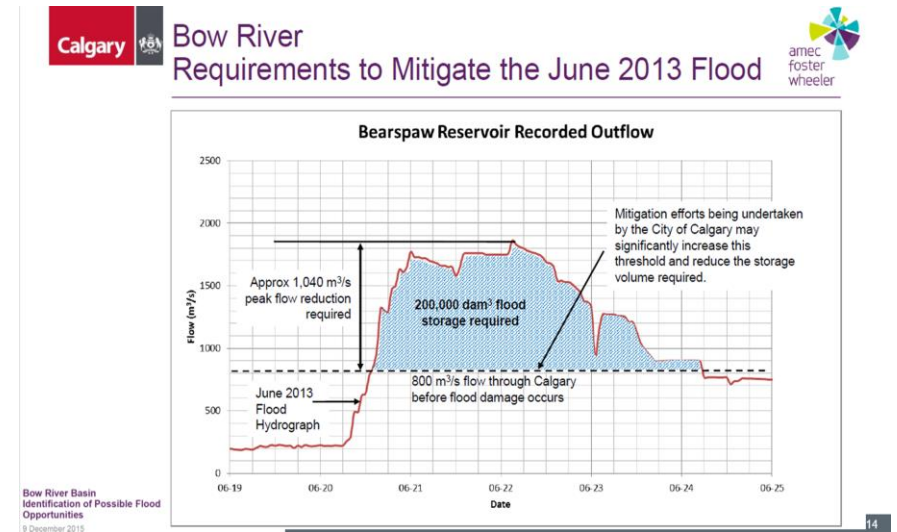
Source Hydro Review



Benchlands Can Achieve 800 m³/s Peak Flow Rate

Can achieve 1:200 year protection (city of Calgary target) with a single new reservoir

- City of Calgary acknowledges that damage threshold flow rate is 800 m³/s in Calgary. Groundwater study has confirmed that Bowness Barrier will not increase damage threshold to 1230 m³/s as proposed.
- Utilizes hydro storage pumping capacity to transfer about 600 m³/sec from Ghost Lake Reservoir to Benchlands Reservoir for 1:200 event.
 - Works in combination with modified operations at Ghost Dam
 - Natural attenuation of Ghost River; a large contributor to both 2005 and 2013 flood.
- Provides both overland and groundwater flood protection for Bow River communities
 - Equitable to SR-1 mitigation for Elbow River communities
 - In SR-1 NRCB hearing the City of Calgary testified that mitigation of groundwater flooding was a requirement for Elbow River mitigation; Bowness deserves the same level of protection.
- As with SR-1, this flood mitigation scheme involves a simple operating protocol that is in response to actual conditions and does not require operator discretion and weather forecast
- This option provides water conservation during heavy rainfall/flooding event that allow for later allocation to irrigation supply.



Benchlands Reservoir is a Generational Opportunity

Climate Adaptation will require bold initiative and leadership

- The current climate crisis will not be addressed only through reducing CO2 emissions. It will require adaptive infrastructure.
- Over 100 years ago our industry and political leaders responded to climate conditions that turned barren land into productive farmland, delivered water security for a growing population and mitigated frequent flooding through reservoir storage.
 - Climate change is presenting the same challenge, and BRFM have a proven solution with expanded water storage.
 - It will be difficult to demonstrate net public good of new flood mitigation reservoir as being currently considered by the BRRO. It will need significant other benefits which Benchlands could provide.
- BRFM has offered innovative solutions to the GoA and the City of Calgary.
- Main obstruction for the Province to move forward with a larger reservoir with 800 m³/s target release rate is that the City of Calgary has asserted they can mitigate flood damage up to 1200 m³/s. The City's own studies have demonstrated that Bowness will continue to experience extensive flood damage.
 - In the Flood Mitigation Measures Assessment (FMMA) A TBL, for the Bow River options considered, in all three categories the option of a larger reservoir and no community barriers scored higher than the recommended option of a smaller reservoir and community barriers. A 4th criteria called "implementation" outweighed the other 3 categories. Why are we not pursuing the best option from the TBL? Why are we not asking for what we need from the GoA?
- BRFM requests the City of Calgary to join us in advocacy for effective and equitable flood mitigation providing both overland and groundwater mitigation. - Increase upstream reservoir and reduce peak flow rate to 800 m³/s