



# **Springbank Off-stream Reservoir (SR1)**

NRCB Hearing: Topic 1  
Summary of Exhibits 253, 254

Karin Hunter, BCom Finance, CFA  
On behalf of the Springbank Concerned  
Landowners Group (SCLG)



# Introduction

- Project Purpose and Need
  - In 2015, AEP chose SR1 because it was “less expensive, more environmentally friendly” and “could be delivered on a shorter timeline”
  - Focus is on Calgary ‘downstream of the Glenmore Reservoir’, rather than the best outcome for all Elbow River communities
  - SR1 protects fewer communities and provides less protection at higher flow rates than MC1
  - SR1 has serious design limitations and flaws that impact its ability to achieve its purpose
  - SR1 Flood Mitigation DOES NOT Meet Government of Alberta and Canadian Dam Association guidelines for flood protection
- Social and Economic Costs and Benefits
  - SR1 costs have increased by over 2.5x since original estimates
  - Alberta Transportation’s own materials acknowledge that SR1 has a lower benefit/cost ratio than MC1
  - Alberta Transportation’s air quality expert acknowledges “unacceptable short term risk to human health” due to unsafe air quality levels; the 2018 EIA contained a calculation error that resulted in emissions doubling (2x) in Exhibit 327, pg 72.
  - Thousands of children will be in the “blast zone”, immediately downwind of SR1
  - What is an acceptable length of time that children should be knowingly and intentionally exposed to unsafe air quality levels?
- Alternatives Considered
  - MC1 provides superior flood protection for more communities under a wider range of flood conditions
  - SR1 results in glaring inequities and has serious design limitations with long-term consequences
- Crown Engagement with the Public
  - Has Alberta Transportation intentionally omitted material facts regarding SR1 that have led the public to fundamentally incorrect conclusions regarding the risks and benefits of the project?

# Project Purpose and Need

Is there a comparable project anywhere to SR1 in the world? – Springbank Open House Question

“Frankly, no there is nothing exactly like this...”

- *Matt Wood, Senior Associate - Chief Natural Systems Design Engineer, Stantec, September 24, 2020*

## Project Purpose and Need

- In 2015, AEP chose SR1 because it was “less expensive, more environmentally friendly” and “could be delivered on a shorter timeline” (Exhibit 252)
  - The Project was designed to hold storage volume of 70 million m<sup>3</sup>
    - Focus was on Calgary downstream of the Glenmore Reservoir, rather than the best outcome for all communities
  - SR1 has serious design limitations that impact its ability to achieve its objective
    - Volume vs flow rate: SR1’s effectiveness is capped at a level that is well below flow rate levels experienced during the 2013 Elbow River flood
      - In a “design flood”, SR1 will only be able to divert less than half of the 1,240 m<sup>3</sup>/s flow rate (to a maximum of 600 m<sup>3</sup>/s)
      - In a “design flood”, the communities downstream of SR1 and west of the Glenmore Reservoir, which include but are not limited to Springbank, Elbow Valley and Discovery Ridge, will experience flooding
  - SR1 DOES NOT meet Government of Alberta, Canadian Dam Association and City of Calgary standards for flood protection
    - All state a minimum of a “1 in 100 year” level of flood protection
      - Alberta Transportation acknowledges “...that the residual flood risk downstream of SR1 and upstream of the Glenmore Reservoir from 640 m<sup>3</sup>/s during a 2013 flood event is similar to that of 1:50-year flood”, Exhibit 327, pg 40
      - SR1 results in obvious inequity in flood protection
  - SR1 does not address the challenges of climate change
    - Lack of consideration for drought and extreme weather events
  - Risk
    - The SR1 design is an unprecedented approach to flood mitigation in Canada, as acknowledged by Stantec
    - The Canadian Dam Association does not have standards that apply to all elements of the Project

# Alternatives Considered

Utilizing Alberta Transportation's data, SR1 is proven to be an inferior project to the MC1 alternative for flood mitigation.  
As per Alberta Transportation's own submissions, MC1 has a superior benefit cost ratio than SR1.

# Alternatives Considered: The Inconvenient Truth for Alberta Transportation about SR1 vs MC1

- SR1 results in glaring inequity in flood protection due to location and diversion limitation; MC1 provides equity
- SR1 Project was designed for the singular benefit of areas 'Downstream of Glenmore Reservoir' with little or no apparent consideration for areas 'Upstream of Glenmore Reservoir'

## MC1 Protects More Communities and More Property at Higher Flowrates than SR1

Scenario 1: 930 m3/s Flood <sup>(1)</sup> "1:100"				Scenario 2: 1,240 m3/s Flood <sup>(1)</sup> "Design Flood"				Scenario 3: 1,984 m3/s Flood <sup>(1)</sup> "1:1000"			
River Flowrate				River Flowrate				River Flowrate			
	Upstream of SR1	Between SR1 and Glenmore Reservoir <sup>(5)</sup>	Downstream of Glenmore Reservoir		Upstream of SR1	Between SR1 and Glenmore Reservoir <sup>(5)</sup>	Downstream of Glenmore Reservoir		Upstream of SR1	Between SR1 and Glenmore Reservoir <sup>(5)</sup>	Downstream of Glenmore Reservoir
SR1	930 m3/s Flooding <sup>(2)</sup>	330 m3/s Flooding <sup>(4)</sup>	160 m3/s	SR1	1,240 m3/s Flooding <sup>(2)</sup>	640 m3/s Flooding <sup>(4)</sup>	160 m3/s	SR1	1,984 m3/s Flooding	1,384 m3/s Flooding	??
MC1 <sup>(3)</sup>	212 m3/s	212 m3/s	170 m3/s	MC1 <sup>(3)</sup>	212 m3/s	212 m3/s	170 m3/s	MC1 <sup>(3)</sup>	830 m3/s	830 m3/s	??
	SR1 Inferior	SR1 Inferior	Neutral		SR1 Inferior	SR1 Inferior	Neutral		SR1 Inferior	SR1 Inferior	SR1 Inferior

Notes:

- Scenarios and rates for MC1 from MC1 Conceptual Design Report, Exhibit 101, page 46, dated August 23, 2017
- Bragg Creek Berms designed for 990m3/s or 1:100 level of overland flooding; protection against groundwater flooding not expected
- Maximum target outflow of MC1 was designed at 212 m3/s as the level required for Glenmore Reservoir operations
- Groundwater flooding and some overland flooding experienced in the 2005 flood for these communities. 2005 flood ~300m3/s
- Assumed diversion rate for SR1 of 600m3/s per 2018 EIA. Exhibit 159, page 83 reduces this to 480m3/s, which is not reflected above


MC1 Better Protection
Neutral
SR1 Inferior to MC1


SR1 is blatantly inferior in higher flowrates



















Notes: See page number 22 for details. MC1 numbers and return periods from Exhibit 101 MC1 Conceptual Design Report, pg 46. SR1 assumed 600m3/s diversion capacity, which is adjusted to 480m3/s in Exhibit 159.

# Alternatives Considered: MC1 vs SR1 – Other Considerations

– SR1 is a vastly inferior alternative with numerous significantly negative outcomes

 MC1 Superior vs SR1

 SR1 Inferior vs MC1

	MC1 (Exhibit 101)	SR1
<b>Climate Change</b>	 - Can be used for drought and higher levels of flow rates, better able to respond to back-to-back storm event as its pool level can be lowered more quickly than SR1	 - Experts agree that climate change is a significant risk for the operations of the project and the structure itself  - Exhibit 325 pg 9: Alberta Transportation states that drought management will be addressed by a new reservoir on the Bow River
<b>Sedimentation</b>	 - Sediment remains under water, in the river system (like Glenmore Reservoir)	 - Massive expected sediment deposition with uncertain long-term environmental effects and expected air quality deterioration
<b>Community Impacts</b>	- None mentioned	 - Drastic changes to the Springbank community – loss of heritage land, businesses, recreation, ongoing disruption due to road closures, future planning, and more
<b>Land Use</b>	 - Some new recreation capacity created (replace Allen Bill pond) and certain park infrastructure moved / replaced	 - Effects of sedimentation are negative and a long term view of the reservoir is lacking. Land use plans which will be designed by AEP, are uncertain and dependent on future flood events.
<b>Air</b>	 - Post flood dust due to wind erosion (however, much sediment retained under water)	 - Fugitive dust could still result in “unacceptable short-term risk to human health” (AT, Exhibit 327 page 94)
<b>Operating Risk</b>	 - “Relatively easy to operate”, no meaningful issues with debris management identified	 - Not mentioned by Alberta Transportation, but significant operating risks raised by SCLG experts
<b>Wildlife / Fish</b>	 - Positive benefits identified through creation of a lake habitat/ecosystem; fish habitat will increase	 - Cliff Wallis (Exhibit 271, pg 2): “The project will have significant adverse effects on biodiversity during construction and operation (inside and outside of flood events).”  - AEP states possible extirpation of Bull Trout (Exhibit 187)
<b>Water Quality and Quantity</b>	- Unclear	 - Experts raise serious concerns about groundwater impacts and risks  - “Monitor” does not “mitigate”, or manage the risk in advance  - You cannot “unbake the cake” once the project is built and the water system is irrevocably changed

# Economic Benefits and Costs

A key criteria for choosing SR1 over MC1 was cost. Since then, known costs have increased 2.5x. Alberta Transportation states “Nor are the cost increases significant”. (Exhibit 325, page 21)

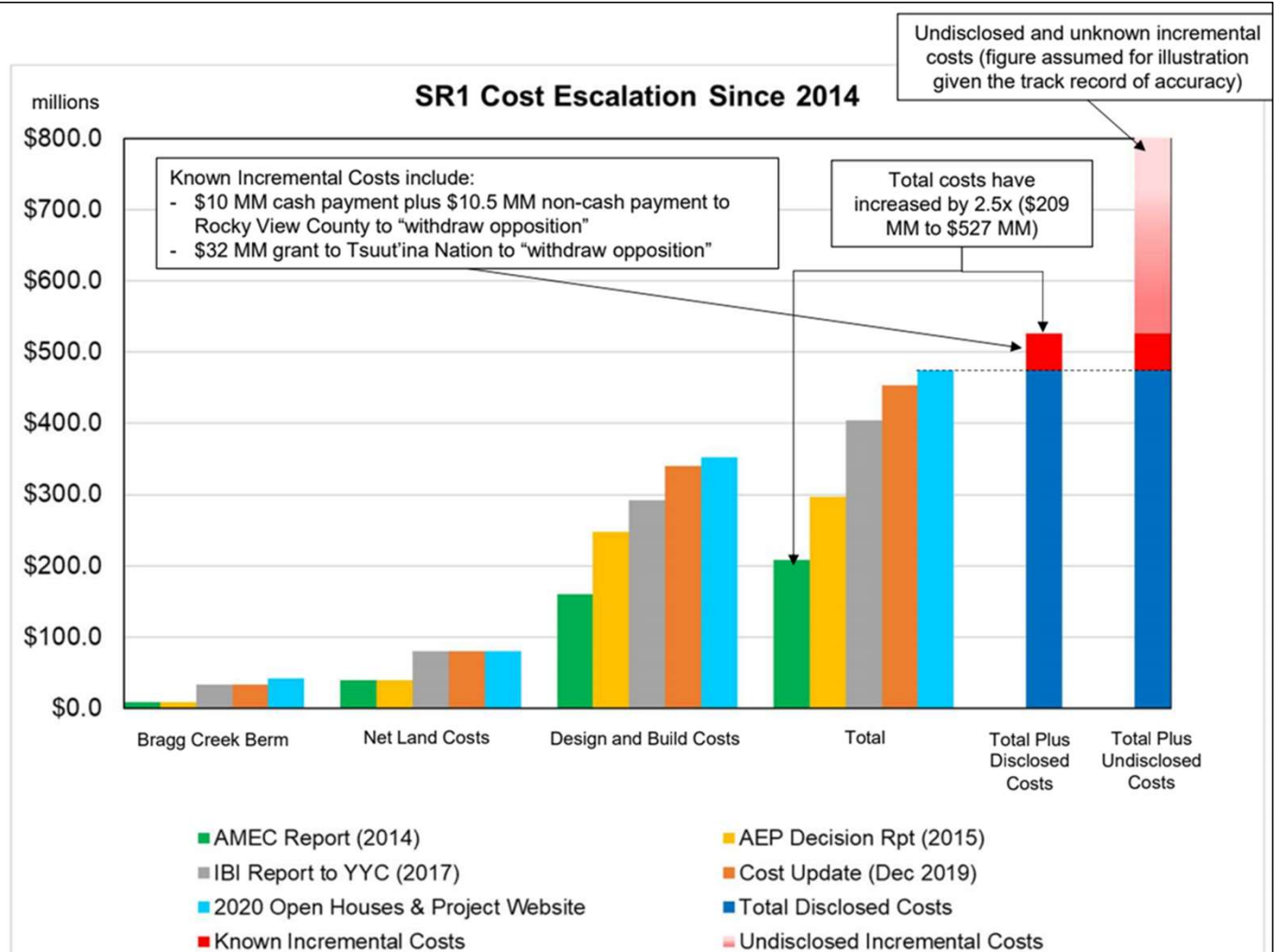


## SR1 Costs Have Continued to Escalate: SR1 Costs Have Increased by Over 2.5x Since Original Estimates

- Why is this important? SR1 was considered “the lowest cost alternative”

### SR1 Cost Escalation

- Alberta Transportation stated that SR1 represented the lowest cost alternative
- Since the decision was made to pursue the SR1 option, the costs have escalated from \$209 million (AMEC 2014) to \$527 million (Total plus Known Incremental Costs for Rocky View County and Tsuut’ina Nation to withdraw opposition)
  - This represents a 2.5x increase in costs
  - This does not include any undisclosed costs



## Updated Benefit/Cost from IBI: The Proponent's own Data Proves That SR1 has a Lower Benefit/Cost Ratio than MC1

- According to the Proponent's own data from 2019 (Exhibit 100), SR1 has a WORSE benefit/cost ratio than MC1
- The Proponent has an obligation to update the 2019 Benefit/Costs Analysis with the latest capital costs for SR1, using the same 2019 date for equivalent and comparable purposes
  - SR1 Capital costs, including land, have increased \$17 million between Exhibit 100, \$463M (April 2019) and Exhibit 159, \$480M (Appendix G.2)
  - Any new capital costs, such as the Emergency Spillway channel, identified in 2020 have yet to be accounted for and must be included; CEEA conditions introduce substantial new cost uncertainty (embankment riprap)
- Regarding benefits, MC1 provides improved flow mitigation over SR1
  - Benefits for MC1 should include the value of avoided damages for communities upstream of the Glenmore Reservoir at the rate differential between SR1 and MC1

**Table IR22-1 Present Values Assuming a 4% Discount Rate**

Indicator	2017 analysis		2019 analysis	
	SR1	MC1 Option	SR1	MC1 Option
PV Benefits	\$653,008,000	\$578,997,000	\$591,610,000	\$481,467,000
PV Costs	\$388,943,000	\$402,999,000	\$432,258,000	\$340,832,000
Net Present Value	\$264,065,000	\$175,998,000	\$159,352,000	\$140,635,000
Benefit/Cost Ratio	1.68	1.44	1.37	1.41

Including Bragg Creek (IR30), Exhibit 90: Benefit/Cost Ratio of 1.28 for SR1 including \$32M for Bragg Berms, page 59

Exhibit 90, Page , IR22-1 and IR30, page 50

The flood mitigation at Bragg Creek is a separate project, already underway. However, if the estimated \$32.8 million for Bragg Creek flood protection is added to the projected costs of SR1 in 2019, and the \$180,000 in AAD added to the benefits for that protection, the benefit cost ratio would decrease from 1.37 to 1.28.

# Social Benefits and Costs

What is the benefit for Springbank? – Springbank Open House Question  
“...there is probably not a whole lot of benefit... [of SR1] in that your life will be better.”  
- Minister Ric McIver, September 24, 2020

**SR1 – 3,610 to 6,900 acres**

- Stanley Park, 1,000 acres
- Fish Creek Park 3,350 acres
- Central Park, NYC, 840 acres
- Nose Hill Park, 2,790 acres
- Calgary Zoo: 92 acres

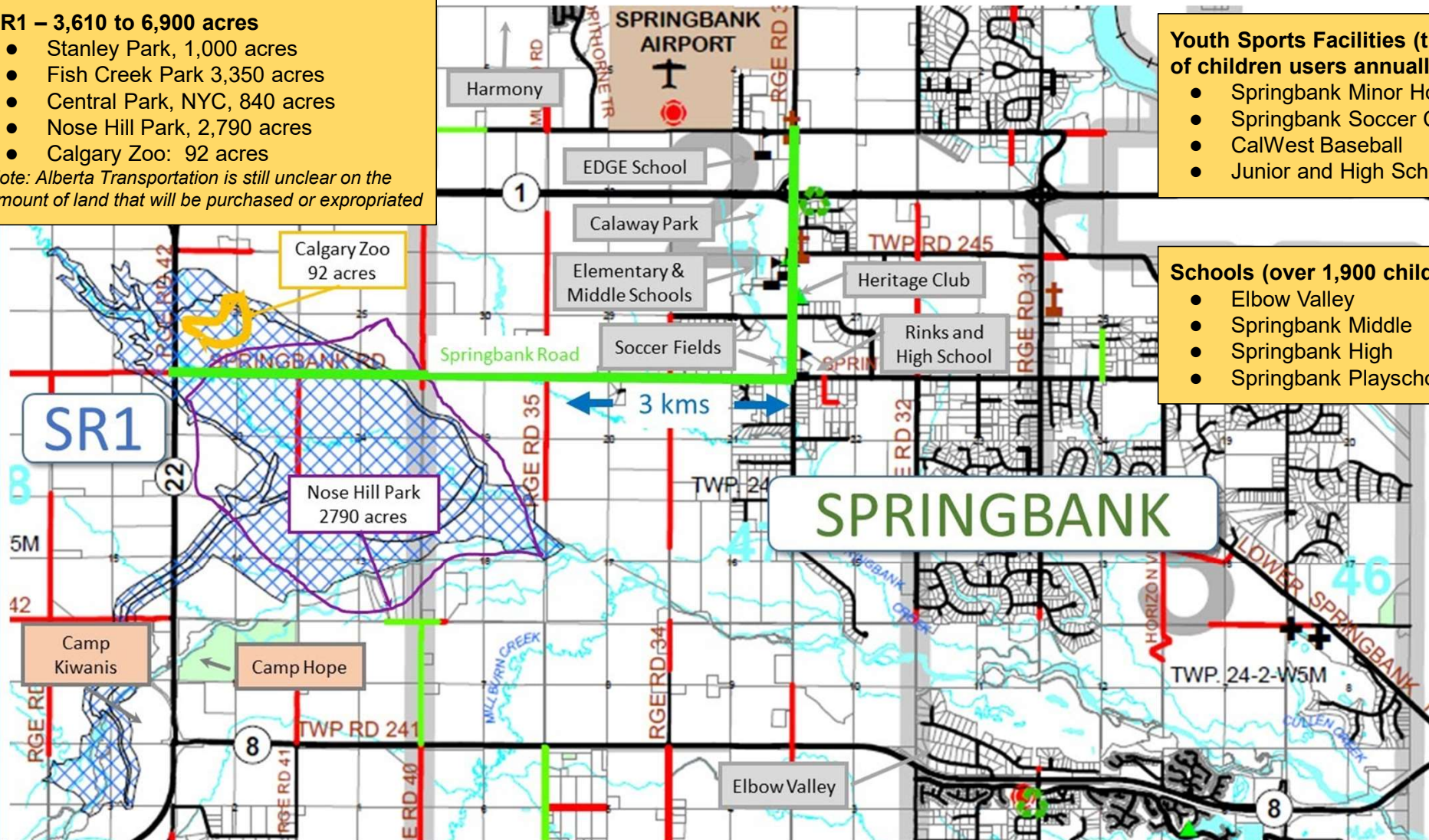
*Note: Alberta Transportation is still unclear on the amount of land that will be purchased or expropriated*

**Youth Sports Facilities (thousands of children users annually)**

- Springbank Minor Hockey
- Springbank Soccer Club
- CalWest Baseball
- Junior and High School Football












**Schools (over 1,900 children)**

- Elbow Valley
- Springbank Middle
- Springbank High
- Springbank Playschool





## SR1 is Riddled With Numerous and Significant Negative Outcomes

- To achieve inferior outcomes vs. MC1, SR1 creates a litany of unexpected negative effects; no outcomes have improved since 2015 Decision Report

	Current
<b>Climate Change</b>	 Experts agree that climate change is a significant risk for the operations of the project and the structure itself
<b>Sedimentation</b>	 Massive expected sediment deposition with uncertain long-term environmental effects and expected air quality deterioration
<b>Community Impacts</b>	 Drastic changes to the Springbank community – loss of heritage land, businesses, recreation, ongoing disruption due to road closures, future planning, and more
<b>Land Use</b>	 Effects of sedimentation are negative and a long term view of the reservoir is lacking. Land use plans which will be designed by AEP, are uncertain and dependent on future flood events
<b>Air Quality</b>	 Fugitive dust could still result in “ <b>unacceptable short-term risk to human health</b> ” (AT, Exhibit 327 page 94)
<b>Operating Risk</b>	 Not mentioned by Alberta Transportation, but significant operating risks raised by SCLG experts
<b>Wildlife / Fish</b>	 Cliff Wallis (Exhibit 271, pg 2): “The project will have significant adverse effects on biodiversity during construction and operation (inside and outside of flood events)”  AEP states possible extirpation of Bull Trout (Exhibit 187)
<b>Water Quality and Quantity</b>	 Experts raise serious concerns about groundwater impacts and risks  “Monitor” does not “mitigate” or manage the risk in advance; “monitor” only watches the damage happen  You cannot “unbake the cake” once the project is built and the water system is irrevocably changed

Note: (1) Exhibits 13 and 252

 SR1 Outcomes Improved Since 2015 Report <sup>(1)</sup>

 SR1 Outcomes Worsened Since 2015 Report <sup>(1)</sup>

# Crown Engagement with the Public

*“Alberta Transportation understands that some local landowners are upset at the prospect of losing lands that have been in their families for generations. It recognizes that SR1 impacts the lives of a number of people. Unfortunately, public works projects which require the acquisition of private land do give rise to these type of impacts.” (Exhibit 325, page 10)*

## Crown Engagement with the Public: Misleading Information on SR1

- SR1 and MC1 are not equal. MC1 provides superior flood mitigation outcomes.
- When was this known? Who was told? Was this information intentionally withheld?

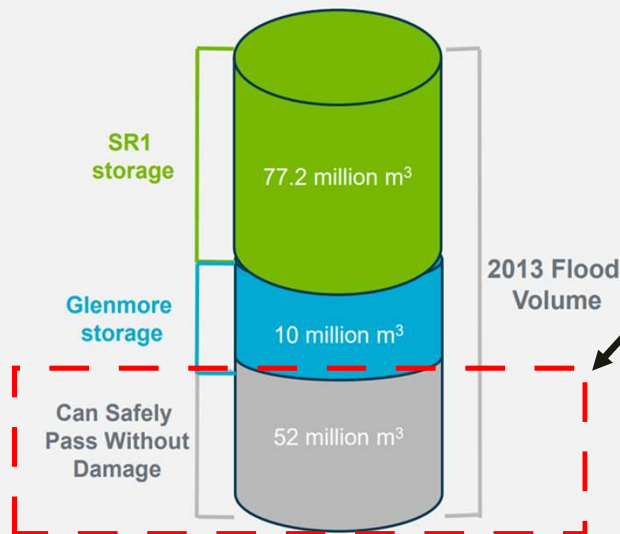
Source: Deltares Report (2015) <sup>(1)</sup>

We conclude that, based on the current design concepts, both storage sites can provide the **required storage** for the 1:200 event used as design flood. As with all detention measures, the effect of storage heavily depends on the expected range in possible flood hydrographs, accurate forecasts and quick response in the operation of the gates. Both schemes would be best positioned as a part of an overall plan for water management within the watershed.

We estimate that MC1 and SR1 would achieve a similar reduction in flood risk once built. SR1

- This is blatantly untrue
- It appears that NO comparison of SR1 and MC1 flood rate analysis was performed
- Using the Proponent's own data, it is clear that MC1 has superior flood reduction capabilities across a range of flood scenarios with the added benefit of its location which protects more communities

### How Does SR1 Work?



- The Proponent has used this illustration on multiple occasions to discuss the benefits of SR1 <sup>(2)</sup>
  - It has NEVER been clearly stated that communities upstream of the Glenmore Reservoir WILL STILL FLOOD under a “design flood” with SR1
- The full benefits of SR1 accrue to communities downstream of the Glenmore Reservoir
  - Therefore “without damage” (per the illustration) is HIGHLY MISLEADING and a MISREPRESENTATION OF FACTS
- With SR1, Bragg Creek is only 1:100 (2013 is 1:200) and Springbank protected to less than 1:50 <sup>(3)</sup>

Notes:

(1) Exhibit 13, Deltares Report

(2) <https://www.alberta.ca/assets/documents/tr-springbank-reservoir-open-house.pdf>, page 5; note, that the 2018 Open House Boards refer to 70.2M m3

(3) Exhibit 325, AT response to submissions, Exhibit 327 page 40

## Crown Engagement with the Public: Full Disclosure of Facts?

- **With SR1, communities between Glenmore Reservoir and SR1 still experience flooding in a design flood.**
  - With SR1, a design flood will cause flooding in communities upstream (west) of Glenmore Reservoir but not residents downstream of the Glenmore Reservoir <sup>(1)</sup>
  - Was the Proponent aware that flood outcomes were so obviously unequal for the various Elbow River communities with the SR1 project?
    - This has NOT been clearly communicated to stakeholders
  - Was the Proponent aware that MC1 provides superior protection at higher river flow rates? <sup>(2)</sup>
  - Was the Proponent aware that there will be “unacceptable short term risk to human health” <sup>(3)</sup> due to unsafe air quality levels (with thousands of children located directly in the “blast zone”)?
  - Why is it that the SCLG, comprised of volunteers, was forced to highlight these facts?
    - Alberta Transportation only acknowledged the unequal outcomes in the event of a design flood and “unacceptable short term risk to human health” issues associated with air quality following SCLG exposure of these items in its submissions to the NRCB
  - If the Proponent **was not aware of these consequences**, they did not perform the appropriate analysis and due diligence
    - This is equivalent to “professional malpractice” and/or incompetence
  - If the Proponent **was aware of these consequences**, but chose not to clearly communicate these facts to stakeholders, or withhold these facts
    - This is equivalent to a wilful misrepresentation, omission, or obfuscation of material facts
  - Has the Proponent intentionally withheld or obfuscated material facts regarding SR1 that ultimately led to fundamentally incorrect conclusions regarding the risks and benefits of the project?

**None of these situations are acceptable.**  
The Alberta Government and Alberta Transportation has a due diligence obligation and an obligation of full disclosure without withholding, omitting or obfuscating facts.

### Notes:

(1) Exhibit 265, page iv, Alberta Environment and Parks (2020) forecast a flowrate during a 1:200 year flood of up to 1,900 CMS.

(2) Exhibit 101, page 46 dated Aug 23, 2017.

(3) Disclosed through Exhibit 327, page 94 on March 11, 2021.



# Full, True, Plain Disclosure: Misleading the Public on SR1

– We have been misled by the Proponent on the risks and benefits of the SR1 Project

	Proponent Statement	Reality
<b>SR1 vs MC1</b>	<ul style="list-style-type: none"> <li>MC1 and SR1 are equal for flood mitigation</li> </ul>	<p><b>✗</b> FALSE. MC1 Is Superior</p> <ul style="list-style-type: none"> <li>Use of volumes, rather than rates to compare the Projects, when rates is a critical limitation for SR1</li> </ul>
	<ul style="list-style-type: none"> <li>SR1 + Bragg Creek Berms is equivalent protection to MC1</li> </ul>	<p><b>✗</b> FALSE. MC1 Is Superior as it provides far better protection to Bragg Creek and Redwood Meadows and will more effectively manage risk from groundwater flooding due to keeping river rates lower</p>
<b>SR1 Effectiveness</b>	<ul style="list-style-type: none"> <li>Presentation of data implies SR1 protect all communities downstream</li> </ul>	<p><b>✗</b> FALSE. MC1 protects more communities, more equitably</p> <ul style="list-style-type: none"> <li>Lack of transparency on the unequal outcomes of SR1 for downstream communities is MISLEADING</li> <li>SR1 does not protect Springbank, Elbow Valley and Discovery Ridge to Alberta Guidelines of 1:100</li> </ul>
<b>MC1 as a Water Storage Facility</b>	<ul style="list-style-type: none"> <li>Communication by the Proponent at Open Houses in 2020 that MC1 does not act as a water storage facility                             <ul style="list-style-type: none"> <li>Mclver, October 8, 2020: “I am sure, because I have asked the question, MC1 did not contemplate a bunch of water storage”</li> <li>Matt Wood, October 8, 2020: Stantec: “MC1 has a ...sediment control pond”</li> </ul> </li> </ul>	<p><b>✗</b> FALSE. MC1 will act as a water storage facility</p> <ul style="list-style-type: none"> <li>Exhibit 101, MC1 Conceptual Design Report,                             <ul style="list-style-type: none"> <li>Pg 11: “permanent pond of approximately 180 acres approximately 15 meters deep”</li> <li>Pg 55: “...the preliminary operating strategy for MC1 has focused primarily on flood management. However, the permanent storage of the facility can also be used to provide additional water supply in the event of an extreme drought. If needed, the projects 3,500 dam<sup>3</sup> permanent storage volume could be utilized to augment flow releases during a severe drought period.... it may even be desirable to increase the project permanent pool level. This could be assessed as a part of future optimization studies should the project...”</li> </ul> </li> <li>Exhibit 3, MC1 Environmental Screening                             <ul style="list-style-type: none"> <li>Pg 67: “The creation of a permanent pond behind the dam is identified as a potential positive effect on recreational use...”</li> </ul> </li> </ul>
<b>Reduction of Diversion Rate</b>	<ul style="list-style-type: none"> <li>Reduction of diversion rate from 600m<sup>3</sup>/s to 480m<sup>3</sup>/s between 2018 EIA and 2020 Design Report</li> </ul>	<p><b>✗</b> NOT MENTIONED / HIDDEN</p> <ul style="list-style-type: none"> <li>Not included on the Change Summary Memo (Exhibit 160)</li> <li>This has significant consequences for flooding downstream of SR1 – another 120m<sup>3</sup>/s going down the river in a design flood (640m<sup>3</sup>/s to 760m<sup>3</sup>/s). This is not acceptable.</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>Unacceptable short term risk to human health</li> </ul>	<p><b>✗</b> ERRORS, FACTS WITHHELD</p> <ul style="list-style-type: none"> <li>Calculation error that resulted in emissions doubling (2x) in Exhibit 327, pg 72.</li> <li>“Unacceptable short term risk to human health” only disclosed 11 days prior to the NRCB hearing</li> </ul>

# Conclusion

## Conclusions

- ✗ Alberta Transportation's own data demonstrates MC1 is a more effective and equitable alternative
- ✗ The magnitude and number of changes in cost, scope, and the negative social and environmental outcomes have undermined the original decision
- ✗ Alberta Transportation's own air quality expert states SR1 will create "unacceptable short term risk to human health" for thousands of children in the "blast zone" (while concluding that effects "not significant, adverse", Exhibit 327, pg 94)
- ✗ The level of flood protection for communities between SR1 and the Glenmore Reservoir is below all stated minimum standards
  - Canadian Dam Association guidelines state a minimum level of "1 in 100 year" level of flood protection
  - Alberta Environment and Parks minimum recommendation is "1 in 100 year" level of flood protection for long term planning
  - City of Calgary bylaws are based on a "1 in 100 year" level of flood protection
  - Alberta Transportation acknowledges that communities downstream of SR1 and upstream of the Glenmore Reservoir are only protected from less than "1 in 50 year" flood
- How is the SR1 Project worthy of approval? How did it get this far?
  - The argument from the Proponent seems to be little more than "it is better than nothing"
  - Is "better than nothing" an appropriate test of Public Interest?

## Panel: Suggested Questions to Ask

- **This discussion/presentation was limited due to time constraints. Therefore, I respectfully request that the Panel consider asking me the following questions**
  - How many children go to school and play sports in the “blast zone” that is immediately downwind of SR1 that will be exposed to “unacceptable short term risk to human health”?
    - What is an acceptable number of children that should be knowingly and intentionally exposed to unsafe air quality levels?
    - What is an acceptable length of time that children should be knowingly and intentionally exposed to unsafe air quality levels?
  - Unequal flood outcomes
    - What material facts do you believe that Alberta Transportation withheld or failed to disclose? Why do you believe they did this?
    - Why is Calgary protected in a 1:200 year flood and the areas upstream of the Glenmore Reservoir are only in a less than 1:50 year flood?
      - Why did Alberta Transportation accept, support and pursue a project that contravenes its own guidelines of “1 in 100 year” level of flood protection and the minimum levels of protection of the Canadian Dam Association, the Alberta Government, Alberta Environment and Parks, and City of Calgary bylaws that all state “1 in 100 year” level of flood protection?
  - MC1 vs SR1
    - Why do you think SR1 was chosen over MC1?
    - What makes MC1 better than SR1?
  - Post-Flood Environment
    - How much sediment and debris will be deposited in SR1 post-flood?
    - What does the landscape really look like post-flood with SR1 and over the long-term?



# Supporting Data

## SR1: Changes in Scope: "Decision" to "Present"

- The SR1 project has experienced material project changes since the initial "decision to pursue SR1"

	<b>"Decision": 2014/2015</b> <b>Exhibit 275 pg 59, 71</b>	<b>"Present": 2021</b> <b>Exhibit 100</b>
Land Footprint	1,760 acres	6,900 acres Total ~3,600 acres PDA
Land Cost	\$40 million	\$140 million
Project Costs - Incl Land, Construction	\$209 million	\$527 million (known costs)
"Decision" report states +\$55 million for 1:200 (Option)		
	<b>Exhibit 275 pg 31</b>	<b>Exhibit 159</b>
Flood Protection	<b>1:100</b>	<b>1:200</b>
Diversion Rate	300m <sup>3</sup> /s	600m <sup>3</sup> /s
Diversion Water Depth	3.2 metres	6 metres
Debris Deflector	n/a	7 meters, 170 meters long
Diversion Inlet Height	9.5 meters	13 meters
Embankment Height	24 meters	29-30 meters
Embankment Length	3 km	3.7 km
Embankment Width (max)	180 meters (est)	275 meters
Reservoir Capacity (net)	56,000 dam <sup>3</sup>	70,200 dam <sup>3</sup>
Service Spillway Height	9 meters	12 meters
Low Level Outlet	20m <sup>3</sup> /s	27m <sup>3</sup> /s
Low Level Outlet Location	Unnamed Creek	Moved 190 meters
Unnamed Creek (in Reservoir)	Natural	Redirected
Unnamed Creek (East)	Natural	Erosion Control
Retention Times	Late Release	Early Release
Sediment Deposition (Design)	Not mentioned	2.3 million tons
Impacted Property Access	Not mentioned	Additional 10 properties

Debris was not considered an issue with SR1 when it was chosen; this is a critical oversight that raise questions about the unprecedented design and effectiveness of the Project

## SR1 has design limitations that restrict its ability to respond to flood and risk events

	<b>SR1</b>	<b>MC1</b>
	<b>Exhibit 159</b>	<b>Exhibit 101</b>
Storage Capacity (m <sup>3</sup> ), net flood storage	70,210,000	70,100,000 <sup>(3)(4)</sup>
Restriction on Reservoir Intake	600m <sup>3</sup> /s <sup>(1)</sup> / 480m <sup>3</sup> /s <sup>(2)</sup>	PMF
Restriction on Reservoir Outflow	27m <sup>3</sup> /s <sup>(5)</sup>	2,600m <sup>3</sup> /s <sup>(6)</sup>
	<b>SR1 Underforms MC1</b>	<b>MC1 Outperforms SR1</b>

### Notes:

1. SR1 EIA, 2018, Exhibit 18
2. SR1 Design Report December 2020, Exhibit 159, page 83
3. MC1 water storage is 93,000dam<sup>3</sup> in a PMF, Exhibit 101, page 46
4. MC1 gross volume is 73,600 dam<sup>3</sup> in a 1:1000 flood, including permanent water of 3,500 dam<sup>3</sup>
5. SR1 Design Report Exhibit 159, pg 202
6. MC1 Conceptual Design Report, 2017, Exhibit 101, page 46

## The diversion cap of 600m<sup>3</sup>/s is a significant limiting element on SR1 benefits

- SR1 design has two limiting factors: volume and diversion capacity
- The alternative at MC1 does not have a diversion limit
- As the floods become larger, SR1 underperformance vs MC1 is magnified

### Flowrate Sensitivity: SR1 vs MC1 and MC1 Benefit

Illustration	River Flowrate (m <sup>3</sup> /s) (A)	SR1		MC1 Report (Aug 2017) <sup>(1)(2)(3)</sup>	MC1 Benefit vs SR1 (m <sup>3</sup> /s)	Outcome
		SR1 Flowrate Diversion (m <sup>3</sup> /s) (B)	Elbow River Adjusted Flowrate (m <sup>3</sup> /s) (A - B)	Elbow River Adjusted Flowrate (m <sup>3</sup> /s)		
	Up to 160	0	Up to 160	Up to 160	Neutral	Neutral Outcome: SR1 = MC1
1:20	440	280	160	212	Neutral	Neutral Outcome: SR1 = MC1
	760	600	160	212	Neutral	Neutral Outcome: SR1 = MC1
1:100	930	600	330	212	118 lower	SR1 inferior outcome
Design Flood	1,240	600	640	212	428 lower	SR1 vastly inferior outcome
1:200 per AEP	1,900	600	1,300	n/a	n/a	MC1 Report did not provide 1,900 m <sup>3</sup> /s
1:1000	1,984	600	1,384	830	554 lower	SR1 vastly inferior outcome

#### Notes:

1. Scenarios and rates for MC1 from MC1 Conceptual Design Report, Exhibit 101, page 46, dated August 23, 2017
2. Maximum target outflow of MC1 was designed at 212 m<sup>3</sup>/s; a sensitivity to this figure was not provided
3. 212 m<sup>3</sup>/s was identified as the average rate that could be managed by the Glenmore Reservoir



# Flow Rate Illustration and Analysis

- With a flowrate maximum capacity of 600 m3/s, SR1 benefits fall woefully short of the flowrate decrease required to protect communities upstream (west) of the Glenmore Reservoir

## SR1 Details - Flowrate Shortfall: 1,240 CMS = 2013 Flood Event per Alberta Transportation

	SR1	Comments
Overall Flowrate Design	1,240 m3/s	- Equivalent to 2013 flood flowrate; 1 in 200 year flood per Alberta Transportation
SR1 Flowrate Maximum Capability	600 m3/s	- As per Alberta Transportation
Elbow River Flowrate <sup>(1)(2)</sup>	640 m3/s	- Design results in 640 m3/s shortfall
Target Flowrate	160 m3/s	- As per Alberta Transportation
Excess Flowrate Above Target	480 m3/s	- Design results in 480 m3/s shortfall over Target Flowrate (above Glenmore Reservoir)

SR1 is inadequate to manage the flowrate forecast by Alberta Transportation

Note: 1. 640 m3/s river flowrate shortfall results in a flooding event upstream (west) of the Glenmore Reservoir  
 2. Communities of Discovery Ridge, Elbow Valley, Springbank, Redwood Meadows and Bragg Creek experience a flood event

## SR1 Details - Flowrate Shortfall: 1,900 CMS = Alberta Environment and Parks (2020)

	M <sup>3</sup> /S	Comments
Overall Flowrate Design	1,900 m3/s	- 1,900 m3/s identified by Alberta Environment and Parks (2020)
SR1 Flowrate Maximum Capability	600 m3/s	- As per Alberta Transportation
River Flowrate Shortfall <sup>(1)(2)(3)</sup>	1,300 m3/s	- Design results in 1,300 m3/s shortfall
Target Flowrate	160 m3/s	- As per Alberta Transportation
Excess Flowrate Above Target	1,140 m3/s	- Design results in 1,140 m3/s shortfall over Target Flowrate (above Glenmore Reservoir)

SR1 is inadequate to manage the flowrate forecast by Alberta Environment and Parks

Note: 1. 1,140 m3/s river flowrate shortfall results in a flooding event upstream (west) and downstream (east) of the Glenmore Reservoir  
 2. Calgary outcomes unknown, but this is larger than 2013 flood  
 3. Communities of Discovery Ridge, Elbow Valley, Springbank, Redwood Meadows and Bragg Creek experience a flood event

## MC1: Flood Mitigation Effectiveness

- MC1 Conceptual Design Report, Exhibit 101, page 46

### 6.1.5. Summary

In summary, a routing model has been developed and used to evaluate the hydraulic performance of the proposed flood mitigation scheme. The results of these runs are summarized in Table 6.1 below.

**Table 6.1: Summary of Flood Passage**

Description (Peak Values)	Floods				
	20-year	100-year	Jun-13	1000-year	PMF
Peak reservoir inflow (m <sup>3</sup> /s)	440	930	1240	1984	2770
Tunnel outlet structure peak discharge rate (m <sup>3</sup> /s)	212	212	212	830	1000
Service spillway peak discharge (m <sup>3</sup> /s)	0	0	0	0	600
Auxiliary earth channel peak discharge (m <sup>3</sup> /s)	0	0	0	0	1000
Maximum reservoir water surface elevation (m)	1404.7	1419.8	1424.4	1424.5	1428.1
Maximum total contained water volume (dam <sup>3</sup> )	13,400	52,100	73,500	73,600	93,000

## MC1: Location and Impacts

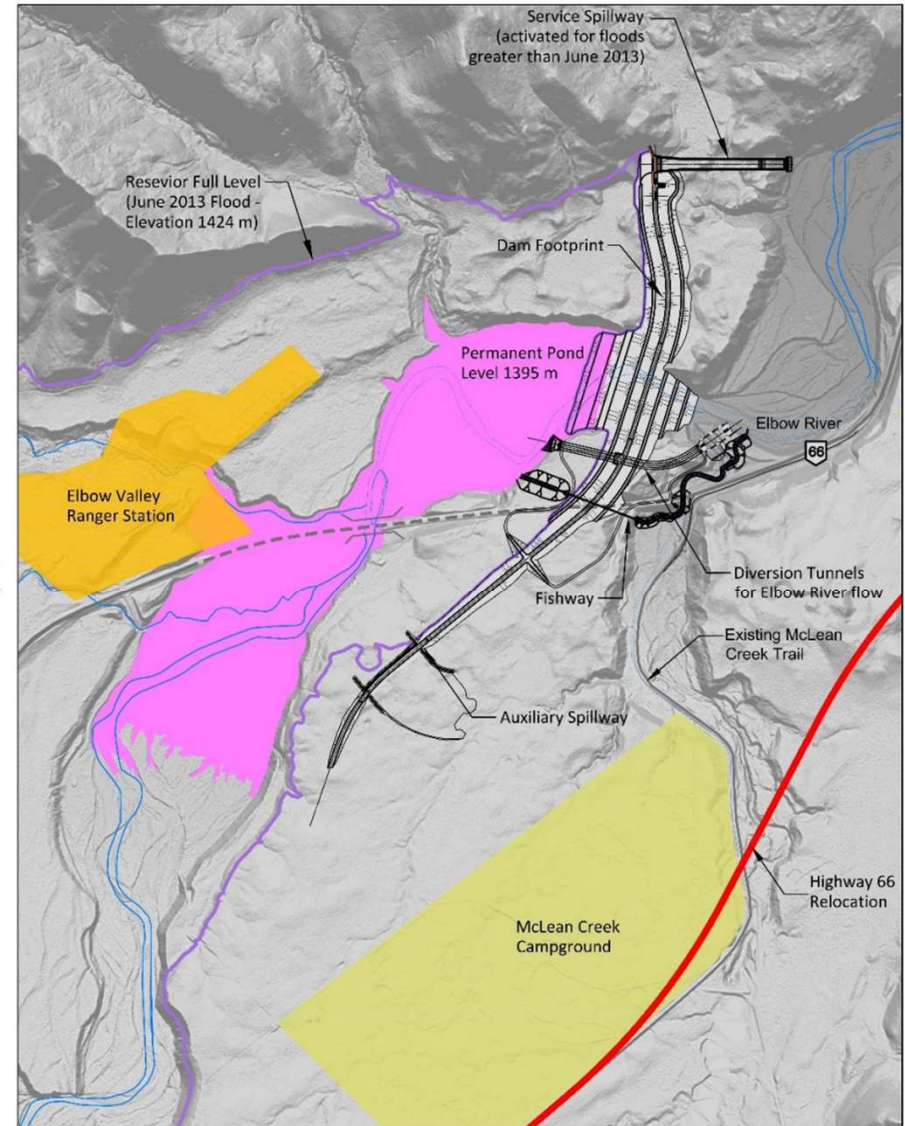
### – MC1 Conceptual Design Report, Exhibit 101, page 48

- MC1 is in a river valley and uses the natural topography of the Elbow River
- Very few recreational amenities are impacted, and those impacted are replaced
- Permanent pool of water - 180 acres at an estimated depth of 15m
- Impacted infrastructure (pg 12)



MC1 DAM CONCEPTUAL DESIGN REPORT

- Elbow Valley Ranger Station (EVRS) and its water/wastewater treatment facilities,
- Approximately 10 kilometers of Highway 66 and the existing bridge over the Elbow River,
- McLean Creek Campground store,
- McLean Creek wastewater lift stations,
- 19 camping stalls at the McLean Creek Campground, and
- Various power and communication lines.



McLean Creek Dam Arrangement

## Crown Engagement with the Public

- **Alberta Transportation acknowledges the decision was made to pursue SR1 prior to any engagement with Springbank residents, stakeholders or community leaders**
  - The communication to the Springbank community, residents and stakeholders was and is woefully inadequate
  - There were a few 'open houses' between 2015 and 2018 that were little more than a few display boards and a Q&A submission box (write down your question and put it in the box); SR1 was presented as the project of choice
    - There was no presentation and limited opportunity for discussion on the project
    - Open Houses were also held in the City of Calgary (for the benefit of Calgary residents)
  - Information Sessions were held in 2020 whereby a panel of individuals delivered a presentation and allowed time for Q&A
    - The most common response to questions was: "...we plan to monitor this" (with reference to silt deposition, wildlife, water contamination, air quality, risk, etc.)
    - Many stakeholders were unaware that the Springbank Information Session was taking place until only days prior, during COVID
    - The Bragg Creek event was held during COVID
    - Many residents did not attend due to notice and COVID health concerns.
  - It should also be noted that Minister Ric McIver and Minister Doug Schweitzer were highlighted as 'keynote speakers' at a Calgary River Committee Action Group on Sep. 19, 2019 and Dec. 15, 2020
    - The SCLG asserts that this is an explicit conflict of interest that may indicate political bias towards SR1
    - Why is a government official, directly responsible for the project, meeting with, and acting a 'keynote speaker' to a special interest group to this project?