# APPENDIX B
# CONSULTATION AND ENGAGEMENT

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# 1.0 INTRODUCTION

This appendix provides the outcomes of Alberta Transportation's stakeholder consultation program and Indigenous engagement program.

# 2.0 STAKEHOLDER ENGAGEMENT

Engagement with stakeholders, including landowners, municipalities, infrastructure companies and others has been ongoing since the fall of 2014 and will continue as the Project progresses. Alberta Transportation is committed to providing Project information to the public as the design becomes finalized and approved.

## 2.1 OVERVIEW OF STAKEHOLDER ENGAGEMENT PROGRAM

The following lists the stakeholder engagement activities to date. Open house presentation boards and handouts are included in Attachment A. Open house issues briefs are included in Attachment B.

### *Project Notification*

During the week of January 12, 2015, an introduction to the Project was distributed by postal code drop to all landowners, occupants, and residents within the area affected. The introduction was also directly mailed or emailed using the stakeholder distribution list. An invitation to the upcoming open houses in January 2015 was included with the introduction.

### *Stakeholder Meetings*

In November and December 2014, separate meetings were held with three of the stakeholders to provide them an initial overview of the Project. These stakeholders were Rocky View County, the Bow River Basin Council and the City of Calgary. Initial issues of concern were also discussed at the meetings with Rocky View County and the City of Calgary.

On November 26, 2014, a meeting was held with Rocky View County to kick-off the Technical Review Committee for the Highway 22 Planning Study.

On December 11, 2014, Alberta Transportation met with the Calgary River Communities Action Group to update them on the Project and discuss issues of concern.

In mid-January 2015, meetings were held with Rocky View County and the Elbow River Watershed Partnership to provide these stakeholders with a Project update in advance of the open houses.

In late January 2015, technical discussions regarding the Project were undertaken with WaterSmart and the Bow River Basin Council.

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A technical discussion about the Project was conducted with the City of Calgary on February 10, 2015, and Alberta Transportation met with Rocky View County to discuss preliminary engineering February 11, 2015.

On February 12, 2015 a meeting was held with the Calgary Regional Partnership to provide them with an overview of the Project, identify additional stakeholders and document early public input and issues of concern for the EIA.

Meetings were held with Telus and Plains Midstream in mid-February 2015 to discuss potential impacts of the Project on local infrastructure.

On March 3, 2015, Alberta Transportation met with affected landowners to provide an overview of the Project, discuss the McLean Creek Environmental Review, review a cost benefit analysis of the projects and respond to questions regarding the Project.

An update meeting was held with the Calgary River Communities Action Group on March 5, 2015.

On May 2, 2016, Alberta Transportation met with affected landowners in Springbank to provide updated Project information.

On May 5, 2016, Alberta Transportation met with Rocky View County Policy and Priorities Committee to provide updated Project Information.

On May 3 and 5, 2016, Alberta Transportation met with City of Calgary Elbow River Flood Mitigation to provide updated Project Information.

Meetings were held with Telus, Altalink, Fortis Alberta, Shaw, Alberta Ethane, TransCanada, Pengrowth Energy and ATCO Gas in June 2016 to discuss potential impacts of the Project on local infrastructure.

On September 16, 2016, Alberta Transportation met with Springbank Airport Authority to provide Project information and discuss the regulatory process.

On November 7, 2016, Alberta Transportation met with Rocky View County Administration to provide an update on the regulatory process, recommended transportation network and the preferred land use option.

On November 18, 2016, Alberta Transportation met with the Bow River Basin Council to discuss the choice of the off-stream reservoir, land ownership issues, road systems and project design.

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March 2018

On November 22, 2016, Alberta Transportation met with the Calgary River Communities Action Group to provide an update on: EIA and CEAA review, road network, project design, land appraisal process, land use and flood easement options and MC1 environmental assessment.

On December 19, 2016, Alberta Transportation met with Representatives of affected landowners and the Tsuut'ina Nation to discuss the Project.

On August 15 and September 27, 2017, Alberta Transportation met with affected landowners in Springbank to provide updated Project information.

### *Project Open Houses - 2015*

During the week of January 12, 2015, advertisements regarding the upcoming open houses were distributed to the Calgary Herald and the Calgary Sun, as well as the local newspaper for Rocky View County and Cochrane.

Open Houses were held in Calgary at Mount Royal University on January 27, 2015, and at Ranche House in Cochrane on January 28, 2015. The open house in Calgary provided the public with an overview of the Project and its timelines, identified additional stakeholders, and documented early public input on issues of concern for the EIA. The Cochrane open house provided the public with an opportunity to participate in technical discussions regarding the Project.

Additional open houses were held at the Pinebrook Golf and Country Club on March 10, 2015 and the Bragg Creek Community Centre March 17, 2015. Both open houses were used to provide an overview of flood mitigation options for the Elbow River basin, a cost analysis of the options, project details, and information on the environmental impact assessment for the Project. Additional stakeholders were also identified at these open houses, and early public input and issues of concern for the environmental impact assessment were documented.

### *Project Open Houses - 2016*

Further open houses were held in Springbank and Calgary on May 10 and 11, 2016 respectively. Open houses were advertized by:

- An April 27 email invitation sent to approximately 250 stakeholders and members of the public who provided contact information to receive project updates
- 476 invitations sent by Canada Post unaddressed admail on May 2
- advertisements placed in the Rocky View Weekly (May 3), Cochrane Times (May 4), Calgary Herald (May 7), and Calgary Sun (May 8)
- a road sign placed in Calgary on the north side of 32 Ave SW, west of 14 St SW on May 2

- a road sign placed at the Springbank Park for All Seasons on May 3
- media announcement and website posting by the Government of Alberta on May 3

The open houses attracted a new group of attendees: Calgarian homeowners who were affected by the June 2013 flood. Attendees continued to ask questions and provided input regarding the design and decision-making processes related to the Project, as well as other flood mitigation projects under consideration.

### *Project Open Houses – 2017*

Open houses were held on May 10 at the Springbank Wild West Centre and May 11 at the Calgary First Church of Nazarene. During the month of August open houses were held at the Springbank Wild West Centre (August 16), Calgary Mount Royal University (August 17), Springbank Wild West Centre (August 22) and the Calgary First Church of Nazarene. The open house provided the public with an overview of the Project and its timelines and documented public input on issues of concern for the EIA. Attendees continued to ask questions and provided input regarding the design and decision-making processes related to the Project, as well as other flood mitigation projects under consideration.

### *Other Activities*

Information on the Project can be found on the Project website at http://alberta.ca/springbank-road.cfm.

# 3.0 INDIGENOUS ENGAGEMENT PROGRAM

## 3.1 OUTCOMES OF INDIGENOUS ENGAGEMENT PROGRAM

The Indigenous engagement program was managed by Dema Land Services for Alberta Transportation. The records of contact and engagement logs are included in a confidential document sent to AEP and CEAA.

The following section presents a timeline of key project-related engagement activities since the Indigenous engagement program began. Alberta Transportation's engagement with Indigenous groups began in 2014 with the five Treaty 7 First Nations in accordance with the Consultation Guidelines and the First Nation Consultation Plan approved by the Alberta Consultation Office (ACO). The Treaty 7 First Nations identified for engagement are Kainai First Nation, Piikani Nation, Siksika Nation, Stoney Nakoda Nations, and Tsuut'ina Nation. In June 2016, an additional eight Indigenous communities and organizations were identified for engagement in the Canadian Environmental Assessment Agency Guidelines for the Project. Consequently, the Indigenous Engagement program for the Project was expanded to include Ermineskin Cree Nation, Foothills Ojibway, Ktunaxa Nation, Louis Bull Tribe, Métis Nation of Alberta, Region 3, Métis Nation British Columbia, Montana First Nation, and Samson Cree Nation.

### 3.1.1 Kainai First Nation

The Government of Alberta ACO and CEA Agency identified Kainai First Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Kainai First Nation Engagement program, including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.1.1 Summary of Engagement Program with Kainai First Nation

***August 18, 2014 to October 22, 2014***

In August 2014, Government of Alberta Aboriginal Relations notified Kainai First Nation about the Project and informed that engagement may be required with Kainai First Nation, as per *Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.*

Subsequently, in August 2014, Alberta Transportation sent a letter notifying Kainai First Nation about the Project and providing a preliminary Project description and plan drawing. Alberta Transportation invited Kainai First Nation to participate in the Project, including sharing any concerns with regards to the Project and the practice of treaty rights and traditional uses with respect to the proposed project area.

In October 2014, Kainai First Nation and Alberta Transportation discussed the Project engagement process logistics, including allowable expenditures. At this time, Kainai First Nation notified Alberta Transportation of Kainai First Nation intent to submit a letter of objection and a letter of non-adequate consultation to the Crown as a result of fees incurred in order to initialize a project file.

### *October 23, 2014 to December 31, 2014*

In October 2014, Kainai First Nation was invited to provide feedback, by November 14, 2014, on the draft AEP Terms of Reference.

In November 2014, Alberta Transportation requested a meeting with Kainai First Nation to discuss the Project. Alberta Transportation provided Kainai First Nation with an updated project plan drawing and the flood mitigation engineering concepts.

On November 25, 2014, Kainai First Nation and Alberta Transportation met to discuss the Project; Kainai First Nation indicated that the community would be requesting funding to complete a traditional use study of the project area.

Also in November 2014, AEP submitted an article describing the Project as well as the project plan drawing to Kainai First Nation for publication in the local newspaper.

In December 2014, Alberta Transportation and Kainai First Nation discussed the project engagement process logistics, including allowable expenditures.

### *January 1, 2015 to March 31, 2015*

In January 2015, Alberta Transportation invited members of Kainai First Nation to attend open houses being held on January 27 and 28, 2015. Alberta Transportation noted that these information sessions were part of the Public Engagement and Consultation process and that members of Kainai First Nation were welcome to attend.

Also in January 2015, Alberta Transportation provided Kainai First Nation with the draft November 25, 2014 meeting notes and invited comments and additions if required.

In February 2015, the final AEP terms of reference were distributed, and Alberta Transportation provided Kainai First Nation with a project update. Kainai First Nation stated that the project area traditional use study needed to be completed prior to any construction activities and requested a meeting to discuss a preliminary site visit. Alberta Transportation acknowledged the community's interest in completing the traditional use study and explained that land access to the project area had not yet been obtained but Alberta Transportation would share information with Kainai First Nation as soon as any changes occurred.

In March 2015, Alberta Transportation provided Kainai First Nation with the storyboards presented during the January 2015 public open houses and invited the community to attend the second open house session scheduled for March 17, 2015. At that time, Alberta Transportation also informed Kainai First Nation that land access to the project area still had not been obtained.

### *April 1, 2015 to March 23, 2016*

Alberta Transportation provided Kainai First Nation with a Project status update in June 2015 and again in September 2015.

In November 2015, Alberta Transportation provided Kainai First Nation with updated conceptual drawings for the downstream flood diversion and informed Kainai First Nation that land access to the project area still had not been obtained.

### *March 24, 2016 to May 5, 2016*

In March 2016, Alberta Transportation notified Kainai First Nation that land access to the project area had been obtained. Kainai First Nation and Alberta Transportation discussed logistics for a preliminary visit to the project area.

On April 7, 2016, Kainai First Nation and Alberta Transportation met to discuss project updates and the traditional use study was initiated with a drive-through visit of the project area. During April 2016, Alberta Transportation provided Kainai First Nation with Project information to aid in the design of the traditional use study, including updated project maps, and a fly-over video of the project area.

### *May 6, 2016 to June 26, 2016*

Alberta Transportation provided Kainai First Nation with Project updates, including an updated fly-over video of the project area, information regarding the public open houses held May 10 and 11, 2016, and AEP terms of reference. As well, logistics for the project area traditional use study site visits were arranged between Kainai First Nation and Alberta Transportation.

Alberta Transportation informed Kainai First Nation that the Project description had been submitted to CEA Agency for review and on May 6, 2016 CEA Agency had accepted the Project description. Following its acceptance of Alberta Transportation's Project description, CEA Agency requested preliminary input from Kainai First Nation regarding the Project. In May 2016, CEA Agency invited Kainai First Nation to provide feedback on potential effects on the environment and on Kainai First Nation as a result of the Project. Kainai First Nation provided feedback to CEA Agency regarding potential effects of the Project.

In June 2016, CEA Agency sent a letter to Kainai First Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to September 15, 2016*

Kainai First Nation and Alberta Transportation held project area site visits as part of the traditional use study. Site visits were held on June 27-July 1, July 11-15, July 20, July 22, and September 6-7.

On June 29, 2016, Kainai First Nation, Alberta Transportation, and Stantec Consulting Ltd. met to discuss the Traditional Ecological Knowledge and Traditional Land Use section of the EIA and the process for incorporating information shared through the traditional use study process.

The CEA Agency comment period, inviting feedback from Kainai First Nation, lasted from June 23 to July 25, 2016. The final guidelines were issued August 10, 2016.

In August and September 2016, Kainai First Nation and Alberta Transportation arranged logistics for a meeting to discuss potential impacts of the Project. In preparation for the meeting, Alberta Transportation provided Kainai First Nation with the AEP terms of reference, CEA Agency guidelines, and a copy of the letter from CEA Agency to Kainai First Nation notifying that a federal EIA would be required for the Project.

On September 15, 2016, Alberta Transportation met with Kainai First Nation, Piikani Nation, Siksika Nation, and Stantec Consulting Ltd. to discuss the progress and outcomes of each community's project area traditional use study.

### *September 16, 2016 to August 31, 2017*

In November 2016, Alberta Transportation provided Kainai First Nation with a copy of the September 15, 2016 draft meeting notes for review. In December 2016, Alberta Transportation also provided Kainai First Nation with a copy of the draft community-specific Project consultation log for review.

Also in December 2016, Alberta Transportation provided Kainai First Nation with an update on the McLean Creek EIA, which was being conducted in relation to the Project.

On December 23, 2016, Alberta Transportation met with Kainai First Nation to discuss the status of the project area traditional use study. Also in December 2016, Alberta Transportation requested a meeting with Kainai First Nation to discuss findings from the project area traditional use study and logistics for the meeting were arranged in December 2016 and January 2017. Alberta Transportation and Kainai First Nation discussed the project area traditional use study, including potential mitigation measures and the anticipated submission date.

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On January 18, 2017, Alberta Transportation met with Kainai First Nation, Piikani Nation, Siksika Nation, and Stantec Consulting Ltd. to discuss the next steps in the EIA process as well as the progress and outcomes of each community's project area traditional use study, including potential mitigation measures and the anticipated submission dates. In late January 2016, Alberta Transportation provided Kainai First Nation with a copy of the EIA presentation given during the January 18, 2016 meeting outlining the status of the EIA and the environmental and socio-economic valued component studies that were being completed. The valued components reviewed during the meeting include:

- air quality and climate
- acoustic environment
- hydrogeology
- hydrology
- surface water quality
- aquatic ecology
- terrain and soils
- vegetation and wetlands
- wildlife and biodiversity
- land use and management
- historical resources
- traditional ecological knowledge and land use
- public health and safety
- infrastructure and services
- economy and employment

Kania First Nation did not identify any additions to the valued components at this time.

In January and February 2017, Alberta Transportation and Kainai First Nation discussed final logistics and process for the project area traditional use study as well as concerns with the Project. Alberta Transportation informed Kainai First Nation about the next steps in the engagement process and confirmed that engagement would continue through the Project regulatory process into 2018.

On February 27, 2017, Alberta Transportation shared notes from the January 18, 2017 Blackfoot Confederacy meeting with Kainai First Nation for their comment and input.

On March 1, 2017, Alberta Transportation shared consultation logs and record of consultation for the Project up to February 27, 2017 with Kainai First Nation.

On March 10, 2017, Alberta Transportation provided an update on the timelines for receiving TUS reports, reviewing those reports and concerns, and reviewing potential mitigation (all which are part of the EIS submissions).

Kainai First Nation submitted a joint project area traditional use study interim report in collaboration with Siksika Nation on March 13, 2017. Concerns raised in the Traditional Use Study interim report included interference with access to the Project lands, effects on ceremonial locations and on Blackfoot cultural sites, effects on wetlands, and upstream and downstream effects.

On May 10, 2017, Alberta Transportation formally responded by letter to issues raised in the submitted joint Kainai First Nation/Siksika Nation traditional use study. This formal response was also emailed to Kainai First Nation on May 11, 2017.

On June 19, 2017, legal counsel for Kainai First Nation contacted Alberta Transportation, NRCB and the CEA Agency by letter and informed the recipients that Kainai First Nation had concerns with the project site tour for CEA Agency officials.

On June 21, 2017, CEA Agency responded by letter to Kainai First Nation's June 19, 2017 letter, acknowledged Kainai First Nation's concerns regarding tours arranged by Alberta Transportation for CEA Agency officials, agreed to cancel the scheduled tour, and also agreed to contact Kainai First Nation if a similar tour was scheduled in the future.

In August 2017, Alberta Transportation provided Kainai First Nation with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

On September 18, 2017, Kainai First Nation submitted a letter to Alberta Transportation expressing concern that the CEAA tour of the project area was conducted from public road allowances rather than on the land.

In September 2017, Alberta Transportation requested permission to use the spatial data included in the joint Kainai First Nation and Siksika Nation interim traditional use study.

On October 19, 2017, Alberta Transportation shared consultation logs up to September 27, 2017 for review and comment by Kainai First Nation.

On November 3, 2017, Alberta Transportation provided Kainai First Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Kainai First Nation. On January 5, 2018, Kainai First Nation responded by letter that feedback could not be provided at this time because the EIS does not conform to the EIS guidelines.

On December 10, 2017, Alberta Transportation provided Kainai First Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

In January 2018, Kainai First Nation inquired whether an adequacy assessment of consultation would be completed by the ACO. ACO responded that an adequacy assessment would not occur at this time because consultation is ongoing.

On January 9, 2018, Alberta Transportation shared records of communication, a specific concerns and response table, and consultation logs from the fall of 2014 to January 5, 2018 for review and comment by Kainai First Nation.

On January 12, 2018, Alberta Transportation inquired whether Kainai First Nation would be submitting a final copy of joint Kainai First Nation and Siksika Nation traditional use study with Siksika Nation. Alberta Transportation also requested permission to use the spatial data included in the joint Kainai First Nation and Siksika Nation interim traditional use study.

Alberta Transportation offered to hold a workshop with Kainai First Nation during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, discussions regarding a workshop with Kainai First Nation were ongoing.

### 3.1.2 Piikani Nation

The Government of Alberta Aboriginal Consultation Office (ACO) and CEA Agency identified Piikani Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Piikani Nation Engagement program, including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.2.1 Summary of Engagement Program with Piikani Nation

***August 18, 2014 to October 22, 2014***

On August 18, 2014, Government of Alberta, Aboriginal Relations contacted Piikani Nation by letter, introduced the Project and informed Piikani Nation that engagement may be required, as per *Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.*

Subsequently, on September 10, 2014, Alberta Transportation sent a letter (dated August 27, 2014) via registered mail notifying Piikani Nation about the Project and providing a preliminary Project description and plan drawing. Alberta Transportation invited Piikani Nation to share any concerns regarding the Project, including potential effects on the practice of treaty rights and traditional use within the project area.

On October 8, 2014, Alberta Transportation sent a copy of the August 27, 2014 notification letter by email to Piikani Nation following a telephone discussion that recognized that the Piikani Nation Consultation Coordinator had not received the original notification letter.

### *October 23, 2014 to December 31, 2014*

In October 2014, Piikani Nation was invited to provide feedback, by November 14, 2014, on the draft AEP terms of reference.

In October 2014, Alberta Transportation requested a meeting with Piikani Nation to discuss the Project. Alberta Transportation provided Piikani Nation with an updated project plan drawing.

On November 7, 2014, Piikani Nation and Alberta Transportation met to discuss the Project; Piikani Nation indicated that the community would be requesting funding to complete a traditional use study of the project area. Piikani Nation also stated that due to upcoming elections, Piikani Nation would not be able to communicate regularly with Alberta Transportation until the election process was complete.

In November 2014, Alberta Transportation provided Piikani Nation with the draft November 7, 2014 meeting notes and invited comments and additions if required. Alberta Transportation also provided Piikani Nation with the flood mitigation engineering concepts.

Also in November 2014, AEP submitted an article describing the Project as well as the project plan drawing to Piikani Nation for publication in the local newspaper.

### *January 1, 2015 to March 31, 2015*

Alberta Transportation provided Piikani Nation with Project updates and the benefits of and process regarding a project area traditional use study.

In January 2015, Alberta Transportation invited members of Piikani Nation to attend the open houses being held on January 27 and 28, 2015. Alberta Transportation noted that these information sessions were part of the public engagement and consultation process and that members of Piikani Nation were welcome to attend.

In February 2015, the final AEP terms of reference were distributed and in February and March 2015, Alberta Transportation provided Piikani Nation with Project updates. Also in March 2015, Alberta Transportation provided Piikani Nation with the storyboards presented during the January 2015 public open houses and invited the community to attend the second open house session scheduled for March 17, 2015. At this time, Alberta Transportation also informed Piikani Nation that land access to the project area still had not been obtained.

### *April 1, 2015 to March 23, 2016*

Alberta Transportation was awaiting direction from the Government of Alberta regarding the Project. Alberta Transportation provided Piikani Nation with a Project status update in June 2015 and again in September 2015.

In November 2015, Alberta Transportation provided Piikani Nation with updated conceptual drawings for the downstream flood diversion and informed Piikani Nation that land access to the project area still had not been obtained.

### *March 24, 2016 to May 5, 2016*

Alberta Transportation provided Piikani Nation with Project updates and the project area traditional use study commenced. In March 2016, Alberta Transportation notified Piikani Nation that land access to the project area had been obtained.

In April 2016, Alberta Transportation requested a meeting with Piikani Nation to reintroduce the Project and to discuss logistics for a preliminary visit to the project area. Alberta Transportation provided Piikani Nation with Project information to aid in the design of the traditional use study, including updated project maps, and a fly-over video of the project area.

### *May 6, 2016 to June 26, 2016*

Alberta Transportation provided Piikani Nation with project updates, including an updated fly-over video of the project area, information regarding the public open houses held May 10 and 11, 2016, and a link to the CEA Agency website.

Alberta Transportation informed Piikani Nation that the project description had been submitted to CEA Agency for review and on May 6, 2016 CEA Agency had accepted the Project description. Following its acceptance of Alberta Transportation's Project description, CEA Agency requested preliminary input from Piikani Nation regarding the Project. In May 2016, CEA Agency invited Piikani Nation to provide feedback on potential effects on the environment and on Piikani Nation as a result of the Project.

In June 2016, CEA Agency sent a letter to Piikani Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to September 15, 2016*

Alberta Transportation provided Piikani Nation with project updates. As well, logistics for the project area traditional use study site visits were arranged between Piikani Nation and Alberta Transportation. On July 20, 2016, the traditional use study was initiated with a drive-through visit of the project area.

In August 2016, Alberta Transportation provided Piikani Nation with an updated project map. As well, Piikani Nation and Alberta Transportation held project area site visits as part of the traditional use study. Site visits were held on August 9-10, August 15-17, and August 30.

On August 15, 2016, Piikani Nation, Alberta Transportation, and Stantec Consulting Ltd. met to discuss the Traditional Ecological Knowledge and Traditional Land Use section of the EIA and the process for incorporating information shared through the traditional use study process.

The CEA Agency comment period (June 23 to July 25) inviting feedback from Piikani Nation continued. The final guidelines were issued August 10, 2016.

In August and September 2016, Piikani Nation and Alberta Transportation arranged logistics for a meeting to discuss potential impacts of the Project. In preparation for the meeting, Alberta Transportation provided Piikani Nation with the AEP terms of reference, CEA Agency guidelines, and a copy of the letter from CEA Agency to Piikani Nation notifying that a federal EIA would be required for the Project.

On September 15, 2016, Alberta Transportation met with Piikani Nation, Kainai First Nation, Siksika Nation, and Stantec Consulting Ltd. to discuss the progress and outcomes of each community's project area traditional use study.

### *September 16, 2016 to August 31, 2017*

In September 2016, Piikani Nation and Alberta Transportation discussed holding additional project area site visits; these site visits were held from October 3-7, 2016.

In November 2016, Alberta Transportation provided Piikani Nation with a copy of the September 15, 2016 draft meeting notes for review. In December 2016, Alberta Transportation also provided Piikani Nation with a copy of the draft community-specific Project consultation log for review. Alberta Transportation provided Piikani Nation with an update on the McLean Creek EIA, which was being conducted in relation to the Project.

Also in December 2016, Alberta Transportation requested a meeting with Piikani Nation to discuss findings from the project area traditional use study and logistics for the meeting were arranged in December 2016 and January 2017.

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On January 18, 2017, Alberta Transportation met with Piikani Nation, Kainai First Nation, Siksika Nation, and Stantec Consulting Ltd. to discuss the next steps in the EIA process as well as the progress and outcomes of each community's project area traditional use study, including potential mitigation measures and the anticipated submission dates. In late January 2016, Alberta Transportation provided Piikani Nation with a copy of the EIA presentation given during the January 18, 2016 meeting, outlining the status of the EIA and the environmental and socio-economic valued component studies that were being completed. The valued components reviewed during the meeting include:

- air quality and climate
- acoustic environment
- hydrogeology
- hydrology
- surface water quality
- aquatic ecology
- terrain and soils
- vegetation and wetlands
- wildlife and biodiversity
- land use and management
- historical resources
- traditional ecological knowledge and land use
- public health and safety
- infrastructure and services
- economy and employment

Piikani Nation did not identify any additions to the valued components at this time.

In January and February 2017, Alberta Transportation and Piikani Nation discussed final logistics and process for the project area traditional use study as well as concerns with the Project.

On February 10, 2017, Piikani Nation met with Alberta Transportation to discuss the project area traditional use study.

In February 2017, Alberta Transportation informed Piikani Nation about the next steps in the engagement process and confirmed that engagement would continue through the Project regulatory process.

Also in February 2017, Alberta Transportation provided Piikani Nation with a project map, site visit field notes, project description, flood mitigation options, and the AEP terms of reference to assist Piikani Nation in the completion of the project area traditional use study.

On February 22, 2017, Piikani Nation submitted a final project area traditional use study report. Concerns expressed related to effects on wetlands, upstream and downstream effects, and potential effects on air quality from flood residue spread by the wind.

On February 24, 2017, Alberta Transportation provided Piikani Nation with a number of flood mitigation files previously provided at a non-functioning download link.

On February 25, 2017, Alberta Transportation informed Piikani Nation that engagement would continue through the regulatory review process (into 2018).

On February 27, 2017, Alberta Transportation shared meeting notes for the January 18, 2017 Blackfoot Confederacy meeting for comment.

In early March 2017, Alberta Transportation shared consultation logs up to the end of February 2017 for review and comment by Piikani Nation.

On May 11, 2017, Alberta Transportation formally responded to the Piikani traditional use report.

In August 2017, Alberta Transportation provided Piikani Nation with information on upcoming open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

On September 26, 2017, Alberta Transportation requested permission to use the spatial data included in the Piikani Nation traditional use study. On November 9, 2017, Piikani Nation explained that the Nation is hesitant to share the results of the study publicly until Piikani Nation knows the status of consultation with other Nations and the mitigation measures proposed for Piikani Nation's concerns. Piikani Nation stated that the traditional use study can be shared with the regulators.

On November 3, 2017, Alberta Transportation provided Piikani Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Piikani Nation.

On December 11, 2017, Alberta Transportation provided Piikani Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

On January 12, 2018, Alberta Transportation again requested permission to use the spatial data included in the Piikani Nation traditional use study.

Alberta Transportation offered to hold a workshop to be held with Piikani Nation during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, discussions regarding a workshop with Piikani Nation were ongoing.

### 3.1.3 Siksika Nation

The Government of Alberta Aboriginal Consultation Office (ACO) and CEA Agency identified Siksika Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Siksika Nation Engagement program, including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.3.1 Summary of Engagement Program with Siksika Nation

***August 18, 2014 to October 22, 2014***

In August 2014, Government of Alberta Aboriginal Relations notified Siksika Nation about the Project and informed that engagement may be required with Siksika Nation, as per *Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.*

Subsequently, in August 2014, Alberta Transportation sent a letter notifying Siksika Nation about the Project and providing a preliminary Project description and plan drawing. Alberta Transportation invited Siksika Nation to participate in the Project, including sharing any concerns with regards to the Project and the practice of treaty rights and traditional uses with respect to the proposed project area.

In October 2014, Alberta Transportation sent a copy of the August 2014 notification letter to Siksika Nation. Also in October, Siksika Nation and Alberta Transportation arranged logistics for a meeting to discuss the Project.

***October 23, 2014 to December 31, 2014***

Alberta Transportation provided Siksika Nation with project information, including project design updates and the draft AEP terms of reference. In October 2014, Siksika Nation was invited to provide feedback on the draft AEP terms of reference by November 14, 2014.

On October 27, 2014, Siksika Nation and Alberta Transportation met to discuss the Project; Siksika Nation indicated that the community would be requesting funding to complete a traditional use study of the project area.

In November 2014, AEP submitted an article describing the Project as well as the project plan drawing to Siksika Nation for publication in the local newspaper; Siksika Nation provided Alberta Transportation with a copy of the published article in late November 2014.

Also in November 2014, Alberta Transportation provided Siksika Nation with the draft November 7, 2014 meeting notes and invited comments and additions if required. Alberta Transportation also provided Siksika Nation with the flood mitigation engineering concepts.

### *January 1, 2015 to March 31, 2015*

Alberta Transportation provided Siksika Nation with project updates and the benefits of and process regarding a project area traditional use study.

In January 2015, Alberta Transportation invited members of Siksika Nation to attend the open houses being held on January 27 and 28, 2015. Alberta Transportation noted that these information sessions were part of the public engagement and consultation process and that members of Siksika Nation were welcome to attend.

In February 2015, the final AEP terms of reference were distributed and in February and March 2015, Alberta Transportation provided Siksika Nation with project updates. Also in March 2015, Alberta Transportation provided Siksika Nation with the storyboards presented during the January 2015 public open houses and invited the community to attend the second open house session scheduled for March 17, 2015. At this time, Alberta Transportation also informed Siksika Nation that land access to the project area still had not been obtained.

### *April 1, 2015 to March 23, 2016*

Alberta Transportation was awaiting direction from the Government of Alberta regarding the Project. Alberta Transportation provided Siksika Nation with a project status update in June 2015 and again in September 2015.

In November 2015, Alberta Transportation provided Siksika Nation with updated conceptual drawings for the downstream flood diversion and informed Siksika Nation that land access to the project area still had not been obtained. At that time, Siksika Nation requested large-scale maps to distribute throughout the community.

In January 2016, Alberta Transportation confirmed that large-scale maps were not currently available but would be shared as soon as possible. Siksika Nation inquired whether Alberta Transportation had met with the Siksika Nation Flood Recovery team regarding the Project. Alberta Transportation confirmed that meetings had occurred between the Siksika Nation Flood Recovery team and the AEP Aboriginal Relations Flood Recovery Task Force.

### *March 24, 2016 to May 5, 2016*

In March 2016, Alberta Transportation notified Siksika Nation that land access to the project area had been obtained.

In April 2016, Alberta Transportation requested a meeting with Siksika Nation to reintroduce the Project and to discuss logistics for a preliminary visit to the project area. On April 27, 2016, Siksika Nation and Alberta Transportation met to discuss project updates and the traditional use study was initiated with a drive-through visit of the project area. Alberta Transportation provided Siksika Nation with project information to aid in the design of the traditional use study, including updated project maps, and a fly-over video of the project area.

### *May 6, 2016 to June 26, 2016*

Alberta Transportation provided Siksika Nation with project updates, including an updated fly-over video of the project area, the public open houses storyboards, and AEP terms of reference. As well, logistics for the project area traditional use study site visits were arranged between Siksika Nation and Alberta Transportation.

Alberta Transportation informed Siksika Nation that the Project description had been submitted to CEA Agency for review and on May 6, 2016 CEA Agency had accepted the Project description. Following its acceptance of Alberta Transportation's Project description, CEA Agency requested preliminary input from Siksika Nation regarding the Project. In May 2016, CEA Agency invited Siksika Nation to provide feedback on potential effects on the environment and on Siksika Nation as a result of the Project.

In June 2016, CEA Agency sent a letter to Siksika Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to September 15, 2016*

Alberta Transportation provided Siksika Nation with project updates. As well, logistics for the project area traditional use study site visits were arranged between Siksika Nation and Alberta Transportation. Site visits were held on July 19-22, August 9, and September 13.

The CEA Agency comment period (June 23 to July 25) inviting feedback from Siksika Nation continued. The final guidelines were issued August 10, 2016.

In August and September 2016, Siksika Nation and Alberta Transportation arranged logistics for a meeting to discuss potential impacts of the Project. In preparation for the meeting, Alberta Transportation provided Siksika Nation with the AEP terms of reference, CEA Agency guidelines,

and a copy of the letter from CEA Agency to Siksika Nation notifying that a federal EIA would be required for the Project.

On September 15, 2016, Alberta Transportation met with Siksika Nation, Kainai First Nation, Piikani Nation, and Stantec Consulting Ltd. to discuss the progress and outcomes of each community's project area traditional use study.

### *September 16, 2016 to August 31, 2017*

Alberta Transportation provided Project updates. Alberta Transportation and Siksika Nation discussed logistics and the process for completion of the project area traditional use study.

In November 2016, Alberta Transportation provided Siksika Nation with a copy of the September 15, 2016 draft meeting notes for review.

In December 2016, Alberta Transportation provided Siksika Nation with a copy of the draft community-specific Project consultation log for review. Also in December 2016, Alberta Transportation provided Siksika Nation with an update on the McLean Creek EIA, which was being conducted in relation to the Project.

Also in December 2016, Alberta Transportation requested a meeting with Siksika Nation to discuss findings from the project area traditional use study and logistics for the meeting were arranged in December 2016 and January 2017.

On January 18, 2017, Alberta Transportation met with Siksika Nation, Piikani Nation, Kainai First Nation, and Stantec Consulting Ltd. to discuss the next steps in the EIA process as well as the progress and outcomes of each community's project area traditional use study, including potential mitigation measures and the anticipated submission dates. In late January 2016, Alberta Transportation provided Siksika Nation with a copy of the EIA presentation given during the January 18, 2016 meeting outlining the status of the EIA and the environmental and socio-economic valued component studies that were being completed. The valued components reviewed during the meeting include:

- air quality and climate
- acoustic environment
- hydrogeology
- hydrology
- surface water quality
- aquatic ecology
- terrain and soils
- vegetation and wetlands
- wildlife and biodiversity
- land use and management

- historical resources
- traditional ecological knowledge and land use
- public health and safety
- infrastructure and services
- economy and employment

Siksika Nation did not identify any additions to the valued components at this time.

In January 2017, Alberta Transportation and Siksika Nation discussed final logistics and process for the project area traditional use study as well as concerns with the Project.

In February 2017, Alberta Transportation informed Siksika Nation about the next steps in the engagement process and confirmed that engagement would continue through the Project regulatory process.

In March 2017, Alberta Transportation shared consultation logs and its record of consultation with Siksika Nation for comment, and provided an update on regulatory timelines for receiving traditional use reports, the review of those reports and concerns raised, and mitigations proposed.

Siksika Nation submitted a joint project area traditional use study interim report in collaboration with Kainai First Nation on March 13, 2017. Concerns raised in the traditional use study interim report included interference with access to the project lands, effects on ceremonial locations and on Blackfoot cultural sites, effects on wetlands, and upstream and downstream effects.

On May 10, 2017, Alberta Transportation provided Siksika Nation with its responses to issues raised by both Siksika Nation and Kainai First Nation in their join interim traditional use study.

In August 2017, Alberta Transportation informed Siksika Nation concerning dates and locations for open houses and requested information on how Siksika Nation wished to receive updates on the project EIA.

### *September 1, 2017 to March 16, 2018*

In September 2017, Alberta Transportation requested permission to use the spatial data included in the joint Kainai First Nation and Siksika Nation interim traditional use study.

On November 3, 2017, Alberta Transportation provided Siksika Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Siksika Nation.

On December 11, 2017, Alberta Transportation provided Siksika Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

On January 12, 2018, Alberta Transportation inquired whether Siksika Nation would be submitting a final copy of joint Kainai First Nation and Siksika Nation traditional use study with Kainai First Nation. Alberta Transportation also requested permission to use the spatial data included in the joint Kainai First Nation and Siksika Nation interim traditional use study.

Alberta Transportation and Siksika Nation held a workshop on February 26, 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). A second workshop was scheduled for February 27, 2018 was postponed and as of March 16, 2018, discussions regarding a workshop with Siksika Nation were ongoing. In accordance with protocols established at the start of each workshop and in recognition of the proprietary nature of TLRU, written summaries of the workshop proceedings were completed by Alberta Transportation and provided to Siksika Nation for review and validation before incorporating any information into a revised EIS. As of March 16, 2018, the summary of the workshop had not been validated by Siksika Nation for use in updating the TLRU sections.

### 3.1.4 Stoney Nakoda Nations (Bearspaw First Nation, Chiniki First Nation, and Wesley First Nation)

The Government of Alberta Aboriginal Consultation Office (ACO) and CEA Agency identified Stoney Nakoda Nations as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Stoney Nakoda Nations Engagement program, including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.4.1 Summary of Engagement Program with Stoney Nakoda Nations

***August 18, 2014 to October 22, 2014***

In August 2014, Government of Alberta Aboriginal Relations notified Stoney Nakoda Nations about the Project and informed that engagement may be required with Stoney Nakoda Nations, as per *Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.*

Subsequently, in August 2014, Alberta Transportation sent a letter notifying Stoney Nakoda Nations about the Project and providing a preliminary project description and plan drawing. Alberta Transportation invited Stoney Nakoda Nations to participate in the Project, including sharing any concerns with regards to the Project and the practice of treaty rights and traditional uses with respect to the proposed project area.

In September 2014, Stoney Nakoda Nations acknowledged the Project and indicated that it affects Stoney Nakoda Nations treaty rights and traditional uses. At that time, Stoney Nakoda Nations provided Alberta Transportation with a Stoney Information Letter (SIL), which outlined intellectual property, protocol, and other processes, and requested that Alberta Transportation complete it as an important first step in the engagement process. In October 2014, Alberta Transportation submitted the completed SIL to Stoney Nakoda Nations.

In September and October 2014, Stoney Nakoda Nations and Alberta Transportation arranged logistics for a meeting to discuss the Project. On October 20, 2014, Stoney Nakoda Nations and Alberta Transportation met to discuss the Project; Stoney Nakoda Nations indicated that the Project is located within the community's traditional territory and Stoney Nakoda Nations requested opportunity to complete a cultural use study of the project area.

### *October 23, 2014 to December 31, 2014*

Alberta Transportation provided Stoney Nakoda Nations with Project information, including Project design updates and the draft AEP terms of reference. In October 2014, Stoney Nakoda Nations was invited to provide feedback on the draft AEP terms of reference by November 14, 2014.

In November 2014, Alberta Transportation provided Stoney Nakoda Nations with the draft October 20, 2014 meeting notes and invited comments and additions if required. Alberta Transportation also provided Stoney Nakoda Nations with the flood mitigation engineering concepts.

Also in November 2014, AEP submitted an article describing the Project as well as the project plan drawing to Stoney Nakoda Nations for publication in the local newspaper.

### *January 1, 2015 to March 31, 2015*

Alberta Transportation provided Stoney Nakoda Nations with Project updates and the benefits of and process regarding a project area traditional use study.

In January 2015, Alberta Transportation invited members of Stoney Nakoda Nations to attend the open houses being held on January 27 and 28, 2015. Alberta Transportation noted that these information sessions were part of the public engagement and consultation process and that members of Stoney Nakoda Nations were welcome to attend.

In February 2015, the final AEP terms of reference were distributed and in February and March 2015, Alberta Transportation provided Stoney Nakoda Nations with project updates. Also in March 2015, Alberta Transportation provided Stoney Nakoda Nations with the storyboards presented during the January 2015 public open houses and invited the community to attend the second open house session scheduled for March 17, 2015. At that time, Alberta Transportation also informed Stoney Nakoda Nations that land access to the project area still had not been obtained.

### *April 1, 2015 to March 23, 2016*

Alberta Transportation was awaiting direction from the Government of Alberta regarding the Project. Alberta Transportation provided Stoney Nakoda Nations with a project status update in June 2015 and again in September 2015.

In November 2015, Alberta Transportation provided Stoney Nakoda Nations with updated conceptual drawings for the downstream flood diversion and informed Stoney Nakoda Nations that land access to the project area still had not been obtained.

### *March 24, 2016 to May 5, 2016*

Alberta Transportation provided Stoney Nakoda Nations with project updates and the project area traditional use study commenced. In March 2016, Alberta Transportation notified Stoney Nakoda Nations that land access to the project area had been obtained.

In April 2016, Alberta Transportation requested a meeting with Stoney Nakoda Nations to reintroduce the Project and to discuss logistics for a preliminary visit to the project area. Alberta Transportation provided Stoney Nakoda Nations with project information to aid in the design of the traditional use study, including updated project maps, and a fly-over video of the project area.

On May 4, 2016, Stoney Nakoda Nations, Alberta Transportation and Stantec Consulting Ltd. met to discuss the Traditional Ecological Knowledge and Traditional Land Use section of the EIA and the process for incorporating information shared through the traditional use study process.

### *May 6, 2016 to June 26, 2016*

Alberta Transportation provided Stoney Nakoda Nations with project updates, including an updated fly-over video of the project area, information regarding the public open houses held May 10 and 11, 2016, and a link to the CEA Agency website.

In May 2016, Alberta Transportation provided Stoney Nakoda Nations with a copy of the draft community-specific project consultation log for review.

Alberta Transportation informed Stoney Nakoda Nations that the project description had been submitted to CEA Agency for review and on May 6, 2016 CEA Agency had accepted the project description. Following its acceptance, CEA Agency requested preliminary input from Chiniki First Nation, Wesley First Nation, and Bearspaw First Nation regarding the Project. In May 2016, CEA Agency invited Chiniki First Nation, Wesley First Nation, and Bearspaw First Nation to provide feedback on potential effects on the environment and on Stoney Nakoda Nations as a result of the Project. Stoney Nakoda Nations provided feedback to CEA Agency regarding potential effects of the Project and highlighted the necessity of conducting a project area cultural use study.

In June 2016, CEA Agency sent a letter to Stoney Nakoda Nations notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to September 15, 2016*

Alberta Transportation provided project updates. As well, Stoney Nakoda Nations and Alberta Transportation arranged logistics for project area site visits being completed as part of the project area traditional use study.

In July 2016, Alberta Transportation provided Stoney Nakoda Nations with the draft May 4, 2016 meeting notes and invited comments and additions if required. Also in July 2014, Alberta Transportation requested a meeting with Stoney Nakoda Nations Chiefs and their Chief Executive Officers to provide a project update.

The CEA Agency comment period (June 23 to July 25) inviting feedback from Stoney Nakoda Nations continued. The final guidelines were issued August 10, 2016.

In August 2016, Stoney Nakoda Nations and Alberta Transportation discussed logistics for the project area traditional use study site visits as well as logistics for the proposed meeting with Stoney Nakoda Nations Chiefs and CEOs.

In September 2016, Alberta Transportation requested input for the project area traditional use study site visits and provided Stoney Nakoda Nations with the AEP terms of reference, CEA Agency guidelines, and copies of the letters from CEA Agency to Chiniki First Nation, Wesley First Nation, and Bearspaw First Nation notifying that a federal EIA would be required for the Project.

### *September 16, 2016 to February 28, 2017*

Alberta Transportation provided Stoney Nakoda Nations with project updates. Logistics for the project area traditional use study were discussed between Stoney Nakoda Nations and Alberta Transportation in September and October 2016. In September 2016, Alberta Transportation provided Stoney Nakoda Nations with an updated project map.

On October 13, 2016, Stoney Nakoda Nations met with Alberta Transportation to arrange additional logistics for the project area traditional use study site visits. On October 20, 2016, the traditional use study was initiated with a drive-through visit of the project area. Site visits were held on October 24-28, and October 31 - November 4.

In November 2016, Alberta Transportation provided Stoney Nakoda Nations with a copy of the project test drill locations completed as part of the EIA.

From November 2016 to February 2017, Stoney Nakoda Nations and Alberta Transportation discussed final logistics for the project area traditional use study. In December 2016, Alberta Transportation requested a meeting with Stoney Nakoda Nations to discuss the process for completing the project area traditional use study. Stoney Nakoda Nations informed Alberta Transportation that some communities were in the process of elections, which was causing a delay in the responses to Alberta Transportation.

Also in December 2016, Alberta Transportation provided Stoney Nakoda Nations with an update on the McLean Creek EIA, which was being conducted in relation to the Project. As well in December 2016, Alberta Transportation also provided Stoney Nakoda Nations with a copy of the draft community-specific project consultation log for review.

In January 2017, Alberta Transportation provided Stoney Nakoda Nations with a presentation outlining the status of the EIA and the environmental and socio-economic valued component studies that were being completed.

In February 2017, Alberta Transportation informed Stoney Nakoda Nations about the next steps in the engagement process and confirmed that it would continue through the project regulatory process. Alberta Transportation encouraged Stoney Nakoda Nations to submit the project area traditional use study as soon as available to allow for its inclusion in the EIA.

### *March 1, 2017 to August 31, 2017*

On March 1, 2017, Alberta Transportation shared consultation logs up to February 27, 2017 for review and comment by Stoney Nakoda Nations.

In March 2017, Alberta Transportation provided Stoney Nakoda Nations with information about the Project schedule and inquired when Stoney Nakoda Nations would be submitting the traditional use study. Alberta Transportation welcomed a draft traditional use study if available and requested a meeting with Stoney Nakoda Nations to discuss the findings from the traditional use study.

On April 13, 2017, Alberta Transportation and Stoney Nakoda Nations met to discuss the traditional use study. Stoney Nakoda Nations reported that the study will potentially be available by the end of April 2017. On April 27, 2017, Alberta Transportation inquired again about the

status of the Stoney Nakoda Nations traditional use study in order to integrate findings and concerns into the EIS.

In August 2017, Alberta Transportation provided Stoney Nakoda Nations with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

On September 14, 2017, Alberta Transportation and Stoney Nakoda Nations met to discuss the Project. Stoney Nakoda Nations requested assistance in accessing the project-specific maps. Stoney Nakoda Nations also expressed concerns about wildlife crossings and passage as well as surface and groundwater. Stoney Nakoda Nations requested a site visit with Elders. In September to November 2017, Alberta Transportation provided Stoney Nakoda Nations with Project maps and welcomed a meeting, including Stantec Consulting Ltd. to discuss the EIS. Alberta Transportation inquired whether Stoney Nakoda Nations required assistance in arranging a site visit with Elders.

On November 3, 2017, Alberta Transportation provided Stoney Nakoda Nations with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Stoney Nakoda Nations. On January 15, 2018, Stoney Nakoda Nations sent a letter providing specific feedback on the EIS.

On December 11, 2017, Alberta Transportation provided Stoney Nakoda Nations with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation and Stoney Nakoda Nations held a workshop on February 12, 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). A follow-up workshop has been scheduled to occur March 20, 2018. In accordance with protocols established at the start of each workshop and in recognition of the proprietary nature of TLRU, written summaries of the workshop proceedings were completed by Alberta Transportation and provided to Stoney Nakoda Nations for review and validation before incorporating any information into a revised EIS. As of March 16, 2018, the summary of the workshop had not been validated by Stoney Nakoda Nations for use in updating the TLRU sections. During the February 12, 2018 workshop, Stoney Nakoda Nations requested that the report, *Stoney Nakoda Nations Cultural Assessment for the "Enhancing grizzly bear management programs through the inclusion of cultural monitoring and traditional ecological knowledge"* be reviewed. Results of this review have been integrated into the EIS.

## 3.1.5 Tsuut'ina Nation

The Government of Alberta Aboriginal Consultation Office (ACO) and CEA Agency identified Tsuut'ina Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Tsuut'ina Nation Engagement program, including key engagement activities as well as issues, concerns, and recommendations.

### 3.1.5.1 Summary of Engagement Program with Tsuut'ina Nation

***August 18, 2014 to October 22, 2014***

In August 2014, Government of Alberta Aboriginal Relations notified Tsuut'ina Nation about the Project and informed that engagement may be required with Tsuut'ina Nation, as per *Alberta's First Nations Consultation Guidelines on Land Management and Resource Development.*

Subsequently, in August 2014, Alberta Transportation sent a letter notifying Tsuut'ina Nation about the Project and providing a preliminary project description and plan drawing. Alberta Transportation invited Tsuut'ina Nation to participate in the Project, including sharing any concerns with regards to the Project and the practice of treaty rights and traditional uses with respect to the proposed project area.

In October 2014, Alberta Transportation requested a meeting with Tsuut'ina Nation to discuss the Project.

***October 23, 2014 to December 31, 2014***

Alberta Transportation provided Tsuut'ina Nation with Project information, including project design updates and the draft AEP terms of reference. In October 2014, Tsuut'ina Nation was invited to provide feedback on the draft AEP terms of reference by November 14, 2014.

In October and November 2014, Alberta Transportation and Tsuut'ina Nation arranged logistics for a meeting to discuss the Project. On November 13, 2014, Tsuut'ina Nation and Alberta Transportation held a meeting; Tsuut'ina Nation indicated that the community would be requesting funding to complete a traditional use study of the project area. Tsuut'ina Nation also stated that due to upcoming elections, Tsuut'ina Nation would not be able to communicate regularly with Alberta Transportation until the election process was complete.

Also in November 2014, Alberta Transportation provided Tsuut'ina Nation with the flood mitigation engineering concepts and AEP submitted an article describing the Project as well as the project plan drawing to Tsuut'ina Nation for publication in the local newspaper.

### *January 1, 2015 to March 31, 2015*

Alberta Transportation provided Tsuut'ina Nation with project updates and the benefits of and process regarding a project area traditional use study.

In January 2015, Alberta Transportation invited members of Tsuut'ina Nation to attend the open houses being held on January 27 and 28, 2015. Alberta Transportation noted that these information sessions were part of the public engagement and consultation process and that members of Tsuut'ina Nation were welcome to attend.

In February 2015, the final AEP terms of reference were distributed and in February and March 2015, Alberta Transportation provided Tsuut'ina Nation with project updates. Also in March 2015, Alberta Transportation provided Tsuut'ina Nation with the storyboards presented during the January 2015 public open houses and invited the community to attend the second open house session scheduled for March 17, 2015. At that time, Alberta Transportation also informed Tsuut'ina Nation that land access to the project area still had not been obtained.

### *April 1, 2015 to March 23, 2016*

Alberta Transportation was awaiting direction from the Government of Alberta regarding the Project. Alberta Transportation provided Tsuut'ina Nation with a project status update in June 2015 and again in September 2015.

On September 17, 2015, Tsuut'ina Nation and the Engagement Resilience and Mitigation team of AEP met to discuss the Project, flood mitigation, and past and future engagement opportunities.

In November 2015, Alberta Transportation provided Tsuut'ina Nation with a copy of the draft community-specific project consultation log for review. As well, Alberta Transportation provided Tsuut'ina Nation with the draft November 7, 2014 meeting notes and invited comments and additions if required. Tsuut'ina Nation provided feedback on the meeting notes and stated that the delay between the meeting date and the date that the meeting notes were sent to Tsuut'ina Nation for review was unsatisfactory. Alberta Transportation apologized for this oversight.

Also in November 2015, Alberta Transportation provided Tsuut'ina Nation with updated conceptual drawings for the downstream flood diversion and informed Tsuut'ina Nation that land access to the project area still had not been obtained.

In December 2015, Tsuut'ina Nation submitted changes for some discussion items from the November 7, 2014 meeting notes more accurately. Tsuut'ina Nation also provided information to Alberta Transportation regarding the process for meaningful engagement regarding the Project. Alberta Transportation confirmed that it will continue to consult with Tsuut'ina Nation and stated

that as soon as more Project information is received from the Crown and land access was obtained, the dialogue between Tsuut'ina Nation and Alberta Transportation would resume.

### *March 24, 2016 to May 5, 2016*

Alberta Transportation provided Tsuut'ina Nation with project updates and the project area traditional use study commenced. In March 2016, Alberta Transportation notified Tsuut'ina Nation that land access to the project area had been obtained. Tsuut'ina Nation requested a meeting with Alberta Transportation to discuss the Government of Alberta engagement process and present Tsuut'ina Nation's process for conducting traditional land use work.

In March and April 2016, Alberta Transportation and Tsuut'ina Nation arranged logistics for the meeting and the meeting was held on April 21, 2016. Following the meeting, Tsuut'ina Nation provided a list of action items and clarification questions regarding the EIA and the engagement process.

Also in April 2016, Alberta Transportation provided Tsuut'ina Nation with project information to aid in the design of the traditional use study, including updated project maps.

### *May 6, 2016 to June 26, 2016*

Alberta Transportation provided Tsuut'ina Nation with project updates, including an updated fly-over video of the project area, information regarding the public open houses held May 10 and 11, 2016, and a link to the CEA Agency website.

In May 2016, the Government of Alberta Infrastructure and Transportation Ministry sent a letter to Tsuut'ina Nation to thank Tsuut'ina Nation for meeting with the Ministry and to state the Ministry's commitment to engagement. The Ministry committed to fund a project area traditional use study for Tsuut'ina Nation.

Also in May 2016, Alberta Transportation provided Tsuut'ina Nation with the draft April 21, 2016 meeting notes and invited comments and additions if required.

In May and June 2016, Tsuut'ina Nation and Alberta Transportation arranged logistics for the project area traditional use study.

Alberta Transportation informed Tsuut'ina Nation that the project description had been submitted to CEA Agency for review and on May 6, 2016 CEA Agency had accepted the Project description. CEA Agency requested preliminary input from Tsuut'ina Nation regarding the Project. In May 2016, CEA Agency invited Tsuut'ina Nation to provide feedback on potential effects on the environment and on Tsuut'ina Nation as a result of the Project. Tsuut'ina Nation provided feedback to CEA Agency regarding impacts on resources supporting traditional

activities and physical and cultural heritage and stated that, to date, there was insufficient information to identify all potential effects from the Project.

In June 2016, CEA Agency sent a letter to Tsuut'ina Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to September 15, 2016*

Alberta Transportation provided project updates. Tsuut'ina Nation and Alberta Transportation arranged logistics for the project area traditional use study.

In June 2016, Alberta Transportation provided Tsuut'ina Nation with a copy of the final AEP terms of reference and provided information about the EIA process and content, including the requirement to include information about traditional ecological knowledge and land use.

The CEA Agency comment period (June 23 to July 25) inviting feedback from Tsuut'ina Nation continued. The final guidelines were issued August 10, 2016.

In July 2016, Alberta Transportation and Tsuut'ina Nation discussed logistics for project area traditional use study site visits. Alberta Transportation requested a meeting to discuss the project, the process and protocols for conducting site visits and to initiate the traditional use study with a drive-through visit of the project area.

In September 2016, Alberta Transportation provided Tsuut'ina Nation with the AEP terms of reference, CEA Agency guidelines, and a copy of the letter from CEA Agency to Tsuut'ina Nation notifying that a federal EIA would be required for the Project. At that time, Alberta Transportation inquired whether Tsuut'ina Nation would like to commence the project area traditional use study by conducting site visits.

### *September 16, 2016 to August 31, 2017*

Alberta Transportation provided project updates. Alberta Transportation and Tsuut'ina Nation discussed logistics and the process for the project area traditional use study.

In September 2016, Alberta Transportation and Tsuut'ina Nation discussed the project area traditional use study site visits, and Tsuut'ina Nation confirmed that the process could not commence until all funding was secured.

Alberta Transportation approved Tsuut'ina Nation's project area traditional use study budget in late September 2016. Alberta Transportation also provided a project map. In October 2016, logistics for the project area traditional use study site visits were arranged. On October 12, 2016,

the traditional use study was initiated with a drive-through visit of the project area. Site visits were held on October 13-21, 2016.

In October 2016, Alberta Transportation provided Tsuut'ina Nation with project maps that included borehole locations, as requested by Tsuut'ina Nation during the site visits.

On October 28, 2016, Tsuut'ina Nation met with Alberta Transportation and Stantec Consulting Ltd. to discuss the EIA process and to discuss potential mitigation measures. In preparation for the meeting, Alberta Transportation provided Tsuut'ina Nation with copies of the AEP terms of reference and CEA Agency guidelines. Following the meeting, Alberta Transportation provided Tsuut'ina Nation with additional copies of the project maps that included borehole locations.

In November 2016, Tsuut'ina Nation and Alberta Transportation discussed logistics and the process for completion of the project area traditional use study. Alberta Transportation inquired whether Tsuut'ina Nation is interested in holding a workshop with Stantec Consulting Ltd. to discuss the EIA.

In December 2016, logistics for additional site visits were discussed. These visits were arranged for December 5-6, 2016; however, due to inclement weather, they were postponed.

Also in December 2016, Alberta Transportation provided Tsuut'ina Nation with a copy of the draft October 28, 2106 meeting notes, and invited comments and additions if required. As well, Alberta Transportation provided Tsuut'ina Nation with an update on the McLean Creek EIA, which was being conducted in relation to the Project.

Alberta Transportation also provided Tsuut'ina Nation with a copy of the draft community-specific project consultation log in December 2016 for review.

In January 2017, further logistics for additional site visits were discussed. As well, Alberta Transportation provided Tsuut'ina Nation with a copy of the updated draft October 28, 2016 meeting notes. Alberta Transportation also provided Tsuut'ina Nation with a presentation outlining the status of the EIA and the environmental and socio-economic valued component studies that were being completed.

Also in January 2017, Alberta Transportation requested a meeting with Tsuut'ina Nation to discuss the Project and the EIA, including information about traditional land use in the project area. Alberta Transportation inquired about the status of the Tsuut'ina Nation project area traditional use study.

In February 2017, Tsuut'ina Nation and Alberta Transportation discussed the process for the completion of the project area traditional use study.

Also in February 2017, Alberta Transportation informed Tsuut'ina Nation about the next steps in the engagement process and confirmed that engagement would continue through the Project regulatory process. Alberta Transportation encouraged Tsuut'ina Nation to submit the project area traditional use study as soon as available to allow for its inclusion in the EIA.

In March 2017, Alberta Transportation provided Tsuut'ina Nation with consultation logs up to February 27, 2017 for their review and comment, as well as certain other phone logs for review and project information for inclusion in the Tsuut'ina SR1 ROC Report.

Also in March 2017, Alberta Transportation informed Tsuut'ina Nation of deadlines related to inclusion of the Tsuut'ina Nation traditional use study in the EIA/EIS and continued to encourage Tsuut'ina Nation to submit their traditional use study in time to allow for its inclusion.

In April and May of 2017, Alberta Transportation continued to request updates on when Alberta Transportation would receive the Tsuut'ina Nation traditional use study report.

In May of 2017, Tsuut'ina Nation provided the Minister of Infrastructure and Transportation with a letter summarizing their issues and concerns regarding the Project, as well as their recommendations for additional traditional use study fieldwork, the holding of a ceremony and feast (with proposed budget) and how to improve engagement with Tsuut'ina Nation moving forward.

In early June of 2017 the Minister of Infrastructure and Transportation formally responded by letter to Tsuut'ina Nation's issues, concerns and recommendations.

In June and July of 2017, Alberta Transportation and Tsuut'ina Nation continued to discuss delivery of the original Tsuut'ina Nation traditional use study as well as the delivery of a second additional traditional land use study. Communications during June and July 2017 included determining preferred dates and locations and logistics for site visits, access permissions, as well as scheduling and planning for a ceremony and feast.

In July 2017, Alberta Transportation shared a number of phone logs with Tsuut'ina Nation for review and comment. Tsuut'ina Nation informed Alberta Transportation that certain changes were needed, Alberta Transportation corrected those errors, and the corrected logs were forwarded to Tsuut'ina Nation for review.

On July 5, 2017 Alberta Transportation informed Tsuut'ina Nation that the budget for continued traditional land use work and ceremony and feast had been approved.

On July 19, 2017, Tsuut'ina Nation contacted Alberta Environment and Parks by letter and explained their concerns regarding the level of engagement on the Project, including concerns regarding site selection, potential increased risk of flooding, effects on fish and wildlife and their

habitat, effects on burial sites, effects on and ground and surface water sources, and Tsuut'ina Nation's participation in the review of the Project.

On July 13, 14, 18 - 21, 24, and 25, 2017, Tsuut'ina Nation members, consultants and representatives of Alberta Transportation participated in site visits inspecting project properties.

Also in July 2017, there were communications regarding scheduling and planning for upcoming meetings between Tsuut'ina Nation and Alberta Transportation and further project site visits.

On August 9 and 10, 2017 Tsuut'ina Nation members representatives of Alberta Transportation participated in additional site visits inspecting project properties.

On August 11, 2017 Alberta Transportation informed Tsuut'ina Nation of the time and locations for the Public Information Sessions planned for August 2017.

On August 23, 2017 Alberta Transportation and a representative of Stantec met with Tsuut'ina Nation Chief and Council members. Stantec gave a presentation on the EIA/EIS. Attendees discussed Tsuut'ina Nation's expressed concerns, including Project location, impacted pipelines, Tsuut'ina Nation's participation in the planning, review and decision-making regarding the Project, Project timelines and potential flooding issues. Tsuut'ina Nation requested copies of the Breach Analysis Report and Hydrology Study and the Historical Resources Section of the EIA/EIS for review. Tsuut'ina Nation also presented the option of having a community information session on reserve.

Also during August 2017 there were communications regarding planning of further meetings between Alberta Transportation and Tsuut'ina Nation. On August 31, 2017 Alberta Transportation and Tsuut'ina Nation met to discuss the EIS and Tsuut'ina Nation presented the option of hosting a community information session on the Tsuut'ina Nation reserve.

### *September 1, 2017 to March 16, 2018*

During September and October 2017 there were communications regarding a meeting between Stantec and Tsuut'ina Nation as well as site visits with Elders.

On November 3, 2017, Alberta Transportation provided Tsuut'ina Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On November 10, 2017, Alberta Transportation inquired about the status of the Tsuut'ina Nation traditional use study.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Tsuut'ina Nation.

On December 11, 2017, Alberta Transportation provided Tsuut'ina Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

On January 5, 2018, Tsuut'ina Nation provided Alberta Transportation with a copy of the draft traditional use study and stated that the draft is to remain confidential between Alberta Transportation and Tsuut'ina Nation. On January 12, 2018 Alberta Transportation confirmed that the draft traditional use study would remain confidential until Tsuut'ina Nation provides approval. Communications occurred between Alberta Transportation and Tsuut'ina Nation in January 2018 to discuss the logistics involved in receiving a final copy of the traditional use study.

Alberta Transportation and Tsuut'ina Nation held a four-day workshop on March 1, 5, 6, and 7 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). Two of these days were site tours with Tsuut'ina Nation Elders. In accordance with protocols established at the start of each workshop and in recognition of the proprietary nature of TLRU, written summaries of the workshop proceedings were completed by Alberta Transportation and provided to Tsuut'ina Nation for review and validation before incorporating any information into a revised EIS. As of March 16, 2018, the summary of the workshop had not been validated by Tsuut'ina Nation for use in updating the TLRU sections.

### 3.1.6 Ermineskin Cree Nation

The CEA Agency guidelines identified Ermineskin Cree Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Ermineskin Cree Nation Engagement program including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.6.1 Summary of Engagement Program with Ermineskin Cree Nation

***May 6, 2016 to June 26, 2016***

CEA Agency requested preliminary input from Ermineskin Cree Nation regarding the Project. In May 2016, CEA Agency invited Ermineskin Cree Nation to provide feedback on potential effects on the environment and on Ermineskin Cree Nation as a result of the Project. Ermineskin Cree Nation provided feedback to CEA Agency regarding potential effects of the Project.

In June 2016, CEA Agency sent a letter to Ermineskin Cree Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to October 31, 2016*

The CEA Agency comment period (June 23 to July 25) inviting feedback from Ermineskin Cree Nation continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Ermineskin Cree Nation about the Project and invited Ermineskin Cree Nation to participate in a dialogue to discuss any project-related merits, issues, or concerns.

### *November 1, 2016 to August 31, 2017*

In November 2016, Alberta Transportation provided Ermineskin Cree Nation with copies of the October 2017 notification letter and the CEA Agency June 23, 2016 letter.

During January through March 2017, there were a number of communications regarding planning of future meetings between Alberta Transportation and Ermineskin Cree Nation.

In June 2017, a site tour with CEAA and Ermineskin Cree Nation was postponed. On June 27, 2017 Alberta Transportation and Ermineskin Cree Nation met to discuss the Project. Ermineskin Cree Nation expressed concerns about wildlife, wildlife movement, and medicinal plants. Ermineskin Cree Nation indicated an interest in taking a tour of the Project area.

In August 2017, Alberta Transportation provided Ermineskin Cree Nation with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

On October 19, 2017, Alberta Transportation shared the most current consultation logs for review and comment by Ermineskin Cree Nation.

On November 3, 2017, Alberta Transportation provided Ermineskin Cree Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Ermineskin Cree Nation. On January 5, 2018, Ermineskin Cree Nation responded by letter that feedback could not be provided at this time because the EIS does not conform to the EIS guidelines.

On December 11, 2017, Alberta Transportation provided Ermineskin Cree Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation offered to hold a workshop with Ermineskin Cree Nation during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, discussions regarding a workshop with Ermineskin Cree Nation were ongoing.

### 3.1.7 Foothills Ojibway

The CEA Agency guidelines identified Foothills Ojibway as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Foothills Ojibway Engagement program including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.7.1 Summary of Engagement Program with Foothills Ojibway

***May 6, 2016 to June 26, 2016***

CEA Agency requested preliminary input from Foothills Ojibway regarding the Project. In May 2016, CEA Agency invited Foothills Ojibway to provide feedback on potential effects on the environment and on Foothills Ojibway as a result of the Project.

In June 2016, CEA Agency sent a letter to Foothills Ojibway notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

***June 27, 2016 to October 31, 2016***

The CEA Agency comment period (June 23 to July 25) inviting feedback from Foothillls Ojibway continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Foothills Ojibway about the Project and invited Foothills Ojibway to participate in a dialogue to discuss any project-related merits, issues, or concerns. In December 2016, Alberta Transportation requested a meeting with Foothills Ojibway to discuss the Project. No response was received from Foothills Ojibway.

***November 1, 2016 to August 31, 2017***

In December 2016, Alberta Transportation provided Foothills Ojibway with copies of the October 2017 notification letter and the CEA Agency June 23, 2016 letter. In March 2017, Alberta Transportation provided Foothills Ojibway another copy of the October 2017 notification letter and inquired whether Foothills Ojibway wished to participate in the Project.

***September 1, 2017 to March 16, 2018***

On November 3, 2017, Alberta Transportation provided Foothills Ojibway with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Foothills Ojibway.

On December 11, 2017, Alberta Transportation provided Foothills Ojibway with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation offered a workshop to be held with Foothills Ojibway during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, Foothills Ojibway had not responded to Alberta Transportation's offer of a workshop.

## 3.1.8 Ktunaxa Nation

The CEA Agency guidelines identified Ktunaxa Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Ktunaxa Nation Engagement program including key engagement activities as well as issues, concerns, and recommendations.

### 3.1.8.1 Summary of Engagement Program with Ktunaxa Nation

***May 6, 2016 to June 26, 2016***

In May 2016, CEA Agency invited Ktunaxa Nation to provide feedback on potential effects on the environment and on Ktunaxa Nation as a result of the Project.

In June 2016, CEA Agency sent a letter to Ktunaxa Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

***June 27, 2016 to September 15, 2016***

The CEA Agency comment period (June 23 to July 25) inviting feedback from Ktunaxa Nation continued. The final guidelines were issued August 10, 2016.

### *September 16, 2016 to August 31, 2017*

In October 2016, Alberta Transportation sent a letter notifying Ktunaxa Nation about the Project and invited Ktunaxa Nation to participate in a dialogue to discuss any project-related merits, issues, or concerns. In December 2016, Alberta Transportation requested a meeting with Ktunaxa Nation to discuss the Project.

On January 9, 2017, Ktunaxa Nation stated that the Nation would not be participating in the Indigenous engagement program for Project due to lack of time and resources and would not be engaging with Alberta Transportation further in relation to the Project.

On May 15, 2017, Alberta Transportation contacted Ktunaxa Nation by email and requested clarification regarding Ktunaxa Nation involvement in the Indigenous engagement program for the Project and offering to meet with them to provide an update on the project. Alberta Transportation did not receive a response.

### *September 1, 2017 to March 16, 2018*

On November 3, 2017, Alberta Transportation provided Ktunaxa Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Ktunaxa Nation.

On December 11, 2017, Alberta Transportation provided Ktunaxa Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation offered to hold a workshop with Ktunaxa Nation during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, Ktunaxa Nation had not responded to Alberta Transportation's offer of a workshop.

## 3.1.9 Louis Bull Tribe

The CEA Agency guidelines identified Louis Bull Tribe as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Louis Bull Tribe Engagement program including key engagement activities as well as issues, concerns, and recommendations.

### 3.1.9.1 Summary of Engagement Program with Louis Bull Tribe

#### *May 6, 2016 to June 26, 2016*

In May 2016, CEA Agency invited Louis Bull Tribe to provide feedback on potential effects on the environment and on Louis Bull Tribe as a result of the Project. Louis Bull Tribe provided feedback to CEA Agency regarding potential effects of the Project.

In June 2016, CEA Agency sent a letter to Louis Bull Tribe notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

#### *June 27, 2016 to October 31, 2016*

The CEA Agency comment period (June 23 to July 25) inviting feedback from Louis Bull Tribe continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Louis Bull Tribe about the Project and invited Louis Bull Tribe to participate in a dialogue to discuss any project-related merits, issues, or concerns. In November 2016, Alberta Transportation requested a meeting with Louis Bull Tribe to discuss the Project and in December 2016 and January 2017 Louis Bull Tribe and Alberta Transportation discussed potential dates to hold a meeting.

#### *November 1, 2016 to August 31, 2017*

In November 2016, Alberta Transportation provided Louis Bull Tribe with copies of the October 2017 notification letter and the CEA Agency June 23, 2016 letter.

During December 2016 through June 2017, there were a number of communications regarding planning of future meetings between Alberta Transportation and Louis Bull Tribe. In May 2017, Alberta Transportation and Louis Bull Tribe discussed logistics for a site tour.

On July 12, 2017, Alberta Transportation and Louis Bull Tribe met to discuss the Project. On July 14, 2017, Alberta Transportation and Louis Bull Tribe held a site tour.

In August 2017, Alberta Transportation provided Louis Bull Tribe with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

***September 1, 2017 to March 16, 2018***

During September through November 2017, there were a number of communications regarding logistics for conducting a traditional use study between Alberta Transportation and Louis Bull Tribe.

On November 3, 2017, Alberta Transportation provided Louis Bull Tribe with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

In December 2017, Alberta Transportation sent copies of a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Louis Bull Tribe.

On December 11, 2017, Alberta Transportation provided Louis Bull Tribe with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation offered a workshop to be held with Louis Bull Tribe during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, discussions regarding a workshop with Louis Bull Tribe were ongoing.

## 3.1.10 Montana First Nation

The CEA Agency guidelines identified Montana First Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Montana First Nation Engagement program including key engagement activities as well as issues, concerns, and recommendations.

### 3.1.10.1 Summary of Engagement Program with Montana First Nation

***May 6, 2016 to June 26, 2016***

In May 2016, CEA Agency invited Montana First Nation to provide feedback on potential effects on the environment and on Montana First Nation as a result of the Project.

In June 2016, CEA Agency sent a letter to Montana First Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to January 1, 2017*

The CEA Agency comment period (June 23 to July 25) inviting feedback from Montana First Nation continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Montana First Nation about the Project and invited Montana First Nation to participate in a dialogue to discuss any project-related merits, issues, or concerns.

In November 2016, Alberta Transportation provided Montana First Nation with copies of the October 2017 notification letter and the CEA Agency June 23, 2016 letter.

During December 2016 and January 2017, there were a number of communications regarding planning of future meetings between Alberta Transportation and Montana First Nation.

### *January 2, 2017 to August 31, 2017*

In January 2017, Montana First Nation met with Alberta Transportation to discuss the Project. Following the meeting, Alberta Transportation provided copies of the AEP terms of reference, CEA Agency guideline, and project map to Montana First Nation.

In August 2017, Alberta Transportation provided Montana First Nation with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

On November 3, 2017, Alberta Transportation provided Montana First Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Montana First Nation.

On December 11, 2017, Alberta Transportation provided Montana First Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

In January 2018, Alberta Transportation shared the most current consultation logs for review and comment by Montana First Nation.

Alberta Transportation offered to hold a workshop with Montana First Nation during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of

the traditional use information in the EIS and include any feedback received. As of March 16, 2018, discussions regarding a workshop with Montana First Nation were ongoing.

### 3.1.11 Samson Cree Nation

The CEA Agency guidelines identified Samson Cree Nation as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Samson Cree Nation Engagement program including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.11.1 Summary of Engagement Program with Samson Cree Nation

***May 6, 2016 to June 26, 2016***

In May 2016, CEA Agency invited Samson Cree Nation to provide feedback on potential effects on the environment and on Samson Cree Nation as a result of the Project.

In June 2016, CEA Agency sent a letter to Samson Cree Nation notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

***June 27, 2016 to October 31, 2016***

The CEA Agency comment period (June 23 to July 25) inviting feedback from Samson Cree Nation continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Samson Cree Nation about the Project and invited Samson Cree Nation to participate in a dialogue to discuss any project-related merits, issues, or concerns.

***November 1, 2016 to August 31, 2017***

On November 29, 2016, Alberta Transportation and Samson Cree Nation met to discuss the Project.

During November 2016 through April 2017, there were communications regarding Alberta Transportation presenting at a South Saskatchewan Regional Plan (SSRP) meeting between Alberta Transportation and Samson Cree Nation. On May 24, 2017, Alberta Transportation presented at the SSRP meeting.

In June 2017, a site tour with CEAA and Samson Cree Nation was postponed.

In July 2017, Alberta Transportation provided Samson Cree Nation with Project maps.

In August 2017, Alberta Transportation provided Samson Cree Nation with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

***September 1, 2017 to March 16, 2018***

On November 3, 2017, Alberta Transportation provided Samson Cree Nation with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

On December 4, 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Samson Cree Nation.

On December 11, 2017, Alberta Transportation provided Samson Cree Nation with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation and Samson Cree Nation held a workshop on February 23, 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). In accordance with protocols established at the start of each workshop and in recognition of the proprietary nature of TLRU, written summaries of the workshop proceedings were completed by Alberta Transportation and provided to Samson Cree Nation for review and validation before incorporating any information into a revised EIS. As of March 16, 2018, the summary of the workshop had not been validated by Samson Cree Nation for use in updating the TLRU sections.

## 3.1.12 Métis Nation of Alberta, Region 3

The CEA Agency guidelines identified Métis Nation of Alberta, Region 3 as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Métis Nation of Alberta, Region 3 Engagement program including key engagement activities as well as issues, concerns, and recommendations.

### 3.1.12.1 Summary of Engagement Program with Métis Nation of Alberta, Region 3

***May 6, 2016 to June 26, 2016***

In May 2016, CEA Agency invited Métis Nation of Alberta, Region 3 to provide feedback on potential effects on the environment and on Métis Nation of Alberta, Region 3 as a result of the Project. Métis Nation of Alberta, Region 3 provided feedback to CEA Agency regarding potential effects of the Project.

In June 2016, CEA Agency sent a letter to Métis Nation of Alberta, Region 3 notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to January 31, 2017*

The CEA Agency comment period (June 23 to July 25) inviting feedback from Métis Nation of Alberta, Region 3 continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Métis Nation of Alberta, Region 3 about the Project and invited Métis Nation of Alberta, Region 3 to participate in a dialogue to discuss any project-related merits, issues, or concerns. In December 2016, Alberta Transportation requested a meeting with Métis Nation of Alberta, Region 3 to discuss the Project and in January 2017, Alberta Transportation resent the Project notification letter and reiterated the invitation to meet to discuss the Project.

In December 2016, Alberta Transportation provided Métis Nation of Alberta, Region 3 with a copy of the October 2017 notification letter.

In January 2017, Alberta Transportation inquired whether Métis Nation of Alberta, Region 3 was interested in participating in the Project.

### *February 1, 2017 to August 31, 2017*

In April 2017, Alberta Transportation again inquired whether Métis Nation of Alberta, Region 3 was interested in participating in the Project.

During April and May 2017, there were communications regarding planning of future meetings between Alberta Transportation and Métis Nation of Alberta, Region 3.

In June through August 2017, Alberta Transportation and Métis Nation of Alberta, Region 3 discussed logistics for participating in the Project.

In August 2017, Alberta Transportation provided Métis Nation of Alberta, Region 3 with information on upcoming public open houses planned for the Calgary, Alberta and Springbank, Alberta areas.

### *September 1, 2017 to March 16, 2018*

In September 2017 through January 2018, Alberta Transportation and Métis Nation of Alberta, Region 3 discussed further logistics for participating in the Project.

On November 3, 2017, Alberta Transportation provided Métis Nation of Alberta, Region 3 with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

In December 2017, Alberta Transportation sent a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Métis Nation of Alberta, Region 3.

On December 11, 2017, Alberta Transportation provided Métis Nation of Alberta, Region 3with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation and Métis Nation of Alberta, Region 3 held a workshop on February 22, 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). In accordance with protocols established at the start of each workshop and in recognition of the proprietary nature of TLRU, written summaries of the workshop proceedings were completed by Alberta Transportation and provided to Métis Nation of Alberta, Region 3 for review and validation before incorporating any information into a revised EIS. As of March 16, 2018, the summary of the workshop had not been validated by Métis Nation of Alberta, Region 3 for use in updating the TLRU sections.

### 3.1.13 Métis Nation British Columbia

The CEA Agency guidelines identified Métis Nation British Columbia as an Indigenous group potentially affected by and requiring engagement in the Project. The following summarizes outcomes of the Métis Nation British Columbia Engagement program including key engagement activities as well as issues, concerns, and recommendations.

#### 3.1.13.1 Summary of Engagement Program with Métis Nation British Columbia

***May 6, 2016 to June 26, 2016***

In May 2016, CEA Agency invited Métis Nation British Columbia to provide feedback on potential effects on the environment and on Métis Nation British Columbia as a result of the Project. Métis Nation British Columbia provided feedback to CEA Agency regarding potential effects of the Project.

In June 2016, CEA Agency sent a letter to Métis Nation British Columbia notifying that a federal EIA would be required for the Project and requesting input on community and traditional knowledge in order to finalize the CEA Agency guidelines.

### *June 27, 2016 to January 31, 2017*

The CEA Agency comment period (June 23 to July 25) inviting feedback from Métis Nation British Columbia continued. The final guidelines were issued August 10, 2016.

In October 2016, Alberta Transportation sent a letter notifying Métis Nation British Columbia about the Project and invited Métis Nation British Columbia to participate in a dialogue to discuss any project-related merits, issues, or concerns. In December 2016, Alberta Transportation requested a meeting with Métis Nation British Columbia to discuss the Project.

In January 2017, it was recognized that the incorrect contact information had been used to contact Métis Nation British Columbia. At that time, Alberta Transportation contacted Métis Nation British Columbia to resend the Project notification letter and invite Métis Nation British Columbia to participate in the Project. Alberta Transportation did not receive a response.

### *February 1, 2017 to March 16, 2018*

On November 3, 2017, Alberta Transportation provided Métis Nation British Columbia with a link to the environmental impact statement and associated briefing documents that had been submitted to the regulators.

In December 2017, Alberta Transportation sent copies of a letter from the Government of Alberta Deputy Minister of Infrastructure regarding the EIS as well as relevant assessment sections and maps and requesting feedback from Métis Nation British Columbia.

On December 11, 2017, Alberta Transportation provided Métis Nation British Columbia with a copy of the CEAA Technical Advisory Group presentation given in Calgary on November 8, 2017.

Alberta Transportation offered a workshop to be held with Métis Nation British Columbia during February or March 2018 to obtain feedback on how traditional use information has been presented in the draft TLRU sections (Sections 14 of Volumes 3A and 3B). The intention was to validate the use of the traditional use information in the EIS and include any feedback received. As of March 16, 2018, Métis Nation British Columbia had not responded to Alberta Transportation's offer of a workshop.

# Attachment 1 STAKEHOLDER OPEN HOUSE DISPLAY BOARDS AND HANDOUTS

**SPRINGBANK OFF-STREAM RESERVOIR PROJECT**
**ENVIRONMENTAL IMPACT ASSESSMENT**
**CONSULTATION AND ENGAGEMENT**

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

# 2015 ENGAGEMENT AND CONSULTATION

Stantec

**SPRINGBANK OFF-STREAM RESERVOIR PROJECT**
**ENVIRONMENTAL IMPACT ASSESSMENT**
**CONSULTATION AND ENGAGEMENT**

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

## January 2015

Stantec

**Springbank Off-stream Reservoir Project**

# Please join us for a flood mitigation consultation session in your community.

The Alberta government is moving forward with an Environmental Impact Assessment and detailed engineering and design of a dry off-stream reservoir near Springbank.

Public consultation for this project is now underway. Please join us to provide feedback and learn more about this important flood mitigation project.

**CALGARY**
**Tuesday, January 27**
**4:30 – 8:00 p.m.**

**Ross Glen Hall**
**Roderick Mah Centre for Continuous Learning**
Mount Royal University
4825 Mount Royal Gate SW

**COCHRANE**
**Wednesday, January 28**
**4:30 – 8:00 p.m.**

Cochrane RancheHouse
101 RancheHouse Road

**Learn more at**
**alberta.ca/springbank-road.cfm**

Alberta Government

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# Springbank Off-Stream Reservoir Project

***Please join Alberta Environment and Sustainable Resource Development, Alberta Transportation, and municipal representatives to learn more about this project.***

OPEN HOUSE

## Calgary
Tuesday, January 27
4:30 – 8 p.m.
Ross Glen Hall
Roderick Mah Centre for Continuous Learning – Mount Royal University
4825 Mount Royal Gate SW

## Cochrane
Wednesday, January 28
4:30 – 8 p.m.
Cochrane RancheHouse
101 RancheHouse Road

locations

The Alberta government is moving forward with an Environmental Impact Assessment and detailed engineering and design of a dry off-stream reservoir near Springbank.

The Springbank Off-Stream Reservoir is a high priority because it will provide a critical layer of flood protection for communities along the Elbow River. A dry reservoir design will provide the required level of flood protection with less impact on land owners and the environment.

The reservoir will be located approximately 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and east of Highway 22. It will have storage capacity of 67.6 million cubic metres. A 4.5 kilometre canal will carry water from the river to the off-stream reservoir during flood conditions.

Public consultation for this project is now underway, with open house events scheduled for Calgary and Cochrane. These events are an opportunity for you to provide feedback and learn more about this important flood mitigation project.

For further information on the Springbank Off-Stream Reservoir Project or copies of the proposed Terms of Reference and associated project information, please contact:

Mark Svenson
Provincial Transportation Environmental Coordinator
Phone: 780-644-8354
Email: springbank-project@gov.ab.ca

Alberta Government

# Exit Survey - Calgary

## Springbank Off-stream Reservoir Open House
## January 27, 2015 - Mount Royal University

Thank you for taking the time to provide your input. A compiled summary of the results of this survey, along with the questions and comments raised at the January 27 and January 28 open houses, will be compiled and submitted as part of the Environmental Impact Assessment application for this project. For your convenience, this survey can also be completed online at https://www.surveymonkey.com/s/QQC9B8Q until February 9, 2015.

1. How did you hear about the open house?
   - □ Newspaper advertisement
   - □ Mailed invitation
   - □ Emailed invitation
   - □ Government of Alberta website
   - □ Social media (Twitter, etc.)
   - □ Word of mouth
   - □ Other _____

2. Were the displays helpful for understanding the proposed project? □ Yes □ No
   If no - why not?

   _____

   _____

   _____

3. Was the information provided by members of the project team helpful in answering your questions? □ Yes □ No
   If no – what information would have been more helpful?

   _____

   _____

   _____

4. The information provided at the open house was:

   □ Too detailed □ Adequate □ Not detailed enough

5. What are the top three priorities you feel the Government of Alberta should address in planning the proposed Springbank Off-stream Reservoir project?

   i)_____

   _____

   _____

# Exit Survey - Calgary

ii)_____

_____

_____

iii)_____

_____

_____

6. Do you have any further questions or comments regarding the proposed project?

_____

_____

_____

7. Going forward, how can the Government of Alberta best share information with stakeholders about the proposed Springbank Off-stream Reservoir project (e.g. newsletters, meetings, open houses, email, website, social media etc.)?

_____

_____

_____

**Please complete the following if you would like to be contacted directly concerning your questions or comments. Thank you.**

Name _____

Mailing address _____

Phone Number _____ Email address _____

This participant survey can also be submitted to the Government of Alberta by mail or email:
Springbank Off-stream Reservoir Project c/o Communica
200, 215 12th Avenue S.E.
Calgary AB T2G 1A2

Springbank-Project@gov.ab.ca

Personal information is being collected by Alberta Transportation under the authorization of Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and is managed in accordance with part 2 of the FOIP Act. Your name, address, email address, and/or phone number will be used for contact purposes to respond to your question(s) or concern(s) regarding the proposed Springbank Off-stream Reservoir project. Your personal information will be shared with the department of Environment and Sustainable Resource Development and Canadian Environmental Assessment Agency. Should you wish to have your personal information removed, corrected or have concerns pertaining to the Springbank Off-stream Reservoir project, please contact Mark Svenson, Alberta Transportation Environmental Coordinator at (780) 644-8354 or springbank-project@gov.ab.ca.

# Exit Survey - Cochrane

## Springbank Off-stream Reservoir Open House
## January 28, 2015 - Cochrane Ranchehouse

Thank you for taking the time to provide your input. A compiled summary of the results of this survey, along with the questions and comments raised at the January 27 and January 28 open houses, will be compiled and submitted as part of the Environmental Impact Assessment application for this project. For your convenience, this survey can also be completed online at https://www.surveymonkey.com/s/QQC9B8Q until February 9, 2015.

1. How did you hear about the open house?
   - □ Newspaper advertisement
   - □ Mailed invitation
   - □ Emailed invitation
   - □ Government of Alberta website
   - □ Social media (Twitter, etc.)
   - □ Word of mouth
   - □ Other _____

2. Were the displays helpful for understanding the proposed project? □ Yes □ No

   If no - why not?

   _____

   _____

   _____

3. Was the information provided by members of the project team helpful in answering your questions? □ Yes □ No

   If no – what information would have been more helpful?

   _____

   _____

   _____

4. The information provided at the Open House was:

   □ Too detailed □ Adequate □ Not detailed enough

5. What are the top three priorities you feel the Government of Alberta should address in planning the proposed Springbank Off-stream Reservoir project?

   i) _____

   _____

   _____

# Exit Survey - Cochrane

ii) _____

_____

_____

iii) _____

_____

_____

6. Do you have any further questions or comments regarding the proposed project?

_____

_____

_____

_____

7. Going forward, how can the Government of Alberta best share information with stakeholders about the proposed Springbank Off-stream Reservoir project (e.g. newsletters, meetings, open houses, email, website, social media etc.)?

_____

_____

_____

**Please complete the following if you would like to be contacted directly concerning your questions or comments. Thank you.**

Name _____

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Calgary AB T2G 1A2

Springbank-Project@gov.ab.ca

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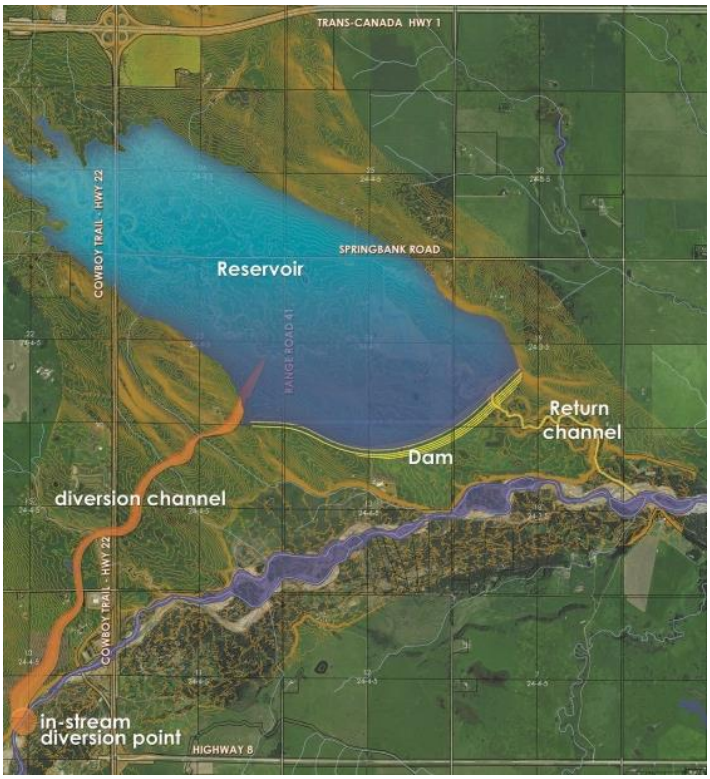
# Springbank Off-stream Reservoir (SR1) – Frequently Asked Questions

1. **What is the Springbank Off-stream Reservoir Project?**
   The Springbank Off-stream Reservoir (SR1) is being undertaken by the Government of Alberta to provide flood protection along the Elbow River. Based on the conceptual design, SR1 would have storage capacity of 67.6 million cubic metres. A 4.5 kilometre canal would carry water from the river to the off-stream reservoir during flood conditions. There will be a modified channel to release water back to the river.

   Information regarding the SR1 project can be found on the Government of Alberta website: http://alberta.ca/springbank-road.cfm




2. **Where is it located?**
   The reservoir will be approximately 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and east of Highway 22.

3. **What is the timeline for the project?**
   Detailed design and engineering, and Environmental Impact Assessment for SR1 are underway. A decision regarding final approval of the project will occur once the report is provided by Stantec, the firm that has been contracted by the Government of Alberta to complete this work, and regulatory requirements have been met. Based on current estimates, construction will begin in 2016 and the reservoir will be operational by spring 2018.

4. **What benefits does a dry reservoir offer?**
   SR1 is being designed as a dry reservoir. A dry reservoir would only be filled with water during a flood situation. Because major floods happen infrequently, a dry design would allow some land owners to continue using the land their families have ranched for generations. A dry reservoir also offers more flood mitigation protection than a wet reservoir, as the full capacity of the reservoir is available to store water during a flood event.

5. **What changes will be required to Springbank Road and Highway 22?**
   The current SR1 design is conceptual. In the conceptual design, it was identified that the existing road will be submerged in water. There are several possible solutions to this, including the possibility of the existing road remaining in its current location with another secondary road to be built, or that the existing road remains in its current location but is raised. These are design details that will be determined, and Stantec will review these considerations as part of their work.

6. **Would SR1 prevent a flood equal to the June 2013 flood?**
   The water storage capacity of SR1, combined with storage capacity available at Glenmore Reservoir, would effectively mitigate 2013-level flood flows on the Elbow River.

7. **Why did the Government of Alberta choose this option over other proposed projects?**
   SR1 was identified as a potential flood mitigation site in February 2014. It was determined that SR1 was conceptually feasible as a flood mitigation site in April 2014.

   Along with SR1, the McLean Creek location (MC1) was identified as a potential location for a dry dam on the Elbow River. However, it was noted that construction costs for MC1 would be higher, the complexity of construction would be higher and environmental costs were likely to be higher. An environmental review of the proposed location has been conducted to obtain more information on the environmental consequences of MC1. This review is currently being studied by government.

8. **What is the impact to the properties and infrastructure within the SR1 footprint?**
   The dry reservoir design provides the opportunity for some of the land within the SR1 footprint to continue to be used for ranching. The level of use and specific design elements will be based on a variety of factors, including landowner preference. These decisions have not yet been made.

9. **How much land is needed for the SR1 option?**
   The surface area would be approximately 650 hectares (1600 acres). This is subject to change, as the design is in the preliminary stages.

10. **How will water be diverted from the Elbow River? How will it be returned?**
    Water from the Elbow River will be diverted through a 4.5 kilometer canal that will carry water from the river to the off-stream reservoir during flood conditions. There will be a modified channel to release water back to the river.

11. **Why can't you just dredge the Glenmore Reservoir to make it deeper to hold more water?**
    Our goal is to effectively mitigate a 2013-level flood. To do this, approximately 83 million cubic metres of water must be stored. Currently, Glenmore Reservoir can be operated to provide about 15 million cubic metres of storage during a flood event. This is well short of the amount of storage needed. Also, simply dredging the existing reservoir may not increase the volume available for flood management due to the height of the dam outlets and intakes to the Calgary water treatment plant.

12. **What is the cost of this project to tax payers?**
    The estimated cost of the project is $215 million, which does not include land acquisition costs.

13. **What is an Environmental Impact Assessment (EIA)?**
    An Environmental Impact Assessment is required where the complexity and scale of a proposed project, technology, resource allocation, or siting considerations create uncertainty about the exact nature of environmental effects, or result in a potential for significant adverse environmental effects. The information gathered during the EIA process helps the appropriate regulatory board determine if the project is in the public interest.

    Information regarding the EIA process can be found on the Government of Alberta website: http://esrd.alberta.ca/lands-forests/land-industrial/programs-and-services/environmental-assessment/

**January 27 and 28, 2015 Open Houses – Overview of Public Issues of Concern**

## Documenting Public Input for the Environmental Impact Assessment

The Terms of Reference for the Environmental Impact Assessment (EIA) for the proposed Springbank Off-stream Reservoir Project (SR1) outlines the public engagement requirements for Alberta Transportation (the Project Proponent). The final report for the EIA must include the concerns and issues expressed by landowners and the public about the proposed project and the actions taken to address those concerns and issues. This includes the process and extent of public engagement used to arrive at the current proposal for flood mitigation and how public input was incorporated into the project development, impact mitigation and monitoring.

## Documenting Public Input at the January 2015 Open Houses

As part of preliminary engagement for the EIA for the proposed project, two public open houses were held to share current information and to record public comments and issues of concern. The open houses were held in Calgary on January 27, 2015, and in Cochrane on January 28, 2015.

At the Open Houses, display boards were positioned around the perimeter of the room, and project representatives were stationed near the boards to speak directly with attendees and provide information and answer questions. Representatives also recorded issues, questions and comments expressed by attendees. An exit survey was also provided for those attendees who wished to provide additional feedback. The exit surveys, as well as the recorded comments from the SR1 team members, also known as a Records of Contact (ROC), were then submitted to Communica Public Affairs' Stakeholder Information Management team to record. Each ROC and survey was recorded verbatim and cross checked as part of a thorough quality control auditing process to ensure every comment was accurately captured. This level of documentation is required for the EIA process.

## Open House Attendance and Records of Contact

A total 528 written ROC forms and surveys were recorded. An online version of the survey was offered to those who wished to provide additional information or could not attend the open houses. The following chart breaks down the final numbers:

| | Calgary | Cochrane | Online | Subtotal |
|---|---|---|---|---|
| **Attendance *(approximate door count)*** | 350 | 205 | N/A | N/A |
| **Survey** | 146 | 55 | 56 | 257 |
| **Record of Contact Forms** | 156 | 115 | N/A | 271 |
| **Total** | | | | 528 |

## Summary of Public Input – Categories of Issues and Concerns

Each ROC or survey included several comments and concerns. Accordingly, every comment was categorized, tallied then totaled. A total of 33 categories of issues or concern were identified. The following chart lists the categories from most common to least common.

| | Issue of Concern Category | | Issue of Concern Category |
|---|---|---|---|
| **1** | Project Alternatives[1] | **18** | Wildlife Impacts |
| **2** | Project Cost | **19** | Land Access for the EIA |
| **3** | Project Planning | **20** | Springbank Landscape Impacts |
| **4** | Project Timeline[2] | **21** | Political Pressures |
| **5** | Upstream Community Impacts[3] | **22** | Water Quality |
| **6** | Lack of Information | **23** | Soil Impacts |
| **7** | Engineering Design and Concept | **24** | Ranch Land Impacts |
| **8** | Landowner Rights | **25** | Recreational Impacts |
| **9** | Flood Policies and Mitigation Plans | **26** | Historical Land Impacts |
| **10** | Lack of Consultation | **27** | Water Table Impacts |
| **11** | Downstream Community Impacts | **28** | Watershed Impacts |
| **12** | Road and Highway Impacts | **29** | Responsibility for the Project |
| **13** | Decision Making Process | **30** | Infrastructure Impacts |
| **14** | Environmental Impacts | **31** | Maintenance of SR1 |
| **15** | Fish Impacts | **32** | Constriction Timeline |
| **16** | Land Acquisition | **33** | Pipeline Disturbance |
| **17** | Flood Protection | | |

[1] Project alternatives included the McLean Creek Reservoir (MC1) or the Calgary Diversion Tunnel.
[2] Project timeline included comments regarding expediting SR1 or slowing down SR1 for a comprehensive Environmental Impact Assessment and decision making process.
[3] Upstream community impacts included the Redwood Meadows and Bragg Creek communities. Accordingly, downstream community impacts included the City of Calgary and other communities on the flood plain east of SR1.

## Open House Exit Survey Sample Comments

As part of identifying the issue categories, the stakeholder engagement tool used by Communica identified the most common occurring phrases from the exit surveys. Many of the written comments in included information requests, suggestions, comments, issues and overall feedback on the engagement process. The following are a few examples of the comments captured:

- "Why is the McLean Creek alternative not considered as the primary option? It would be cheaper and affect fewer families." – *Survey Respondent*
- "Determine the true costs, including mitigation for Redwood Meadows and Bragg Creek. As well as land acquisition and the impact to the Springbank community. Once these costs are determined, compare with MC1 to determine which project truly benefits Albertans. Currently, it seems SR1 only benefits select Calgarians." – *Survey Respondent*
- "Is there money for the Project considering the price of oil? What about the cost of the roads surrounding the reservoir every time there would be a flood? There needs to be equal comparisons of all projects with all the costs. The cost of acquiring land in Springbank is considerable versus the cost of moving campgrounds." – *Open House Attendee*
- "Maximum flood protection is important, not only for individual homes, but also for downtown Calgary and infrastructure. Stop making this about just individual homes - it is much more than that. Be cost effective, SR1 makes more sense than rebuilding again." – *Survey Respondent*
- "The use of non-Crown land leaving out upstream communities is not essentially solving the one in hundred year flood. There are impacts to land owners; and at what cost to the Albertan/Canadian tax payers?" – *Survey Respondent*
- "I am concerned about whether sufficient attention was being paid to Bow River mitigation, and whether combined projects were sufficient to withstand another 2013 flood event." – *Survey Respondent*
- "The Glenmore tunnel should be built in conjunction with the dam, so both would be completed at the same time." – *Survey Respondent*
- "I am not concerned with the project. Flood restoration and clean-up costs are greater than the cost of SR1." – *Open House Attendee*
- "I would like to see the same open house format for all Project alternatives. I am pleased with the manner in which information was presented … What happens to the land after a flood, in terms of silt and debris?" – *Open House Attendee*
- "Consider all projects before making a final decision and base evidence on concrete environmental, social, and financial facts." – *Survey Respondent*
- "More consultation needs to take place with affected communities such as Springbank, Bragg Creek and Redwood Meadows. There are many more families and landowners impacted than what is currently being reported." – *Survey Respondent*
- "I am concerned about the amount of time it is taking to complete the Environmental Impact Assessment. Will a cost benefit analysis be done?" – *Open House Attendee*
- "I am concerned with the lack of consultation with Bragg Creek and other upstream communities, including First Nations. I am in favour of the McLean Creek alternative." – *Open House Attendee*

# Springbank Off-stream Reservoir Open House

Alberta Government

## The following information was presented at open houses held:

## January 27, 2015 in Calgary

**(Mount Royal University 4:30 - 8 p.m.)**

## January 28, 2015 in Cochrane

**(Cochrane RancheHouse 4:30 - 8 p.m.)**

Alberta Government

# Welcome to the Springbank Off-stream Reservoir Open House

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Commitment to Stakeholder Engagement

Alberta Government

- Building ongoing relationships through effective consultation and open and honest communication.
- Effectively addressing interests, priorities and concerns, and engaging those potentially affected by the project in a timely manner.
- Utilizing stakeholder feedback when making project decisions where possible and appropriate.
- Providing open, suitable communication lines and accessibility to project information; actively encouraging feedback.
- Identifying opportunities for continuous improvement of the consultation process as it unfolds.
- Meeting or exceeding all applicable regulatory requirements.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Engagement

Alberta Government

# Listening and learning

Stakeholder engagement is a process that allows anyone potentially affected by a project to:

- Become informed.
- Ask questions and have them answered.
- Raise concerns and have them addressed.
- Provide input into the project.

Consultation is critical to the proposed Springbank Off-stream Reservoir project.

- We are committed to sharing information and working with the public and First Nations communities to ensure all input and concerns are heard, understood and addressed.
- Where appropriate, the information gathered will be used to refine the proposed project design.
- Your comments about the project and the commitments we make will be a part of the regulatory application.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Alberta's Approach to Flood Mitigation

Alberta Government

**Seven key elements that guide our approach to flood mitigation:**

- Overall watershed management.
- Flood modelling prediction and warning systems.
- Flood risk management policies.
- Water management and mitigation infrastructure.
- Erosion control.
- Local mitigation initiatives by municipalities.
- Individual mitigation measures for homes.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Other Projects Under Consideration

Alberta Government

## McLean Creek Dry Dam

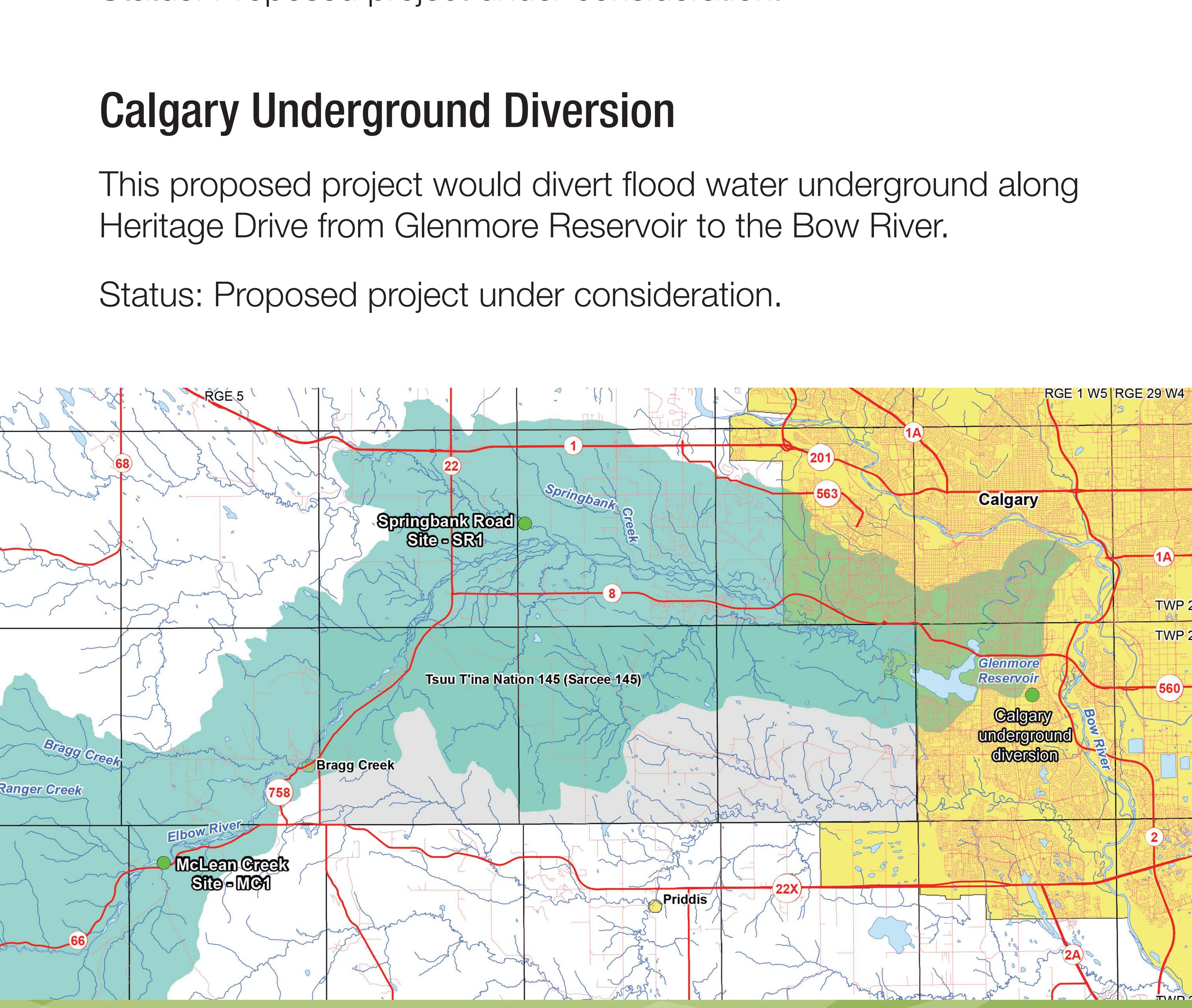
This proposed dry dam upstream of Bragg Creek would help control flow rates on the Elbow River during a flood.

Status: Proposed project under consideration.

## Calgary Underground Diversion

This proposed project would divert flood water underground along Heritage Drive from Glenmore Reservoir to the Bow River.

Status: Proposed project under consideration.




Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Project Overview

Alberta Government

## What is the Springbank Off-stream Reservoir?

- The Springbank Off-stream Reservoir provides a critical layer of flood protection for communities downstream of the diversion along the Elbow River.
- The reservoir would be located approximately 15 kilometres west of Calgary, east of Highway 22, south of Highway 1, and north of Highway 8 and the Elbow River.
- The proposed concept is to divert flood flows through a diversion channel from the Elbow River into an off-stream storage reservoir.
- Water would be temporarily contained and released back into the Elbow River once the flood recedes.
- **Project status:** Engineering, design and Environmental Impact Assessment (EIA) are currently underway.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Proposed Project Components

Alberta Government

### Diversion structure

- The diversion structure will be constructed on the Elbow River.
- When water levels in the river reach a certain threshold, water would begin to flow through the diversion structure into the diversion channel.

### Diversion channel

- The diversion channel would be approximately 4.5 km from the Elbow River to storage reservoir.
- It would be excavated through the adjacent uplands to transport flood water to the reservoir.

### Dam and storage reservoir

- The surface area would be approximately 650 hectares (1600 acres).
- The storage site includes an earthfill dam approximately 24 metres high to temporarily contain up to 67.6 million cubic metres of diverted flood water.

### Return channel

- There will be a modified channel to return the water back to the river.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Dry Reservoir

Alberta Government

# What benefits does a dry reservoir offer?

- Dry reservoirs are catchment areas designed to hold excess water for a short period of time during a flood, while allowing water to move freely during normal conditions.
- The reservoir will be filled with water during a flood event.
- A dry reservoir also offers more flood mitigation protection than a wet reservoir would. It ensures the full capacity of the reservoir is available to store water during a potential flood event.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Project Map

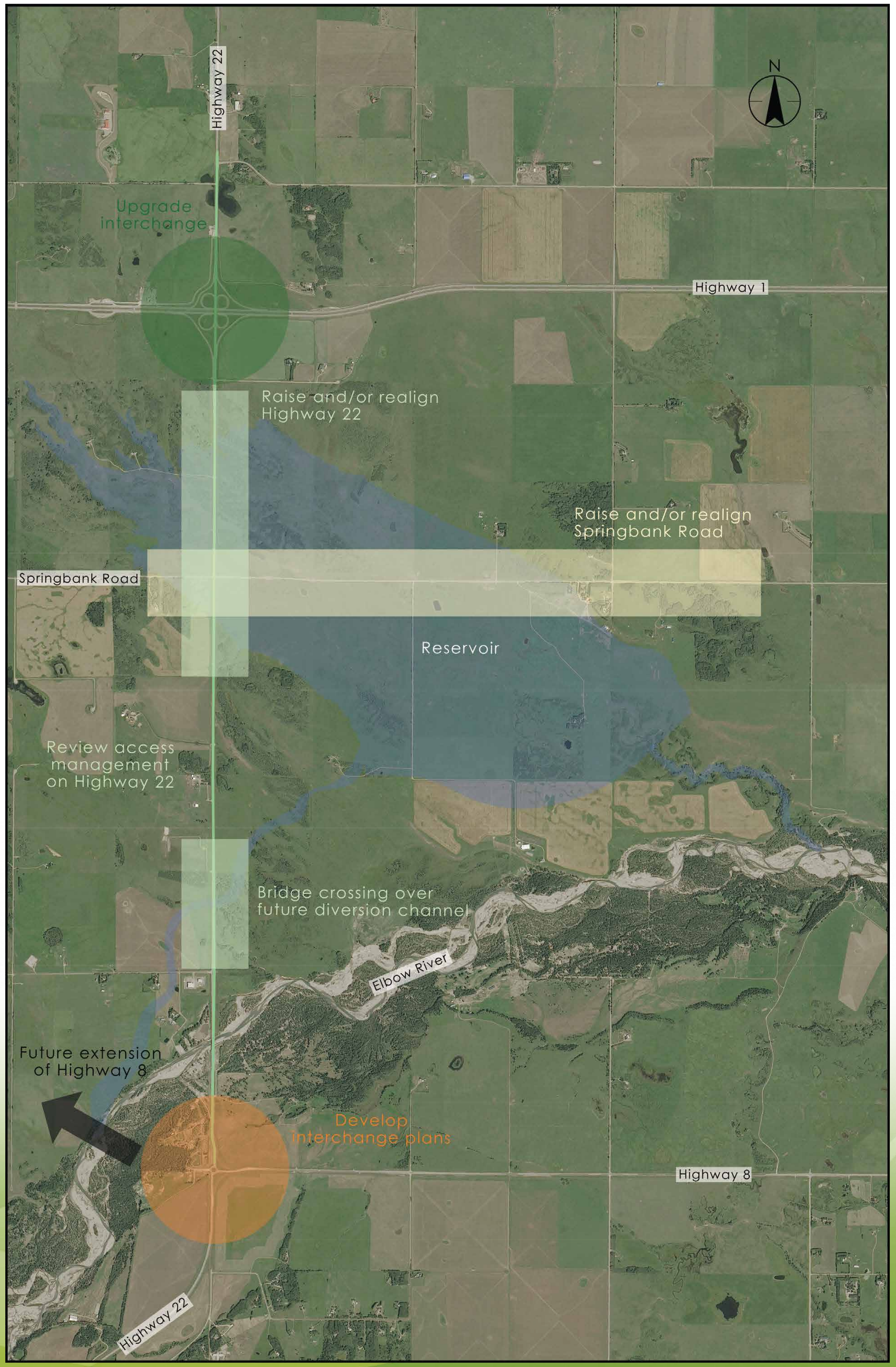
Alberta Government

TRANS-CANADA HWY 1
TOWNSHIP ROAD 244
COWBOY TRAIL - HWY 22
SPRINGBANK ROAD
RANGE ROAD 41
Reservoir
Dam
Return channel
Diversion Channel
In-Stream Diversion Point
HIGHWAY 8

# Springbank Off-stream Reservoir Open House

## Potential Changes to Highway 22 and Springbank Road

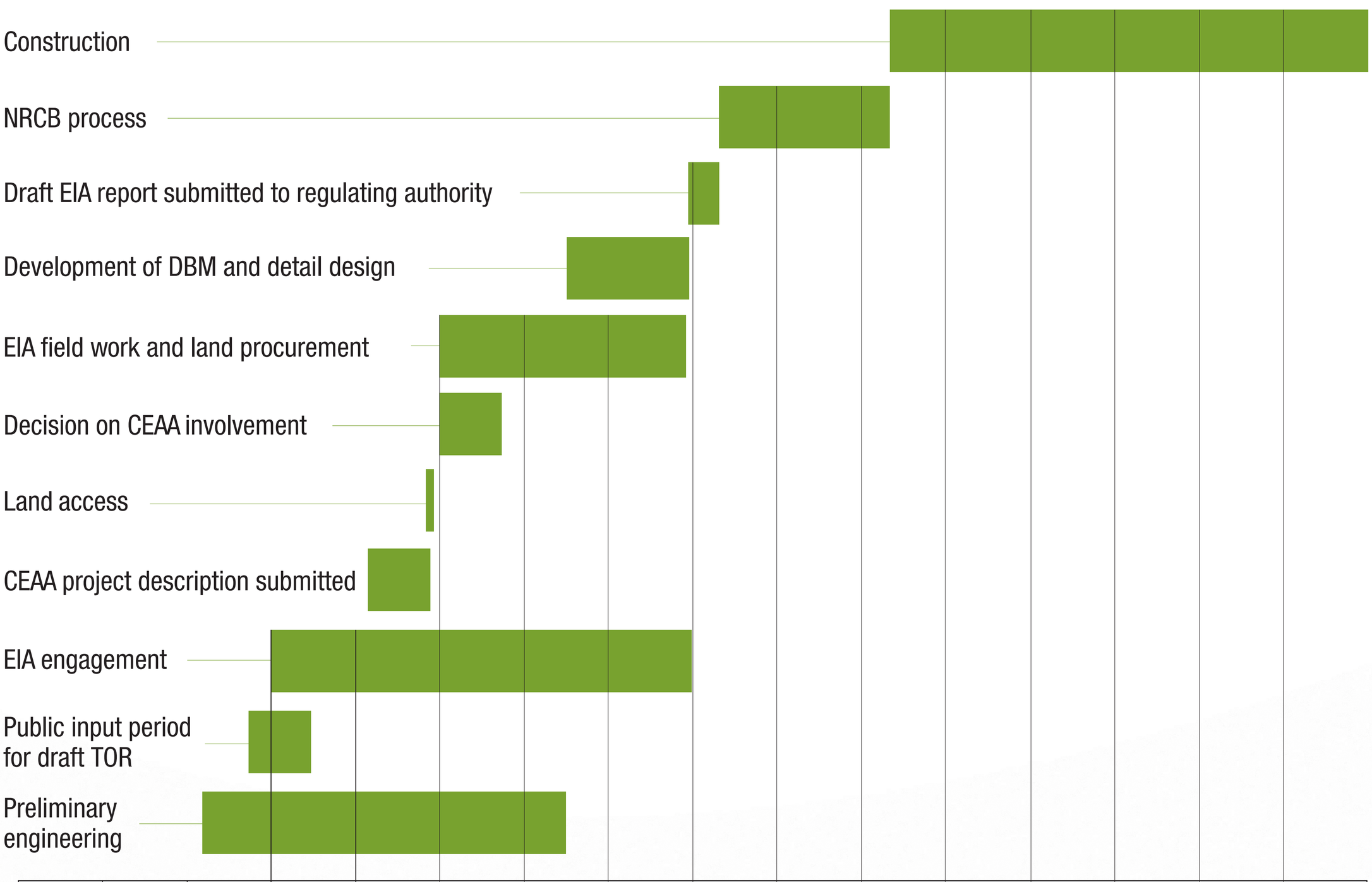
Alberta Government



# Springbank Off-stream Reservoir Open House

## Proposed Project Timeline

Alberta Government




As of January 20, 2015 and subject to change.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Environmental Impact Assessment

Alberta Government

# What is an EIA?

- Environmental Impact Assessment (EIA) is the process used to gather the information necessary to evaluate the potential positive and negative effects of a proposed project.
- It is an important first step of the regulatory process.
- It is prepared in accordance with the Final Terms of Reference and environmental information requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and associated regulations, and the *Canadian Environmental Assessment Act* (CEAA 2012) and associated regulations.
- The EIA Report will form part of the application to the Natural Resources Conservation Board (NRCB).
- The EIA answers four main questions:

    1. What are the existing conditions (the baseline)?
    2. What changes would there be due to the project?
    3. Will the project result in any significant environmental, social, economic and health effects (positive and/or negative)?
    4. How can we mitigate the potential negative effects?

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Alberta EIA Process

Alberta Government

Alberta Transportation prepares Proposed Terms of Reference (TOR) and Project Description

Alberta Transportation submits Proposed TOR to ESRD and public for review (September 2014)

Public review and input on Proposed TOR (September 15 - November 14, 2014)

ESRD review and issue of Final TOR (January 2015)

Alberta Transportation submits EIA Report (February 2016)

ESRD coordinates technical review to confirm application completion

NRCB regulatory and public review of EIA begins

**Stakeholder Engagement**

* A project description will be filed with CEAA in February 2015 to determine if a federal review process is also required under CEAA 2012.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

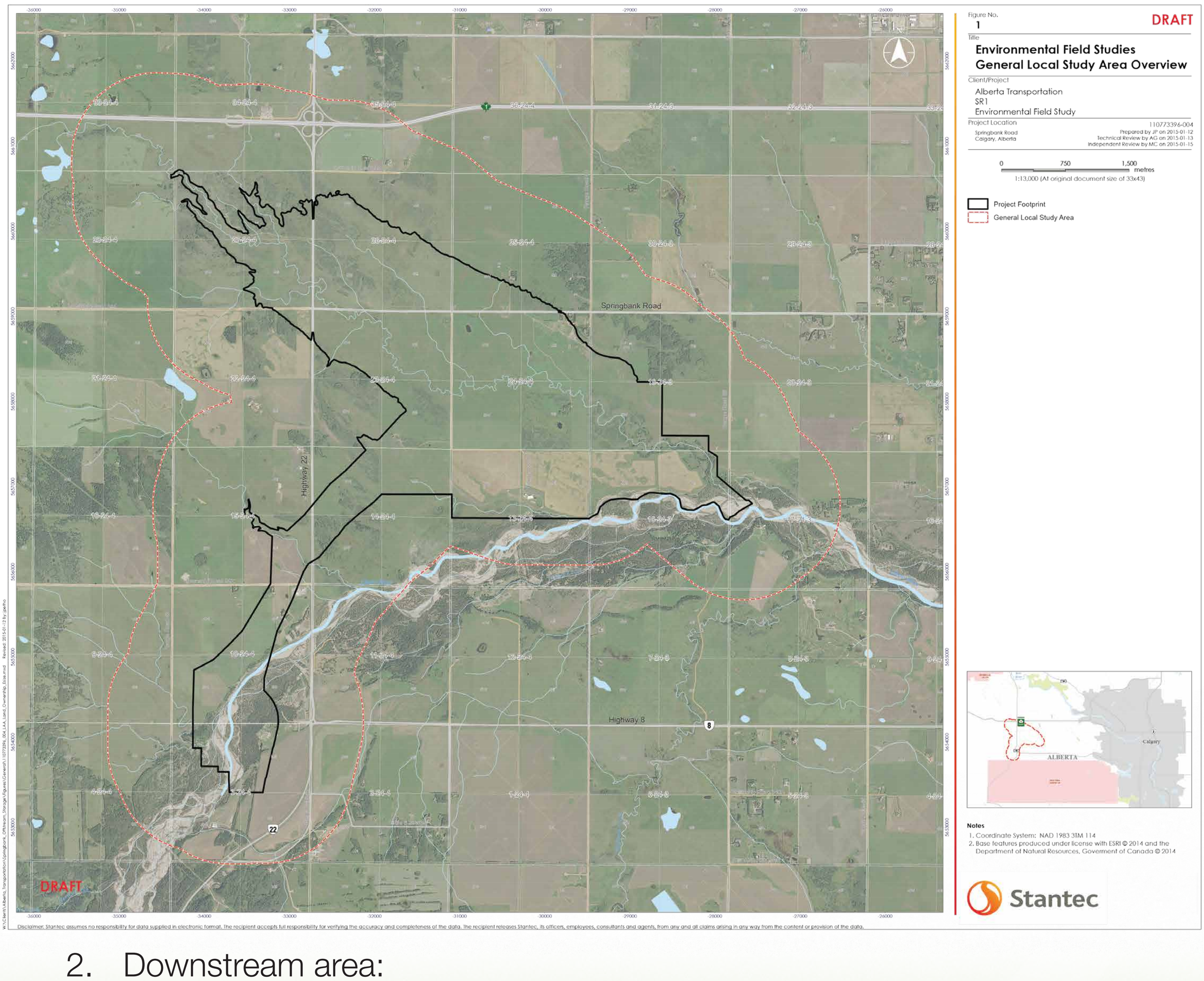
# Springbank Off-stream Reservoir Open House

## Proposed EIA Study Area - Two Areas of Focus

Alberta Government

1. Project footprint: Area directly affected by the proposed work:

- The generalized local study area includes the project footprint plus a 1 km buffer.




2. Downstream area:

- The regional context of this project includes the Glenmore Reservoir — located approximately 18.5 km downstream.

- The operation of the project and the Glenmore Reservoir will be considered together to achieve maximum benefit of flood control.

- The baseline water conditions in the project area (including the Glenmore Reservoir) will be described as well as project components and activities that may affect future water conditions in the regional context.

# Springbank Off-stream Reservoir Open House

## EIA Field Studies

Alberta Government

- Air quality
- Noise
- Soils and terrain
- Hydrogeology
- Surface water
- Water quality
- Groundwater modelling
- Vegetation
- Wildlife
- Aquatic habitat
- Climate and climate change
- Vibration assessment
- Land use and management
- Transportation and infrastructure
- Heritage resources / HRA field studies
- Socio-economic effects
- Public health and safety

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

Alberta Government

## Contact us

Mark Svenson

Provincial Transportation Environmental Coordinator

Phone: 780-644-8354

Email: springbank-project@gov.ab.ca

Learn more at: alberta.ca/springbank-road.cfm

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

# Springbank Off-stream Reservoir Open House

## Exit Survey

Alberta Government

# Please take a moment to complete an exit survey.

Presented at Open Houses in Calgary (January 27, 2015) and Cochrane (January 28, 2015)

**SPRINGBANK OFF-STREAM RESERVOIR PROJECT**
**ENVIRONMENTAL IMPACT ASSESSMENT**
**CONSULTATION AND ENGAGEMENT**

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

## March 2015

Stantec

Paid advertising for March 2015 Open Houses

- Highway sign up on Highway 22 at the Redwood Meadows Golf Course on February 24 for the original March 3, 2017 open house which was cancelled. A new sign was put up for the March 10 and 17 open houses on March 4.
- Ads went in the Rocky View Weekly on March 3 & 10 and the Cochrane Times on March 4 & 11.
- No postcards were mailed for the March 2015 open houses.

**Springbank Off-stream Reservoir Project**

# Please join us for a flood mitigation open house in your community.

The Alberta government is moving forward with an Environmental Impact Assessment and detailed engineering and design of a dry off-stream reservoir near Springbank.

Public consultation for this project is now underway. Please join us to provide feedback and learn more about this important flood mitigation project.

**SPRINGBANK**
**Tuesday, March 10**
**4:30 – 8:00 p.m.**

Pinebrook Golf &
Country Club
166 Pinebrook Way SW

**BRAGG CREEK**
**Tuesday, March 17**
**4:30 – 8:00 p.m.**

Bragg Creek
Community Centre
23 White Avenue

**Learn more at**
**alberta.ca/springbank-road.cfm**

Alberta Government

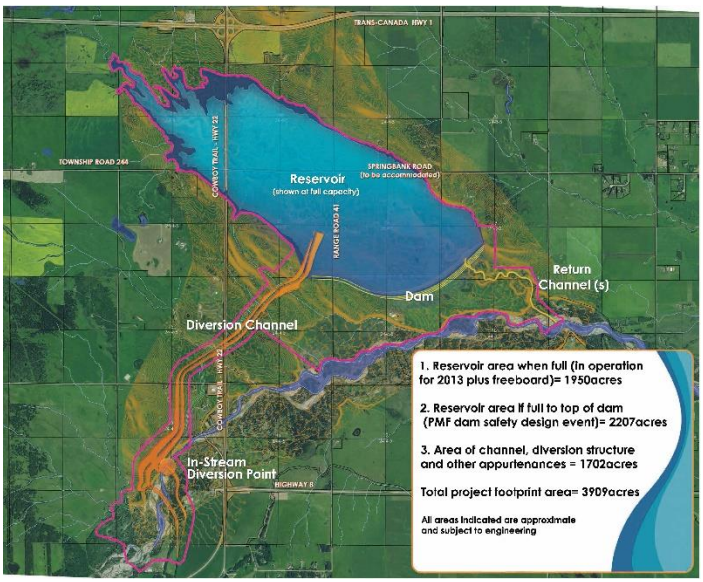
GOA-3925 5x7-Springbank_Mar3.indd 1 2015-02-26 10:50 AM

# Springbank Off-stream Reservoir (SR1) – Frequently Asked Questions

**1. What is the Springbank Off-stream Reservoir Project?**

The Springbank Off-stream Reservoir (SR1) project is being undertaken by the Government of Alberta to provide flood protection along the Elbow River. Based on the conceptual design, SR1 would have storage capacity of 67.6 million cubic metres. During flood conditions, a 4.5 kilometre canal would carry water from the river to the off-stream reservoir and a modified channel would release water back to the river.

Information regarding the SR1 project can be found on the Government of Alberta website: http://alberta.ca/springbank-road.cfm




**2. Where will it be located?**
The reservoir will be approximately 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and east of Highway 22.

**3. What is the timeline for the project?**
Detailed design and engineering, and Environmental Impact Assessment for SR1 are underway. A decision regarding final approval of the project will occur once the report is provided by Stantec, the firm contracted by the Government of Alberta to complete this work, and regulatory requirements have been met. Based on current estimates, construction will begin in 2016 and the reservoir will be operational by spring 2018.

**4. What benefits does a dry reservoir offer?**
SR1 is being designed as a dry reservoir. A dry reservoir would only hold water during a high-water situation. Because major floods happen infrequently, a dry design would allow some land owners to continue using the land their families have ranched for generations. A dry reservoir also offers more flood mitigation protection than a wet reservoir, as the full capacity of the reservoir is available to store water during a flood event.

**5. What changes will be required to Springbank Road and Highway 22?**
The current SR1 design is conceptual. In the conceptual design, it was identified that the existing road would be submerged in water during a flood event. There are several possible solutions to this, including leaving the existing road in its current location with another secondary road to be built, or raising the existing road. These are design details that will be determined, and Stantec will review these considerations as part of their work.

**6. Would SR1 prevent a flood equal to the June 2013 flood?**
The water storage capacity of SR1, combined with storage capacity available at Glenmore Reservoir, would effectively mitigate 2013-level flood flows on the Elbow River.

7. **Why did the Government of Alberta choose this option over other proposed projects?**
   Along with SR1, the McLean Creek location (MC1) was identified as a potential location for a dry dam on the Elbow River. However, it was noted that construction costs for MC1 would be higher, the construction would be more complex and environmental impacts would be greater. An environmental review of the proposed location has been conducted to obtain more information on the environmental consequences of MC1. This review is currently being studied and is available on the government website.

8. **What is the impact to the properties and infrastructure within the SR1 footprint?**
   The dry reservoir design may provide the opportunity for some of the land within the SR1 footprint to continue to be used for ranching. The level of use and specific design elements of SR1 will be based on a variety of factors, including landowner preference. These decisions have not yet been made.

9. **How much land is needed for the SR1 option?**
   As of March 9, 2015, the outside perimeter of the full land base that could be impacted when the final design is completed is 3,909 acres, and includes government controlled lands (road allowances). This also includes surplus borders around the various components of the infrastructure that may or may not be required, and lands that may not be impacted once the precise location is defined through engineering design. It is very unlikely that all land within the final project footprint would need to be acquired. Land on the periphery of the reservoir would rarely be inundated with water, therefore there are more options for the owners of these parcels.

   The surface area of the reservoir at full supply level (elevation 1,212.0 metres) based on the current dam location would be approximately 1,952 acres. This is based on the 2013 flood event estimate and includes 1.5 metres of freeboard above full supply level.

   All land area details above are subject to change, as the design is in the preliminary stages.

10. **How will water be diverted from the Elbow River? How will it be returned?**
    Water from the Elbow River would be diverted through a 4.5 kilometre canal from the river to the off-stream reservoir during flood conditions. There would be a modified channel to release water back to the river at a later time. Design and location details are still being determined.

11. **Why can't you just dredge the Glenmore Reservoir to make it deeper to hold more water?**
    Our goal is to effectively mitigate a 2013-level flood. Currently, Glenmore Reservoir can be operated to provide about 10 million cubic metres of storage during a flood event. This is well short of the amount of storage needed. Also, simply dredging the existing reservoir may not increase the volume available for flood management due to the height of the dam outlets and intakes to the Calgary water treatment plant.

12. **What is the cost of this project to taxpayers?**
    The estimated cost of the project is $215 million, plus land acquisition costs.

13. **What is an Environmental Impact Assessment (EIA)?**
    An Environmental Impact Assessment is required where the complexity and scale of a proposed project, technology, resource allocation, or siting considerations create uncertainty about the exact nature of environmental effects, or result in a potential for significant adverse environmental effects. The information gathered during the EIA process helps the appropriate regulatory board determine if the project is in the public interest.

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# Springbank Off-stream Reservoir Open House

## Exit Survey - Springbank, March 10

Alberta Government

Thank you for taking the time to provide your input on the proposed Springbank Off-stream Reservoir (SR1) project. Your comments will be compiled and submitted as part of a summary for the Environmental Impact Assessment application for this project. For your convenience, this survey can also be completed online at https://www.surveymonkey.com/r/WZHBK68 until March 17, 2015.

1. Of the following issues or concerns listed, please rate your **top 5 priorities** for the Government of Alberta to address regarding the proposed Springbank Off-stream Reservoir Project (1 = most important, etc.):

| | **Issue of Concern Category** | | **Issue of Concern Category** |
|---|---|---|---|
| | Consideration of other Options (McLean Creek or Calgary Underground Diversion Tunnel) | | Maintenance and Operation of Springbank Off-stream Reservoir |
| | Project Timelines | | Downstream Community |
| | Project Cost | | Environment |
| | Environmental Impact Assessment Process | | Road and Highway |
| | Project Planning and Decision Making | | Infrastructure |
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| | Springbank Off-stream Reservoir Engineering Design and Concept | | Water Table |
| | Land | | Fish |
| | Recreation | | Social or Community |
| | Historical Land | | Better Flood Policies and Mitigation Plans |
| | Regulatory Process (NRCB) | | Other: |

2. Do you support the Springbank Off-stream Reservoir Project?

☐ **Yes** ☐ **No** ☐ **Undecided**

3. The information provided at the open house was:

☐ **Inadequate** – information was not detailed enough, my questions were not answered.

☐ **Adequate** – information was vague or confusing, and I still have unanswered questions.

☐ **Sufficient** – there was enough information to understand the project.

☐ **Excellent** – the information provided was substantial and clearly communicated.

# Springbank Off-stream Reservoir Open House

## Exit Survey - Springbank, March 10

Alberta Government

4. What communication methods can the Government of Alberta use to share information with stakeholders about the proposed Springbank Off-stream Reservoir Project?

- ☐ Newsletters
- ☐ Meetings
- ☐ Open Houses
- ☐ Email
- ☐ Website
- ☐ Social Media
- ☐ TV News
- ☐ Radio
- ☐ Community Associations
- ☐ Billboards
- ☐ Interest Groups
- ☐ All of the above

5. Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?

_____

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Please complete the following if you would like to receive ongoing information on the Springbank Off-stream Reservoir Project. Thank you!

Name(s) _____

Mailing Address: _____

Phone Number: _____ Email: _____

This survey can also be submitted to the Government of Alberta by mail or email:

Springbank Off-stream Reservoir Project c/o Communica Public Affairs
200, 215 12 Avenue S.E.
Calgary, AB T2G 1A2

Springbank-Project@gov.ab.ca

Personal information is being collected by Alberta Transportation under the authorization of Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and is managed in accordance with part 2 of the FOIP Act. Your name, address, email address, and/or phone number will be used for contact purposes to respond to your question(s) or concern(s) regarding the proposed Springbank Off-stream Reservoir project. Your personal information will be shared with the department of Environment and Sustainable Resource Development and Canadian Environmental Assessment Agency. Should you wish to have your personal information removed, corrected or have concerns pertaining to the Springbank Off-stream Reservoir project, please contact Mark Svenson, Alberta Transportation Environmental Coordinator at (780) 644-8354 or springbank-project@gov.ab.ca

# Springbank Off-stream Reservoir (SR1) – Frequently Asked Questions

**1. What is the Springbank Off-stream Reservoir Project?**

The Springbank Off-stream Reservoir (SR1) project is being undertaken by the Government of Alberta to provide flood protection along the Elbow River. Based on the conceptual design, SR1 would have storage capacity of 67.6 million cubic metres. During flood conditions, a 4.5 kilometre canal would carry water from the river to the off-stream reservoir and a modified channel would release water back to the river.

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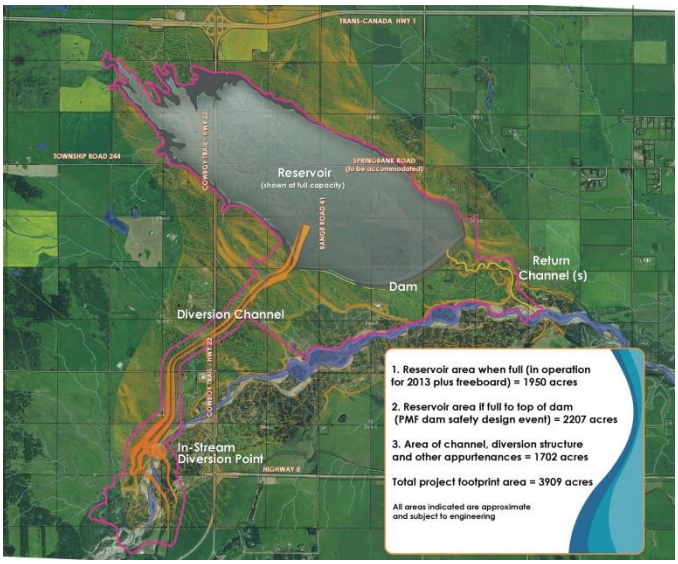


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The reservoir will be approximately 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and east of Highway 22.

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# Exit Survey - Bragg Creek

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| | **Issue of Concern Category** | | **Issue of Concern Category** |
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| | Regulatory Process (NRCB) | | Other: |

2. Do you support the Springbank Off-stream Reservoir Project?

☐ **Yes** ☐ **No** ☐ **Undecided**

3. The information provided at the open house was:

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# Exit Survey - Bragg Creek

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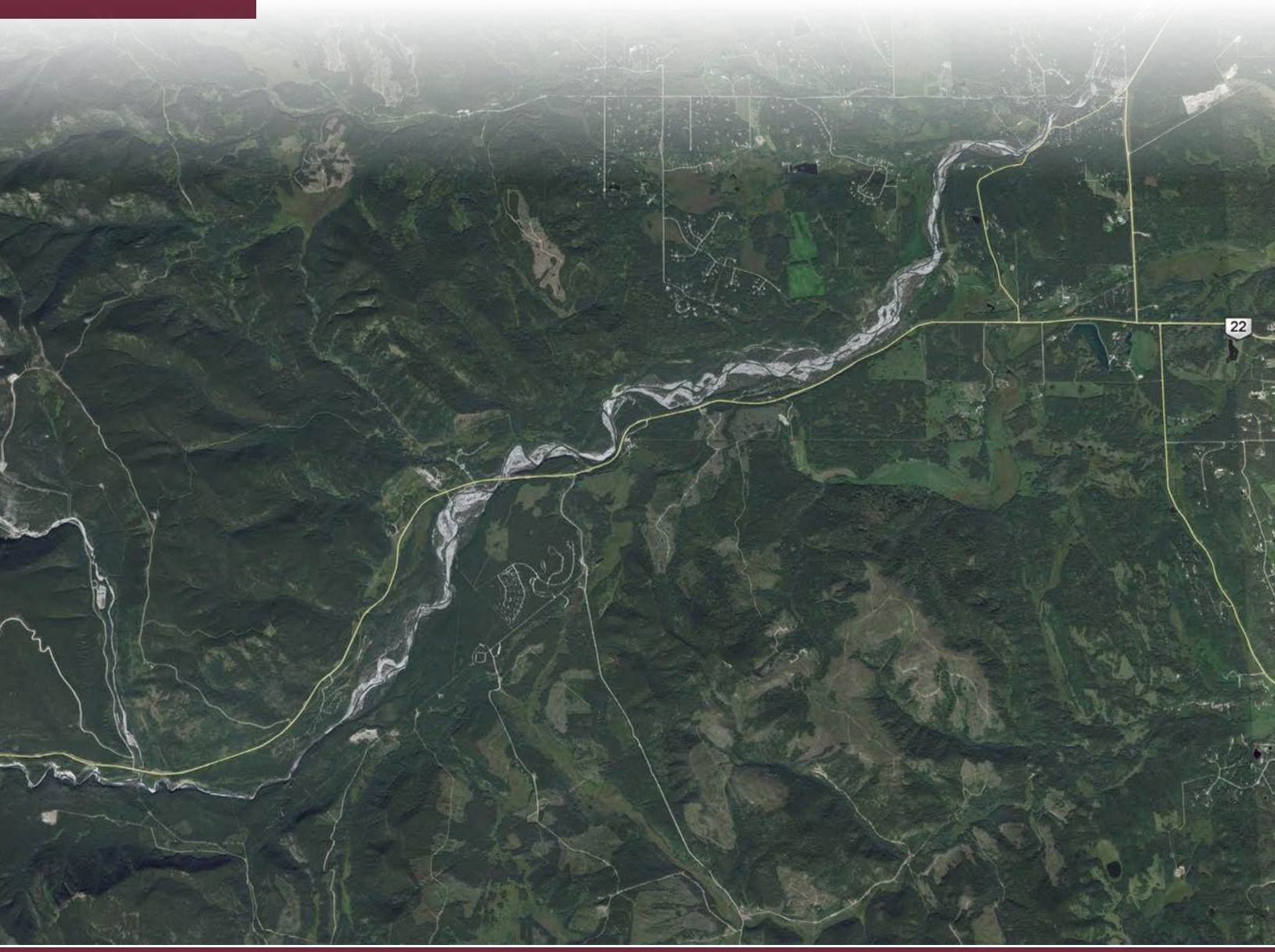
IBI

Alberta Government




REPORT

# Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: McLean Creek Flood Storage

Prepared for Government of Alberta
ESRD - Resilience and Mitigation
by IBI Group
February 18, 2015

**IBI GROUP**
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February 18, 2015

Ms. Heather Ziober
Project Manager, Strategic Integration and Projects
Government of Alberta
Environmental and Sustainable Resource Development
205 J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, AB T6H 5T6

Dear Ms. Ziober:

**BENEFIT/COST ANALYSIS OF FLOOD MITIGATION PROJECTS FOR THE CITY OF CALGARY: MCLEAN CREEK FLOOD STORAGE**

Enclosed please find the draft final report for the aforementioned assignment. The report describes the benefit/cost analysis undertaken for the McLean Creek Flood Storage Mitigation Project in relation to ameliorating the City of Calgary flood damages. This analysis culminates with a comparison of the benefit/cost ratios for the three major mitigation projects under consideration of which the McLean Creek Flood Storage Project ranks second.

Should you have any questions or require additional information please do not hesitate to contact the undersigned.

Yours truly,

**IBI GROUP**

<Original signed by>

Stephen Shawcross
Director

<Original signed by>

Augusto Ribeiro, P.Eng.

SS/mp

cc: Cathy Maniego, Government of Alberta, Environment and Sustainable Resource Development
Andrew Wilson, Government of Alberta, Environment and Sustainable Resource Development

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IBI Group is a group of firms providing professional services and is affiliated with IBI Group Architects Engineers

# Benefit/Cost Analysis for Flood Mitigation Projects for the City of Calgary: McLean Creek Flood Storage

Submitted to Government of Alberta
ESRD - Resilience and Mitigation
by IBI Group

February 2015

## Study Team Members

### IBI Group

Stephen Shawcross

Augusto Ribeiro

Neil MacLean

David Sol

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Samantha Huchulak

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Appendix A – City of Calgary Flood Damage Estimates

Appendix B – 2013 Southern Alberta Disaster Recovery Program

# Executive Summary

## Key Metrics

### Project Costs

| Item | Cost |
|---|---|
| Project Construction | $239,581,000 |
| Infrastructure Relocation | $45,000,000 |
| Environmental Impact Studies | $4,000,000 |
| **Total 1:100 Year Protection** | **$288,581,000** |
| Additional Cost for 1:200 Year Protection | $55,000,000 |
| **Total 1:200 Year Protection** | **$343,581,000** |
| Annual Operation and Maintenance | $1,800,000 |

### Benefit/Cost Analysis

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $332,708,000 | $387,699,000 | $332,708,000 | $387,699,000 |
| Benefit/Cost Ratio | 1.43 | 1.65 | 1.01 | 1.05 |
| Net Present Value | $144,191,000 | $252,244,000 | $4,139,000 | $21,202,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

### Benefit/Cost Comparison

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |

# 1 Introduction

## 1.1 Background

The flood of 2013 was a devastating event for Southern Alberta and the City of Calgary. The flood event had the largest economic impact of any extreme weather event in Canada to date. As part of the response to protect communities from future flood damage, the Province of Alberta commissioned a study through the Flood Mitigation Advisory Panel to provide engineering assessments and practical solutions on possible flood mitigation measures.

In October of 2013, AMEC Environment & Infrastructure (AMEC) was contracted to provide a flood mitigation feasibility study for the Bow River, Elbow River and Oldman River basins.

A number of mitigation schemes were considered for the Elbow River upstream of the City of Calgary, including an off-stream flood storage project at McLean Creek.

As part of the subsequent Provincial Flood Damage Assessment Study, IBI Group was commissioned by the Government of Alberta ESRD Operations, Resilience and Mitigation Branch to undertake a benefit/cost analysis of the McLean Creek Flood Storage project

## 1.2 Purpose

The purpose of the benefit/cost analysis is to provide a comparison of project benefits, in terms of damages averted, to project costs including capital and operating costs, to determine if the project under consideration is economically viable.

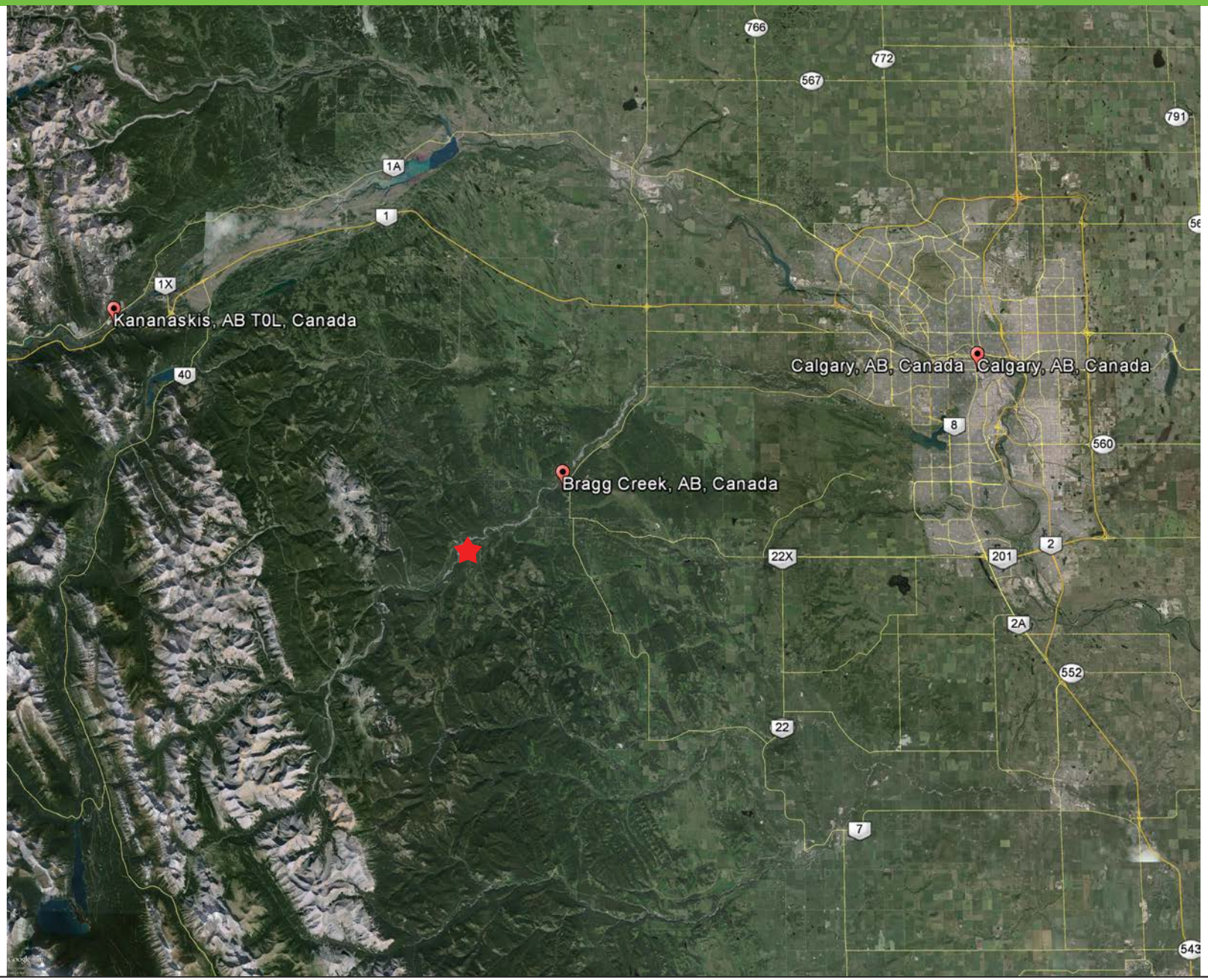
## 1.3 Scope

For the purposes of this study, benefits are restricted to economic benefits accruing within the study area, which is defined as the flood risk area within the City of Calgary boundaries. The study utilizes current damage estimates based on updated stage-damage curves and the Provincial Rapid Flood Damage Assessment Model. Project costs are based on the estimates prepared as part of the McLean Creek Flood Storage project submitted to the Southern Alberta Flood Recovery Task Force and dated June 2014.

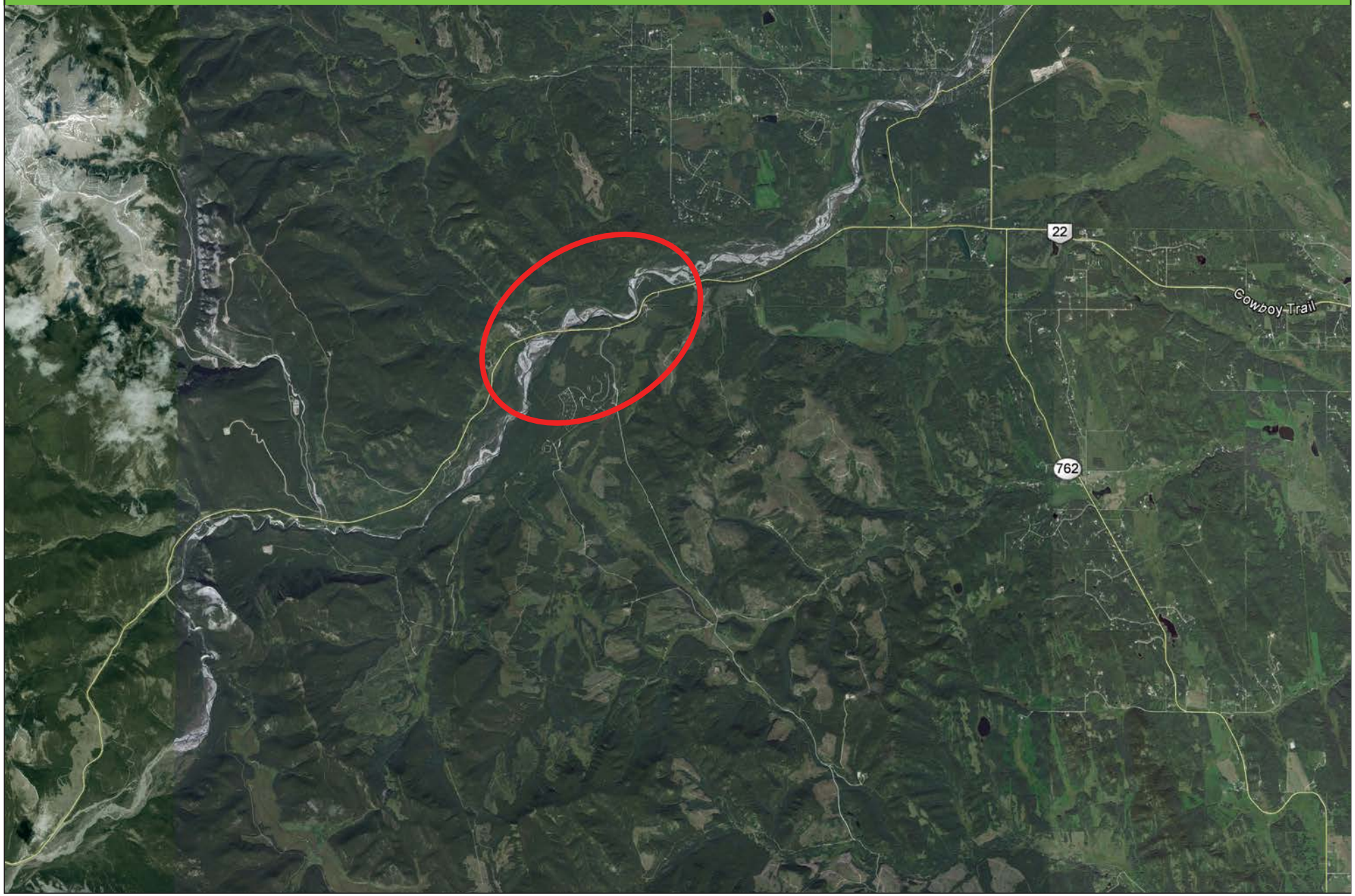
# 2 Context

**Exhibit 2.1** illustrates the study area, while **Exhibit 2.2** illustrates the location of the proposed project.

# Regional Setting



# Local Setting



# 3 Project Description

The Elbow River Dam at McLean Creak (MC1) site was previously identified and investigated for flood mitigation as part of the *1986 Elbow River Floodplain Management Study* by W-E-R Engineering Ltd., IBI Group, and Ecos Engineering. The site is located in the Green Zone on Crown Land approximately 10 km upstream of the Town of Bragg Creek, and immediately upstream of the confluence of McLean Creek with the Elbow River.

This project concept considers building an earth fill dam across the main stem of the Elbow River. It includes a combined concrete outlet/service spillway structure for discharging normal and flood flows, and includes an auxiliary earth cut channel spillway to protect the dam from extreme floods up to the probable maximum flood (PMF) event. The dam site and reservoir area are illustrated in **Exhibit 3.1**.

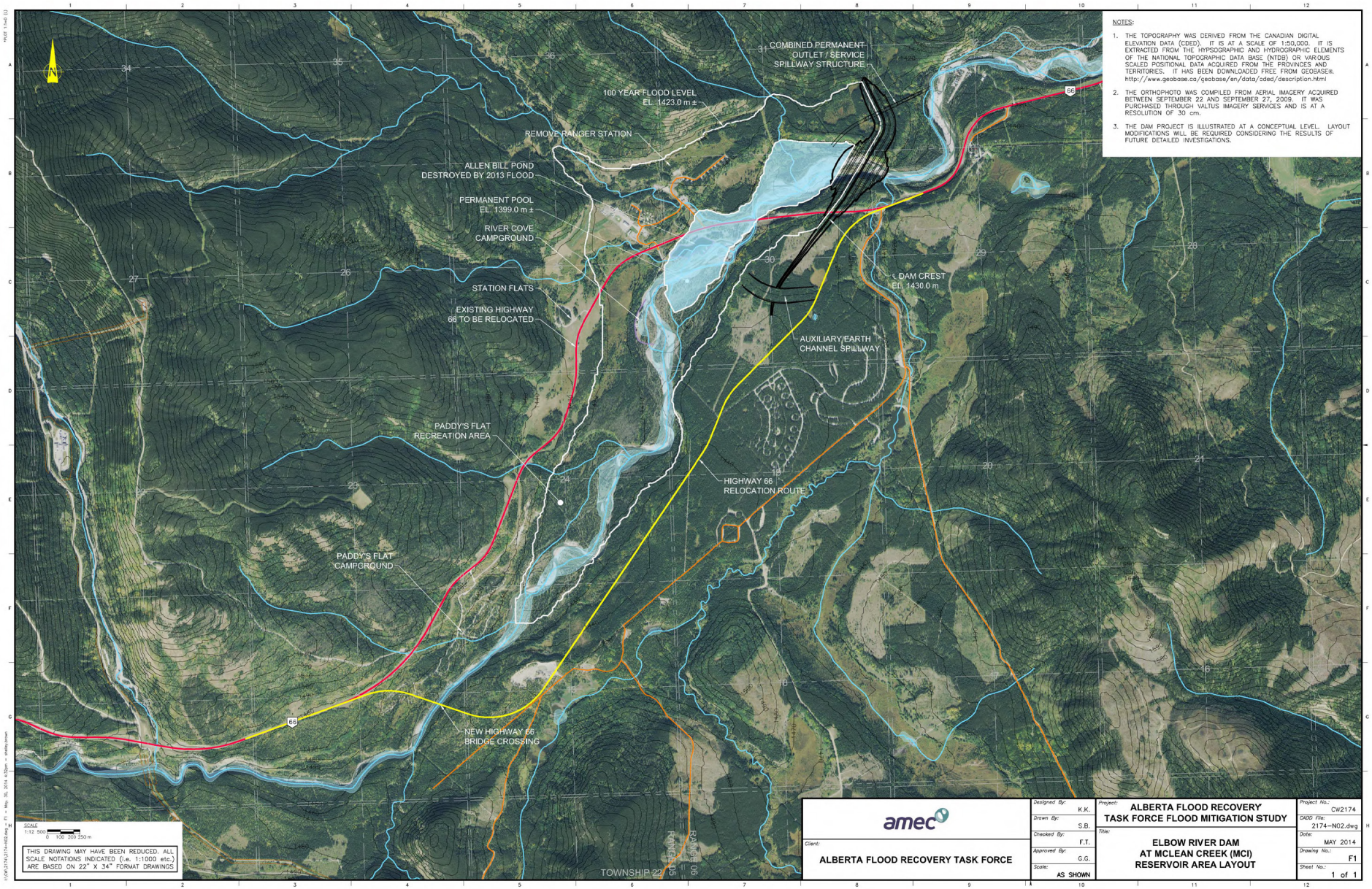
The proposed earth fill dam (main embankment) traverses a river gorge which is approximately 110 m wide at the base and is steep walled for a height of about 28 m (see **Exhibit 3.2**). The left abutment has a high knob-like feature falling away to an undulating plateau more-or-less equal to the height of the main gorge and then rising again to the northwest. The right abutment has a plateau at about the same elevation and then rises again to the southwest. The Kananaskis Country Highway 66 traverses the right abutment. The river valley itself bends sharply to the north-northeast at the dam site, facilitating the construction of an auxiliary earth channel spillway on the right bank. Similarly, the topography and river alignment are well suited for construction of a permanent outlet/spillway structure in the left valley abutment.

The permanent outlet/service spillway is a gated conduit structure with its intake invert located about 21 m above valley bottom (see **Exhibit 3.3**). The structure concrete gates would typically be left in the wide open position thereby allowing free passage of river water with minimum reservoir level rise during normal flow conditions (i.e., non-flood). The gates would be strategically closed during flood events thereby holding back a significant portion of the flow in reservoir storage. The concrete structure also serves as a service spillway designed to pass even more extreme flood events, if they ever occur, thereby protecting the dam from potential overtopping and associated catastrophic failure.

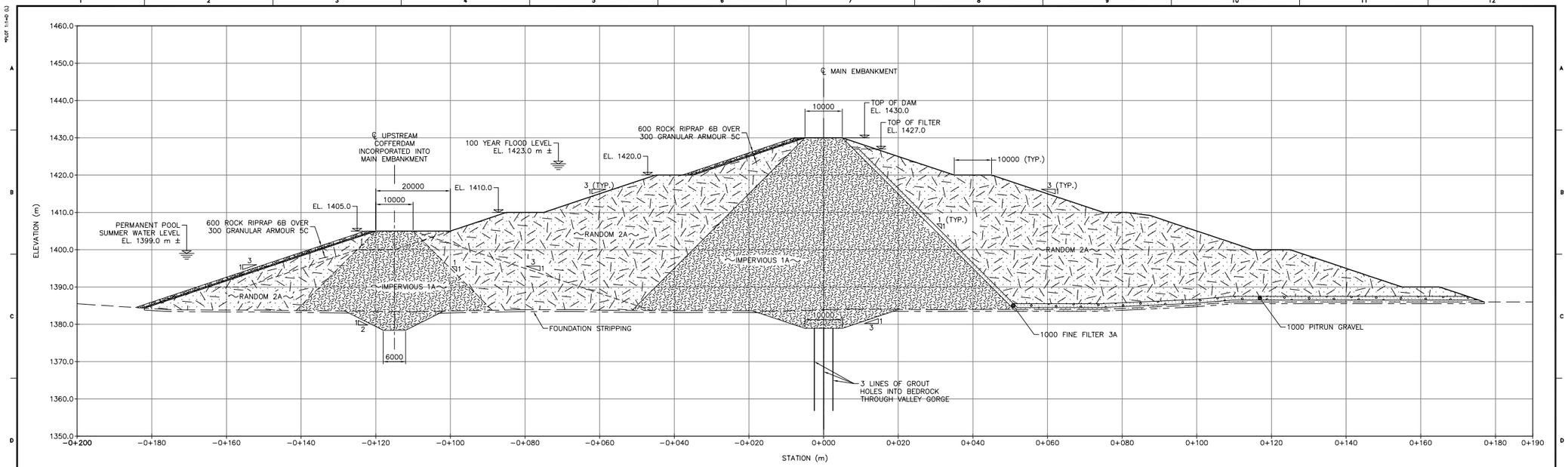
This conceptual design includes a small permanent pool in the valley bottom extending from river bottom elevation 1,379.0 m to the permanent outlet structure intake invert elevation 1,398.0 m, thereby permanently containing approximately 4,000 $dam^3$ of water as dead storage.

This storage is intended to prevent incoming larger bottom sediment from plugging the intake area, and could also replace the previously existing Allen Bill Pond which was destroyed by the 2013 flood. There is no low level outlet to release the dead storage. Additional water could be contained above the dead storage El. 1,398.0 m (i.e., multi-use storage) by regulating the permanent outlet gates using pre-programmed automation methods, rather than leaving the gates in the wide open position as considered herein. The potential value and/or need for multi-use storage at this site should be evaluated as part of the future study.

# Elbow River Dam at McLean Creek (MCI) Reservoir Area Layout



# Details - Elbow River Dam at McLean Creek (MCI) Dam Section




MAIN DAM SECTION
SCALE 1:500

SCALE
1:500
0 5 10 m

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc.) ARE BASED ON 22" X 34" FORMAT DRAWINGS

| REV | D | M | Y | ISSUE/REVISION DESCRIPTION | ENG. | APPR. |
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| A | 00 | 00 | 00 | ISSUED FOR CLIENT REVIEW | X.X. | X.X. |

Client: ALBERTA FLOOD RECOVERY TASK FORCE

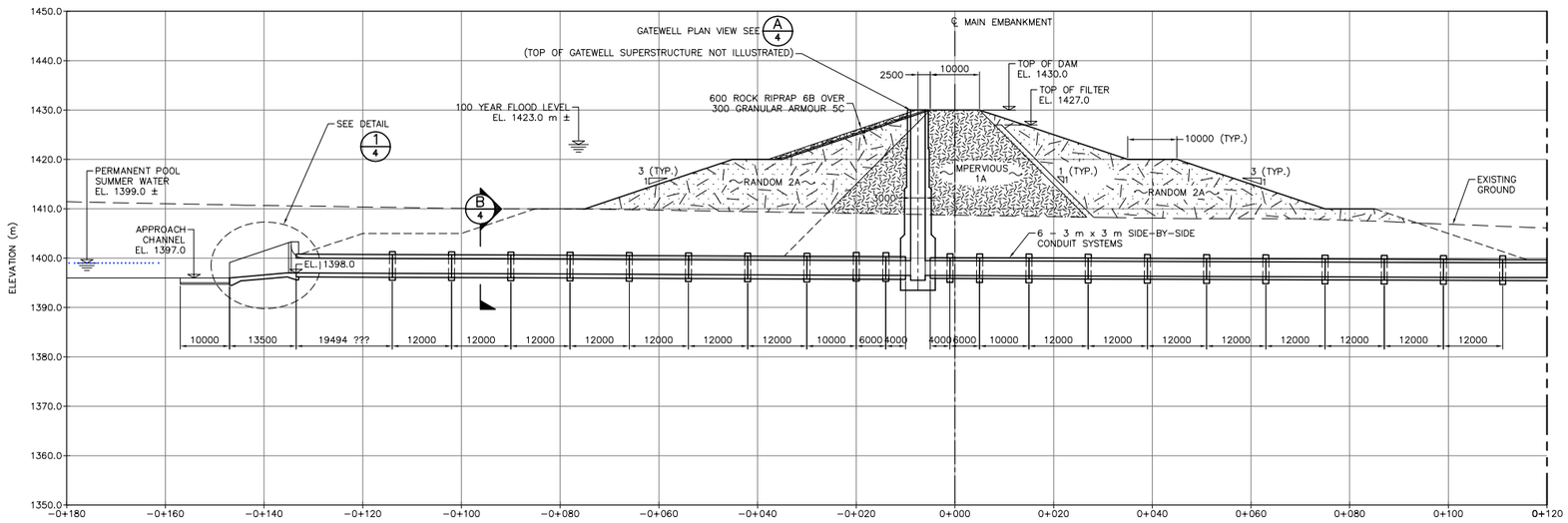
Designed By: K.K.
Drawn By: M.H.
Checked By: F.T.
Approved By: G.G.
Scale: AS SHOWN

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: ELBOW RIVER DAM AT MCLEAN CREEK (MCI) DAM SECTION

Project No.: CW2174
CADD File: 2174–N02.dwg
Date: MAY 2014
Drawing No.: F2
Sheet No.: 1 of 1

# Details - Elbow River Dam at McLean Creek (MCI) Combined Permanent Outlet / Service Spillway Structure Profile




℄ PROFILE COMBINED PERMANENT OUTLET / SERVICE SPILLWAY STRUCTURE
SCALE 1:500

SCALE 1:500 0 5 10 m

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED (i.e. 1:1000 etc.) ARE BASED ON 22" X 34" FORMAT DRAWINGS

| REV | D | M | Y | ISSUE/REVISION DESCRIPTION | ENG. | APPR |
|---|---|---|---|---|---|---|
| A | 00 | 00 | 00 | ISSUED FOR CLIENT REVIEW | X.X. | X.X. |

Client: ALBERTA FLOOD RECOVERY TASK FORCE

| | |
|---|---|
| Designed By: | K.K. |
| Drawn By: | S.B. |
| Checked By: | F.T. |
| Approved By: | G.G. |
| Scale: | AS SHOWN |

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: ELBOW RIVER DAM AT MCLEAN CREEK (MCI) COMBINED PERMANENT OUTLET / SERVICE SPILLWAY STRUCTURE PROFILE

| | |
|---|---|
| Project No.: | CW2174 |
| CADD File: | 2174-N02.dwg |
| Date: | MAY 2014 |
| Drawing No.: | F3 |
| Sheet No.: | 1 of 1 |

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# 4 Cost Estimate

## 4.1 Project Cost Estimate

A detailed cost estimate is provided in **Exhibit 4.1**[1]. The project cost is estimated to be $239,581,000. The estimate provided herein is based on 2012 construction price data. Year 2012 prices were used considering that 2013 construction prices are skewed as a result of abnormal activity which resulted from the June 2013 flood event. It is assumed that the construction of MC1 would take place in a more competitive environment for contractors and suppliers, and as such the 2012 prices are considered indicative of realistic project cost.

Additional subsurface soils investigations are required to better establish the concept details presented herein. More detailed hydrological assessment and topographic data are required to better establish the size of required works. A contingency allowance of 25% has been included in an effort to account for additional costs which could result from future additional information and the results of more detailed design work. No allowance is included for escalation until the time of construction.

To increase the flood protection above the 1% AEP, to the 2013 flood-of-record level, would require the dam crest level raised by approximately 4 m to El. 1,434.0 m, and would result in an additional cost of approximately $55 million. This amount includes contingency and engineering allowances.

## 4.2 Existing Infrastructure Impacts[2]

The proposed project is located within the Green Zone and is located entirely on Crown Land. Highway 66 and numerous existing recreational facilities will be impacted by the proposed project.

The resulting reservoir will inundate a portion of existing Kananaskis Highway 66 including a bridge crossing of the Elbow River. A potential highway and bridge relocation route around the south side of the reservoir is illustrated on Exhibit 3.1. Additional study is required to establish a preferred route. It may be desirable to retain a portion of the existing Highway 66 to provide access from the west, to existing and/or new facilities along the north side of the reservoir impoundment area.

The dam and reservoir area is characterized by fairly intensive recreational use, including day use and extended activities, covering all four seasons. The existing recreational facilities' locations are illustrated on Exhibit 3.1 and are discussed below:

- The Paddy's Flat recreational area borders the Elbow River on the north side bank and is adjacent to the flood plain. There are two campgrounds within this area, the first is a group camping facility while the second offers public camping for both tent and trailers. The campgrounds offer standard serviced campsites with water, vault toilets, fire pits, and tables. Paddy's Flat is a seasonal use site only (May to October) with a total of 98 public campsites. The campgrounds are above the 1% AEP flood level; however, some impacts are anticipated as a result of the Highway 66 relocation.

[1] AMEC Environmental & Infrastructure, *Southern Alberta Flood Recovery Task Force, Volume 4 – Flood Mitigation Measures, Appendix F – Elbow River Dam at McLean Creek*, p 21-22, May 2014
[2] Ibid, p 18-19.

# Elbow River Dam at McLean Creek (MC1) Cost Estimate

| Item | Unit | Quantity | Unit Price | Extension |
|---|---|---|---|---|
| **General** | | | | |
| Mob./Demobilization | lump sum | 1 | $10,000,000.00 | $10,000,000 |
| Care of Water | lump sum | 1 | $8,000,000.00 | $8,000,000 |
| Clearing & Timber Salvage | hectares | 60 | $12,000.00 | $720,000 |
| Haul Roads | km | 10 | $300,000.00 | $3,000,000 |
| Power Line Relocation | lump sum | lump sum | $400,000.00 | $400,000 |
| Ranger Station Removal | lump sum | lump sum | $1,200,000.00 | $1,200,000 |
| Topsoil/Seeding etc. | $m^2$ | 1,200,000 | $1.50 | $1,800,000 |
| | **Subtotal General** | | | **$25,120,000** |
| **Main Dam Embankment** | | | | |
| Stripping | $m^3$ | 200,000 | $6.00 | $1,200,000 |
| Rock Excavation | $m^3$ | 20,000 | $20.00 | $400,000 |
| Common Excavation | $m^3$ | 20,000 | $5.50 | $110,000 |
| Borrow Excavation | $m^3$ | 3,900,000 | $5.50 | $21,450,000 |
| Overhaul | $m^3$km | 3,900,000 | $1.50 | $5,850,000 |
| Impervious Fill | $m^3$ | 1,800,000 | $1.50 | $2,700,000 |
| Random Fill | $m^3$ | 1,700,000 | $1.40 | $2,380,000 |
| Fine Filter | $m^3$ | 152,000 | $80.00 | $12,160,000 |
| Coarse Filter | $m^3$ | 19,000 | $80.00 | $1,520,000 |
| Pitrun Gravel | $m^3$ | 120,000 | $20.00 | $2,400,000 |
| Rock Riprap | $m^3$ | 38,000 | $130.00 | $4,940,000 |
| Bedding Gravel | $m^3$ | 19,000 | $60.00 | $1,140,000 |
| Geotechnical Instruments | lump sum | 1 | $800,000.00 | $800,000 |
| Grout Curtain | lump sum | 1 | $2,000,000.00 | $2,000,000 |
| | **Subtotal Main Dam** | | | **$59,050,000** |
| **Combined Outlet/Service Spillway Structure** | | | | |
| Stripping | $m^3$ | 7,200 | $6.00 | $43,200 |
| Common Excavation | $m^3$ | 600,000 | $5.50 | $3,300,000 |
| Structure Fill | $m^3$ | 20,000 | $30.00 | $600,000 |
| Reinforced Concrete | $m^3$ | 25,000 | $1,000.00 | $25,800,000 |
| Fine Filter | $m^3$ | 2,700 | $90.00 | $243,000 |
| Coarse Filter | $m^3$ | 1,900 | $90.00 | $171,000 |
| Piping System | lump sum | 1 | $400,000.00 | $400,000 |
| Rock Riprap | $m^3$ | 1,900 | $130.00 | $247,000 |
| Bedding Gravel | $m^3$ | 600 | $70.00 | $42,000 |
| Gate/Hoist Systems | each | 6 | $560,000.00 | $3,360,000 |
| Superstructure | lump sum | lump sum | $90,000.00 | $90,000 |
| Controls/Instrumentation | lump sum | lump sum | $300,000.00 | $300,000 |
| Electrical/Mechanical | lump sum | lump sum | $500,000.00 | $500,000 |
| | **Subtotal Structure** | | | **$34,296,000** |
| **Auxiliary Earth Channel Spilllway** | | | | |
| Stripping | $m^3$ | 7,200 | $6.00 | $43,000 |
| Common Excavation | $m^3$ | 100,000 | $6.00 | $600,000 |
| Fuse Plug System | $m^3$ | 200 | $60.00 | $12,000 |
| | **Subtotal Auxiliary Spillway** | | | **$655,000** |
| **Highway 66 Relocation** | | | | |
| Grading | km | 8 | $600,000.00 | $4,800,000 |
| Base/Pavement | km | 8 | $750,000.00 | $6,000,000 |
| Elbow River Bridge | lump sum | lump sum | $4,000,000.00 | $4,000,000 |
| Mclean Creek Crossing | lump sum | lump sum | $800,000.00 | $800,000 |
| | **Subtotal Highway 66** | | | **$15,600,000** |
| **Spillway System Allowances Considering May 2014 Geotechnical Investigations** | | | | |
| Service Spillway | lump sum | lump sum | $16,000,000 | $16,000,000 |
| Auxiliary Spillway | lump sum | lump sum | $9,000,000 | $9,000,000 |
| | **Subtotal Spillway Design Upgrader** | | | **$25,000,000** |
| | | | | |
| | **SUBTOTAL CONSTRUCTION** | | | **$159,721,000** |
| | -Contingencies (25%) | | | $39,930,000 |
| | **Subtotal Construction and Contingencies** | | | **$199,651,000** |
| | -Engineering/Environmental (20%) | | | $39,930,000 |
| | **TOTAL CONSTRUCTION** | | | **$239,581,000** |

- River Cove is a group camping facility only. The facility is on the north side, adjacent to the Elbow River within the flood area, and features the usual picnic tables, water, fire pits, and vault toilets. Relocation or removal would be required.
- Allen Bill Pond was a combination hiking trailhead and day use picnic site located on the north side of the Elbow River, and south of existing Highway 66 immediately upstream of the Elbow River Bridge. The pond was stocked with rainbow trout and was a popular fishing site. This pond was destroyed during the 2013 flood. The proposed McLean Creek dam site permanent pond dead storage could serve similar recreational purposes.
- Station Flats is a hiking and horseback trailhead. Located on the north side of Highway 66, there is a small gravelled parking lot and vault toilets. Highway 66 provided access to this area. That access from the east will no longer exist.
- The Elbow Ranger Station is located on the north side of Highway 66 along Ranger Creek, and these facilities would be affected. The existing facilities include a large maintenance compound, a station office building which houses three departments (Alberta Forestry Services, Alberta Parks and Recreation, Alberta Fish and Wildlife), a dining hall, 8 seasonal bunk houses, 11 permanent residences, 2 mobile homes, and 1 cold compound storage building. It is not known to what extent these facilities are currently used, if at all. Requirements would need to be established and the station relocated or dismantled.

Costs of replicating the aforementioned facilities within the general area and on Crown Land has been conservatively estimated at between $40 and $50 million[3]. In addition, the environmental impact assessment studies required to evaluate the project have been estimated at $4 million[4].

# 5 Flood Damages

## 5.1 Without Mitigation Alternative

### 5.1.1 City of Calgary

Flood damage estimates were generated for the City of Calgary employing updated stage-damage curves and the Provincial Rapid Flood Damage Assessment Model. Damage assessments were generated for nine return frequencies including: 1:2 year, 1:5 year, 1:10 year, 1:20 year, 1:50 year, 1:100 year, 1:200 year, 1:500 year and 1:1000 year, which allowed for the computation of average annual damages. Damage estimates were also assessed under two cases: a higher or “worst case” condition and a lower or “anticipated case” condition.

The detailed analysis of City of Calgary flood damages is contained under separate cover; however, summary tables are contained in **Appendix A**. For the 1:100 year flood under the higher damage case, total damages on the Elbow are estimated at $741,005,000. Average annual damages for the Elbow River under the higher case equate to $30,110,965.

For the 1:100 year flood under the lower case assumptions, total damages on the Elbow River are estimated at $538,369,000 with average annual damages estimated at $21,728,927.

[3] Government of Alberta - Environmental and Sustainable Resource Development, Resilience & Mitigation Branch.
[4] Ibid.

### 5.1.2 Other Damages

Flood damage studies, akin to the detailed assessment undertaken for the City of Calgary have not been generated for areas downstream of the McLean Creek storage project including Bragg Creek, Redwood Meadows and infrastructure within Rocky View County which would be protected by the proposed McLean Creek project. These damages constitute costs over and above those accruing to the City of Calgary and should be taken into consideration as part of the benefit/cost analysis.

A variety of secondary sources were employed to determine damages, including the damage claims submitted under the 2013 Southern Alberta Disaster Recovery Program along with a previous study of Bragg Creek completed for Alberta Environment Planning Division in 1987[5].

In terms of the 2013 Southern Alberta Disaster Recovery Program, the total estimated amount for flood recovery projects between the McLean Creek dam site and the City of Calgary is approximately $5.6 million. This amount is made up of $1.084 million for recovery projects in Rocky View County (including Bragg Creek), $2.657 million for recovery projects in the Townsite of Redwood Meadows, and $1.901 million for recovery projects in the Tsuu T'ina First Nation. Details are contained in **Appendix B**.

#### *5.1.2.1 1987 Bragg Creek Floodplain Management Study*

The 1987 Bragg Creek Floodplain Management Study identified 37 residential units and 21 commercial units within the flood hazard area. This has increased to 51 residential units and 29 commercial units, representing an increase of 27% for residential and 28% for commercial. A very cursory assessment of potential damages employing values from the updated stage-damage curves suggests total damages in the order of $12.7 million for the Bragg Creek flood study area for the 1:100 year event.

#### *5.1.2.2 Cost Implications*

At this juncture it is not possible to accurately calculate average annual damages for the areas downstream of MC1. Notwithstanding, in order to account for the other damages, and therefore additional costs that will be incurred by the Glenmore Reservoir Diversion and SR1 (Springbank Off-Stream Flood Storage) projects over the MC1 project, an additional $8.9 million in total costs are proposed to be added to these other projects.

## 5.2 With Mitigation Alternative

Implementation of the McLean Creek Flood Storage project results in a reduction of average annual damages under the four cases as follows:

- 1:100 year level of protection under the higher damage scenario = $19,461,291
- 1:200 year level of protection under the higher damage scenario = $26,114,777
- 1:100 year level of protection under the lower damage scenario = $13,746,068
- 1:200 year level of protection under the lower damage scenario = $16,686,439

[5] *Bragg Creek Floodplain Management Study – Final Report*, J.N. MacKenzie Engineering Ltd. in association with W-E-R Engineering Ltd., IBI Group and Ecos Engineering Services Ltd., January 1987.

# 6 Benefit/Cost Analysis

## 6.1 Benefit/Cost Analysis for Flood Mitigation Projects

For flood mitigation projects, economic evaluation requires a comparison between the events predicted to occur if the project is built and those predicted to occur if the project is not built. This is called the “with and without principle”. For flood control one cannot directly equate an exchange in the market, however flood control benefits can be estimated by assuming they are equivalent to the flood damage prevented.

For flood mitigation projects the probabilistic approach to benefit/cost estimates is used. To reiterate, within the defined flood risk area, flood damages were estimated with the application of depth-damage curves applied to the various return flood events (probability). The flood damage probability distribution was then plotted and the average annual damage (AAD) estimated for project evaluation purposes.

With the updated average annual damages and cost estimates of the diversion alternative, an economic efficiency evaluation was performed. This evaluation is based upon the net present value (NPV) of respective benefits and costs. The net present value of any project is governed by three variables: the average annual cost or benefit, discount rate, and discount period. To provide a consistent economic evaluation of flood mitigation projects across the Province, a common discount rate of 4% was agreed upon and applied. The discount period is the estimate of the alternative’s project life.

The benefit/cost (B/C) ratio of a project is the ratio of net present value of the benefits (average annual damages) over the net present value of the costs. This value is the indicator of economic efficiency. Where the benefits exceed costs, the ratio would be greater than 1.0, and where benefits are less than costs then the ratio would be less than 1.0. An economically-efficient project would have a B/C ratio greater than 1.0. At a B/C ratio of 1.0, the project is at a breakeven point.

## 6.2 Assumptions/Methodology

The following assumptions were employed in the benefit/cost analysis:

- Costs are based on the estimated capital and operational/maintenance costs presented in Section 4.
- $8.9 million in capital costs was added to the Glenmore Reservoir Diversion and Springbank Off-Stream Storage projects to account for required mitigation measures upstream thereby taking into account the benefits accruing to the McLean Creek Flood Storage project.
- $45 million in costs was added for relocating existing infrastructure.
- $4 million in costs was added for environmental impact studies.
- Benefits are based on the quantification of flood damages averted as outlined in Section 5.
- The benefit/cost analysis has been carried out using a net present value analysis.
- A 100 year economic analysis.
- Annual operating and maintenance costs of $1.8 million.

### 6.2.1 MC1 (McLean Creek Flood Storage Project) and SR1 (Springbank Off-Stream Flood Storage Project)

Net benefits for MC1 and SR1 were computed on the basis that the projects will provide protection downstream of Glenmore Dam to the 1:100 and 1:200 year flood events. When these events are exceeded, the damages will start to increase rapidly as the peak discharge passes through the flood hazard area within the City of Calgary. Without additional hydrologic routing, it was assumed that once the design event is exceeded, full damages are incurred. With additional hydrologic routing it is possible that the benefit/cost ratios of these schemes will improve somewhat.

### 6.2.2 Glenmore Reservoir Diversion

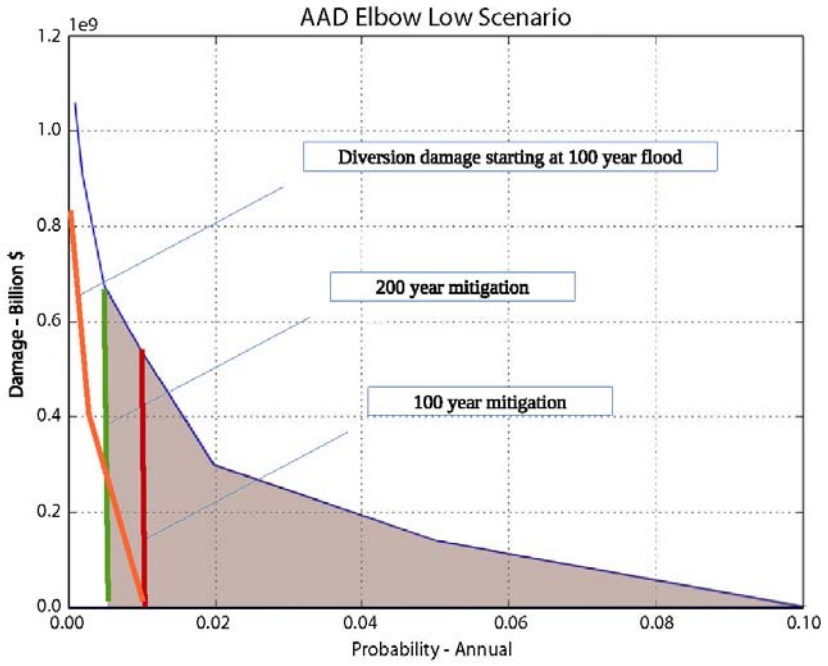
With respect to the Glenmore Reservoir Diversion it was possible to calculate the reduced damages that would be achieved as a result of the 500 and 700 CMS diversion. The incremental flow was passed downstream and damages based on the reduced flood flow were computed to determine the net benefits. Consequently, a higher benefit can be attributed to the diversion scheme based on this higher level of analysis. Notwithstanding the higher overall benefits, the actual benefit/cost ratio as illustrated in the next section is lower than the MC1 and SR1 schemes due to the much higher cost base of the Glenmore Reservoir Diversion.

**Exhibit 6.1** illustrates this principle considering the average annual damage on the Elbow under the low damage scenario. If all flood damage can be eliminated then the average annual damage is equal to the area under the curve from the Y to the X axis. This is the total average annual damage.

If a dyke is constructed to a 100 year flood protection, the area right of the red line is subtracted from the total average annual damage. This is the value of the average annual damage averted. However, when the 100 year flood is exceeded then all the properties are flooded instantaneously (area to the left of the red line). Similarly, for a dyke built to the 200 year level of protection.

Conversely, in the case of the diversion tunnel, the mitigation is the area right of the orange line. In this case, when the diverted flow is exceeded, then the damage occurs gradually (slope of the orange curve) rather than vertically, like the dyke situation.

**Exhibit 6.1: Affect of Mitigation on Average Annual Damage**



## 6.3 Discussion of Results

**Exhibit 6.2** highlights the key results of the benefit/cost analysis for the McLean Creek Flood Storage project considering the four cases as discussed.

For the 1:100 year level of protection under the high damage scenario, the present value of benefits is $477 million versus the present value of costs at $333 million, rendering a positive benefit/cost ratio of 1.43.

At the 1:200 year level of protection, the benefit/cost ratio increases slightly to 1.65, proving both alternatives to be economically viable projects.

For the low damage scenario, the 1:100 year present value of benefits is $337 million versus $333 million in costs, rendering a benefit/cost ratio of 1.01. Once again, for the 1:200 year level of protection the benefit/cost ratio increases slightly to 1.05.

**Exhibit 6.2: Benefit/Cost Analysis**

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $332,708,000 | $387,699,000 | $332,708,000 | $387,699,000 |
| Benefit/Cost Ratio | 1.43 | 1.65 | 1.01 | 1.05 |
| Net Present Value | $144,191,000 | $252,244,000 | $4,139,000 | $21,202,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

## 6.4 Benefits Beyond the Study Area

Of the three mitigation projects under consideration, only one – the McLean Creek Flood Storage project (MC1) – provides benefits beyond the primary study area, the City of Calgary. An analysis of any potential benefits downstream of the City was outside the scope of this analysis. Needless to say, it is anticipated that benefits downstream of the City would be marginal in any event.

## 6.5 Triple Bottom Line Considerations

Traditional economic analyses of flood mitigation alternatives have generally assumed a straightforward objective of maximizing the net benefits (total benefits minus total costs) that accrue to a project. Society however, has other goals besides economic efficiency. These goals or objectives are the results of outcomes that society desires and have more recently been described as triple bottom line objectives which include, in addition to economic objectives, considerations of environmental and social impacts. In relation to flood mitigation projects, the following criteria are often considered in the evaluation process:

- Disaster prevention:
  - reduces current losses
  - reduces future losses
  - potential residential loss of life
  - potential non-residential loss of life
- Environmental impact:
  - biophysical impacts
  - social impacts
  - aesthetic impacts
- Implementation:
  - complexity
  - flexibility of integration with other measures
- Incidental benefits:
  - recreation
  - drought mitigation
  - other

This study was concerned solely with economic efficiency and consequently does not include analysis of the aforementioned non-commensurable criteria.

## 6.6 Summary and Conclusions

**Exhibit 6.3** below illustrates the relative ranking of the flood mitigation projects.

**Exhibit 6.3: Benefit/Cost Ratio**

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |

The McLean Creek Flood Storage project achieves a positive benefit/cost ratio in all four scenarios and ranks second behind the SR1 project. [6]



[6] Refer to IBI Group Reports: *Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: Springbank Off-Stream Flood Storage (February 2015)* and *Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: Glenmore Reservoir Diversion (February 2015).*

# Appendix A – City of Calgary Flood Damage Estimates

# Total Damages, Bow and Elbow Rivers, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $268,753,000 | $414,798,000 | $686,791,000 | $947,786,000 | $1,329,201,000 | $1,496,364,000 |
| | Indirect 15% | $0 | $0 | $0 | $40,313,000 | $62,220,000 | $103,019,000 | $142,168,000 | $199,380,000 | $224,455,000 |
| | Total | $0 | $0 | $0 | $309,066,000 | $477,018,000 | $789,810,000 | $1,089,954,000 | $1,528,581,000 | $1,720,819,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,210,000 | $37,446,000 | $111,079,000 | $271,990,000 | $493,824,000 | $572,607,000 |
| | Indirect 323% | $0 | $0 | $0 | $49,128,000 | $120,951,000 | $358,785,000 | $878,528,000 | $1,595,052,000 | $1,849,521,000 |
| | Total | $0 | $0 | $0 | $64,338,000 | $158,397,000 | $469,864,000 | $1,150,518,000 | $2,088,876,000 | $2,422,128,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $101,508,000 | $170,620,000 | $299,100,000 | $452,626,000 | $686,656,000 | $780,711,000 |
| | Indirect 20% | $0 | $0 | $0 | $20,302,000 | $34,124,000 | $59,820,000 | $90,525,000 | $137,331,000 | $156,142,000 |
| | Total | $0 | $0 | $0 | $121,810,000 | $204,744,000 | $358,920,000 | $543,151,000 | $823,987,000 | $936,853,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 185% | $0 | $0 | $0 | $18,860,000 | $78,030,000 | $127,400,000 | $169,928,000 | $308,521,000 | $357,741,000 |
| | Total | $0 | $0 | $0 | $29,060,000 | $120,230,000 | $196,300,000 | $261,828,000 | $475,374,000 | $551,213,000 |
| Total | Direct | $0 | $0 | $0 | $395,671,000 | $665,064,000 | $1,165,870,000 | $1,764,302,000 | $2,676,534,000 | $3,043,154,000 |
| | Indirect 73% | $0 | $0 | $0 | $128,603,000 | $295,325,000 | $649,024,000 | $1,281,149,000 | $2,240,284,000 | $2,587,859,000 |
| | Total | $0 | $0 | $0 | $524,274,000 | $960,389,000 | $1,814,894,000 | $3,045,451,000 | $4,916,818,000 | $5,631,013,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Total Damages, Bow River, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $167,738,000 | $247,549,000 | $387,075,000 | $582,482,000 | $891,235,000 | $991,311,000 |
| | Indirect 15% | $0 | $0 | $0 | $25,161,000 | $37,133,000 | $58,062,000 | $87,372,000 | $133,685,000 | $148,697,000 |
| | Total | $0 | $0 | $0 | $192,899,000 | $284,682,000 | $445,137,000 | $669,854,000 | $1,024,920,000 | $1,140,008,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,128,000 | $36,965,000 | $100,874,000 | $256,774,000 | $471,284,000 | $539,790,000 |
| | Indirect 323% | $0 | $0 | $0 | $48,863,000 | $119,397,000 | $325,823,000 | $829,380,000 | $1,522,248,000 | $1,743,522,000 |
| | Total | $0 | $0 | $0 | $63,991,000 | $156,362,000 | $426,697,000 | $1,086,154,000 | $1,993,532,000 | $2,283,312,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $63,102,000 | $98,179,000 | $168,379,000 | $289,606,000 | $470,170,000 | $528,344,000 |
| | Indirect 20% | $0 | $0 | $0 | $12,621,000 | $19,636,000 | $33,676,000 | $57,921,000 | $94,034,000 | $105,669,000 |
| | Total | $0 | $0 | $0 | $75,723,000 | $117,815,000 | $202,055,000 | $347,527,000 | $564,204,000 | $634,013,000 |
| Stampede | Direct | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Indirect 185% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Total | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total | Direct | $0 | $0 | $0 | $245,968,000 | $382,693,000 | $656,328,000 | $1,128,862,000 | $1,832,689,000 | $2,059,445,000 |
| | Indirect 84% | $0 | $0 | $0 | $86,645,000 | $176,166,000 | $417,561,000 | $974,673,000 | $1,749,967,000 | $1,997,888,000 |
| | Total | $0 | $0 | $0 | $332,613,000 | $558,859,000 | $1,073,889,000 | $2,103,535,000 | $3,582,656,000 | $4,057,333,000 |

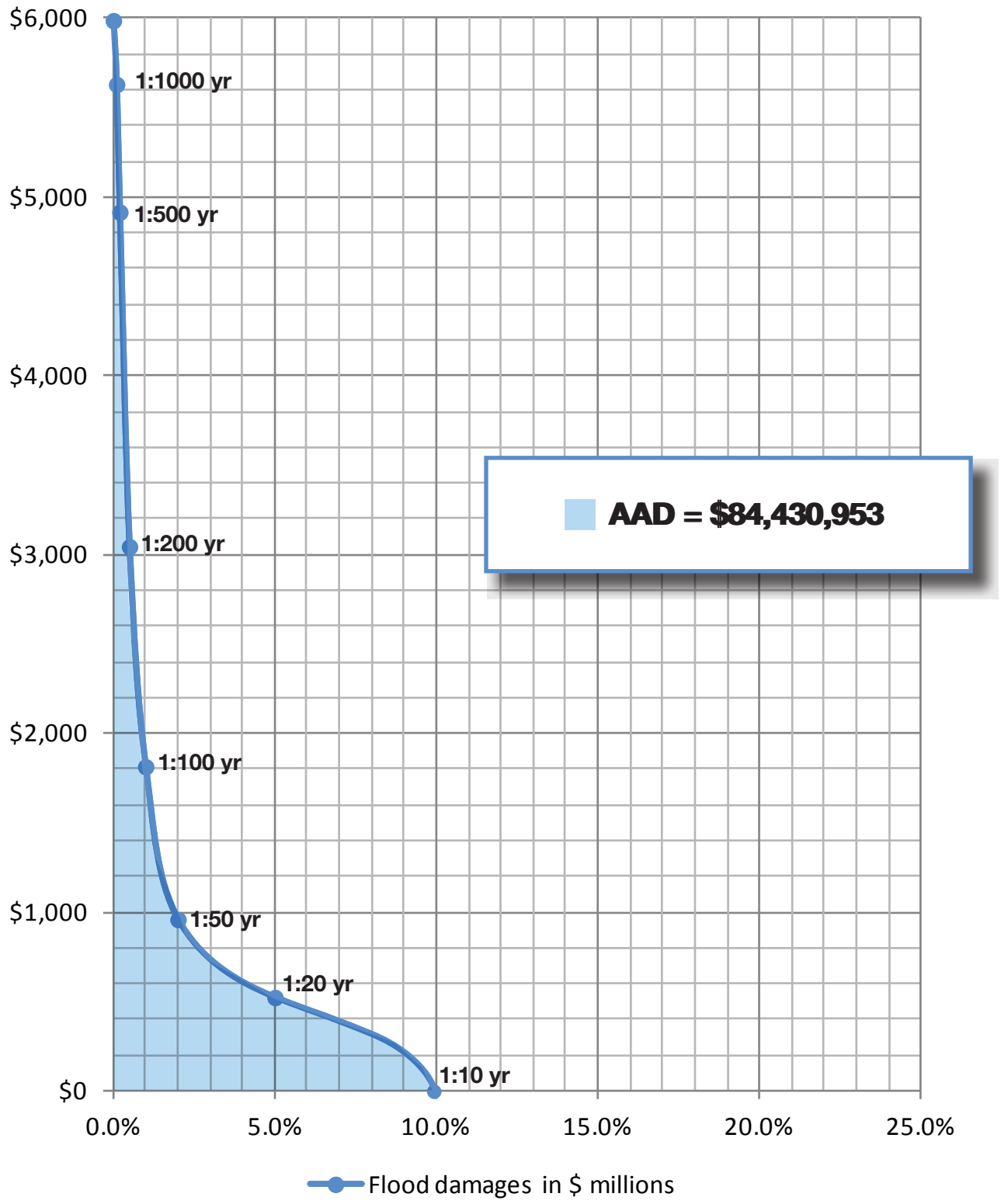
* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Total Damages, Elbow River, With Sewer Backup

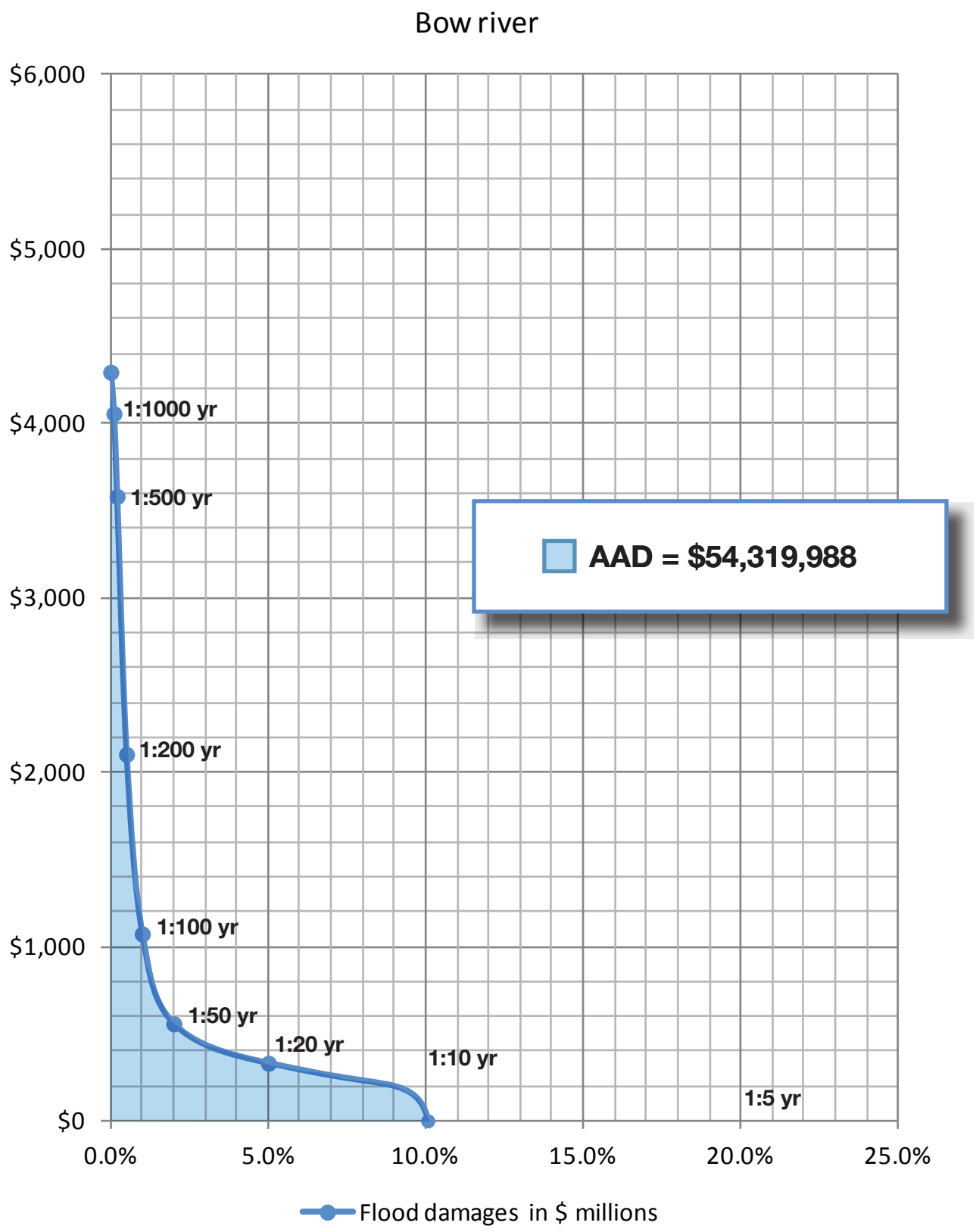
| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $0 | $0 | $0 | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $0 | $0 | $0 | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $0 | $0 | $0 | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 323% | $0 | $0 | $0 | $265,000 | $1,554,000 | $32,962,000 | $49,148,000 | $72,804,000 | $105,999,000 |
| | Total | $0 | $0 | $0 | $347,000 | $2,035,000 | $43,167,000 | $64,364,000 | $95,344,000 | $138,816,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $38,406,000 | $72,441,000 | $130,721,000 | $163,020,000 | $216,486,000 | $252,367,000 |
| | Indirect 20% | $0 | $0 | $0 | $7,681,000 | $14,488,000 | $26,144,000 | $32,604,000 | $43,297,000 | $50,473,000 |
| | Total | $0 | $0 | $0 | $46,087,000 | $86,929,000 | $156,865,000 | $195,624,000 | $259,783,000 | $302,840,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 185% | $0 | $0 | $0 | $18,860,000 | $78,030,000 | $127,400,000 | $169,928,000 | $308,521,000 | $357,741,000 |
| | Total | $0 | $0 | $0 | $29,060,000 | $120,230,000 | $196,300,000 | $261,828,000 | $475,374,000 | $551,213,000 |
| Total | Direct | $0 | $0 | $0 | $149,703,000 | $282,371,000 | $509,542,000 | $635,440,000 | $843,845,000 | $983,709,000 |
| | Indirect 52% | $0 | $0 | $0 | $41,958,000 | $119,159,000 | $231,463,000 | $306,476,000 | $490,317,000 | $589,971,000 |
| | Total | $0 | $0 | $0 | $191,661,000 | $401,530,000 | $741,005,000 | $941,916,000 | $1,334,162,000 | $1,573,680,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

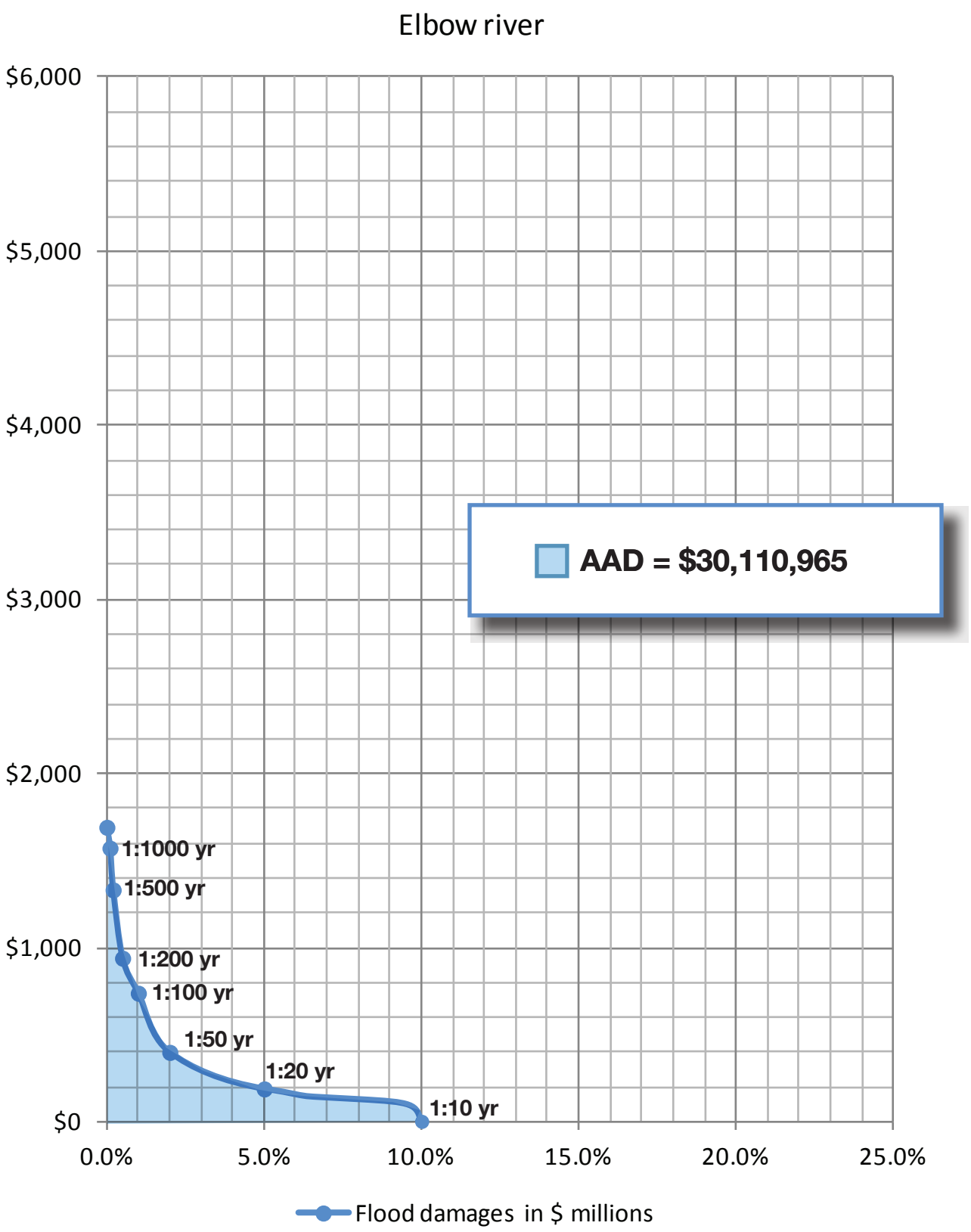
# Flood Damages Probability Distribution, Bow and Elbow Rivers



# Flood Damages Probability Distribution, Bow River



# Flood Damages Probability Distribution, Elbow River



# Alternative Damage Scenario - Total Damages, Bow and Elbow Rivers, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 * | 5 * | 10 ** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $268,753,000 | $414,798,000 | $686,791,000 | $947,786,000 | $1,329,201,000 | $1,496,364,000 |
| | Indirect 15% | $0 | $0 | $0 | $40,313,000 | $62,220,000 | $103,019,000 | $142,168,000 | $199,380,000 | $224,455,000 |
| | Total | $0 | $0 | $0 | $309,066,000 | $477,018,000 | $789,810,000 | $1,089,954,000 | $1,528,581,000 | $1,720,819,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,210,000 | $37,446,000 | $111,079,000 | $271,990,000 | $493,824,000 | $572,607,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $16,851,000 | $49,986,000 | $122,396,000 | $222,221,000 | $257,673,000 |
| | Total | $0 | $0 | $0 | $15,210,000 | $54,297,000 | $161,065,000 | $394,386,000 | $716,045,000 | $830,280,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $21,639,000 | $90,929,000 | $159,400,000 | $241,219,000 | $365,941,000 | $416,066,000 |
| | Indirect 20% | $0 | $0 | $0 | $4,328,000 | $18,186,000 | $31,880,000 | $48,244,000 | $73,188,000 | $83,213,000 |
| | Total | $0 | $0 | $0 | $25,967,000 | $109,115,000 | $191,280,000 | $289,463,000 | $439,129,000 | $499,279,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 38% | $0 | $0 | $0 | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $0 | $0 | $0 | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $0 | $0 | $0 | $315,802,000 | $585,373,000 | $1,026,170,000 | $1,552,895,000 | $2,355,819,000 | $2,678,509,000 |
| | Indirect 22% | $0 | $0 | $0 | $48,549,000 | $113,427,000 | $211,285,000 | $348,021,000 | $558,721,000 | $639,473,000 |
| | Total | $0 | $0 | $0 | $364,351,000 | $698,800,000 | $1,237,455,000 | $1,900,916,000 | $2,914,540,000 | $3,317,982,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Alternative Damage Scenario - Total Damages, Bow River, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 * | 5 * | 10 ** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $167,738,000 | $247,549,000 | $387,075,000 | $582,482,000 | $891,235,000 | $991,311,000 |
| | Indirect 15% | $0 | $0 | $0 | $25,161,000 | $37,133,000 | $58,062,000 | $87,372,000 | $133,685,000 | $148,697,000 |
| | Total | $0 | $0 | $0 | $192,899,000 | $284,682,000 | $445,137,000 | $669,854,000 | $1,024,920,000 | $1,140,008,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,128,000 | $36,965,000 | $100,874,000 | $256,774,000 | $471,284,000 | $539,790,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $16,635,000 | $45,394,000 | $115,549,000 | $212,078,000 | $242,905,000 |
| | Total | $0 | $0 | $0 | $15,128,000 | $53,600,000 | $146,268,000 | $372,323,000 | $683,362,000 | $782,695,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $13,452,000 | $52,323,000 | $89,734,000 | $154,340,000 | $250,569,000 | $281,571,000 |
| | Indirect 20% | $0 | $0 | $0 | $2,691,000 | $10,465,000 | $17,947,000 | $30,868,000 | $50,114,000 | $56,314,000 |
| | Total | $0 | $0 | $0 | $16,143,000 | $62,788,000 | $107,681,000 | $185,208,000 | $300,683,000 | $337,885,000 |
| Stampede | Direct | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Indirect 38% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Total | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total | Direct | $0 | $0 | $0 | $196,318,000 | $336,837,000 | $577,683,000 | $993,596,000 | $1,613,088,000 | $1,812,672,000 |
| | Indirect 23% | $0 | $0 | $0 | $27,852,000 | $64,233,000 | $121,403,000 | $233,789,000 | $395,877,000 | $447,916,000 |
| | Total | $0 | $0 | $0 | $224,170,000 | $401,070,000 | $699,086,000 | $1,227,385,000 | $2,008,965,000 | $2,260,588,000 |

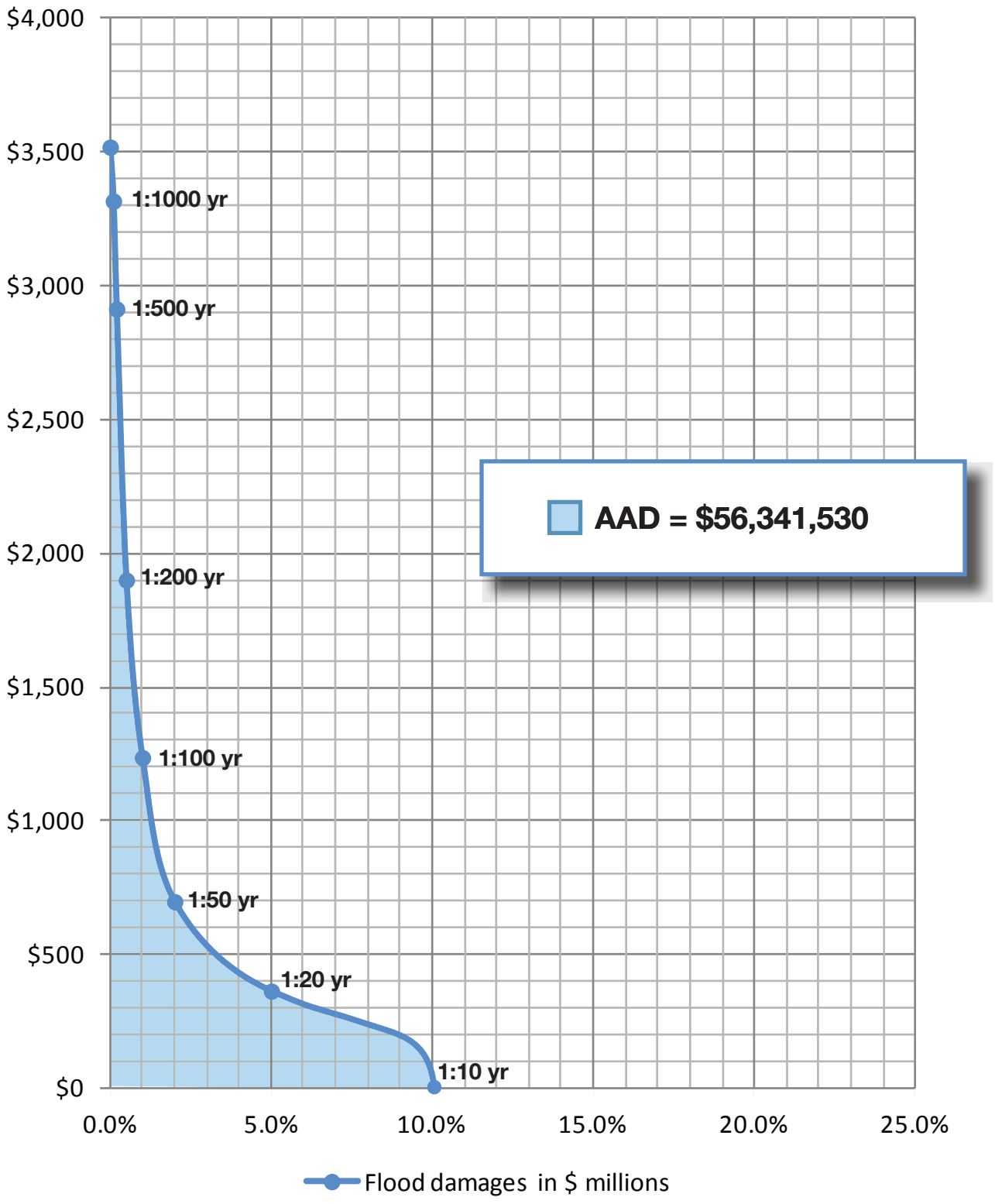
* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Alternative Damage Scenario - Total Damages, Elbow River, With Sewer Backup

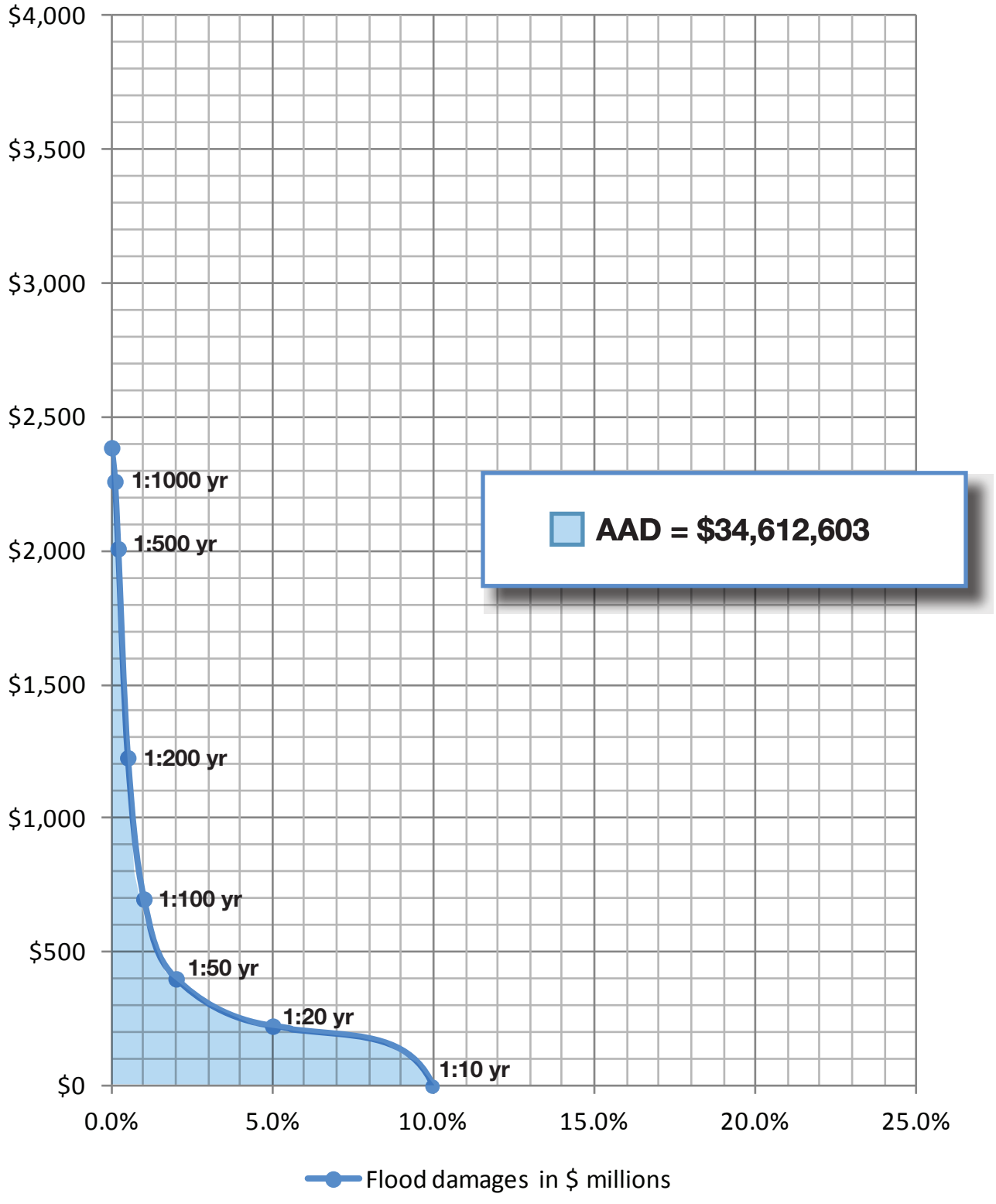
| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 * | 5 * | 10 ** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $0 | $0 | $0 | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $0 | $0 | $0 | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $0 | $0 | $0 | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $216,000 | $4,592,000 | $6,847,000 | $10,143,000 | $14,768,000 |
| | Total | $0 | $0 | $0 | $82,000 | $697,000 | $14,797,000 | $22,063,000 | $32,683,000 | $47,585,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $8,187,000 | $38,606,000 | $69,666,000 | $86,879,000 | $115,372,000 | $134,495,000 |
| | Indirect 20% | $0 | $0 | $0 | $1,637,000 | $7,721,000 | $13,933,000 | $17,376,000 | $23,074,000 | $26,899,000 |
| | Total | $0 | $0 | $0 | $9,824,000 | $46,327,000 | $83,599,000 | $104,255,000 | $138,446,000 | $161,394,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 38% | $0 | $0 | $0 | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $0 | $0 | $0 | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $0 | $0 | $0 | $119,484,000 | $248,536,000 | $448,487,000 | $559,299,000 | $742,731,000 | $865,837,000 |
| | Indirect 21% | $0 | $0 | $0 | $20,697,000 | $49,194,000 | $89,882,000 | $114,232,000 | $162,844,000 | $191,557,000 |
| | Total | $0 | $0 | $0 | $140,181,000 | $297,730,000 | $538,369,000 | $673,531,000 | $905,575,000 | $1,057,394,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

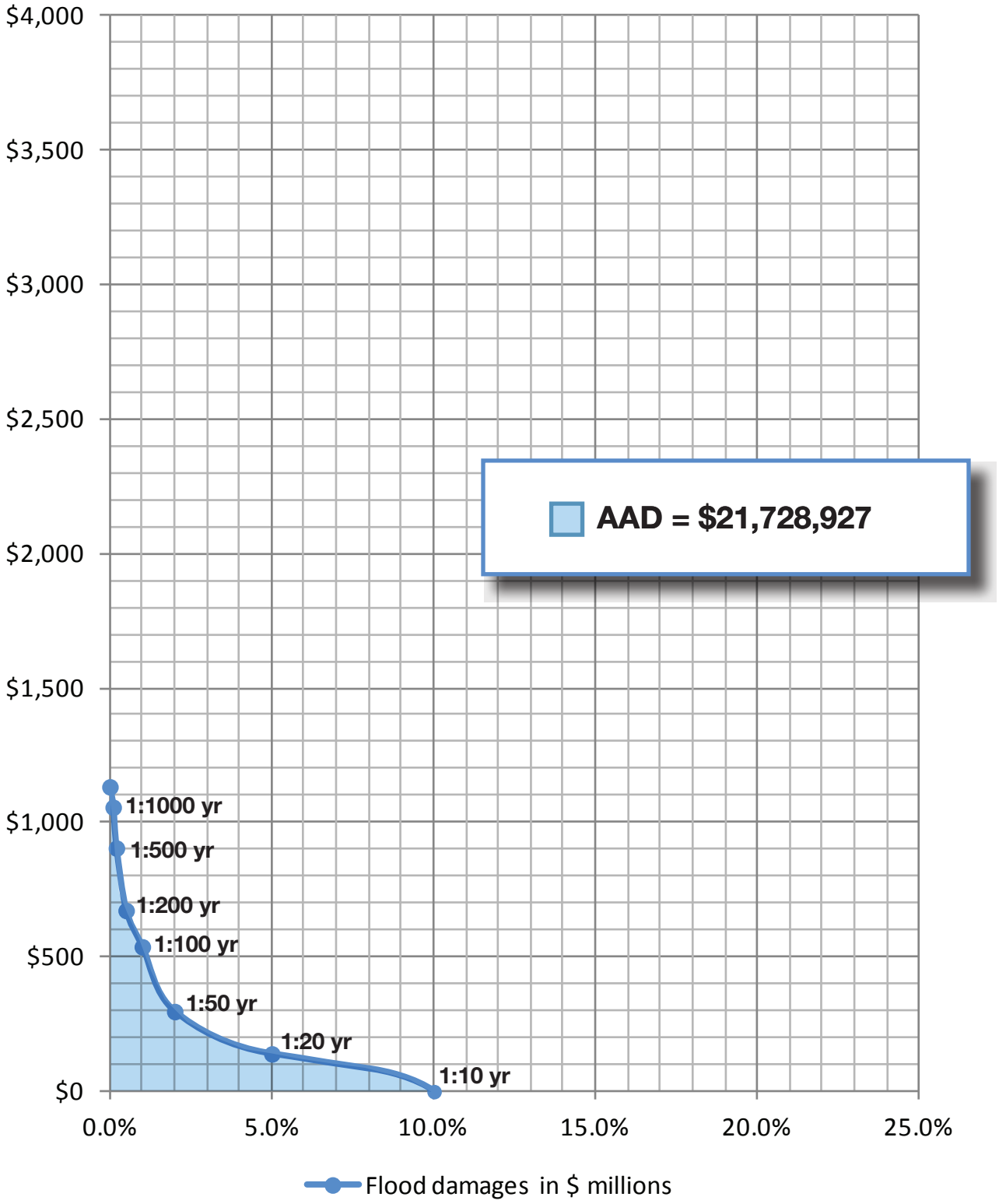
## Alternative Damage Scenario - Flood Damages Probability Distribution, Bow and Elbow Rivers



## Alternative Damage Scenario - Flood Damages Probability Distribution, Bow River



## Alternative Damage Scenario - Flood Damages Probability Distribution, Elbow River



# Appendix B – 2013 Southern Alberta Disaster Recovery Program

## 2013 Southern Alberta Disaster Recovery Program - Ongoing Project Estimate Tracking - As of February 4, 2014

### Rocky View County Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Emergency Operations | Ongoing | Y | Sept. 19, 2013 | 450000.00 | Approved inspection estimate |
| 2 | Hamlet of Bragg Creek water intake | Ongoing | Y | Sept. 19, 2013 | 110000.00 | Approved inspection estimate |
| 3 | Hamlet of Bragg Creek road damage | Ongoing | Y | Sept. 19, 2013 | 20000.00 | Approved inspection estimate |
| 4 | Balsam Ave Erosion | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 5 | Access to Hamlet of Bragg Creek Snowbirds Chalet | Ongoing | Y | Sept. 19, 2013 | 5000.00 | Approved inspection estimate |
| 6 | Hamlet of Bragg Creek Community Centre | Ongoing | Y | Sept. 19, 2013 | 35000.00 | Approved inspection estimate |
| 7 | Wood debris site | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 8 | Wintergreen road | Ongoing | Y | Sept. 19, 2013 | 10000.00 | Approved inspection estimate |
| 9 | Slapping Tail Pond | Ongoing | Y | Sept. 19, 2013 | 75000.00 | Approved inspection estimate |
| 12 | RR 54, S of TWP road 234 | Ongoing | Y | Sept. 19, 2013 | 10000.00 | Approved inspection estimate |
| 14 | Bracken Road gate and spillway | Ongoing | Y | Sept. 19, 2013 | 15000.00 | Approved inspection estimate |
| 15 | Bracken Road | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 16 | Bracken Road S TWP Rd 232, Bragg Creek BF72292 | Ongoing | Y | Sept. 19, 2013 | 29000.00 | Approved inspection estimate |
| 18 | RR 41, S of Springbank Road, Gross Creek BF74057 | Ongoing | Y | Sept. 19, 2013 | 15000.00 | Approved inspection estimate |
| 19 | Springbank road W of RR 35, Springbank Creek BF9024 | Ongoing | Y | Sept. 19, 2013 | 20770.00 | Approved inspection estimate |
| 33 | Bragg Creek Municipal Park | Ongoing | Y | Sept. 19, 2013 | 20000.00 | Approved inspection estimate |
| 34 | Springbank Park for All Seasons | Ongoing | N | Dec. 9, 2013 | 194000.00 | Applicant initial estimate only |
| TOTAL BUDGET ESTIMATES FOR ROCKY VIEW COUNTY ONGOING PROJECTS | | | | | $1,083,770.00 | |

## 2013 Southern Alberta Disaster Recovery Program - Ongoing Project Estimate Tracking - As of February 4, 2014

### Townsite of Redwood Meadows Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Northern berm breach | Ongoing | Y | Sept. 10, 2013 | 838000.00 | Approved inspection estimate |
| 2 | Sleigh Drive berm breach | Ongoing | Y | Sept. 10, 2013 | 75000.00 | Approved inspection estimate |
| 3 | Use of existing rip rap for flood protection | Ongoing | Y | Sept. 10, 2013 | 465000.00 | Approved inspection estimate |
| 4 | Water treatment plant | Ongoing | Y | Sept. 10, 2013 | 75000.00 | Approved inspection estimate |
| 5 | Playground berm breach | Ongoing | Y | Sept. 10, 2013 | 690000.00 | Approved inspection estimate |
| 6 | Berm breach, #18 Redwood Meadows Drive | Ongoing | Y | Sept. 10, 2013 | 444000.00 | Approved inspection estimate |
| 7 | Sanitary sewer pumping station | Ongoing | Y | Sept. 10, 2013 | 70000.00 | Approved inspection estimate |
| TOTAL BUDGET ESTIMATES FOR TOWNSITE OF REDWOOD MEADOWS ONGOING PROJECTS | | | | | $2,657,000.00 | |

### Tsuu T'ina Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Emergency Operations | Ongoing | N | Sept. 25, 2013 | 60384.22 | Applicant initial estimate only |
| 2 | Infrastructure Damage | Ongoing | N | Sept. 25, 2013 | 211611.26 | Applicant initial estimate only |
| 3 | Housing | Ongoing | N | Sept. 25, 2013 | 29914.77 | Applicant initial estimate only |
| 4 | Band Works | Ongoing | Y | Nov. 11, 2013 | 800000.00 | Approved inspection estimate |
| 5 | Redwood Meadows Golf Course | Ongoing | Y | Nov. 11, 2013 | 800000.00 | Approved inspection estimate |
| TOTAL BUDGET ESTIMATES FOR TSUU T'INA FIRST NATION ONGOING PROJECTS | | | | | $1,901,910.25 | |

**TOTAL ESTIMATE OF ONGOING PROJECTS** **$5,642,680.25**

Alberta Government

# Environmental Assessment Program

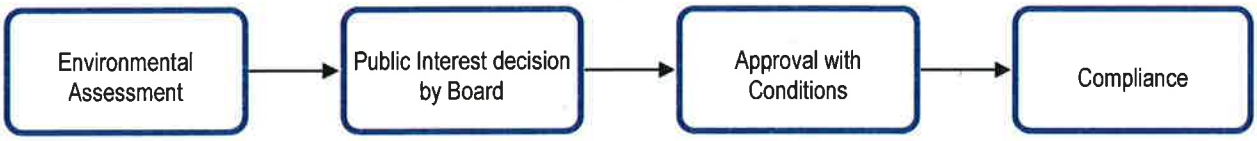
# Alberta's Environmental Assessment Process

**Updated March 2013**

## Introduction

In Alberta, laws are in place to regulate industrial activities to protect the environment and human health. Alberta Environment and Sustainable Resource Development (ESRD) is responsible for a number of major Acts which accomplish this; two of these are the *Environmental Protection and Enhancement Act* (EPEA) and the *Water Act*. Many activities must obtain formal approval under these Acts before they can begin to construct or operate.

The Environmental Assessment Process is the first of four regulatory steps:




***Environmental Assessment*** – examines a project to determine what the environmental, social, economic and health implications may be;

***Public interest decision*** – the applicable board[1] or Minister decides whether it is in the public interest to let the project go ahead;

***Approval with conditions*** – multiple regulators give formal approval to the project under various pieces of legislation. These approvals set specific conditions under which the project can be constructed and operate; and

***Compliance*** – ensure that the project is operating within the specified approval conditions.

Not all proposed projects will be required to go through the Environmental Assessment Process. There are also environmental assessments conducted in Alberta which do not fall under the responsibility of ESRD and are not mandated by EPEA or the *Water Act*. The Government of Canada, municipalities, corporations and lending institutions also undertake environmental assessment processes under their own laws and authority, for a variety of purposes.

When a proposed project is required to undergo both a provincial and federal environmental assessment, the two governments cooperate to minimize overlap. This process is set out in a bilateral agreement: *The Canada – Alberta Agreement for Environmental Assessment Cooperation* (http://www.ceaa-acee.gc.ca/.asp?lang=En&n=C2E001F1-1).

[1] Under current legislation the public interest decision could be made by three potential boards, depending on the type of project. The boards include the Alberta Utilities Commission (AUC), the Energy Resources Conservation Board (ERCB) and the Natural Resources Conservation Board (NRCB).

## The Purpose of Environmental Assessment

Alberta's Environmental Assessment process has three basic goals:

***Gather information*** – the process ensures that enough information is provided by the Proponent to inform the public and government agencies about the Proponent's understanding of the consequences of their project;

***Public involvement*** – the process provides an opportunity for people who may be affected by a proposed activity to express any concerns and provide advice to Proponents and government agencies; and

***Support sustainable development*** – the information provided during the process allows early consideration of the project's place in the overall plan for Alberta's environment and economy.

## The Stages of the Environmental Assessment Process

### Is an Environmental Impact Assessment report required?

The Environmental Assessment process is shown in the diagram at the end of this guide. It begins when the Proponent, ESRD Approvals Director[2], another government department, local authority or other person informs the ESRD Environmental Assessment Director[3] about a new project.

The Proponent submits a Project Summary Table and a map (http://environment.alberta.ca/01503.html) to the Environmental Assessment Director who reviews these documents to determine if the project is:

***Mandatory*** and will require an EIA;

***Exempted***[4] from Alberta's Environmental Assessment process; or

***Discretionary***.

For Discretionary activity projects, the Director may decide that:

- an EIA report is not required, and the Proponent can apply for any approvals that may be required; or
- more information is needed to determine if an EIA report is required through the preparation of a Screening Report.

To facilitate a Screening Report, the Proponent prepares a Disclosure Document (see Preparing Disclosure Documents for Environmental Assessment Screenings - http://environment.alberta.ca/01516.html). The Director considers the Disclosure information and any input from the public to decide if an EIA report is required.

The Minister can also require that an EIA be prepared, even if the activity appears on the exempted list.

### Terms of Reference and EIA

If an EIA is required, the Proponent prepares Proposed Terms of Reference (PTOR)[5] and, if required, a First Nations Consultation Plan[6]

---

[2] An Alberta Environment and Sustainable Resource Development employee appointed by Ministerial Order to make decisions under Part 2, Division 2, of the *Environmental Protection and Enhancement Act*.

[3] An Alberta Environment and Sustainable Resource Development employee appointed by Ministerial Order to make decisions under Part 2, Division 1, of the *Environmental Protection and Enhancement Act*.

[4] See the *Environmental Assessment (Mandatory and Exempted Activities) Regulation* (http://www.qp.alberta.ca/1266.cfm?page=1993_111.cfm&leg_type=Regs&isbncln=9780779738137)

[5] The Proposed Terms of Reference are largely based on Standardized Terms of Reference (http://environment.alberta.ca/01501.html)

[6] This is done with the assistance of the SREM Aboriginal Affairs Branch (SAAB) of ESRD. See Alberta's First Nations Consultation Guidelines on Land Management and Resource Development (http://www.aboriginal.alberta.ca/documents/First_Nations_and_Metis_Relations/First_Nations_Consultation_Guidelines_LM_RD.pdf)

The First Nations Consultation Plan and an advertising plan need to be approved by.ESRD The PTORs are then advertised by the proponent to allow the public to provide comments. The Environmental Assessment Director considers input received from the public and from other government agencies and issues the final Terms of Reference that sets the scope for the EIA report.

EIA reports typically include:

- a detailed description of the project;
- the location and environmental setting for the project, and baseline environmental, social and culture information;
- the potential positive and negative environmental, health, social, economic and cultural effects of the proposed activity;
- plans to mitigate potential adverse effects and to respond to emergencies;
- information on public and First Nations consultation; and
- an assessment of cumulative effects[7].

More detailed information on the preparation of EIA reports is available on the Alberta Environmental Assessment website (http://environment.alberta.ca/01495.html).

Once completed, the EIA report is submitted to the Environmental Assessment Director for review. For most large energy or resource development projects, the EIA report forms part of the integrated application submitted to the applicable board.

## Technical Review

The regulatory review of the EIA report is coordinated by ESRD and involves a multi-disciplinary, integrated team of provincial experts[8]. Depending upon the nature and location of the project, federal agencies may also participate in the evaluation of the EIA report.

The purpose of the review is to identify any project-related uncertainties or risks and determine if the information provided by the Proponent meets the requirements of the Terms of Reference. If the information provided is unclear or insufficient to meet these objectives, the Director may ask the Proponent for additional information. These questions are called Supplemental Information Requests (SIRs).

When the Review team is satisfied they understand the nature of the proposed activity, the Proponent's description of potential effects and mitigation and that the Terms of Reference have been met, a recommendation is made to the Environmental Assessment Director.

The Director takes this information and makes a determination that the EIA report is complete and then formally refers the EIA report to the Board or the Minister to become part of the Public Interest Decision.

## Public Interest Decision and Regulatory Approvals

Once a project has been through an environmental assessment, **it does not mean that project has been approved** or that it can commence construction or operation. It has simply met the information requirements necessary to move onto the next phase of the regulatory process.

Information about the next steps in the regulatory process may be obtained from:

- ESRD (http://environment.alberta.ca/01531.html);

[7] See ERCB/NRCB/ESRD Information Letter *Cumulative Effects Assessment in Environmental Impact Assessment Reports under the Alberta Environmental Protection and Enhancement Act* (http://environment.alberta.ca/03040.html).

[8] Alberta Environment and Sustainable Resource Development commonly use Third-Party Contractors to review their portion of the EIA. See the heading Third-Party Contracting (3PC) http://environment.alberta.ca/01495.html

- AUC (http://www.auc.ab.ca/involving-albertans/getting-involved/Pages/HowtoParticipate.aspx)
- ERCB (http://ercb.ca/learn-about-energy/enerfaqs/enerfaqs02)
- NRCB (http://www.nrcb.gov.ab.ca/forms/nrGuides.aspx)

## Citation

This report may be cited as:

*Alberta's Environmental Assessment Process – Updated March 2013*. Alberta Environment and Sustainable Resource Development, Environmental Assessment Program, Edmonton, Alberta. EA Guide 2008-1. 5 pp.

## Environmental Assessment Contacts

Further information about Alberta's Environmental Assessment process can be obtained from:

Environmental Assessment Team
Alberta Environment and Sustainable Resource Development
111 Twin Atria
4999 – 98 Avenue
Edmonton, Alberta
T6B 2X3

Phone: (780) 427-2700

Fax: (780) 427-9102

Email: environmental.assessment@gov.ab.ca

Website:
http://www.environment.alberta.ca/01495.html

## Canadian Environmental Assessment Agency Contact Information

Information about the Canadian Environmental Assessment process can obtained from:

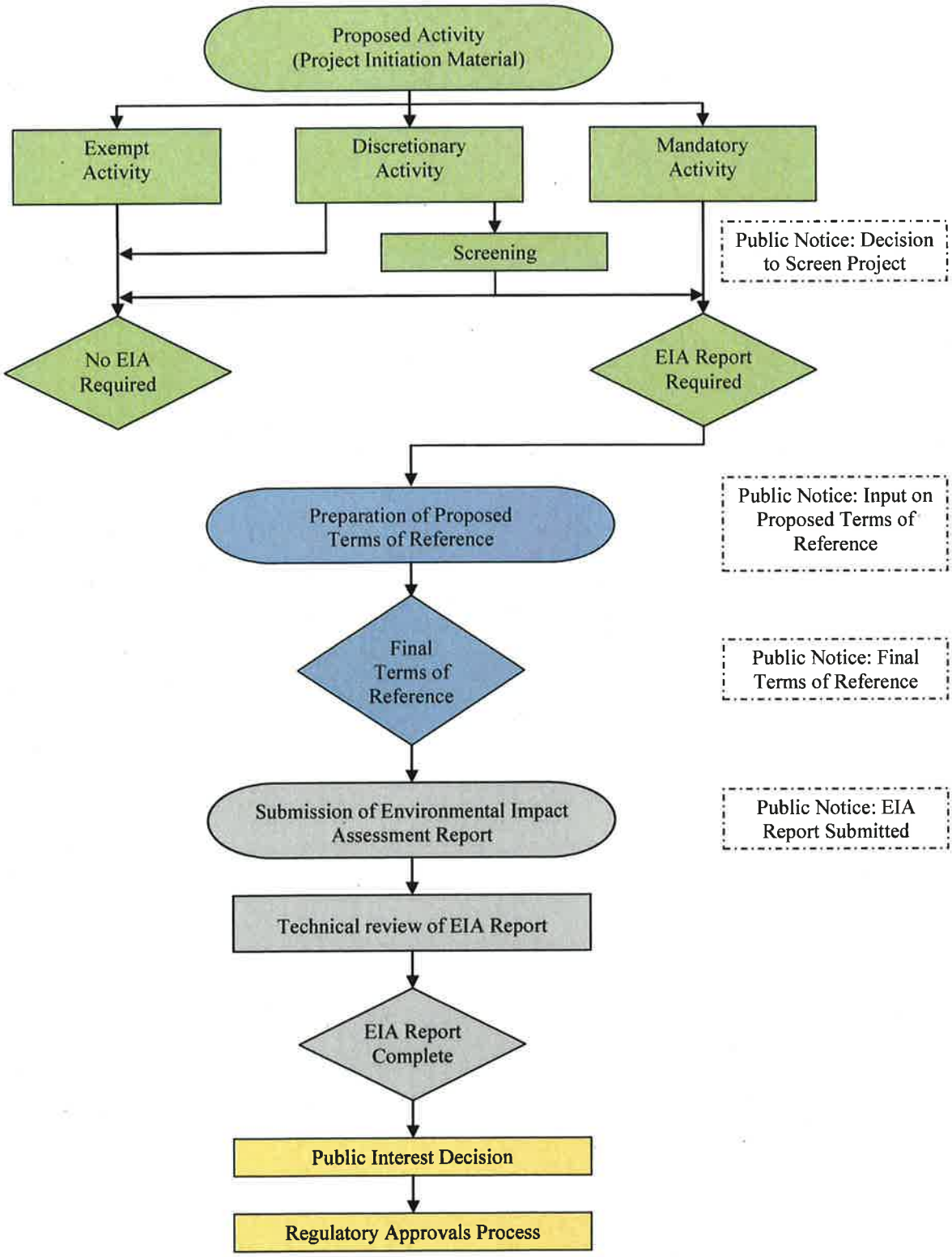
Canadian Environmental Assessment Agency
Alberta and Northwest Territories Office
#425, 10115 – 100 A Street
Edmonton, Alberta T5J 2W2

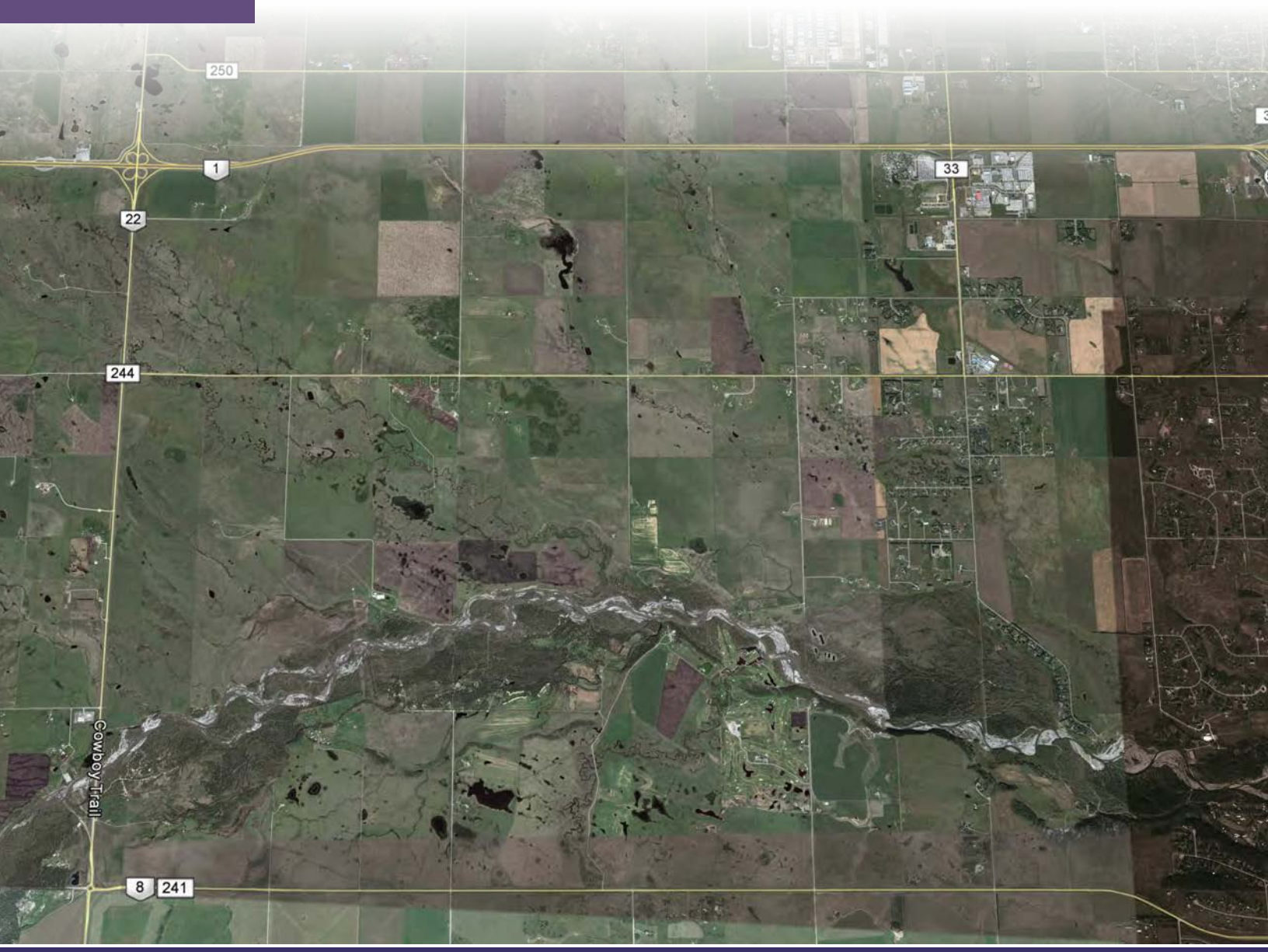
Phone: (780) 495-2037
Fax: (780) 495-2876

Email: ceaa.alberta@ceaa-acee.gc.ca

Website: http://www.ceaa.gc.ca

## Alberta's Environmental Assessment Process






REPORT

# Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: Springbank Off-Stream Flood Storage

Prepared for Government of Alberta
ESRD - Resilience and Mitigation
by IBI Group
February 18, 2015

IBI GROUP
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February 18, 2015

Ms. Heather Ziober
Project Manager, Strategic Integration and Projects
Government of Alberta
Environment and Sustainable Resource Development
205 J.G. O'Donoghue Building
7000 - 113 Street
Edmonton, AB T6H 5T6

Dear Ms. Ziober:

**BENEFIT/COST ANALYSIS OF FLOOD MITIGATION PROJECTS FOR THE CITY OF CALGARY: SPRINGBANK OFF-STREAM FLOOD STORAGE**

Enclosed please find the draft final report for the aforementioned assignment. The report describes the benefit/cost analysis undertaken for the Springbank Off-Stream Flood Storage Mitigation Project in relation to ameliorating the City of Calgary flood damages. This analysis culminates with a comparison of the benefit/cost ratios for the three major mitigation projects under consideration of which the Springbank Off-Stream Flood Storage Project ranks first.

Should you have any questions or require additional information please do not hesitate to contact the undersigned.

Yours truly,

**IBI GROUP**

<Original signed by>

Stephen Shawcross
Director

<Original signed by>

Augusto Ribeiro, P.Eng.

SS/mp

cc: Cathy Maniego, Government of Alberta, Environment and Sustainable Resource Development
Andrew Wilson, Government of Alberta, Environment and Sustainable Resource Development

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IBI Group is a group of firms providing professional services and is affiliated with IBI Group Architects Engineers

# Benefit/Cost Analysis for Flood Mitigation Projects for the City of Calgary: Springbank Off-Stream Flood Storage

Submitted to Government of Alberta
ESRD - Resilience and Mitigation
by IBI Group

February 2015

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# Executive Summary

## Key Metrics

### Project Costs

| Item | Cost |
|---|---|
| Project Construction | $159,768,000 |
| Upstream Mitigation | $8,900,000 |
| Land Acquisition | $40,000,000 |
| **Total 1:100 Year Protection** | **$208,668,000** |
| Additional Cost for 1:200 Year Protection | $55,000,000 |
| **Total 1:200 Year Protection** | **$263,668,000** |
| Annual Operation and Maintenance | $1,800,000 |

### Benefit/Cost Analysis

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $255,098,000 | $309,607,000 | $255,098,000 | $309,607,000 |
| Benefit/Cost Ratio | 1.87 | 2.07 | 1.32 | 1.32 |
| Net Present Value | $221,801,000 | $330,336,000 | $81,749,000 | $99,294,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

### Benefit/Cost Comparison

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |

# 1 Introduction

## 1.1 Background

The flood of 2013 was a devastating event for Southern Alberta and the City of Calgary. The flood event had the largest economic impact of any extreme weather event in Canada to date. As part of the response to protect communities from future flood damage, the Province of Alberta commissioned a study through the Flood Mitigation Advisory Panel to provide engineering assessments and practical solutions on possible flood mitigation measures.

In October of 2013, AMEC Environment & Infrastructure (AMEC) was contracted to provide a flood mitigation feasibility study for the Bow River, Elbow River and Oldman River Basins.

A number of mitigation schemes were considered for the Elbow River upstream of the City of Calgary, including an off-stream flood storage project in Springbank.

As part of the subsequent Provincial Flood Damage Assessment Study, IBI Group was commissioned by the Government of Alberta ESRD Operations, Resilience and Mitigation Branch to undertake a benefit/cost analysis of the Springbank Off-Stream Flood Storage project.

## 1.2 Purpose

The purpose of the benefit/cost analysis is to provide a comparison of project benefits, in terms of damages averted, to project costs including capital and operating costs, to determine if the project under consideration is economically viable.

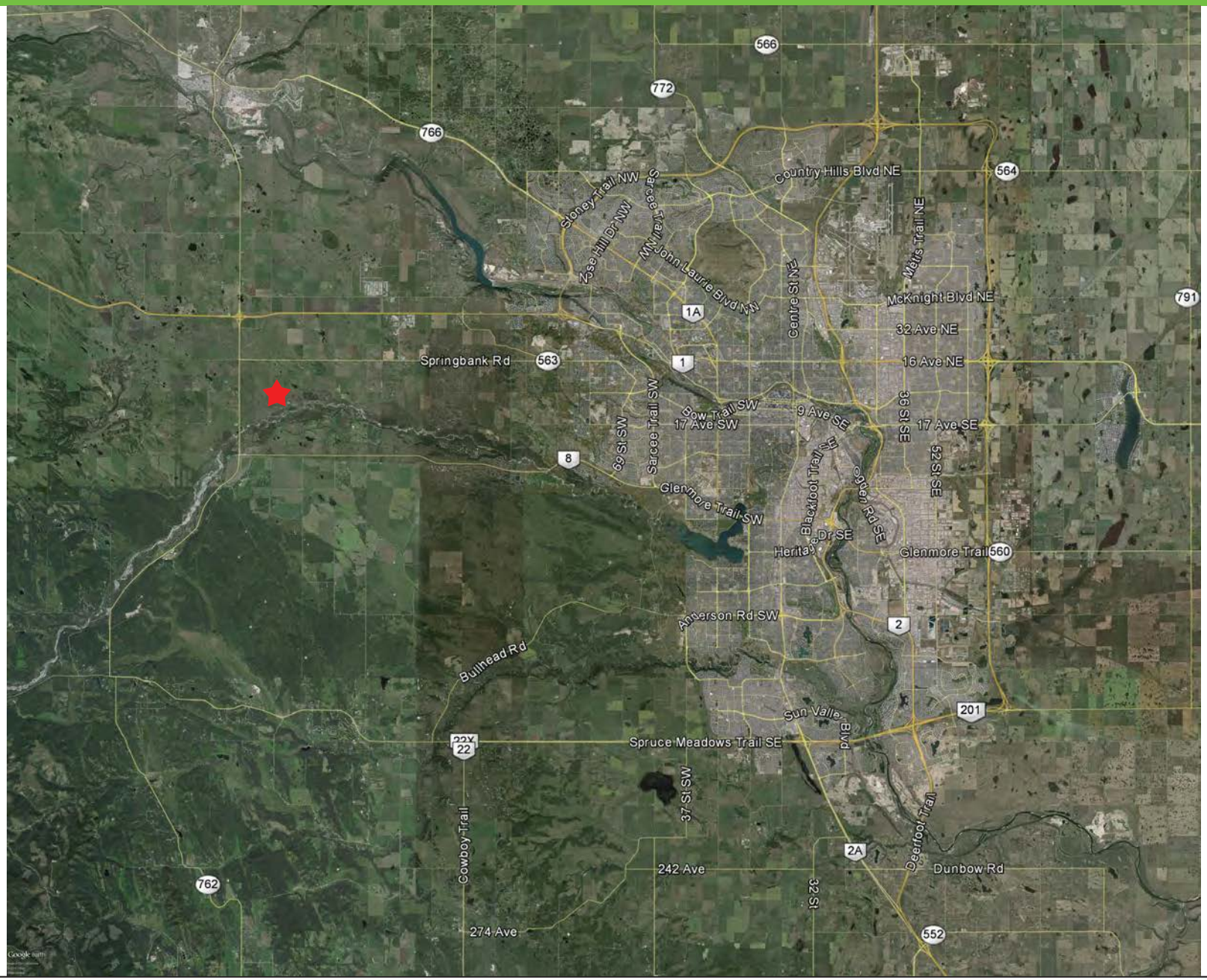
## 1.3 Scope

For the purposes of this study, benefits are restricted to economic benefits accruing within the study area, which is defined as the flood risk area within the City of Calgary boundaries. The study utilizes current damage estimates based on updated stage-damage curves and the Provincial Rapid Flood Damage Assessment Model. Project costs are based on the estimates prepared as part of the Springbank Off-Stream Storage project submitted to the Southern Alberta Flood Recovery Task Force and dated June 2014.

# 2 Context

**Exhibit 2.1** illustrates the study area, while **Exhibit 2.2** illustrates the location of the off-stream storage project.

# Regional Setting



# Local Setting

# 3 Project Description

The project consists of three basic components:

1. a river diversion structure;
2. a diversion channel and reservoir inlet structure; and
3. an off-stream storage dam and reservoir.

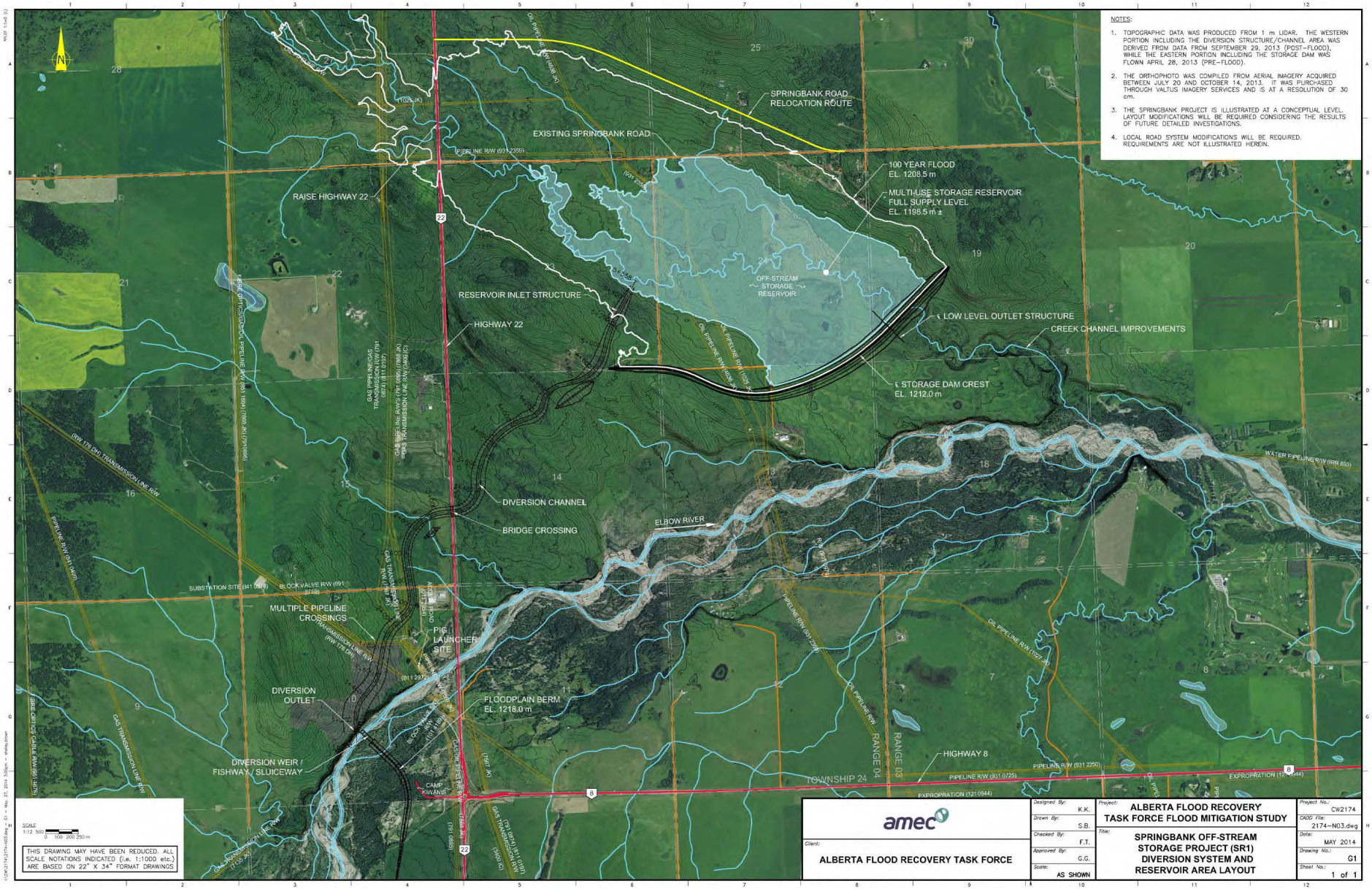
The diversion structure system would consist of a concrete overflow weir section crossing the Elbow River, a gated concrete sluiceway/fishway located adjacent to the left side valley abutment with its invert at the river thalweg level, and a gated diversion outlet structure located in the left valley abutment immediately upstream of the sluiceway. A conceptual design layout for the diversion structure system is provided in **Exhibit 3.1**. Additional structure details are provided in **Exhibit 3.2**, **Exhibit 3.3** and **Exhibit 3.4**.

The proposed diversion channel profile and a typical channel section are illustrated in **Exhibit 3.5**. The diversion channel is designed to convey a peak diversion flow of 300 $m^3$/s from the Elbow River into the off-stream storage reservoir. The channel is designed with a 24 m bottom width, three horizontal to one vertical side slopes and a 3.6 m water depth.

A 3 km long earthfill storage dam, having a maximum height of 24 m, is required to contain the diverted flood water. The conceptual design considers a zoned earthfill dam with a clay core and random earthfill shells as illustrated in **Exhibit 3.6**. Embankment slopes of 3H:1V are provided with 6 m wide berms at strategic levels resulting in average dam slopes of between 3H:1V and 4H:1V. The berms are included to provide stability, and to facilitate access for inspection, maintenance and geotechnical instrument monitoring.

The dam system will include a gated low-level outlet structure. The structure will include a 1.5 m wide by 1.8 m high concrete conduit through the dam, including a gatewell tower located near the dam centreline as illustrated in **Exhibit 3.7**. This structure will be used to release stored water back into the river after the flood has passed. Channel improvements will be required along the creek, connecting this outlet to the Elbow River.

# Springbank Off-Stream Storage Project (SR1) Diversion System and Reservoir Area Layout



# Details - Springbank Off-Stream Storage Project (SR1) Diversion Weir / Sluiceway / Fishway / Outlet Structure System

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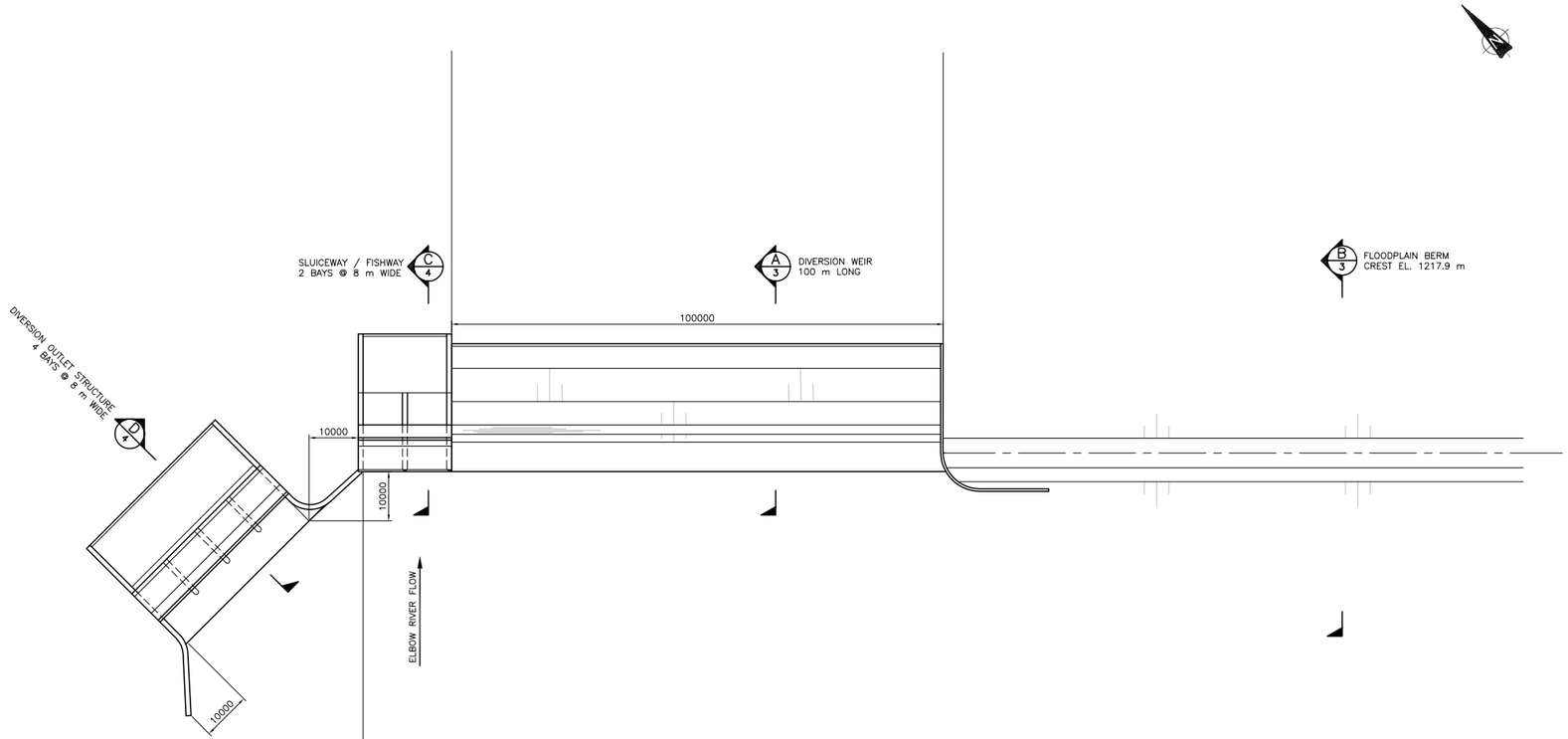


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Client: ALBERTA FLOOD RECOVERY TASK FORCE

Designed By: K.K.
Drawn By: S.B.
Checked By: F.T.
Approved By: G.G.
Scale: AS SHOWN

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) DIVERSION WEIR / SLUICEWAY / FISHWAY / OUTLET STRUCTURE SYSTEM

Project No.: CW2174
CADD File: 2174-B08.dwg
Date: MAY 2014
Drawing No.: G2
Sheet No.: 1 of 1

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# Details - Springbank Off-Stream Storage Project (SR1) Diversion Structure System Sections (Sheet 1 of 2)

NOTES:

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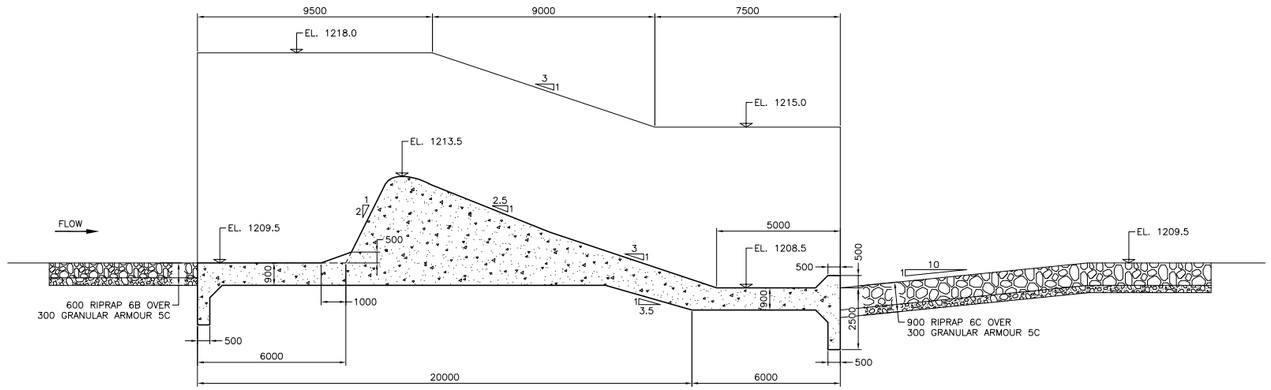


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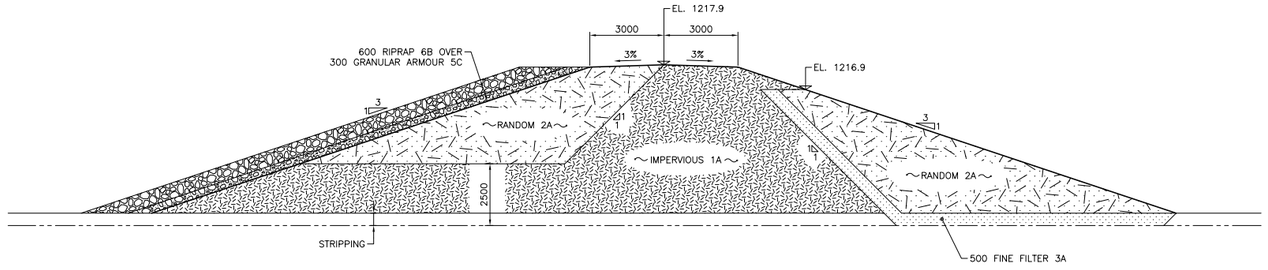


B2 SECTION – FLOODPLAIN BERM
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amec

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Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) DIVERSION STRUCTURE SYSTEM SECTIONS (SHEET 1 of 2)

Project No.: CW2174
CADD File: 2174-B03.dwg
Date: MAY 2014
Drawing No.: G3
Sheet No.: 1 of 1

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# Details - Springbank Off-Stream Storage Project (SR1) Diversion Structure System Sections (Sheet 2 of 2)

NOTES:

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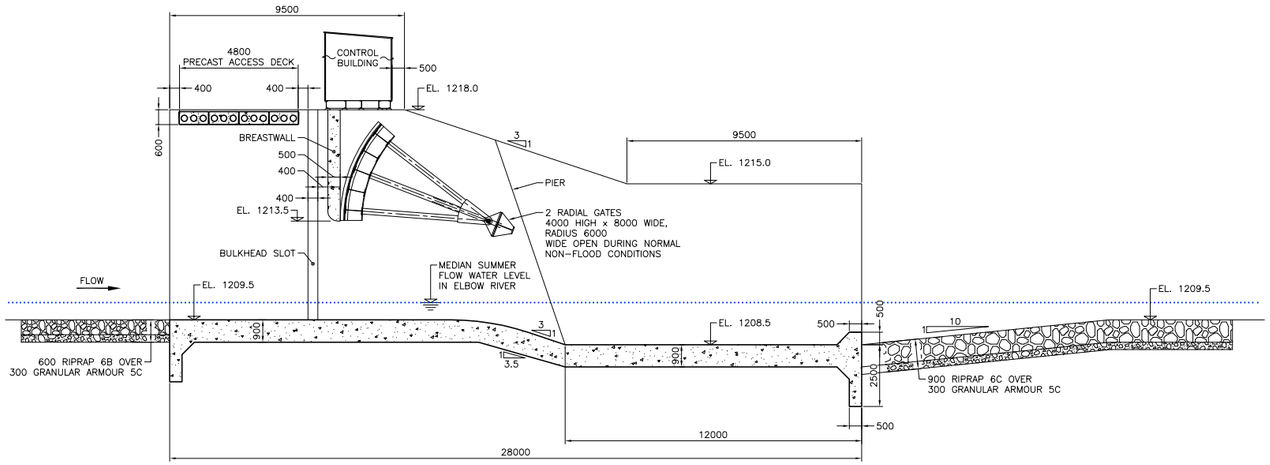


C/2 SECTION – SLUICEWAY / FISHWAY
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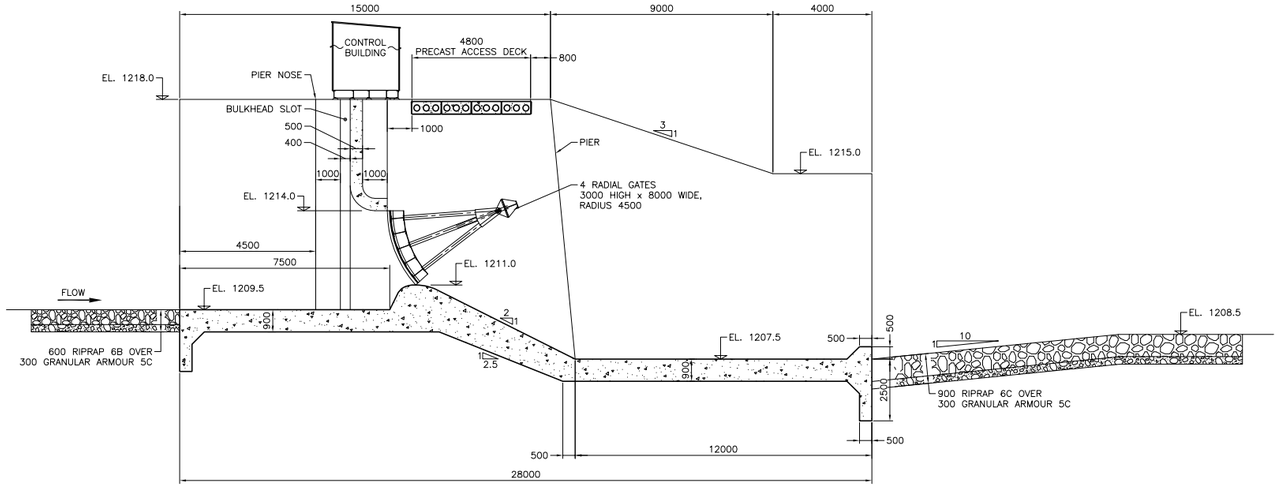


D/2 SECTION – DIVERSION OUTLET STRUCTURE
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Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) DIVERSION STRUCTURE SYSTEM SECTIONS (SHEET 2 of 2)

| | |
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| CADD File: | 2174-B05.dwg |
| Date: | MAY 2014 |
| Drawing No.: | G4 |
| Sheet No.: | 1 of 1 |

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# Details - Springbank Off-Stream Storage Project (SR1) Diversion Channel

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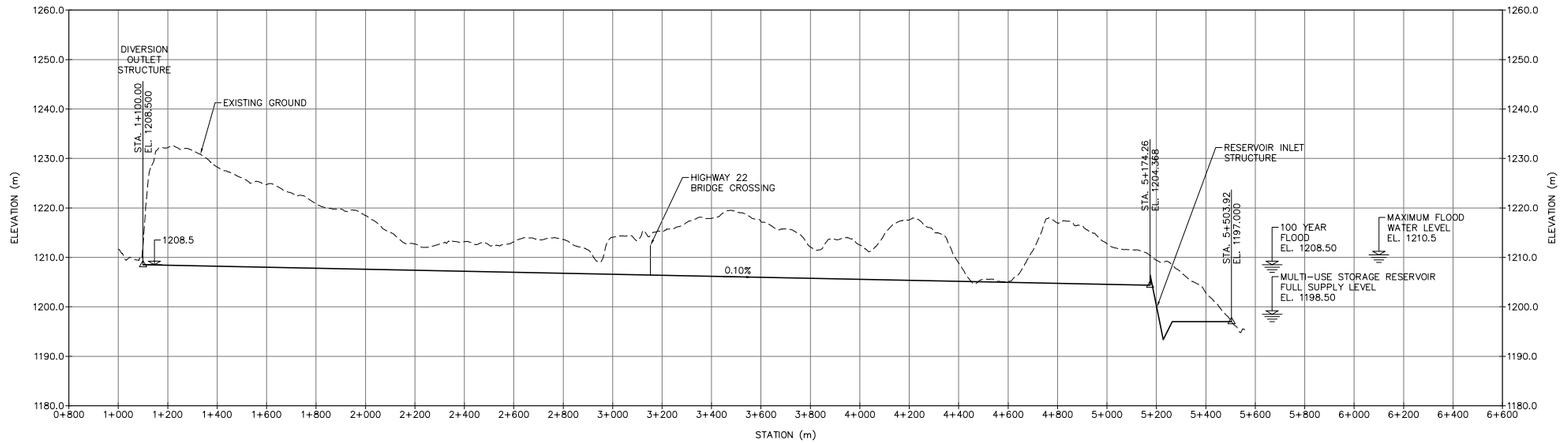


DIVERSION CHANNEL PROFILE

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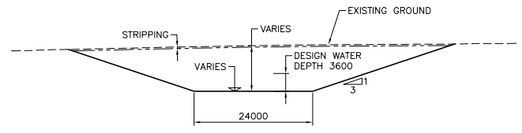


DIVERSION CHANNEL TYPICAL CROSS SECTION

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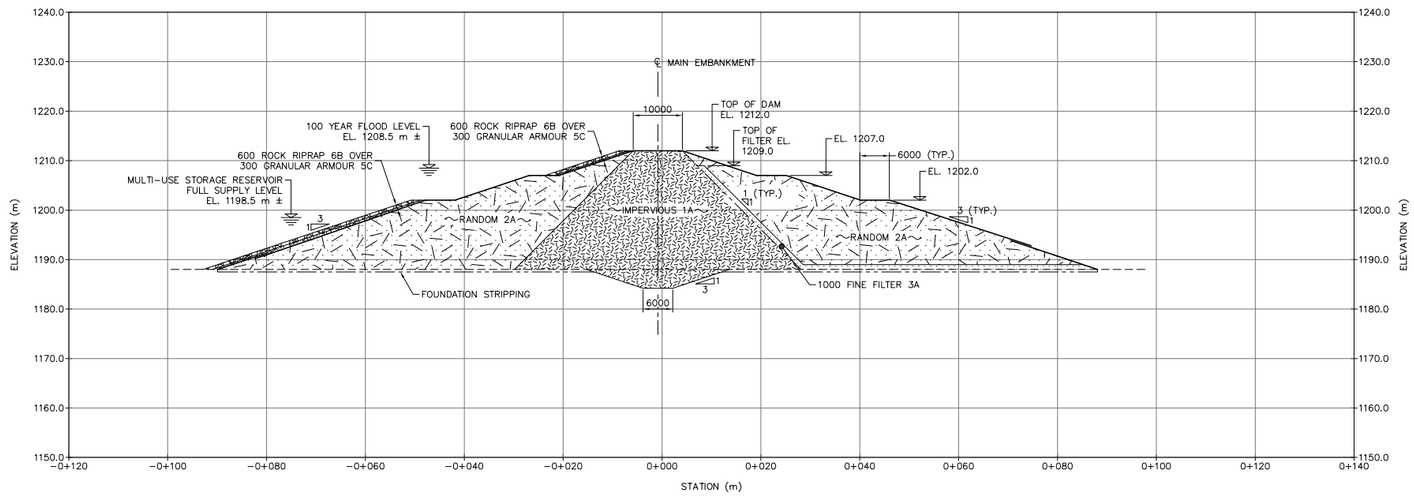
Scale: AS SHOWN

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) DIVERSION CHANNEL

Project No.: CW2174
CADD File: 2174-N03.dwg
Date: MAY 2014
Drawing No.: G5
Sheet No.: 1 of 1

# Details - Springbank Off-Stream Storage Project (SR1) Off-Stream Storage Dam & Low Level Outlet




OFF-STREAM STORAGE DAM
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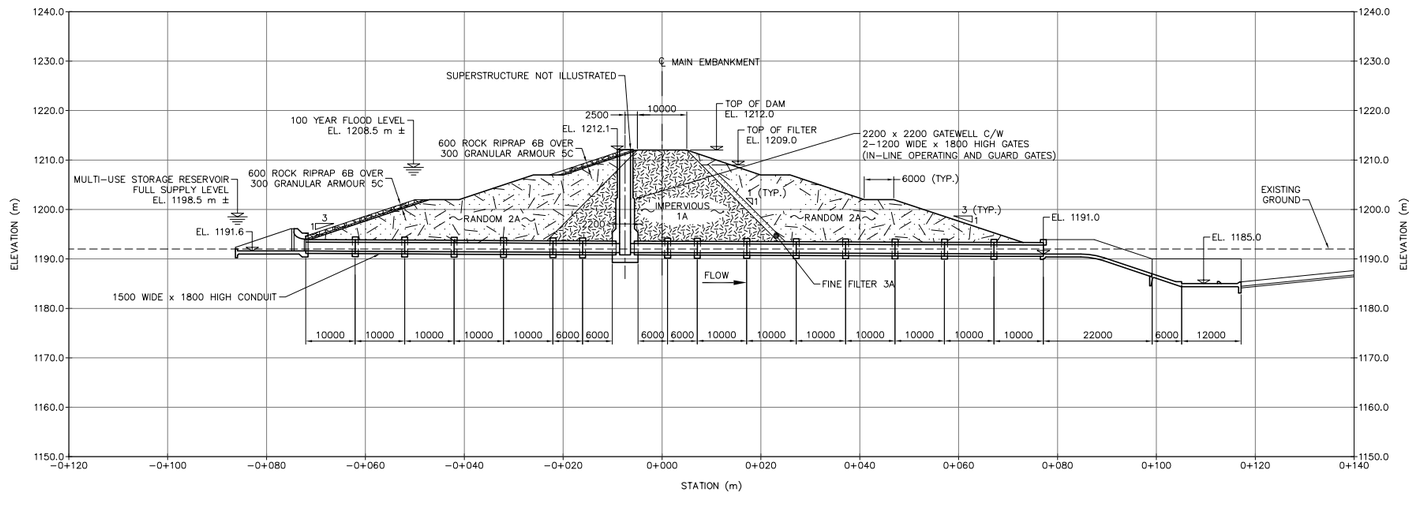


LOW LEVEL OUTLET STRUCTURE
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NOTES:

1. ELEVATIONS ARE IN METRES AND DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

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Client: ALBERTA FLOOD RECOVERY TASK FORCE

| | |
|---|---|
| Designed By: | K.K. |
| Drawn By: | S.B. |
| Checked By: | F.T. |
| Approved By: | G.G. |
| Scale: | AS SHOWN |

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) OFF-STREAM STORAGE DAM & LOW LEVEL OUTLET

| | |
|---|---|
| Project No.: | CW2174 |
| CADD File: | 2174-N03.dwg |
| Date: | MAY 2014 |
| Drawing No.: | G6 |
| Sheet No.: | 1 of 1 |

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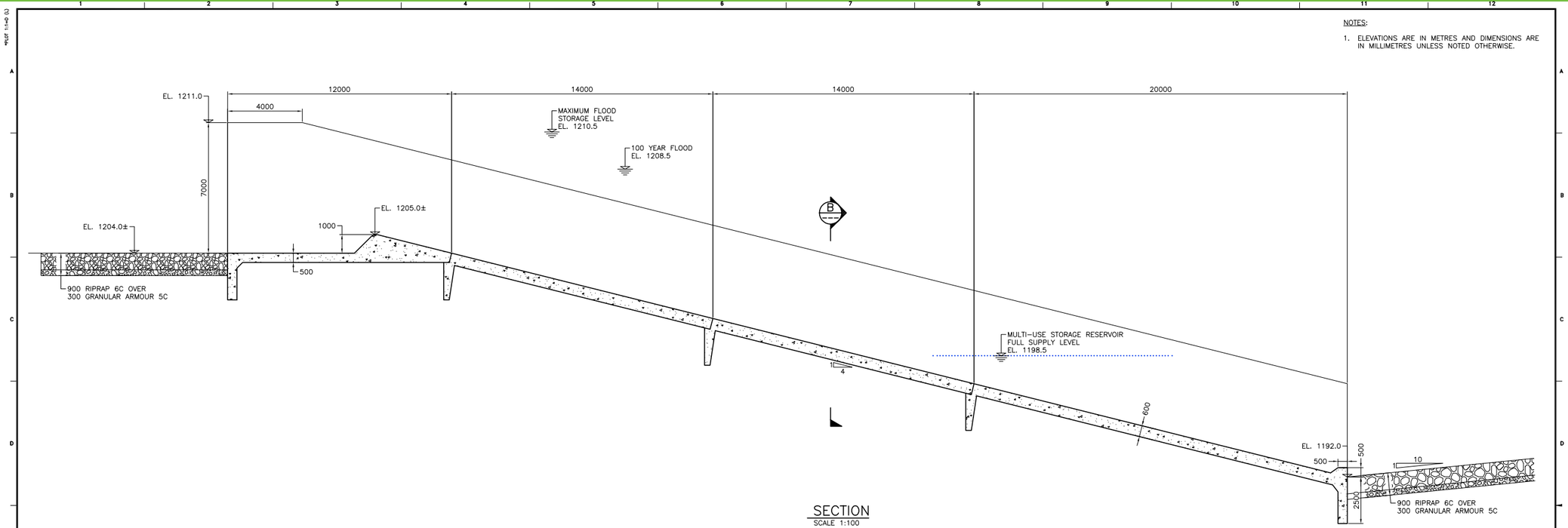
# Details - Springbank Off-Stream Storage Project (SR1) Reservoir Inlet Structure

NOTES:

1. ELEVATIONS ARE IN METRES AND DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.




SECTION
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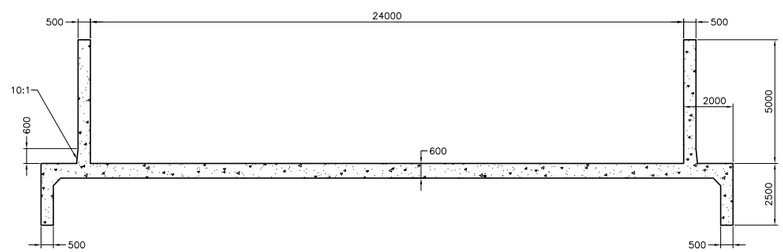


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Client: ALBERTA FLOOD RECOVERY TASK FORCE

Designed By: K.K.
Drawn By: S.B.
Checked By: F.T.
Approved By: G.G.
Scale: AS SHOWN

Project: ALBERTA FLOOD RECOVERY TASK FORCE FLOOD MITIGATION STUDY

Title: SPRINGBANK OFF-STREAM STORAGE PROJECT (SR1) RESERVOIR INLET STRUCTURE

Project No.: CW2174
CADD File: 2174-B06.dwg
Date: MAY 2014
Drawing No.: G7
Sheet No.: 1 of 1

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# 4 Cost Estimate

A detailed cost estimate is provided in **Exhibit 4.1A/B**[1]. The project cost is estimated to be $159,768,000. This price does not include the cost of land acquisition. The estimate provided herein is based on 2012 construction price data. Year 2012 prices were used considering that 2013 construction prices are skewed as a result of abnormal activity which resulted from the June 2013 flood event. It is assumed that the construction of SR1 would take place in a more competitive environment for contractors and suppliers, and as such the 2012 prices are considered indicative of realistic project cost. The estimate was produced considering the conceptual designs presented herein. Additional subsurface soils investigations are required to better establish the concept details presented herein. More detailed hydrological assessment and topographic data are required to better establish the size of required works. A contingency allowance of 25% has been included in an effort to account for additional costs which could result from future additional information and the results of more detailed design work. No allowance is included for escalation until the time of construction.

To increase the flood protection above the 1% AEP, to the 2013 flood of record level would require the dam crest level raised by approximately 2.5m to Elevation 1214.5m and would also require a larger diversion outlet structure and channel. These adjustments would result in additional project cost of approximately $55 million. This amount includes contingency and engineering allowances.

## 4.1 Land Acquisition

Land requirements were based on the conceptual design footprint including the diversion, storage reservoir to contain a 1:100 year event, and dam, and equated to some ±1,760 acres.[2] Currently, this land is under cultivation or pasture. In terms of planning status, the land is currently designated Ranch and Farm District (RF) according to the Rocky View County Land Use Bylaw. The purpose and intent of this land use designation is to “provide for agricultural activities as the primary land use on a quarter section of land or on a large balance of lands from a previous subdivision” (Rocky View County Land Use Bylaw, 1998).

There are no Area Structure Plans in place for the area and according to the County’s Growth Management Strategy, the area has not been recognized as a location for future growth (see **Appendix A**).

To establish potential land acquisition costs, 2014 MLS sales transactions for raw land and country residential style lots within the Springbank area (see **Exhibit 4.2**) were analyzed along with data from country residential developments including Watermark, Silverhorn and Harmony (see **Appendix B**). In addition, real estate brokers were solicited for opinions on potential land values in the general area.

Typical agricultural land values vary considerably depending upon soil quality, crop potential, etc. and vary from $4,000 to $8,000/acre. Larger transactions of farmland (±120 acres) have ranged between $6,000 and $9,000/acre within the general area. Using the upper bound of say $10,000/acre, would equate to a land acquisition cost of $17.6 million.

Developable land values are considerably higher with larger land assemblies (±120 acres) ranging from between $22,000 and $105,000/acre and averaging $50,000/acre.

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1 AMEC Environmental & Infrastructure, *Southern Alberta Flood Recovery Task Force, Volume 4 – Flood Mitigation Measures, Appendix G – Springbank Off-Stream Storage Project*, May 2014.

2 Actual land requirements will vary based on the detailed design of the facility which is currently underway.

# Off-Stream Storage Project (SR1) Cost Estimate (1 of 2)

| Item | Unit | Quantity | Unit Price | Extension |
|---|---|---|---|---|
| **General** | | | | |
| Mob./Demobilization | lump sum | lump sum | 7,000,000.00 | $7,000,000 |
| Care of Water | lump sum | lump sum | 3,000,000.00 | $3,000,000 |
| Clearing & Timber Salvage | hectares | 10 | 12,000.00 | $120,000 |
| Raise Highway 22 | lump sum | lump sum | 2,000,000 | 2,000,000 |
| Local Road Modifications | km | 15 | 250,000.00 | $3,750,000 |
| Topsoil/Seeding etc. | $m^2$ | 1,200,000 | 1.50 | $1,800,000 |
| | **Subtotal General** | | | **$17,670,000** |
| **River Diversion Structure System** | | | | |
| Stripping | $m^3$ | 5,000 | 6.00 | $30,000 |
| Common Excavation | $m^3$ | 20,000 | 10.00 | $200,000 |
| Structure Fill | $m^3$ | 10,000 | 30.00 | $300,000 |
| Diversion Weir Concrete | $m^3$ | 4,900 | 1,000.00 | $4,900,000 |
| Sluice/Fishway Concrete | $m^3$ | 990 | 1,000.00 | $990,000 |
| Outlet Structure Concrete | $m^3$ | 1,900 | 1,000.00 | $1,900,000 |
| Precast Decks | lump sum | lump sum | 560,000.00 | $560,000 |
| Fine Filter | $m^3$ | 1,200 | 90.00 | $108,000 |
| Coarse Filter | $m^3$ | 1,200 | 90.00 | $108,000 |
| Piping System | lump sum | lump sum | 200,000.00 | $200,000 |
| Rock Riprap | $m^3$ | 6,400 | 130.00 | $832,000 |
| Bedding Gravel | $m^3$ | 2,200 | 70.00 | $154,000 |
| Gate/Hoist Systems | each | 6 | 500,000.00 | $3,000,000 |
| Controls/Instrumentation | lump sum | lump sum | 300,000.00 | $300,000 |
| Electrical/Mechanical | lump sum | lump sum | 500,000.00 | $500,000 |
| Superstructures | each | 2 | 90,000.00 | $180,000 |
| | **Subtotal Diversion Structure System** | | | **$14,262,000** |
| **Floodplain Berm** | | | | |
| Stripping | $m^3$ | 18,000 | 6.00 | $108,000 |
| Impervious Fill | $m^3$ | 90,000 | 1.50 | $135,000 |
| Random Fill | $m^3$ | 60,000 | 1.40 | $84,000 |
| Fine Filter | $m^3$ | 6,000 | 90.00 | $540,000 |
| Rock Riprap | $m^3$ | 8,000 | 130.00 | $1,040,000 |
| Bedding Gravel | $m^3$ | 4,000 | 60.00 | $240,000 |
| | **Subtotal Floodplain Berm** | | | **$2,147,000** |

| Item | Unit | Quantity | Unit Price | Extension |
|---|---|---|---|---|
| **Diversion Channel & Reservoir Inlet Structure** | | | | |
| Stripping | $m^3$ | 180,000 | 6.00 | $1,080,000 |
| Common Excavation | $m^3$ | 1,800,000 | 5.50 | $9,900,000 |
| Rock Excavation | $m^3$ | 200,000 | 10.00 | $2,000,000 |
| Impervious Fill | $m^3$ | 10,000 | 20.00 | $200,000 |
| Inlet Chute Concrete | $m^3$ | 2,000 | 1,200.00 | $2,400,000 |
| Fine Filter | $m^3$ | 660 | 90.00 | $59,000 |
| Coarse Filter | $m^3$ | 1,760 | 90.00 | $158,000 |
| Piping System | lump sum | lump sum | 200,000.00 | $200,000 |
| Bridge Crossings | each | 1 | 4,000,000.00 | $4,000,000 |
| Pipeline Crossings | lump sum | lump sum | 4,000,000.00 | $4,000,000 |
| Power Line Relocation | lump sum | lump sum | 300,000.00 | $300,000 |
| | **Subtotal Diversion Channel System** | | | **$24,298,000** |

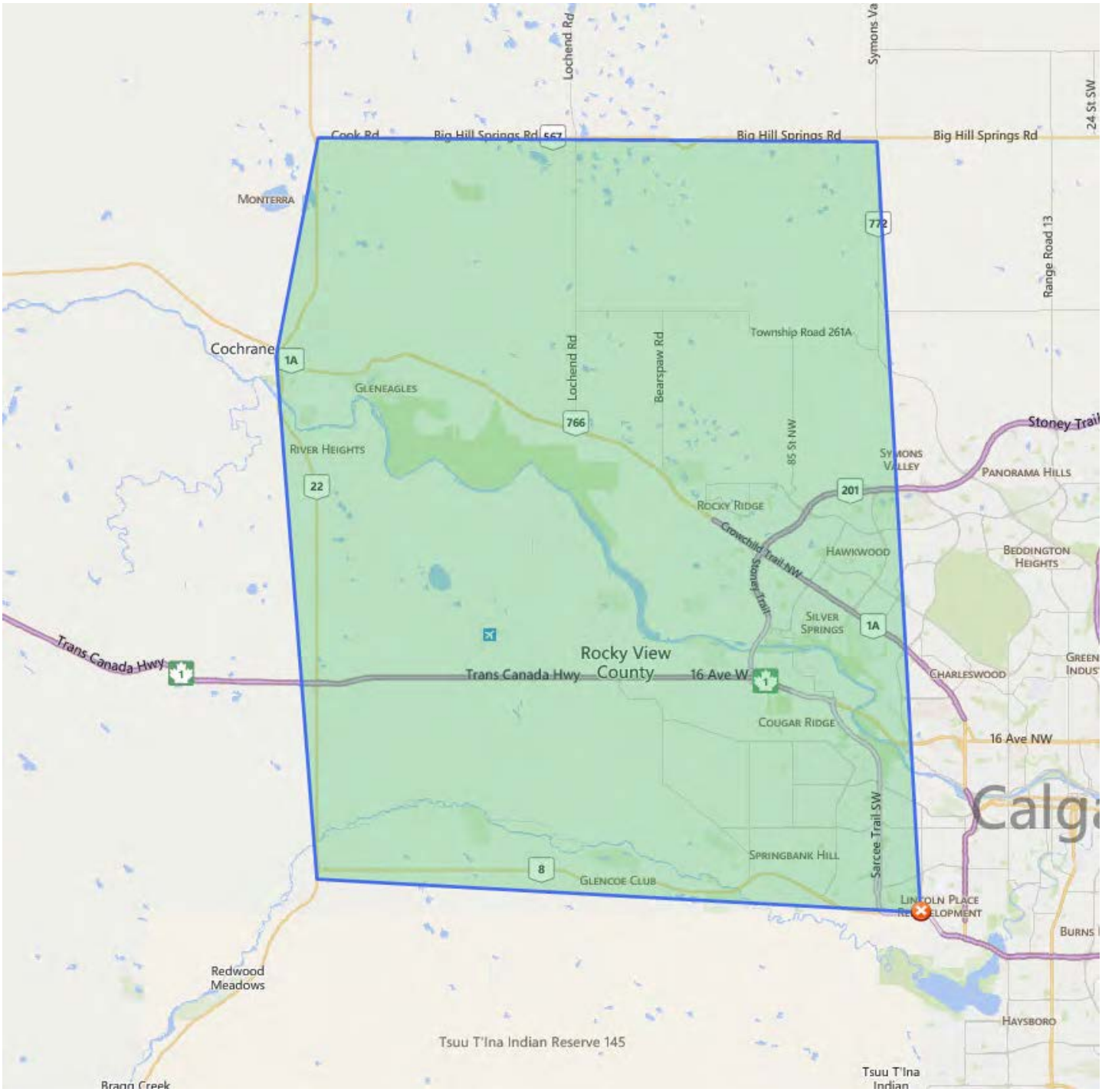
# Off-Stream Storage Project (SR1) Cost Estimate (2 of 2)

| Off-stream Storage Dam | | | | |
|---|---|---|---|---|
| Stripping | $m^3$ | 180,000 | 6.00 | $1,080,000 |
| Borrow Excavation | $m^3$ | 1,700,000 | 5.00 | $8,500,000 |
| Overhaul | $m^3$km | 2,500,000 | 1.50 | $3,750,000 |
| Impervious Fill | $m^3$ | 1,600,000 | 1.50 | $2,400,000 |
| Random Fill | $m^3$ | 1,200,000 | 1.40 | $1,680,000 |
| Fine Filter | $m^3$ | 140,000 | 60.00 | $8,400,000 |
| Coarse Filter | $m^3$ | 20,000 | 60.00 | $1,200,000 |
| Rock Riprap | $m^3$ | 62,000 | 130.00 | $8,060,000 |
| Bedding Gravel | $m^3$ | 31,000 | 60.00 | $1,860,000 |
| Geotechnical Instruments | lump sum | lump sum | 400,000.00 | $400,000 |
| | **Subtotal Off-stream Dam** | | | **$37,330,000** |

| Dam Outlet Structure and Downstream Channel Improvements | | | | |
|---|---|---|---|---|
| Structure Excavation | $m^3$ | 20,000 | 20.00 | $400,000 |
| Structure Fill | $m^3$ | 15,000 | 30.00 | $450,000 |
| Reinforced Concrete | $m^3$ | 1,600 | 1,200.00 | $1,920,000 |
| Rock Riprap | $m^3$ | 600 | 130.00 | $78,000 |
| Bedding Gravel | $m^3$ | 300 | 70.00 | $21,000 |
| Gate/Hoist Systems | each | lump sum | 160,000.00 | $320,000 |
| Controls/Instrumentation | lump sum | lump sum | 100,000.00 | $100,000 |
| Electrical/Mechanical | lump sum | lump sum | 400,000.00 | $400,000 |
| Superstructure | lump sum | lump sum | 50,000.00 | $50,000 |
| | **Subtotal Structure & Channel Improvements** | | | **$3,739,000** |

| Item | Unit | Quantity | Unit Price | Extension |
|---|---|---|---|---|
| **Springbank Road Relocation** | | | | |
| Grading | km | 5 | 550,000.00 | $2,750,000 |
| Base/Pavement | km | 5 | 650,000.00 | $3,250,000 |
| Creek Crossings | lump sum | lump sum | 1,000,000.00 | $1,000,000 |
| | **Subtotal Springbank Road Relocation** | | | **$7,000,000** |
| | | | | |
| | **SUBTOTAL CONSTRUCTION** | | | **$106,446,000** |
| | Contingencies (25%) | | | $26,661,000 |
| | **Subtotal Construction and Contingencies** | | | **$133,107,000** |
| | Engineering/Environmental (20%) | | | $26,661,000 |
| | **TOTAL CONSTRUCTION** | | | **$159,768,000** |

# Market Area Considered



Individual country residential lots sold within the market area range from $107,000 to $378,000/acre and average $193,000/acre. The latter reflects developed land value with the final sales prices reflecting the cost of raw land, servicing (roads, sanitary, storm and water), sales commissions, marketing, legal and developer profit.

The community of Harmony, located within the market area some 2 to 3 km to the north, is a 1,748 acre master-planned community, featuring a 140 acre lake, golf course, village centre and mixed residential community (see **Appendix C**). Assuming approvals were obtained for a similar type of development on the site in question, with an acquisition price of $50,000/acre, total land acquisition under these assumptions would equate to $88 million; however, given the size of the acquisition it is likely that this value would be discounted to reflect the anticipated absorption over a long timeframe. At a discount rate of 4% and a projected 20 year life expectancy for the development, the acquisition cost would be $40.163 million in 2014$.

If the current land owners choose to develop rather than sell the land to a third party developer, then the value of the ultimate project (depending upon a large number of factors) could be worth considerably more than the land value as stated.

In summary, land acquisition costs range from a low of $17.6 million to a high of $40.1 million, depending upon the precise circumstances surrounding the negotiation and ultimate acquisition. For the purposes of this study the higher value, $40 million, is proposed for use in the benefit/cost analysis.

## 4.2 Flood Defences at Bragg Creek

The flood mitigation measures study for the Bow, Elbow and Old Man River basins recommended flood defences at Bragg Creek if flood protection infrastructure for the City of Calgary was located downstream of Bragg Creek. Protection of the Hamlet via dykes was proposed with a further recommendation that if a decision was made to proceed with SR1 as the preferred flood storage scheme for the Elbow River, then the detailed design and planning for the dykes of Bragg Creek should be initiated as soon as possible.[3] Costs for the dyke system were estimated at $6.2 million (see **Appendix D**).

# 5 Flood Damages

## 5.1 Without Mitigation Alternative

### 5.1.1 City of Calgary

Flood damage estimates were generated for the City of Calgary employing updated stage-damage curves and the Provincial Rapid Flood Damage Assessment Model. Damage assessments were generated for nine return frequencies including: 1:2 year, 1:5 year, 1:10 year, 1:20 year, 1:50 year, 1:100 year, 1:200 year, 1:500 year and 1:1000 year, which allowed for the computation of average annual damages. Damage estimates were also assessed under two cases: a higher or “worst case” condition and a lower or “anticipated case” condition.

The detailed analysis of City of Calgary flood damages is contained under separate cover; however, summary tables are contained in **Appendix E**. For the 1:100 year flood under the higher damage case, total damages on the Elbow are estimated at $741,005,000. Average annual damages for the Elbow River under the higher case equate to $30,110,965.

[3] AMEC Environmental & Infrastructure, *Southern Alberta Flood Recovery Task Force, Flood Mitigation Measures for the Bow, Elbow and Oldman River Basins, Volume 1 – Summary Recommendations Report – Final,* June 2014.

For the 1:100 year flood under the lower case assumptions, total damages on the Elbow River are estimated at $538,369,000 with average annual damages estimated at $21,728,927.

### 5.1.2 Other Damages

Flood damage studies, akin to the detailed assessment undertaken for the City of Calgary have not been generated for areas upstream of the Springbank Off-Stream Flood Storage project including Bragg Creek, Redwood Meadows and infrastructure within Rocky View County which would not be protected by the proposed Springbank Off-Stream Flood Storage project. These damages constitute costs over and above those accruing to the City of Calgary and should be taken into consideration as part of the benefit/cost analysis.

A variety of secondary sources were employed to determine damages, including the damage claims submitted under the 2013 Southern Alberta Disaster Recovery Program along with a previous study of Bragg Creek completed for Alberta Environment Planning Division in 1987[4].

In terms of the 2013 Southern Alberta Disaster Recovery Program, the total estimated amount for flood recovery projects between the McLean Creek dam site and the City of Calgary is approximately $5.6 million. This amount is made up of $1.084 million for recovery projects in Rocky View County (including Bragg Creek), $2.657 million for recovery projects in the Townsite of Redwood Meadows, and $1.901 million for recovery projects in the Tsuu T'ina First Nation. Details are contained in **Appendix F**.

#### *5.1.2.1 1987 Bragg Creek Floodplain Management Study*

The 1987 Bragg Creek Floodplain Management Study identified 37 residential units and 21 commercial units within the flood hazard area. This has increased to 51 residential units and 29 commercial units, representing an increase of 27% for residential and 28% for commercial. A very cursory assessment of potential damages employing values from the updated stage-damage curves suggests total damages in the order of $12.7 million for the Bragg Creek flood study area for the 1:100 year event.

#### *5.1.2.2 Cost Implications*

At this juncture it is not possible to accurately calculate average annual damages for the areas upstream of the Springbank Offstream Flood Storage project. Notwithstanding, in order to account for the other damages, and therefore additional costs that will be incurred by the SR1 project over the MC1 project, an additional $8.9 million in total costs are proposed to be added to the SR1 project.

## 5.2 With Mitigation Alternative

Implementation of the Springbank Off-Stream Flood Storage project results in a reduction of average annual damages under the four cases as follows:

- 1:100 year level of protection under the higher damage scenario = $19,461,291
- 1:200 year level of protection under the higher damage scenario = $26,114,777
- 1:100 year level of protection under the lower damage scenario = $13,746,068
- 1:200 year level of protection under the lower damage scenario = $16,686,439

[4] *Bragg Creek Floodplain Management Study – Final Report*, J.N. MacKenzie Engineering Ltd. in association with W-E-R Engineering Ltd., IBI Group and Ecos Engineering Services Ltd., January 1987.

# 6 Benefit/Cost Analysis

## 6.1 Benefit/Cost Analysis for Flood Mitigation Projects

For flood mitigation projects, economic evaluation requires a comparison between the events predicted to occur if the project is built and those predicted to occur if the project is not built. This is called the "with and without principle". For flood control one cannot directly equate an exchange in the market, however flood control benefits can be estimated by assuming they are equivalent to the flood damage prevented.

For flood mitigation projects the probabilistic approach to benefit/cost estimates is used. To reiterate, within the defined flood risk area, flood damages were estimated with the application of depth-damage curves applied to the various return flood events (probability). The flood damage probability distribution was then plotted and the average annual damage (AAD) estimated for project evaluation purposes.

With the updated average annual damages and cost estimates of the diversion alternative, an economic efficiency evaluation was performed. This evaluation is based upon the net present value (NPV) of respective benefits and costs. The net present value of any project is governed by three variables: the average annual cost or benefit, discount rate, and discount period. To provide a consistent economic evaluation of flood mitigation projects across the Province, a common discount rate of 4% was agreed upon and applied. The discount period is the estimate of the alternative's project life.

The benefit/cost (B/C) ratio of a project is the ratio of net present value of the benefits (average annual damages) over the net present value of the costs. This value is the indicator of economic efficiency. Where the benefits exceed costs, the ratio would be greater than 1.0, and where benefits are less than costs then the ratio would be less than 1.0. An economically-efficient project would have a B/C ratio greater than 1.0. At a B/C ratio of 1.0, the project is at a breakeven point.

## 6.2 Assumptions/Methodology

The following assumptions were employed in the benefit/cost analysis:

- Costs are based on the estimated capital and operational/maintenance costs presented in Section 4.
- $8.9 million in capital costs was added to the Springbank Off-Stream Flood Storage scenario to account for required mitigation measures upstream.
- Benefits are based on the quantification of flood damages averted as outlined in Section 5.
- The benefit/cost analysis has been carried out using a net present value analysis.
- A 100 year economic analysis.
- Annual operating and maintenance costs of $1.8 million.

### 6.2.1 MC1 (McLean Creek Flood Storage Project) and SR1 (Springbank Off-Stream Flood Storage Project)

Net benefits for MC1 and SR1 were computed on the basis that the projects will provide protection downstream of Glenmore Dam to the 1:100 and 1:200 year flood events. When these events are exceeded, the damages will start to increase rapidly as the peak discharge passes through the flood hazard area within the City of Calgary. Without additional hydrologic routing, it was assumed that once the design event is exceeded, full damages are incurred. With

additional hydrologic routing it is possible that the benefit/cost ratios of these schemes will improve somewhat.

### 6.2.2 Glenmore Reservoir Diversion

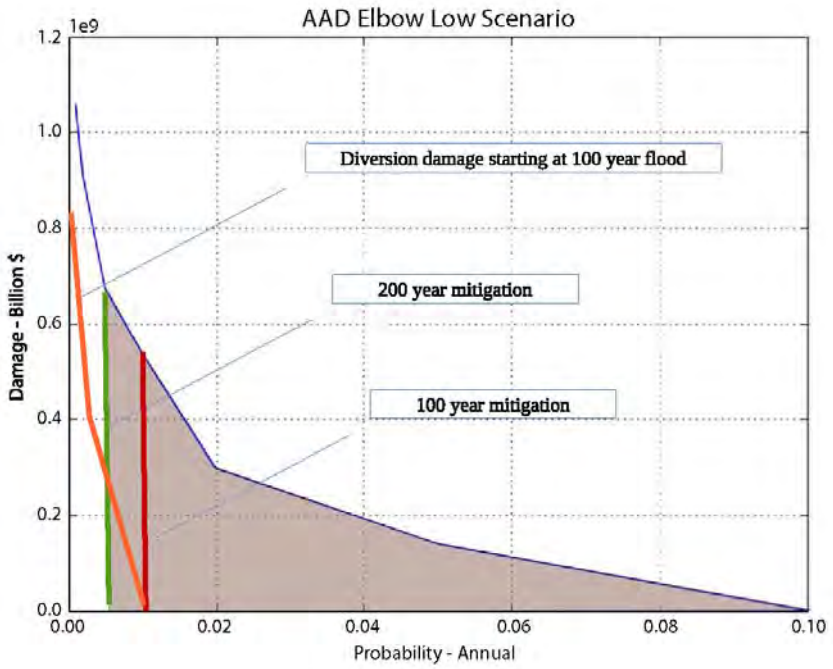
With respect to the Glenmore Reservoir Diversion it was possible to calculate the reduced damages that would be achieved as a result of the 500 and 700 CMS diversion. The incremental flow was passed downstream and damages based on the reduced flood flow were computed to determine the net benefits. Consequently, a higher benefit can be attributed to the diversion scheme based on this higher level of analysis. Notwithstanding the higher overall benefits, the actual benefit/cost ratio as illustrated in the next section is lower than the MC1 and SR1 schemes due to the much higher cost base of the Glenmore Reservoir Diversion.

**Exhibit 6.1** illustrates this principle considering the average annual damage on the Elbow under the low damage scenario. If all flood damage can be eliminated then the average annual damage is equal to the area under the curve from the Y to the X axis. This is the total average annual damage.

If a dyke is constructed to a 100 year flood protection, the area right of the red line is subtracted from the total average annual damage. This is the value of the average annual damage averted. However, when the 100 year flood is exceeded then all the properties are flooded instantaneously (area to the left of the red line). Similarly, for a dyke built to the 200 year level of protection.

Conversely, in the case of the diversion tunnel, the mitigation is the area right of the orange line. In this case, when the diverted flow is exceeded, then the damage occurs gradually (slope of the orange curve) rather than vertically, like the dyke situation.

**Exhibit 6.1: Affect of Mitigation on Average Annual Damage**



## 6.3 Discussion of Results

**Exhibit 6.2** highlights the key results of the benefit/cost analysis of the Springbank Off-Stream Flood Storage project considering the four cases as discussed.

For the 1:100 year level of protection under the high damage scenario the present value of benefits is $477 million versus $255 million in costs, rendering a positive benefit/cost ratio of 1.87.

At the 1:200 year level of protection, the benefit/cost ratio increases to 2.07, an economically viable project with a very attractive benefit/cost ratio.

For the low damage scenario the 1:100 year present value of benefits is $337 million versus costs of $255 million, rendering a benefit/cost ratio of 1.32.

With the 1:200 year level of protection the benefit/cost ratio remains at 1.32, once again an economically viable project with a positive benefit/cost ratio.

**Exhibit 6.2: Benefit/Cost Analysis**

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $255,098,000 | $309,607,000 | $255,098,000 | $309,607,000 |
| Benefit/Cost Ratio | 1.87 | 2.07 | 1.32 | 1.32 |
| Net Present Value | $221,801,000 | $330,336,000 | $81,749,000 | $99,294,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

## 6.4 Benefits Beyond the Study Area

Of the three mitigation projects under consideration, only one – the McLean Creek Flood Storage project (MC1) – provides benefits beyond the primary study area, the City of Calgary. An analysis of any potential benefits downstream of the City was outside the scope of this analysis. Needless to say, it is anticipated that benefits downstream of the City would be marginal in any event.

## 6.5 Triple Bottom Line Considerations

Traditional economic analyses of flood mitigation alternatives have generally assumed a straightforward objective of maximizing the net benefits (total benefits minus total costs) that accrue to a project. Society however, has other goals besides economic efficiency. These goals or objectives are the results of outcomes that society desires and have more recently been described as triple bottom line objectives which include, in addition to economic objectives, considerations of environmental and social impacts. In relation to flood mitigation projects, the following criteria are often considered in the evaluation process:

- Disaster prevention:
  - reduces current losses
  - reduces future losses
  - potential residential loss of life
  - potential non-residential loss of life
- Environmental impact:
  - biophysical impacts
  - social impacts
  - aesthetic impacts
- Implementation:
  - complexity
  - flexibility of integration with other measures
- Incidental benefits:
  - recreation
  - drought mitigation
  - other

This study was concerned solely with economic efficiency and consequently does not include analysis of the aforementioned non-commensurable criteria.

## 6.6 Summary and Conclusions

**Exhibit 6.3** below illustrates the relative ranking of the flood mitigation projects.

**Exhibit 6.3: Benefit/Cost Ratio**

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |

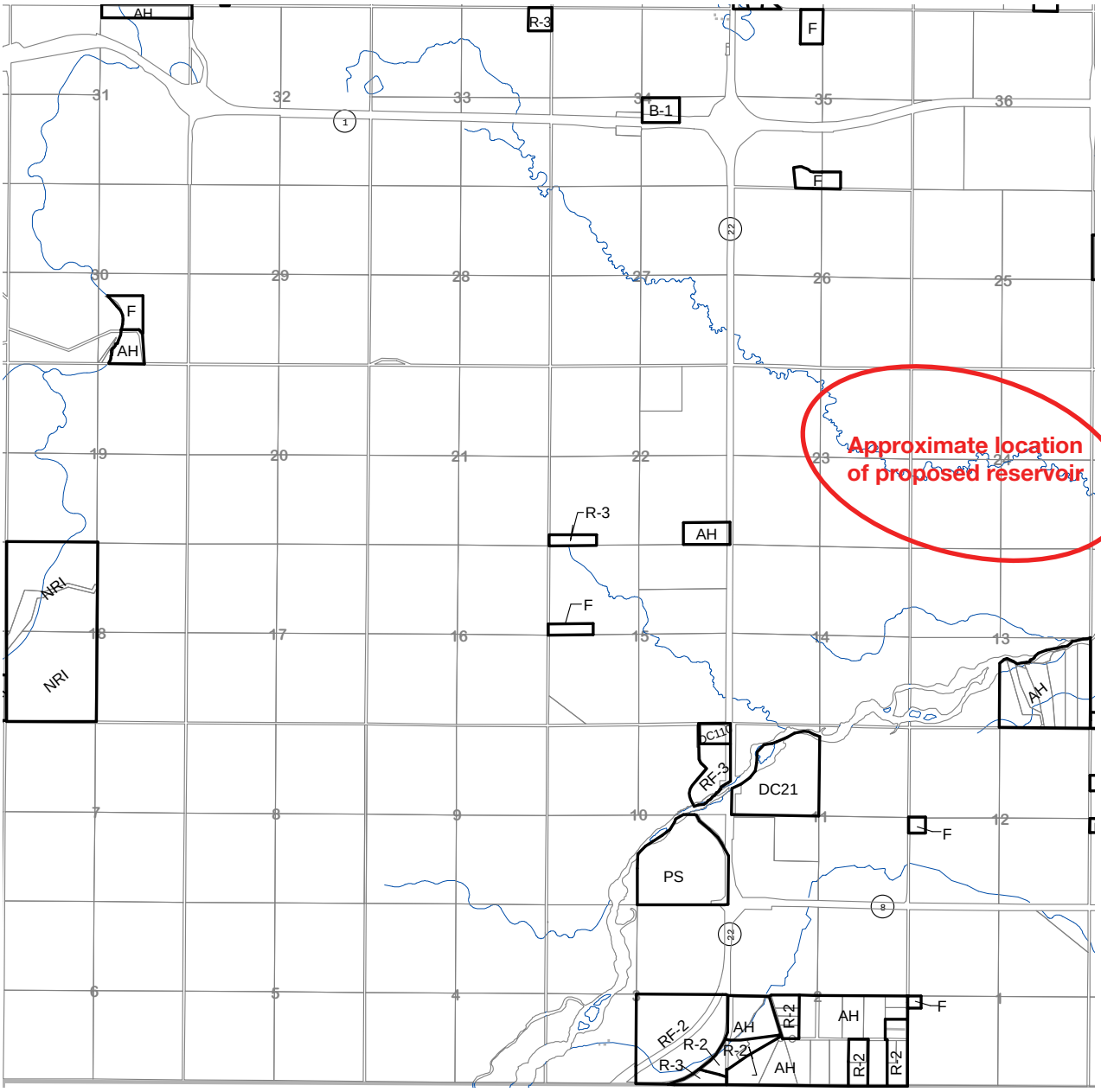
The Springbank Off-Stream Flood Storage project achieves a positive benefit/cost ratio under all four scenarios and ranks first ahead of the other two mitigation projects with significantly higher benefit/cost ratios.[5]



[5] Refer to IBI Group Reports: *Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: McLean Creek Flood Storage (February 2015)* and *Benefit/Cost Analysis of Flood Mitigation Projects for the City of Calgary: Glenmore Reservoir Diversion (February 2015).*

# Appendix A – Entitlement Status of Lands for Off-Stream Storage Project

# Municipal District of Rocky View #44 - Land Use Map No. 48




ALL LANDS ARE DESIGNATED RF UNLESS NOTED OTHERWISE

| | |
|---|---|
| RANCH AND FARM DISTRICT | RF |
| SEE EXCEPTIONS LISTED WITH THIS DISTRICT | RF * |
| RANCH AND FARM TWO DISTRICT | RF-2 |
| RANCH AND FARM THREE DISTRICT | RF-3 |
| AGRICULTURAL HOLDING DISTRICT | AH |
| FARMSTEAD DISTRICT | F |
| RESIDENTIAL ONE DISTRICT | R-1 |
| RESIDENTIAL TWO DISTRICT | R-2 |
| RESIDENTIAL THREE DISTRICT | R-3 |
| HIGHWAY BUSINESS DISTRICT | B-1 |
| GENERAL BUSINESS DISTRICT | B-2 |
| LIMITED BUSINESS DISTRICT | B-3 |
| RECREATION BUSINESS DISTRICT | B-4 |
| AGRICULTURAL BUSINESS DISTRICT | B-5 |
| LOCAL BUSINESS DISTRICT | B-6 |
| HIGHWAY FRONTAGE BUSINESS DISTRICT | B-HF |
| BUSINESS CAMPUS BUSINESS DISTRICT | B-BC |
| INDUSTRIAL CAMPUS BUSINESS DISTRICT | B-IC |

| | |
|---|---|
| RECREATION DESTINATION BUSINESS DISTRICT | B-RD |
| LEISURE AND RECREATION BUSINESS DISTRICT | B-LR |
| AGRICULTURAL SERVICES BUSINESS DISTRICT | B-AS |
| POINT COMMERCIAL DISTRICT | C-PT |
| VILLAGE CENTRE COMMERCIAL DISTRICT | C-VC |
| LOCAL COMMERCIAL DISTRICT | C-LC |
| REGIONAL COMMERCIAL DISTRICT | C-RC |
| INDUSTRIAL ACTIVITY DISTRICT | I-IA |
| STORAGE AND SALES INDUSTRIAL DISTRICT | I-SS |
| NATURAL RESOURCE INDUSTRIAL DISTRICT | NRI |
| HAMLET RESIDENTIAL SINGLE FAMILY DISTRICT | HR-1 |
| HAMLET RESIDENTIAL (2) DISTRICT | HR-2 |
| HAMLET COMMERCIAL DISTRICT | HC |
| HAMLET INDUSTRIAL DISTRICT | HI |
| PUBLIC SERVICES DISTRICT | PS |
| AIRPORT DISTRICT | AP |
| DIRECT CONTROL DISTRICT | DC |

N

MUNICIPAL DISTRICT OF ROCKY VIEW #44

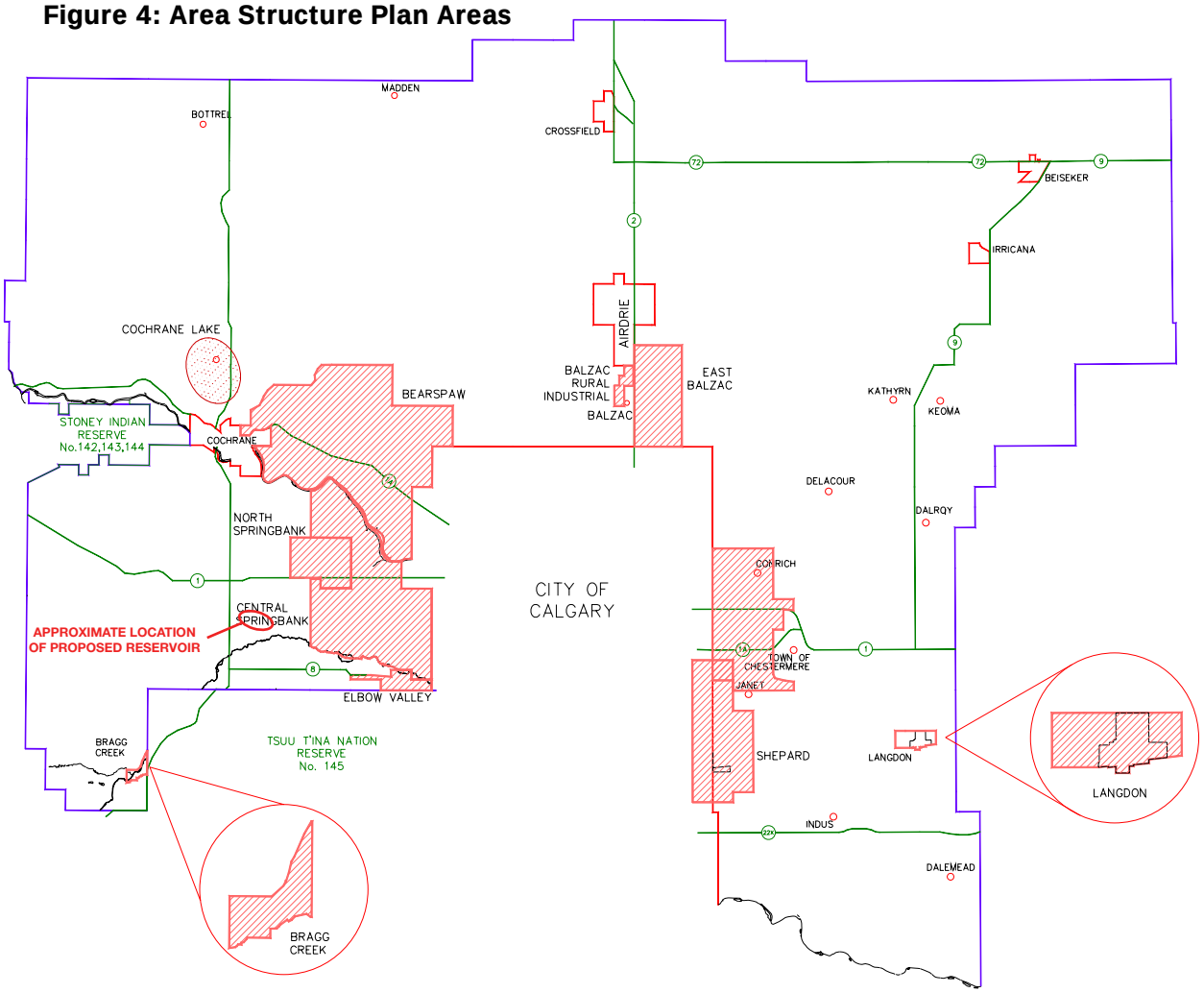
TWP. 24-4-W5M

Part FIVE of the BYLAW No. C-4841-97

LAND USE MAP No. 48

DATE: Mar 02, 2009

**Figure 4: Area Structure Plan Areas**




# MUNICIPAL DISTRICT OF ROCKY VIEW No.44

## SUGGESTED AND APPROVED AREA STRUCTURE PLANS

N

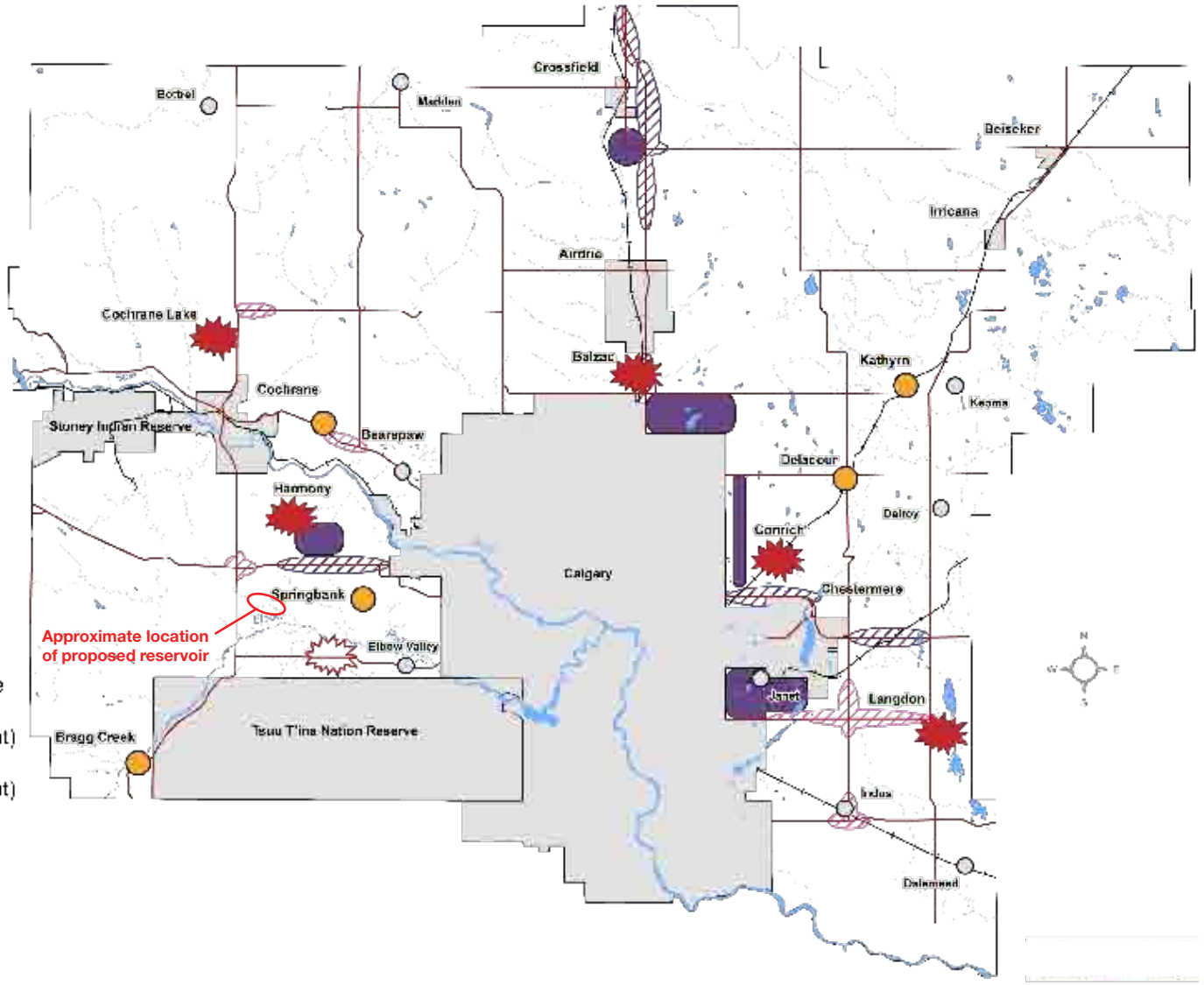
AREA STRUCTURE PLANS
(EXISTING OR BEING PREPARED)

AREAS UNDER DEVELOPMENT PRESSURE

January 2003

# Municipal District of Rocky View #44 - Growth Management Strategy Map

*this map is conceptual, not to scale and for illustrative purposes only.*



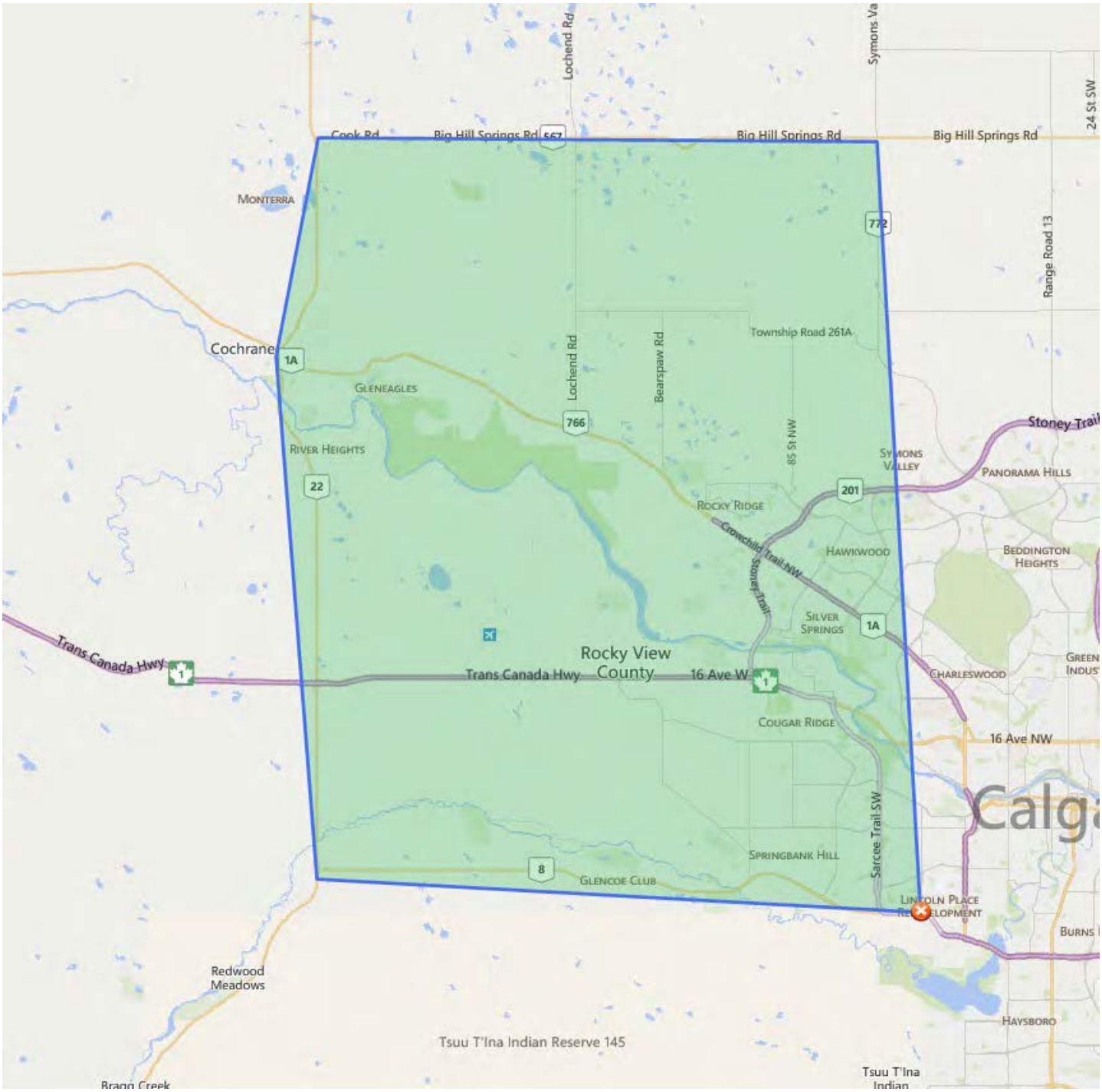

**Legend**

- Growth Node
- Potential Growth Node
- Community Core
- Existing Community
- Business Node/Regional Employment Centre
- Major Business Corridor (Nodal Development)
- Minor Business Corridor (Nodal Development)

**Prepared April 16, 2009.**

# Appendix B – Springbank Area MLS Sales and Listing Data for 2014

# Market Area Considered



# Rocky View West Listing

| Sta | ML Number | Address | List Price | Sold Price | Community Desc | List Date | Off Market Dat | Total Ac | Days c | Condo Name | Condo Type | Number of Parcels | Cummu | County | List Price / Acre | Sold Price / Acre | Postal Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C3553126 | 227 CHURCH RANCHES WY NW | $ 719,000.00 | | Church Ranches | 06/02/2013 | | 3.43 | 650 | | | | 800 | ALBERTA | $ 209,620.99 | | T3R 1B2 |
| A | C3586217 | 242258 Windhorse WY | $ 410,000.00 | | Springbank | 19/09/2013 | | 2.05 | 425 | | | | 425 | ALBERTA | $ 200,000.00 | | T3Z 0B4 |
| A | C3586227 | 35 WINDHORSE GR | $ 435,000.00 | | Springbank | 19/09/2013 | | 2.03 | 425 | | | | 425 | ALBERTA | $ 214,285.71 | | T3Z 0B4 |
| A | C3599739 | Lochend RD NW | $ 8,000,000.00 | | Bearspaw_Calg | 10/02/2014 | | 158.85 | 281 | | | | 281 | ALBERTA | $ 50,361.98 | | T3L 2R2 |
| A | C3604034 | Highway # 22 North of Cochrane | $ 1,500,000.00 | | Cochrane Lake | 10/03/2014 | | 53.55 | 253 | | | | 253 | ALBERTA | $ 28,011.20 | | T4C 1A9 |
| A | C3605546 | 124 WILLOW CREEK SU | $ 472,500.00 | | Bearspaw_Calg | 21/03/2014 | | 2.02 | 242 | | | | 242 | ALBERTA | $ 233,910.89 | | T3R 0K3 |
| A | C3606704 | 116 GRIZZLY RI | $ 450,000.00 | | Bearspaw Country Estates | 28/03/2014 | | 4.05 | 235 | Z-name Not Listed | | | 235 | ALBERTA | $ 111,111.11 | | T3Z 1H5 |
| A | C3617284 | 67 CHEYANNE MEADOWS WAY | $ 699,000.00 | | Church Ranches | 23/05/2014 | | 2.34 | 179 | | | | 179 | ALBERTA | $ 298,717.95 | | T3R 1B6 |
| A | C3629847 | 262 Lochend Road | $ 3,969,000.00 | | None | 06/08/2014 | | 157.56 | 104 | | | | 104 | ALBERTA | $ 25,190.40 | | T4C 0X0 |
| A | C3631166 | 251095 WELLAND WY | $ 595,000.00 | | Bearspaw_Calg | 14/08/2014 | | 4.42 | 96 | Z-name Not Listed | | | 277 | ALBERTA | $ 134,615.39 | | T3R 1L3 |
| A | C3631295 | 41216 Camden Lane | $ 550,000.00 | | None | 12/08/2014 | | 3.95 | 98 | | | | 98 | ALBERTA | $ 139,240.51 | | T4C 1B1 |
| A | C3629151 | 50 BLAZER ESTATES RG | $ 1,100,000.00 | | Bearspaw_Calg | 01/08/2014 | | 8.08 | 109 | | | | 109 | ALBERTA | $ 136,138.61 | | T3L 2N7 |
| A | C3641919 | 116 BEARSPAW MEADOWS | $ 799,999.00 | | Lynx Ridge | 23/10/2014 | | 2.72 | 26 | | | | 26 | ALBERTA | $ 294,117.28 | | T3L 2M3 |
| A | C3583465 | 108 AVENTERRA | $ 359,000.00 | | Springbank | 30/08/2013 | | 2.03 | 445 | | | | 445 | ALBERTA | $ 176,847.29 | | T3J 5J4 |
| A | C3640329 | 31239 TWP RD 252 | $ 675,000.00 | | Springbank | 17/10/2014 | | 4 | 32 | | | | 32 | ALBERTA | $ 168,750.00 | | T3Z 1E8 |
| A | C3639338 | 24333 Meadow DR | $ 499,900.00 | | Bearspaw_Calg | 08/10/2014 | | 2 | 41 | | | | 41 | ALBERTA | $ 249,950.00 | | T3R 1G3 |
| A | C3621718 | 10 BEARSPAW VALLEY PLACE | $ 499,900.00 | | Bearspaw_Calg | 16/06/2014 | | 1.96 | 155 | | | | 155 | ALBERTA | $ 255,051.02 | | T3G 3G3 |
| A | C3642556 | 118 WINDHORSE CO | $ 384,900.00 | | Springbank | 03/11/2014 | | 2.05 | 15 | | | | 303 | ALBERTA | $ 187,756.10 | | T3Z 0B4 |
| A | C3621729 | 18 BEARSPAW VALLEY PLACE | $ 499,900.00 | | Bearspaw_Calg | 16/06/2014 | | 1.93 | 155 | | | | 155 | ALBERTA | $ 259,015.54 | | T2E 2E2 |
| A | C3575040 | 242244 WINDHORSE | $ 410,000.00 | | Springbank | 27/06/2013 | | 2.02 | 509 | | | | 509 | ALBERTA | $ 202,970.30 | | T3Z 0B4 |
| A | C3637861 | 6 GLENDALE ESTATES MR | $ 459,000.00 | | Bearspaw_Calg | 29/09/2014 | | 1.98 | 50 | | | | 212 | ALBERTA | $ 231,818.18 | | T4C 1A2 |
| A | C3613051 | 123 BROWN BEAR | $ 399,000.00 | | Bearspaw Country Estates | 02/05/2014 | | 2.08 | 200 | | | | 200 | ALBERTA | $ 191,826.92 | | T4C 0B5 |
| A | C3629825 | 43 Big Hill Springs CV | $ 570,000.00 | | Bearspaw_Calg | 06/08/2014 | | 4.86 | 104 | | | | 104 | ALBERTA | $ 117,283.95 | | T4C 1A2 |
| A | C3637529 | 22 GLENDALE ESTATES MR | $ 389,000.00 | | Bearspaw_Calg | 25/09/2014 | | 2 | 54 | Z-name Not Listed | | | 54 | ALBERTA | $ 194,500.00 | | T3R 1G3 |
| A | C3614265 | 31060 SWIFT CREEK | $ 494,900.00 | | Springbank | 08/05/2014 | | 2.08 | 194 | | | | 194 | ALBERTA | $ 237,932.69 | | T3Z 0B7 |
| A | C3586173 | 31040 WINDHORSE DR | $ 460,000.00 | | Springbank | 19/09/2013 | | 2.03 | 425 | | | | 425 | ALBERTA | $ 226,600.99 | | T3Z 0B4 |
| A | C3586195 | 12 WINDHORSE BA | $ 460,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 230,000.00 | | T3Z 0B4 |
| A | C3586198 | 16 WINDHORSE BA | $ 410,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 205,000.00 | | T3Z 0B4 |
| A | C3586221 | 43 WINDHORSE GR | $ 485,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 242,500.00 | | T3Z 0B4 |
| A | C3586237 | 242162 WINDHORSE WY | $ 510,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 255,000.00 | | T3Z 0B4 |
| A | C3586224 | 39 WINDHORSE GR | $ 485,000.00 | | Springbank | 19/09/2013 | | 2.05 | 425 | | | | 425 | ALBERTA | $ 236,585.37 | | T3Z 0B4 |
| A | C3586243 | 242176 WINDHORSE WY | $ 435,000.00 | | Springbank | 19/09/2013 | | 2.01 | 425 | | | | 425 | ALBERTA | $ 216,417.91 | | T3Z 0B4 |
| A | C3586234 | 242150 WINDHORSE WY | $ 510,000.00 | | Springbank | 19/09/2013 | | 2.02 | 425 | | | | 425 | ALBERTA | $ 252,475.25 | | T3Z 0B4 |
| A | C3617248 | 31156 Township Road 251A | $ 749,800.00 | | Springbank | 23/05/2014 | | 10.63 | 179 | Z-name Not Listed | | | 179 | ALBERTA | $ 70,536.22 | | T3Z 1E6 |
| A | C3602240 | 21 SWIFT CREEK GR. | $ 588,000.00 | | Springbank | 26/02/2014 | | 2 | 265 | | | | 265 | ALBERTA | $ 294,000.00 | | T2Z 0B6 |
| A | C3561891 | | $ 13,500,000.00 | | None | 05/04/2013 | | 121.37 | 592 | | | | 1257 | ALBERTA | $ 111,230.12 | | T3Z 2E4 |
| A | C3633051 | 37 Westbluff PL | $ 2,450,000.00 | | Springbank | 27/08/2014 | | 10.01 | 83 | | | | 83 | ALBERTA | $ 244,755.25 | | T3Z 3P2 |
| A | C3621724 | 14 BEARSPAW VALLEY PLACE | $ 499,900.00 | | Bearspaw_Calg | 16/06/2014 | | 1.95 | 155 | | | | 155 | ALBERTA | $ 256,358.97 | | T2E 2E2 |
| A | C3595058 | 2 BEARSPAW VALLEY | $ 499,000.00 | | Bearspaw_Calg | 29/12/2013 | | 1.97 | 324 | | | | 844 | ALBERTA | $ 253,299.49 | | T3R 1A3 |
| A | C3638507 | | $ 2,000,000.00 | | Glendale Meadows | 02/10/2014 | | 25.32 | 47 | | | | 47 | ALBERTA | $ 78,988.94 | | T4C 2G4 |
| A | C3632325 | 35195 Springbank RD | $ 8,960,000.00 | | Springbank | 22/08/2014 | | 320 | 88 | | | | 436 | ALBERTA | $ 28,000.00 | | T3Z 3H3 |
| A | C3603978 | 25151 ESCARPMENT RIDGE VW | $ 900,000.00 | | None | 10/03/2014 | | 2.31 | 253 | | | | 253 | ALBERTA | $ 389,610.39 | | T3Z 3M7 |
| A | C3618112 | Lochend RD | $ 3,080,000.00 | | Bearspaw_Calg | 26/05/2014 | | 138.97 | 176 | | | | 176 | ALBERTA | $ 22,163.06 | | T3L 2R2 |
| A | C3593709 | | $ 3,950,000.00 | | Springbank | 30/11/2013 | | 73.95 | 353 | | | | 353 | ALBERTA | $ 53,414.47 | | A0A 0A0 |
| A | C3593826 | 11 Rolling Range PL | $ 429,000.00 | | Rolling Range Est | 29/11/2013 | | 3.98 | 354 | | | | 354 | ALBERTA | $ 107,788.95 | | T4C 1A1 |
| A | C3618530 | 19 MCKENDRICK PT | $ 684,900.00 | | Springland Estates | 26/05/2014 | | 2.3 | 176 | | | | 208 | ALBERTA | $ 297,782.61 | | T3Z 3K1 |
| A | C3639339 | 24345 Meadow DR | $ 459,000.00 | | Bearspaw_Calg | 08/10/2014 | | 2 | 41 | | | | 41 | ALBERTA | $ 229,500.00 | | T3R 1G3 |
| A | C3639342 | 24349 Meadow DR | $ 449,000.00 | | Bearspaw_Calg | 08/10/2014 | | 2 | 41 | | | | 41 | ALBERTA | $ 224,500.00 | | T3R 1G3 |
| A | C3629788 | 45 BEARSPAW SUMMIT PL | $ 375,000.00 | | Bearspaw_Calg | 06/08/2014 | | 1.98 | 104 | | | | 104 | ALBERTA | $ 189,393.94 | | T3A 1G4 |
| A | C3629992 | 40 Rolling Range DR | $ 3,600,000.00 | | None | 03/08/2014 | | 19.88 | 107 | | | | 107 | ALBERTA | $ 181,086.52 | | T4C 2A3 |
| A | C3594983 | Bearspaw 160 acres NW of Calgary | $ 1,900,000.00 | | None | 24/12/2013 | | 160 | 329 | | | | 601 | ALBERTA | $ 11,875.00 | | T3R 1C4 |
| A | C3629125 | 251208 RGE RD 32 | $ 864,000.00 | | Springbank | 30/07/2014 | | 12.31 | 111 | | | | 111 | ALBERTA | $ 70,186.84 | | T3Z 0X0 |
| A | C3586216 | 31100 WINDHORSE DR | $ 410,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 205,000.00 | | T3Z 0B4 |
| A | C3586180 | 4 WINDHORSE BA | $ 435,000.00 | | Springbank | 19/09/2013 | | 2.32 | 425 | | | | 425 | ALBERTA | $ 187,500.00 | | T3Z 0B4 |
| A | C3586189 | 8 WINDHORSE BA | $ 460,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 230,000.00 | | T3Z 0B4 |

# Rocky View West Listing

| Sta | ML Number | Address | List Price | Sold Price | Community Desc | List Date | Off Market Dat | Total Ac | Days c | Condo Name | Condo Type | Number of Parcels | Cummu | County | List Price / Acre | Sold Price / Acre | Postal Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | C3586233 | 114 WINDHORSE CO | $ 460,000.00 | | Springbank | 19/09/2013 | | 2 | 425 | | | | 425 | ALBERTA | $ 230,000.00 | | T3Z 0B4 |
| A | C3586239 | 242168 WINDHORSE WY | $ 460,000.00 | | Springbank | 19/09/2013 | | 2.01 | 425 | | | | 425 | ALBERTA | $ 228,855.72 | | T3Z 0B4 |
| A | C3633344 | 30 GLENDALE ESTATES MR | $ 389,000.00 | | Bearspaw_Calg | 28/08/2014 | | 1.98 | 82 | | | | 1015 | ALBERTA | $ 196,464.65 | | T3R 1G3 |
| A | C3629801 | 35 Big Hill Springs CV | $ 540,000.00 | | Bearspaw_Calg | 06/08/2014 | | 4.6 | 104 | | | | 104 | ALBERTA | $ 117,391.30 | | T4C 1A4 |
| A | C3640579 | 24 GRANDVIEW PL | $ 525,000.00 | | Springbank | 19/10/2014 | | 1.98 | 30 | | | | 30 | ALBERTA | $ 265,151.52 | | T3Z 0A7 |
| A | C3616382 | 24 Villosa Ridge PT | $ 389,000.00 | | None | 20/05/2014 | | 2.04 | 182 | | | | 182 | ALBERTA | $ 190,686.28 | | T3Z 1H2 |
| A | C3637865 | 10 GLENDALE ESTATES MR | $ 499,000.00 | | Bearspaw_Calg | 29/09/2014 | | 2 | 50 | | | | 1545 | ALBERTA | $ 249,500.00 | | T3R 1G3 |
| A | C3639734 | 5 MOUNTAIN GLEN | $ 425,000.00 | | None | 12/10/2014 | | 4 | 37 | | | | 37 | ALBERTA | $ 106,250.00 | | T4C 0G6 |
| A | C3621144 | 34080 GLENDALE Road - TWP RD 260 | $ 7,559,000.00 | | None | 07/06/2014 | | 134.5 | 164 | | | | 164 | ALBERTA | $ 56,200.74 | | T0L 0W0 |
| A | C3627556 | 243081 Morning Vista WY | $ 405,000.00 | | None | 21/07/2014 | | 1.98 | 120 | | | | 120 | ALBERTA | $ 204,545.46 | | T3Z 0B2 |
| X | C3574569 | 31119 GRANDARCHES DR | $ 735,000.00 | | Springbank | 22/06/2013 | 15/11/2014 | 2.04 | 511 | | | | 511 | ALBERTA | $ 360,294.12 | | T3Z 0B6 |
| X | C3627952 | Glenbow RD | $ 398,500.00 | | None | 24/07/2014 | 15/11/2014 | 3.7 | 114 | | | | 114 | ALBERTA | $ 107,702.70 | | T4C 2G4 |
| X | C3626603 | 260084 GLENBOW | $ 1,498,850.00 | | None | 14/07/2014 | 15/11/2014 | 22.6 | 124 | | | | 124 | ALBERTA | $ 66,320.80 | | T4C 2G4 |
| X | C3545385 | | $ 555,450.00 | | Springbank | 06/11/2012 | 06/11/2014 | 2.91 | 730 | Z-name Not Listed | | | 730 | ALBERTA | $ 190,876.29 | | T3Z 3K1 |
| X | C3634076 | | $ 499,900.00 | | None | 02/09/2014 | 05/11/2014 | 4.3 | 64 | | | | 64 | ALBERTA | $ 116,255.81 | | T1T 1T1 |
| X | C3625542 | 118 WINDHORSE CO | $ 395,000.00 | | Springbank | 08/07/2014 | 31/10/2014 | 2.05 | 115 | | | | 290 | ALBERTA | $ 192,682.93 | | T3Z 0B4 |
| X | C3587680 | 251092 WELLAND | $ 585,000.00 | | Bearspaw_Calg | 27/09/2013 | 31/10/2014 | 4.25 | 399 | | | | 399 | ALBERTA | $ 137,647.06 | | T3R 1L3 |
| S | C3586252 | 242230 WINDHORSE WY | $ 435,000.00 | $ 388,000.00 | Springbank | 19/09/2013 | 28/10/2014 | 2.03 | 404 | | | | 404 | ALBERTA | $ 214,285.71 | $ 191,133.01 | T3Z 0B4 |
| S | C3590964 | Springbank Heights DR | $ 545,000.00 | $ 535,000.00 | Springbank | 30/10/2013 | 27/10/2014 | 4.1 | 362 | | | | 359 | ALBERTA | $ 132,926.83 | $ 130,487.81 | T3Z 1C4 |
| T | C3597033 | 120 GRANDVIEW WY | $ 499,900.00 | | Springbank | 20/01/2014 | 07/10/2014 | 2.04 | 260 | | | | 260 | ALBERTA | $ 245,049.02 | | T3Z 0A8 |
| X | C3613618 | 31038 SWIFT CREEK | $ 455,000.00 | | Springbank | 06/05/2014 | 06/10/2014 | 2.04 | 153 | | | | 153 | ALBERTA | $ 223,039.22 | | T3Z 0B7 |
| X | C3625066 | 25 SWIFT CREEK GR | $ 479,000.00 | | Springbank | 05/07/2014 | 05/10/2014 | 2.01 | 92 | | | | 92 | ALBERTA | $ 238,308.46 | | T3Z 0B6 |
| X | C3618522 | 24190 MEADOW | $ 529,000.00 | | Bearspaw Acres | 29/05/2014 | 30/09/2014 | 2.2 | 124 | | | | 124 | ALBERTA | $ 240,454.55 | | T3R 1A8 |
| X | C3588538 | 30032 LOWER SPRINGBANK RD | $ 539,900.00 | | Springbank | 07/10/2013 | 30/09/2014 | 2.08 | 358 | | | | 358 | ALBERTA | $ 259,567.31 | | T3Z 3K7 |
| X | C3606041 | 15 CORRAL VIEW | $ 510,000.00 | | Springbank | 24/03/2014 | 28/09/2014 | 2.32 | 188 | | | | 188 | ALBERTA | $ 219,827.59 | | T3A 2B7 |
| X | C3595970 | 10 GLENDALE ESTATES MR | $ 499,000.00 | | Bearspaw_Calg | 10/01/2014 | 26/09/2014 | 2 | 259 | | | | 1495 | ALBERTA | $ 249,500.00 | | T3R 1G3 |
| S | C3625546 | 242255 WINDHORSE WY | $ 394,900.00 | $ 320,000.00 | Springbank | 08/07/2014 | 13/09/2014 | 2.93 | 67 | | | | 242 | ALBERTA | $ 134,778.16 | $ 109,215.02 | T3Z 0B4 |
| S | C3586246 | 242190 WINDHORSE WY | $ 435,000.00 | $ 391,500.00 | Springbank | 19/09/2013 | 12/09/2014 | 2 | 358 | | | | 358 | ALBERTA | $ 217,500.00 | $ 195,750.00 | T3Z 0B4 |
| S | C3586248 | 242208 WINDHORSE WY | $ 410,000.00 | $ 369,000.00 | Springbank | 19/09/2013 | 12/09/2014 | 2.02 | 358 | | | | 358 | ALBERTA | $ 202,970.30 | $ 182,673.27 | T3Z 0B4 |
| S | E3361283 | 25006 TWP RD 264A | $ 1,500,000.00 | $ 1,375,000.00 | None | 29/01/2014 | 09/09/2014 | 151.5 | 223 | | | | 222 | ALBERTA | $ 9,900.99 | $ 9,075.91 | T3R 1J6 |
| S | E3361286 | 25006 TWP RD 264A | $ 1,300,000.00 | $ 1,175,000.00 | None | 29/01/2014 | 09/09/2014 | 137.19 | 223 | | | | 222 | ALBERTA | $ 9,475.91 | $ 8,564.76 | T3R 1J6 |
| S | E3361284 | 25006 TWP RD 264A | $ 1,300,000.00 | $ 1,175,000.00 | None | 29/01/2014 | 09/09/2014 | 162.99 | 223 | | | | 222 | ALBERTA | $ 7,975.95 | $ 7,209.03 | T3R 1J6 |
| S | E3361285 | 25006 TWP RD 264A | $ 1,300,000.00 | $ 1,175,000.00 | None | 29/01/2014 | 09/09/2014 | 172.75 | 223 | | | | 222 | ALBERTA | $ 7,525.33 | $ 6,801.74 | T3R 1J6 |
| X | C3623835 | Bearspaw RD | $ 1,400,000.00 | | Bearspaw_Calg | 27/06/2014 | 08/09/2014 | 20.02 | 73 | | | | 73 | ALBERTA | $ 69,930.07 | | T3R 1C4 |
| X | C3623843 | Bearspaw RD | $ 2,000,000.00 | | Bearspaw_Calg | 27/06/2014 | 08/09/2014 | 20.02 | 73 | | | | 73 | ALBERTA | $ 99,900.10 | | T3R 1C4 |
| X | C3598205 | 224 BROWN BEAR | $ 409,900.00 | | Bearspaw Country Estates | 29/01/2014 | 31/08/2014 | 2.01 | 214 | Z-name Not Listed | | | 214 | ALBERTA | $ 203,930.35 | | T4C 0B5 |
| X | C3605262 | Symons Valley Road | $ 2,595,000.00 | | None | 15/03/2014 | 31/08/2014 | 103 | 169 | | | 1 | 169 | ALBERTA | $ 25,194.18 | | T4B 2A3 |
| X | C3613691 | 29 SWIFT CREEK GR | $ 425,000.00 | | Springbank | 06/05/2014 | 31/08/2014 | 2 | 117 | Z-name Not Listed | | | 117 | ALBERTA | $ 212,500.00 | | T3Z 0B7 |
| X | C3617357 | 244230 OLD BANFF COACH | $ 1,288,888.00 | | Springbank | 24/05/2014 | 30/08/2014 | 7.05 | 98 | | | | 98 | ALBERTA | $ 182,820.99 | | T2H 0K2 |
| X | C3595707 | 30 GLENDALE ESTATES MR | $ 388,900.00 | | Bearspaw_Calg | 08/01/2014 | 26/08/2014 | 1.98 | 230 | | | | 934 | ALBERTA | $ 196,414.14 | | T3R 1G3 |
| X | C3616404 | 35195 Springbank RD | $ 8,960,000.00 | | Springbank | 20/05/2014 | 20/08/2014 | 320 | 92 | | | | 348 | ALBERTA | $ 28,000.00 | | T3Z 3H3 |
| S | C3621941 | 32050 KODIAK SPRINGS RD RD | $ 460,000.00 | $ 425,000.00 | Bearspaw_Calg | 16/06/2014 | 15/08/2014 | 2.02 | 60 | Z-name Not Listed | | | 60 | ALBERTA | $ 227,722.77 | $ 210,396.04 | T4C 1X2 |
| X | C3602054 | 12 Cody Range WY | $ 529,900.00 | | Bearspaw_Calg | 26/02/2014 | 01/08/2014 | 2.2 | 156 | | | | 338 | ALBERTA | $ 240,863.64 | | T3R 1C1 |
| X | C3608525 | 31120 GRANDARCHES | $ 469,900.00 | | Springbank | 08/04/2014 | 31/07/2014 | 2.03 | 114 | | | | 114 | ALBERTA | $ 231,477.83 | | T3Z 0C3 |
| X | C3584175 | 243020 MORNING VISTA WY | $ 399,000.00 | | Springbank | 05/09/2013 | 31/07/2014 | 2 | 329 | Z-name Not Listed | | | 329 | ALBERTA | $ 199,500.00 | | T3Z 0B2 |
| X | C3598421 | 251095 WELLAND WY | $ 639,000.00 | | Bearspaw_Calg | 31/01/2014 | 31/07/2014 | 4.42 | 181 | Z-name Not Listed | | | 181 | ALBERTA | $ 144,570.14 | | T3R 1L3 |
| S | C3586219 | 242211 WINDHORSE WY | $ 410,000.00 | $ 390,500.00 | Springbank | 19/09/2013 | 25/07/2014 | 2.04 | 309 | | | | 309 | ALBERTA | $ 200,980.39 | $ 191,421.57 | T3Z 0B4 |
| S | C3597208 | 63 ROLLING ACRES PL | $ 1,050,000.00 | $ 1,000,000.00 | Bearspaw Acres | 19/01/2014 | 18/07/2014 | 19.91 | 180 | | | | 209 | ALBERTA | $ 52,737.32 | $ 50,226.02 | T3R 1B8 |
| S | C3623094 | 214 PARTRIDGE BAY | $ 369,900.00 | $ 355,000.00 | Partridge Heights | 23/06/2014 | 17/07/2014 | 2 | 24 | Z-name Not Listed | | | 187 | ALBERTA | $ 184,950.00 | $ 177,500.00 | T3Z 2B9 |
| X | C3596752 | 232 BROWN BEAR PT | $ 399,500.00 | | Bearspaw_Calg | 17/01/2014 | 17/07/2014 | 2.01 | 181 | | | | 181 | ALBERTA | $ 198,756.22 | | T3R 1G3 |
| S | C3612237 | 185 SPRINGBANK HEIGHTS | $ 435,000.00 | $ 410,000.00 | Springbank | 29/04/2014 | 09/07/2014 | 2.42 | 71 | | | | 71 | ALBERTA | $ 179,752.07 | $ 169,421.49 | T3Z 1C4 |
| X | C3584193 | 243039 MORNING VISTA WY | $ 349,000.00 | | Springbank | 05/09/2013 | 06/07/2014 | 1.98 | 304 | | | | 304 | ALBERTA | $ 176,262.63 | | T2Z 0B2 |
| S | C3605365 | 30 WOODLAND GL | $ 398,700.00 | $ 390,000.00 | Bearspaw_Calg | 20/03/2014 | 02/07/2014 | 1.98 | 102 | | | 1 | 102 | ALBERTA | $ 201,363.64 | $ 196,969.70 | T3R 1G4 |
| X | C3595607 | 118 WINDHORSE CO | $ 425,000.00 | | Springbank | 07/01/2014 | 02/07/2014 | 2.05 | 176 | | | | 175 | ALBERTA | $ 207,317.07 | | T3Z 0B4 |
| X | C3595610 | 242255 WINDHORSE WY | $ 399,900.00 | | Springbank | 07/01/2014 | 02/07/2014 | 2.93 | 176 | | | | 175 | ALBERTA | $ 136,484.64 | | T3Z 0B4 |

# Rocky View West Listing

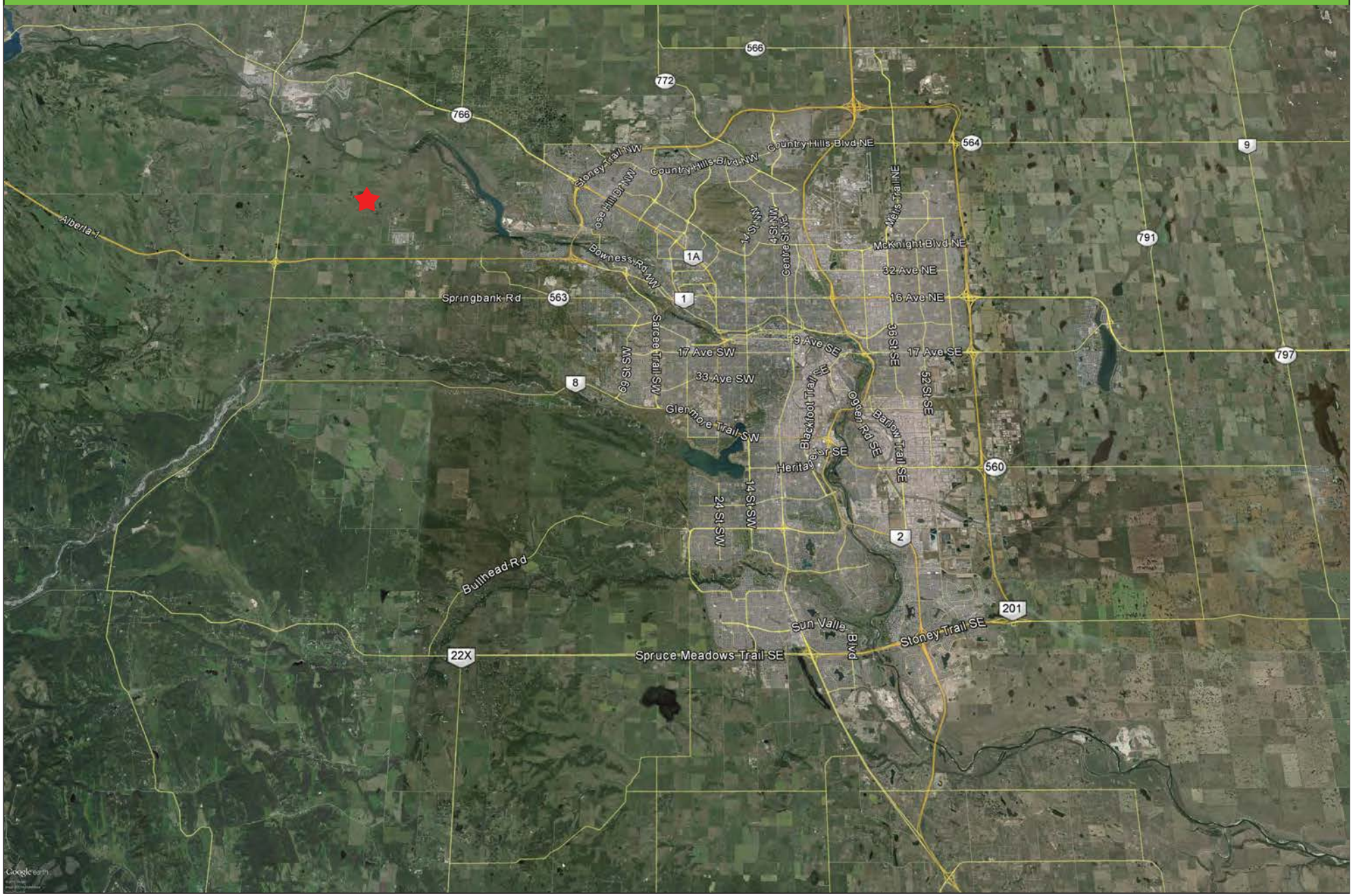
| Sta | ML Number | Address | List Price | Sold Price | Community Desc | List Date | Off Market Dat | Total Ac | Days c | Condo Name | Condo Type | Number of Parcels | Cummu | County | List Price / Acre | Sold Price / Acre | Postal Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | C3560024 | # Lot 3 25205 Bearspaw PL | $ 474,900.00 | | Bearspaw_Calg | 26/03/2013 | 01/07/2014 | 1.98 | 462 | | | | 462 | ALBERTA | $ 239,848.49 | | T3R 1H5 |
| X | C3560021 | # Lot 1 25205 BEARSPAW | $ 474,900.00 | | Bearspaw_Calg | 26/03/2013 | 01/07/2014 | 1.98 | 462 | | | | 462 | ALBERTA | $ 239,848.49 | | T3R 1H5 |
| X | C3607552 | 43 Big Hill Springs CV | $ 535,000.00 | | Big Hill Springs Est | 02/04/2014 | 30/06/2014 | 4.86 | 89 | | | | 89 | ALBERTA | $ 110,082.31 | | T4C 1A2 |
| X | C3595854 | 37 EMERALD BAY DR | $ 950,000.00 | | Springbank Links | 09/01/2014 | 30/06/2014 | 2.05 | 172 | | | | 172 | ALBERTA | $ 463,414.63 | | T3Z 1E3 |
| S | C3608674 | 31108 SWIFT CREEK TC | $ 499,800.00 | $ 470,000.00 | Springbank | 09/04/2014 | 25/06/2014 | 2.06 | 77 | Z-name Not Listed | | | 77 | ALBERTA | $ 242,621.36 | $ 228,155.34 | T3Z 0B7 |
| S | C3620912 | 206 GRIZZLY | $ 350,000.00 | $ 343,000.00 | Bearspaw Country Estates | 11/06/2014 | 24/06/2014 | 2.01 | 13 | | | | 13 | ALBERTA | $ 174,129.35 | $ 170,646.77 | T3L 2M7 |
| S | C3585708 | | $ 319,900.00 | $ 305,000.00 | Springbank | 16/09/2013 | 24/06/2014 | 2.84 | 281 | | | | 281 | ALBERTA | $ 112,640.85 | $ 107,394.37 | T3Z 2P8 |
| S | C3595505 | 34 GLENDALE ESTATES MR | $ 399,000.00 | $ 380,000.00 | Bearspaw_Calg | 06/01/2014 | 19/06/2014 | 1.98 | 164 | | | | 1403 | ALBERTA | $ 201,515.15 | $ 191,919.19 | T3R 1G3 |
| X | C3608310 | 24039 Burma RD | $ 895,000.00 | | Bearspaw_Calg | 07/04/2014 | 13/06/2014 | 15.81 | 67 | Z-name Not Listed | | | 126 | ALBERTA | $ 56,609.74 | | T3R 1E3 |
| S | C3608128 | 59 Big Hill Spings CV | $ 460,000.00 | $ 460,000.00 | Big Hill Springs Est | 05/04/2014 | 11/06/2014 | 4.01 | 67 | | | | 67 | ALBERTA | $ 114,713.22 | $ 114,713.22 | T4C 1A2 |
| X | C3595774 | 244119 PARTRIDGE | $ 470,000.00 | | Springbank | 08/01/2014 | 08/06/2014 | 2 | 151 | | | | 151 | ALBERTA | $ 235,000.00 | | T3P 0R3 |
| X | C3582915 | 244119 PARTRIDGE | $ 549,000.00 | | Springbank | 26/08/2013 | 08/06/2014 | 2 | 286 | | | | 286 | ALBERTA | $ 274,500.00 | | T2P 0R3 |
| X | C3594825 | 214 PARTRIDGE BA | $ 389,900.00 | | Partridge Heights | 20/12/2013 | 01/06/2014 | 2 | 163 | Z-name Not Listed | | | 163 | ALBERTA | $ 194,950.00 | | T3Z 2B9 |
| X | C3584161 | 213 MORGANS WY | $ 429,000.00 | | Springbank | 05/09/2013 | 31/05/2014 | 2 | 268 | Z-name Not Listed | | | 268 | ALBERTA | $ 214,500.00 | | T3Z 0B9 |
| X | C3568110 | 24 GRANDVIEW PLACE | $ 550,000.00 | | Springbank | 14/05/2013 | 31/05/2014 | 1.98 | 382 | | | | 382 | ALBERTA | $ 277,777.78 | | T3Z 0A7 |
| X | C3584203 | 206 MORNING VISTA VW | $ 479,000.00 | | Springbank | 05/09/2013 | 31/05/2014 | 2 | 268 | | | | 268 | ALBERTA | $ 239,500.00 | | T3Z 0B2 |
| S | C3605791 | 242091 RGE RD 32 | $ 2,195,000.00 | $ 2,195,000.00 | Springbank | 21/03/2014 | 27/05/2014 | 20 | 67 | | | | 67 | ALBERTA | $ 109,750.00 | $ 109,750.00 | T1X 0K1 |
| S | C3589267 | 26 ELBOW RIVER RD | $ 549,000.00 | $ 500,000.00 | Elbow River Estates | 15/10/2013 | 23/05/2014 | 4.08 | 220 | | | | 435 | ALBERTA | $ 134,558.82 | $ 122,549.02 | T3Z 2V2 |
| S | C3575046 | 3 WINDHORSE | $ 435,000.00 | $ 410,000.00 | Springbank | 27/06/2013 | 22/05/2014 | 2 | 329 | | | | 329 | ALBERTA | $ 217,500.00 | $ 205,000.00 | T3Z 0B4 |
| X | C3600987 | 35195 Springbank Road | $ 8,960,000.00 | | Springbank | 15/02/2014 | 18/05/2014 | 320 | 92 | | | | 256 | ALBERTA | $ 28,000.00 | | T3Z 3H3 |
| S | C3596619 | 11 KODIAK SPRINGS CV | $ 435,000.00 | $ 435,000.00 | Bearspaw Country Estates | 14/01/2014 | 17/05/2014 | 2 | 123 | | | | 123 | ALBERTA | $ 217,500.00 | $ 217,500.00 | T4C 0B5 |
| S | C3613969 | HAGGARD ROAD | $ 2,299,000.00 | $ 2,100,000.00 | Springbank | 07/05/2014 | 16/05/2014 | 34.35 | 9 | | | | 9 | ALBERTA | $ 66,928.68 | $ 61,135.37 | T3Z 3P3 |
| X | C3599346 | 31099 SWIFT CREEK | $ 749,000.00 | | Springbank | 06/02/2014 | 14/05/2014 | 2 | 97 | | | | 97 | ALBERTA | $ 374,500.00 | | T3A 0J7 |
| S | C3607356 | 24166 Old Banff Coach RD SW | $ 930,000.00 | $ 825,000.00 | NONE | 01/04/2014 | 11/05/2014 | 6.61 | 39 | | | | 39 | ALBERTA | $ 140,695.92 | $ 124,810.89 | T3Z 3N4 |
| S | C3586211 | 24 WINDHORSE BA | $ 410,000.00 | $ 370,000.00 | Springbank | 19/09/2013 | 09/05/2014 | 2.06 | 232 | | | | 232 | ALBERTA | $ 199,029.13 | $ 179,611.65 | T3Z 0B4 |
| S | C3581797 | 5 SWIFT CREEK GR | $ 499,800.00 | $ 462,000.00 | Springbank | 15/08/2013 | 05/05/2014 | 2.01 | 263 | | | | 263 | ALBERTA | $ 248,656.72 | $ 229,850.75 | T3Z 0B6 |
| S | C3607424 | | $ 1,500,000.00 | $ 1,500,000.00 | Bearspaw_Calg | 01/04/2014 | 05/05/2014 | 73.11 | 34 | | | | 34 | ALBERTA | $ 20,517.03 | $ 20,517.03 | T4C 1A7 |
| S | C3610858 | 116 Swift Creek CV SW | $ 459,900.00 | $ 430,000.00 | Springbank | 22/04/2014 | 02/05/2014 | 2.07 | 10 | | | | 826 | ALBERTA | $ 222,173.91 | $ 207,729.47 | T3Z 0B6 |
| S | C3603531 | 76 Eagle Butte Ranch | $ 549,000.00 | $ 485,000.00 | Springbank | 06/03/2014 | 01/05/2014 | 2.03 | 56 | | | | 126 | ALBERTA | $ 270,443.35 | $ 238,916.26 | T3Z 1K3 |
| S | C3541963 | 13 Country Meadows PL | $ 435,950.00 | $ 430,000.00 | Springbank | 01/10/2012 | 30/04/2014 | 1.98 | 576 | | | | 576 | ALBERTA | $ 220,176.77 | $ 217,171.72 | T3Z 0C3 |
| S | C3594713 | 251100 WELLAND WY | $ 680,000.00 | $ 635,000.00 | Bearspaw_Calg | 18/12/2013 | 30/04/2014 | 4.84 | 133 | | | | 629 | ALBERTA | $ 140,495.87 | $ 131,198.35 | T3R 1L3 |
| X | C3574240 | 8 Mountain Glen Close | $ 409,000.00 | | None | 20/06/2013 | 30/04/2014 | 2 | 314 | | | | 314 | ALBERTA | $ 204,500.00 | | T0L 0W0 |
| X | C3578466 | 21 Silverhorn VA | $ 625,000.00 | | None | 23/07/2013 | 30/04/2014 | 1.98 | 281 | | | | 281 | ALBERTA | $ 315,656.57 | | T3R 1C8 |
| X | C3598689 | Glenbow RD | $ 399,500.00 | | None | 31/01/2014 | 30/04/2014 | 3.7 | 89 | | | | 89 | ALBERTA | $ 107,972.97 | | T4C 2G4 |
| S | C3485203 | 39 MORGANS COURT | $ 475,000.00 | $ 488,250.00 | Morgans Rise | 21/07/2011 | 29/04/2014 | 2 | 1013 | Z-name Not Listed | | | 1013 | ALBERTA | $ 237,500.00 | $ 244,125.00 | T3Z 0A5 |
| S | C3593855 | 251225 Range Road 33 | $ 279,900.00 | $ 275,000.00 | Springbank | 02/12/2013 | 28/04/2014 | 2.13 | 147 | Z-name Not Listed | | | 147 | ALBERTA | $ 131,408.45 | $ 129,107.98 | T3Z 1K7 |
| X | C3589102 | | $ 469,000.00 | | None | 09/10/2013 | 09/04/2014 | 4.05 | 182 | | | | 182 | ALBERTA | $ 115,802.47 | | T4B 2B7 |
| X | C3599079 | 24039 Burma RD | $ 995,000.00 | | Bearspaw_Calg | 05/02/2014 | 05/04/2014 | 15.81 | 59 | Z-name Not Listed | | | 59 | ALBERTA | $ 62,934.85 | | T3R 1E3 |
| S | C3541959 | 9 Country Meadows PL | $ 430,700.00 | $ 422,000.00 | Springbank | 01/10/2012 | 26/03/2014 | 1.98 | 541 | | | | 541 | ALBERTA | $ 217,525.25 | $ 213,131.31 | T3Z 0C3 |
| S | C3596982 | 31159 GRANDARCHES | $ 779,000.00 | $ 750,000.00 | Springbank | 17/01/2014 | 25/03/2014 | 1.98 | 67 | | | | 67 | ALBERTA | $ 393,434.34 | $ 378,787.88 | T3Z 0A7 |
| X | C3586641 | 116 Swift Creek CV SW | $ 459,900.00 | | Springbank | 22/09/2013 | 23/03/2014 | 2.07 | 182 | | | | 816 | ALBERTA | $ 222,173.91 | | T3Z 0B6 |
| S | C3601812 | 244131 PARTRIDGE | $ 549,000.00 | $ 500,000.00 | Partridge Heights | 25/02/2014 | 17/03/2014 | 2.01 | 20 | | | | 20 | ALBERTA | $ 273,134.33 | $ 248,756.22 | T2P 0R3 |
| T | C3604801 | 5 MOUNTAIN GLEN CL | $ 399,500.00 | | None | 14/03/2014 | 17/03/2014 | 4 | 32 | | | | 32 | ALBERTA | $ 99,875.00 | | T4C 0G6 |
| S | C3586229 | 31 WINDHORSE GR | $ 410,000.00 | $ 380,000.00 | Springbank | 19/09/2013 | 13/03/2014 | 2.1 | 175 | | | | 175 | ALBERTA | $ 195,238.10 | $ 180,952.38 | T3Z 0B4 |
| S | C3586253 | 31071 WINDHORSE DR | $ 435,000.00 | $ 393,000.00 | Springbank | 19/09/2013 | 05/03/2014 | 2 | 167 | | | | 167 | ALBERTA | $ 217,500.00 | $ 196,500.00 | T3Z 0B4 |
| S | C3598161 | 251116 WELLAND | $ 589,000.00 | $ 579,000.00 | None | 29/01/2014 | 05/03/2014 | 4.5 | 35 | | | | 35 | ALBERTA | $ 130,888.89 | $ 128,666.67 | T3R 1L3 |
| S | C3563563 | | $ 579,900.00 | $ 549,900.00 | None | 17/04/2013 | 03/03/2014 | 3.98 | 320 | | | | 653 | ALBERTA | $ 145,703.52 | $ 138,165.83 | T3Z 2E3 |
| X | C3561483 | 49 UPLANDS RIDGE | $ 849,900.00 | | Uplands | 03/04/2013 | 03/03/2014 | 2 | 334 | Z-name Not Listed | | | 334 | ALBERTA | $ 424,950.00 | | T3Z 3N5 |
| X | C3576960 | 24166 Old Banff Coach Road RD | $ 1,200,000.00 | | None | 12/07/2013 | 01/03/2014 | 6.61 | 232 | | | | 232 | ALBERTA | $ 181,543.12 | | T3Z 3N4 |
| X | C3589835 | Eagle Butte Ranch | $ 549,000.00 | | Eagle Butte Ranches | 18/10/2013 | 28/02/2014 | 2.03 | 72 | | | | 72 | ALBERTA | $ 270,443.35 | | T3Z 1K3 |
| X | C3466512 | 243238 HORIZON VIEW ROAD | $ 995,000.00 | | Horizon View Estates | 18/03/2011 | 28/02/2014 | 5.27 | 1078 | Z-name Not Listed | | | 1078 | ALBERTA | $ 188,804.55 | | T3Z 3M3 |
| X | C3590765 | 164 GRANDVIEW WAY | $ 625,000.00 | | Springbank | 28/10/2013 | 28/02/2014 | 1.99 | 123 | | | | 123 | ALBERTA | $ 314,070.35 | | T3Z 0A8 |
| X | C3582467 | 12 Cody Range WY | $ 519,900.00 | | Church Ranches | 22/08/2013 | 21/02/2014 | 2.2 | 183 | | | | 183 | ALBERTA | $ 236,318.18 | | T3R 1C1 |
| X | C3581383 | 45 BEARSPAW SUMMIT PL | $ 390,000.00 | | Bearspaw_Calg | 14/08/2013 | 14/02/2014 | 1.98 | 184 | | | | 275 | ALBERTA | $ 196,969.70 | | T3A 1G4 |
| X | C3592535 | 35195 Springbank Road | $ 8,960,000.00 | | Springbank | 15/11/2013 | 14/02/2014 | 320 | 91 | | | | 168 | ALBERTA | $ 28,000.00 | | T3Z 3H3 |

# Rocky View West Listing

| Sta | ML Number | Address | List Price | Sold Price | Community Desc | List Date | Off Market Dat | Total Ac | Days c | Condo Name | Condo Type | Number of Parcels | Cummu | County | List Price / Acre | Sold Price / Acre | Postal Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | C3581253 | | $ 1,000,000.00 | | Glenbow | 12/08/2013 | 08/02/2014 | 4.27 | 180 | | | | 180 | ALBERTA | $ 234,192.04 | | T4C 0B7 |
| S | C3592943 | | $ 2,250,000.00 | $ 2,000,000.00 | Springbank | 20/11/2013 | 07/02/2014 | 34.32 | 79 | | | | 79 | ALBERTA | $ 65,559.44 | $ 58,275.06 | T3Z 3P3 |
| X | C3580848 | 3 Cheyanne Meadows GA N | $ 588,000.00 | | Bearspaw Acres | 09/08/2013 | 06/02/2014 | 1.98 | 181 | No Name | | | 181 | ALBERTA | $ 296,969.70 | | T3R 1B7 |
| X | C3327199 | 22 Highway, 4 miles north of Cochrane | $ 1,500,000.00 | | None | 13/05/2008 | 31/01/2014 | 53.3 | 2089 | | | | 2089 | ALBERTA | $ 28,142.59 | | T4C 1A9 |
| S | C3485205 | 35 MORGANS COURT | $ 425,000.00 | $ 441,000.00 | Morgans Rise | 21/07/2011 | 20/01/2014 | 2 | 914 | Z-name Not Listed | | | 914 | ALBERTA | $ 212,500.00 | $ 220,500.00 | T3Z 0A5 |
| S | C3545360 | 25198 SPRINGBANK RD. | $ 2,185,000.00 | $ 1,800,000.00 | Springbank | 05/11/2012 | 20/01/2014 | 20.29 | 441 | Z-name Not Listed | | | 441 | ALBERTA | $ 107,688.52 | $ 88,713.65 | T3Z 3M8 |
| T | C3594630 | 63 rolling acres PL NW | $ 1,200,000.00 | | Bearspaw Acres | 16/12/2013 | 16/01/2014 | 19.91 | 31 | | | 1 | 31 | ALBERTA | $ 60,271.22 | | T3R 1B8 |
| S | C3587544 | 31147 GRANDARCHES DR | $ 799,000.00 | $ 750,000.00 | Springbank | 23/09/2013 | 14/01/2014 | 1.98 | 113 | | | | 113 | ALBERTA | $ 403,535.35 | $ 378,787.88 | T3Z 0A7 |
| S | C3595608 | 242163 WINDHORSE WY | $ 450,000.00 | $ 417,000.00 | Springbank | 07/01/2014 | 14/01/2014 | 2.02 | 7 | | | | 7 | ALBERTA | $ 222,772.28 | $ 206,435.64 | T3Z 0B4 |
| S | C3588038 | 228 Horizon View GL | $ 595,000.00 | $ 550,000.00 | Springbank | 03/10/2013 | 13/01/2014 | 1.98 | 102 | | | | 102 | ALBERTA | $ 300,505.05 | $ 277,777.78 | T3Z 3M6 |
| X | C3592381 | 262 Lochend RD | $ 4,410,000.00 | | None | 08/11/2013 | 10/01/2014 | 157.56 | 63 | | | | 63 | ALBERTA | $ 27,989.34 | | T4C 2A3 |
| X | C3575097 | 43 GRANDVIEW PL | $ 595,000.00 | | Springbank | 27/06/2013 | 06/01/2014 | 2.03 | 193 | | | | 193 | ALBERTA | $ 293,103.45 | | T3Z 0A8 |
| X | E3343728 | 25006 TWP RD 264A | $ 6,200,000.00 | | None | 02/07/2013 | 06/01/2014 | 627.89 | 188 | | | 4 | 188 | ALBERTA | $ 9,874.34 | | T3R 1J6 |
| S | C3591083 | ASPEN DRIVE | $ 500,000.00 | $ 500,000.00 | Aspen park | 30/10/2013 | 05/01/2014 | 4 | 67 | | | | 67 | ALBERTA | $ 125,000.00 | $ 125,000.00 | T3R 1A5 |

# Appendix C – Harmony Mixed-Use Development, Springbank

# Regional Setting

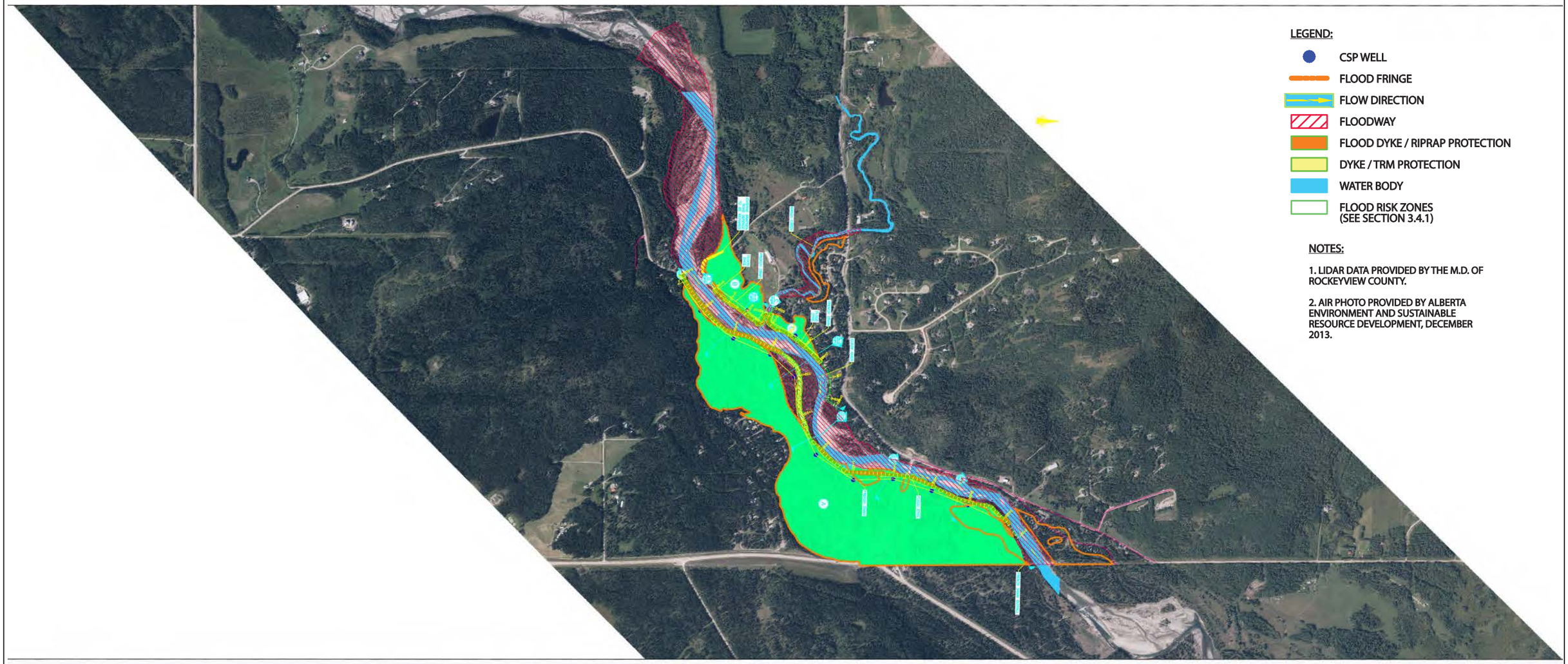


# Local Setting

# Conceptual Master Plan - Harmony

# Appendix D – Bragg Creek Proposed Dyke System

# Bragg Creek Flood Risk Area and Proposed Dyke System




Source:
amec - Southern Alberta Flood Recovery Task Force
Flood Mitigation Measures for the Bow, Elbow and Oldman River Basins
Volume 4 - Flood Mitigation Measures - Final
June 2014

## Elbow River at Banff Creek

Source:
amec - Southern Alberta Flood Recovery Task Force
Flood Mitigation Measures for the Bow, Elbow and Oldman River Basins
Volume 4 - Flood Mitigation Measures - Final
June 2014

N

# Conceptual Cost Estimate - Bragg Creek Flood Defence Dykes & French Drain

| Item No. | Item Description | Unit | Quantity | Unit Price | Extension |
|---|---|---|---|---|---|
| | **ALLOWANCES** | | | | |
| 1 | Larger Riprap sizing | Allow. | Allowance | | $200,000 |
| | **TEMPORARY FACILITIES** | | | | |
| 2 | Mobilization and Demobilization | L.S. | 1 | Lump Sum | $50,000 |
| 3 | Existing and Temporary Roads | L.S. | 1 | Lump Sum | $10,000 |
| | **SITE PREPARATION** | | | | |
| 4 | Clearing & Grubbing | ha | 3 | $2,000.00 | $6,251 |
| 5 | Topsoil & Subsoil Stripping | $m^3$ | 11315 | $5.00 | $56,577 |
| 6 | Care of Water | L.S. | 1 | Lump Sum | $75,000 |
| | **EXCAVATION** | | | | |
| 7 | Common Excavation | $m^3$ | 13820 | $6.50 | $89,831 |
| | **FILL PLACEMENT** | | | | |
| 8 | Low Permeable Fill | $m^3$ | 56263 | $10.00 | $562,628 |
| 9 | Common Fill | $m^3$ | 9577 | $6.00 | $57,461 |
| | **GRANULAR AND RIPRAP MATERIALS** | | | | |
| 10 | Granular Drain Rock | tonnes | 5456 | $35.00 | $190,966 |
| 11 | Riprap Zone 6B | tonnes | 14770 | $130.00 | $1,920,103 |
| 12 | Riprap Zone 6A | tonnes | 202 | $110.00 | $22,176 |
| 13 | Gravel Armour | tonnes | 9231 | $40.00 | $369,251 |
| 14 | Non-Woven Geotextile | $m^2$ | 15385 | $3.00 | $46,156 |
| | **SITE CONSTRUCTION** | | | | |
| 15 | 600 Dia. Perforated HDPE Pipe | m | 2947 | $120.00 | $353,606 |
| 16 | CSP Well Supply and Installation | L.S. | 12 | $15,000.00 | $180,000 |
| | **LANDSCAPING** | | | | |
| 17 | Topsoil & Subsoil Placement | $m^2$ | 15390 | $1.50 | $23,084 |
| 18 | Turf Reinforcement Mat | $m^2$ | 30779 | $6.00 | $184,674 |
| 19 | Hydroseeding | $m^2$ | 30779 | $3.50 | $107,727 |
| | **SUBTOTAL** | | | | **$4,505,490** |
| | | | | | |
| | **CONTINGENCIES @ 25%** | | | | **$1,126,373** |
| | | | | | |
| | **ENGINEERING @ 12%** | | | | **$540,659** |
| | | | | | |
| | **ESTIMATED TOTAL COST** | | | | **$6,173,000** |

Source:
amec - Southern Alberta Flood Recovery Task Force
Flood Mitigation Measures for the Bow, Elbow and Oldman River Basins
Volume 4 - Flood Mitigation Measures - Final
June 2014

# Appendix E – City of Calgary Flood Damage Estimates

# Total Damages, Bow and Elbow Rivers, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $268,753,000 | $414,798,000 | $686,791,000 | $947,786,000 | $1,329,201,000 | $1,496,364,000 |
| | Indirect 15% | $0 | $0 | $0 | $40,313,000 | $62,220,000 | $103,019,000 | $142,168,000 | $199,380,000 | $224,455,000 |
| | Total | $0 | $0 | $0 | $309,066,000 | $477,018,000 | $789,810,000 | $1,089,954,000 | $1,528,581,000 | $1,720,819,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,210,000 | $37,446,000 | $111,079,000 | $271,990,000 | $493,824,000 | $572,607,000 |
| | Indirect 323% | $0 | $0 | $0 | $49,128,000 | $120,951,000 | $358,785,000 | $878,528,000 | $1,595,052,000 | $1,849,521,000 |
| | Total | $0 | $0 | $0 | $64,338,000 | $158,397,000 | $469,864,000 | $1,150,518,000 | $2,088,876,000 | $2,422,128,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $101,508,000 | $170,620,000 | $299,100,000 | $452,626,000 | $686,656,000 | $780,711,000 |
| | Indirect 20% | $0 | $0 | $0 | $20,302,000 | $34,124,000 | $59,820,000 | $90,525,000 | $137,331,000 | $156,142,000 |
| | Total | $0 | $0 | $0 | $121,810,000 | $204,744,000 | $358,920,000 | $543,151,000 | $823,987,000 | $936,853,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 185% | $0 | $0 | $0 | $18,860,000 | $78,030,000 | $127,400,000 | $169,928,000 | $308,521,000 | $357,741,000 |
| | Total | $0 | $0 | $0 | $29,060,000 | $120,230,000 | $196,300,000 | $261,828,000 | $475,374,000 | $551,213,000 |
| Total | Direct | $0 | $0 | $0 | $395,671,000 | $665,064,000 | $1,165,870,000 | $1,764,302,000 | $2,676,534,000 | $3,043,154,000 |
| | Indirect 73% | $0 | $0 | $0 | $128,603,000 | $295,325,000 | $649,024,000 | $1,281,149,000 | $2,240,284,000 | $2,587,859,000 |
| | Total | $0 | $0 | $0 | $524,274,000 | $960,389,000 | $1,814,894,000 | $3,045,451,000 | $4,916,818,000 | $5,631,013,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Total Damages, Bow River, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $167,738,000 | $247,549,000 | $387,075,000 | $582,482,000 | $891,235,000 | $991,311,000 |
| | Indirect 15% | $0 | $0 | $0 | $25,161,000 | $37,133,000 | $58,062,000 | $87,372,000 | $133,685,000 | $148,697,000 |
| | Total | $0 | $0 | $0 | $192,899,000 | $284,682,000 | $445,137,000 | $669,854,000 | $1,024,920,000 | $1,140,008,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,128,000 | $36,965,000 | $100,874,000 | $256,774,000 | $471,284,000 | $539,790,000 |
| | Indirect 323% | $0 | $0 | $0 | $48,863,000 | $119,397,000 | $325,823,000 | $829,380,000 | $1,522,248,000 | $1,743,522,000 |
| | Total | $0 | $0 | $0 | $63,991,000 | $156,362,000 | $426,697,000 | $1,086,154,000 | $1,993,532,000 | $2,283,312,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $63,102,000 | $98,179,000 | $168,379,000 | $289,606,000 | $470,170,000 | $528,344,000 |
| | Indirect 20% | $0 | $0 | $0 | $12,621,000 | $19,636,000 | $33,676,000 | $57,921,000 | $94,034,000 | $105,669,000 |
| | Total | $0 | $0 | $0 | $75,723,000 | $117,815,000 | $202,055,000 | $347,527,000 | $564,204,000 | $634,013,000 |
| Stampede | Direct | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Indirect 185% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Total | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total | Direct | $0 | $0 | $0 | $245,968,000 | $382,693,000 | $656,328,000 | $1,128,862,000 | $1,832,689,000 | $2,059,445,000 |
| | Indirect 84% | $0 | $0 | $0 | $86,645,000 | $176,166,000 | $417,561,000 | $974,673,000 | $1,749,967,000 | $1,997,888,000 |
| | Total | $0 | $0 | $0 | $332,613,000 | $558,859,000 | $1,073,889,000 | $2,103,535,000 | $3,582,656,000 | $4,057,333,000 |

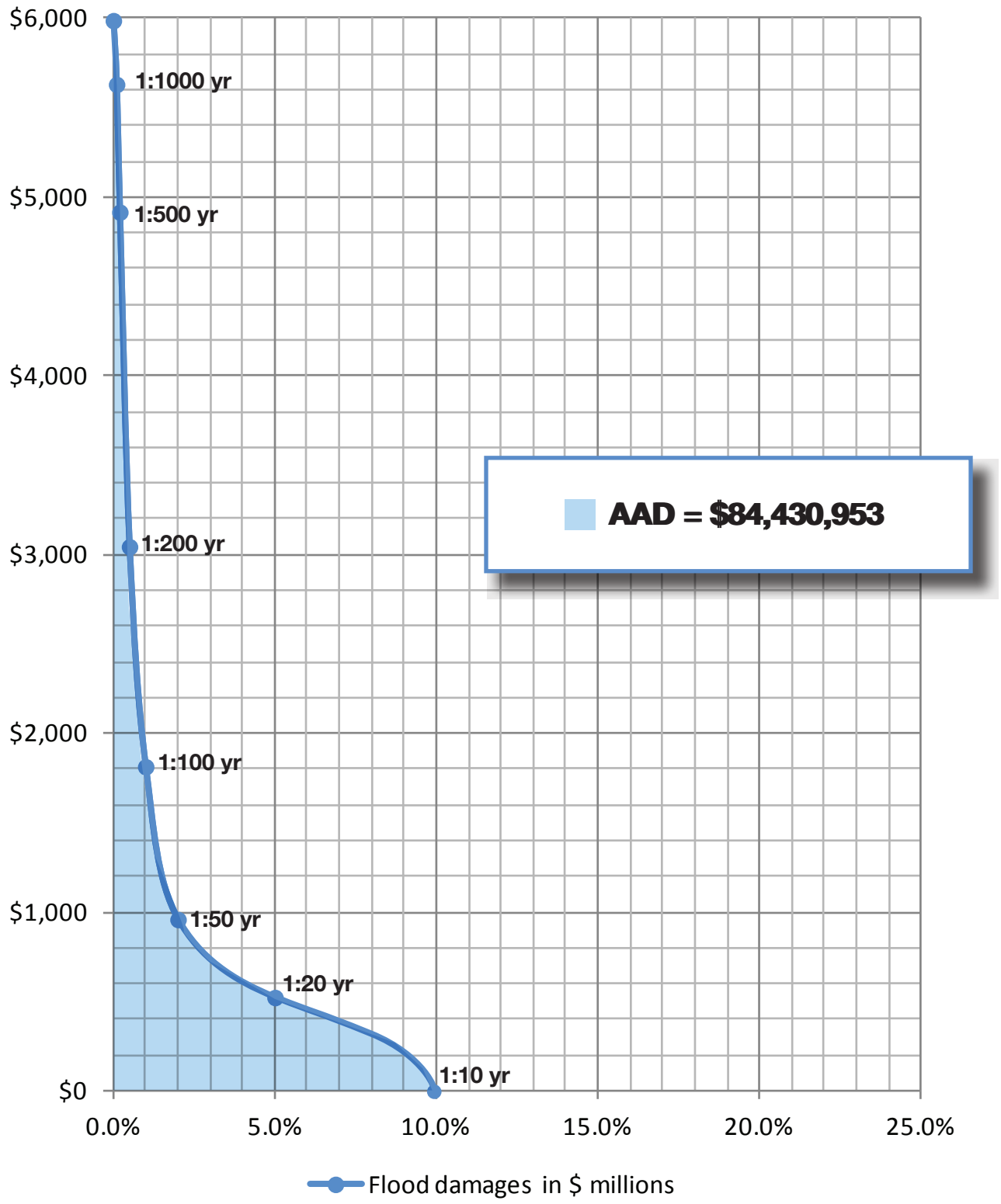
* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Total Damages, Elbow River, With Sewer Backup

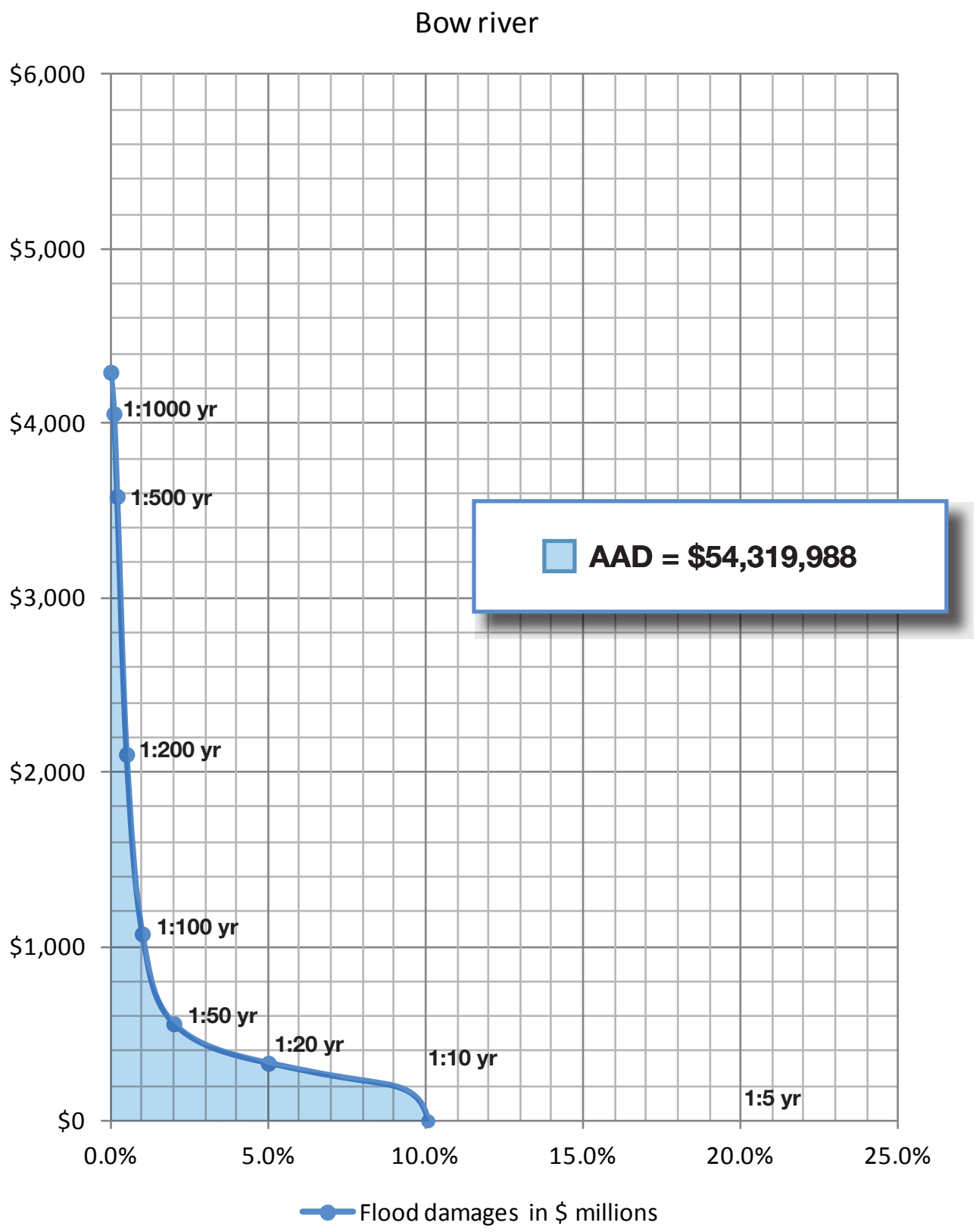
| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $0 | $0 | $0 | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $0 | $0 | $0 | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $0 | $0 | $0 | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 323% | $0 | $0 | $0 | $265,000 | $1,554,000 | $32,962,000 | $49,148,000 | $72,804,000 | $105,999,000 |
| | Total | $0 | $0 | $0 | $347,000 | $2,035,000 | $43,167,000 | $64,364,000 | $95,344,000 | $138,816,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $38,406,000 | $72,441,000 | $130,721,000 | $163,020,000 | $216,486,000 | $252,367,000 |
| | Indirect 20% | $0 | $0 | $0 | $7,681,000 | $14,488,000 | $26,144,000 | $32,604,000 | $43,297,000 | $50,473,000 |
| | Total | $0 | $0 | $0 | $46,087,000 | $86,929,000 | $156,865,000 | $195,624,000 | $259,783,000 | $302,840,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 185% | $0 | $0 | $0 | $18,860,000 | $78,030,000 | $127,400,000 | $169,928,000 | $308,521,000 | $357,741,000 |
| | Total | $0 | $0 | $0 | $29,060,000 | $120,230,000 | $196,300,000 | $261,828,000 | $475,374,000 | $551,213,000 |
| Total | Direct | $0 | $0 | $0 | $149,703,000 | $282,371,000 | $509,542,000 | $635,440,000 | $843,845,000 | $983,709,000 |
| | Indirect 52% | $0 | $0 | $0 | $41,958,000 | $119,159,000 | $231,463,000 | $306,476,000 | $490,317,000 | $589,971,000 |
| | Total | $0 | $0 | $0 | $191,661,000 | $401,530,000 | $741,005,000 | $941,916,000 | $1,334,162,000 | $1,573,680,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

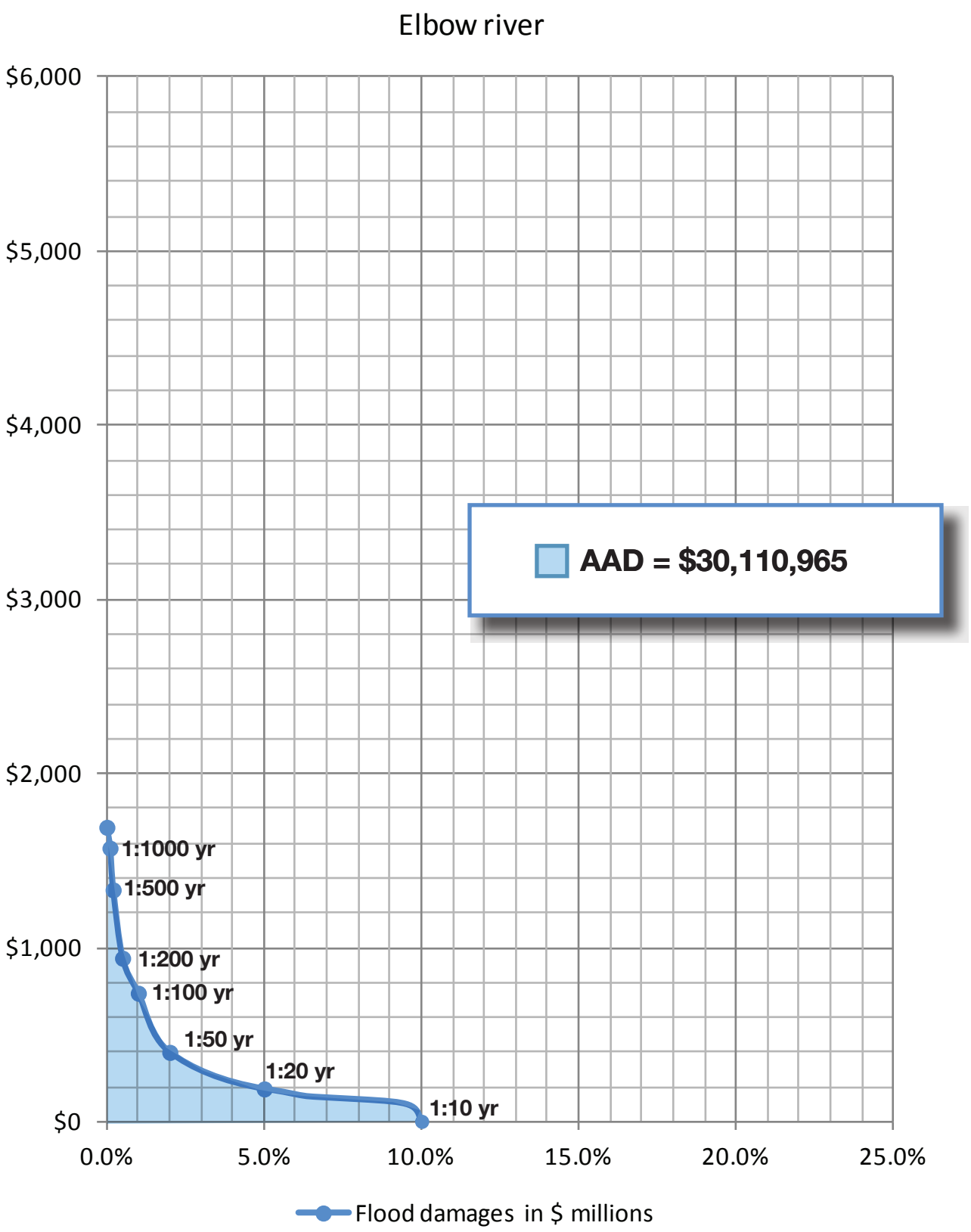
# Flood Damages Probability Distribution, Bow and Elbow Rivers



# Flood Damages Probability Distribution, Bow River



# Flood Damages Probability Distribution, Elbow River



# Alternative Damage Scenario - Total Damages, Bow and Elbow Rivers, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $268,753,000 | $414,798,000 | $686,791,000 | $947,786,000 | $1,329,201,000 | $1,496,364,000 |
| | Indirect 15% | $0 | $0 | $0 | $40,313,000 | $62,220,000 | $103,019,000 | $142,168,000 | $199,380,000 | $224,455,000 |
| | Total | $0 | $0 | $0 | $309,066,000 | $477,018,000 | $789,810,000 | $1,089,954,000 | $1,528,581,000 | $1,720,819,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,210,000 | $37,446,000 | $111,079,000 | $271,990,000 | $493,824,000 | $572,607,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $16,851,000 | $49,986,000 | $122,396,000 | $222,221,000 | $257,673,000 |
| | Total | $0 | $0 | $0 | $15,210,000 | $54,297,000 | $161,065,000 | $394,386,000 | $716,045,000 | $830,280,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $21,639,000 | $90,929,000 | $159,400,000 | $241,219,000 | $365,941,000 | $416,066,000 |
| | Indirect 20% | $0 | $0 | $0 | $4,328,000 | $18,186,000 | $31,880,000 | $48,244,000 | $73,188,000 | $83,213,000 |
| | Total | $0 | $0 | $0 | $25,967,000 | $109,115,000 | $191,280,000 | $289,463,000 | $439,129,000 | $499,279,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 38% | $0 | $0 | $0 | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $0 | $0 | $0 | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $0 | $0 | $0 | $315,802,000 | $585,373,000 | $1,026,170,000 | $1,552,895,000 | $2,355,819,000 | $2,678,509,000 |
| | Indirect 22% | $0 | $0 | $0 | $48,549,000 | $113,427,000 | $211,285,000 | $348,021,000 | $558,721,000 | $639,473,000 |
| | Total | $0 | $0 | $0 | $364,351,000 | $698,800,000 | $1,237,455,000 | $1,900,916,000 | $2,914,540,000 | $3,317,982,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Alternative Damage Scenario - Total Damages, Bow River, With Sewer Backup

| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $167,738,000 | $247,549,000 | $387,075,000 | $582,482,000 | $891,235,000 | $991,311,000 |
| | Indirect 15% | $0 | $0 | $0 | $25,161,000 | $37,133,000 | $58,062,000 | $87,372,000 | $133,685,000 | $148,697,000 |
| | Total | $0 | $0 | $0 | $192,899,000 | $284,682,000 | $445,137,000 | $669,854,000 | $1,024,920,000 | $1,140,008,000 |
| Commercial | Direct | $0 | $0 | $0 | $15,128,000 | $36,965,000 | $100,874,000 | $256,774,000 | $471,284,000 | $539,790,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $16,635,000 | $45,394,000 | $115,549,000 | $212,078,000 | $242,905,000 |
| | Total | $0 | $0 | $0 | $15,128,000 | $53,600,000 | $146,268,000 | $372,323,000 | $683,362,000 | $782,695,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $13,452,000 | $52,323,000 | $89,734,000 | $154,340,000 | $250,569,000 | $281,571,000 |
| | Indirect 20% | $0 | $0 | $0 | $2,691,000 | $10,465,000 | $17,947,000 | $30,868,000 | $50,114,000 | $56,314,000 |
| | Total | $0 | $0 | $0 | $16,143,000 | $62,788,000 | $107,681,000 | $185,208,000 | $300,683,000 | $337,885,000 |
| Stampede | Direct | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Indirect 38% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| | Total | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total | Direct | $0 | $0 | $0 | $196,318,000 | $336,837,000 | $577,683,000 | $993,596,000 | $1,613,088,000 | $1,812,672,000 |
| | Indirect 23% | $0 | $0 | $0 | $27,852,000 | $64,233,000 | $121,403,000 | $233,789,000 | $395,877,000 | $447,916,000 |
| | Total | $0 | $0 | $0 | $224,170,000 | $401,070,000 | $699,086,000 | $1,227,385,000 | $2,008,965,000 | $2,260,588,000 |

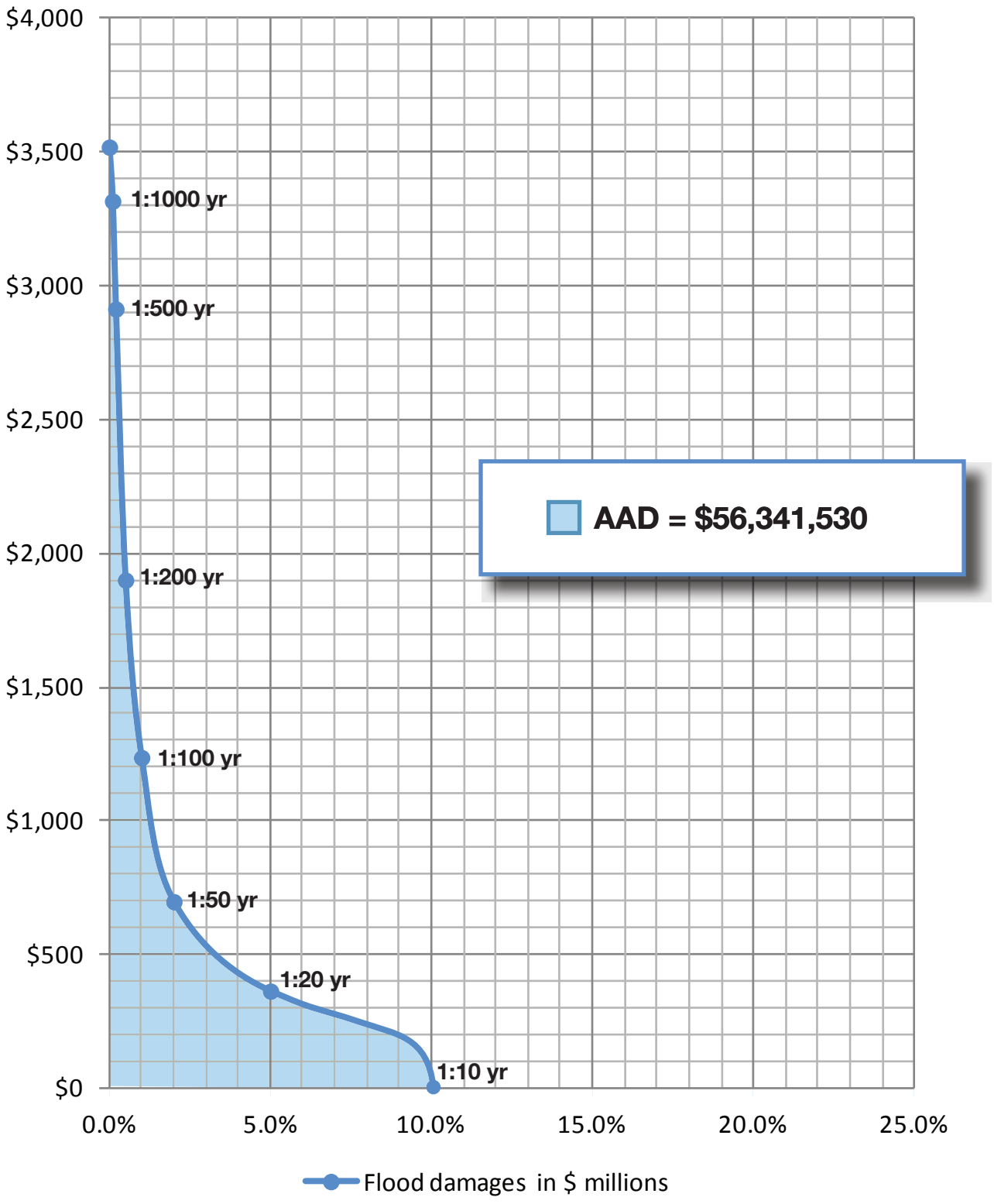
* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

# Alternative Damage Scenario - Total Damages, Elbow River, With Sewer Backup

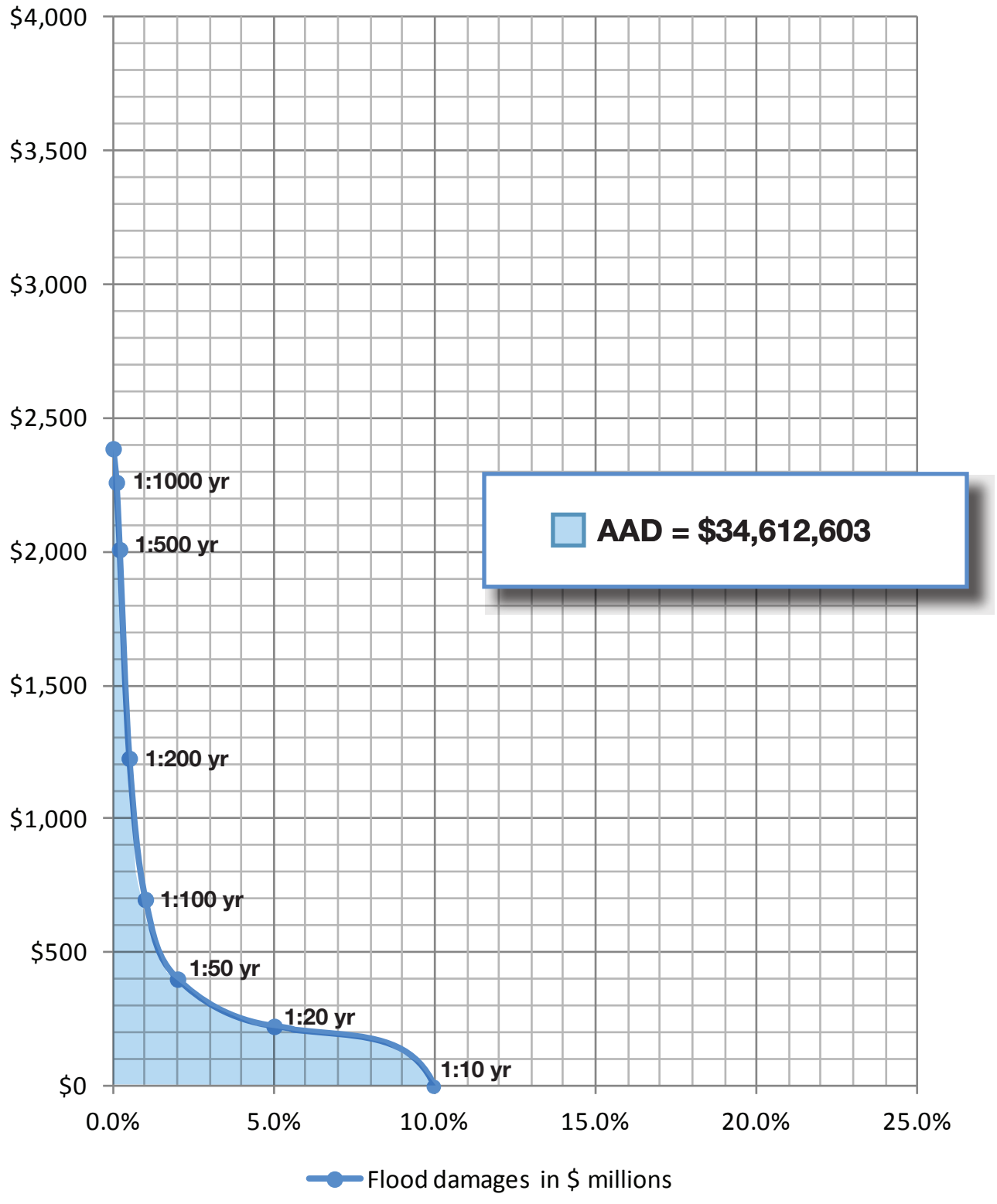
| Categories of damage | | Return frequency, in years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2* | 5* | 10** | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $0 | $0 | $0 | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $0 | $0 | $0 | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $0 | $0 | $0 | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $0 | $0 | $0 | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 45% | $0 | $0 | $0 | $0 | $216,000 | $4,592,000 | $6,847,000 | $10,143,000 | $14,768,000 |
| | Total | $0 | $0 | $0 | $82,000 | $697,000 | $14,797,000 | $22,063,000 | $32,683,000 | $47,585,000 |
| Infrastructure | Direct | $0 | $0 | $0 | $8,187,000 | $38,606,000 | $69,666,000 | $86,879,000 | $115,372,000 | $134,495,000 |
| | Indirect 20% | $0 | $0 | $0 | $1,637,000 | $7,721,000 | $13,933,000 | $17,376,000 | $23,074,000 | $26,899,000 |
| | Total | $0 | $0 | $0 | $9,824,000 | $46,327,000 | $83,599,000 | $104,255,000 | $138,446,000 | $161,394,000 |
| Stampede | Direct | $0 | $0 | $0 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 38% | $0 | $0 | $0 | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $0 | $0 | $0 | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $0 | $0 | $0 | $119,484,000 | $248,536,000 | $448,487,000 | $559,299,000 | $742,731,000 | $865,837,000 |
| | Indirect 21% | $0 | $0 | $0 | $20,697,000 | $49,194,000 | $89,882,000 | $114,232,000 | $162,844,000 | $191,557,000 |
| | Total | $0 | $0 | $0 | $140,181,000 | $297,730,000 | $538,369,000 | $673,531,000 | $905,575,000 | $1,057,394,000 |

* No Actual damages occur at these flow levels
** Flood Flow primarily contained within the river

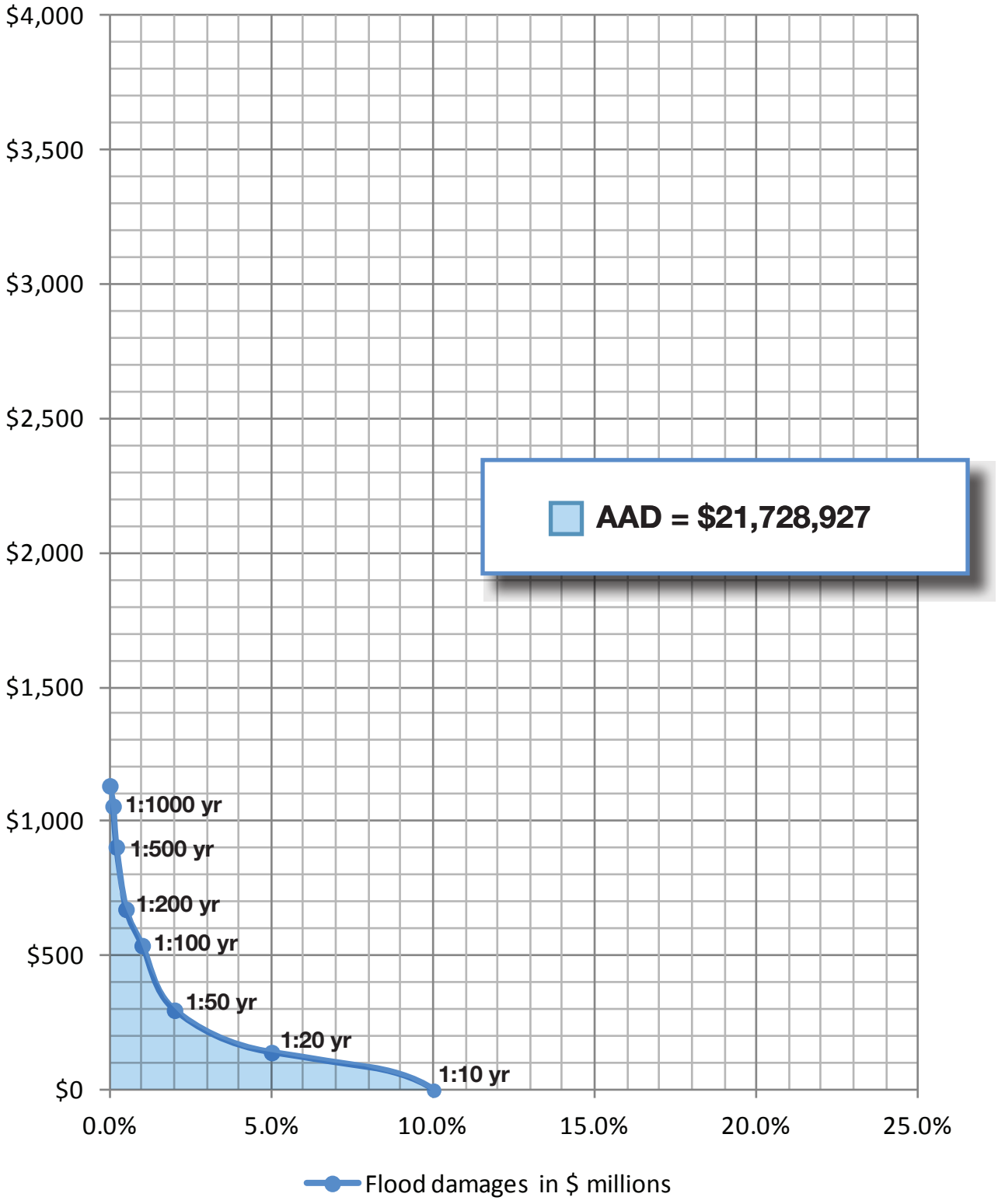
## Alternative Damage Scenario - Flood Damages Probability Distribution, Bow and Elbow Rivers



## Alternative Damage Scenario - Flood Damages Probability Distribution, Bow River



## Alternative Damage Scenario - Flood Damages Probability Distribution, Elbow River



# Appendix F – 2013 Southern Alberta Disaster Recovery Program

## Rocky View County Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Emergency Operations | Ongoing | Y | Sept. 19, 2013 | 450000.00 | Approved inspection estimate |
| 2 | Hamlet of Bragg Creek water intake | Ongoing | Y | Sept. 19, 2013 | 110000.00 | Approved inspection estimate |
| 3 | Hamlet of Bragg Creek road damage | Ongoing | Y | Sept. 19, 2013 | 20000.00 | Approved inspection estimate |
| 4 | Balsam Ave Erosion | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 5 | Access to Hamlet of Bragg Creek Snowbirds Chalet | Ongoing | Y | Sept. 19, 2013 | 5000.00 | Approved inspection estimate |
| 6 | Hamlet of Bragg Creek Community Centre | Ongoing | Y | Sept. 19, 2013 | 35000.00 | Approved inspection estimate |
| 7 | Wood debris site | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 8 | Wintergreen road | Ongoing | Y | Sept. 19, 2013 | 10000.00 | Approved inspection estimate |
| 9 | Slapping Tail Pond | Ongoing | Y | Sept. 19, 2013 | 75000.00 | Approved inspection estimate |
| 12 | RR 54, S of TWP road 234 | Ongoing | Y | Sept. 19, 2013 | 10000.00 | Approved inspection estimate |
| 14 | Bracken Road gate and spillway | Ongoing | Y | Sept. 19, 2013 | 15000.00 | Approved inspection estimate |
| 15 | Bracken Road | Ongoing | Y | Sept. 19, 2013 | 25000.00 | Approved inspection estimate |
| 16 | Bracken Road S TWP Rd 232, Bragg Creek BF72292 | Ongoing | Y | Sept. 19, 2013 | 29000.00 | Approved inspection estimate |
| 18 | RR 41, S of Springbank Road, Gross Creek BF74057 | Ongoing | Y | Sept. 19, 2013 | 15000.00 | Approved inspection estimate |
| 19 | Springbank road W of RR 35, Springbank Creek BF9024 | Ongoing | Y | Sept. 19, 2013 | 20770.00 | Approved inspection estimate |
| 33 | Bragg Creek Municipal Park | Ongoing | Y | Sept. 19, 2013 | 20000.00 | Approved inspection estimate |
| 34 | Springbank Park for All Seasons | Ongoing | N | Dec. 9, 2013 | 194000.00 | Applicant initial estimate only |
| TOTAL BUDGET ESTIMATES FOR ROCKY VIEW COUNTY ONGOING PROJECTS | | | | | $1,083,770.00 | |

# 2013 Southern Alberta Disaster Recovery Program - Ongoing Project Estimate Tracking - As of February 4, 2014

## Townsite of Redwood Meadows Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Northern berm breach | Ongoing | Y | Sept. 10, 2013 | 838000.00 | Approved inspection estimate |
| 2 | Sleigh Drive berm breach | Ongoing | Y | Sept. 10, 2013 | 75000.00 | Approved inspection estimate |
| 3 | Use of existing rip rap for flood protection | Ongoing | Y | Sept. 10, 2013 | 465000.00 | Approved inspection estimate |
| 4 | Water treatment plant | Ongoing | Y | Sept. 10, 2013 | 75000.00 | Approved inspection estimate |
| 5 | Playground berm breach | Ongoing | Y | Sept. 10, 2013 | 690000.00 | Approved inspection estimate |
| 6 | Berm breach, #18 Redwood Meadows Drive | Ongoing | Y | Sept. 10, 2013 | 444000.00 | Approved inspection estimate |
| 7 | Sanitary sewer pumping station | Ongoing | Y | Sept. 10, 2013 | 70000.00 | Approved inspection estimate |
| TOTAL BUDGET ESTIMATES FOR TOWNSITE OF REDWOOD MEADOWS ONGOING PROJECTS | | | | | $2,657,000.00 | |

## Tsuu T'ina Ongoing Project Estimates

| Project Number | Project Name | Status | Approved Estimate (Y/N) | Latest Estimate Date | Estimate ($) | Comments |
|---|---|---|---|---|---|---|
| 1 | Emergency Operations | Ongoing | N | Sept. 25, 2013 | 60384.22 | Applicant initial estimate only |
| 2 | Infrastructure Damage | Ongoing | N | Sept. 25, 2013 | 211611.26 | Applicant initial estimate only |
| 3 | Housing | Ongoing | N | Sept. 25, 2013 | 29914.77 | Applicant initial estimate only |
| 4 | Band Works | Ongoing | Y | Nov. 11, 2013 | 800000.00 | Approved inspection estimate |
| 5 | Redwood Meadows Golf Course | Ongoing | Y | Nov. 11, 2013 | 800000.00 | Approved inspection estimate |
| TOTAL BUDGET ESTIMATES FOR TSUU T'INA FIRST NATION ONGOING PROJECTS | | | | | $1,901,910.25 | |

**TOTAL ESTIMATE OF ONGOING PROJECTS** **$5,642,680.25**

# Elbow River Flood Mitigation Project Decisions Fact Sheet

Benefit-cost analysis studies show the Springbank Off-stream Reservoir offers a higher benefit-cost ratio than the McLean Creek Dry Dam or Glenmore Reservoir Diversion (also known as the Calgary Tunnel).

## Benefit-Cost Ratios for Proposed Projects

| | Worst-Case Damage Scenario | | Anticipated Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Protection | 1:200 Protection | 1:100 Protection | 1:200 Protection |
| Springbank Off-stream Reservoir | 1.87 | 2.07 | 1.32 | 1.32 |
| McLean Creek Dry Dam | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore Reservoir Diversion | 1.21 | 1.20 | 0.81 | 0.83 |

## Assumptions and Methodology

Assumptions and methodology used in **all three** benefit-cost analyses:

- Damage assessments were generated for nine return frequencies to calculate average annual damages, including: 1:2 year, 1:5 year, 1:10 year, 1:20 year, 1:50 year, 1:100 year, 1:200 year, 1:500 year and 1:1000 year.
- Damage estimates were also assessed under two cases:
  - a higher, or “worst case”, condition, and
  - a lower, or “anticipated case”, condition.
- Costs are based on the estimated capital and operational/maintenance costs presented in Section 4 of each report.
- Benefits are based on the quantification of flood damages averted as outlined in Section 5 of each report.
- The benefit/cost analysis has been carried out using a net present value analysis.
- A 100-year economic analysis was used.
- Annual operating and maintenance costs are assessed at $1.8 million.

For both the **Springbank Off-stream Reservoir** and **Glenmore Reservoir Diversion**, $8.9 million in capital costs were added to each project to account for required mitigation measures upstream in Bragg Creek and Redwood Meadows.

For the **Springbank Off-stream Reservoir**, an additional $40 million in capital costs were added to account for land acquisition.

For the **McLean Creek Dry Dam**, an additional $45 million in capital costs were added to account for the replacement or relocation of impacted Parks infrastructure.

For both the **Springbank Off-Stream Reservoir** and **McLean Creek Dry Dam**, it was assumed that once the design event is exceeded, full damages are incurred. This is due to the absence of additional hydrologic routing.

For the **Glenmore Reservoir Diversion**, it was possible to calculate the reduced damages that would be achieved as a result of the 500 and 700 cubic metres per second diversion (1:100 year and 1:200 year protection, respectively). The incremental flow was passed downstream and damages based on the reduced flood flow were computed to determine the net benefits. Consequently, a higher benefit can be attributed to the diversion scheme based on this higher level of analysis.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## Total Estimated Costs for Proposed Projects

Below is a breakdown of the estimated costs for 2013-level protection used in the benefit-cost analysis for each project. Annual operating and maintenance costs of $1.8 million were added to each project.

| | Springbank Off-stream Reservoir | McLean Creek Dry Dam | Glenmore Reservoir Diversion (700 $m^3/s$) |
|---|---|---|---|
| Estimated construction costs for 2013-level protection | $214,768,000 | $294,581,000 | $498,200,000 |
| Land acquisition | $40,000,000 | | |
| Park/Infrastructure replacement | | $45,000,000 | |
| Bragg Creek protection | $8,900,000 | | $8,900,000 |
| Environmental Impact Studies | | $4,000,000 | |
| **TOTAL** | **$263,668,000** | **$343,581,000** | **$507,100,000** |

## Provincial Flood Damage Assessment Study

The Alberta government initiated the Provincial Flood Damage Assessment Study (PFDAS) in July 2014 to:

- Update/develop flood damage curves in select communities at risk of flood to 2014 economic values and establish adjustment indices for their use in 60 different flood-prone communities across Alberta;
- Develop a computerized model for estimating flood damages; and
- Undertake flood damage estimates for select communities in Alberta.

Key points regarding content and structural stage-damage curves include:

- Direct flood damages were estimated separately for residential and non-residential structures, and also for losses to structures versus contents;
- Potential losses vary significantly by the type of use, reflecting differences in construction materials, techniques and quality, and also in the amount and type of contents located in those structures;
- The analysis resulted in updated depth-damage curves for various categories of residential and non-residential structures and contents based on extensive first- and second-order research including representative sampling of residences and non-residential structures within selected functional groups.

Calgary, High River, Fort McMurray and Drumheller were identified as high priority communities and will be the subject of flood damage assessments undertaken as part of the PFDAS. Flood damage assessments for High River, Fort McMurray and Drumheller will be complete at the end of March.

The City of Calgary was selected for the pilot study due to recent flood damage experience, large inventory of residential and commercial structural types and categories, recent update of hydraulic modelling in 2012 and analysis of 2013 flood flows, and availability of accurate rehabilitation costs.

**Total damage along the Elbow River (within Calgary) for a 1:100 year flood**
**Anticipated Damage Scenario**

| Categories of Damage | Direct | Indirect | Total |
|---|---|---|---|
| Residential | $299,716,000 | $44,957,000 | $344,673,000 |
| Commercial | $10,205,000 | $4,592,000 | $14,797,000 |
| Infrastructure | $69,666,000 | $13,933,000 | $83,599,000 |
| Stampede | $68,900,000 | $26,400,000 | $95,300,000 |
| Total | $448,487,000 | $89,882,000 | **$538,369,000** |

The full versions of all reports are available at http://www.alberta.ca/flood-mitigation-studies.cfm.


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# Springbank Off-stream Reservoir Open House

Alberta Government

**The following information was presented at an open house held:**

**March 10, 2015 in Calgary (Springbank)**

**(Pinebrook Golf & Country Club 4:30 - 8 p.m.)**

Alberta Government

# Welcome to the Springbank Off-stream Reservoir Open House

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Engagement

Alberta Government

# Listening and learning

Stakeholder engagement is a process that allows anyone potentially affected by a project to:

- Become informed.
- Ask questions and have them answered.
- Raise concerns and have them addressed.
- Provide input into the project.

Engagement is critical to the proposed Springbank Off-stream Reservoir project.

- We are committed to sharing information and working with the public and First Nations communities to ensure all input and concerns are heard, understood and addressed.
- Where appropriate, the information gathered will be used to refine the proposed project design.
- Your comments about the project and the commitments we make will be a part of the regulatory application.
- The Stakeholder Engagement process for the EIA is unbiased and coordinated through a third-party consultancy.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## What's New

Updated information since open houses on
January 27 and 28, 2015

- Benefit - Cost Analysis information for Springbank Off-stream Reservoir, McLean Creek Dry Dam and the Calgary Underground Diversion Tunnel.
- Information on the McLean Creek Environmental Overview.
- Revised map showing the project perimeter with impacted land.
- Revised map showing the size of the project as compared to the Glenmore Reservoir.
- Information on the Natural Resources Conservation Board (NRCB) process.
- Additional information on regulatory approval processes.
- 2013 flood event information related to the proposed mitigation initiatives.

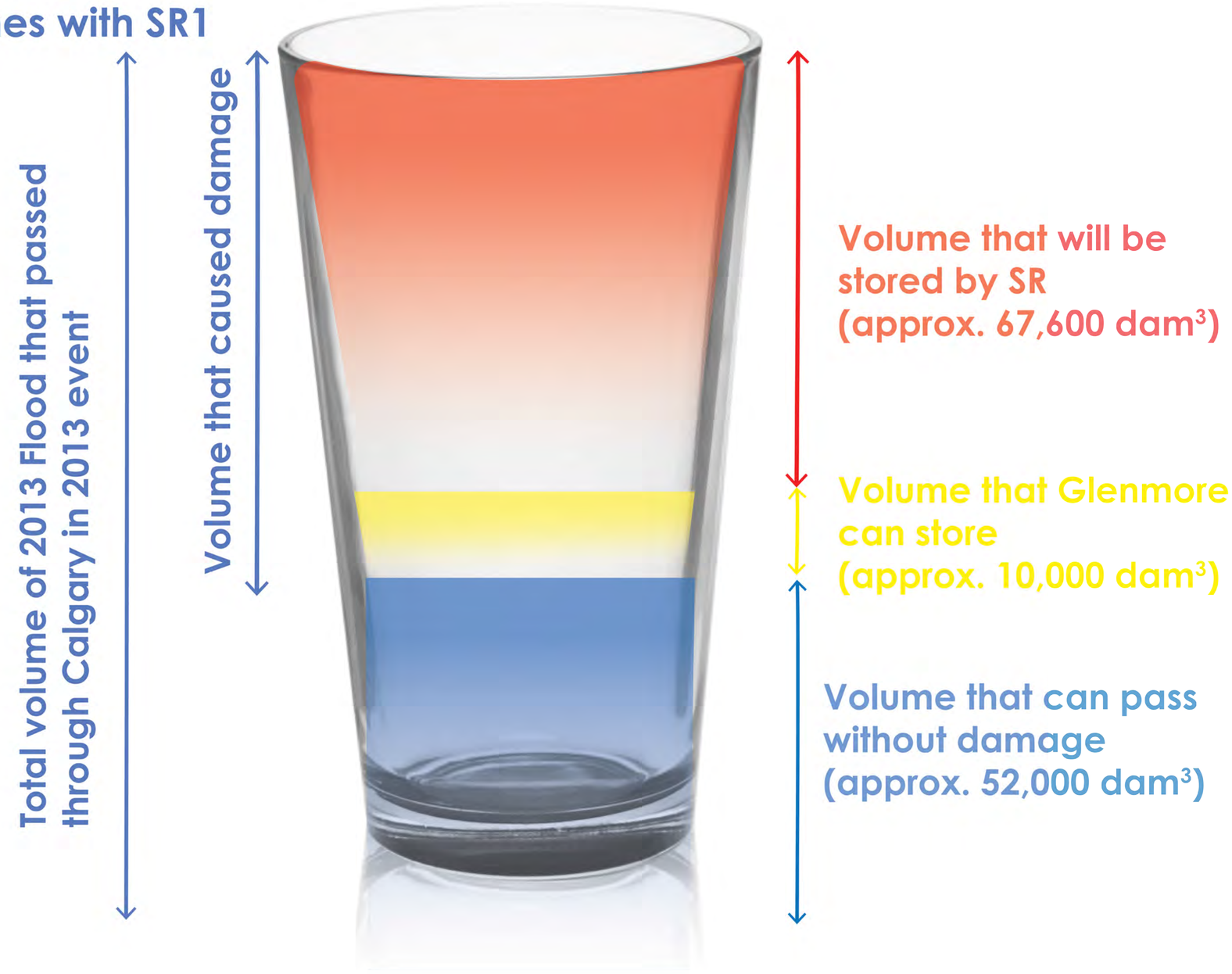
Presented at Calgary (Springbank) Open House on March 10, 2015

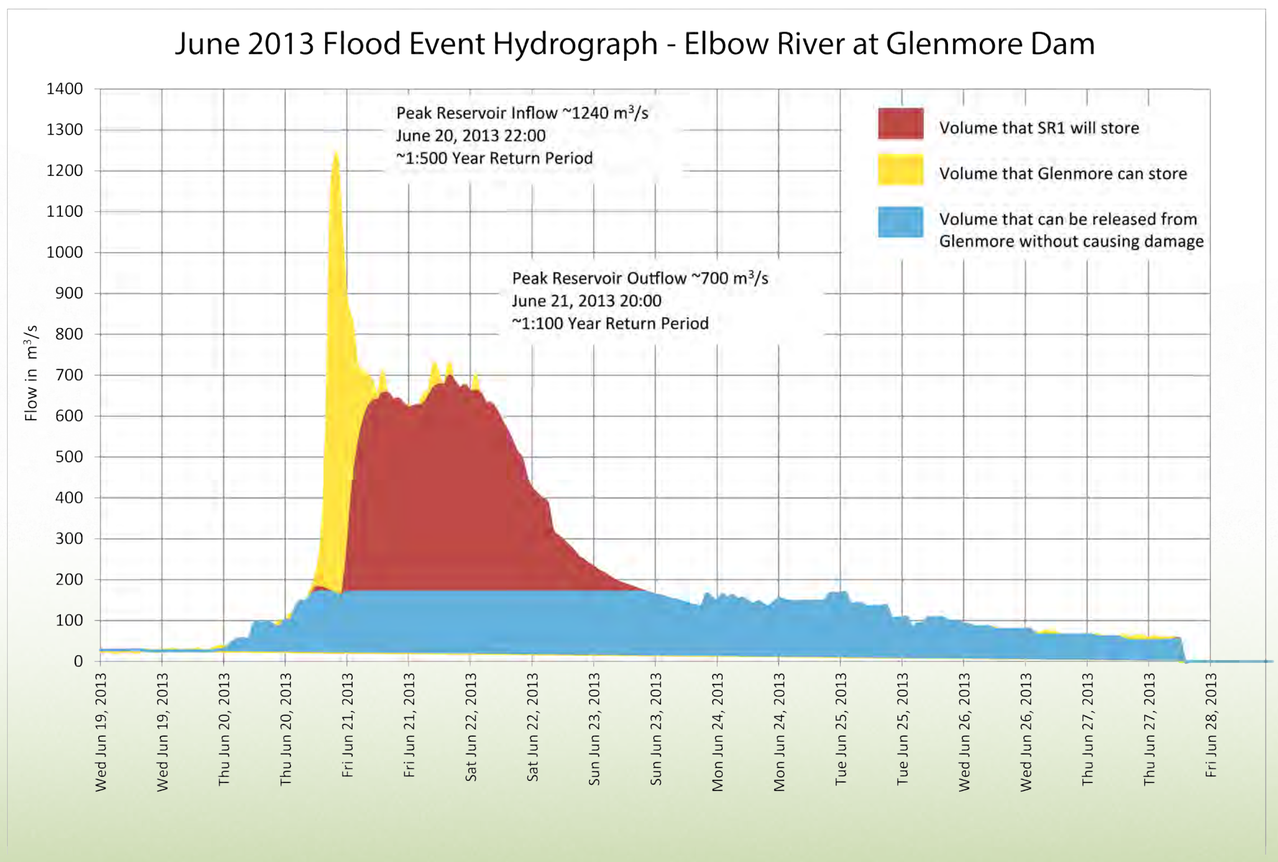
# Springbank Off-stream Reservoir Open House

## 2013 Flood Event

Alberta Government

### June 2013 Flood Volumes with SR1




The Springbank Off-stream Reservoir is being designed to store the same water volume that caused damage in the 2013 flood event.

- 1 dam³ is 1 cubic decameter (1000 m³)
- 1 Olympic swimming pool = 2.5 dam³
- 27,040 Olympic swimming pools = 67,600 dam³

Peak flow recorded on the Bow River, upstream of the Elbow River during the 2013 flood was 1780 m³/s. (AMEC 2014).

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Alberta's Approach to Flood Mitigation

Alberta Government

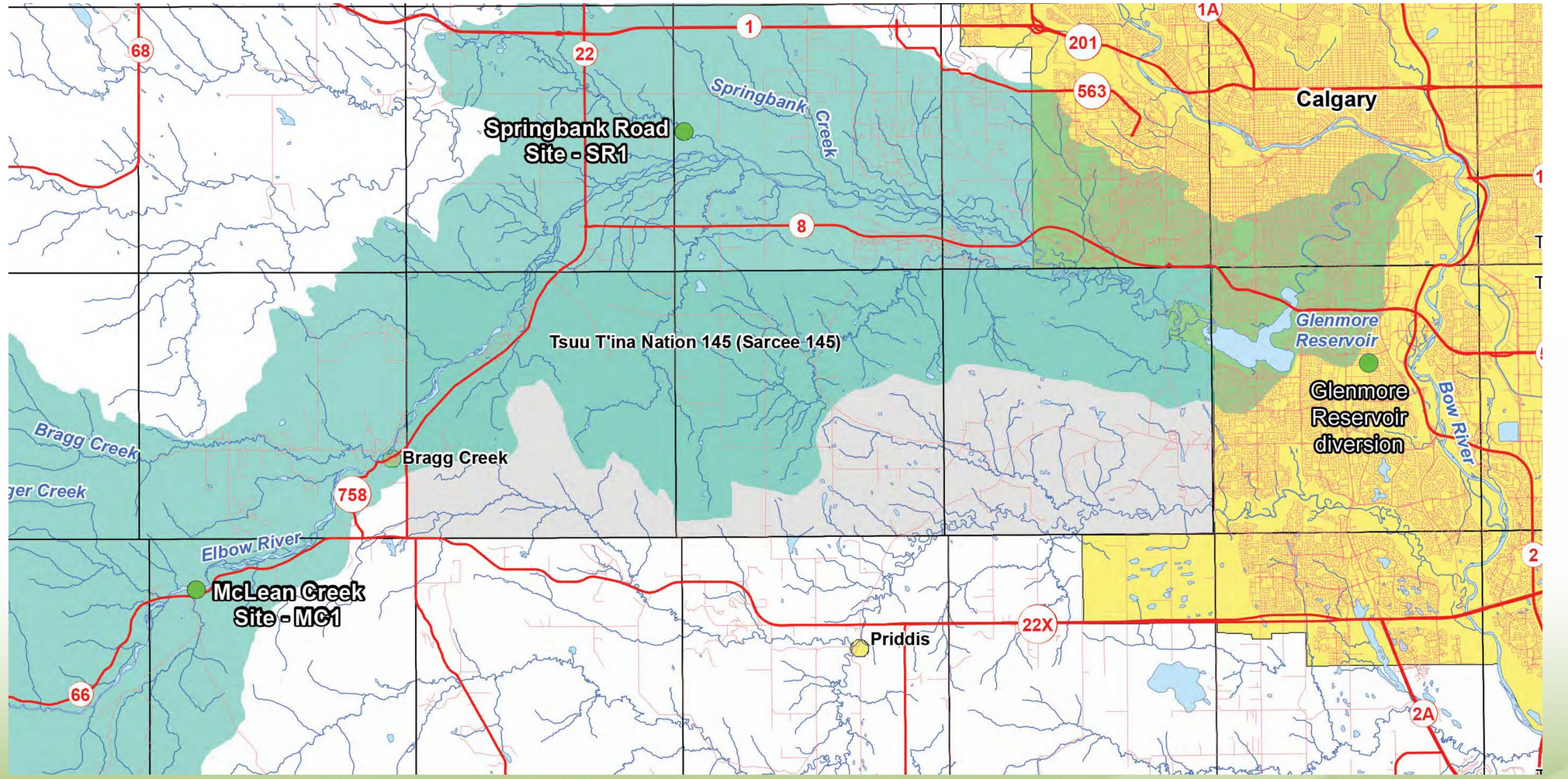
**Seven key elements that guide our approach to flood mitigation:**

- Overall watershed management.
- Flood modelling prediction and warning systems.
- Flood risk management policies.
- Water management and mitigation infrastructure.
- Erosion control.
- Local mitigation initiatives by municipalities.
- Individual mitigation measures for homes.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Project Locations

Alberta Government




Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Bow River Dams

There are four dams on the main stem of the Bow River:

- Bearspaw Dam - TransAlta
- Kananaskis Dam (Seebe Reservoir) - TransAlta
- Ghost Dam - TransAlta
- Horseshoe Dam - TransAlta

The total storage capacity of existing TransAlta reservoirs is approximately 704,000 $dam^3$. (AMEC 2014)

There are a number of other dams in the Bow River Basin upstream of Calgary.

**Other significant dams in the Bow River Basin:**

- Interlakes Dam – TransAlta (Upper Kananaskis Lake, Kananaskis River)
- Pocaterra Dam – TransAlta (Lower Kananaskis Lake, Kananaskis River)
- Barrier Dam – TransAlta (Barrier Lake, Kananaskis River)
- Cascade Dam – TransAlta (Cascade River /Lake Minnewanka)
- Canyon Dam and Three Sisters Dam – TransAlta (Spray Lake Storage Reservoir System on the Spray River and Goat Creek)

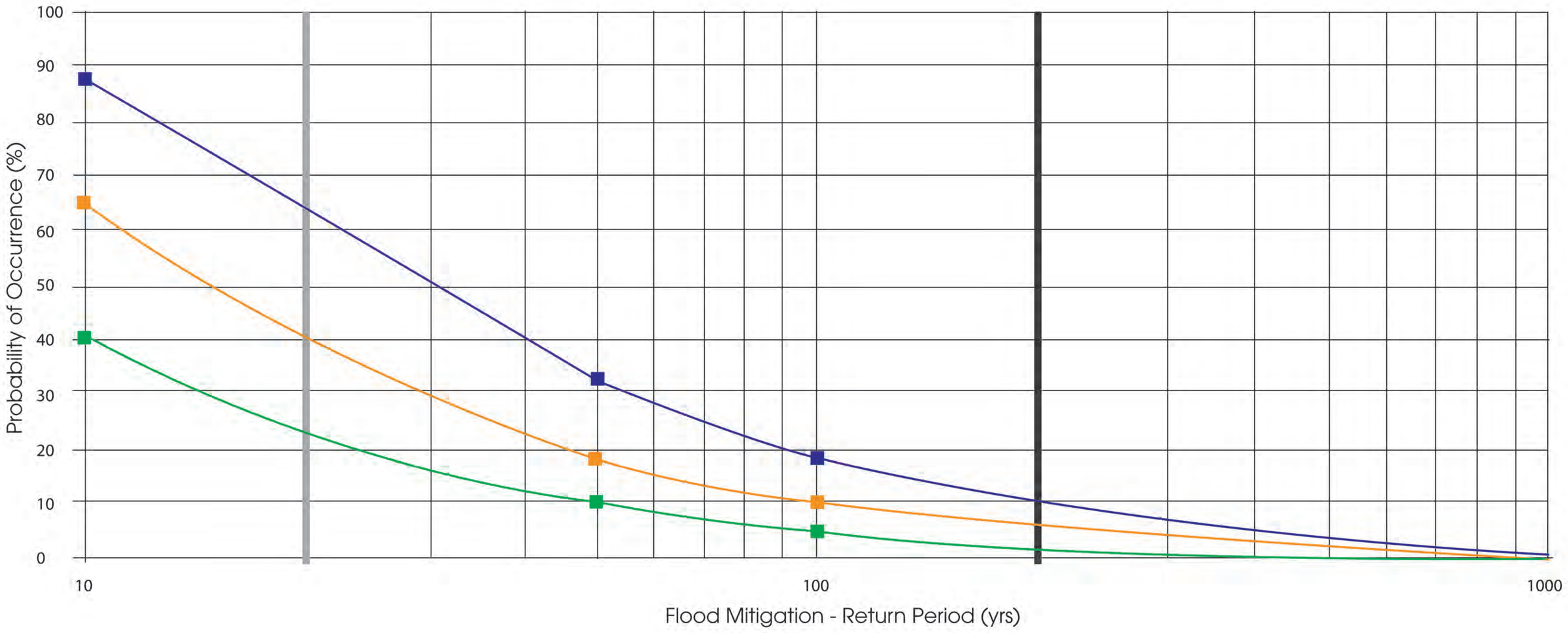
## What's Next

- Due to its size and location on the Bow River, the Ghost Dam offers the best, and quickest, opportunity for flood mitigation.
- An agreement was in place for 2014 with TransAlta to modify operations of the Ghost Dam to provide part of an immediate flood mitigation solution for the Bow River. Discussions are ongoing for future years.
- The Government of Alberta will be working with TransAlta to actively manage water levels in the Ghost Dam.

# Springbank Off-stream Reservoir Open House

## Elbow River Flood Mitigation

Alberta Government




This graph shows the likelihood of a damage-causing rainfall event is approximately 20 per cent in any five year period.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Decision to Proceed

Alberta Government

Based on the preliminary findings of the cost estimates and environmental information presented in flood mitigation studies by AMEC in March 2014, a decision was made to proceed with development of the Springbank Off-stream Reservoir Project.

- This decision was further confirmed by the McLean Creek Environmental Scan Report (AMEC, 2015) and the Benefit-Cost Analyses Report (IBI Group, 2015).

The decision to proceed with this project first is based on:

- Preliminary environmental, social and economic factors
- Projected regulatory review timelines
- Preliminary benefit-cost analyses – as defined by the IBI Group report
- Constructability and risk during construction
- Timelines to construct
- Other considerations

## Systems approach to flood mitigation

As part of the overall systems approach for the Elbow River, work also continues on the following potential flood mitigation options:

- Implement localized mitigation measures including berming, hardening, infrastructure modification, dredging, etc.
- McLean Creek Dam
- Calgary Underground Diversion Tunnel

# Springbank Off-stream Reservoir Open House

## Dam Locations & Safety FAQs

Alberta Government

**Q. How was the location for the Springbank Off-stream Reservoir selected? Could it be moved further west or east?**

- The location for the project is governed by topography.
- It takes advantage of the surrounding hills and expansive valley of the project area to minimize the amount of earth fill (or excavation) that is required to achieve the design storage volumes.

**Q. Would the reservoir be able to handle a larger flood than what occurred in 2013?**

- It is being designed to mitigate flooding to the 2013 event, or equivalent.

**Q. What are the flood mitigation plans for Bragg Creek and Redwood Meadows?**

- Funding is provided under a community flood mitigation program to protect these communities from future flooding. Local mitigation measures are being considered, and McLean Creek is still under consideration.

# Springbank Off-stream Reservoir Open House

## Benefit - Cost Analysis

Alberta Government

### Benefit/Cost Comparison

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |

The same criteria and assumptions were used to evaluate all three potential projects.

### Project Comparison

| | Springbank Off-stream Reservoir | McLean Creek Dam |
|---|---|---|
| Design Event | 2013 Flood Event | 2013 Flood Event |
| Level of Design Considered | Conceptual | Conceptual |
| Land Requirements | Private Land | Crown Land |
| Roads/Land Access | - Raising Hwy 22<br>- Realignment of Springbank Road<br>- Bridge Crossing of Diversion<br>- Local Road Modifications | - Hwy 66 Relocation including Bridge<br>- Haul/Access Roads |
| River Diversion Structure | Yes | N/A |
| Diversion Channel | Yes | N/A |
| Floodplain Berm | Yes | N/A |
| Main Dam Structure | Yes | Yes |
| Outlet Structure and Spillways | Yes | Yes |
| Construction Contingency | 25% | 25% |
| Engineering/Environmental | 20% | 20% |
| Total Cost Estimate | $214,768,000 | $294,581,000 |

# Springbank Off-stream Reservoir Open House

## Project Comparisons

Alberta Government

Based on the preliminary desktop environmental review done to date.

| | McLean Creek | Springbank Reservoir |
|---|---|---|
| Type of Reservoir | On-stream Reservoir | Off-stream Reservoir |
| Land Ownership | Crown Land | Freehold Land |
| Anticipated Flood Storage Volume Capacity | 49,000 dam³ (100-year design flood) | 67,600 dam³ (2013 design flood) |
| Location | • On the Elbow River near McLean Creek | • Diversion on the Elbow River near Hwy 22 and channel to move flood water to storage facility in Springbank. |
| Operation Start Date (Anticipated) | Approximately 7 years from decision to proceed. | Spring 2018 |
| Construction TImeline (Anticipated) | • Construction period is 2 to 3 years. | • Approx. 18 months.<br>• In-stream river work expected to be 1 year. |
| Vegetation | • Recorded rare plants in area (reported in 1960s). | • No recorded rare plants. |
| Wildlife of Concern | • Identified grizzly bear, harlequin duck and wolverine habitat (species listed as sensitive, at risk, or of special concern). | • Not identified as habitat for grizzly bear, harlequin duck and wolverine. |
| Fish and Fish Habitat | • At low flow, concern about bull trout and mountain whitefish movement.<br>• Spring passage concerns for passing rainbow trout. | |
| | • Fish – potential for west slope cutthroat trout (listed as threatened).<br>• Possible populations of brook trout, brown trout, bull trout, cutthroat trout, long nose dace, mountain whitefish, rainbow trout, and white sucker.<br>• Habitat - Greater potential to change in-stream transport of woody debris and bed load (cobble, gravels) and Substantive changes to fish habitat in the area that will be impounded.<br>• Concerns with stranding fish in impoundments behind the dam as water drains out because on-stream.<br>• More in-stream work in the river equates to the potential to cause longer disruptions to fish in the Elbow River. Higher potential for "serious harm to fish."<br>• Larger in-stream footprint. | • Fish – no native strains of west slope cutthroat trout reported.<br>• Possible populations of brook trout, brown trout, bull trout, burbot, longnose dace, longnose sucker, mountain whitefish, and rainbow trout.<br>• Habitat - Allows bedload and woody debris movement at lower frequency floods.<br>• Greater opportunity to encourage positive drainage that will allow for fish to escape or be rescued.<br>• Lower in the watershed - has larger fish (stronger swimmers), more migratory potential and higher potential for northern pike and burbot (slow swimmers).<br>• Smaller scale of river work and larger river means fish are better able to find over-wintering habitat.<br>• Smaller in-stream footprint. |

# Springbank Off-stream Reservoir Open House

## Other Projects Under Consideration

Alberta Government

## McLean Creek Dry Dam

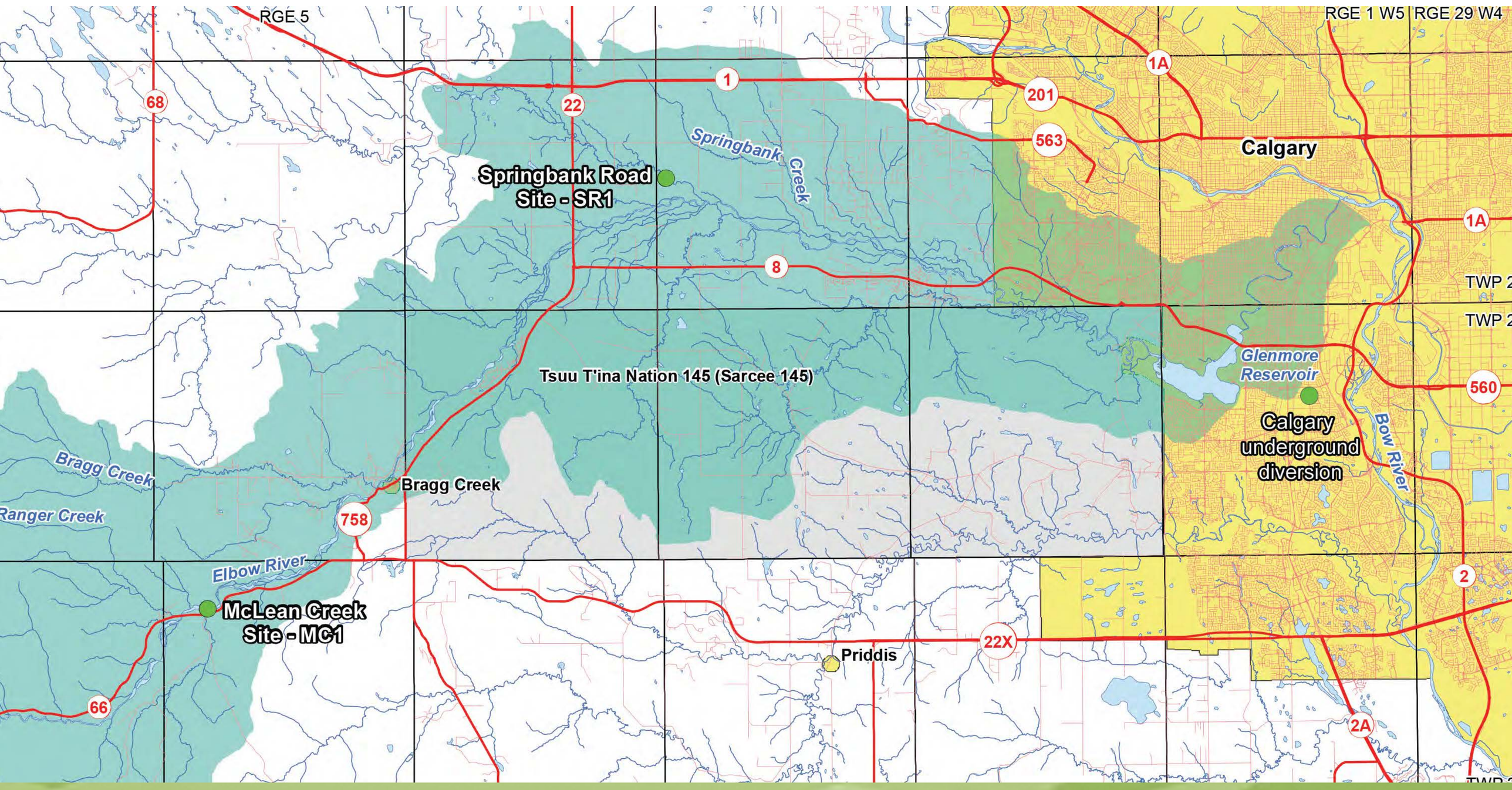
This proposed dry dam upstream of Bragg Creek would help control flow rates on the Elbow River during a flood.

Status: Proposed project under consideration.

## Calgary Underground Diversion

This proposed project would divert flood water underground along Heritage Drive from Glenmore Reservoir to the Bow River.

Status: Proposed project under consideration.

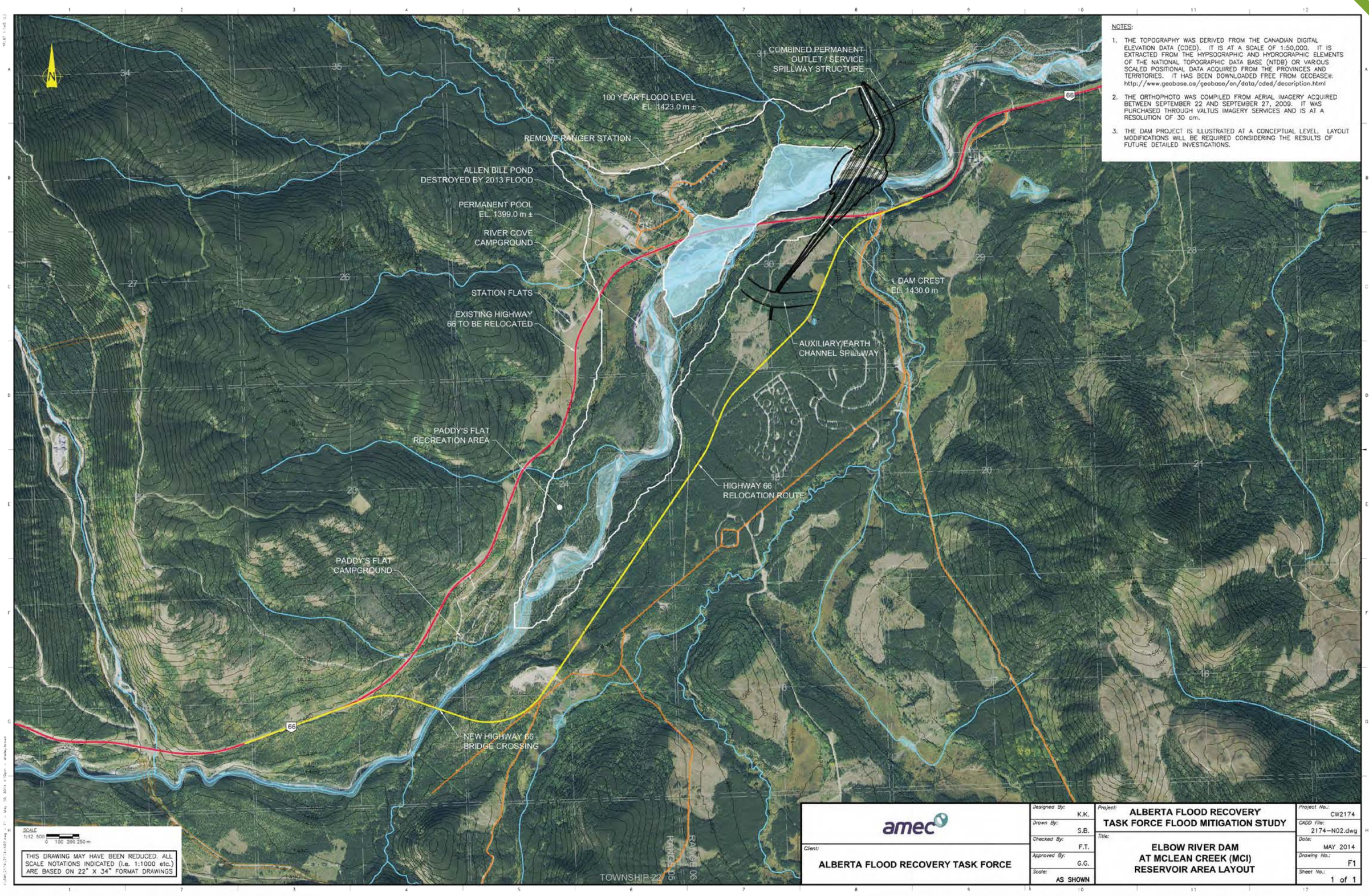



Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Conceptual Map McLean Creek Dry Dam

Alberta Government

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# Springbank Off-stream Reservoir Open House

## McLean Creek Environmental Review Study Findings

Alberta Government

The study found:

- Operating regime would have a direct  and significant influence on potential environmental effects of the project.
- The dam would be a physical barrier resulting in changes to flows, aquatic habitat, and movement of fish and wildlife.
- Potential effects on bull trout, grizzly bear and other listed species.
- Mitigation and management of potential impacts may be needed at a regional scale.
- Land and resource use will be altered by construction and operation.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Anticipated Damage Scenario - Total Damages, Elbow River, with Sewer Backup

Alberta Government

| Categories of Damage | | Return Frequency, in Years | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | **10** | **20** | **50** | **100** | **200** | **500** | **1,000** |
| Residential | Direct | $62,973,000 | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $9,446,000 | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $72,419,000 | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $0 | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 15% | $0 | $0 | $216,000 | $4,592,000 | $6,847,000 | $10,143,000 | $14,768,000 |
| | Total | $0 | $82,000 | $697,000 | $14,797,000 | $22,063,000 | $32,683,000 | $47,585,000 |
| Infrastructure | Direct | $2,572,000 | $8,187,000 | $38,606,000 | $69,666,000 | $86,879,000 | $115,372,000 | $134,495,000 |
| | Indirect 15% | $514,000 | $1,637,000 | $7,721,000 | $13,933,000 | $17,376,000 | $23,074,000 | $26,899,000 |
| | Total | $3,086,000 | $9,824,000 | $46,327,000 | $83,599,000 | $104,255,000 | $138,446,000 | $161,394,000 |
| Stampede | Direct | $6,963,000 | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 15% | $2,668,000 | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $9,631,000 | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $72,508,000 | $119,484,000 | $248,536,000 | $448,487,000 | $559,299,000 | $742,731,000 | $865,837,000 |
| | Indirect 15% | $12,628,000 | $20,697,000 | $49,194,000 | $89,882,000 | $114,232,000 | $162,844,000 | $191,557,000 |
| | Total | $85,136,000 | $140,181,000 | $297,730,000 | $538,369,000 | $673,531,000 | $905,575,000 | $1,057,394,000 |

* No actual damages occur below 1:10

Presented at Calgary (Springbank) Open House on March 10, 2015

# Benefit/Cost Ratios

Alberta Government

| Mitigation Project | Worst-case Damage Scenario | | Anticipated Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year | 1:200 Year | 1:100 Year | 1:200 Year |
| Springbank Off-stream Reservoir | 1.87 | 2.07 | 1.32 | 1.32 |
| McLean Creek Dry Dam | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore Reservoir Diversion | 1.21 | 1.20 | 0.81 | 0.83 |

The Springbank Off-stream Reservoir project achieves a positive benefit/cost ratio under all four scenarios and ranks first ahead of the other two mitigation projects with significantly higher benefit/cost ratios.

# General Flood Damage Calculation Methodology

Alberta Government

## INPUT

- Drainage area
- Streamflow Records
- Past streamflow analyses

- Channel and floodplain geometry
- Roughness coefficients
- Bridge and culvert details

- Topographic survey of structures
- Synthetic/historical stage damage curves
- Commercial/industrial inventories
- Agricultural

## TASK

Identification of Damage Centre

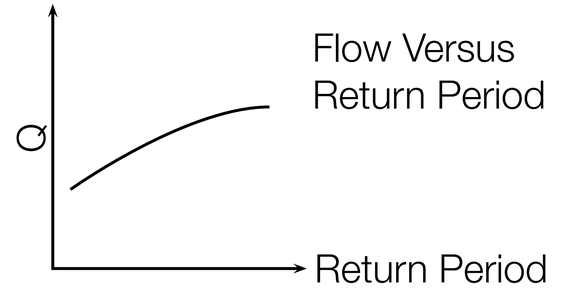
Hydrologic Analysis
- Single station frequency analysis
- Regional frequency analysis
- Tests for suitability of low record

Hydraulic Analysis
- Backwater profiles through damage centre for all return period floods
- Select damage reaches
- Estimate stage (depth) for each reach return period

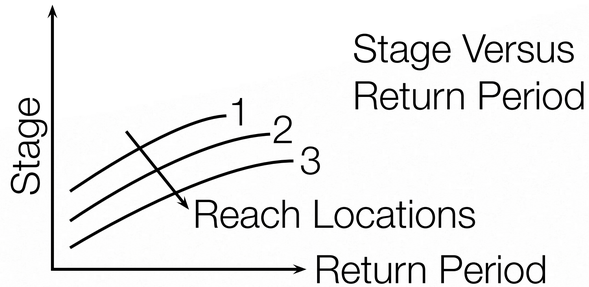
Stage Damage Calculations
- Select type of damage curve for varying land use
- Modify or Add to curves depending on project specifics
- Accumulate damage estimates for stage increments

Total Damage Calculations
- Determine damage versus return period (probability) and accumulate overall reaches
- Integrate under damage versus probability curve to estimate expected annual damage (EAD)

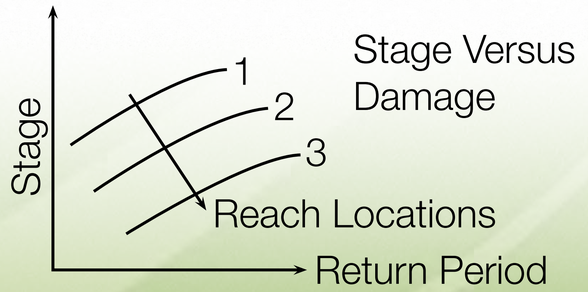
## OUTPUT



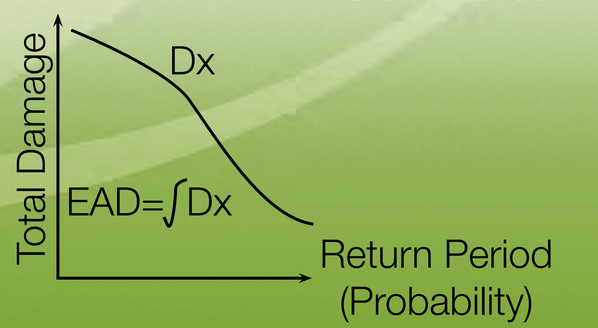
Flow Versus Return Period



Stage Versus Return Period



Stage Versus Damage

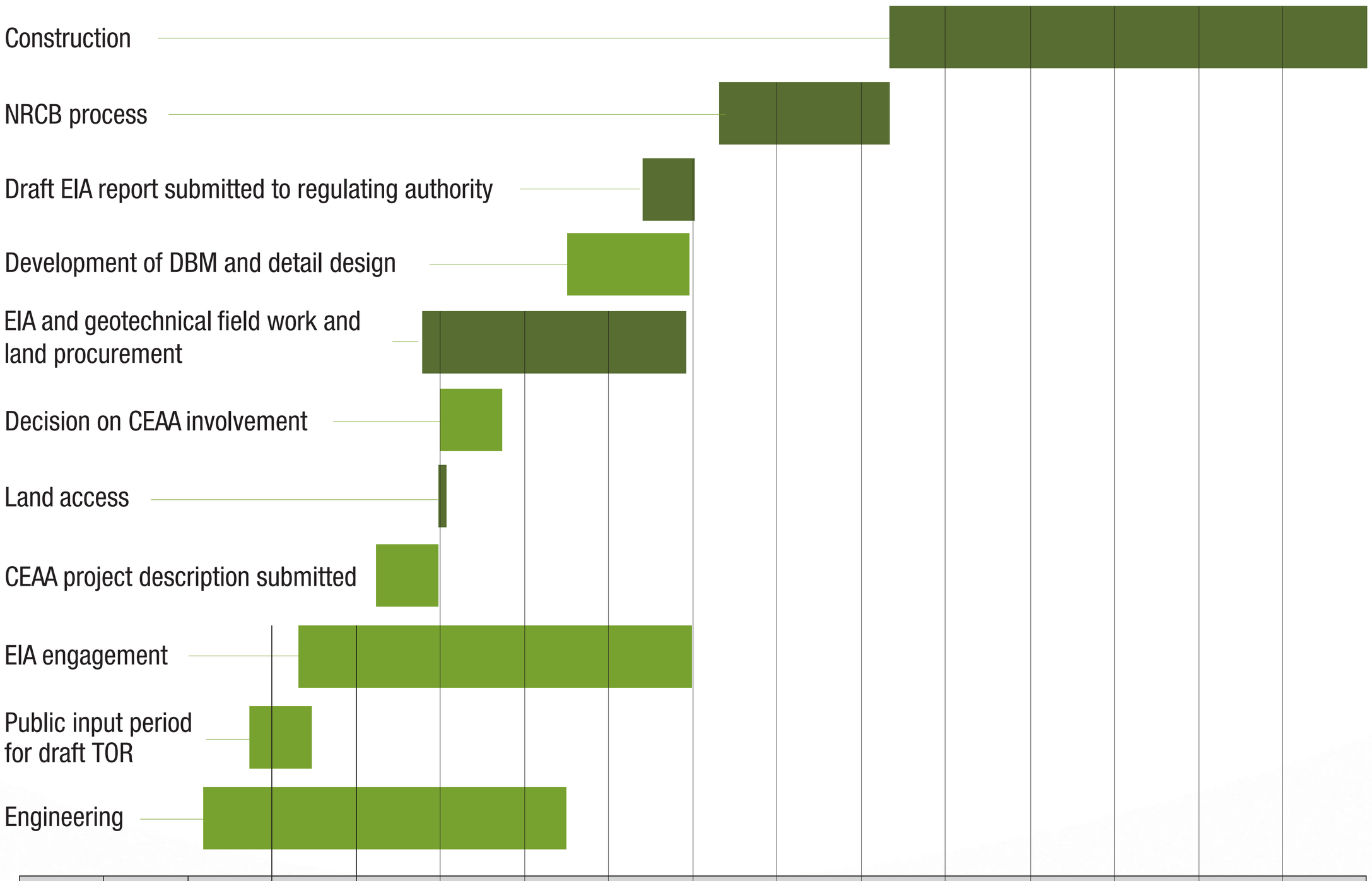



Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Proposed Project Timeline

Alberta Government




As of March 9, 2015 and subject to change.

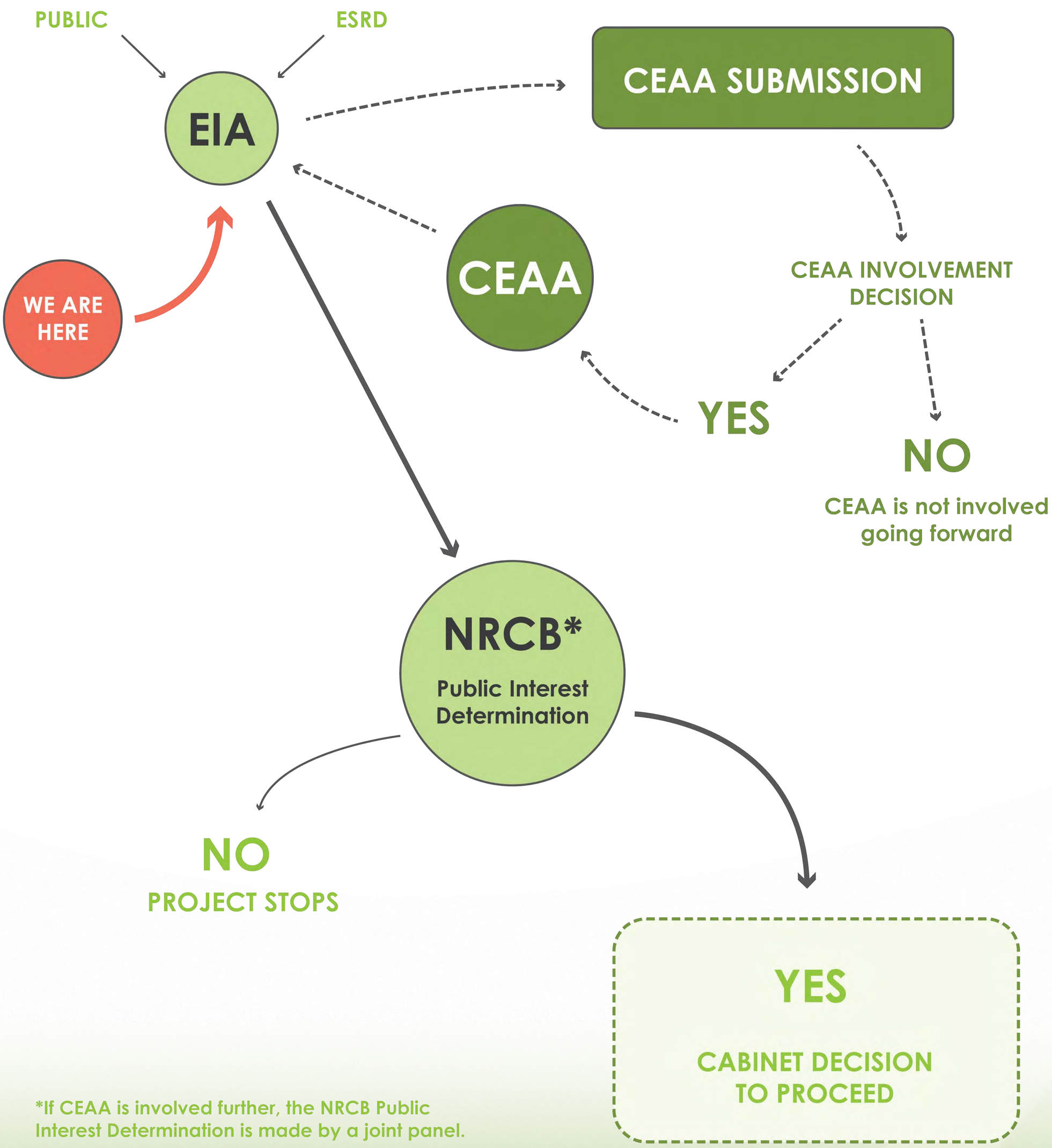
Critical Path Activities

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Project Approval (Regulatory)

Alberta Government




*If CEAA is involved further, the NRCB Public Interest Determination is made by a joint panel.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Environmental Impact Assessment

Alberta Government

# What is an EIA?

- Environmental Impact Assessment (EIA) is the process used to gather the information necessary to evaluate the potential positive and negative effects of a proposed project.
- It is an important first step of the regulatory process.
- It is prepared in accordance with the Final Terms of Reference and environmental information requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and associated regulations, and the *Canadian Environmental Assessment Act* (CEAA 2012) and associated regulations.
- The EIA Report will form part of the application to the Natural Resources Conservation Board (NRCB).
- The EIA answers four main questions:

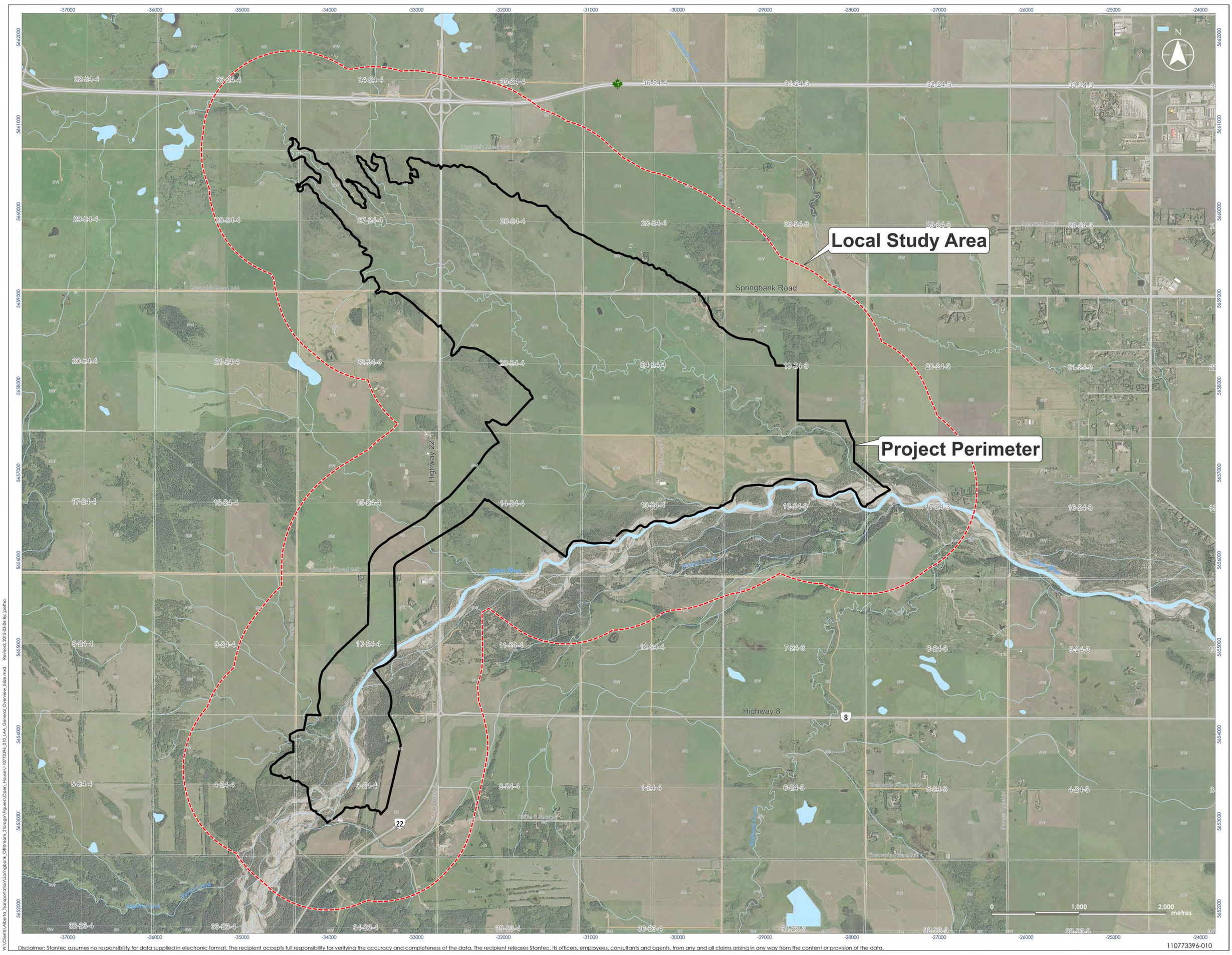
  1. What are the existing conditions (the baseline)?
  2. What changes would there be due to the project?
  3. Will the project result in any significant environmental, social, economic and health effects (positive and/or negative)?
  4. How can we mitigate the potential negative effects?

# Springbank Off-stream Reservoir Open House

## Proposed EIA Study Area - Two Areas of Focus

Alberta Government

1. Project footprint: Area directly affected by the proposed work:

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Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

110773396-010

2. Downstream area:

- The regional context of this project includes the Glenmore Reservoir — located approximately 18.5 km downstream.
- The operation of the project and the Glenmore Reservoir will be considered together to achieve maximum benefit of flood control.
- The baseline water conditions in the project area (including the Glenmore Reservoir) will be described as well as project components and activities that may affect future water conditions in the regional context.

# Springbank Off-stream Reservoir Open House

## Alberta EIA Process

Alberta Transportation prepares Proposed Terms of Reference (TOR) and Project Description

↓

Alberta Transportation submits Proposed TOR to ESRD and public for review (September 2014)

↓

Public review and input on Proposed TOR (September 15 - November 14, 2014)

↓

ESRD review and issue of Final TOR (January 2015)

↓

Alberta Transportation submits EIA Report (February 2016)

↓

ESRD coordinates technical review to confirm application completion

↓

NRCB regulatory and public review of EIA begins

**Stakeholder Engagement**

* A project description will be filed with CEAA in February 2015 to determine if a federal review process is also required under CEAA 2012.

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Draft Field Programs

| | 2015 | | | | | | | | | | 2016 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | March | April | May | June | July | August | September | October | November | December | January | February | March | April |
| Air Quality | | | | | | Once every 2 wks | | | | | | | | |
| Noise | | | | June 15-17 | | | | | | | | | | |
| Terrain/Soils | | | All of May | | | | | | | | | | | |
| Hydrogeology | Drilling & Existing Well Examination | | | Monthly trips of 1 day each | | | | | | | | | | |
| Surface Water | | Apr 15-17 | May 18-22 | June 5-25 | | Aug 4-6 | | | | | Jan 4-6 | | | |
| Vegetation and Wetlands | | | | June 8-12 | All of July | Aug 10-14 | | | | | | | | |
| Wildlife | | 1 day | All of May | All of June | | 1 day | | | | 1 day | 2 months | | 1 day | |
| Aquatic Environment | | | | | 3 months | | | | | | | | | |
| Historical Resources | Present during drilling | | | | | | | | | | | | | |
| Traditional Knowledge and Traditional Land Use | | | | | TBD | | | | | | | | | |
| Geotechnical Assessment | Drilling | | | | | | | | | | | | | |
| Geomorphology and Sediment Transport | | 3 days | | 2 weeks | 2 days | 2 days | 2 days | | | | | | | |

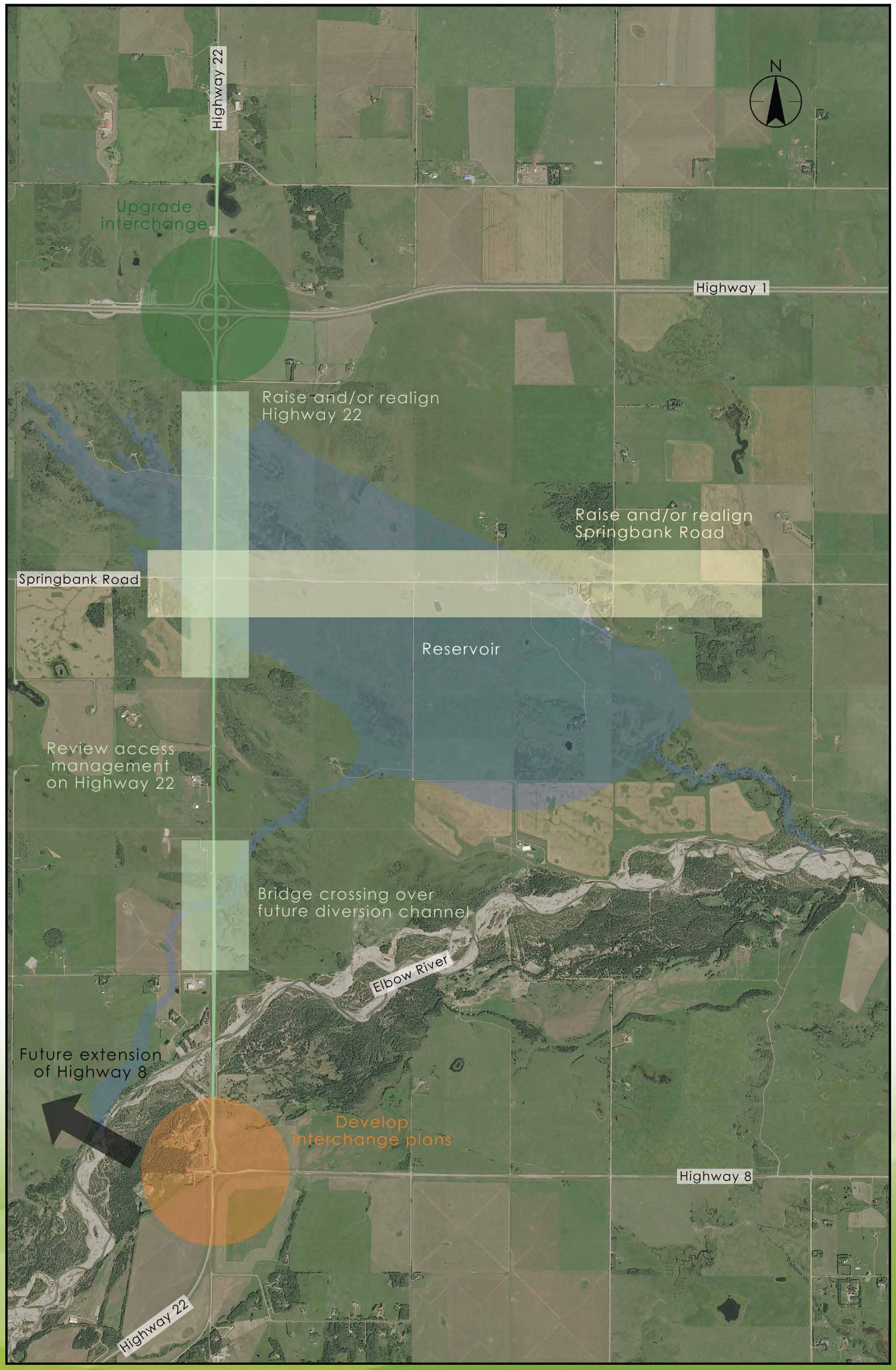
Last Updated 03/04/2015

Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Potential Changes to Highway 22 and Springbank Road

Alberta Government

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# Springbank Off-stream Reservoir Open House

## Project Overview

Alberta Government

## What is the Springbank Off-stream Reservoir?

- The Springbank Off-stream Reservoir provides a critical layer of flood protection for communities downstream of the diversion along the Elbow River.
- The reservoir would be located approximately 15 kilometres west of Calgary, east of Highway 22, south of Highway 1, and north of Highway 8 and the Elbow River.
- The proposed concept is to divert flood flows through a diversion channel from the Elbow River into an off-stream storage reservoir.
- Water would be temporarily contained and released back into the Elbow River once the flood recedes.
- **Project status:** Engineering, design and Environmental Impact Assessment (EIA) are currently underway.

# Springbank Off-stream Reservoir Open House

## Proposed Project Components

Alberta Government

### Diversion structure

- The diversion structure will be constructed on the Elbow River.
- When water levels in the river reach a certain threshold, water would begin to flow through the diversion structure into the diversion channel.

### Diversion channel

- The diversion channel would be approximately 4.5 km from the Elbow River to storage reservoir.
- It would be excavated through the adjacent uplands to transport flood water to the reservoir.

### Dam and storage reservoir

- The surface area would be approximately 650 hectares (1600 acres).
- The storage site includes an earthfill dam approximately 24 metres high to temporarily contain up to 67.6 million cubic metres of diverted flood water.

### Return channel

- There will be a modified channel to return the water back to the river.

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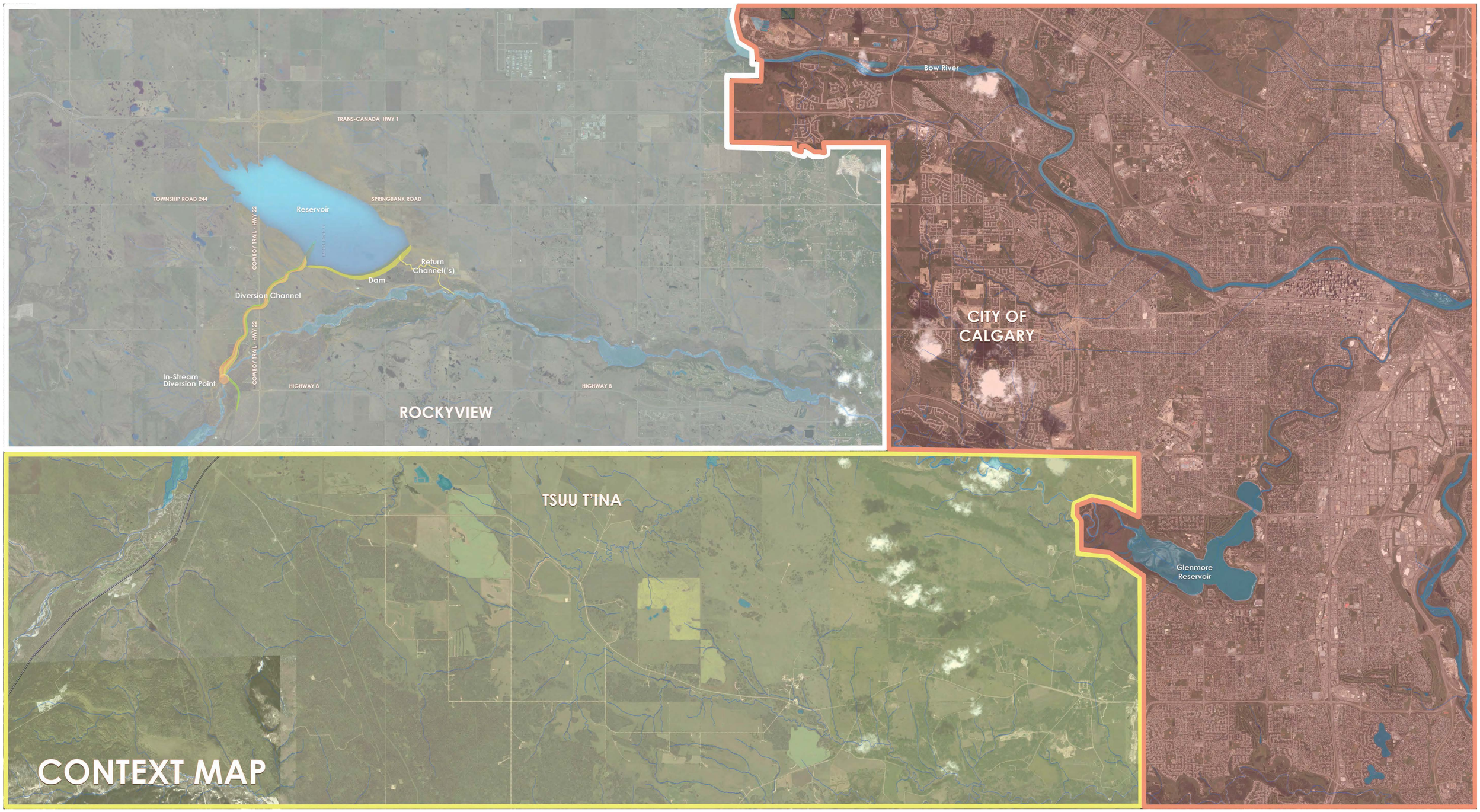
# Springbank Off-stream Reservoir Open House

## Context Map

Alberta Government

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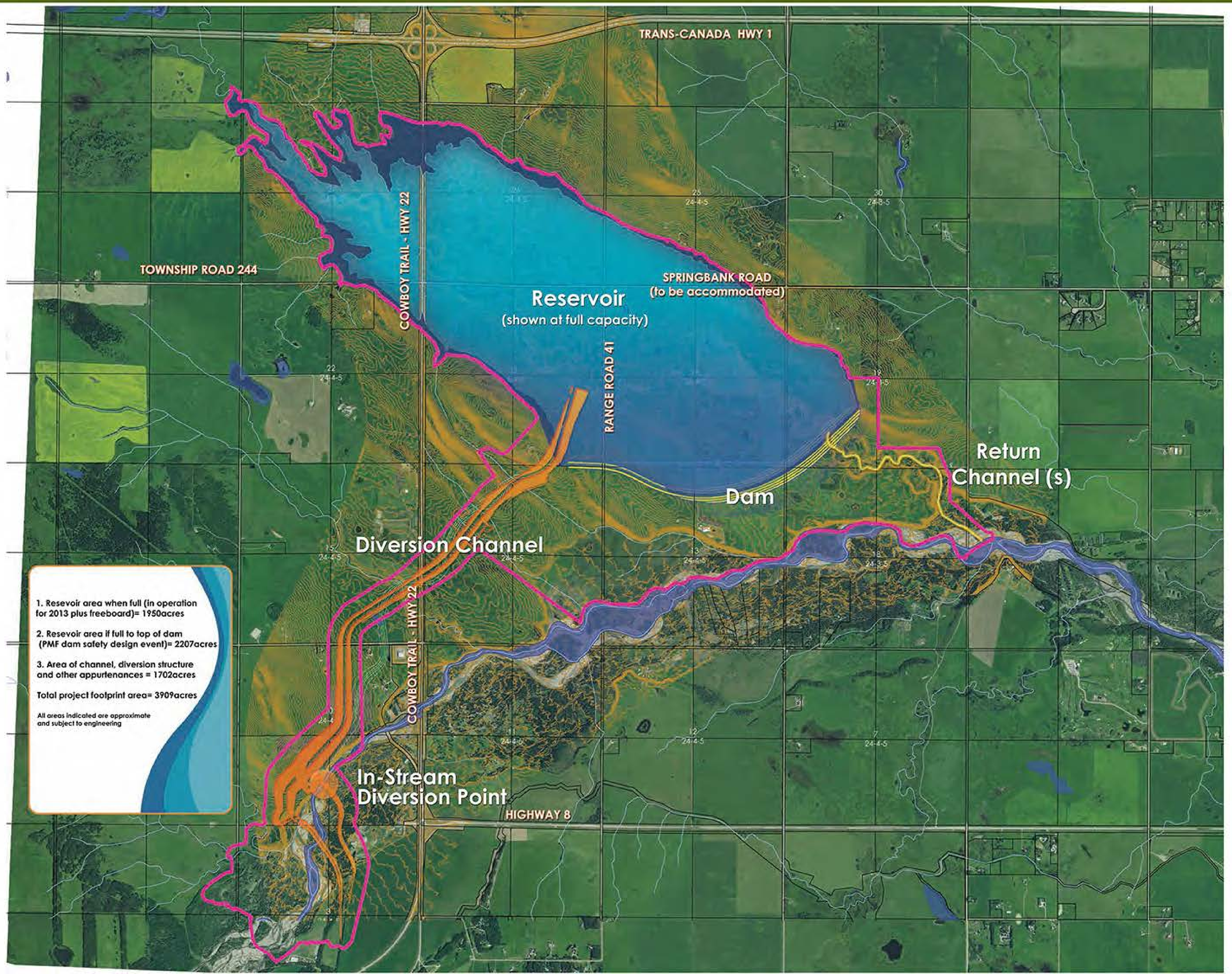
# Springbank Off-stream Reservoir Open House

## Project Map

Alberta Government



# Springbank Off-stream Reservoir Open House

## Perimeter Map

Alberta Government

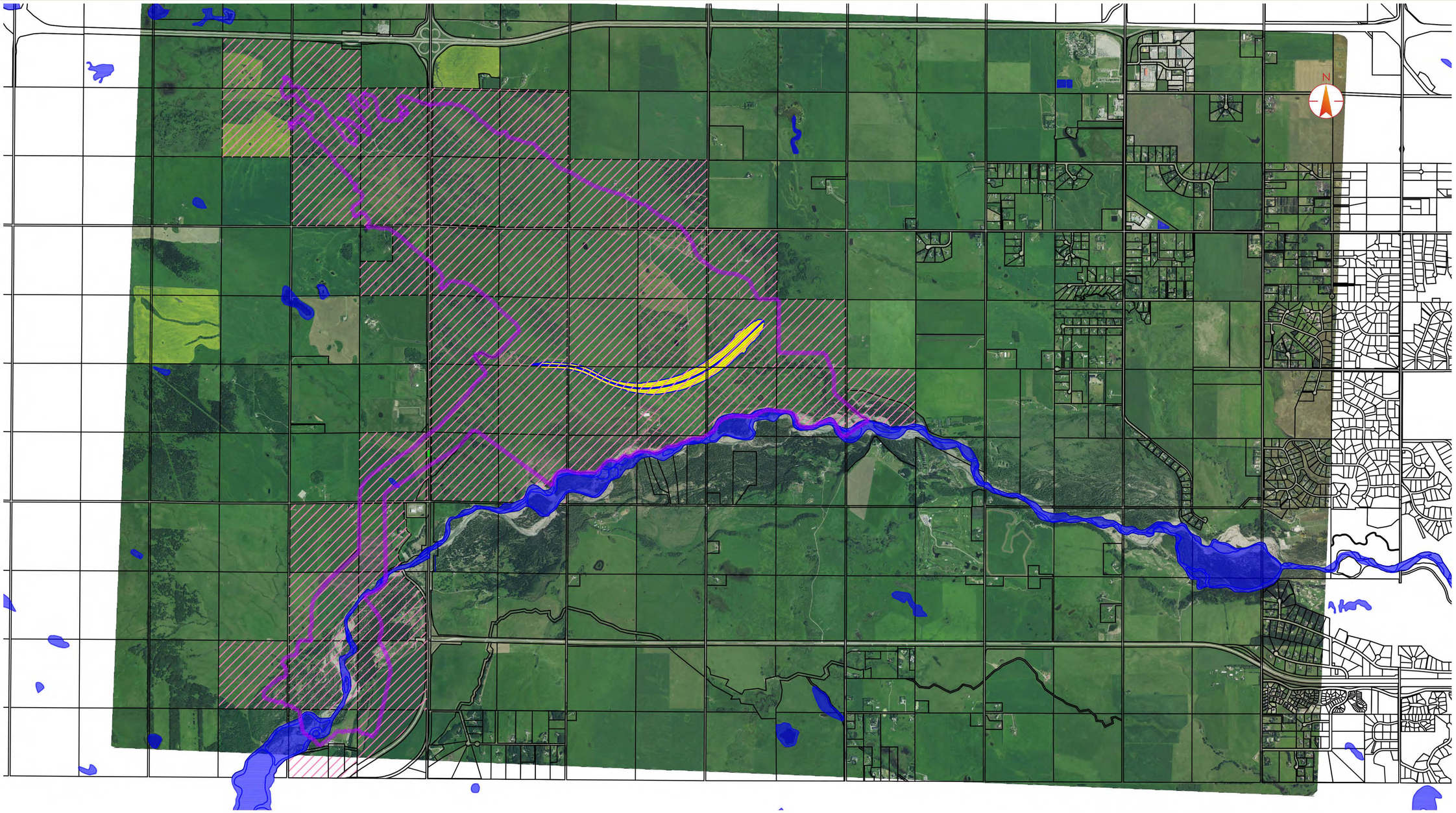



FIGURE 1.0 | Springbank, Rocky View County, AB

## SR1 OFFSITE STORAGE RESERVOIR

Project Map

PREPARED FOR: ALBERTA TRANSPORTATION

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Current Project Perimeter 3909 (+/-) acres

Impacted Lands (6,884 +/- acres)

Notes:

1. EXISTING TOPGRAPHIC SURVEY MAPPING WAS PROVIDED BY Alberta Transportation. SURFACE TOPORGRAPHY IS BASED ON A COMPOSITE AERIAL SURVEY TAKEN IN April of 2013 AND SUPPLEMENTED ON Sept 2013.
2. PROPERTY BOUNDARIES SHOWN WERE ACQUIRED FROM Environment and Sustainable Resource Development (ESRD). THE PROPERTY BOUNDARIES ARE SUBJECT TO ALL EASMENETS, COVENANTS AND RESTRICTIONS, RECORDED AND/OR UNRECORDED. STANTEC CONSULTING SERVICES INC. MAKE NO GUARANTEE WITH RESPECT TO THE EXISTENCE OF SUCH RESTRICTIONS.
3. THE APPROXIMATE UNDERGROUND Oil and GAS LINE LOCATIONS ARE BASED ON Abacus Datagraphics Ltd. THE APPROXIMATE OVERHEAD ELECTRIC LOCATIONS ARE BASED ON data from Fortis. THE APPROXIMATE UNDERGROUND STORM SEWER, SANITARY SEWER AND WATER LINES ARE BASED ON data from Rocky View County.
4. LOCATIONS OF BUILDINGS, FENCELINES, AND EDGE OF PAVEMENT WERE DIGITIZED BY STANTEC FROM AERIAL PHOTOGRAPHY FLOWN between July 20 and Oct 14, 2013 AND PROVIDED BY Alberta Transportation.
5. NO FIELD TOPOGRAPHIC SURVEYS HAVE BEEN PERFORMED BY STANTEC AT THE TIME OF DRAWING DEVELOPMENT.

NTS

Alberta Transportation

Stantec
Design with community in mind

110773396

March 3, 2015

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Presented at Calgary (Springbank) Open House on March 10, 2015

# Springbank Off-stream Reservoir Open House

## Dry Reservoir

Alberta Government

# What benefits does a dry reservoir offer?

- Dry reservoirs are catchment areas designed to hold excess water for a short period of time during a flood, while allowing water to move freely during normal conditions.
- The reservoir will be filled with water during a flood event.
- A dry reservoir also offers more flood mitigation protection than a wet reservoir would. It ensures the full capacity of the reservoir is available to store water during a potential flood event.

Presented at Calgary (Springbank) Open House on March 10, 2015

Alberta Government

# Contact us

Mark Svenson

Provincial Transportation Environmental Coordinator

Phone: 780-644-8354

Email: springbank-project@gov.ab.ca

Learn more at: alberta.ca/springbank-road.cfm

# Springbank Off-stream Reservoir Open House

Alberta Government

**The following information was presented at an open house held:**

**March 17, 2015 in Bragg Creek**

**(Bragg Creek Community Centre 4:30 - 8 p.m.)**

Alberta Government

# Welcome to the Springbank Off-stream Reservoir Open House

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Engagement

Alberta Government

# Listening and learning

Stakeholder engagement is a process that allows anyone potentially affected by a project to:

- Become informed.
- Ask questions and have them answered.
- Raise concerns and have them addressed.
- Provide input into the project.

Engagement is critical to the proposed Springbank Off-stream Reservoir project.

- We are committed to sharing information and working with the public and First Nations communities to ensure all input and concerns are heard, understood and addressed.
- Where appropriate, the information gathered will be used to refine the proposed project design.
- Your comments about the project and the commitments we make will be a part of the regulatory application.
- The Stakeholder Engagement process for the EIA is unbiased and coordinated through a third-party consultancy.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## What's New

Alberta Government

Updated information since open houses on January 27 and 28, 2015

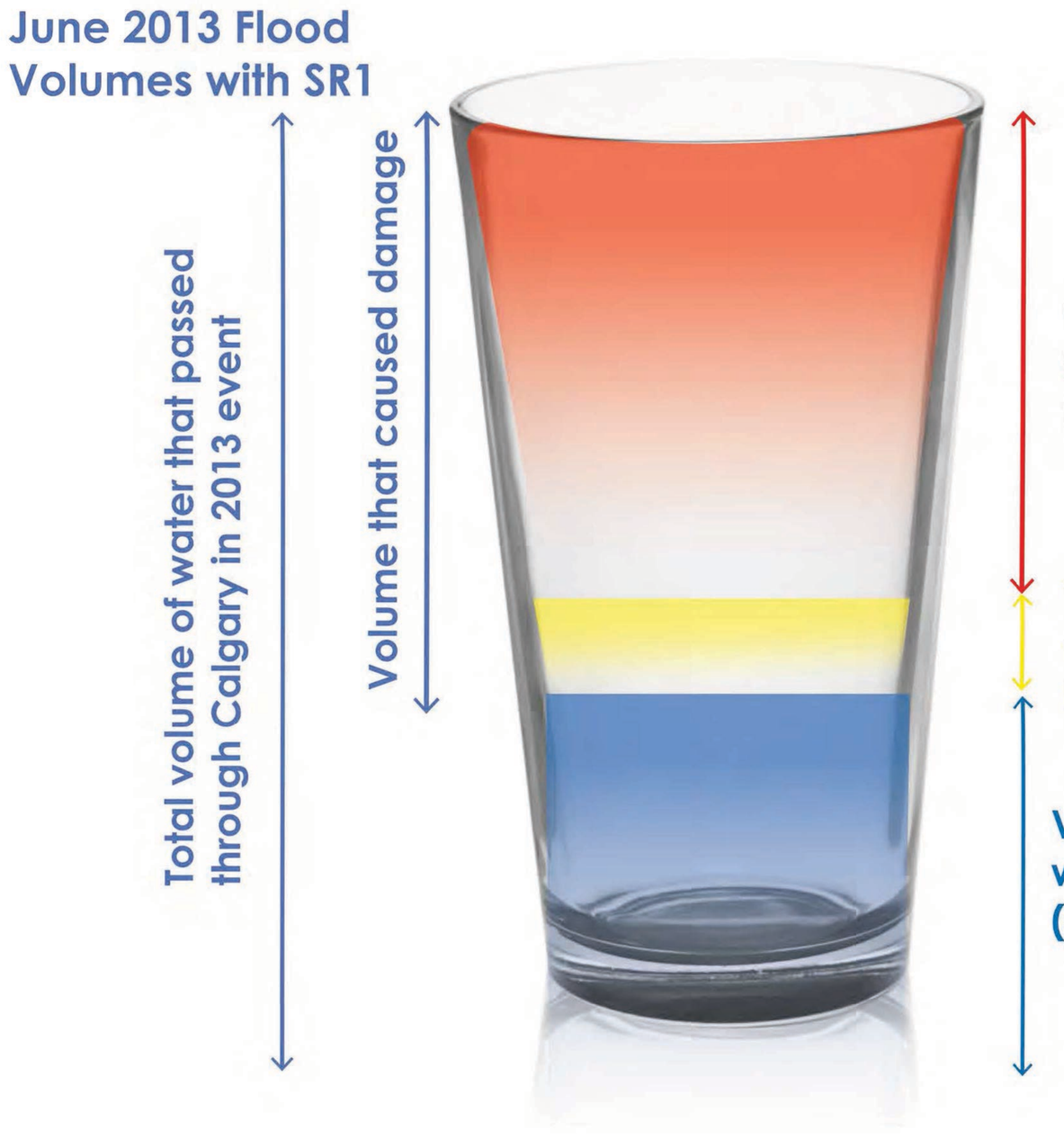
- Benefit - Cost Analysis information for Springbank Off-stream Reservoir, McLean Creek Dry Dam and the Calgary Underground Diversion Tunnel.
- Information on the McLean Creek Environmental Overview.
- Revised map showing the project perimeter with impacted land.
- Revised map showing the size of the project as compared to the Glenmore Reservoir.
- Information on the Natural Resources Conservation Board (NRCB) process.
- Additional information on regulatory approval processes.
- 2013 flood event information related to the proposed mitigation initiatives.

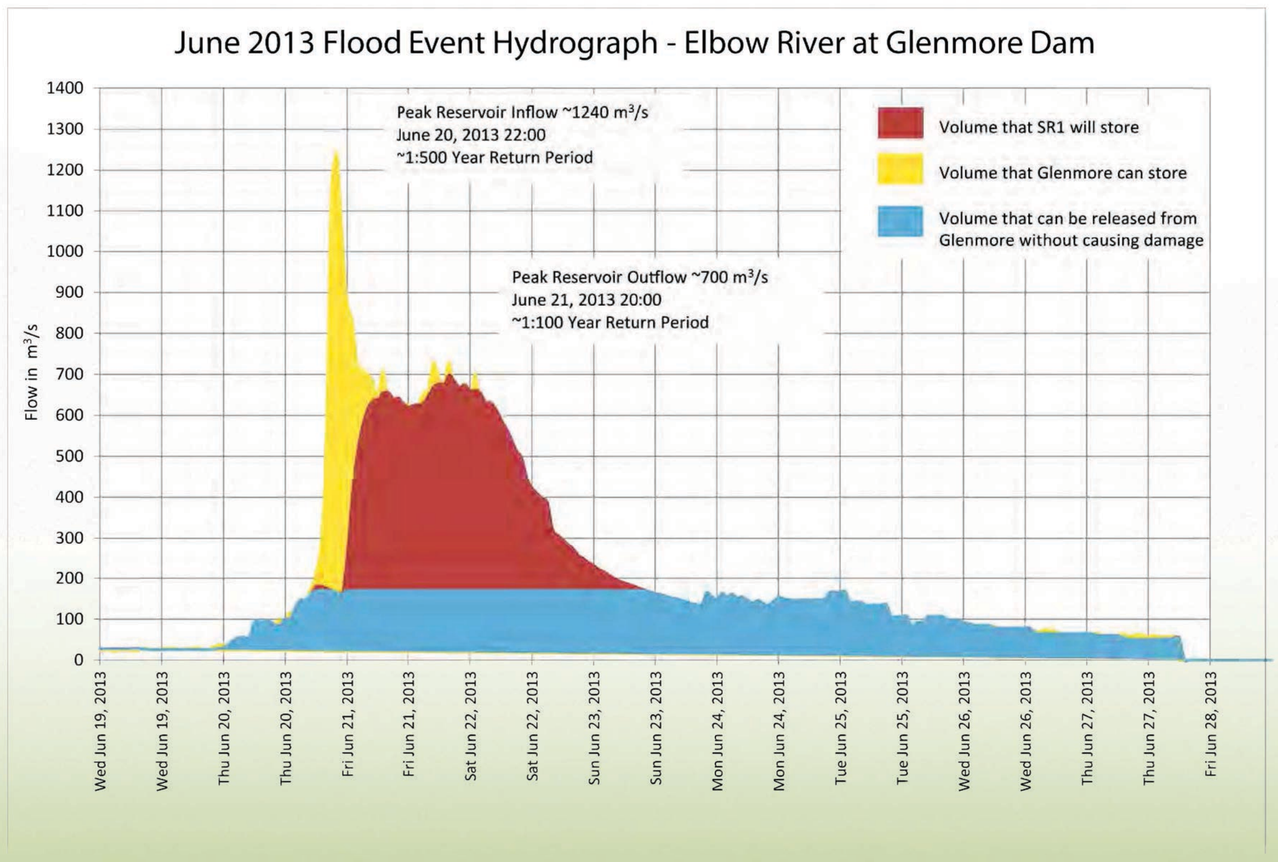
Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## 2013 Flood Event

Alberta Government




The Springbank Off-stream Reservoir is being designed to store the same water volume that caused damage in the 2013 flood event.

- 1 dam³ is 1 cubic decameter (1,000 m³)
- 1 Olympic swimming pool = 2.5 dam³
- 27,040 Olympic swimming pools = 67,600 dam³

Peak flow recorded on the Bow River, upstream of the Elbow River during the 2013 flood was 1,780 m³/s. (AMEC 2014).

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Alberta's Approach to Flood Mitigation

Alberta Government

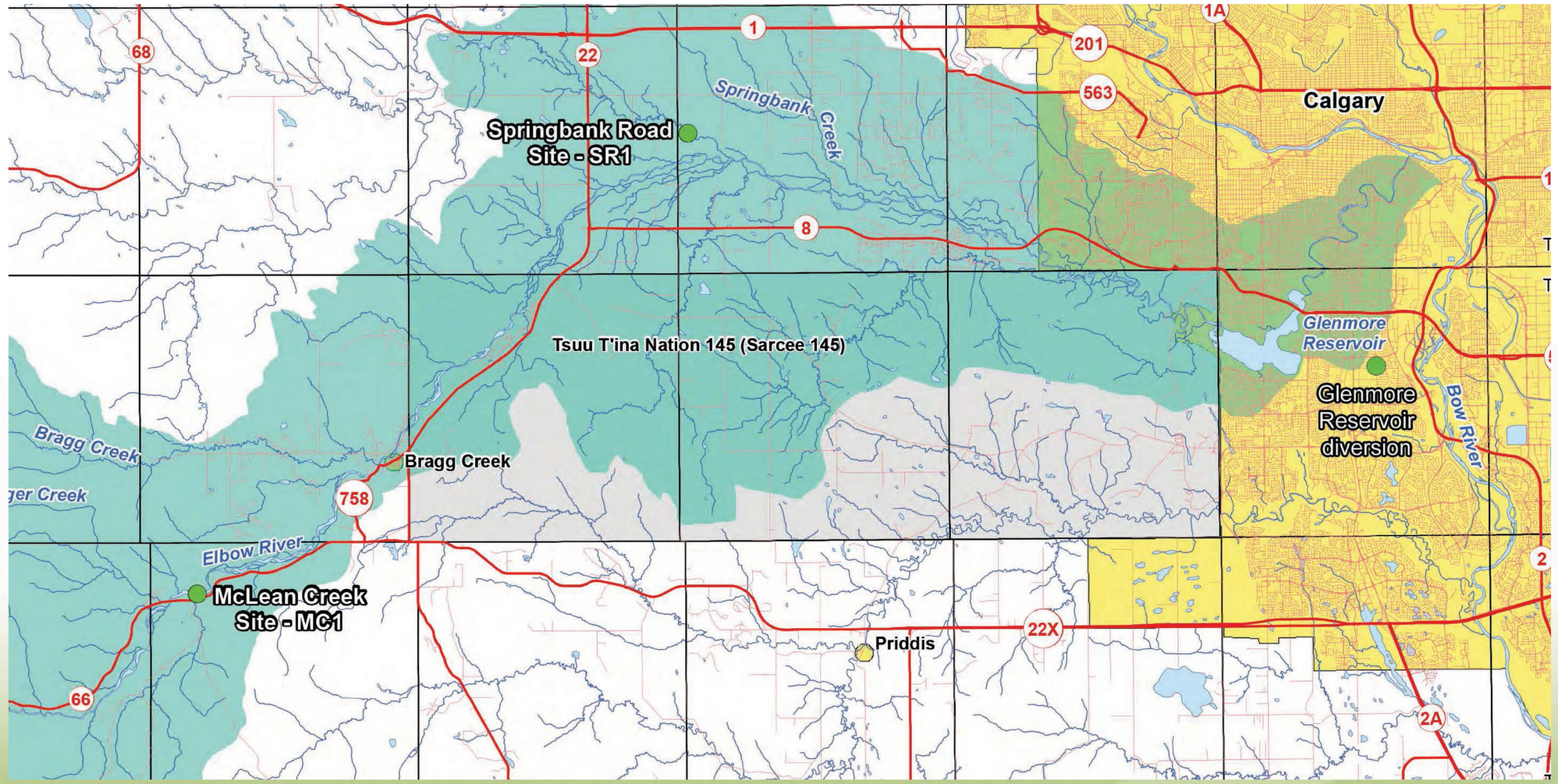
**Seven key elements that guide our approach to flood mitigation:**

- Overall watershed management.
- Flood modelling prediction and warning systems.
- Flood risk management policies.
- Water management and mitigation infrastructure.
- Erosion control.
- Local mitigation initiatives by municipalities.
- Individual mitigation measures for homes.

Presented at Bragg Creek Open House on March 17, 2015

# Project Locations

Alberta Government

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# Springbank Off-stream Reservoir Open House

## Bow River Dams

There are four dams on the main stem of the Bow River:

- Bearspaw Dam - TransAlta
- Kananaskis Dam (Seebe Reservoir) - TransAlta
- Ghost Dam - TransAlta
- Horseshoe Dam - TransAlta

The total storage capacity of existing TransAlta reservoirs is approximately 704,000 $dam^3$. (AMEC 2014)

There are a number of other dams in the Bow River Basin upstream of Calgary.

**Other significant dams in the Bow River Basin:**

- Interlakes Dam – TransAlta (Upper Kananaskis Lake, Kananaskis River)
- Pocaterra Dam – TransAlta (Lower Kananaskis Lake, Kananaskis River)
- Barrier Dam – TransAlta (Barrier Lake, Kananaskis River)
- Cascade Dam – TransAlta (Cascade River /Lake Minnewanka)
- Canyon Dam and Three Sisters Dam – TransAlta (Spray Lake Storage Reservoir System on the Spray River and Goat Creek)

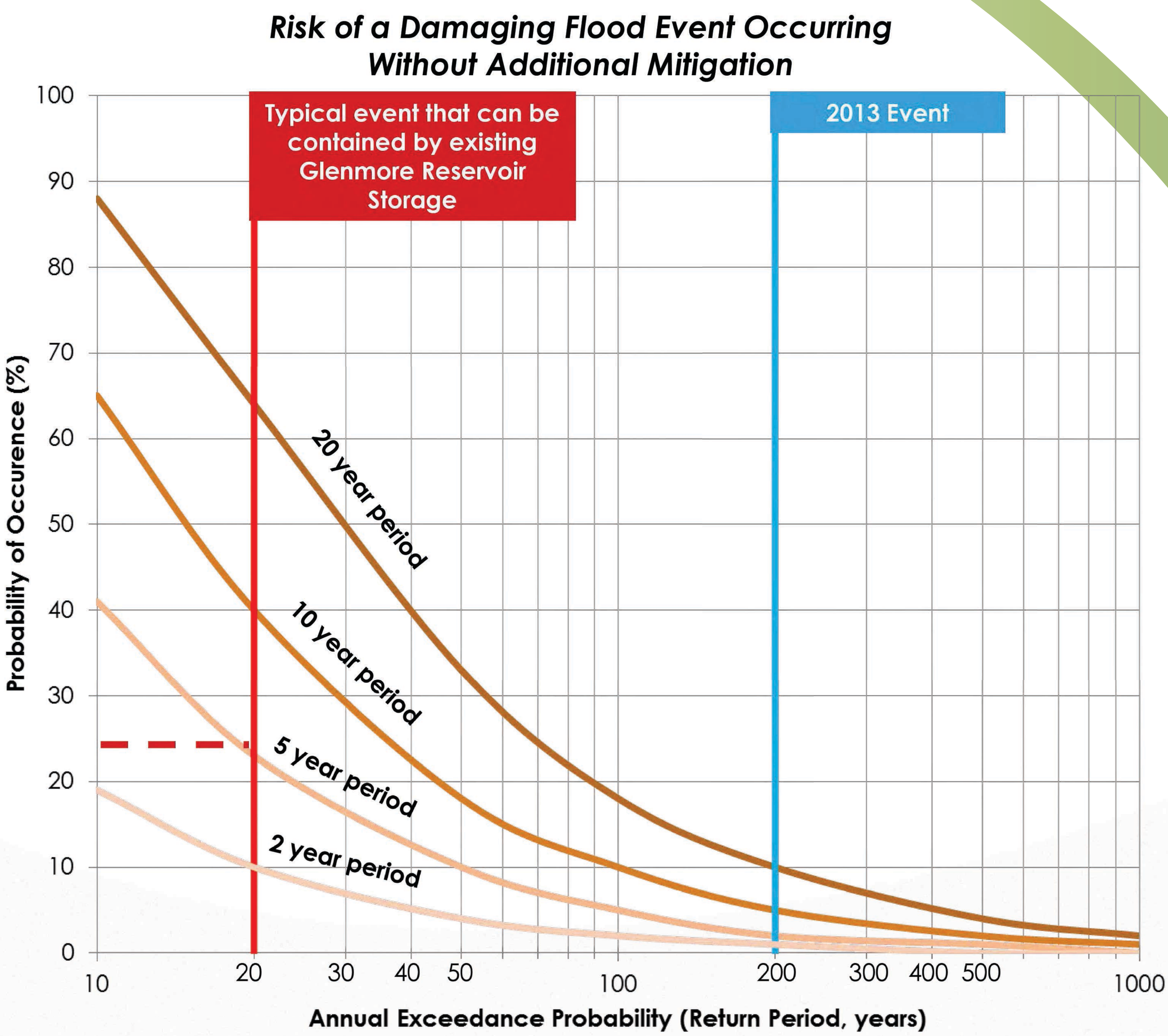
## What's Next

- Due to its size and location on the Bow River, the Ghost Dam offers the best, and quickest, opportunity for flood mitigation.
- An agreement was in place for 2014 with TransAlta to modify operations of the Ghost Dam to provide part of an immediate flood mitigation solution for the Bow River. Discussions are ongoing for future years.
- The Government of Alberta will be working with TransAlta to actively manage water levels in the Ghost Dam.

# Springbank Off-stream Reservoir Open House

## Elbow River Flood Mitigation

Alberta Government




In a 5 year period, there is roughly a 23% chance of a damage-causing flood downstream of Glenmore Reservoir

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Decision to Proceed

Alberta Government

Based on the preliminary findings of the cost estimates and environmental information presented in flood mitigation studies by AMEC in March 2014, a decision was made to proceed with development of the Springbank Off-stream Reservoir Project.

- This decision was further confirmed by the McLean Creek Environmental Scan Report (AMEC, 2015) and the Benefit-Cost Analyses Report (IBI Group, 2015).

The decision to proceed with this project first is based on:

- Preliminary environmental, social and economic factors
- Projected regulatory review timelines
- Preliminary benefit-cost analyses – as defined by the IBI Group report
- Constructability and risk during construction
- Timelines to construct
- Other considerations

## Systems approach to flood mitigation

As part of the overall systems approach for the Elbow River, work also continues on the following potential flood mitigation options:

- Implement localized mitigation measures including berming, hardening, infrastructure modification, dredging, etc.
- McLean Creek Dam
- Calgary Underground Diversion Tunnel

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Dam Locations & Safety FAQs

Alberta Government

**Q. How was the location for the Springbank Off-stream Reservoir selected? Could it be moved further west or east?**

- The location for the project is governed by topography.
- It takes advantage of the surrounding hills and expansive valley of the project area to minimize the amount of earth fill (or excavation) that is required to achieve the design storage volumes.

**Q. Would the reservoir be able to handle a larger flood than what occurred in 2013?**

- It is being designed to mitigate flooding to the 2013 event, or equivalent.

**Q. What are the flood mitigation plans for Bragg Creek and Redwood Meadows?**

- Funding is provided under a community flood mitigation program to protect these communities from future flooding. Local mitigation measures are being considered, and McLean Creek is still under consideration.

# Benefit Cost Analysis of Flood Mitigation Projects

## Purpose and Scope

Alberta Government

**Purpose:**

The purpose of the benefit/cost analysis is to provide a comparison of project benefits, in terms of damages averted, to project costs including capital and operating costs, to determine if the project under consideration is economically viable.

**Scope:**

For the purposes of this study, benefits are restricted to economic benefits accruing within the study area, which is defined as the flood risk area within the City of Calgary boundaries.

The study utilizes current damage estimates based on updated stage-damage curves and the Provincial Rapid Flood Damage Assessment Model.

Project costs are based on the estimates prepared as part of the mitigation projects submitted to the Southern Alberta Flood Recovery Task Force in 2014.

# Benefit Cost Analysis of Flood Mitigation Projects

## Assumptions/Methodology

Alberta Government

- The benefit/cost (B/C) ratio of a project is the ratio of net present value of the benefits (average annual damages) over the net present value of the costs.

- This value is the indicator of economic efficiency.

- Where the benefits exceed costs, the ratio would be greater than 1.0, and where benefits are less than costs then the ratio would be less than 1.0.

- An economically-efficient project would have a B/C ratio greater than 1.0. At a B/C ratio of 1.0, the project is at a breakeven point.

- Costs are based on the estimated capital and operational/ maintenance costs.

- $8.9 million in capital costs was added to the Springbank Off-Stream Flood Storage and Glenmore Reservoir Diversion project to account for required mitigation measures upstream.

- Benefits are based on the quantification of flood damages averted.

- The benefit/cost analysis has been carried out using a net present value analysis.

- A 100 year economic analysis.

- Annual operating and maintenance costs of $1.8 million.

Presented at Bragg Creek Open House on March 17, 2015

# Benefit Cost Analysis of Flood Mitigation Projects

## Discussion of Results

Alberta Government

### Benefit/Cost Analysis of Springbank Off-Stream Storage

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $255,098,000 | $309,607,000 | $255,098,000 | $309,607,000 |
| Benefit/Cost Ratio | 1.87 | 2.07 | 1.32 | 1.32 |
| Net Present Value | $221,801,000 | $330,336,000 | $81,749,000 | $99,294,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

### Benefit/Cost Analysis of McLean Creek Flood Storage Site

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $476,899,000 | $639,943,000 | $336,847,000 | $408,901,000 |
| PV Costs (development & operating total cost) | $332,708,000 | $387,699,000 | $322,708,000 | $387,699,000 |
| Benefit/Cost Ratio | 1.43 | 1.65 | 1.01 | 1.05 |
| Net Present Value | $144,191,000 | $252,244,000 | $4,139,000 | $21,202,000 |
| Average Annual Damages | $19,461,291 | $26,114,777 | $13,746,068 | $16,686,439 |

### Benefit/Cost Analysis of Glenmore Reservoir Diversion

| Indicator | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| PV Benefits (average annual damages) | $621,715,000 | $664,189,000 | $416,313,000 | $458,787,000 |
| PV Costs (development & operating total cost) | $512,465,000 | $511,960,000 | #512,465,000 | $551,960.000 |
| Benefit/Cost Ratio | 1.21 | 1.20 | 0.81 | 0.83 |
| Net Present Value | $109,250,000 | $122,229,000 | -$96,152,000 | -$93,173,000 |
| Average Annual Damages | $25,370,933 | $27,104,222 | $16,988,895 | $18,722,184 |

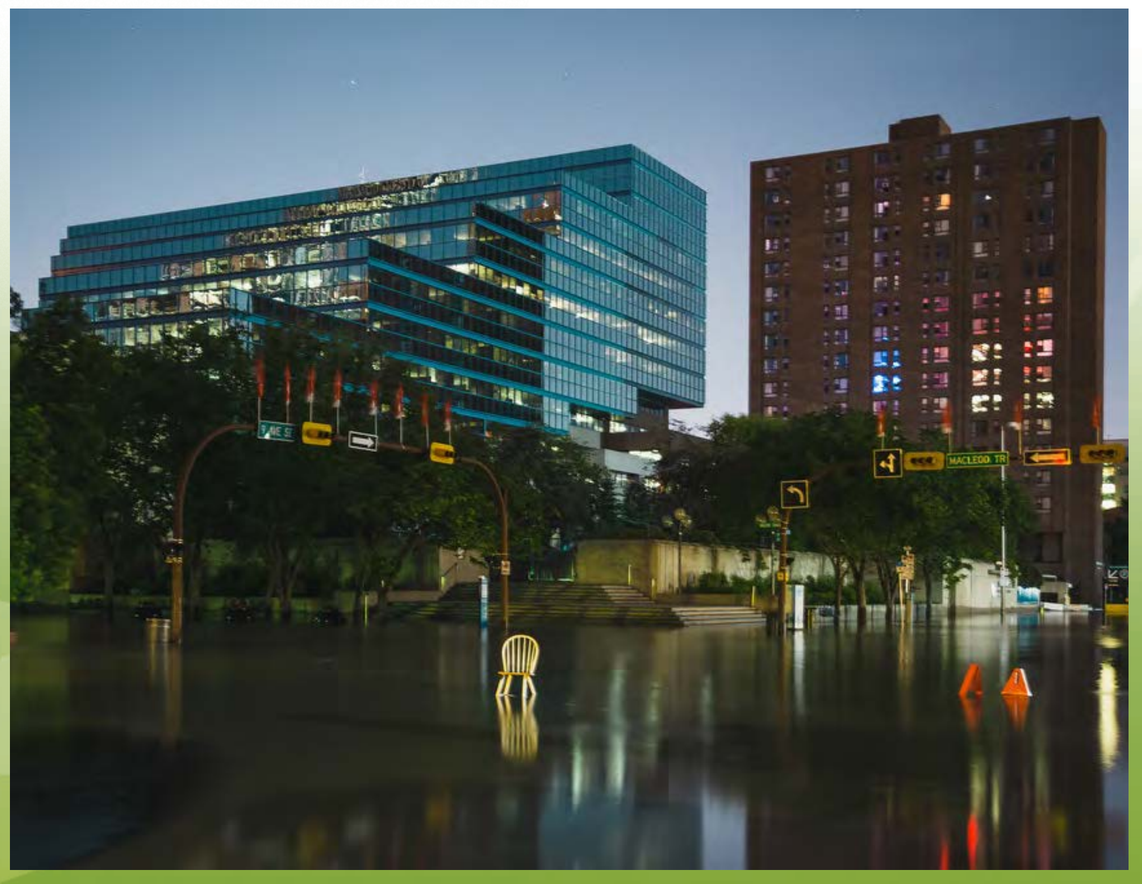
# Benefit Cost Analysis of Flood Mitigation Projects

## Summary and Conclusions

Alberta Government

### Benefit/Cost Ratio

| Mitigation Project | High Damage Scenario | | Low Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year Protection | 1:200 Year Protection | 1:100 Year Protection | 1:200 Year Protection |
| SR1 | 1.87 | 2.07 | 1.32 | 1.32 |
| MC1 | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore | 1.21 | 1.20 | 0.81 | 0.83 |




Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Project Comparisons

Alberta Government

Based on the preliminary desktop environmental review done to date.

| | McLean Creek | Springbank Reservoir |
|---|---|---|
| Type of Reservoir | On-stream Reservoir | Off-stream Reservoir |
| Land Ownership | Crown Land | Freehold Land |
| Anticipated Flood Storage Volume Capacity | 49,000 dam³ (100-year design flood) | 67,600 dam³ (2013 design flood) |
| Location | • On the Elbow River near McLean Creek | • Diversion on the Elbow River near Hwy 22 and channel to move flood water to storage facility in Springbank. |
| Operation Start Date (Anticipated) | Approximately 7 years from decision to proceed. | Spring 2018 |
| Construction TImeline (Anticipated) | • Construction period is 2 to 3 years. | • Approx. 18 months.<br>• In-stream river work expected to be 1 year. |
| Vegetation | • Recorded rare plants in area (reported in 1960s). | • No recorded rare plants. |
| Wildlife of Concern | • Identified grizzly bear, harlequin duck and wolverine habitat (species listed as sensitive, at risk, or of special concern). | • Not identified as habitat for grizzly bear, harlequin duck and wolverine. |
| Fish and Fish Habitat | • At low flow, concern about bull trout and mountain whitefish movement.<br>• Spring passage concerns for passing rainbow trout. | |
| | • Fish – potential for west slope cutthroat trout (listed as threatened).<br>• Possible populations of brook trout, brown trout, bull trout, cutthroat trout, long nose dace, mountain whitefish, rainbow trout, and white sucker.<br>• Habitat - Greater potential to change in-stream transport of woody debris and bed load (cobble, gravels) and Substantive changes to fish habitat in the area that will be impounded.<br>• Concerns with stranding fish in impoundments behind the dam as water drains out because on-stream.<br>• More in-stream work in the river equates to the potential to cause longer disruptions to fish in the Elbow River. Higher potential for "serious harm to fish."<br>• Larger in-stream footprint. | • Fish – no native strains of west slope cutthroat trout reported.<br>• Possible populations of brook trout, brown trout, bull trout, burbot, longnose dace, longnose sucker, mountain whitefish, and rainbow trout.<br>• Habitat - Allows bedload and woody debris movement at lower frequency floods.<br>• Greater opportunity to encourage positive drainage that will allow for fish to escape or be rescued.<br>• Lower in the watershed - has larger fish (stronger swimmers), more migratory potential and higher potential for northern pike and burbot (slow swimmers).<br>• Smaller scale of river work and larger river means fish are better able to find over-wintering habitat.<br>• Smaller in-stream footprint. |

# Anticipated Damage Scenario - Total Damages, Elbow River, with Sewer Backup

Alberta Government

| Categories of Damage | | Return Frequency, in Years | | | | | |
|---|---|---|---|---|---|---|---|
| | | 20 | 50 | 100 | 200 | 500 | 1,000 |
| Residential | Direct | $101,015,000 | $167,249,000 | $299,716,000 | $365,304,000 | $437,966,000 | $505,053,000 |
| | Indirect 15% | $15,152,000 | $25,087,000 | $44,957,000 | $54,796,000 | $65,695,000 | $75,758,000 |
| | Total | $116,167,000 | $192,336,000 | $344,673,000 | $420,100,000 | $503,661,000 | $580,811,000 |
| Commercial | Direct | $82,000 | $481,000 | $10,205,000 | $15,216,000 | $22,540,000 | $32,817,000 |
| | Indirect 45% | $0 | $216,000 | $4,592,000 | $6,847,000 | $10,143,000 | $14,768,000 |
| | Total | $82,000 | $697,000 | $14,797,000 | $22,063,000 | $32,683,000 | $47,585,000 |
| Infrastructure | Direct | $8,187,000 | $38,606,000 | $69,666,000 | $86,879,000 | $115,372,000 | $134,495,000 |
| | Indirect 20% | $1,637,000 | $7,721,000 | $13,933,000 | $17,376,000 | $23,074,000 | $26,899,000 |
| | Total | $9,824,000 | $46,327,000 | $83,599,000 | $104,255,000 | $138,446,000 | $161,394,000 |
| Stampede | Direct | $10,200,000 | $42,200,000 | $68,900,000 | $91,900,000 | $166,853,000 | $193,472,000 |
| | Indirect 38% | $3,908,000 | $16,170,000 | $26,400,000 | $35,213,000 | $63,932,000 | $74,132,000 |
| | Total | $14,108,000 | $58,370,000 | $95,300,000 | $127,113,000 | $230,785,000 | $267,604,000 |
| Total | Direct | $119,484,000 | $248,536,000 | $448,487,000 | $559,299,000 | $742,731,000 | $865,837,000 |
| | Indirect 21% | $20,697,000 | $49,194,000 | $89,882,000 | $114,232,000 | $162,844,000 | $191,557,000 |
| | Total | $140,181,000 | $297,730,000 | $538,369,000 | $673,531,000 | $905,575,000 | $1,057,394,000 |

* No actual damages occur below 1:10

# Benefit/Cost Ratios

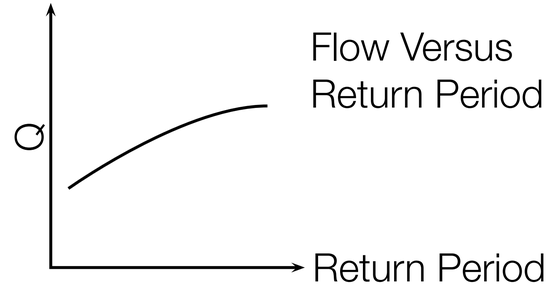
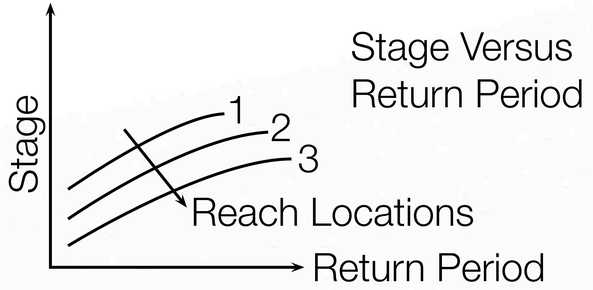
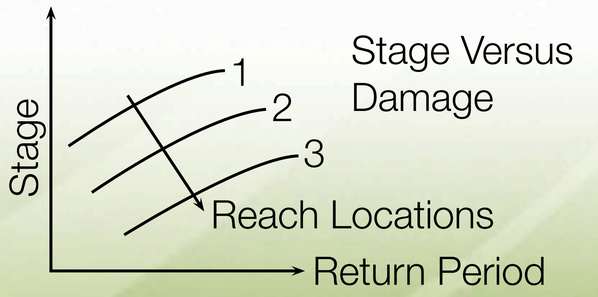
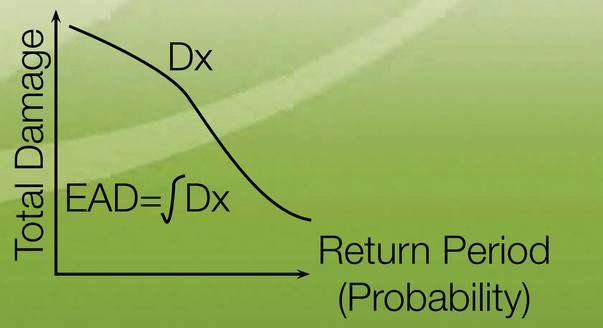
Alberta Government

| Mitigation Project | Worst-case Damage Scenario | | Anticipated Damage Scenario | |
|---|---|---|---|---|
| | 1:100 Year | 1:200 Year | 1:100 Year | 1:200 Year |
| Springbank Off-stream Reservoir | 1.87 | 2.07 | 1.32 | 1.32 |
| McLean Creek Dry Dam | 1.43 | 1.65 | 1.01 | 1.05 |
| Glenmore Reservoir Diversion | 1.21 | 1.20 | 0.81 | 0.83 |

The Springbank Off-stream Reservoir project achieves a positive benefit/cost ratio under all four scenarios and ranks first ahead of the other two mitigation projects with significantly higher benefit/cost ratios.

# General Flood Damage Calculation Methodology

Alberta Government

| INPUT | TASK | OUTPUT |
|---|---|---|
| • Drainage area<br>• Streamflow Records<br>• Past streamflow analyses | Identification of Damage Centre<br>**Hydrologic Analysis**<br>• Single station frequency analysis<br>• Regional frequency analysis<br>• Tests for suitability of low record |  |
| • Channel and floodplain geometry<br>• Roughness coefficients<br>• Bridge and culvert details | **Hydraulic Analysis**<br>• Backwater profiles through damage centre for all return period floods<br>• Select damage reaches<br>• Estimate stage (depth) for each reach return period |  |
| • Topographic survey of structures<br>• Synthetic/historical stage damage curves<br>• Commercial/industrial inventories<br>• Agricultural | **Stage Damage Calculations**<br>• Select type of damage curve for varying land use<br>• Modify or Add to curves depending on project specifics<br>• Accumulate damage estimates for stage increments |  |
| | **Total Damage Calculations**<br>• Determine damage versus return period (probability) and accumulate overall reaches<br>• Integrate under damage versus probability curve to estimate expected annual damage (EAD) |  |

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Other Projects Under Consideration

Alberta Government

## McLean Creek Dry Dam

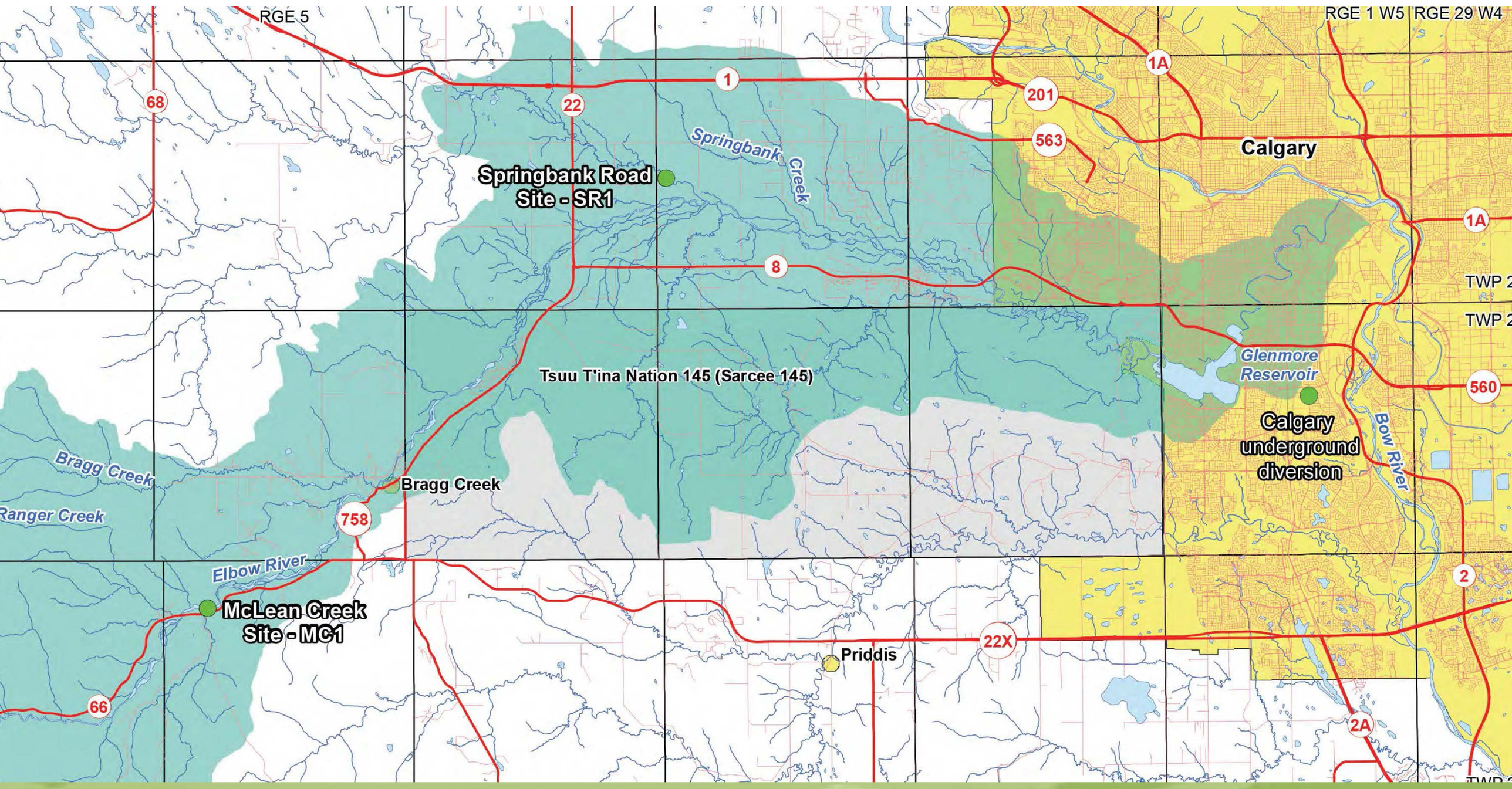
This proposed dry dam upstream of Bragg Creek would help control flow rates on the Elbow River during a flood.

Status: Proposed project under consideration.

## Calgary Underground Diversion

This proposed project would divert flood water underground along Heritage Drive from Glenmore Reservoir to the Bow River.

Status: Proposed project under consideration.

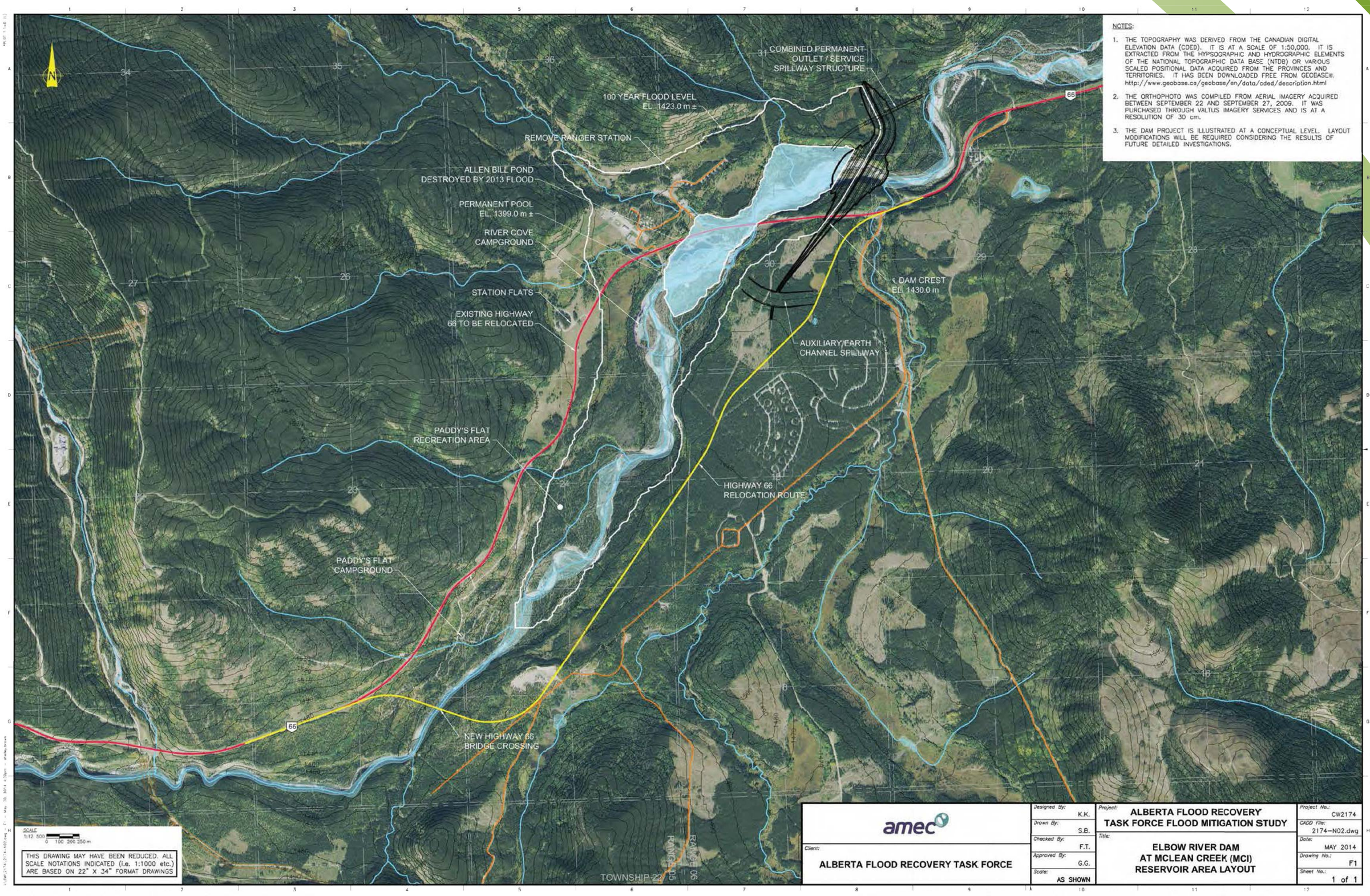



Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Conceptual Map McLean Creek Dry Dam

Alberta Government




Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## McLean Creek Environmental Review Study Findings

Alberta Government

The study found:

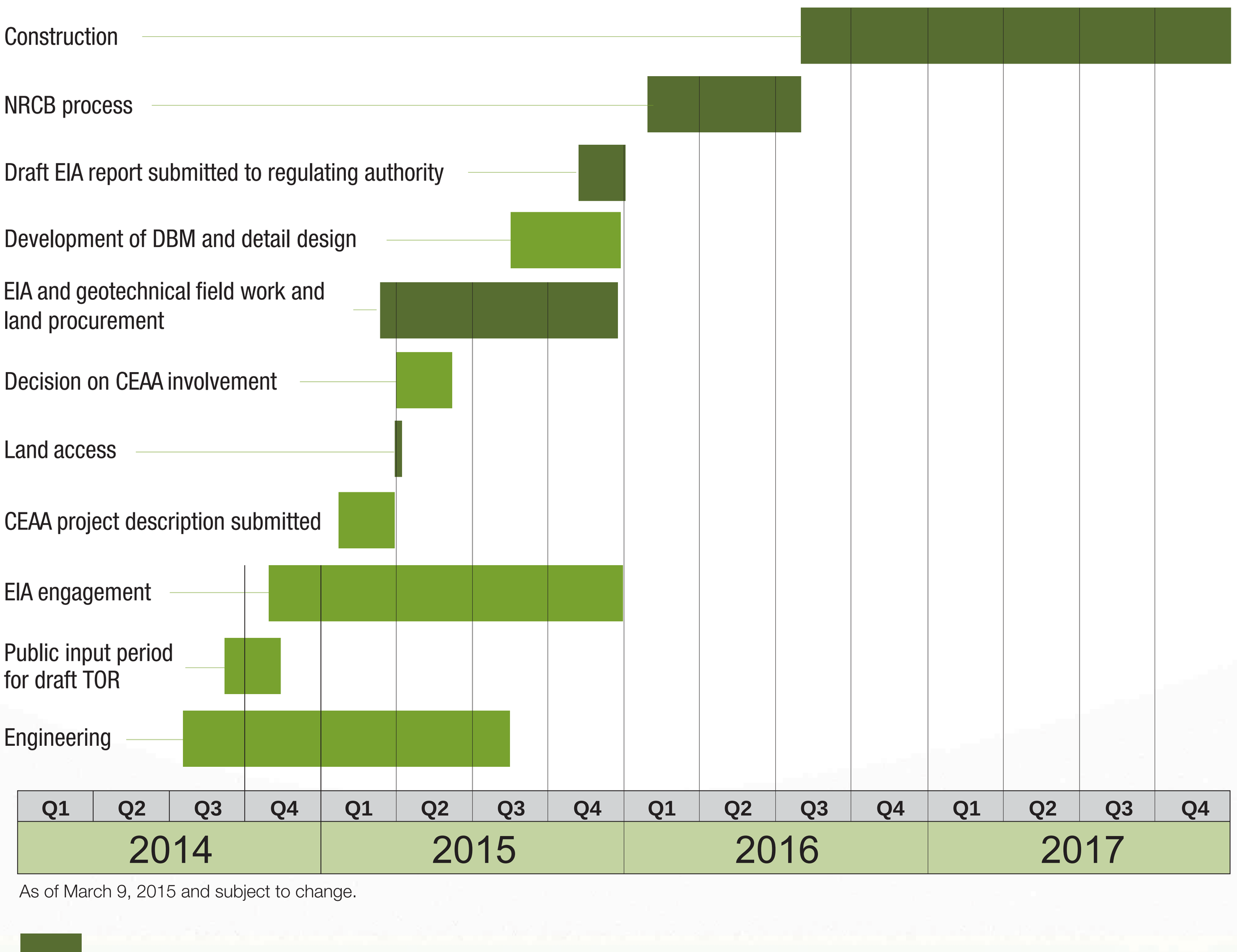
- Operating regime would have a direct  and significant influence on potential environmental effects of the project.
- The dam would be a physical barrier resulting in changes to flows, aquatic habitat, and movement of fish and wildlife.
- Potential effects on bull trout, grizzly bear and other listed species.
- Mitigation and management of potential impacts may be needed at a regional scale.
- Land and resource use will be altered by construction and operation.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Proposed Project Timeline

Alberta Government




As of March 9, 2015 and subject to change.

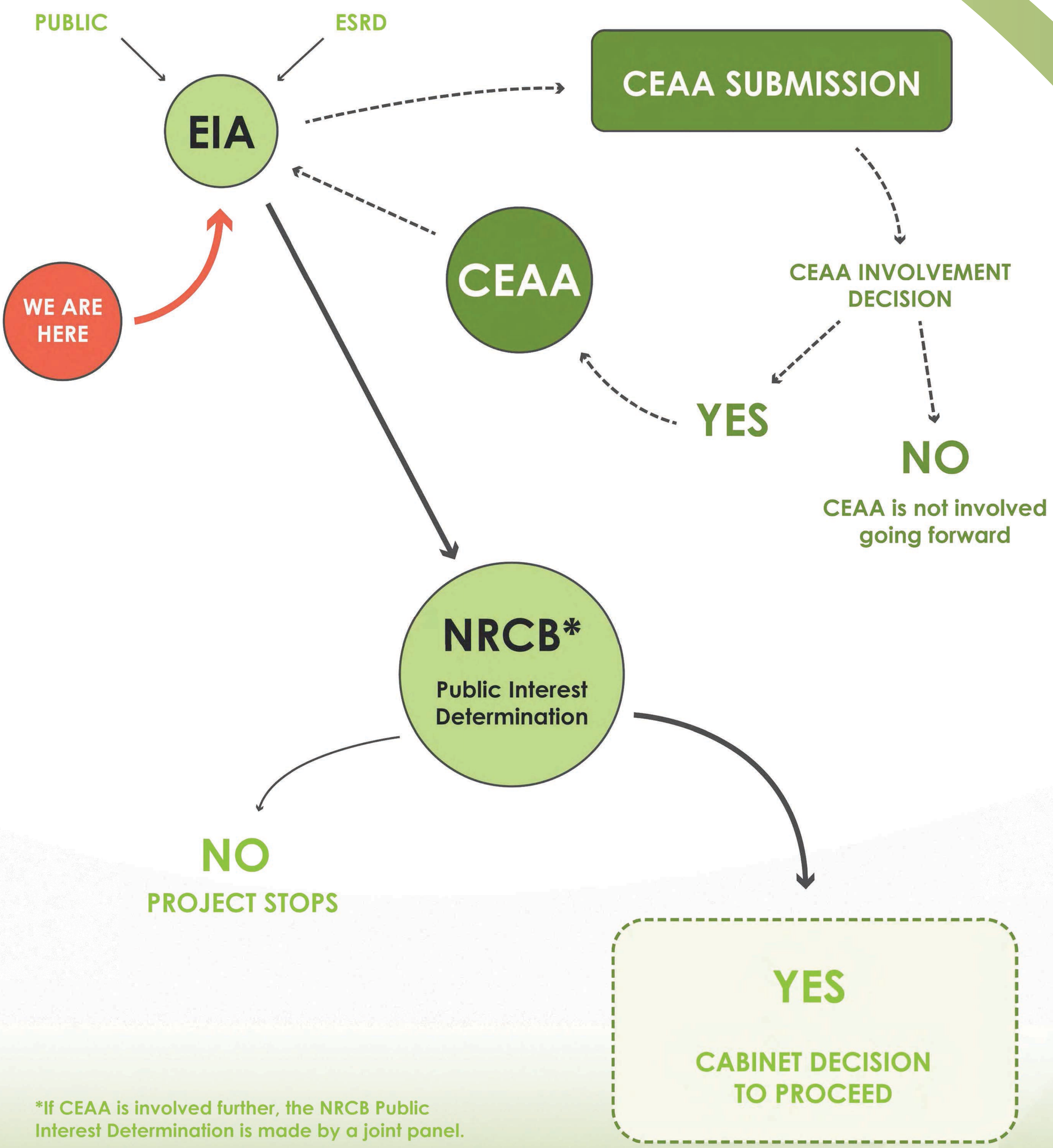
Critical Path Activities

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Project Approval (Regulatory)

Alberta Government




*If CEAA is involved further, the NRCB Public Interest Determination is made by a joint panel.

Legend:

ESRD - Alberta Environment and Sustainable Recource Development
CEAA - Canadian Environmental Assessment Agency
NRCB - Natural Resources Conservation Board

EIA - Environmental Impact Assessment

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Environmental Impact Assessment

Alberta Government

## What is an EIA?

- Environmental Impact Assessment (EIA) is the process used to gather the information necessary to evaluate the potential positive and negative effects of a proposed project.
- It is an important first step of the regulatory process.
- It is prepared in accordance with the Final Terms of Reference and environmental information requirements prescribed under the *Environmental Protection and Enhancement Act* (EPEA) and associated regulations, and the *Canadian Environmental Assessment Act* (CEAA 2012) and associated regulations.
- The EIA Report will form part of the application to the Natural Resources Conservation Board (NRCB).
- The EIA answers four main questions:

    1. What are the existing conditions (the baseline)?
    2. What changes would there be due to the project?
    3. Will the project result in any significant environmental, social, economic and health effects (positive and/or negative)?
    4. How can we mitigate the potential negative effects?

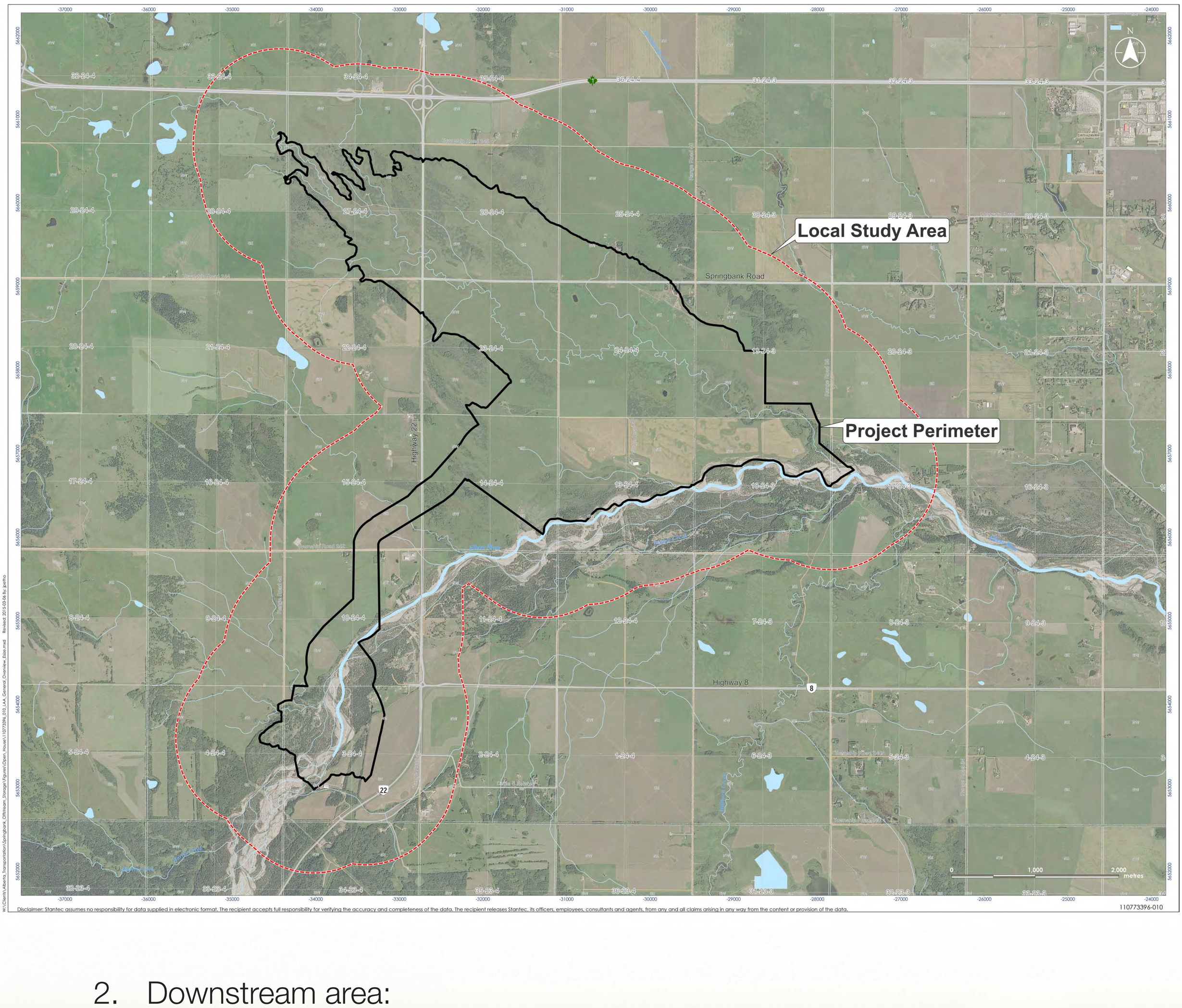
Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Proposed EIA Study Area - Two Areas of Focus

Alberta Government

1. Project footprint: Area directly affected by the proposed work:




W:\Clients\Alberta_Transportation\Springbank_Offstream_Storage\Figures\Open_House\110773396_010_LAA_General_Overview_Estes.mxd Revised: 2015-03-06 By: jsetho

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

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2. Downstream area:

- The regional context of this project includes the Glenmore Reservoir — located approximately 18.5 km downstream.
- The operation of the project and the Glenmore Reservoir will be considered together to achieve maximum benefit of flood control.
- The baseline water conditions in the project area (including the Glenmore Reservoir) will be described as well as project components and activities that may affect future water conditions in the regional context.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Alberta EIA Process

Alberta Government

Alberta Transportation prepares Proposed Terms of Reference (TOR) and Project Description

Alberta Transportation submits Proposed TOR to ESRD and public for review (September 2014)

Public review and input on Proposed TOR (September 15 - November 14, 2014)

ESRD review and issue of Final TOR (January 2015)

Alberta Transportation submits EIA Report (February 2016)

ESRD coordinates technical review to confirm application completion

NRCB regulatory and public review of EIA begins

**Stakeholder Engagement**

* A project description will be filed with CEAA in March 2015 to determine if a federal review process is also required under CEAA 2012.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Draft Field Programs

Alberta Government

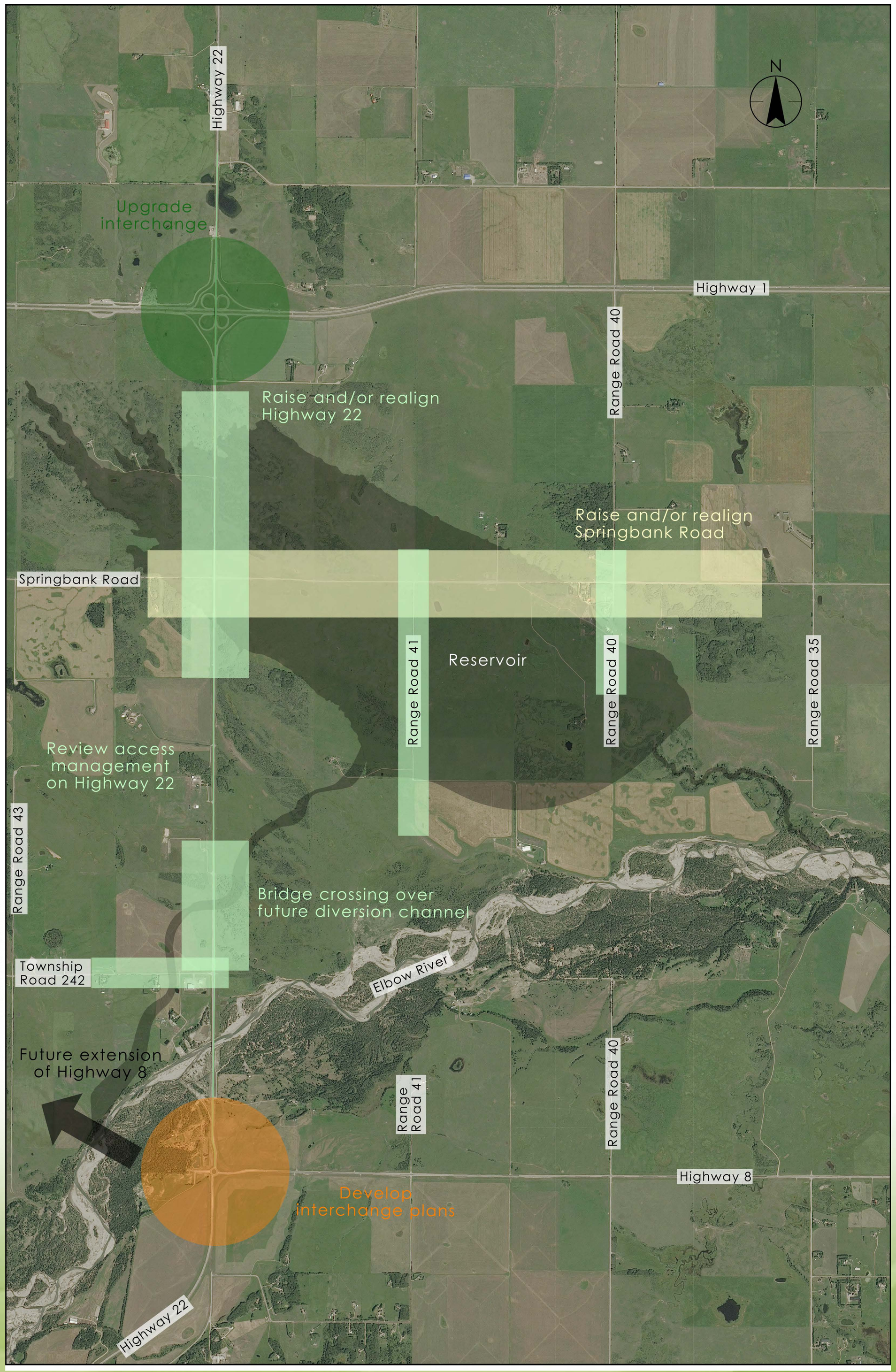
| | 2015 | | | | | | | | | | 2016 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | March | April | May | June | July | August | September | October | November | December | January | February | March | April |
| Air Quality | | | | | | Once every 2 wks | | | | | | | | |
| Noise | | | | June 15-17 | | | | | | | | | | |
| Terrain/Soils | | | All of May | | | | | | | | | | | |
| Hydrogeology | Drilling & Existing Well Examination | | | Monthly trips of 1 day each | | | | | | | | | | |
| Surface Water | | Apr 15-17 | May 18-22 | June 5-25 | | Aug 4-6 | | | | | Jan 4-6 | | | |
| Vegetation and Wetlands | | | | June 8-12 | All of July | Aug 10-14 | | | | | | | | |
| Wildlife | | 1 day | All of May | All of June | | 1 day | | | | 1 day | 2 months | | 1 day | |
| Aquatic Environment | | | | | 3 months | | | | | | | | | |
| Historical Resources | Present during drilling | | | | | | | | | | | | | |
| Traditional Knowledge and Traditional Land Use | | | | | TBD | | | | | | | | | |
| Geotechnical Assessment | Drilling | | | | | | | | | | | | | |
| Geomorphology and Sediment Transport | | 3 days | | 2 weeks | 2 days | 2 days | 2 days | | | | | | | |

Last Updated 03/04/2015

# Springbank Off-stream Reservoir Open House

## Potential Changes to Highway 22 and Springbank Road

Alberta Government




Alignment options for roads will be considered as part of the Highway Planning Functional Assessment for the Project. Proposed concepts (or changes) will be shared later this spring for input.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Project Overview

Alberta Government

## What is the Springbank Off-stream Reservoir?

- The Springbank Off-stream Reservoir provides a critical layer of flood protection for communities downstream of the diversion along the Elbow River.
- The reservoir would be located approximately 15 kilometres west of Calgary, east of Highway 22, south of Highway 1, and north of Highway 8 and the Elbow River.
- The proposed concept is to divert flood flows through a diversion channel from the Elbow River into an off-stream storage reservoir.
- Water would be temporarily contained and released back into the Elbow River once the flood recedes.
- **Project status:** Engineering, design and Environmental Impact Assessment (EIA) are currently underway.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Proposed Project Components

Alberta Government

## Diversion structure

- The diversion structure will be constructed on the Elbow River.
- When water levels in the river reach a certain threshold, water would begin to flow through the diversion structure into the diversion channel.

## Diversion channel

- The diversion channel would be approximately 4.5 km from the Elbow River to storage reservoir.
- It would be excavated through the adjacent uplands to transport flood water to the reservoir.

## Dam and storage reservoir

- The surface area would be approximately 650 hectares (1600 acres).
- The storage site includes an earthfill dam approximately 24 metres high to temporarily contain up to 67.6 million cubic metres of diverted flood water.

## Return channel

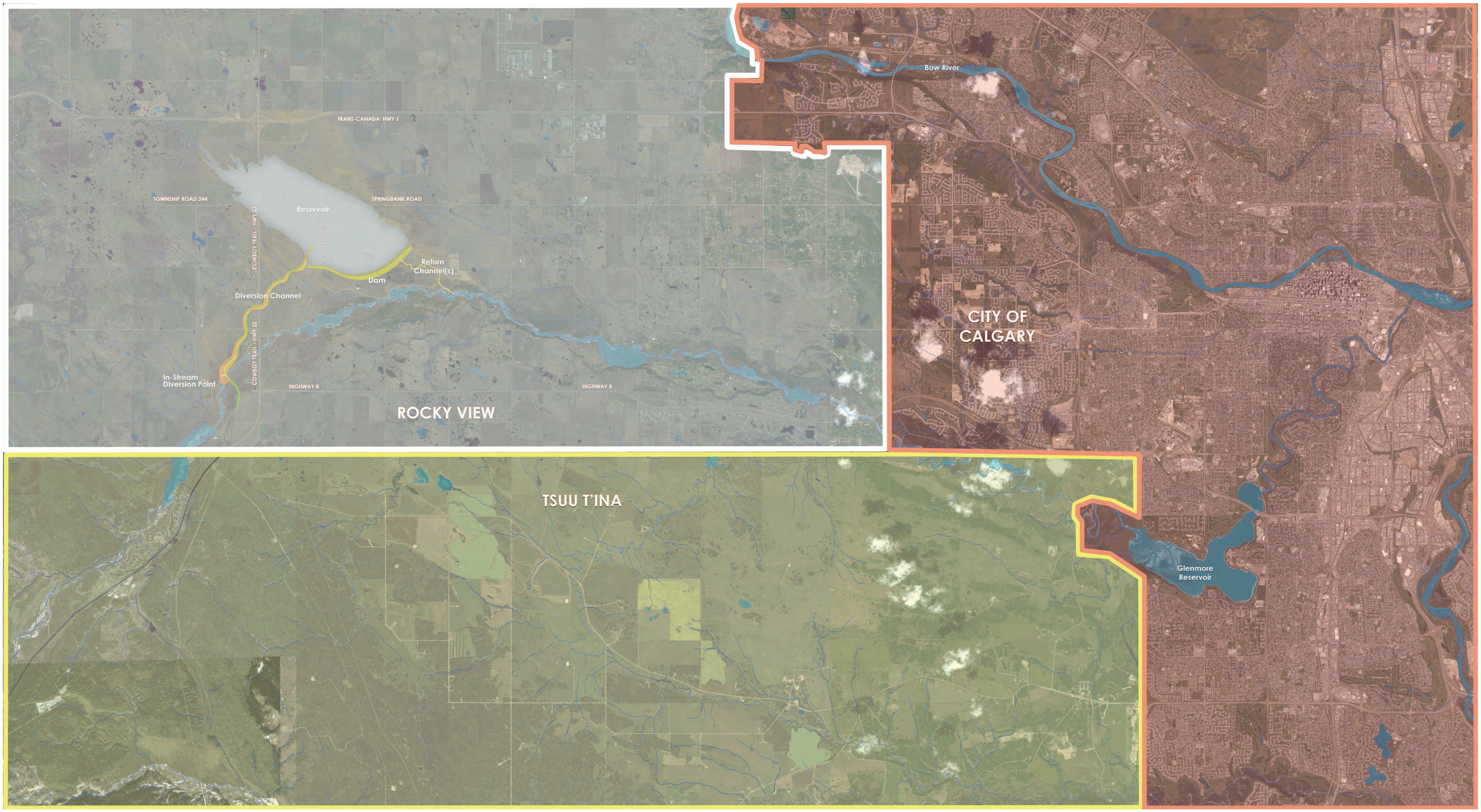
- There will be a modified channel to return the water back to the river.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Context Map

Alberta Government

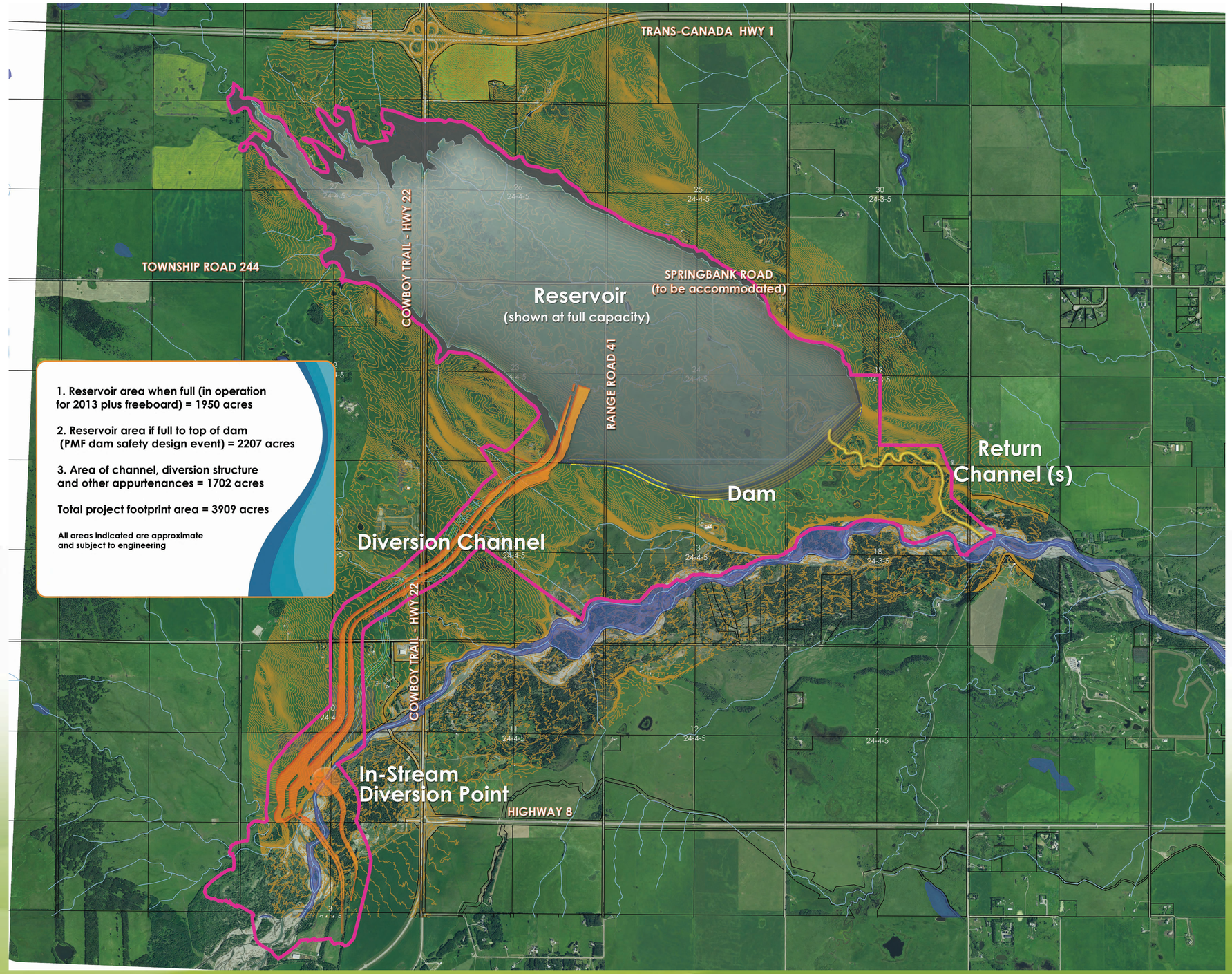



Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-Stream Reservoir Open House

## Project Map

Alberta Government




Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

## Perimeter Map

Alberta Government

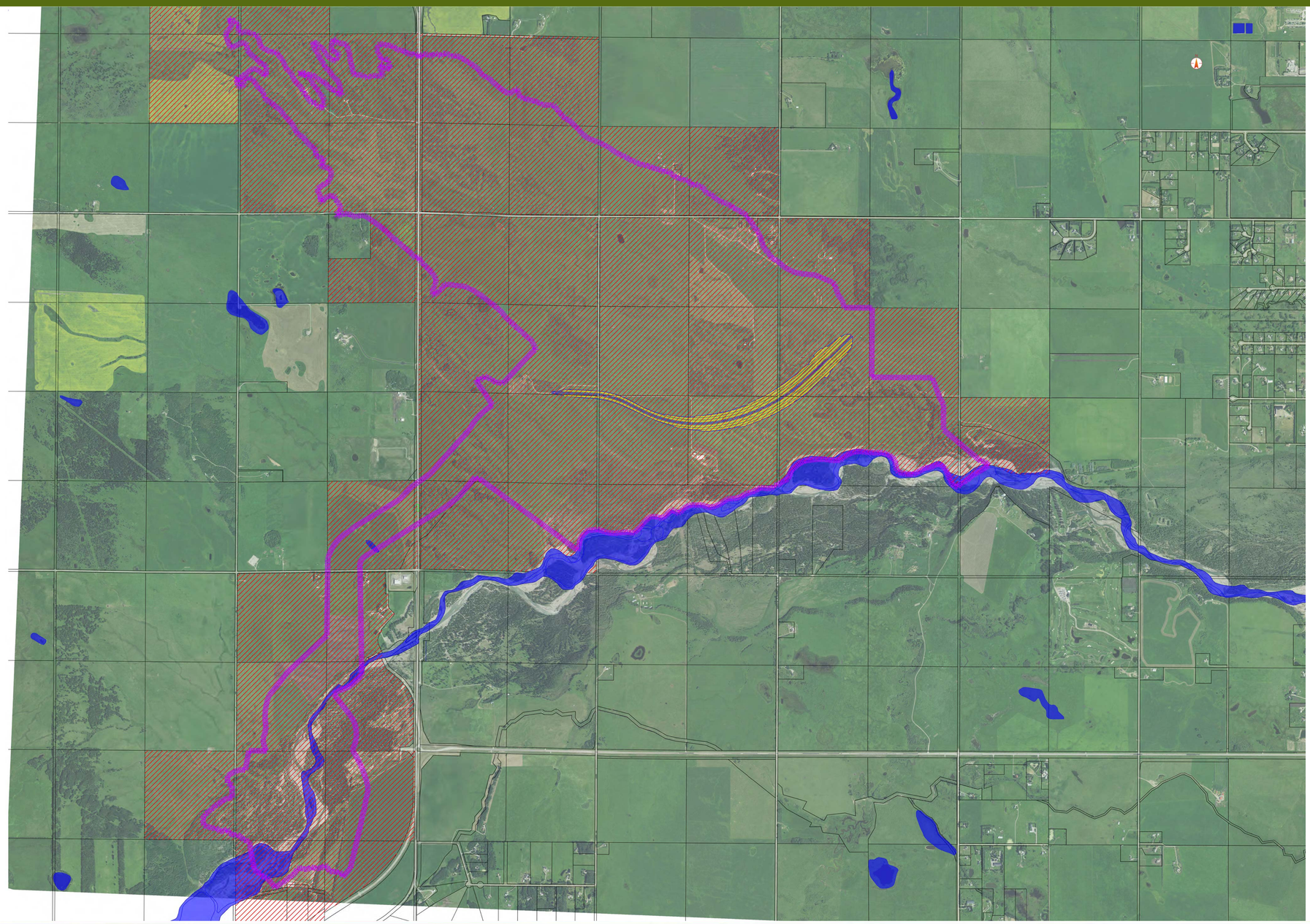


FIGURE 1.0 | Springbank, Rocky View County, AB

## SR1 OFFSITE STORAGE RESERVOIR

Project Map

PREPARED FOR: ALBERTA TRANSPORTATION

U:\110773396\CAD\drawing\archive\Springbank-Reservoir-base-mike-working.dwg

Current Project Perimeter 3909 (+/-) acres

Impacted Lands (6,884 +/- acres)

Notes:

1. EXISTING TOPOGRAPHIC SURVEY MAPPING WAS PROVIDED BY Alberta Transportation. SURFACE TOPOGRAPHY IS BASED ON A COMPOSITE AERIAL SURVEY TAKEN IN APRIL of 2013 AND SUPPLEMENTED ON SEPT 2013.

2. PROPERTY BOUNDARIES SHOWN WERE ACQUIRED FROM Environment and Sustainable Resource Development (ESRD). THE PROPERTY BOUNDARIES ARE SUBJECT TO ALL EASEMENTS, COVENANTS AND RESTRICTIONS, RECORDED AND/OR UNRECORDED. STANTEC CONSULTING SERVICES INC. MAKES NO GUARANTEE WITH RESPECT TO THE EXISTENCE OF SUCH RESTRICTIONS.

3. THE APPROXIMATE UNDERGROUND Oil and GAS LINE LOCATIONS ARE BASED ON Abacus Datagraphics Ltd. THE APPROXIMATE OVERHEAD ELECTRIC LOCATIONS ARE BASED ON data FROM FORTIS. THE APPROXIMATE UNDERGROUND STORM SEWER, SANITARY SEWER AND WATER LINES ARE BASED ON DATA FROM ROCKY VIEW COUNTY.

4. LOCATIONS OF BUILDINGS, FENCELINES, AND EDGE OF PAVEMENT WERE DIGITIZED BY STANTEC FROM AERIAL PHOTOGRAPHY FLOWN BETWEEN JULY 20 and OCT 14, 2013 AND PROVIDED BY ALBERTA TRANSPORTATION.

5. NO FIELD TOPOGRAPHIC SURVEYS HAVE BEEN PERFORMED BY STANTEC AT THE TIME OF DRAWING DEVELOPMENT.

Alberta Transportation

Stantec
Design with community in mind

NTS

110773396

March 3, 2015

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# Springbank Off-stream Reservoir Open House

## Dry Reservoir

Alberta Government

# What benefits does a dry reservoir offer?

- Dry reservoirs are catchment areas designed to hold excess water for a short period of time during a flood, while allowing water to move freely during normal conditions.
- The reservoir will be filled with water during a flood event.
- A dry reservoir also offers more flood mitigation protection than a wet reservoir would. It ensures the full capacity of the reservoir is available to store water during a potential flood event.

Presented at Bragg Creek Open House on March 17, 2015

# Springbank Off-stream Reservoir Open House

Alberta Government

## Contact us

Mark Svenson

Provincial Transportation Environmental Coordinator

Phone: 780-644-8354

Email: springbank-project@gov.ab.ca

Learn more at: alberta.ca/springbank-road.cfm

Presented at Bragg Creek Open House on March 17, 2015

**March 10 and 17, 2015 Open Houses – Overview of Issues and Concerns**

## Documenting Public Input for the Environmental Impact Assessment

The Terms of Reference for the Environmental Impact Assessment (EIA) for the proposed Springbank Off-stream Reservoir Project (SR1) outlines the public engagement requirements for Alberta Transportation (the Project Proponent). The final report for the EIA must include the concerns and issues expressed by landowners and the public about the proposed project and the actions taken to address those concerns and issues. This includes the process and extent of public engagement used to arrive at the current proposal for flood mitigation and how public input was incorporated into the project development, impact mitigation and monitoring.

## Documenting Public Input at the March 2015 Open Houses

As part of preliminary engagement for the EIA for the proposed project, four open houses were held to share current information and to record public comments, issues and concerns. Two open houses were held in January, one in Calgary on January 27, 2015, and the other in Cochrane on January 28, 2015. The March open houses were held on March 10, 2015 in the Springbank community and on March 17, 2015 in Bragg Creek.

At the open houses, display boards were positioned around the perimeter of the room, and project representatives were stationed near the boards to speak directly with attendees, providing information and answering questions. Representatives recorded issues, questions and comments expressed by attendees. An exit survey was also provided for those attendees who wished to provide additional feedback. The exit surveys, as well as the recorded comments from the SR1 team members, also known as a Record of Contact (ROC), were then submitted to Communica Public Affairs' Stakeholder Information Management team to record. Each ROC and survey was recorded verbatim and cross checked as part of a thorough quality control auditing process to ensure every comment was accurately captured. This level of documentation is required for the EIA process.

## Open House Attendance and Records of Contact

An online version of the survey was offered to those who wished to provide additional information or could not attend the open houses. The following chart breaks down the final numbers:

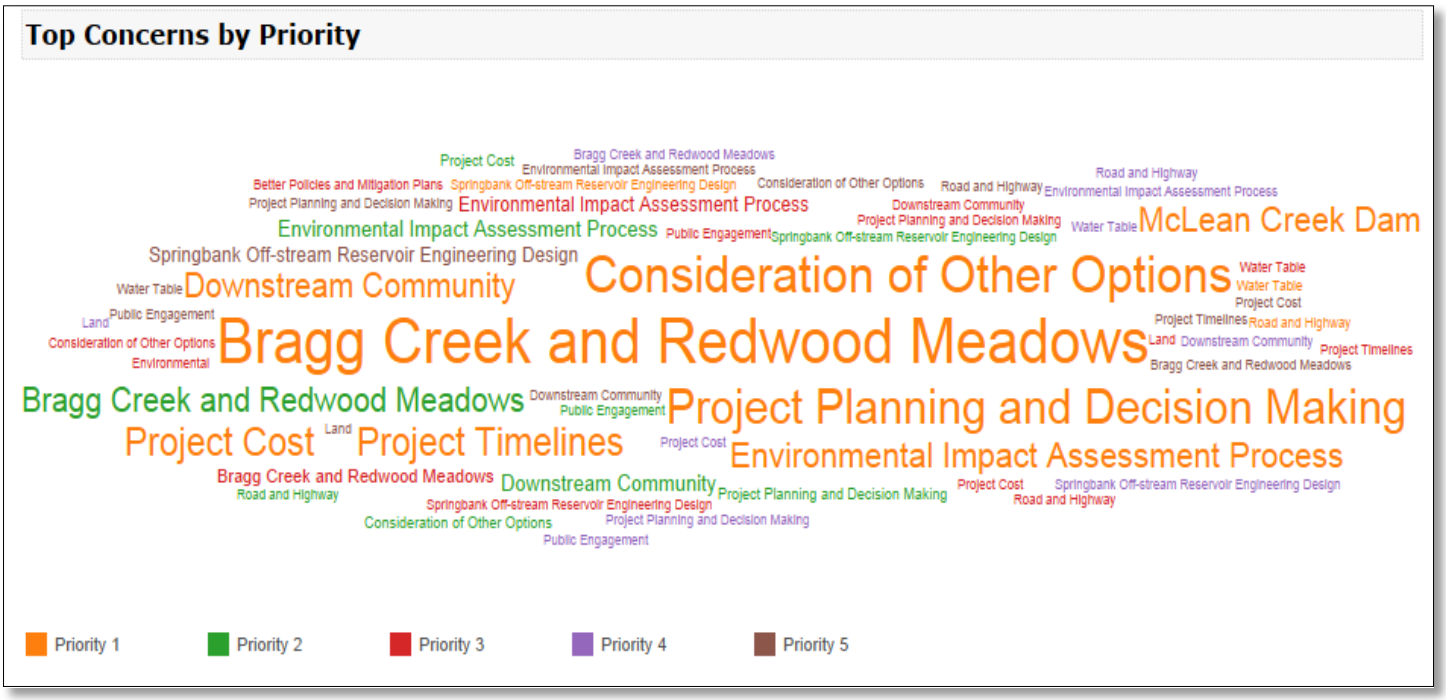
| MARCH 2015 | Springbank | Bragg Creek | Online | Sub Total |
|---|---|---|---|---|
| **Attendance** *(approximate door count)* | 214 | 322 | N/A | N/A |
| **Exit Survey** | 84 | 148 | 24 | 256 |
| **Record of Contact Form** | 108 | 87 | N/A | 195 |
| **Total** | | | | 451 |

## Summary of Public Input - Issues and Concerns

During the March open houses, attendees were asked to rank their *Top 5 Issues and Concerns* as one of the questions from an optional exit survey. Out of 12 possible selections, the following list represents the most frequent selections for *Priority 1*:

1. Upstream Community Impacts – Bragg Creek and Redwood Meadows Flood Mitigation
2. Consideration of Other Options (McLean Creek or Calgary Underground Diversion Tunnel)
3. Project Planning and Decision Making
4. Environmental Impact Assessment Process
5. Project Cost

Although rankings of the issues and concerns differed from one survey respondent to another, many priorities were similar. The following word cloud displays frequency of issue or concern based off selection of priority. Each priority, ranked one through five, is colour coded. The larger the word, the more frequently it occurred.






[communica]

## March Open House Exit Survey and ROC Comments

Comments included information requests, suggestions for the engineering design and concept, and overall feedback on the project planning process of SR1. The following are a few examples of comments captured:

- "I am concerned that a decision regarding the Project was made without considering all costs associated with land acquisition. The Springbank Off-stream Reservoir provides no protection to Redwood Meadows and Bragg Creek." – *Survey Respondent*

- "I am concerned about the effects of silt and how they would be mitigated, as well as smell, mosquitoes, and dust." - *Open House Attendee*

- "Why is nothing being done to protect Bragg Creek and Redwood Meadows? With money being spent on SR1, the government could buy those communities out or at least protect them." – *Survey Respondent*

- "I support the project but the project timelines are too slow, and the regulatory process is too cumbersome." – *Survey Respondent*

- "McLean Creek is the only project alternative that can prevent future flood damages to Bragg Creek and Redwood Meadows. McLean Creek is the more cost effective alternative." – *Survey Respondent*

- "There is a Grizzly Bear corridor between Bragg Creek and Springbank. Why is there no information on the Grizzly Bear population in Springbank?" –*Open House Attendee*

- "None of the province's 7 key elements to flood mitigation, included people or their livelihoods. The government is more concerned about wildlife, habitat and the environmental impacts of McLean Creek Dry Dam. Not one poster at the open house talked about the "human factor." – *Survey Respondent*

- "The Project does not appear to be thoroughly thought out. I am concerned about the accuracy of the associated costs of the Project and the effects it would have on the water table, fish and wildlife." – *Survey Respondent*

- "The costs associated with the Springbank Off-stream Reservoir Project were misleading and didn't take into account land acquisition costs and the raising of Highway 22." – *Survey Respondent*

- "I am disappointed in the decision making process. Decisions are being made before the reports are completed." – *Survey Respondent*

**SPRINGBANK OFF-STREAM RESERVOIR PROJECT**
**ENVIRONMENTAL IMPACT ASSESSMENT**
**CONSULTATION AND ENGAGEMENT**

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

## April 2015

Stantec

[communica]

April 20, 2015

**Springbank Off-Stream Reservoir**

Stakeholder Engagement Questions and Response Summary

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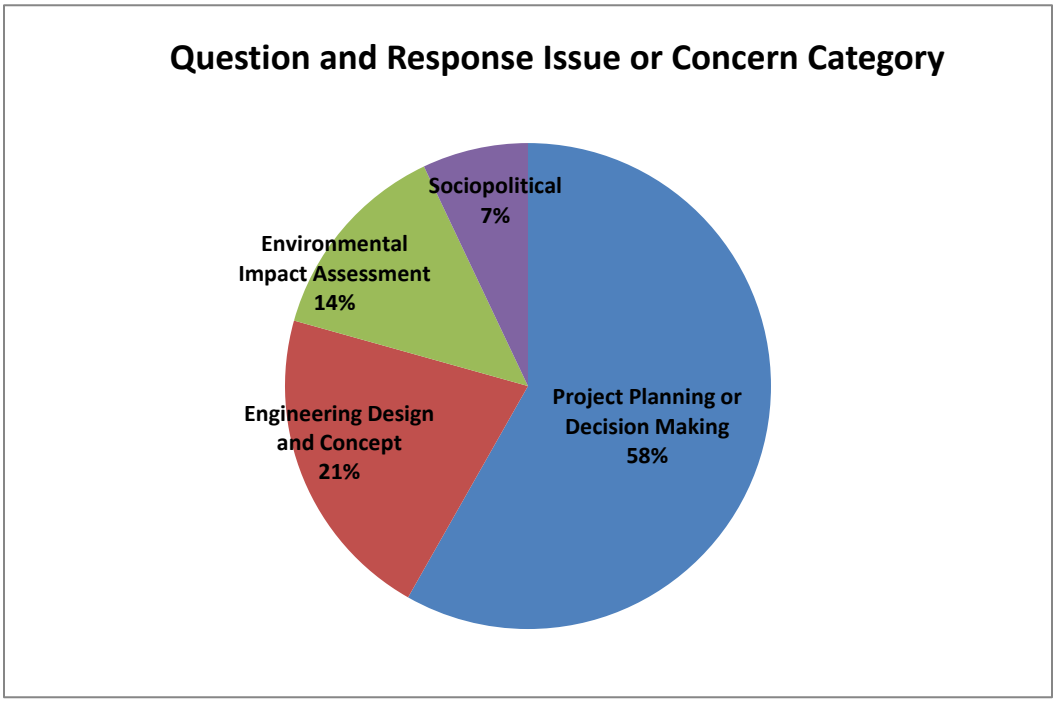
**Overview of Questions and Response Tables (as of April 16, 2015)**

Ongoing consultation for the Springbank Off-stream Reservoir (SR1) Project has been tracked and documented in a centralized stakeholder engagement tracking tool. The following two tables are examples of the questions captured to date throughout the engagement process. Questions were consolidated from open houses, email enquiries, meetings, and one-on-one communications between the project team and any individual interested in SR1. The summary tables break down the questions and responses as follows:

1. The first table is the *Summary of Questions and Responses Provided* which displays a summary of general questions, categorized by topic of issue or concern. The individuals who asked these questions requested follow-up on their issues or concerns. The Government of Alberta, Stantec or Communica provided responses to these inquiries. Accordingly, duplicate questions were consolidated as part of the summary table. See pages 2 – 9.
2. The second table, *Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested)*, lists additional questions where a follow-up was not required or requested by stakeholders. These questions have been documented to include in the decision making process of SR1, the Environmental Impact Assessment (EIA), or engineering design and concept considerations. See pages 10 – 18.

**Analysis of Issue or Concern Topic**

Questions recorded were specific and unique to the stakeholder's perception of SR1. Each question was then categorized by issue or concern topic in order to accurately group the issues or concerns. Approximately **65%** of the issue or concern topics related to Project Planning or Decision Making and Sociopolitical inquiries. The remaining **35%** were with regard to the EIA or the Engineering Design and Concept. The following graph breaks down these trends.



| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Bragg Creek and Redwood Meadows Flood Mitigation | Why has SR1 been chosen over upstream options that would protect Bragg Creek, Redwood Meadows, Springbank and Calgary?<br>Why is the Government moving forward on SR1 when the EIA for SR1, MC1 and the Calgary Diversion Tunnel are not complete? | SR1 was identified as the most viable option, based on data provided through AMEC's 2013 feasibility study. There are environmental concerns with the McLean Creek Dam, and its environmental review is almost complete. Each of the three proposed Elbow River mitigation infrastructure projects are undergoing a robust cost-benefit analysis. A decision by the provincial government based on the cost-benefit analysis is expected at the end of the month. |
| Bragg Creek and Redwood Meadows Flood Mitigation | How will SR1 protect upstream communities? | The Government of Alberta has committed funding to community mitigation at Bragg Creek and Redwood Meadows |
| Bragg Creek and Redwood Meadows Flood Mitigation | What are the flood mitigation plans for Bragg Creek and Redwood Meadows? | The Government of Alberta has committed funding to community mitigation at Bragg Creek. Rocky View County is leading the project, and is moving forward with detailed engineering and design. The Project team member included AMEC's conceptual design for Bragg Creek's flood defenses, and advised the stakeholder to get in contact with their local councillor. Information regarding the Room for the River Pilot in the Bow River Basin Final Report. |
| Bragg Creek and Redwood Meadows Flood Mitigation | Is removal of Redwood Meadows being considered as a flood mitigation alternative? | The Government of Alberta has committed funding to the community of Redwood Meadows and to Tsuu T'ina Nation for local community mitigation. |
| Bragg Creek and Redwood Meadows Flood Mitigation | Why was an option that also provides protection for Bragg Creek and Redwood Meadows not selected? | The EIA is currently in process for both McLean Creek and the Calgary Diversion Tunnel. |
| Construction Timeline | Has a date been set for construction to begin on the project? | Detailed engineering, design and environmental impact assessment for SR1 is currently under way and processes were occurring concurrently to help ensure the Government of Alberta was doing all that they can to move the project forward quickly. All regulatory requirements must be met prior to construction commencing and suggested that based on current estimates, construction would begin in 2017. |
| Construction Timelines | Will there be interruptions to Kamp Kiwanis due to construction of SR1? | Interruption concerns can be discussed when necessary. |
| Decision Making Process | What other options has the government considered aside from SR1? | The project team provided information, in electronic format, information on the Government of Alberta's responsibilities in regard to flood mitigation, and the various options proposed and examined. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Decision Making Process | Why was SR1 selected to move forward with engineering? | SR1 was identified as the most viable option, based on data provided through AMEC's 2013 feasibility study. There are environmental concerns with the McLean Creek Dam, and its environmental review is almost complete. Each of the three proposed Elbow River mitigation infrastructure projects are undergoing a robust cost-benefit analysis. A decision by the provincial government based on the cost-benefit analysis is expected at the end of the month. |
| Decision Making Process | Why is wildlife being protected instead of the residents of Bragg Creek and Redwood Meadows? | The Government of Alberta is working with upstream communities to implement community mitigation measures to protect them against future flooding. |
| Decision Making Process | Why is the cost benefit analysis being presented at the open house if it is inaccurate? | The cost benefit analysis of the Elbow River flood mitigation options is still being undertaken. A link to the project website and the cost benefit analysis was also provided to the stakeholder. |
| Decision Making Process | What was the cost of 2013 flood? | The cost of the 2013 flood was provided to stakeholder by email. |
| Decision Making Process | What percent of the 2013 flood was caused by the Elbow and by the Bow River? | A link to the Provincial Flood Damages Assessment Study on the Government of Alberta website was provided to the stakeholder. |
| Downstream Community Impacts | Can the EIA capture the impacts to downstream communities? | Part of the EIA discusses the implications, both positive and negative, of a delay in proceeding with the project. A link to the TOR and project website was also provided to the stakeholder, and informed the stakeholder that a cost benefit analysis would soon be available to the public. |
| Engineering Design and Concept | How long will it take to fill SR1? | It would take approximately three days to fill the reservoir in an extreme situation. |
| Engineering Design and Concept | Are release rates and impacts to existing creeks from headwaters being studied?<br>How will SR1 be operated? | Engineers are in the process of determining the operation regime for SR1 which includes release rates. The release rates, natural drainage considerations and environmental requirements would drive the design of the outlet infrastructure. We recognize the opportunity to preserve the creek and will investigate the feasibility of doing so as part of preliminary engineering. |
| Engineering Design and Concept | How will water levels be predicted and managed?<br>What levels of flooding would prompt SR1 to be used? | Engineers are using data recorded from Water Survey Canada thermometric stations at Sarcee and Bragg Creek, and hydrologic computer modelling to determine flow rates. Both 1-dimensional and 2-dimensional hydraulic modelings are being used with that data to assess water levels and hydraulic performance in various flood and low water scenarios. There is a program in place for more localized measurement and study of the hydrology and water levels. |
| Engineering Design and Concept | Could the floodplain berm (diversion channel) be moved so it does not cut Kamp Kiwanis in half? | Drawings are preliminary and could be re-evaluated. |
| Engineering Design and Concept | Would the project affect the Springbank Airport?<br>What is the master drainage plan for the area? | The Project Team directed the stakeholder to contact Rocky View County as they would hold this plan if it existed. |
| Environmental Impact Assessment Process | Will landowners be informed of any drilling on site for the Environmental Impact Assessment studies? | Landowners would be notified in advance of any drilling activity required for EIA studies. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Environmental Impact Assessment Process | Could there be issues of pictures being inadvertently taken of Kamp Kiwanis clients by cameras that would be set up to take pictures of wildlife? | Wildlife cameras will be set up where people traffic is low and mitigation / avoidance strategy could be worked out to ensure people wouldn't be caught on camera. |
| Environmental Impact Assessment Process | How long would it take to prepare an EIA? Have heard it would take 4- 5 years to complete the EIA for McLean Creek. | It would take one year's worth of data to create an EIA. |
| Environmental Impact Assessment | Will the Bow Point Nursery be affected by SR1? | The Bow Point Nursery is not within the project area; however it is still too early in the EAI process to determine any potential impacts. |
| Fish | Will SR1 impact the fish species in the Elbow River? | Impacts to fish and water quality will be investigated as part of the EIA process and as outlined in the EIA Terms of Reference. The findings of the EIA will be ready for public review later this year. |
| Flood Policies and Mitigation Plans | Why is it taking Calgary so long to build its flood mitigation projects? | The Government of Alberta had provided the resources to build critical layers of flood protection for the most vulnerable communities. Quick action has been taken to move forward with projects like SR1. The detailed engineering, design, and EIA are all underway and occurring concurrently. The regulatory requirements must be met, but are being completed simultaneously to ensure timeline efficiencies where possible. The Cabinet is expected to make a decision on McLean Creek Dam and Calgary Underground Diversion within the next month. |
| Flood Policies and Mitigation Plans | What is the province doing to prevent impacts to people and infrastructure aside from dam projects? | Programs to relocate people from the floodway and policies to prohibit development in floodways are under development. The Dutch Option for the River program could be adapted and applied here to reduce the vulnerability of people and infrastructure and improve the overall environmental quality in the bow river basin. Natural, non-structural solutions would play a role in improving drought resiliency. Alberta also requires that forestry companies conduct their activities in ways that minimize environmental and social impacts. |
| Flood Policies and Mitigation Plans | What is the status of land buyouts along the Elbow River? | Policies on future use and future ownership of the Flood Relocation Program lands would be reviewed by Alberta Emergency Management Agency's multi-departmental Flood Policy Working Group, with final decisions made at the Deputy Minister and Cabinet level. Those decisions have not been made. Future uses of the Flood Relocation Program lands would largely be determined by the provisions of the Floodway Development Regulation, which is being drafted by Municipal Affairs. All Calgary Flood Relocation Program properties have been assessed and all houses would be demolished beginning of spring. A Project Team member forwarded a link to the Municipal Affairs website. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Flood Policies and Mitigation Plans | How does SR1 compare to the 2005 flood mitigation report? | A number of recommended strategies to mitigated future flooding were included in the 2006 report. Although SR1 was not included in that report it was identified as a solution in the 2014 flood mitigation feasibility studies. Alberta's approach to flood mitigation is a layered approach which includes community mitigation, updates to existing infrastructure and large infrastructure projects. |
| Flood Policies and Mitigation Plans | When will a report be completed for McLean Creek? | Report will be complete in a month and a link to information on feasibility studies and flood mitigation plans was provided. |
| Flood Policies and Mitigation Plans | Why isn't the government considering modeling flood mitigation after the SSRP?<br>Is the South Saskatchewan River Plan a governing provincial document?<br>Is SR1 in-line with the South Saskatchewan Regional Plan? | The Government of Alberta acknowledges the SSRP and the importance of land as a limited resource and the need to maintain an agricultural land base for sustainable growth and diversification. As a result, the Government of Alberta is dedicated to meaningful public engagement including discussion with directly affected landowners to ensure that their voices are heard and respected and to inform our decision-making process going forward regarding future land use of the Springbank Off-stream Reservoir project site. |
| Geology | Are there concerns about the alluvial geology in the area? | This will be reviewed as part of the EIA process. |
| Lack of Information | Request for the Terms of Reference (TOR). | Project member sent TOR electronically. |
| Lack of Information | Request for additional information about the project. | Project member sent a copy of the Springbank Off-Stream Reservoir Project electronically. |
| Lack of Information | Requested more information about the Room for the River pilot study.<br>What is the status of the Room for the River initiative? | The pilot offered a series of options for the implementation of Dutch flood mitigation concepts in Alberta. Various suggestions from stakeholders were included in the report, however the study didn't assess the viability of any suggestions from social, financial, ecological or engineering perspectives. The study also does not represent the policy direction of the Government of Alberta (GOA). The GOA is reviewing the report and would move forward on projects and policies that made sense. There is no discussion of removing the Redwood Meadows berm, rather the GOA committed $2.5 million in funding to Redwood Meadows. |
| Lack of Information | Request for EIA. | Project team member sent the link electronically to the stakeholder. |
| Lack of Information | Request for Cost Benefit Analysis. | Project team member sent the link electronically to the stakeholder. |
| Lack of Information | Request for open house information. | A PDF of the open house scheduled was sent electronically to the stakeholder. |
| Lack of information | Request for project map. | A map was sent electronically to the stakeholder. |
| Lack of Information | Requested historical flood records and head water information for Elbow River. | A link to the Elbow River's historical data was provided electronically to the client. |
| Lack of Information | Breakdown of costs between SR1 and MC1 is inaccurate | Information provided on costs estimates used for the cost-benefit analysis and estimates used for required lands amounts. |
| Lack of Information | Request for open house materials. | Email with requested information sent by project team. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Lack of Information | What are the dates and locations for the March Open Houses? | An email provided a link to the web site with the dates and locations. |
| Land | What is the land use strategy for SR1? | Land use has not yet been determined for4 SR1; discussions regarding this topic are ongoing. The EIA process would review any proposed land uses for the reservoir and would advise on management strategies. Access to the diversion canal was part of the project design which has not yet been finalized. The stakeholder was also directed to the project website. |
| Land Reclamation | What will be the effects of the silt left in the reservoir once it has been drained and how will it be cleaned? | Land use and impacts on the land within the proposed reservoir will be available later in the year for public review and comment. The stakeholder was also provided a link to the EIA's Terms of Reference and the project website. |
| Land Access | Has the project team been granted land access to conduct surveys related to the EIA? | Progress has been made with the landowners to gain access to their lands. |
| Land Access | Will there be compensation for land access? | Stantec is unable to negotiate compensation on behalf of the province of Alberta. A representative from the government will contact further about the matter. |
| Land Acquisition | What is the land acquisition process? | An explanation regarding the land expropriation process in Alberta was given, as well as a link to the Land Expropriation Act. |
| Land Acquisition | How much land is required for SR1? | Estimates for the amount of land needed is based on conceptual design footprint including the diversion, storage reservoir to contain a 1/100 year flood event, and dam, and equated to some 1,760 acres. As of March 9, 2015, the outside perimeter of the full land base that could be impacted when the final design is completed was 3,909 acres. At this point, land requirements are still unknown because the project is still in design; however the estimated land area required has increased since the cost benefit analysis was undertaken. |
| Land Acquisition | Has the amount of land required for SR1 quadrupled? Why has the Government of Alberta stated that the number of acres needed for the SR1 project is 1600 acres when the actual number is over 7000 acres? | As of March 9, 2015, the outside perimeter of the full land base that could be impacted when the final design was completed was 3,909 acres, and included government controlled lands (road allowances). Another number that was shared at recent open houses and on the project website was 6,884 acres, which did not represent the perimeter of the land base that would be impacted by the final design. |
| Project Alternatives | Why is SR1 gaining momentum over the McLean Creek option? | The government is continuing with environmental studies at the McLean Creek site as well as looking at other alternatives. These alternatives will be incorporated into the final environmental assessment for SR1. SR1 would provide effective flood protection for the city, while minimizing impacts on communities and infrastructure downstream. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Project Alternatives, Decision Making Process | Would MC1 offer as much flood protection as SR1? Is this being included as a factor in the decision making process? | Both projects were designed to provide protection for a 1:100 level flood, which is the standard for Alberta Flood Mitigation. The Government of Alberta requested that SR1 be designed for a 2013 flood, which is a higher level of flood protection. MC1 would need certain elements of the conceptual design updated, to provide the same protection as SR1. The EIA for MC1 and a cost benefit analysis for SR1, MC1 and Calgary Diversion Tunnel are being completed. Cabinet would make a decision regarding the next steps for MC1 and the Calgary Diversion Tunnel within the month. |
| Project Cost | How much financial damage will be prevented by SR1? | The Project team informed him of the costs incurred from the 2013 flood and the costs for flood mitigation from the IBI Group's 2014 report. The Project team provided the link to the benefit-cost analysis report and the link to SR1's summary overview, benefit-cost ratio, and project website. |
| Project Cost | Please provide a cost breakdown for why SR1 was being favored over MC1. | SR1 would cost approximately $215 million, not including land acquisition costs, while MC1 would cost approximately $295 million, and the Calgary Underground diversion project would cost approximately $498 million. |
| Project Cost | The costs presented at the open house were inaccurate with the old number of acres from the 2014 map. Please provide a recalculated size and cost of the project. | A Project Team member provided information used for cost estimates on the cost-benefit analysis, and land use for the final design. |
| Project Planning | When will the cost benefit analysis be complete? | The analysis on both McLean Creek and SR1 were taken from the AMEC feasibility study report. Current information on land requirements were also provided to the stakeholder. |
| Project Planning | What will happen to the empty homes in Elbow Park that were bought out by the province (homeless people may move into them - this presents safety concerns)? | Policies on future use and ownership of the Flood Relocation Program lands would be reviewed by Alberta Emergency Management Agency's multi-departmental Flood Policy Working Group, with final decisions made at the Deputy Minister and Cabinet level - these decisions have not yet been made. Future uses of the Flood Relocation Program lands would largely be determined by the provisions of the Floodway Development Regulation, which is being drafted by Municipal Affairs. All Calgary Flood Relocation Program properties have been assessed, and all houses would be demolished beginning of spring. A link to the Municipal Affairs website was also provided to the stakeholder. |
| Project Planning | A stakeholder expressed concern that there is no trust in the system, and no communication between the levels and departments of government. | An SR1 Project Team member provided information on communication that has taken place between the SR1 Project Team and various Provincial Government departments, municipalities and stakeholder groups. |
| Project Planning | How long will water be held in the reservoir before it is returned to the river? | Design and operations elements are currently under analysis and discussion. New engineering and design information will be made available on the Government of Alberta's web site. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Project Planning | When will a decision on the SR1 project be made? | The engineering, design and EIA are underway. The project was a high priority for the government, and once all regulatory requirements are met, Cabinet would make a final decision and construction would proceed if approved. A copy of the current project timeline was provided. |
| Project Planning | Will all debris from the project be cleaned off adjacent land once the reservoir is emptied after a flood? | The impacts on the land within the proposed reservoir basin will be included in the EIA and available for public review and comment later in 2015. |
| Project Planning | How close will SR1 be to residential areas? | All potential environmental and social impacts will be taken into account as part of the EIA. |
| Project Timeline | Why won't the project be completed sooner? | SR1 has been identified as a priority for the Government of Alberta, and progress has been made on the engineering, design and EIA. A Project Team member provided a link to the project website, and informed the stakeholder that it would be updated continually as the project progresses. |
| Project Timeline | What are the project timelines and deadlines for EIA and engineering? | EIA and TOR are complete and on the website and Project timeline shared at the Open House is on page 12 of the document posted on the Project website.<br>Multiple times no response was provided to concerns about timelines |
| Project Timeline, Environmental Impact Assessment Process | What happens if there is a delay in getting land access to complete the EIA studies? Will this delay the project? | The Government of Alberta is working with landowners to gain access to their lands, sot the EIA could be completed. Discussions with landowners have been positive and resulted in progress. Landowners need to be heard and respected in this process. The government of Alberta has also committed to community mitigation at Bragg Creek and Redwood Meadows. |
| Public Engagement and Input | Why was different information presented at the March open houses than during the January open houses? | The project information supplied at the Bragg Creek open house was different because there was new information to present, specifically in regard to the environmental review of the McLean Creek Dry Dam and the cost benefit analysis for the Elbow River mitigation options. The stakeholder was also provided a link to the project website. |
| Public Engagement and Input | What project details will be provided at the January open houses in Calgary and Cochrane? Why were these areas chosen for the open houses? | Open Houses provide an opportunity for residents to learn about the key aspects of the SR1 project and Environmental Impact Assessment (EIA) process, ask questions, provide comments and find out what opportunities to provide input in the future as the project progresses. Open Houses provide the project stakeholder engagement team with an early understanding of the key issues of concern to be addressed as we move through the process. |
| Regulatory Process | What stage is SR1 at in regard to the regulatory process?<br>How involved will the Federal Government be in SR1?<br>What are the regulatory processes for the project? | SR1 is at the Environmental Assessment phase, and the final Terms of Reference of the EIA have been issued by ESRD. Work is underway for the EIA field program to complete the required studies for the EIA, and the Project Team is working on filing a project description with the Canadian Environmental Assessment Agency. This will determine if a federal environmental review is required. Representatives from the NRCB will be present at the Bragg Creek open house to explain the regulatory process. |

| Summary of Questions and Responses Provided | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Response** |
| Road and Highway | When will information regarding the plans for affected roads be available?<br>Will there be additional costs for roads surrounding the reservoir every time there is a flood? | The road program for SR1 will be available in late summer/early fall for public input and comment. Highway 22 and Springbank Road are being reviewed as part of roads work. |
| Water Quality | How would reservoir water quality be managed when draining into the Elbow River? | Information of this nature will be made publicly available later this year. |
| Water Quality | How will SR1 affect water quality in the area? | Information regarding impacts to water quality of the reservoir, and associated measures to manage impacts will be available later this year for public review and comment. |
| Water Table | How will the water table be impacted by SR1? Will there be implications to water well and septic systems in the SR1 project area? | The water table impacts would be addressed in the SR1 Environmental Impact Assessment (EIA), available later in 2015 for public review and comment. Stakeholders are directed to the project website. |
| Water Table | How will SR1 impact natural springs? | The Project Team informed the stakeholder that the water table impacts would be addressed in the EIA, and that it would be available later in the year for public comment and review. |
| Watershed, Water Quality | What would happen when flood water was released into the river if contaminated with cattle manure? | EIA would review the impact of livestock waste product entering the Elbow River as a result of the diversion. The EIA findings would be available late 2015 for public input and comment. More information is available on the SR1 project web site. |
| Wildlife Impacts | Is wildlife being considered in the planning of SR1? | Wildlife habitat and migration patterns would be reviewed as part of the EIA, and results would be made available to the public engagement and input. |
| Wildlife Impacts | Will there be an environmental assessment done between Forget Me Not Pond and SR1 to determine if it is a grizzly bear habitat? | Grizzly bear habitat and migration patterns will be reviewed as part of the EIA and results will be available to the public once completed. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Bragg Creek and Redwood Meadows Flood Mitigation | How will SR1 protect upstream communities? | The Government of Alberta has committed funding to community mitigation at Bragg Creek and Redwood Meadows. |
| Business or Commercial | How will local businesses be impacted by SR1? | Question taken into consideration for the EIA. |
| Decision Making Process | Why has the Premier publicly stated the government is moving forward with SR1? | Information available at http://alberta.ca/flood-mitigation.cfm |
| Decision Making Process | How can a final decision on SR1 be made when land and hydrology surveys have not been completed? | Question provided to the Government of Alberta for further consideration. |
| Decision Making Process | If Calgary had not been flooded, would SR1 be an issue? | Question provided to the Government of Alberta for further consideration. |
| Decision Making Process | What would happen if a flood event happens 100 miles north or south of SR1? | General answer provided regarding considerations for Alberta flood mitigation strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Decision Making Process | How much water does Calgary need (for water shortage)? | SR1 is being proposed as a dry reservoir for flood mitigation. |
| Decision Making Process | Why isn't the government following its own process in terms of decision making? | Question provided to the Government of Alberta for further consideration. |
| Decision Making Process | How could the government justify sacrificing so many people in the Springbank community? | Question taken into consideration for decision making. |
| Decision Making Process | What was the extent of historic floods from the 1800s, and have those flood levels been considered for SR1? | Question taken into consideration for project planning decision making. |
| Decision Making Process | Who benefits from the provinces flood mitigation plans? | General answer provided regarding considerations for Alberta flood mitigation strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Decision Making Process | Were there other cost estimations from other jurisdictions that calculated net present value of flood damage versus mitigation? | Question taken into consideration for decision making. |
| Decision Making Process, Project Alternatives | Is SR1 being built as a stop-gap solution until McLean Creek Dry Dam can be approved? | General answer provided regarding considerations for Alberta flood mitigation strategy. |
| Decision Making Process, Project Cost | How can SR1 be justified over MC1 when the land hasn't been bought yet in Springbank? | General answer provided regarding EIA's for other flood mitigation projects. |
| Decision Making Process, Public Engagement and Input | Why was the decision made to move ahead on SR1 without full public disclosure such as land acquisition costs? | Question taken into consideration for project planning decision making. |
| Downstream Community Impacts | What will happen to insurance rates downstream of SR1? | Question taken into consideration for project planning decision making. |
| Downstream Community Impacts | How will birds who are attracted to the water at SR1 impact Springbank Airport traffic? | Question taken into consideration for project planning decision making. |
| Downstream Community Impacts | What would happen if SR1 backed up or broke and flooded the surrounding communities? | Question taken into consideration for SR1 Engineering Design and Concept. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Engineering Design and Concept | A stakeholder indicated that the proposed dykes in Bragg Creek would ruin his view and affect tourism in the area. | Concern taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Where will the water line upstream be? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Is SR1 being built as a water reservoir for Calgary and future developments? | SR1 is being proposed as a dry reservoir for flood mitigation. |
| Engineering Design and Concept | When will stakeholders get to see what SR1 will actually look like? | Question taken into consideration for project planning decision making. |
| Engineering Design and Concept | How will SR1 be tested before implementation? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Will SR1 be used every year after it has been constructed? | Question taken into consideration for project planning decision making. |
| Engineering Design and Concept | What is the size of SR1 in comparison to the Glenmore Reservoir? | Question taken into consideration for project planning decision making. |
| Engineering Design and Concept | Does SR1 have the capacity to increase in size? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | What would happen to the back flow when the diversion is triggered? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | How is the channel and outlet being designed? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | How high is the berm? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Who is providing the material required to construct the dam? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | What is the drainage plan for SR1 and how will the surrounding area be affected? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | How will water in the reservoir be managed? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | What are the expected flow rates from SR1 to Glenmore Reservoir and beyond? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Is Springbank Creek protected from the Reservoir? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | How will odours be controlled after the release of water from the reservoir? | General answer provided regarding EIA process and considerations. |
| Engineering Design and Concept | What will happen if SR1 overflows? | Question taken into consideration for SR1 Engineering Design and Concept. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Engineering Design and Concept | How will SR1 be tested to ensure it operates effectively? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Will SR1 look like a tailing pond? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | When will the diversion weir be activated? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | What about cattle or other animals crossing the diversion tunnel? What will be done to prevent this? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | The Valley region shows an area on the map where water could back up - would this be looked at further instead of the SR1 project area? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept | Could the Engineers develop an alternate design for SR1 that wouldn't use radial gates on the inlet structure that diverts all water in excess of a base flow into the reservoir? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Engineering Design and Concept, Environment | Will there be an issue with smell, dust or mosquitos? | Question taken into consideration for the EIA. |
| Engineering Design and Concept, Environmental Impact Assessment Process | How will the visual and noise impacts associated with SR1 affect residents in Redwood Meadows? | Question taken into consideration for the EIA. |
| Environment | Why are there other dams in the Kananaskis Country if environmental concerns are so prevalent? | Question taken into consideration for project planning decision making. |
| Environmental Impact Assessment Process | Why is there no wildlife studies scheduled for September-October? | Question taken into consideration for project planning decision making. |
| Environmental Impact Assessment Process | Will geotechnical studies be done for all diversion channel options for the project? | Question taken into consideration for the EIA. |
| Flood Policies and Mitigation Plans | Is there a plan for flood mitigation for the Bow River? | Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Policies and Mitigation Plans | Why were builders allowed to build on flood plains? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Policies and Mitigation Plans | What was the cost to rebuild the zoo, and why wasn't it moved? | Information on City of Calgary flood mitigation projects available at http://www.calgary.ca/General/flood-recovery/Pages/RecoveryUpdates.aspx |
| Flood Policies and Mitigation Plans | Why was SR1 not included in the flood mitigation studies completed by Alberta WaterSmart? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Flood Policies and Mitigation Plans | Why should SR1 provide flood mitigation for the City of Calgary at the expense of Springbank? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Policies and Mitigation Plans | Is there an option of buy-outs on the flood plains? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Policies and Mitigation Plans | What percentage of flooding in Calgary is due to the Elbow River and what is due to the Bow River? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Policies and Mitigation Plans | What steps is the Government of Alberta taking to address climate change (addressing land use in the watershed which contributed to flooding, specifically clear-cut logging and wetland drainage practices)? | Question taken into consideration for project planning decision making. |
| Flood Protection | What flood mitigation measures are happening before the construction of SR1 is complete? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Flood Protection | What is the frequency of major flood events in the area? | Question taken into consideration for project planning decision making. |
| Lack of Consultation | Stakeholders are not being listened to, is this the precedent of how taxpayers would be dealt with from now on? | Question taken into consideration for project planning decision making. |
| Lack of Consultation | Has Springbank airport been included in SR1 consultation? | Question taken into consideration for the EIA. |
| Lack of Consultation, Upstream Community Impacts | How are Redwood Meadows and other communities upstream of SR1 being consulted on flood mitigation for their areas? | General response provided regarding the Government's Bragg Creek and Redwood Meadows flood mitigation budget. |
| Lack of Consultation, Public Engagement and Input | Were the landowners or stakeholders consulted before SR1 was announced? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Lack of Information | Will there be a possibility of a question period with an expert panel? | Question taken into consideration for upcoming open houses. |
| Lack of Information | Why is inaccurate information being presented to the public? | Question taken into consideration for upcoming open houses. |
| Lack of Information | Now that the size of the project has changed, when will the cost-benefit analysis be re-calculated with accurate information? | Question taken into consideration for project planning decision making. |
| Lack of Information | Will additional studies be available for subsequent open houses? | Question taken into consideration for upcoming open houses. |
| Land | Will the land be leased out for growing crops? | Question taken into consideration for project planning decision making. |
| Land | Will low lying areas be turned into swamps after a flood? | Question taken into consideration for SR1 Engineering Design and Concept. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Land Reclamation | How will the designated land for flooding be used in non-flood years and after it's flooded? | Question taken into consideration for project planning decision making. |
| Land Access | Is land access required to be maintained during a flood event? | Question taken into consideration for project planning decision making. |
| Land Acquisition | What are the real costs of land acquisition for SR1? | Question taken into consideration for project planning decision making. |
| Land Reclamation | Will the land be suitable for agriculture between storing flood waters? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Landowner Rights | How will land owners be compensated? | Question taken into consideration for project planning decision making. |
| Landowner Rights | What will happen to landowners that are displaced as a result of SR1 being built? | Question taken into consideration for project planning decision making. |
| Landowner Rights | What rights do landowners have in this process? | Question taken into consideration for project planning decision making. |
| Landowner Rights | How will SR1 affect property value? | Question taken into consideration for project planning decision making. |
| Maintenance of SR1 | How would the maintenance of the dam be funded? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Maintenance of SR1 | How will the dam and reservoir be maintained after a flood? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Pipeline Disturbance | How will the project address pipelines, gas lines and gas wells in the area? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Pipeline Disturbance | How many metres of pipeline would have to be removed and relocated? | Question taken into consideration for project planning decision making. |
| Political Pressures | What group is SR1 protecting? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Political Pressures | Are votes more important than people? | Question provided to the Government of Alberta for further consideration. |
| Political Pressures | Was SR1 selected because it was quick, easy and protected someone's riding? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Political Pressures, Project Planning | How can the Government of Alberta approve SR1 before the concerns from Bragg Creek and Redwood Meadows are addressed? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Project Alternatives | Why isn't McLean Creek being considered for a dry diversion? | General answer provided regarding EIA's for other flood mitigation projects. |
| Project Alternatives | Why is a "do nothing" option not being considered? | General answer provided regarding EIA's for other flood mitigation projects. |
| Project Alternatives | What is raising the costs for MC1? | General answer provided regarding EIA's for other flood mitigation projects. |
| Project Alternatives | Will there be an open house for McLean Creek? | Question taken into consideration for upcoming open houses. |
| Project Cost | What would be the cost of relocating SR1? | Question taken into consideration for project planning decision making. |
| Project Cost | Why is the cost to protect the ranger station in the McLean Creek area so high? | General answer provided regarding EIA's for other flood mitigation projects. |
| Project Cost | What percentage of SR1 will be funded by the province? | Question taken into consideration for project planning decision making. |
| Project Cost | Would insurance companies contribute to the development of SR1? | Question taken into consideration for project planning decision making. |
| Project Cost | What are the cost controls for SR1? | Question taken into consideration for project planning decision making. |
| Project Cost | What is the total cost of external consulting for feasibility studies? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Project Cost | Does the Province have enough money for this Project, given the low price of oil? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Project Cost, Decision Making Process | As there appears to be many errors, have the errors propagated through the cost chain in a nonlinear fashion? | Question taken into consideration for project planning decision making. |
| Project Cost, Project Planning | Why is the cost of land acquisition not being shared and not based on real estate numbers? | Question taken into consideration for project planning decision making. |
| Project Costs | When is the value of flood protection for Bragg Creek and Redwood Meadows be added to the cost-benefit analysis? | Question taken into consideration for project planning decision making. |
| Project Costs, Lack of Information | Why has the amount of land needed for SR1 increased, but the costs have remained the same? | Question taken into consideration for project planning decision making. |
| Project Planning | How is the government considering the WaterSmart proposal? | Question taken into consideration for project planning decision making. |
| Project Planning | What can be done collectively and individually to help the affected landowners to mitigate their loss? | Question taken into consideration for project planning decision making. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Project Planning | Could the location of SR1 be moved to Tsuu T'ina land? | Question taken into consideration for project planning decision making. |
| Project Planning | Why has the previous cost comparison charts disappeared? | Question taken into consideration for upcoming open houses. |
| Project Planning | Will there be a warning system for floods in the area, such as a siren? | Question taken into consideration for project planning decision making. |
| Project Planning | Why were no bureaucrats or lower level politicians present at the open house? | Question provided to the Government of Alberta for further consideration. |
| Project Planning | Will the choice of the channel location be solely made on engineering decisions or will socio-economic considerations be factored in? | Question taken into consideration for project planning decision making. |
| Project Planning | Is reclamation of the site part of the plan after a flood? | Question taken into consideration for project planning decision making. |
| Project Planning | Will the water from SR1 be used for fracking? | Question taken into consideration for project planning decision making. |
| Project Planning | Does the government realize that the animals that live in McLean Creek also live in Springbank? | General answer provided regarding EIA process and timelines. |
| Project Planning | Could SR1 be used for draught mitigation? Could it be turned into a draught project? | Question taken into consideration for project planning decision making. |
| Project Planning | Will the Government of Alberta use the dam for power for the City of Calgary? | SR1 is being proposed as a dry reservoir for flood mitigation. |
| Project Planning | Why is public money being spent to buy private land? | General information provided on the Government of Alberta Flood Mitigation Strategy. Information available at http://alberta.ca/flood-mitigation.cfm |
| Project Timeline | Can the government provide assurance that SR1 will not be delayed indefinitely, in order to protect the City of Calgary from future flooding? | Question taken into consideration for project planning decision making. |
| Public Engagement and Input | Why didn't affected residents have the opportunity to vote on SR1? | Question provided to the Government of Alberta for further consideration. |
| Public Engagement and Input | Can the open house format include a Q&A portion? | Question taken into consideration for upcoming open houses. |
| Public Engagement and Input | Why are all the affected houses in the SR1 project area not included in the project maps? | Question taken into consideration for project planning and decision making and EIA. |
| Public Engagement and Input | Has the government listened to the communities, voters, environmentalists, planners and engineers - does the government care about Albertans? | Question provided to the Government of Alberta for further consideration. |
| Recreational | How will SR1 impact Kamp Kiwanis? | General response regarding consultation and engagement with Kamp Kiwanis. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Recreational, Project Alternatives | Would it be possible to recover tax dollars through tourism by damming McLean Creek? | Question taken into consideration for project planning decision making. |
| Recreational, Project Alternatives | What are the economic benefits of SR1 on Alberta tourism in comparison to McLean Creek? | Question taken into consideration for project planning decision making. |
| Regulatory Process | Is SR1 legislated differently than logging and recreation? | Question taken into consideration for project planning and decision making. |
| Regulatory Process | Why is Prentice saying the project is going ahead if the NRCB makes the final decision? | General information provided. The engineering, design and EIA are underway. The project was a high priority for the government, and once all regulatory requirements are met, Cabinet would make a final decision and construction would proceed if approved. |
| Road and Highway | Has anyone talked about changing truck routes, specifically Highway 1 and 22 and whether there would be any effects from changing the routes? | Question taken into consideration for project planning decision making. |
| Road and Highway | Where will the transport truck bypass be relocated? | Question taken into consideration for project planning decision making. |
| Road and Highway | How will Springbank Road, Highway 22 and Range Road 41 be accommodated and what costs will be associated with road accommodation? | Question taken into consideration for project planning decision making. |
| Road and Highway | Will road access be affected after SR1 construction is complete? | Question taken into consideration for project planning decision making. |
| Road and Highway | Will roads remain open and operational during a flood event? | Question taken into consideration for project planning decision making. |
| Road and Highway | How will new road designs impact Highway 8 because it was designed to channel flood water and is submersible. | Question taken into consideration for project planning decision making. |
| Road and Highway | Will a road be built at the top of the dam in order to maintain access to land in this area? | Question taken into consideration for SR1 Engineering Design and Concept. |
| Roads and Highways | If Highway 22 is flooded, how long would it take to empty the reservoir? | Question taken into consideration for project planning decision making. |
| Springbank Landscape Impacts | How does SR1 affect the Springbank landscape? | Question taken into consideration for the EIA. |
| Springbank Landscape Impacts | Have the aesthetic impacts for travelers been considered in the project planning process? | Question taken into consideration for the EIA. |
| Water Table | How would SR1 impact the aquifer? | Question taken into consideration for the EIA. |
| Water Table | Will there be implications to water well and septic systems in the SR1 project area? | Question taken into consideration for the EIA. |

| Questions and Comments Taken Into Consideration for the EIA or Project Design (No Follow-up Requested) | | |
|---|---|---|
| **Issue or Concern** | **Question** | **Consideration or Result of Question** |
| Watershed | Will SR1 have an effect on nearby watersheds, in particular Springbank Creek? | Question taken into consideration for the EIA. |
| Wildlife Impacts | Will elk herds be considered in the EIA? | General answer provided regarding the EIA process and timelines. |
| Wildlife Impacts | Why has there been no mention of moose, grizzly bears or black bears in the Springbank area? | Question taken into consideration for project planning decision making. |

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

# 2016 ENGAGEMENT AND CONSULTATION

# Springbank Strawberry Tea, perfect for Mother's Day

FILE PHOTO/*Rocky View Publishing*

***TEA TIME -*** The Springbank Heritage Club will host the seventh annual Strawberry Tea event May 7.

**NINA GROSSMAN**
*Rocky View Publishing*

Just in time for Mother's Day comes the Springbank Heritage Club's seventh annual Strawberry Tea. The event is a chance to treat a deserving mom or grandmother to some shortcake, biscuits or angel food cake topped with strawberries and whipping cream.

From 2 to 7 p.m. on May 7 the Heritage Club will host the tea for all members of Springbank and surrounding communities at a cost of $5 at the door with proceeds going to the club.

Springbank Heritage Club volunteer Flo Sytsma said the event will be a lot of fun for the community.

This year's theme will include bird-themed décor and a production of *Birds* by the Senior Singers. Sytsma said the 20 and 30 minute song selections will be tunes folks recognize from "way back when."

The ladies from the Heritage Club are doing the baking and, as always, tea and treats will be served on fine bone china in high tea style.

Sytsma said the event will take place rain or shine.

While no dress code is in place, she recommended wearing your best tea-time appropriate apparel.

In the past, Springbank's Strawberry Tea has seen turnouts of 90 to 100 people and has proven a great event to ring in the spring season and enjoy a community gathering with some mouth-watering treats and excellent entertainment.

The Springbank Heritage Club is a not-for-profit senior citizen's centre owned and maintained by club members working entirely as volunteers. The club provides a busy monthly calendar that includes various volunteer opportunities and social events like weekly game afternoons and monthly potluck dinners. Members can also enjoy health and wellness events that include blood pressure and foot care clinics. An annual membership is $25 and is available to individuals 50 and older.

The Springbank Heritage Club is located off the TransCanada highway at the Calaway Park Overpass.

For more information, contact the club at 403-242-9350.

## INNISFAIL AUCTION MARKET — AUCTION MART report.....

for 712 head for the week ending April 27, 2016.

**STEERS**

0-300 lbs. avg. $1.90-$2.50
300-399 lbs. avg. $1.90-$2.50
400-499 lbs. avg. $1.85-$2.40
500-599 lbs. avg. $1.70-$2.20
600-699 lbs. avg. $1.80-$2.20
700-799 lbs. avg. $1.70-$2.10
800-899 lbs. avg. $1.60-$2.00
900-999 lbs. avg. $1.41-$1.70
1000+ lbs. avg. $1.40-$1.60

**HEIFERS**

0-300 lbs. avg. $1.80-$2.40
300-399 lbs. avg. $1.80-$2.20
400-499 lbs. avg. $1.85-$2.00
500-599 lbs. avg. $1.75-$1.99
600-699 lbs. avg. $1.60-$1.90
700-799 lbs. avg. $1.50-$1.80
800-899 lbs. avg. $1.40-$1.70
900-999 lbs. avg. $1.40-$1.50
1000+ lbs. avg. $1.30-$1.48
Butcher Cows $.85-$1.05
Bulls $1.10-$1.40
Feeder Bulls $1.20-$1.60
Bred Cows $1,500-$2,300
Pairs $1,800-$2,700

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## Public Notice

### Proposed Wind Mobile Corp. Telecommunication Tower

**Tower Type:** Monopole

**Proposed Height:** 45 meters

**Lease Dimensions:** 20m x 20m

**Location:** 261093 Wagon Wheel View (Plan 0811034, Block 2, Lot 1) East of Cross Iron Mills Shopping Center

**Coordinates:** 51.202602 -113.95642

**Access:** The site will be accessed off of Wagon Wheel View through existing parking lot to facility

**Includes:** The facility will include equipment in locked cabinets located at the base of the tower. Furthermore a locked fence will surround the shelter.

**Purpose:** A structure at this location will provide in-fill coverage to Cross Iron Mills Shopping Center, Wagon Wheel Industrial Park and surrounding areas With respect to this matter, the public is invited to provide written comments by May 31, 2016 to the contact information provided below.

Please include a return address.

**WIND Mobile Corp**
**c/o Evolve Surface Strategies Inc.**
**Attention: Tanya Elchuk**
**111-2966 Main Street SE**
**Airdrie, AB T4B 3G4**
**Phone: 403-912-2600**
**Email: comments@evolveinc.ca**

****Clerical Correction: The public notice which ran on April 26, 2016 incorrectly listed Evolve Surface Strategies location to be in Calgary, Alberta, this has now been corrected to the proper city. ****

**Springbank Off-stream Reservoir Project**

## Please join us for a Springbank Off-stream Reservoir Project information session in your community.

Following the Alberta government's commitment to build the Springbank Off-stream Reservoir as part of the overall provincial flood mitigation strategy, the Environmental Impact Assessment (EIA) required for the project is now underway.

Designed as a dry dam unless flood conditions are present, the Springbank Off-stream Reservoir will work in tandem with the Glenmore Reservoir in Calgary. Together, the combined storage capacity would accommodate water volumes equal to the 2013 flood.

The Springbank Off-stream Reservoir will be about 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and predominantly east of Highway 22.

Public engagement for this project is continuing. Please join us to learn more about how this project is progressing and to provide your feedback.

**SPRINGBANK**
**Tuesday, May 10**
**5:00 – 8:00 p.m.**

**Wild Wild West Event Centre**
67 Commercial Court
Exit 169, off of the Trans Canada West
Next to Calaway Park

**CALGARY**
**Wednesday, May 11**
**5:00 – 8:00 p.m.**

**Calgary First Church of the Nazarene**
65 Richard Way SW

Learn more at
alberta.ca/springbank-road.cfm

Alberta

# Three bylaws get first reading

Town council gave first reading to three bylaws on Apr. 25 that deal with set tree requirements on residential lots, landscaping for new homes and maximum building heights.

If passed, Bylaw 17/2016 would require a minimum of one tree be planted in the front lawn of all new single or semi-detached homes. The aim is to make Cochrane greener without creating an intrusive planning process.

Bylaw 18/2016 calls for all new residential lots to be 40 per cent landscaped at minimum rather than the current 25 per cent. Multi-family districts will be required to have 3 shrubs per 25 metres squared instead of two and that more top soil be laid down when planting trees, shrubs and perennial grasses. A definition was also added for xeriscaping, which entails landscaping practices meant to curtail the need for water irrigation to promote water conservation.

Dealing with maximum building heights, Bylaw 19/2016 was initially brought forward by Councillor Morgan Nagel with the intent of making any building more than five storeys a discretionary use. This would place it under greater scrutiny and prevent homeowners from being blind-sided by larger buildings overlooking their backyards than what they were told to expect when they bought their homes.

In order to do this, administration recommended that principal buildings proposed to be between six and eight storeys be listed as discretionary uses that would be directed to the Cochrane Planning Commission as the Development Authority. This amendment would apply to any area in Cochrane that does not stipulate maximum building heights in its land-use designations.

These bylaws will now go before the Cochrane Planning Commission on May 18 before returning to council for a public hearing on May 24.

*dfeil@postmedia.com*

CONTRIBUTED

**Four members from the Cochrane Fire Department took the Stairwell Challenge in Calgary on Sunday, raising $2,200 in an event that drew in 400 firefighters and raised $180,000 for Wellspring Calgary. Left to right: Derek Orr (who made the climb in 12:58 minutes), Brad Hoey (22:44), Chris Chyka (15:08), Dave Levisky (18:56).**

# *Three face multiple drug charges*

Three people, one from Cochrane, are facing a number of charges, large drug related, after being pulled over for a roadside stop by Cochrane RCMP on May 1 at 3:43 A.M.

A burned out tail light drew the RCMP's attention to the vehicle and it became increasingly suspicion when an overwhelming odour of marijuana was emanating from the vehicle's interior. In addition, illegal drugs were in plain view.

A subsequent search revealed marijuana, crack cocaine, suspected methamphetamine, MDMA, a firearm, knives, bear spray, drug paraphernalia and a large sum of Canadian currency.

Brenna Drader, 20, of Cochrane and Dylan Morley-Johnson, 26, and Branden Newborn, 29, both from Calgary, are facing multiple charges, including possession of methamphetamine, marijuana and MDMA and made their first court appearance on Monday.

*ctimes.editor@sunmedia.ca*

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Learn more at
alberta.ca/springbank-road.cfm

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ALBERTA WILDFIRES

## Limits put on use of ATVs as fire fears continue

*RYAN RUMBOLT*

Alberta issued a provincewide ban Friday on the recreational use of off-road and all-terrain vehicles, fearing their use could spark wildfires.

"We do not take this step lightly; however, we must reduce the potential for more wildfires throughout the province," Shannon Phillips, minister of environment and parks, said in a statement.

"The government announced a provincewide fire ban yesterday along with an appeal to limit the use of off-road vehicles," said Phillips.

"Members of the Alberta Off-Highway Vehicle Association (AOHVA) contacted the government and urged them to find a way to put a ban in place."

"Quite simply, OHV recreational use under our current conditions has the very real potential to contribute to an already catastrophic wildfire season."

There are a wide number of exceptions to the provincewide ban.

"This restriction applies only to recreational use on public lands and provincial parks, including designated off-highway vehicle trails," Municipal Affairs Minister Danielle Larivee said during a news conference on Friday.

The ATV ban will not apply to agricultural, commercial or industrial use, and will not apply to indigenous people using off-highway vehicles for farming, business operations or traditional uses.

Phillips said everyone in Alberta needs to be fire-conscious because of the dangerous conditions, especially when disposing of flammable material like cigarette butts.

The off-highway vehicle restriction will be in place until further notice.

# Persistence pays off as boys reunite with parents

## Principal goes the extra mile after blaze splits Fort McMurray families

*JANET FRENCH*

The second she saw her son Ryan step onto the Northlands foot bridge, Priscillah Moatshe broke into a run and tossed her purse onto the cement.

"I'll never leave you," she said, embracing her 12-year-old in a crushing hug.

The tearful reunion came more than three days after the Grade 7 student went to class at K. A. Clark elementary school Tuesday in Fort McMurray, anticipating a typical day. The mass exodus of 88,000 people fleeing a wildfire was anything but typical.

It left two of school principal Merrie-Rae Mitsopoulos's students in her care and separated from their parents for at least two days.

An exhausted Moatshe didn't want to talk for long on Friday.

During the evacuation, she headed north to the work camps, but couldn't meet up with Ryan.

On Thursday night, she wound up on airlift out, to Calgary.

She took an overnight bus Friday morning to try to reach her son, now in Edmonton.

"I'm with my son. I'm so happy. It was hard," she said, grinning.

When the threat of wildfire prompted the evacuation of central and southern Fort McMurray, five of Mitsopoulos's students had yet to be collected by their parents.

Mitsopoulos led the five remaining children and some staff onto a school bus organized by Fort McMurray Catholic Schools.

She and neighbouring Father Turcotte School principal Lisa Hilsenteger took their remaining kids on a sluggish ride through evacuation traffic to Holy Trinity High School, which happens to be near the Mitsopoulos's house.

Mitsopoulos called her babysitter, asked her to get sons Nick, 11, and Kristofer, 9, to pack a bag, and meet them at the high school.

Parents of three remaining students managed to find the school bus, but two could not.

The group then went on a painstakingly slow journey up to a camp 50 kilometres north of town, then back through the burning municipality in the wee hours of Wednesday.

The bus dropped off Mitsopoulos, her two kids, Ryan, and a 13-year-old student at the Nexen Long Lake facility south of Fort McMurray, where her husband George is the site manager. She's grateful for how welcoming the company was during the emergency.

All the while, Mitsopoulos was texting and calling Moatshe, sending her pictures of the preteen playing cards with her sons.

She couldn't reach the other boy's mother at all — the mom's cellphone had broken.

Finally, an email arrived from the boy's neighbour, saying she was in a Syncrude camp north of town and the teen's mother was looking for her son.

"It was such a relief. I couldn't imagine being a parent not knowing where your child was," Mitsopoulos said.

Her plan was to stay put in the comfortable Nexen camp to try to reconnect her two students with their families.

That plan changed Wednesday evening when the relentless blaze spread rapidly south, prompting the evacuation of Nexen.

Mitsopoulos and the four boys climbed onto an evacuation bus, hoping to go to the Edmonton area, where her brother in-law lives.

But, no — the bus was going to Red Deer, and that was that.

She drifted off and awoke to find the bus stopped — somewhere. She didn't know where. Another passenger told her the bus had a mechanical problem and they were stopped in Edmonton for repair. She told the boys to grab their bags, and off they got.

Her in-laws had beds — even new toothbrushes — waiting for everyone in their St. Albert home.

On Thursday, the Mitsopoulos family brought the other boy to the evacuation centre set up at Northlands to reunite with his mother and little brother.

Ryan's turn for a reunion came Friday afternoon.

"I couldn't wait to hug him," Moatshe said.

She asked Mitsopoulos, "Did he bother you?" which made the principal laugh. "No. He was good," she said with a smile.

Ryan said he wasn't scared during the trip.

He was looking forward to meeting up with a friend in Edmonton.

"I'm just really happy that I could help these kids and their moms," Mitsopoulos said.

"I look at it as a parent. It was possible that I could have not been with my kids, too."

*jfrench@postmedia.com*

*Twitter.com/jantafrench*

Priscillah Moatshe is reunited with her son Ryan, 12, at the Edmonton Evacuation Centre on Friday. The mother and son were separated by the Fort McMurray wildfire for more than three days. *DAVID BLOOM*

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**SPRINGBANK**
**Tuesday, May 10**
**5:00 – 8:00 p.m.**

**Wild Wild West Event Centre**
67 Commercial Court
Exit 169, off of the Trans Canada West
Next to Calaway Park

**CALGARY**
**Wednesday, May 11**
**5:00 – 8:00 p.m.**

**Calgary First Church of the Nazarene**
65 Richard Way SW

Learn more at
alberta.ca/springbank-road.cfm

Alberta

CALAE653443_1_1

Calgary

IMPORTANT INFORMATION

High-flow advisory

On Tuesday, May 10, 2016* The City will be releasing water from the Glenmore Reservoir and increasing the flow rate of the Elbow River.
**This will be a controlled release.**

All people and pets are asked to stay away from the river edge and banks, and closed pathways on the Elbow and Bow riverbanks downstream of Inglewood during this event.

City staff and emergency personnel will be onsite to monitor river levels and assess potential impacts to river adjacent properties and communities. River conditions will remain high throughout the day. Flow rates will fluctuate and may pose an elevated risk to river users.

The City's Flood Readiness campaign runs from May 15 to July 15, each year when the risk of river flooding is the greatest in Calgary. Citizens, property and business owners are encouraged to understand their flood risk, prepare for flood conditions and stay informed.

**Visit calgary.ca/floodinfo.**

*Depending on weather conditions, this date is subject to change.

CALSAG80068_1_1

# U.S. sees signs of fifth nuclear test in N. Korea

WASHINGTON — North Korea may be preparing to carry out a fifth nuclear test in the near future judging by commercial satellite images of the country's nuclear test site taken on May 5, a U.S. think tank said on Friday.

The 38 North website, run by Johns Hopkins University's School of Advanced International Studies, said the images showed vehicle movement at the site "not often seen there except during preparations for a test."

There has been intense speculation that communist North Korea may conduct its fifth test of a nuclear device during a congress of the ruling Workers' Party now underway.

The analysis from 38 North said the imagery of the Punggye-ri test site "suggests that Pyongyang may be preparing for a nuclear test in the near future."

It said that while the images continued to show low levels of activity, the vehicles had been spotted at what was believed to be the Command Center, some 6 km south of the main site.

PLEIADES ©2016, DISTRIBUTION AIRBUS DS/REUTERS

The Punggye-ri test site in North Korea is seen in an image from Airbus Defense & Space and 38 North taken Thursday.

A senior U.S. official, asked about the 38 North report, repeated a call for North Korea "to refrain from actions and rhetoric that further destabilize the region" and stick to past commitments to denuclearize.

"Our commitment to the defence of our allies, including the Republic of Korea and Japan, in the face of these threats, remains ironclad," he added. "We are prepared to defend ourselves and our allies from any attack or provocation."

The 38 North website reported last month that satellite images showed North Korea may have resumed tunnelling at Punggye-ri, activity similar to that seen before the country's most recent nuclear test in January.

The website reported in early December that satellite photographs from the two previous months indicated North Korea was digging a new tunnel for nuclear testing.

**– Reuters**

# Praise be to Kim

## DPRK congress includes coronation for leader

**ERIC TALMADGE**
The Associated Press

PYONGYANG, Korea, Democratic People's Republic Of — Senior members of North Korea's ruling regime took to the stage on Saturday to praise their party and leader Kim Jong Un at their biggest meeting in 36 years, a much-touted and tightly choreographed event intended to demonstrate Kim is firmly in control despite his country's deepening international isolation over its nuclear weapons program.

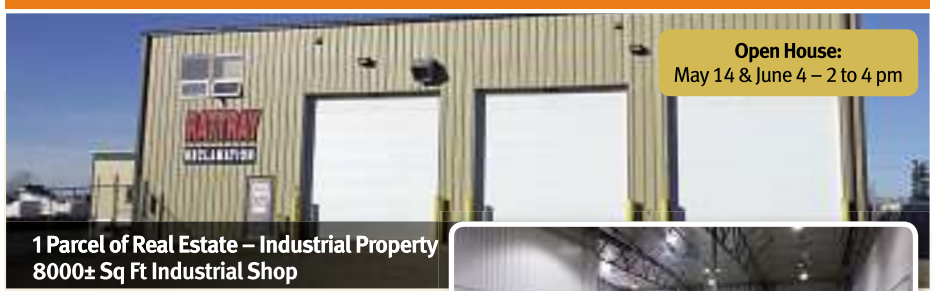
In something like a formal coronation for Kim, the ruling Workers' Party congress was also expected to officially elect him to its top post.

According to the North's state-run media, the agenda for the congress includes reviewing the work of the party's Central Committee and Central Audit Commission, revising party rules, electing Kim to the top party post and installing a new central party leadership — though no major departures from the current lineup were expected.

Video of the proceedings broadcast on state television on the second day of the congress Saturday showed party officials reporting accomplishments in the military, science and economy as part of the first item on the agenda.

The decision to formally install — or, perhaps more accurately, reinstall — Kim at the top is a step along the lines of his late father and grandfather, who both held the title of general secretary of the Workers' Party, and would demonstrate the young leader is in full control and ready to begin a new era of his own.

Unreserved Public Real Estate Auction
**Rattray Reclamation**
**Strathmore, AB | June 15, 2016** – Selling at the Edmonton Auction Site




**1 Parcel of Real Estate – Industrial Property**
**8000± Sq Ft Industrial Shop**

**Parcel 1 – Plan 9813631 Block 6 Lots 20 & 21**
**2± Title Acres – Industrial Property**
**Address: 132 Orchard Way, Strathmore, AB**

**2005 8000± sq ft industrial shop**

- (2) 100 ft drive thru bays, 100 ft drive thru wash bay, 60 ft service bay – 25,000 lb truck hoist ***(sells separately)***
- Locker room, parts room
- Second floor 1150± sq ft office
- Radiant & forced air natural gas heat

**8 Ft x 20 Ft Office Trailer *(sells separately)***

For more information, contact:
**David Rattray - Owner**
403.934.4809

Jerry Hodge - Ritchie Bros. Real Estate
780.706.6652 | jhodge@rbauction.com

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Visit our website for auction and property details:
rbauction.com/realestate

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Springbank Off-stream Reservoir Project

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Alberta

# 4 X 8 TEMPLATE

DOUBLED SIDED

| | | | | | | | | | | | | | | | |
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| | **S** | **P** | **R** | **I** | **N** | **G** | **B** | **A** | **N** | **K** | | **D** | **A** | **M** | | |
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| | | **C** | **A** | **L** | **G** | **A** | **R** | **Y** | | **F** | **I** | **R** | **S** | **T** | | |
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# 4 X 8 TEMPLATE

DOUBLED SIDED

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| **W** | **I** | **L** | **D** | | **W** | **E** | **S** | **T** | | **C** | **E** | **N** | **T** | **R** | **E** | |
| **5:00** | **PM** | | **To** | | **8:00** | **PM** | | | | | | | | | | |

SPRINGBANK DAM
OPEN HOUSE
MAY 10
5-8PM
WILD WEST CTR

# Springbank Off-stream Reservoir Project

Thank you for taking the time to provide your input on the proposed Springbank Off-stream Reservoir (SR1) project. Your comments will be compiled and submitted as part of a summary for the Environmental Impact Assessment application for this project. For your convenience, this survey can also be completed online at https://www.surveymonkey.com/r/SR1exitsurvey until May 18, 2016.

1. Of the following issues or concerns listed, please select your top 5 priorities for the Government of Alberta to address regarding the Environmental Impact Assessment (EIA) for the Springbank Off-stream Reservoir:

| | Issue or Concern Category | | Issue or Concern Category |
|---|---|---|---|
| | Geotechnical Assessment (testing on subsurface soil and bedrock conditions) | | Geomorphology/Sediment Transport (stability and sediment supply effects on SR1 and the Elbow River) |
| | Noise | | Air Quality |
| | Terrain/Soils | | Social Impacts |
| | Hydrogeology (groundwater and subsurface geology) | | Economic Impacts |
| | Surface Water | | EIA Process and Opportunities for Input |
| | Vegetation and Wetlands | | Traditional Knowledge and Traditional Land Use |
| | Wetlands | | Project Schedule |
| | Project Alternatives | | Heritage Sites |
| | Wildlife | | Engineering Concept and Design |
| | Fish | | Safety |
| | Aquatic Environment (fish habitat) | | Road Alterations |
| | Historical Resources | | Recreation (impacts to recreational activity in the area) |
| | Visual Quality | | Project Planning |

2. The information provided at the open house was:

- ☐ **Inadequate** – information was not detailed enough and my questions were not answered.
- ☐ **Adequate** – information was vague or confusing and I still have unanswered questions.
- ☐ **Sufficient** – there was enough information to understand the project.
- ☐ **Excellent** – the information provided was substantial and clearly communicated.

# Springbank Off-stream Reservoir Project

3. Do you support the Springbank Off-stream Reservoir Project?

☐ Yes ☐ No ☐ Undecided

4. Rate the Government of Alberta's efforts to engage with and share information with stakeholders about the proposed Springbank Off-stream Reservoir Project.

☐ Excellent ☐ Good ☐ Satisfactory ☐ Poor

5. Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?

Please complete the following if you would like to receive ongoing information on the Springbank Off-stream Reservoir Project. Thank you!

Please Print

Name(s): _____

Mailing Address: _____

Phone Number: _____ Email: _____

This survey can also be submitted to the Government of Alberta by mail or email:

Springbank Off-stream Reservoir Project c/o
Communica Public Affairs
200, 215 12 Avenue S.E.
Calgary, AB T2G 1A2

**Springbank-Project@gov.ab.ca**

Personal information is being collected by Alberta Transportation under the authorization of Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and is managed in accordance with part 2 of the FOIP Act. Your name and email address will be used for contact purposes to send updates. Your postal code is being collected for analysis of location to river and to the proposed Springbank Off-stream Reservoir Project. Your personal information will be shared with the Department of Environment and Sustainable Resource Development, the Canadian Environmental Assessment Agency, and to anyone viewing this sheet during sign-in. Should you wish to have your personal information removed, corrected or have concerns pertaining to the Springbank Off-stream Reservoir Project, please contact Mark Svenson, Alberta Transportation Environmental Coordinator at (780) 644-8354 or springbank-project@gov.ab.ca.

# Springbank Off-stream Reservoir Project

**The Springbank Off-stream Reservoir, or Springbank Project, is a dry reservoir that will store water temporarily during a flood.**

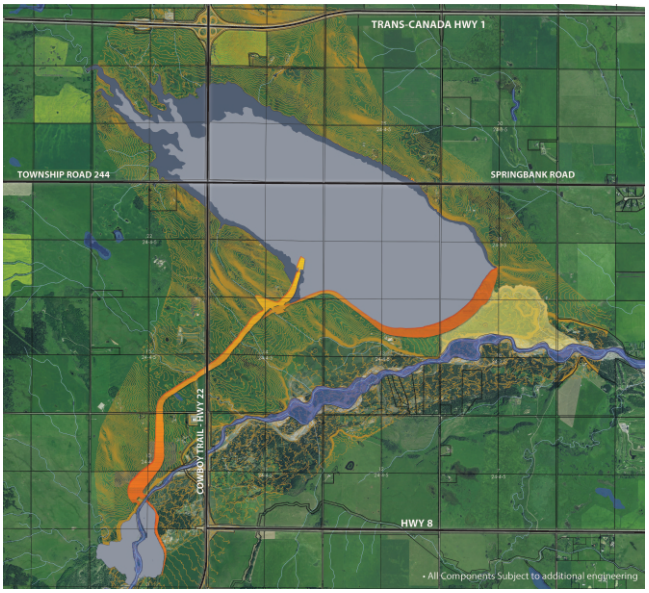
**The Springbank Project will work in tandem with the Glenmore Reservoir in Calgary.**

## How it works

During a flood, a diversion channel carries water from the Elbow River to the off-stream reservoir, which would have a storage capacity of 70.2 million $m^3$ or about 28,000 Olympic-sized swimming pools. When peak waters have passed, an outlet structure safely releases the water back to the Elbow River in a controlled manner.

The Springbank Reservoir will work together with the Glenmore Reservoir, which has 10 million $m^3$ of available flood storage, to achieve the level of protection required.

## Location



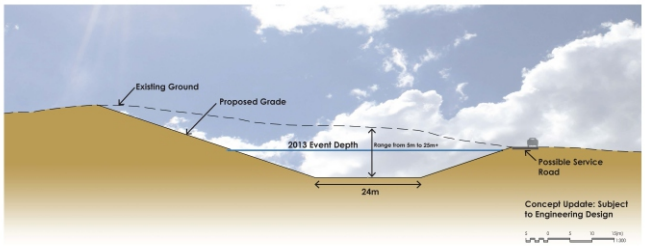

The reservoir will be approximately 15 km west of Calgary near Springbank Road, north of the Elbow River and predominantly east of Highway 22.

## What it looks like

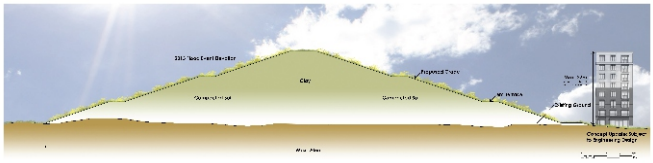
Stantec

Alberta Government

A diversion structure, with several components that work together, controls how much flood water enters the diversion channel.



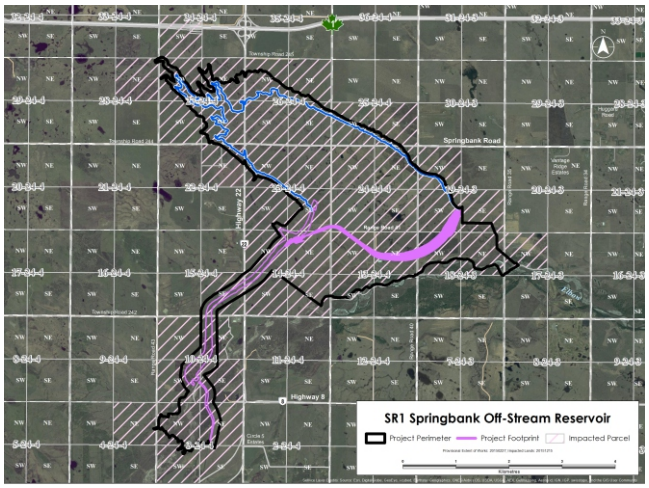

The diversion channel then carries flood waters to the storage reservoir. The channel is about 4.5 km long and has a bottom width of 24 m. The channel cut would be similar to an irrigation canal with side slopes of about 3:1 (horizontal:vertical). It will generally be vegetated with native species; erosion protection may be provided at select locations where fast water speed is anticipated.



At the southeast end of the reservoir, an earthen dam will have a terraced profile and grass surface. At its tallest, it will be approximately 27 m high or approximately the height of an 8-story building.

## Area needed

The total area within the project perimeter is 3,610 acres, including road allowances, structures and the maximum extent of any backwater during emergency scenarios. This perimeter also includes surplus borders around the various components of the infrastructure that may or may not be required as the precise location of the components is defined through additional engineering assessment and design.




The reservoir's full supply level is achieved when it is storing the 2013 flood event (water elevation 1,210.5 m, based on current conceptual design). Based on the current dam location this flooded area would be approximately 1,950 acres.

## Project status

Alberta Transportation is responsible for the project development, applying for regulatory approvals and, once received, construction. Engagement with stakeholders, including landowners, municipalities, Aboriginal communities, infrastructure companies and other flood mitigation project teams, is underway and will continue throughout the process.

Stantec Consulting has been retained for the design and engineering, and the Environmental Impact Assessment (EIA). An EIA is required for various environmental regulatory processes and is now underway.

The EIA for the Springbank Project is examining a variety of issues, including but not limited to air quality, noise, vegetation and wetland, historical resources, traditional knowledge and traditional

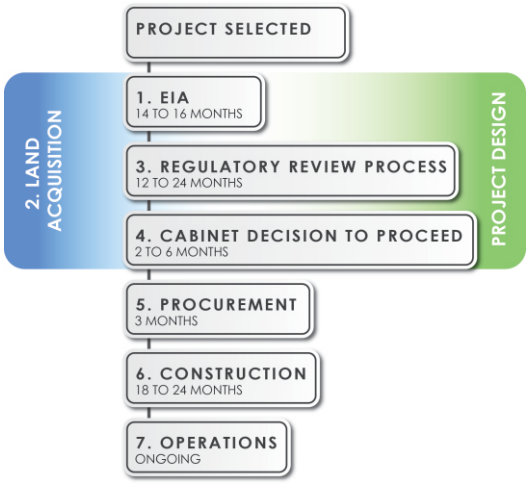
land use. Learn more about the EIA by reading the Terms of Reference at www.alberta.ca/springbank-road.cfm.

The EIA will answer the following main questions:

1. What are the existing conditions (the baseline)?
2. What effects would there be due to the project?
3. What are the mitigation measures that would minimize these effects?
4. What are the residual effects and their significance?
5. What are the cumulative effects?

Discussions with stakeholders will continue throughout the process.

As with any major infrastructure project of this size and scope, there are a number of steps that must be undertaken to ensure the project is designed responsibly. The Government of Alberta respects the regulatory process, which is in the control of regulators, and will take whatever time is required to make sure that Albertans in Calgary and other communities in southern Alberta are appropriately protected from the impact of future floods.




## Feedback

The feedback we have heard so far has been documented and provided to the design team. We will continue to have discussions with stakeholders and record how the project will affect them, building on what we've heard so far. If you have questions or comments, email springbank-project@gov.ab.ca at any time.

# Welcome to the Springbank Off-stream Reservoir (SR1) Open Houses

## May 10 & 11, 2016

# Springbank Off-stream Reservoir Project

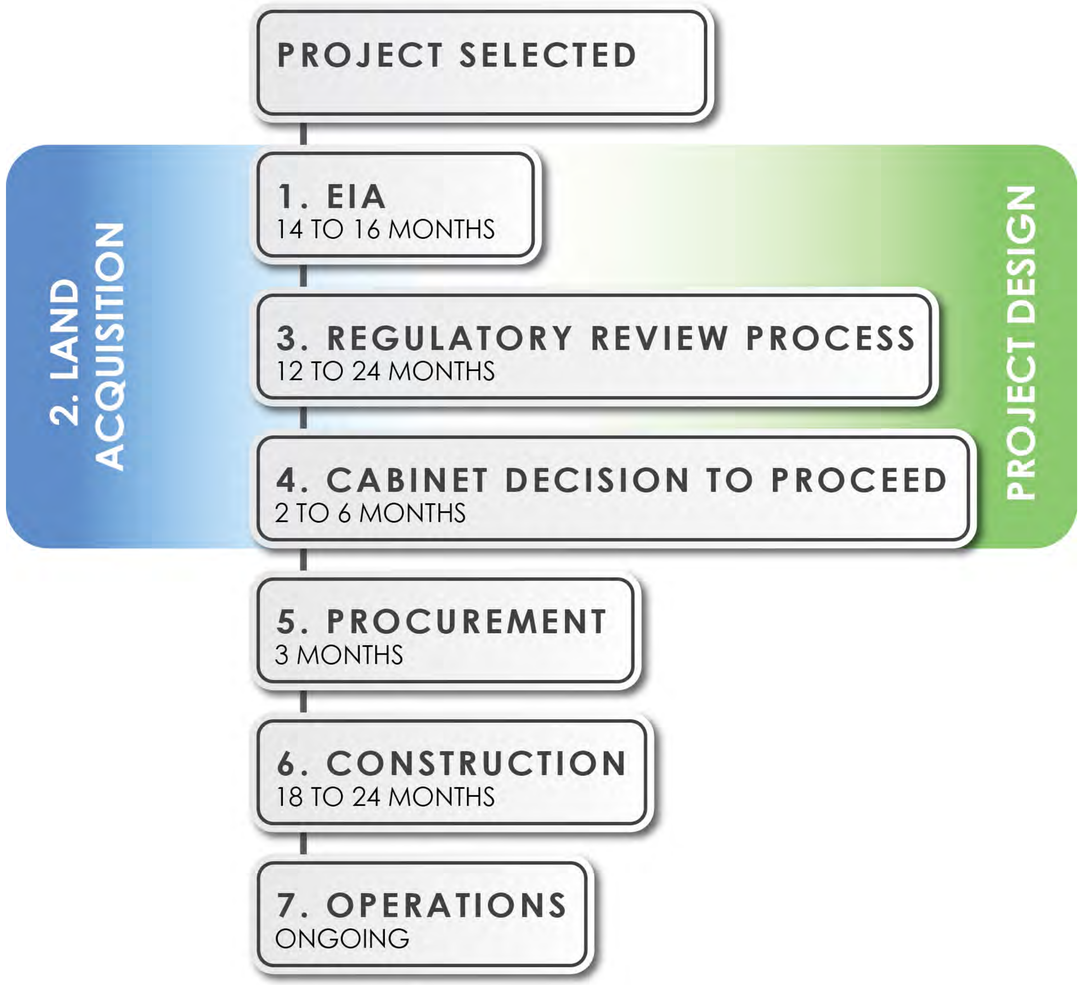
## What's New

This open house is intended to share information about the Springbank Off-stream Reservoir Project and how it has progressed. Here's what is new:

- October 26, 2015: Government of Alberta announced the Springbank Project would move ahead with the Environmental Impact Assessment (EIA)
- Anticipated implementation of milestones
- EIA: Field studies have begun
- Project design for the EIA:
  - Engineering concept advanced
  - Historical flood events captured in the Springbank Project
  - Preferred option for road network
- Regulatory Review Process: Project description submitted to Canadian Environmental Assessment Agency (CEAA)

# Springbank Off-stream Reservoir Path Forward

## Anticipated implementation of milestones

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Periods are approximate.

# Springbank Off-stream Reservoir Project

## Flood Mitigation Plan

## Alberta Environment and Parks

The Springbank Project represents a key part of the government's flood mitigation plan.

In addition, the government announced that the Province will provide approximately $33 million for local mitigation at Bragg Creek, and additional funding to protect Redwood Meadows. The City of Calgary will receive $150 million in dedicated funding over 10 years through the Alberta Community Resilience Program.

Progress is being made on Bow River flood mitigation. A working group is being struck, which will be jointly chaired by the Province and the City of Calgary, and will include representation from rural municipalities, irrigation districts, local First Nations communities and other stakeholders to assess water storage options within the Bow River Basin.

# Choosing the Springbank Project

In June 2015, Alberta Environment and Parks commissioned the Dutch research foundation Deltares to review the original infrastructure proposal reports and a subsequent benefit/cost study for flood mitigation work on the Elbow River and provide a recommendation on which project to take forward to construction-ready status.

The Springbank Off-stream Reservoir and upstream local mitigation were chosen over the McLean Creek Dam because the Springbank option is less costly, will have less environmental impact, has shorter timelines, and will capture more runoff due to the Springbank Off-stream Reservoir's location further downstream.

**The Springbank option is also:**

- Closer to operational response teams and access roads, and less vulnerable to damage during extreme weather events
- Less sensitive to impacts from sediment and debris
- More environmentally friendly than the McLean Creek Dam, which would require the removal of trees and vegetation from the reservoir area and would irreparably alter the habitat for wildlife and fish population
- Quicker to construct and less likely to be negatively impacted by weather related delays or risk of catastrophic failure

# Springbank Off-stream Reservoir Project

## Why is the Springbank Off-stream Reservoir needed?

The Springbank Off-stream Reservoir, combined with the Glenmore Reservoir in Calgary, will provide protection against a 2013-level flood event for communities along the Elbow River.

A recent flood damage assessment for the City of Calgary suggests that there is up to $942 million at risk on the Elbow River should a 2013-level flood event take place.

# Springbank Off-stream Reservoir Project

## What is the Springbank Off-stream Reservoir?

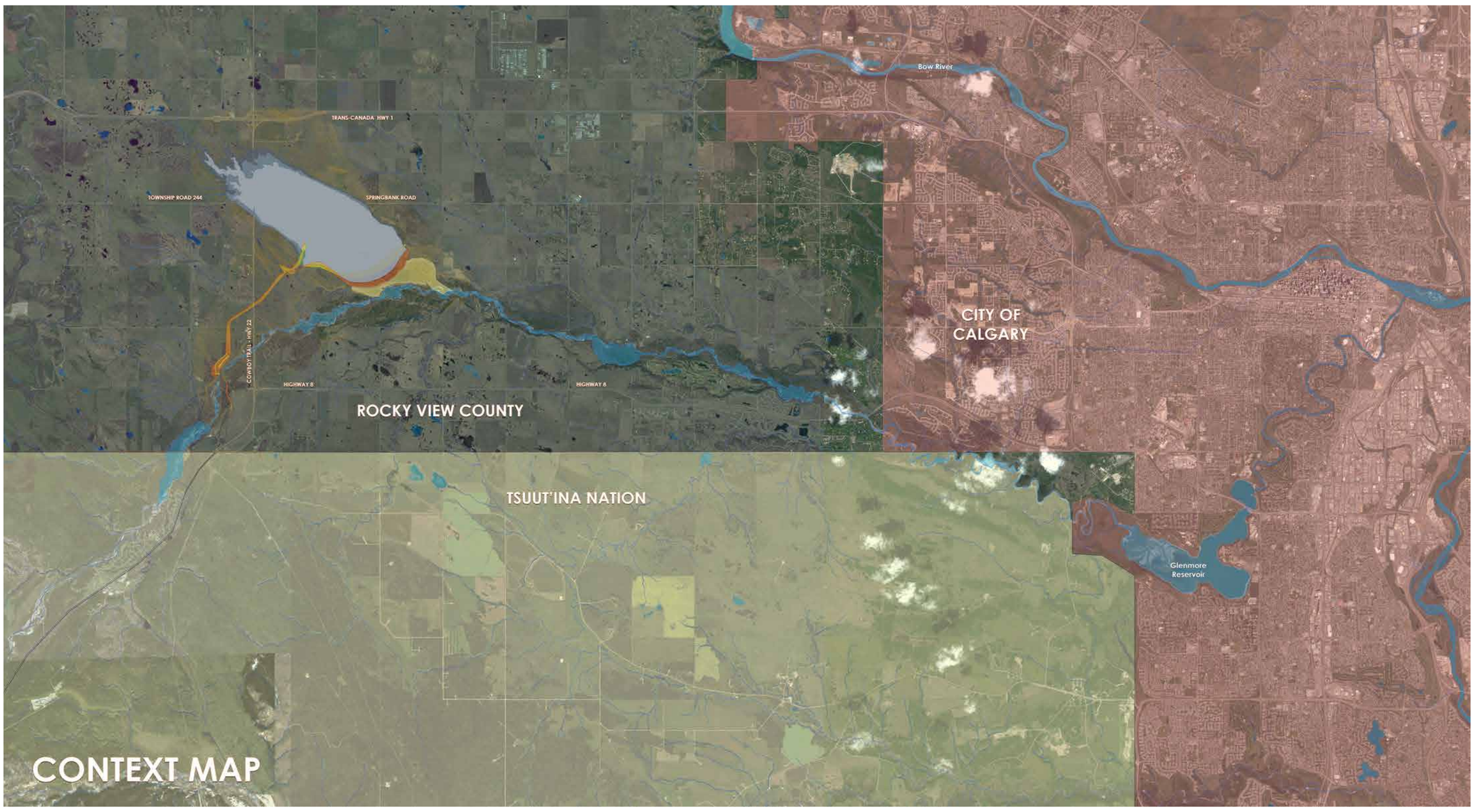
The Springbank Off-stream Reservoir, or Springbank Project, is a dry reservoir that will store water temporarily during a flood.

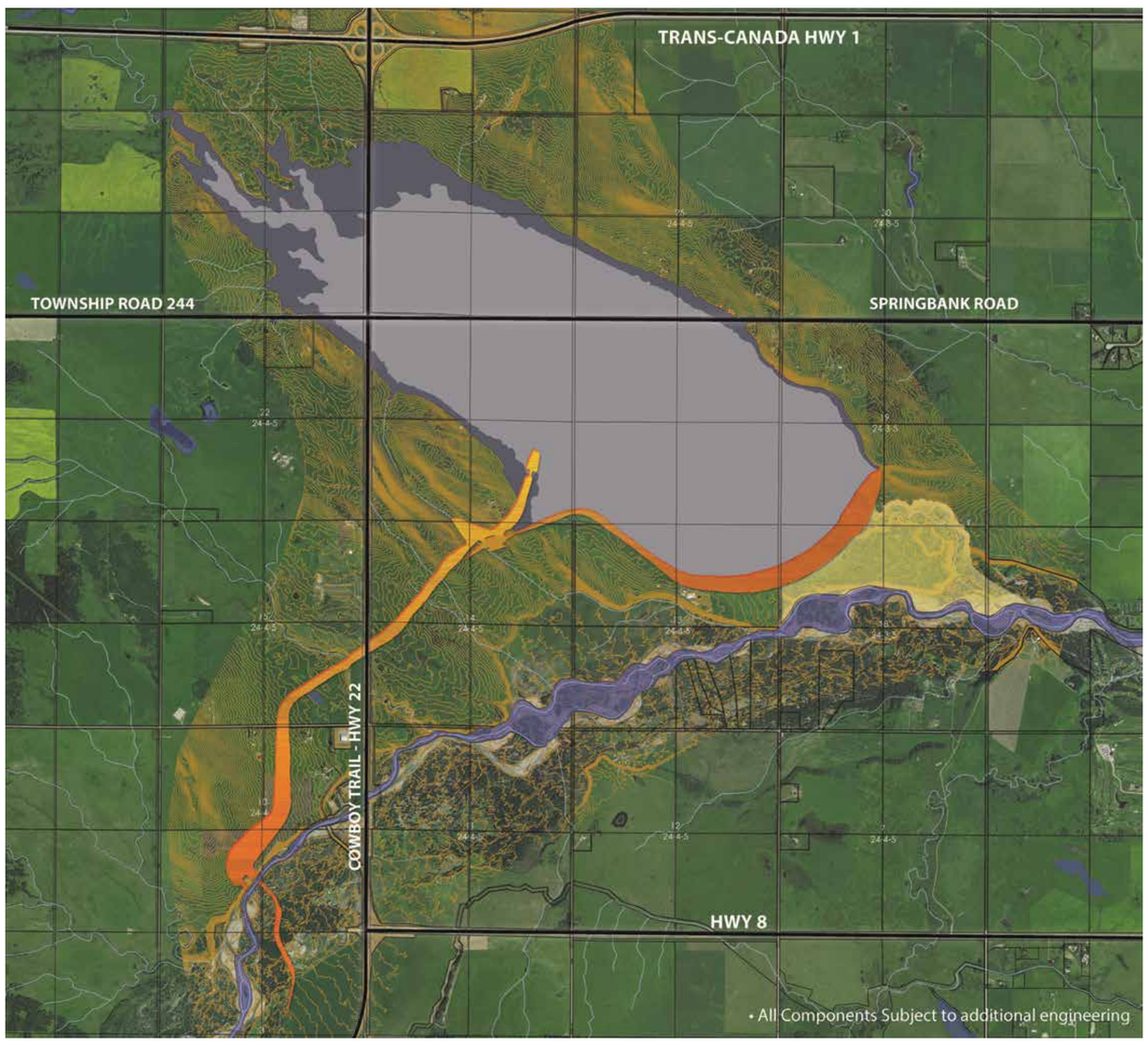
The Springbank Project will work in tandem with the Glenmore Reservoir in Calgary. Together, the combined storage capacity would accommodate water volumes equal to the 2013 flood.

During flood conditions, a channel would carry water from the Elbow River to the off-stream reservoir. When the flood subsides, an outlet structure would release the water in a controlled manner back to the Elbow River.

# Springbank Off-stream Reservoir Project

## Where is the project located?




The Springbank Project will be approximately 15 km west of Calgary near Springbank Road, north of the Elbow River and predominantly east of Highway 22.

# Springbank Off-stream Reservoir Project

## Listening and Learning

## Why are we having an open house?

**Engagement allows those potentially affected by a project to:**

- Become informed.
- Ask questions and hear answers.
- Raise concerns and have them addressed.
- Provide input into the project.

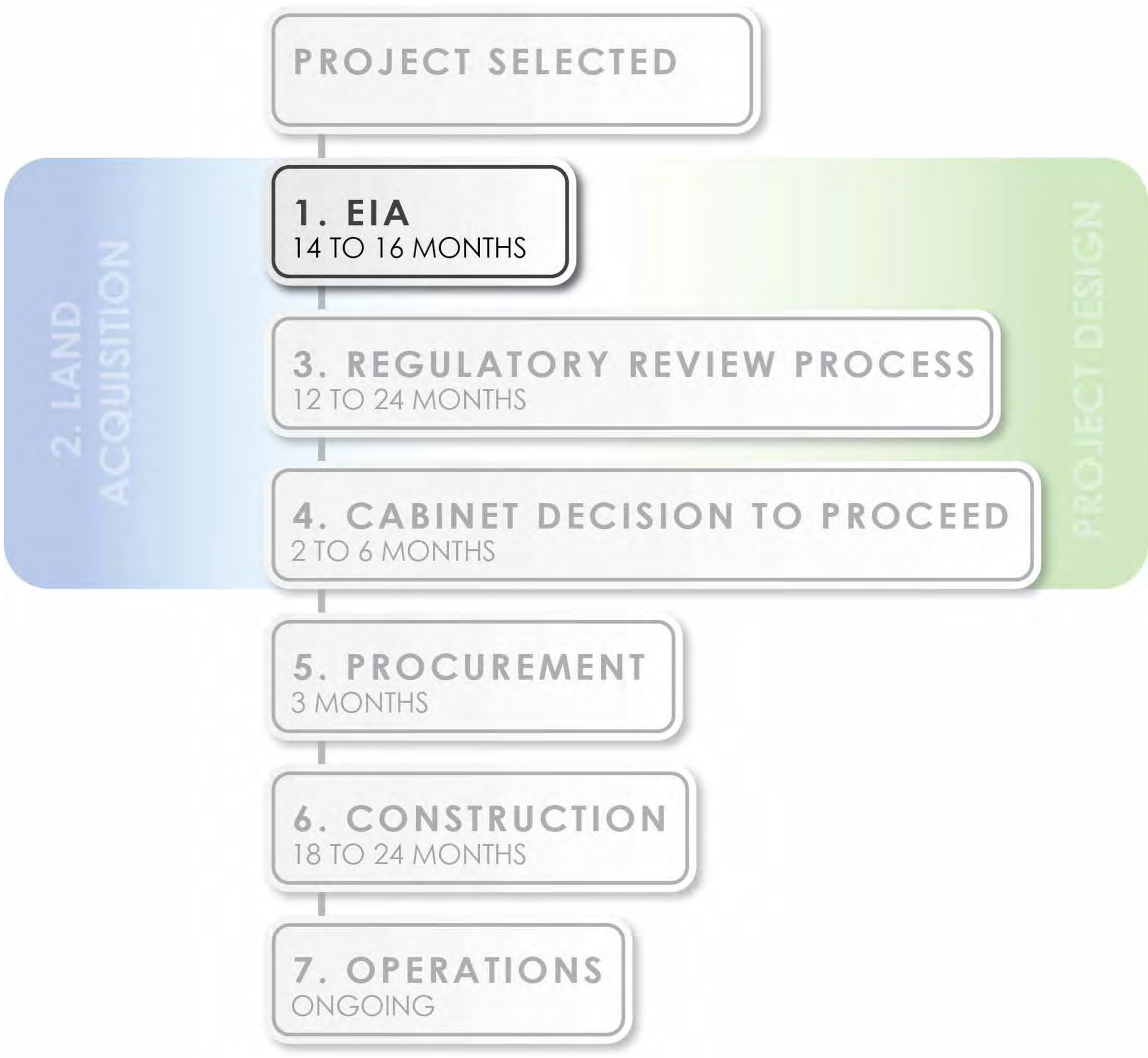
We will listen to stakeholders who may be affected by the project and, when possible, address their concerns. This information will be included in the Environmental Impact Assessment (EIA) where appropriate.

We will continuously improve the engagement process as it unfolds.

# Springbank Off-stream Reservoir Project

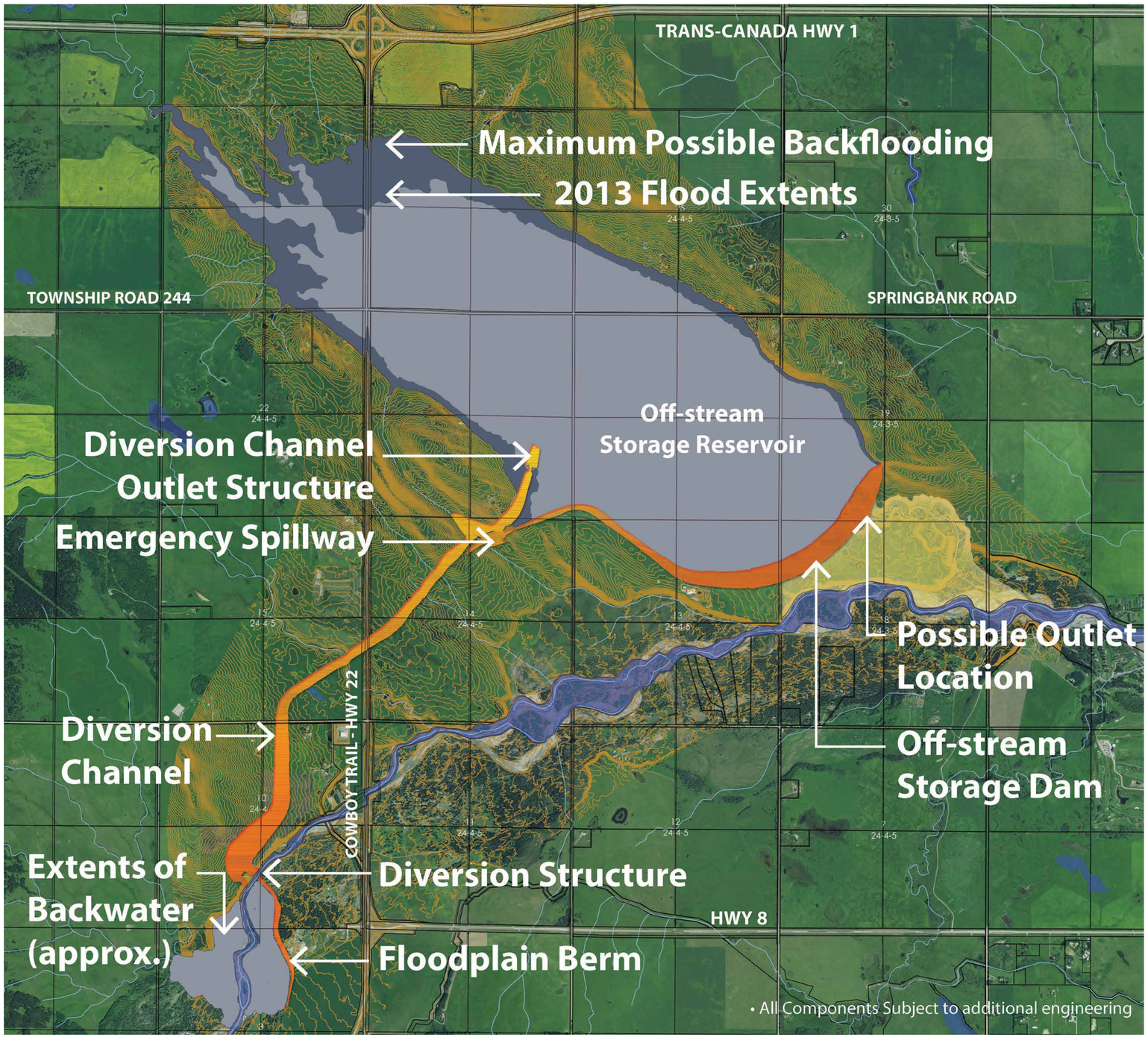
## Environmental Impact Assessment

This section of the open house relates to the EIA and project design.




Periods are approximate.

# Project Components



# Springbank Off-stream Reservoir Project

## Diversion Structure Concept

The diversion structure concept has the following components:

- Floodplain berm that captures flood water and directs it to the diversion structure.
- Gated structures that control how much water is allowed to continue downstream, and how much backwater builds at the diversion structure. The backwater drives floodwaters into the diversion inlet, and ultimately to the storage reservoir.

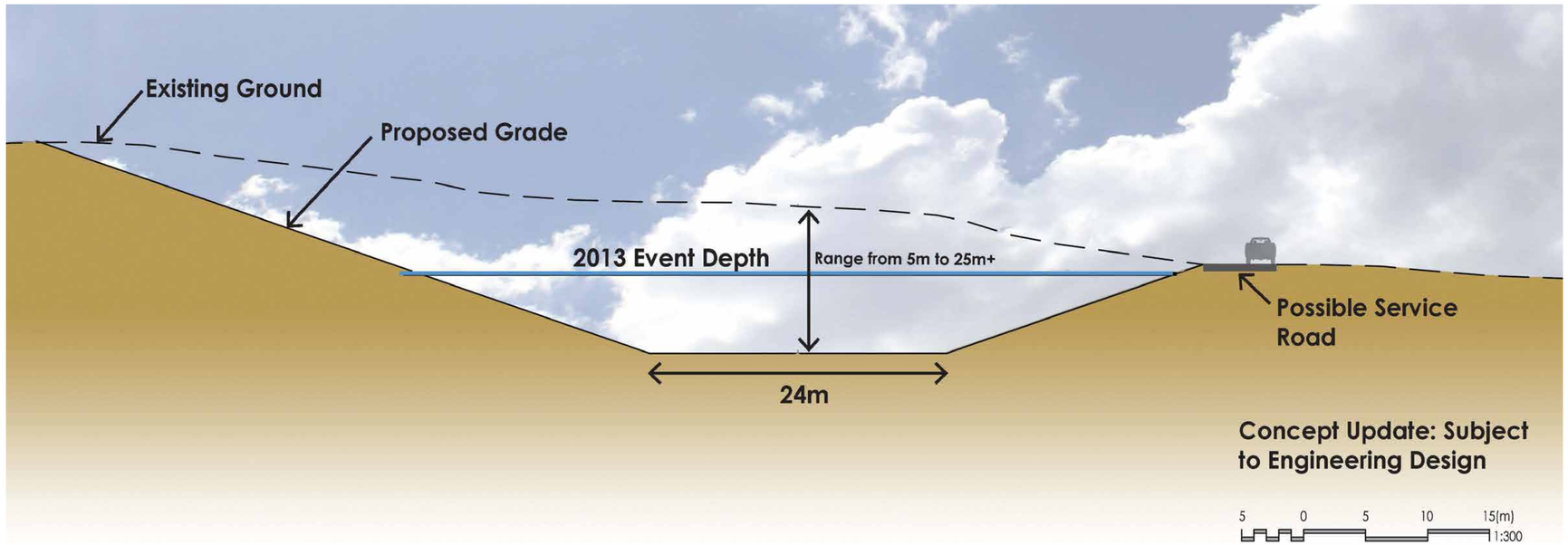
# Springbank Off-stream Reservoir Project

## Diversion Structure Concept

The diversion structure location is based on river's slope, alignment and other characteristics necessary for the project to work as designed.

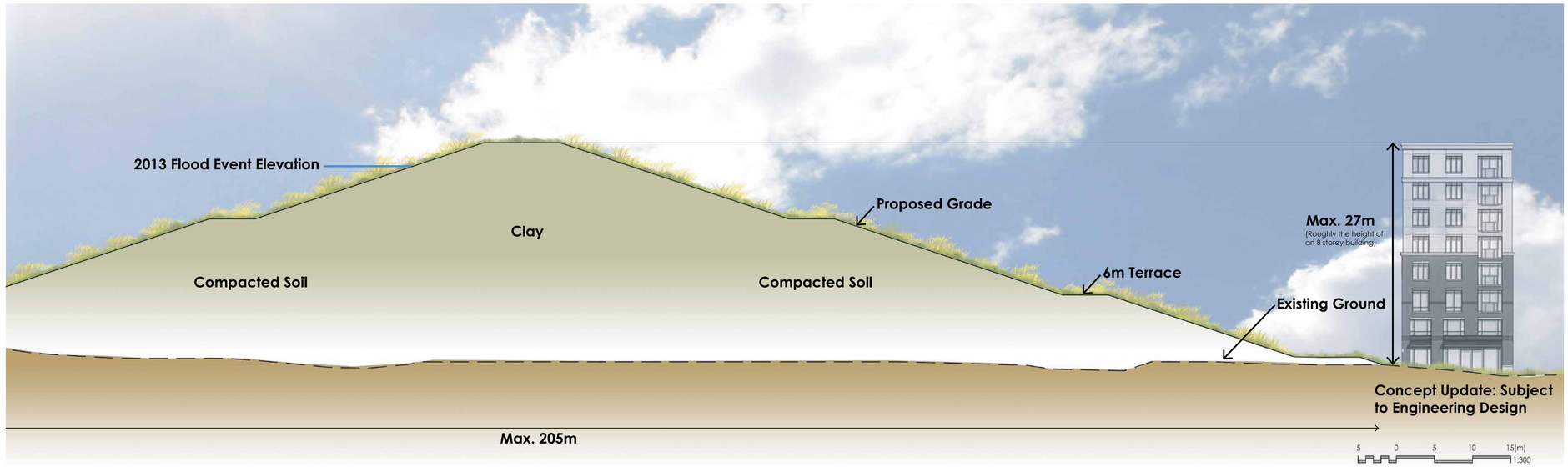
# Springbank Off-stream Reservoir Project

## Diversion Channel Concept




- The diversion channel carries flood waters about 4.5 km from the diversion structure to the storage reservoir.
- The channel cut would be similar to an irrigation canal with side slopes of about 3:1 (horizontal:vertical).
- The diversion channel will generally be vegetated with native species.
- Erosion protection may be provided at select locations where high velocities are anticipated.

# Dam Concept

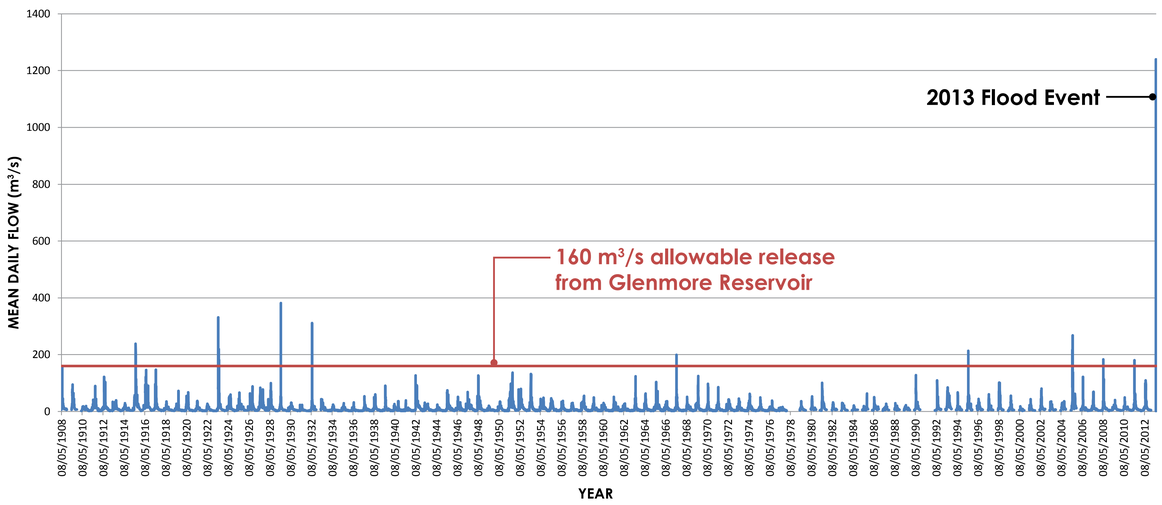



- The dam is earthen and will have a terraced profile with grass surface.
- At its tallest, it will be about 27 m high, about the height of an 8-story building.
- The dam uses natural topography to store water behind it.
- The reservoir has a design flood storage capacity of 70.2 million cubic metres, about the volume of 28,000 Olympic swimming pools.
- The outlet structures release and carry the water from the storage reservoir back to the Elbow River.

# Springbank Off-stream Reservoir Project

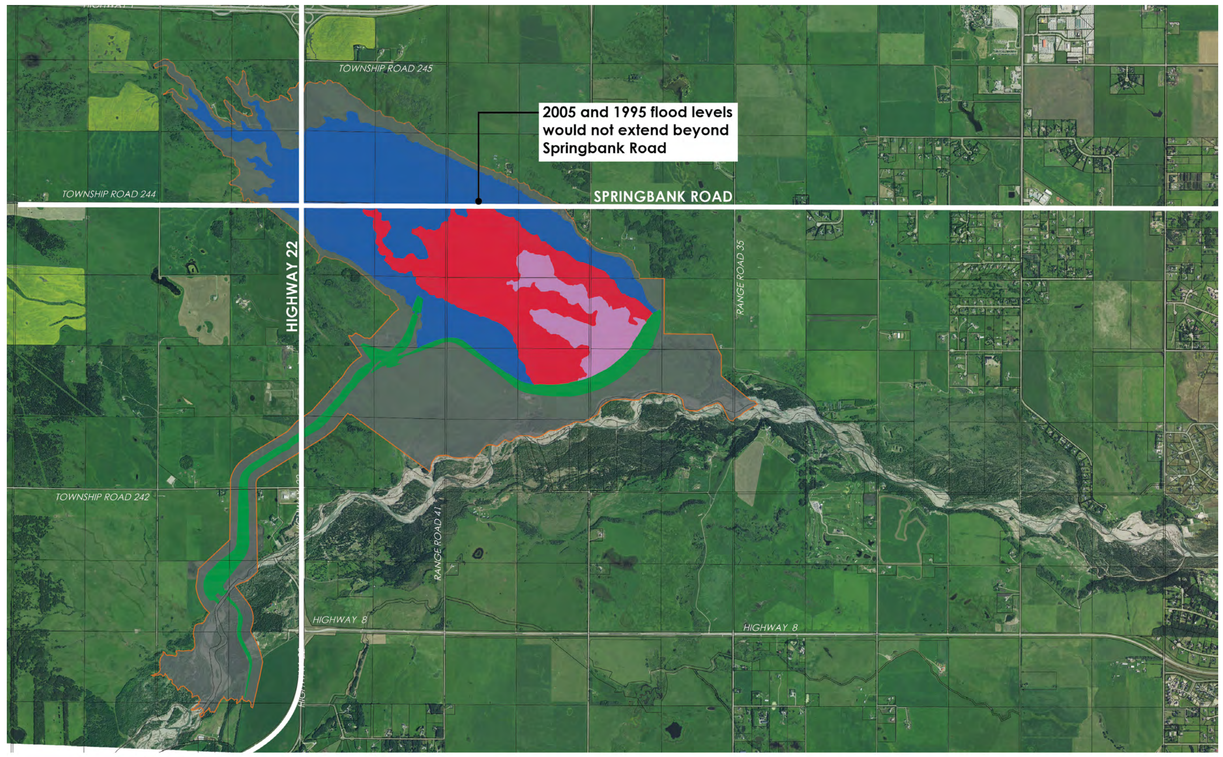
## Historical Context

**The Springbank Project would have likely operated eight times over the last 108 years.**




*** 2008 and 2010 Managed by Glenmore Reservoir**

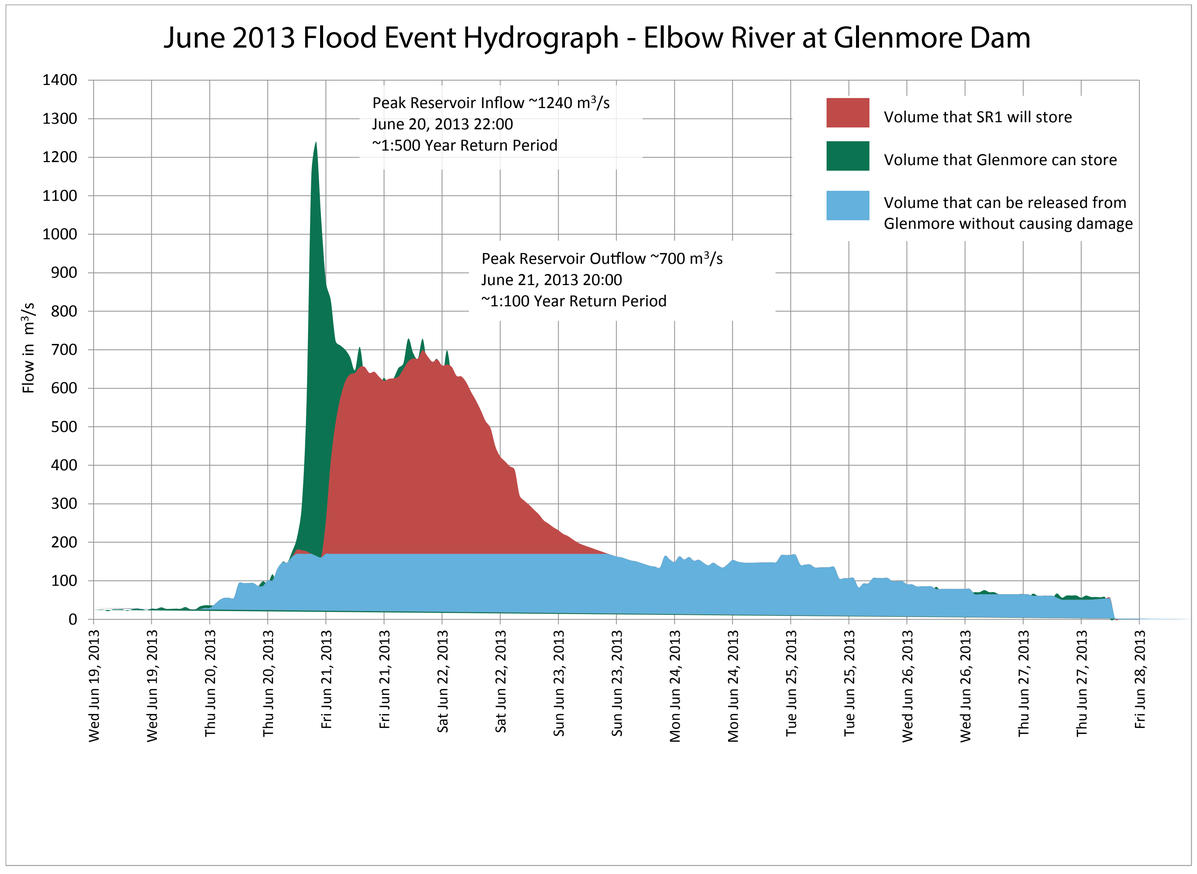
In the last 20 years, the Springbank Project would have operated in 1995, 2005 and 2013. Note that the floods of 2008 and 2011 would likely not have triggered the need to operate the Springbank Project because flood volumes could have been managed by the Glenmore Reservoir alone.



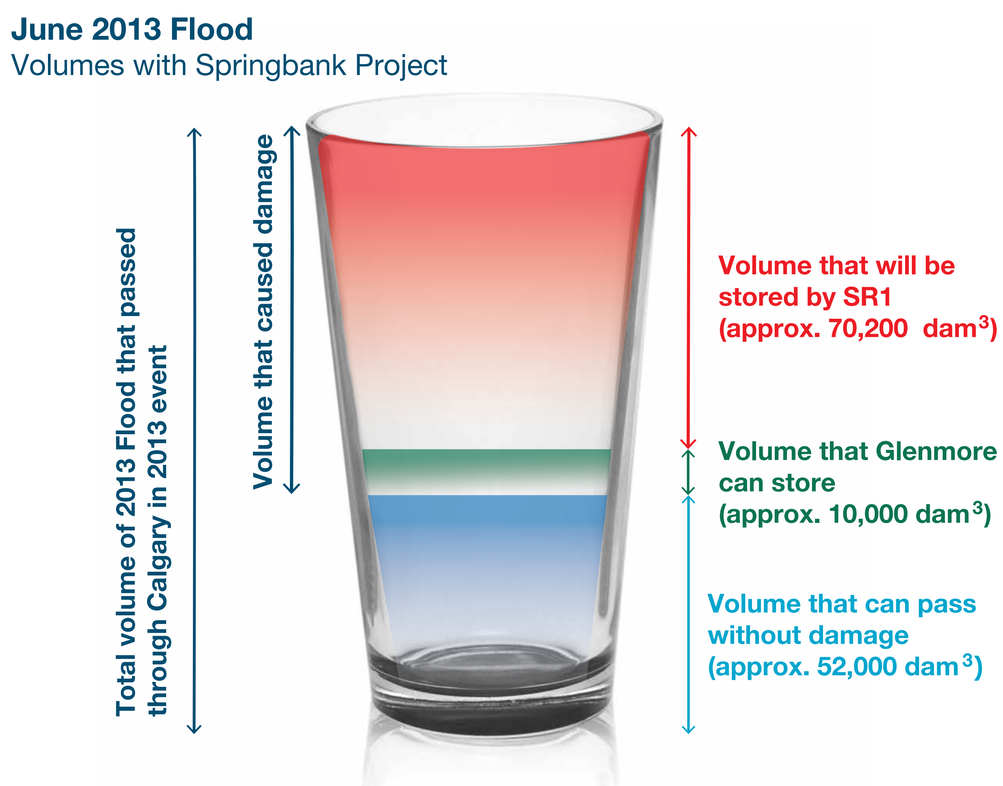

This map compares how much the reservoir would have filled during those recent flood events.

# Springbank Off-stream Reservoir Project

## Storing the 2013 flood

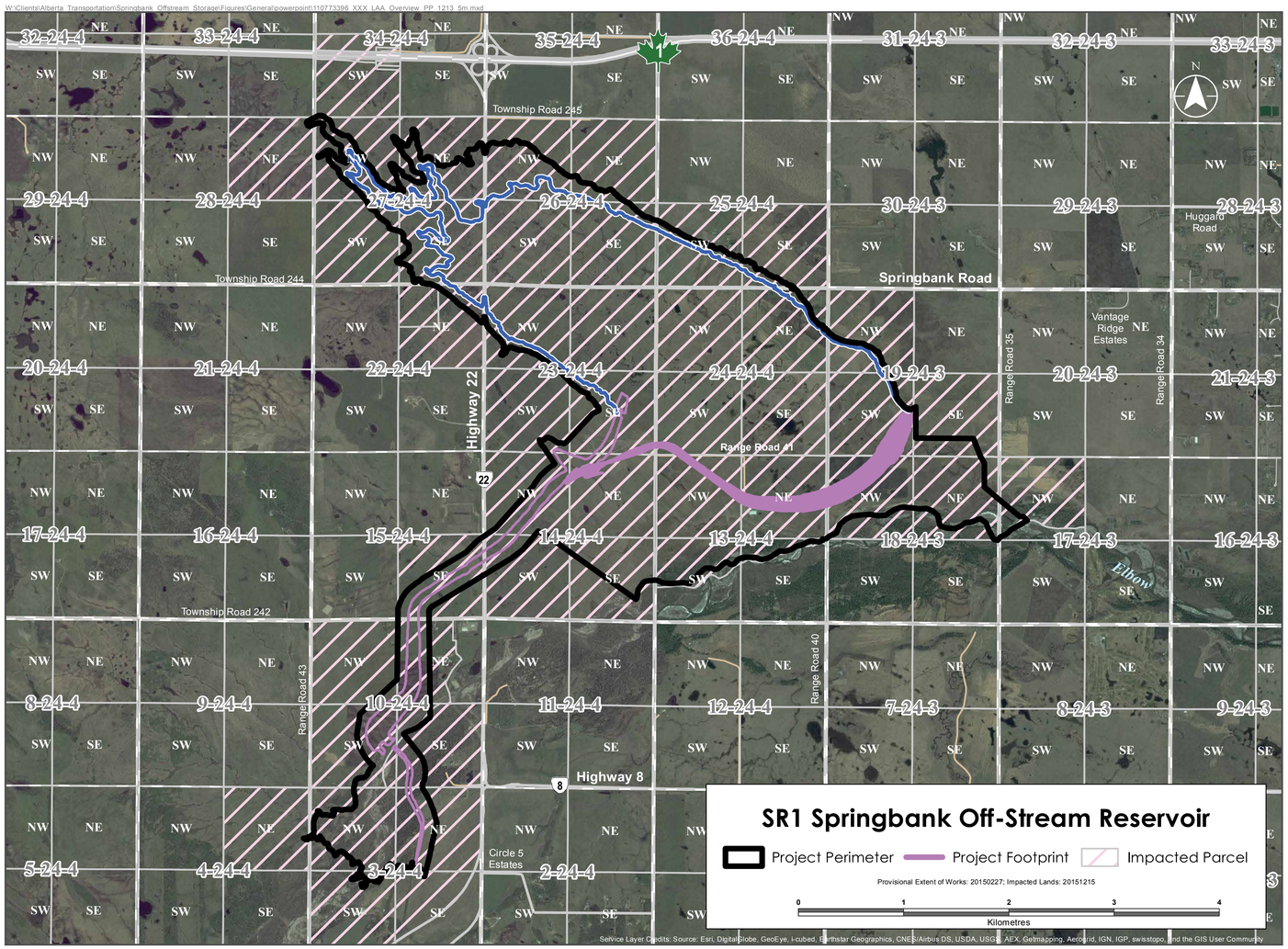



This graph shows how the Glenmore Reservoir and the Springbank Project could have worked together during the 2013 flood.




The storage required by the Springbank Project is defined by the volume of water that caused damage downstream of the Glenmore Reservoir during the 2013 flood.

# Land Requirements




- The project perimeter is the current boundary for the project within which the project footprint will sit.
- The project footprint will be determined following preliminary engineering.
- Total area within the project perimeter is 3,610 acres.
  - includes land for road allowances, structures and the maximum extent of any backwater during emergency scenarios.
  - includes surplus borders around various components of the infrastructure that may or may not be required. The precise location of the components and their footprint will be defined through engineering assessment and design.
- The reservoir's full supply level is achieved when it is storing the 2013 flood event (water elevation 1,210.5 m, based on the current conceptual design). Based on the current dam location, this flooded area would be approximately 1,950 acres.

# Springbank Off-stream Reservoir Project

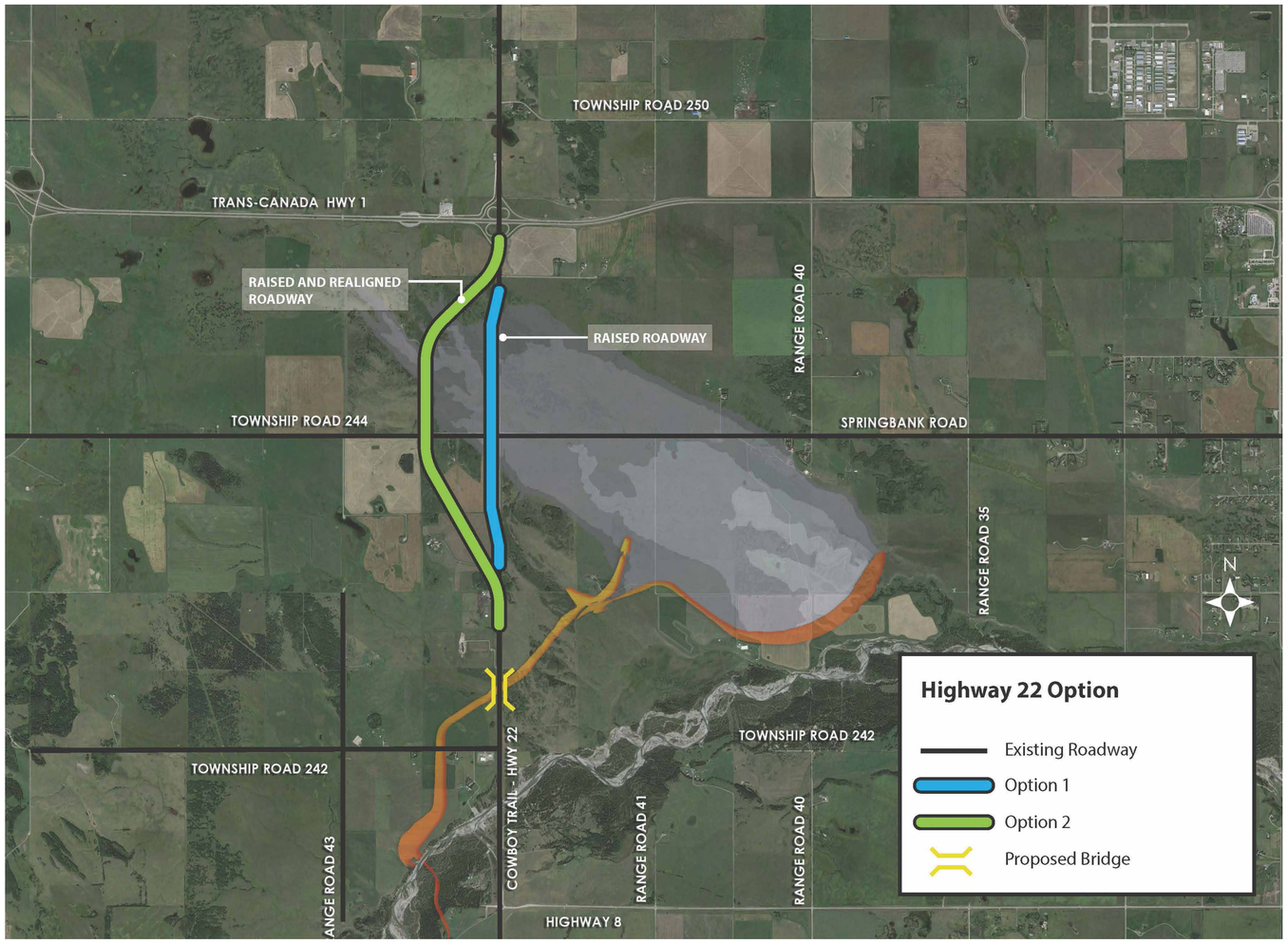
## Road Network Considerations

The development of roadway options considered the following issues identified at previous information session:

- Maintaining land access, including emergency access
- Road access during a flood event
- Impact to roadway users during construction and flood event
- Roadway costs

# Springbank Off-stream Reservoir Project

## Highway 22 Options




### Option 1: Raise Highway 22

- Accommodates future twinning plans
- Estimated construction cost: $19.0 million

### Option 2: Raise and realign Highway 22

- Requires more land and less fill material than Option 1
- Estimated construction cost: $19.8 million

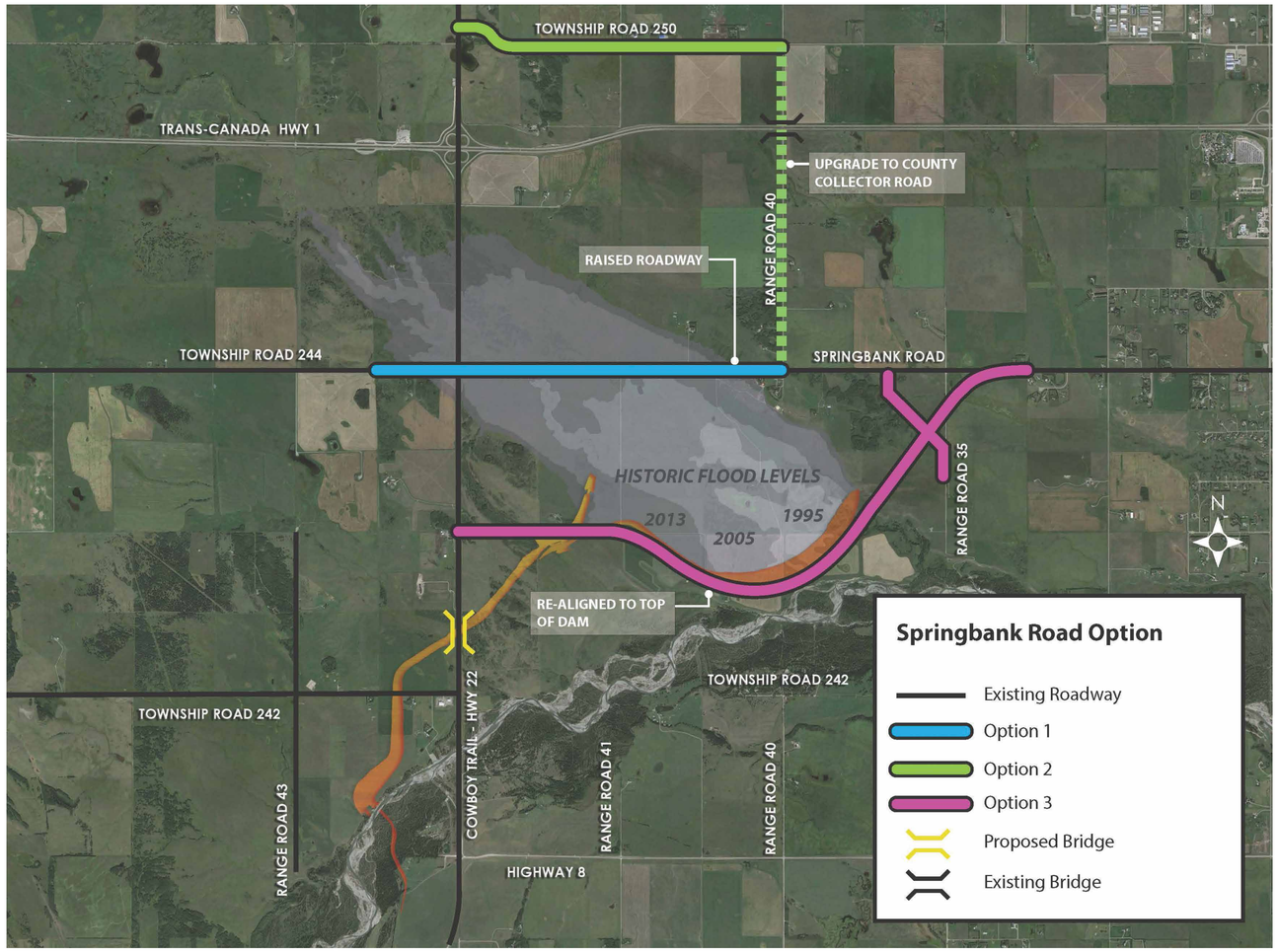
| | Option 1 | Option 2 |
|---|---|---|
| Planning Level Construction Cost | ● | ○ |
| Environmental/ Historical | ● | ○ |
| Development Impacts | ● | ○ |
| Flood Impact/ Road Remediation (2013 flood event) | ◑ | ◑ |
| Road User Cost (RUC) | ● | ○ |
| Travel Distance | ● | ○ |

● Good
◑ Average
○ Poor

Preliminary technical design subject to approval.

# Springbank Off-stream Reservoir Project

## Springbank Road Options




| | Option 1 | Option 2 | Option 3 |
|---|---|---|---|
| Planning Level Construction Cost | ○ | ● | ◑ |
| Environmental/ Historical | ○ | ● | ◑ |
| Development Impacts | ◑ | ◑ | ◑ |
| Flood Impact/ Road Remediation (2013 flood event) | ● | ○ | ● |
| Road User Cost (RUC) | ● | ● | ○ |
| Travel Distance | ● | ● | ○ |

Good ●
Average ◑
Poor ○

Preliminary technical design subject to approval.

### Option 1: Raise Springbank Road

- Road embankment: maximum 16 metres high with 2013 flood level
- Requires more land than Option 2
- Reservoir hydraulics and flood water extents impacted
- Estimated construction cost: $52.2 million

### Option 2: Retain existing Springbank Road

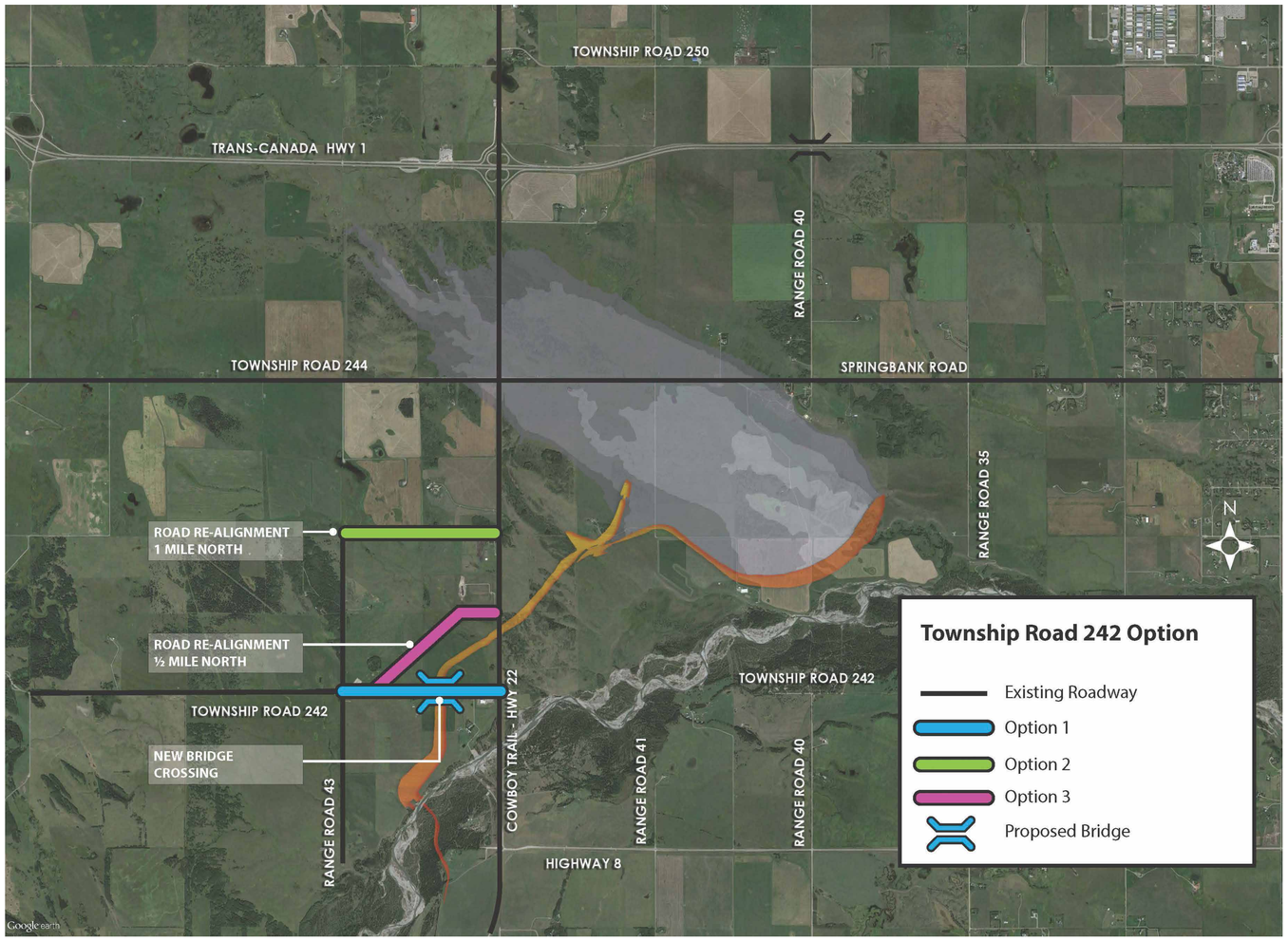
- Detour traffic on Range Road 40/Township Road 250 during construction and a 2013 flood event
- Inundated Springbank Road during 2013 flood event; road remediation would follow
- Estimated construction cost: $2.0 million

### Option 3: Realign Springbank Road to the south and run on top of dam

- Additional bridge over proposed canal
- Requires more land than Option 1 or 2
- Increased travel distance to Highway 1
- Maximum 2 lanes on top of dam
- Estimated construction cost: $11.8 million

# Springbank Off-stream Reservoir Project

## Township Road 242 Options




### Option 1: New bridge crossings over the proposed canal

- Estimated construction cost: $6.2 million

### Option 2: Realign using Range Road 43, 1 mile north

- Requires more land than Option 1
- Impacts existing development
- Estimated construction cost: $4.8 million

### Option 3: Diagonal realignment ½ mile north

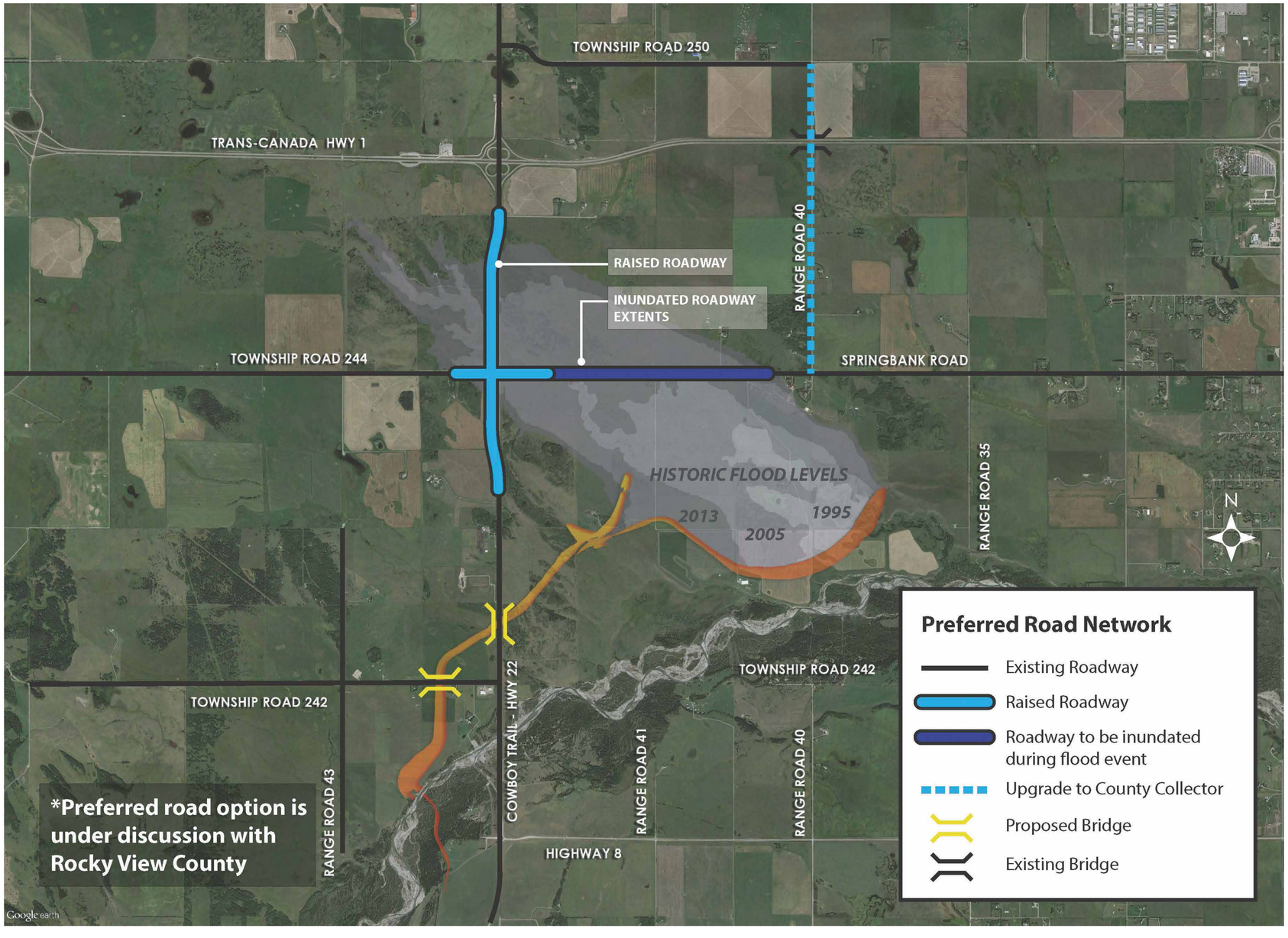
- Requires more land than Option 2
- Estimated construction cost: $3.1 million

| | Option 1 | Option 2 | Option 3 |
|---|---|---|---|
| Planning Level Construction Cost | ○ | ◑ | ● |
| Environmental/ Historical | ● | ○ | ○ |
| Development Impacts | ● | ○ | ● |
| Future Access Management Impact | ● | ● | ○ |

● Good
◑ Average
○ Poor

Preliminary technical design subject to approval.

# Preferred Option for Road Network




## Technically preferred option includes:

- Raise Highway 22 in existing location, shift west
- Retain existing Springbank Road
- New raised intersection of Highway 22 and Springbank Road
- Upgrade Range Road 40/ Township Road 250 for detour
- New bridge crossings over the proposed canal along Highway 22 and Township Road 242

## Why is this option the preferred plan?

- Least potential environmental and historical resources impact
- Least development impacts
- Maximizes use of existing infrastructure
- Most cost effective

Preliminary technical design subject to approval.

# What is an EIA?

**Environmental Impact Assessments (EIAs) typically include:**

- a detailed description of the project including the design;
- the location and environmental setting for the project;
- baseline environmental, social and culture information;
- the potential positive and negative environmental, health, social, economic and cultural effects of the proposed activity as well as an assessment of cumulative effects;
- plans to mitigate potential adverse effects and to respond to emergencies; and
- information on public and First Nations consultation.

Regulations require that project proponents prepare an EIA, which will become part of an overall project application to the Natural Resources Conservation Board (NRCB). This allows regulators to make an informed public-interest decision about if and how the project should proceed.

**The EIA answers the following main questions:**

1. What are the existing conditions (the baseline)?
2. What effects would there be due to the project?
3. What are the mitigation measures that would minimize these effects?
4. What are the residual effects and their significance?
5. What are the cumulative effects?

# Springbank Off-stream Reservoir Project

## EIA Terms of Reference

The EIA follows the Terms of Reference for this project, which was finalized after public review February 2015, and environmental information requirements (Environmental Protection and Enhancement Act and associated regulations and potentially the Canadian Environmental Assessment Act, 2012 (CEAA 2012) and associated regulations).

**The EIA analyzes existing conditions, including environmental, socio-economic and health and safety, including:**

- air quality
- noise
- soils and terrain
- hydrogeology
- surface water
- vegetation and wetlands
- wildlife
- aquatic habitat
- land use and management
- heritage resources
- traditional ecological knowledge and land use
- public health and safety
- socio-economic assessment

# Springbank Off-stream Reservoir Project

## EIA Local Field Work: Two areas of study

### 1 Local assessment area:

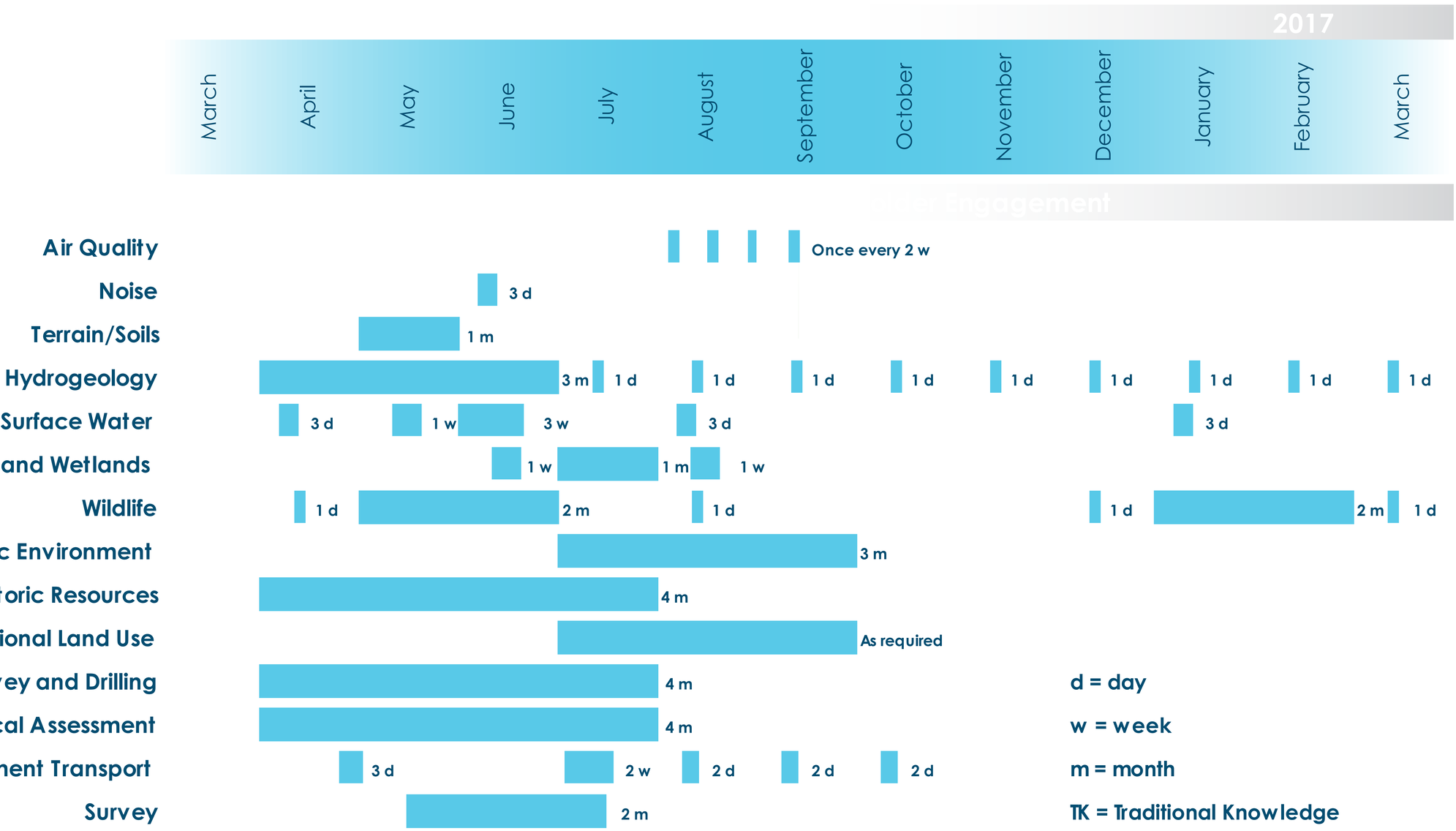
The area within the project perimeter plus a buffer zone around it.

### 2 Downstream area:

- The regional context of the project includes the Glenmore Reservoir—located approximately 18.5 km downstream.
- The operation of the project and the Glenmore Reservoir will be considered together to achieve maximum benefit of flood control.
- The baseline water conditions in the project area (including the Glenmore Reservoir) will be described as well as project components and activities that may affect future water conditions in the regional context.

# Springbank Off-stream Reservoir Project

## EIA Schedule




d = day

w = week

m = month

TK = Traditional Knowledge

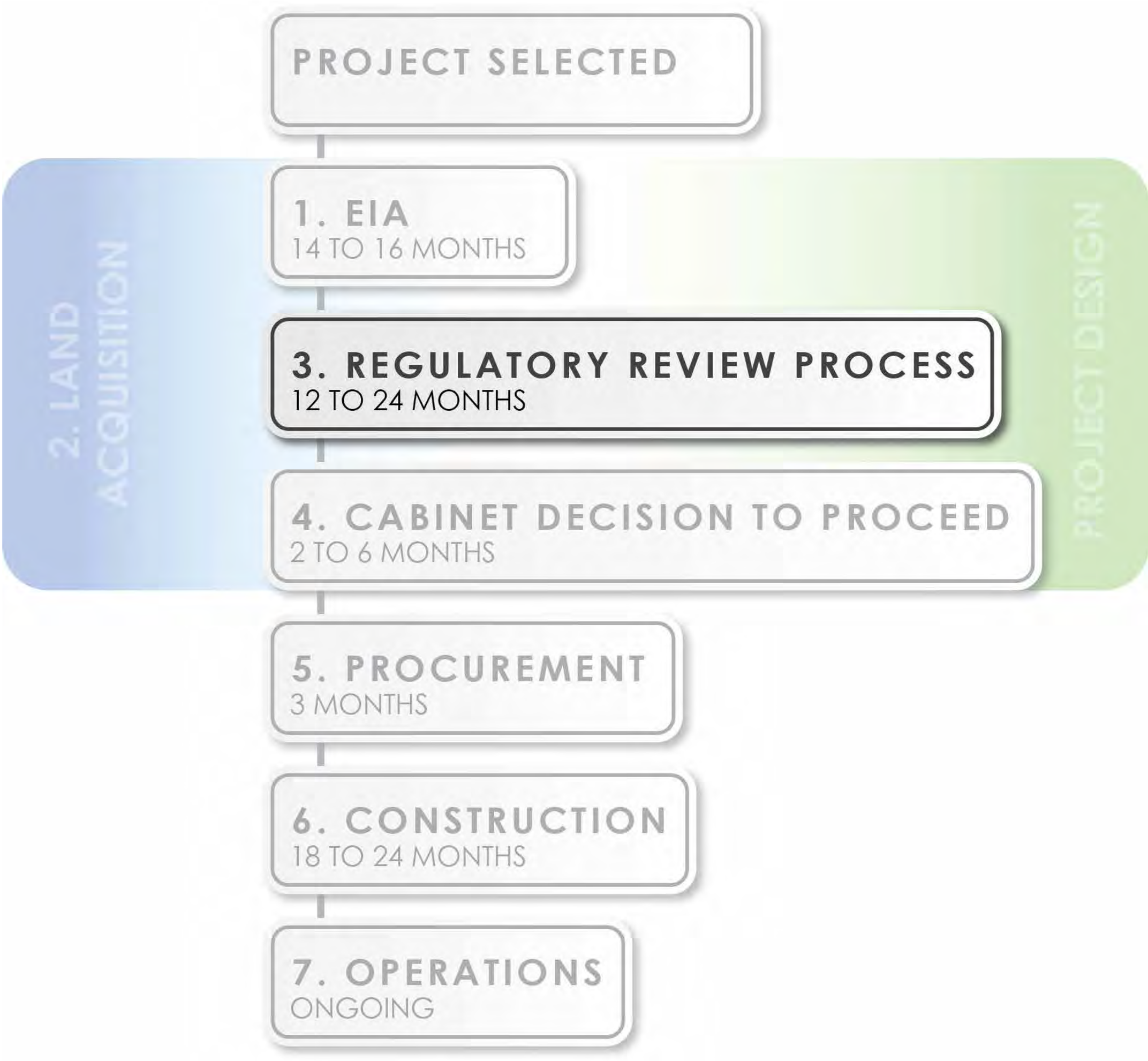
Updated: April 15, 2016

Rev 2

# Springbank Off-stream Reservoir Project

## Regulatory Review Process

This section of the open house relates to the Regulatory Review Process




Periods are approximate.

# Why is there a regulatory process?

The Natural Resource Conservation Board (NRCB or board) conducts independent, quasi-judicial reviews of proposed non-energy natural resource projects to determine their public interest.

The NRCB must consider the environmental, economic and social impacts of a project in order to determine its public interest.

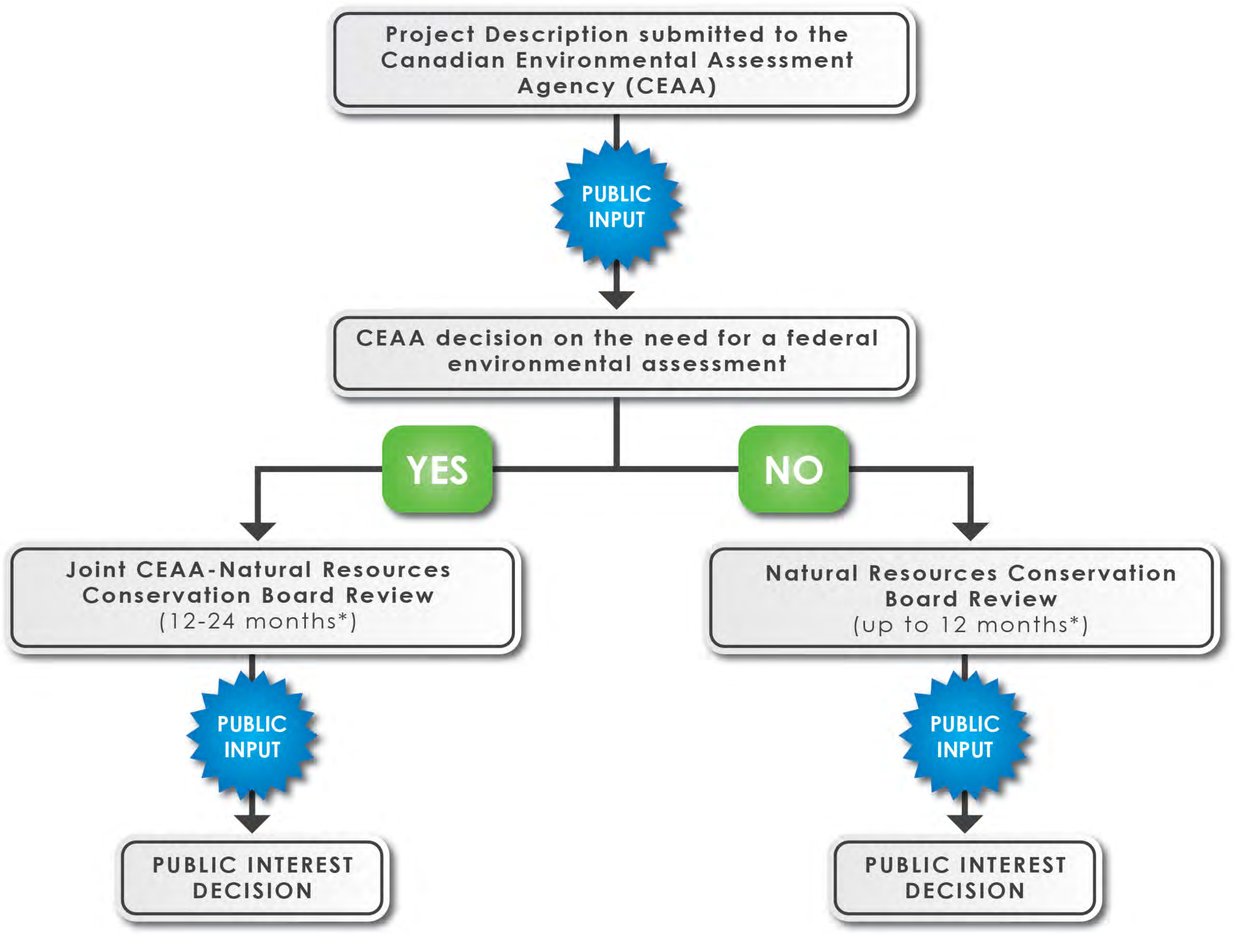
The board hears evidence from the applicant, government agencies, non-governmental organizations and citizens. In most cases, the evidence is brought forward in a public hearing. Hearing participants, including the board and board staff, have an opportunity to test the evidence put forward by other participants through questioning.

The board values public participation in its review process for proposed natural resource developments. Albertans who are directly affected by a proposed development are encouraged to participate in the review process, including the public hearing if one is held. Individuals or groups who wish to provide relevant evidence about an application for a proposed natural resource project should register with the board within the timeframe set out in the hearing notice.

The board weighs the evidence and decides what, in its view, is in the public interest. The board documents the matters considered and the conclusions it reached in order to approve or deny a project.

# Springbank Off-stream Reservoir Project

## Regulatory Review Process




* Timelines may be extended by the Regulating Authority if required

# Springbank Off-stream Reservoir Project

## Summary of Engagement

Phase one of engagement was to build understanding with stakeholders about the Springbank Project. Now that the environmental impact assessment (EIA) field work is underway, phase two of engagement will continue the dialogue with a greater focus on the EIA and project design.

- Meetings with landowners
- First Nations consultation
- Public open houses (Calgary, Cochrane, Springbank area)
  - Four conducted to-date, two open houses this week, more in the future
- Over 40 meetings to-date with stakeholders including Bow River Basin Council, Elbow River Watershed Partnership and the Calgary River Communities Action Group
- Meetings with Rocky View County
- Meetings with the City of Calgary
- Meetings with affected industry and utilities
- Ongoing project email and phone inquiries
- Information on project web site alberta.ca/springbank-road.cfm

Public input is important at this stage of the EIA process and critical to responsible project design.

# Public input on EIA and project design

Tell us what questions or concerns you want investigated regarding the EIA topics listed in the terms of reference.

The final EIA will be shared with stakeholders with an opportunity to provide input directly to the regulator.

# Springbank Off-stream Reservoir Project

Please take a moment to complete an exit survey.

# Springbank Off-stream Reservoir Project

Thank you for taking the time to provide your input on the proposed Springbank Off-stream Reservoir (SR1) project. Your comments will be compiled and submitted as part of a summary for the Environmental Impact Assessment application for this project. For your convenience, this survey can also be completed online at https://www.surveymonkey.com/r/SR1exitsurvey until May 18, 2016.

1. Of the following issues or concerns listed, please select your top 5 priorities for the Government of Alberta to address regarding the Environmental Impact Assessment (EIA) for the Springbank Off-stream Reservoir:

| | Issue or Concern Category | | Issue or Concern Category |
|---|---|---|---|
| | Geotechnical Assessment (testing on subsurface soil and bedrock conditions) | | Geomorphology/Sediment Transport (stability and sediment supply effects on SR1 and the Elbow River) |
| | Noise | | Air Quality |
| | Terrain/Soils | | Social Impacts |
| | Hydrogeology (groundwater and subsurface geology) | | Economic Impacts |
| | Surface Water | | EIA Process and Opportunities for Input |
| | Vegetation and Wetlands | | Traditional Knowledge and Traditional Land Use |
| | Wetlands | | Project Schedule |
| | Project Alternatives | | Heritage Sites |
| | Wildlife | | Engineering Concept and Design |
| | Fish | | Safety |
| | Aquatic Environment (fish habitat) | | Road Alterations |
| | Historical Resources | | Recreation (impacts to recreational activity in the area) |
| | Visual Quality | | Project Planning |

2. The information provided at the open house was:

- ☐ **Inadequate** – information was not detailed enough and my questions were not answered.
- ☐ **Adequate** – information was vague or confusing and I still have unanswered questions.
- ☐ **Sufficient** – there was enough information to understand the project.
- ☐ **Excellent** – the information provided was substantial and clearly communicated.

# Springbank Off-stream Reservoir Project

3 Do you support the Springbank Off-stream Reservoir Project?

☐ Yes ☐ No ☐ Undecided

4 Rate the Government of Alberta's efforts to engage with and share information with stakeholders about the proposed Springbank Off-stream Reservoir Project.

☐ Excellent ☐ Good ☐ Satisfactory ☐ Poor

5 Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?

Please complete the following if you would like to receive ongoing information on the Springbank Off-stream Reservoir Project. Thank you!

Please Print

Name(s): _____

Mailing Address: _____

Phone Number: _____ Email: _____

This survey can also be submitted to the Government of Alberta by mail or email:

Springbank Off-stream Reservoir Project c/o
Communica Public Affairs
200, 215 12 Avenue S.E.
Calgary, AB T2G 1A2

**Springbank-Project@gov.ab.ca**

Personal information is being collected by Alberta Transportation under the authorization of Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and is managed in accordance with part 2 of the FOIP Act. Your name and email address will be used for contact purposes to send updates. Your postal code is being collected for analysis of location to river and to the proposed Springbank Off-stream Reservoir Project. Your personal information will be shared with the Department of Environment and Sustainable Resource Development, the Canadian Environmental Assessment Agency, and to anyone viewing this sheet during sign-in. Should you wish to have your personal information removed, corrected or have concerns pertaining to the Springbank Off-stream Reservoir Project, please contact Mark Svenson, Alberta Transportation Environmental Coordinator at (780) 644-8354 or springbank-project@gov.ab.ca.

# Springbank Off-stream Reservoir Project

## Contact Us

**Email:** Springbank-Project@gov.ab.ca
**Phone:** 780-644-8354
**Website:** alberta.ca/springbank-road.cfm

# Springbank Off-stream Reservoir Project

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**SPRINGBANK OFF-STREAM RESERVOIR PROJECT**
**ENVIRONMENTAL IMPACT ASSESSMENT**
**CONSULTATION AND ENGAGEMENT**

Attachment 1 Stakeholder Open House Display Boards and Handouts
March 2018

# 2017 ENGAGEMENT AND CONSULTATION

Stantec

Springbank Off-stream Reservoir Project

# Please join us for a Springbank Off-stream Reservoir Project information session.

Following the Alberta government's commitment to build the Springbank Off-stream Reservoir as part of the overall provincial flood mitigation strategy, the Environmental Impact Assessment (EIA) required for the project is now nearing completion.

Designed as a dry dam unless flood conditions are present, the Springbank Off-stream Reservoir will work in tandem with the Glenmore Reservoir in Calgary. Together, the combined storage capacity would accommodate the excess water volume that caused the 2013 flood.

The Springbank Off-stream Reservoir will be about 15 kilometres west of Calgary near Springbank Road, north of the Elbow River and predominantly east of Highway 22.

Public engagement for this project is continuing. Please join us to learn more about how this project is progressing and to provide your feedback.

**SPRINGBANK**
**Wednesday August 16th**
**5:00 – 8:00 p.m.**

**Tuesday August 22nd**
**5:00 – 8:00 p.m.**

**Wild Wild West Event Centre**
67 Commercial Crt.
Calgary AB T3Z 2A6

**CALGARY**
**Thursday August 17th**
**5:00 – 8:00 p.m.**

**Mount Royal University - Ross Glen Hall**
4825 Mt Royal Gate SW
Calgary AB T3E 7N5

**CALGARY**
**Tuesday August 29th**
**5:00 – 8:00 p.m.**

**Calgary First Church of the Nazarene**
65 Richard Way SW
Calgary AB T3E 7N2

Learn more at
alberta.ca/springbank-road.cfm

Alberta

Springbank Off-stream Reservoir Project

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Exit 169, off of the TransCanada Highway
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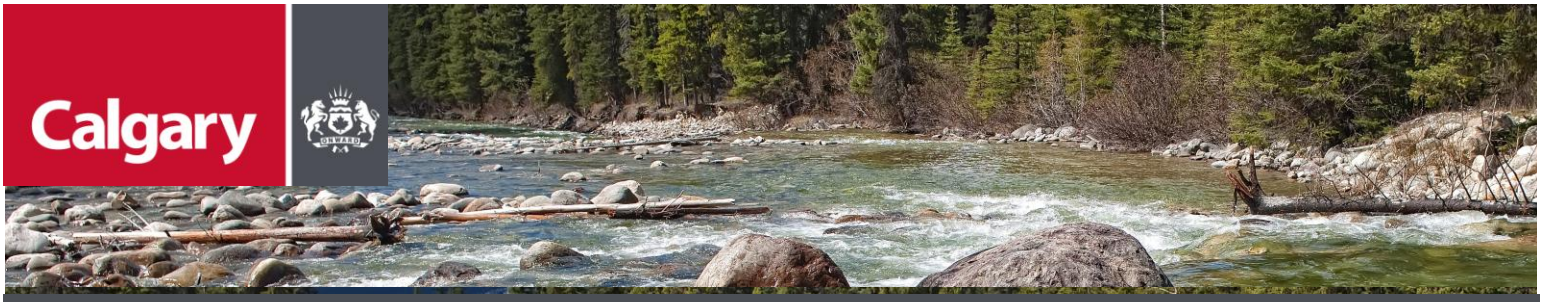
Alberta



# Water Services

## Flood Resiliency and Mitigation

**August 2017**

# Springbank Off-Stream Reservoir (SR1)

In 2013, Calgary experienced its largest flood since 1932, which resulted in approximately $5 billion in damages across Alberta, and over $400 million in damages to the City of Calgary's infrastructure. Many homes and businesses in Calgary's most established neighborhoods experienced devastating damage from river and stormwater flooding.

Since the 2013 floods, the City of Calgary has made flood resiliency a priority and placed considerable attention on mitigation to reduce the risk of future flood damage. In addition to technical studies to better understand flood risk, and identification of structural and non-structural flood mitigation measures, the City of Calgary and the Province have committed over $150 million for various projects to build long-term flood resilience throughout Calgary.

## River flooding affects us all

Calgary was established at the confluence of the Bow and Elbow Rivers. The short, steep distance the rivers travel from the mountains to Calgary means that intense flooding can happen quickly and with little warning. There will always be a risk of flooding in Calgary.

Now home to over 1 million people, with the downtown core and historic neighbourhoods located along the river, building resilience to flooding is a top priority for the City of Calgary.

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## Flood Mitigation Measures Assessment

In 2016, The City hired IBI Group and Golder Associates to update the Provincial Flood Damage Assessment study and to assess and recommend future resiliency and mitigation measures. The assessment included a technical study, a sustainability analysis and community engagement.

The high level findings of the assessment were:

- Without any mitigation in place, the annual flood damage costs in Calgary would average $170 million per year.
- Investments in flood mitigation to date have decreased the flood damage risk by approximately 30 per cent.
- The Province of Alberta's Springbank Off-Stream Reservoir and improved Glenmore Dam gates will protect Calgary from Elbow River flood waters to an event similar to the 2013 flood.
- The Province's multi-year agreement with TransAlta to modify operations at the Ghost Reservoir for flood mitigation purposes provides significant flood mitigation for Calgary.
- A new upstream reservoir, in combination with ongoing TransAlta operations and complementary flood barriers in communities along the Bow River, will protect Calgary from an event similar to 2013.
- A barrier implementation plan must be adaptable to Provincial policy decisions and include community engagement. Any future policy changes must align with Provincial flood hazard regulations, Federal guidelines, and structural mitigation that is put in place.
- Property level mitigation can significantly reduce risk of flood damage.

2016-1012

## Calgary's Flood Resiliency Plan

The City is committed to integrated watershed management that provides a high level of flood resilience for our communities, and also protects the natural river valley, enhancing water quality, water supply and the environmental function of the watershed. To reduce Calgary's flood risk, a combination of watershed, community, property level mitigation solutions, and floodplain policy is necessary. Calgary's approach provides flexible and adaptable strategies to reduce flood risk for a large city.

The plan was developed considering The City's principles and priorities regarding flood resiliency: public safety, sustainable watershed management, cost beneficial investments, adaptability and flexibility, equitable protection on both rivers, community receptivity, and shared responsibility. The City's strategy is a holistic, adaptable, multi-faceted, and resilient approach that incorporates policy and regulation, structural and non-structural mitigation measures, and both public and private resiliency measures.

## Elbow River Mitigation

The Flood Mitigation Measures Assessment (FMMA) confirmed the Springbank Off-Stream Reservoir (SR1) combined with the installation of higher gates at the Glenmore Dam will mitigate a flood similar to the 2013 flood. It is estimated that the flood risk will be reduced approximately 25 per cent by the higher gates on the Glenmore Dam, and 75 per cent by SR1.

The Assessment concluded that the mitigation provided by SR1 for the Elbow River communities cannot be replaced by fortification by barriers alone. Barriers alone were not considered viable because of the size and scale of the barriers and associated implications:

- Require barriers to be built on private property.
- Significantly disrupt communities function and aesthetics.
- Need to be built along the on both sides of the Elbow River for almost the entire length of the Elbow River (over 14 kilometers in length).
- Have an average height between 1.6 and 3 meters. In some areas, the maximum height would be between 5 and 6 meters.
- Disrupt riparian and river ecosystems and disconnect the community from the river.
- Not be cost-beneficial, and cost more money than building SR1.

## Springbank Off-Stream Reservoir (SR1)

In 2015, the Province committed to SR1 on the Elbow River. It is approximately 18.5 kilometres upstream of the Glenmore Dam, near Springbank Road, north of the Elbow River and mostly east of Highway 22.

As it is outside of The City of Calgary's jurisdiction, the Province of Alberta is responsible for the location, design, and construction of the reservoir. For project details, please visit the Province's webpage (click here).

The reservoir will store water temporarily during a flood and release the water slowly afterwards. For more information on the Province's project, please visit Alberta Environment and Parks webpage on the Springbank Off-Stream Reservoir.

SR1 is a critical piece of Calgary's flood resiliency and mitigation plan for the Elbow River.

For more information on the Province's Springbank Off-Stream Reservoir project, visit:
http://aep.alberta.ca/water/programs-and-services/flood-mitigation/flood-mitigation-projects/springbank-road.aspx

## Frequently Asked Questions

The following Frequently Asked Questions have been prepared in response to citizen questions about the role of SR1 in The City's Flood Resiliency and Mitigation Plan.

**What is The City's role in the building of SR1 and the environmental impact assessment process?**
The City continues to support SR1 as it is a critical piece of infrastructure that will help control river flows on the Elbow River. The City also values a healthy and resilient watershed that will continue to provide reliable, clean water and ecosystem services for current and future generations.

The City continues to follow the Environmental Impact Assessment process and supports a timely, yet thorough environmental review of the project to ensure the least amount of environmental impact for the greatest benefit is achieved.

**What level of protection does SR1 provide to Calgary?**
The combination of SR1 and the raised gates on the Glenmore Dam will provide protection against floods from the Elbow River similar in size to the 2013 flood event. It is estimated that SR1 will provide 75 per cent and the Glenmore Reservoir will provide 25 per cent of the storage needed to control a large event.

**Can the Glenmore Dam prevent Elbow River flooding on its own?**
No. The Glenmore Reservoir and Dam were constructed over 85 years ago to provide Calgarians with a safe and sufficient supply of drinking water. The reservoir and dam are managed to store an adequate supply for drinking water, reduce the impact of small to intermediate sized floods and sustain environmental health, and provide recreational opportunities.

Currently, the reservoir is not large enough to hold the amount of water from an event the size of the 2013 flood. The infrastructure at the Glenmore Dam is currently being upgraded. One part of the project will be to install new steel gates that will improve the operational efficiency of the dam while also allowing The City to hold more water in the reservoir to help manage floods and drought in the future. The capacity of the Glenmore Reservoir will be doubled to about 20 million cubic meters once the new gates are installed and operational. This will provide approximately 25 per cent of the protection needed to protect the Elbow River communities from a flood the size equivalent to the 2013 flood. The remaining 75 per cent of the flow would be provided by SR1.

The water level in the Glenmore Reservoir is constantly monitored so that operators can respond to sudden changes in river flows entering the reservoir while also controlling the flow coming out of the reservoir to reduce the downstream impacts of high river flows.

**Will SR1 and Glenmore Gates protect downtown Calgary?**
In addition to residential communities along the Elbow River, commercial areas on the eastern and southern side of the downtown core will also benefit. This includes areas such as 4$^{th}$ Street in Mission, Beltline, Victoria Park, East Village, and parts of Inglewood.

**Why doesn't the city build barriers along the Elbow River instead of relying on SR1?**
The mitigation provided by the Springbank Off-stream Reservoir project cannot be replaced by fortification by barriers along the length of the Elbow River. The barriers would require significant private land acquisition, dramatically disrupt community function and aesthetics, and significantly impact the riparian and fish habitat of the river. The fortification of the Elbow River with barriers ranked poorly in the sustainability analysis, and was viewed unfavourably during community engagement.

**What measures are in place until SR1 and the Glenmore Gate Upgrades are completed and operating?**
The City of Calgary's priority when planning for and responding to flooding is public safety, protection of critical infrastructure and maintenance of vital community services, and protection of large areas to minimize the social and economic impact on the social and on the city, ensuring sustainability.

The City has a Flood Emergency Response Plan that is activated if necessary. The City undertakes a number of activities each year to prepare for potential emergencies. These include:

- Annual revision to The City's Flood Emergency Response Plans.
- Field readiness to monitor and operate stormwater outfall gates, lift station plans, pre-positioning of pumps and other emergency supplies.
- Training and exercises for Water Utility employees on equipment deployment and emergency response.
- Monitoring of ice and river conditions in partnership with Alberta Environment and Parks.

**What other measures is Calgary taking to protect citizens?**
In addition to the structural measures that are part of the flood resiliency plan, we are exploring additional policy and regulatory changes and property level mitigation programs that could further increase flood resiliency, reduce future flood risk and decrease future flood damages.

The Municipal Development Plan was updated in 2014 with top priorities related to flood resiliency, that include no new development in the floodway except redevelopment of residential properties on an existing footprint, and all development and redevelopment with the Flood Hazard Area be designed to prevent damage caused by overland and groundwater flooding.

Amendments to The City's Land Use Bylaw included:

- In the floodway, no new development is allowed beyond the existing building footprint. All floodway redevelopment is discretionary.
- In the flood fringe and overland flow areas, main floors and mechanical/electrical systems must be set above the designated flood elevation (1:100 flood). Development in flood fringe and overland flow areas must follow these rules regardless of parcel history (i.e. no "grandfathering"). Updated 1:100 flood elevations are also provided by The City as advisory.

- In the flood fringe, building setbacks apply (30m/60m depending on which creek/river, or 6m from the floodway, depending on parcel history).
- New and redeveloped properties in the flood hazard area require back flow valves.
- A “sliding-scale” approach is employed to requiring mitigation measures for redevelopment. Small building alterations require minimal mitigation measures and large alterations require more robust flood mitigation measures.
- Restrictions and advisory conditions on what is allowed to be stored on a parcel in the flood hazard area, to prevent environmental contamination and river debris.

**What measures are not being pursued?**
The following measures have previously been researched and set aside as they were not technically, economically, environmentally, or socially practical:

- Dredging of the Glenmore Reservoir, Elbow River or Bow River.
- Elbow River tunnel from Glenmore Reservoir to Bow River.
- Full fortification of the Elbow and Bow Rivers.

**Could SR1 impact water quality in the Elbow River, and how will that affect Calgary’s drinking water?**
The Elbow River is the source of water for the Glenmore Water Treatment Plant and provides drinking water for about half of Calgary’s population.

The City of Calgary works hard to ensure a safe, clean and reliable supply of drinking water. Our world-class water treatment and testing facilities continue to meet or perform better than all federal and provincial health guidelines. The City closely monitors drinking water daily throughout the system from the river, to our treatment plants and throughout the distribution system that delivers water to homes and businesses, conducting more than 150,000 tests annually.

The City is awaiting the results of the Province’s SR1 water quality impact study that is being undertaken for the Environmental Impact Assessment to determine the potential impacts on Calgary’s drinking water.

**Is my property at risk of flooding?**
There are a number of maps that are available on The City’s website that can help citizens determine their flood risk. For more information, visit Calgary.ca/floodinfo to see whether your property is located in the flood hazard area.

**What can citizens do to protect their property?**
Flooding can happen at any time in Calgary. The period between May 15 and July 15 is when we are most likely to experience flooding since historically this is when we receive our largest rainfalls.

To make sure you and your family are prepared as possible in the event a flood occurs, follow the steps below:

- Read The City’s Flood Readiness Guide
- Create a 72 hour kit
- Get the latest alerts and notices from Alberta Emergency Alert and Alberta Rivers app
- Create an evacuation plan
- Visit Calgary.ca/floodinfo for more information.

**Why is The City not buying out properties at risk of flooding?**
Based on property values alone, it is prohibitively expensive to purchase properties in the current 1:100 flood hazard area. The buy-out costs have been estimated to be up to five times greater than the cost of SR1. In addition, there would be the costs associated with building demolition, conversion of the land to parkland, and incentives to assist homeowners to relocate.

**How will SR1 change land-use regulations?**
The Province is currently updating designated hazard maps. The impact of SR1 and any flood mapping changes are unknown at this time. The City will align any of its future land use for Calgary with the new provincial flood maps and policy changes once they are released by The Province.

If you have any questions, or would like more information on The City’s flood mitigation activities, please **contact 311** or visit **calgary.ca/floodinfo**

# Glossary

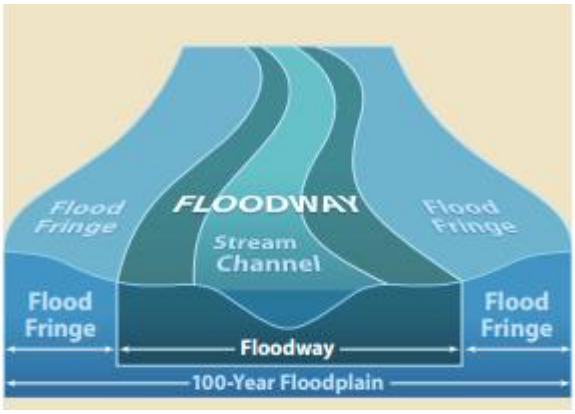
**Design Flood** – The size of flood that flood-related policies and structures are designed to protect against. In Alberta, flood-related policies, such as Calgary bylaws, are based on a 1:100 year flood. The design flood for structural design depends on the structure, but it is often the 1:100 year flood.

**Flood mitigation –** Includes policies or structures that reduce the risk of floods to a community, either by preventing floodwater from entering the community or by reducing the potential damages or threats to public safety when flooding does occur.

**Flood barrier** – Is an earthen embankment (known as a berm or a dyke), flood wall, or a temporary wall constructed of sand bags or other materials built to provide protection from floods.

**Flood hazard mapping** – Flood hazard mapping shows flood hazard areas along streams and rivers.

**Flood Hazard Area** – In Alberta, the flood hazard area is the area that would be flooded in a 1:100 year flood. It is typically divided into two zones: floodway and flood fringe. In some areas, such as Calgary, there may also be a third zone, called the overland flow zone, which is considered a special part of the flood fringe.




**Floodway** – The floodway includes the channel of a river and, in some places, the land next to the river. The floodway carries the bulk of the floodwater downstream. Flow is usually fastest and deepest in the floodway.

**Floodplain** - The area next to a river which can flood when river flows are high. The floodway and flood fringe are within the floodplain.

**Flood fringe** – The area outside of the floodway that is flooded in a 1:100 year event, but where flows are not as deep or fast as in the floodway.

**Flow Rate –** Flow is a measure of the amount of water traveling past a point in a given amount of time. In rivers, the flow of water is typically reported in cubic metres per second ($m^3/s$). A cubic meter is the volume of water contained in a cube of one metre high, one meter wide, and one metre deep. It is equivalent to 1000 litres of water and weighs a metric tonne. Typical flow rates on the Elbow River are 25 $m^3/s$ in spring and 3 $m^3/s$ in winter.

**Mitigation measures** – Structural measures keep river flood water out of communities to a specified water level, reduce property damage and increase public safety. Examples of physical structures are dams and reservoirs, as well as barriers.

- **Upstream physical measures** such as dams and reservoirs are built to control or slow the flow of the river to reduce the risk of flooding to a community as a whole.
- **Local physical barriers**, such as dykes and barriers are placed where the river banks need to be raised to prevent flooding at specific locations and providing protection to specific communities/areas.

**Non-structural mitigation measures –** Are mitigation measures based in knowledge, practice, or agreement to reduce risk and improve resiliency. These measures include policies, land use planning, development regulations, emergency response and public training and awareness.

**Watershed** – The entire land area that drains to a river. The Elbow River watershed extends up into the Rocky Mountains beyond Bragg Creek. Calgary gets its water from both the Elbow River and Bow River watersheds.

**1 in 100 year flood** – A large flood that has a one per cent chance of occurring in any given year. It can also be called a 1 per cent flood or a 100-year flood, and is often written as “1:100 year flood”. Although called a “1 in 100 year flood” there will not necessarily be one every 100 years. It is even possible to have more than one 1 in 100 year flood in the same year. On the Elbow River, the estimated flow rate coming into the Glenmore Reservoir in a 1:100 year flood is about 950 $m^3/s$.

# Springbank Off-Stream Reservoir Project
## Environmental Impact Assessment

## Environmental Impact Assessment

Federal and provincial regulations require that project proponents prepare an environmental impact assessment (EIA). This allows regulators to make an informed public-interest decision about if and how the project should proceed.

### EIAs typically include:

- A detailed description of the project including the design
- Description of project alternatives considered
- The location and environmental setting for the project
- Baseline environmental, social and cultural information
- The potential positive and negative environmental, health, social, economic and cultural effects of the proposed project
- Plans to mitigate adverse effects and enhance benefits
- The potential residual effects following the implementation of mitigation measures
- An assessment of cumulative effects
- Information on stakeholder and Aboriginal consultation

### EIAs typically answer:

- What are the existing conditions (the baseline)?
- What effects would there be due to the project?
- What are the mitigation measures that would minimize these effects?
- What are the residual effects and their significance?
- What are the cumulative effects?

## The Springbank Project's EIA

Studies for the EIA were conducted throughout 2016 and into early 2017. These studies included the collection of field information and the modelling of expected effects due to the project. The project team is currently preparing the assessment report, including the effects of the project on Valued Components (VCs), which are:

- Air quality and climate
- The acoustic environment
- Hydrogeology
- Hydrology (surface water)
- Water quality
- Aquatic ecology
- Terrain and soils
- Vegetation and wetlands
- Wildlife and biodiversity
- Land use and management
- Historical resources
- Traditional ecological knowledge and land use
- Public health and safety
- Infrastructure and services
- Economy and employment

### Areas of Study:

From a geographical perspective, the EIA has three distinct areas of study:

1. Project Disturbance Area (PDA) encompasses the project footprint and is the anticipated area of physical disturbance associated with the construction and operation of the Project.
2. Local Assessment Area (LAA) is the maximum area within which Project environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence. The LAA includes the PDA and adjacent areas where environmental effects may reasonably be expected to occur. The LAA encompasses the PDA and is different for each VC.
3. Regional Assessment Area (RAA) is the area within which the Project's environmental effects may interact or accumulate with the environmental effects of other projects or activities that have been or will be carried out such that cumulative environmental effects may potentially occur. The RAA encompasses the PDA and the LAA and is different for each VC.

# Environmental Concerns

## Stakeholders raised concerns about the environmental effects of the Springbank Project, including:

- Air quality impacts
- Feasibility
- Land and soil impacts
- Project alternatives
- Traditional land use
- Wildlife and fish impacts
- Water quality
- Watershed impacts

All concerns have been documented and considered by the project team in the environmental assessment and design process. These concerns will be included in the environmental report submitted to the regulators.

## Potential Issues and Mitigation Strategies

| Environmental Component | Potential Issue | Potential Mitigation |
|---|---|---|
| **Vegetation and Wetlands** | 123 ha of wetlands were identified within the project development area, 9 ha of which are in the area covered by permanent facilities. | Wetland replacement will be developed for wetlands that are permanently disturbed by the project. |
| | Three species of rare plants were identified within the Local Assessment Area; only one (slender cress) is in the Project Development Area. | The location in the temporary construction footprint will be flagged and avoided if practical. |
| **Wildlife and biodiversity** | Migratory birds protected under the *Migratory Birds Convention Act*, including olive sided flycatcher (a SARA listed species), were observed during the field study. | Clearing will occur outside the nesting period (February 15 to August 31), where possible. If clearing is required during this period, nest sweeps will be conducted prior to any activity. If active nests are found, setback distances will be observed. |
| | Raptor nests (including stick nests and platform nests, both observed in the LAA) were identified during the field studies. | |
| | During the field program, ungulates were found to move across the area where the diversion channel is located. Rip rap is planned to line certain areas of the channel; ungulates do not often cross rip rap. | The diversion channel slope will be at an angle such that ungulates can cross.<br><br>Any fencing installed along the diversion channel will be wildlife-friendly fencing. (Varying designs exist and will be based on what is appropriate for wildlife crossing and controlling livestock in the area.) The auxiliary spillway will be covered by a soil layer to permit passage of wildlife along the Elbow River corridor. |
| | The project is within a Key Wildlife and Biodiversity Zone. Designated by the Government of Alberta, these zones are considered to be a combination of key winter ungulate habitat and higher habitat potential. Specific Land Use Guidelines are recommended for these zones. | A wildlife mitigation and monitoring plan will be developed in consultation with regulators. |
| **Surface water** | The low-level outlet channel creek can accommodate water flowing up to around 1 $m^3/s$. Water flowing through the creek during draining of the reservoir could be up to a maximum of 27 $m^3/s$, which would scour the existing channel, removing sediment. | Depending on conditions, flow release rate will be controlled to reduce scour potential. Stream restoration post-flood could occur should the discharge of the reservoir alter the creek. |
| | Deposition of sediment where the outlet channel meets the Elbow River may alter the position of the Elbow River and modify localized sediment transport. | Stream restoration post-flood could occur where the outlet channel meets the Elbow River. |

**This summary information will be included with supporting evidence in the report to regulators. The regulators may ask for further information if they have questions, which Alberta Transportation will provide.**

| | | |
|---|---|---|
| **Aquatics** | High-value fish habitat is located in the area of the instream project components. | Isolation measures will be in place to avoid disturbance to fish.<br><br>Habitat offsetting will be required to address project-related habitat loss. |
| | Fish passage in the Elbow River may be affected at low flows. | Engineering design of the instream works will allow for fish passage during low flows. |
| | Fish could be carried into the reservoir during floods. | The reservoir and outlet will be graded to allow fish to move downstream out of the reservoir during draining. Fish rescue will be conducted after flood operation if required. |
| **Hydrogeology** | In areas where groundwater level is shallow, excavation during construction will interact with groundwater. | Water collected during construction will be discharged back into the same watershed. Water control during construction and operation will be implemented to avoid ponding. |
| | 19 water wells were found within the project development area. If wells are not decommissioned prior to operations, specifically during flooding/inundation, this could cause a connection between ground and surface water and potentially contaminate the groundwater during flooding. | Wells within the off-stream reservoir will be decommissioned prior to operations. |
| **Historical resources** | Historical resource sites have been identified within the project development area. Twenty-two sites were recorded during the current studies including 21 archaeological sites (precontact and historic) and one historic structure site. The sites included single stone artifacts, campsites, and homestead sites. | All practical efforts will be made to avoid these sites. If avoidance is not practical, the activity will be monitored by an archaeological inspector and any findings will be recorded and reported to Alberta Culture and Tourism. |
| | Areas of high palaeontological potential were identified in the subsurface of the project development area. | Where avoidance is not possible, construction will be monitored by a professional palaeontologist. |
| **Traditional Land and Resource Use** | Traditional Land Use sites, including sites of cultural interest and harvesting areas, have been identified within the Project Development Area visited during the field program and in the Traditional Use Studies. | Avoidance of these sites will be applied to the extent practical. Mitigation measures for sites and concerns identified will be subject to discussions with Aboriginal groups engaged on the Project. |
| **Noise during construction** | Noise during construction is expected to be a nuisance. | Noise mitigation may include construction-activity schedule adjustment, work restrictions, and the construction of localized berms in certain areas. |
| **Air quality** | Particulate matter (dust) deposition are expected to be high in the local area during construction. | Large equipment will be used for earth moving to minimize the number of trips required. The haul distances will be minimized to the extent practical. Ambient air-quality monitoring will be conducted for particulate matter during construction. If the air monitoring indicates high concentration and deposition for particulate matter, additional dust mitigation measures will be implemented. |
| | Particulate matter may be an issue following draining of the reservoir after flood events. The deposited sediment is expected to be coarser grained and less susceptible to wind erosion than fine-grained material. | Dust mitigation measures, such as the use of tackifiers, will be used where necessary. |

The public will have an opportunity to comment on the project's EIA and CEAA's draft report. Check the CEAA website (**www.canada.ca/en/ environmental-assessment-agency.html**) and NRCB website (**www.nrcb.ca**) for more information about how to participate in the regulatory process.

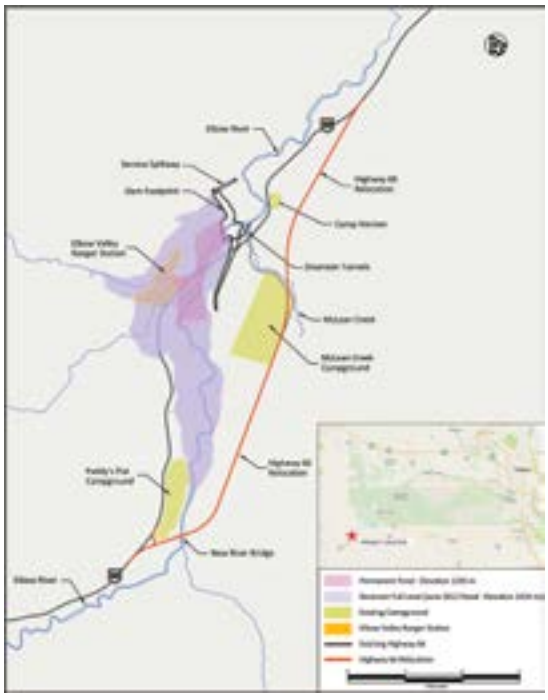
# McLean Creek Option**
## Overview

McLean Creek Dam permanent pond

## Background

A Flood Mitigation Report completed in 2014 by Alberta Environment and Parks (AEP) identified the Springbank Off-Stream Reservoir (Springbank Project) and McLean Creek Dam (McLean Creek Option) as flood mitigation options for the Elbow River. In October 2015, the Government of Alberta announced proceeding with the Springbank Project.

The Environmental Impact Assessment (EIA) for the Springbank Project requires a more detailed conceptual engineering and environmental study of the McLean Creek Option as an alternative.



## The McLean Creek Option includes the following components:

**Earth-fill Dam** - An earth-filled dam would be constructed across the Elbow River valley immediately upstream of the McLean Creek and Elbow River confluence. The dam would be approximately 50 meters high and 2300 meters long. The dam would allow temporary storage of flood waters in an on-stream reservoir that would have the capacity to store a flood equal to the 2013 flood event and larger floods including a Probable Maximum Flood (PMF) event.

**Cofferdam and Diversion Tunnels** – The upstream portion of the earth-filled dam would be constructed ahead of the main dam to act as a cofferdam to control and divert the Elbow River flows around the work area during construction of the 50-meter-high portion of the dam. The cofferdam would divert the river through two 6-meter-diameter gated diversion tunnels which would be constructed in the rock formation through the right dam abutment. The gated tunnels would be operated to control river flows not only during the dam's construction, but also for the permanent river flow control system for the dam.

**Permanent Pond** – The diversion tunnels would be designed and positioned to create and maintain an on-stream permanent pond upstream of the dam. The tunnel's inlet, at approximately four meters above the river bed, would create and maintain the pond. The pond would have a surface area of about 180 acres and a maximum depth of approximately 15 meters.

**Service Spillway** – An un-gated service spillway would be constructed on the left dam abutment. The concrete spillway structure would be approximately 40 meters wide and 400 meters long. The service spillway's function is to pass floods in excess of the June 2013 event over its crest and into the Elbow River downstream of the dam.

**Auxiliary Spillway** – An un-gated auxiliary spillway structure, 200 metres wide, would be constructed on the far right dam abutment. The auxiliary spillway's crest elevation, having a higher elevation than the service spillway's crest, would allow it to pass floods in excess of the service spillway's capacity. It would have the capacity to pass a PMF event.

**Infrastructure Relocation** – Existing infrastructure located within the McLean Creek dam and reservoir footprint that would be impacted during a flood event would need to be relocated. These facilities include:

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

# McLean Creek Option FAQ

McLean Creek Dam permanent pond

**Q: Would the McLean Creek Option impact current land use for the area?**

**A:** Changes to the Crown and Park Land's existing land use designations would be expected. Modifications to the existing land leases would be required, and some security fencing would be required in the dam area.

**Q: Why is such a high dam (50 m in height) needed for such a small river?**

**A:** The dam height is necessary to create a reservoir with sufficient volume to store the June 2013 flood. The height is also governed by the shape of the Elbow River valley and the relatively high-intensity flood and snowmelt events that occur in the steep mountains and basin area.

**Q: Would the McLean Creek Option impact recreational use, such as the trails and campgrounds?**

**A:** The campground could remain open through construction. There would be impacts due to construction activities such as noise and increased construction traffic. There would be some permanent impacts to the existing campground store, a few stalls in McLean Creek campground, and the Elbow Trail system northwest of the river. These impacted elements would be relocated as required.

**Q: Why would the Highway 66 and the Elbow River bridge need to be relocated?**

**A:** With the dam in place, a portion of Highway 66 and the bridge would be under the water level of the permanent pond. The highway would need to be relocated to maintain access to the area. The location and alignment of the relocated highway has been selected to minimize impacts to the campgrounds and environment by utilizing the alignment of the existing McLean Creek Trail surfaced roadway.

**Q: Would the trees and plants within the dam and reservoir footprint be impacted?**

**A:** Plants and trees within the permanent pond area would be impacted and would need to be cleared. Flood water temporarily stored in the on-stream reservoir behind the dam would recede to normal operating levels within two weeks by releasing the water through the diversion tunnels. Dominant tree and plant species in this flood zone are capable of tolerating infrequent short-term inundation. Less hardy plant species that are intolerant to flooding may not survive and some areas may need to be revegetated after a flood event.

**Q: Would there be an impact to wildlife in the area during construction?**

**A:** The McLean Creek Dam Option falls within an identified Key Wildlife and Biodiversity Zone and Grizzly Bear Recovery Zone. Potential effects on wildlife would vary among the different species that inhabit or use the area. The dam would create additional lake habitat, which would benefit diving waterfowl and other waterbirds and new wintering habitat for fish. Construction of the dam and related works would, however, result in the removal of some wildlife habitat areas from active use and the alteration of habitat features in certain areas, which could be reduced by minimizing the area of disturbance, reclaiming disturbed areas after construction, and identifying habitat offsetting opportunities.

**Q: Would fish in the Elbow River be impacted?**

**A:** Fish habitat would change within the area from river to lake habitat. The creation of the permanent pond could result in new rearing and wintering habitat (i.e. increased ice cover during winter). Fish passage would be provided by a 260-metre long, three-metre diameter tunnel with baffle chambers at the inlet and outlet. A naturalized, four-metre wide channel upstream and downstream of the tunnel would connect the permanent pond downstream.The ability of fish to consistently utilize the new habitat could, however, be affected by pond level fluctuations and sediment deposition.

# Springbank Off-Stream Reservoir Project
## Engineering Information Handout

## What is the Springbank Project?

The Springbank Off-stream Reservoir (Springbank Project) is a dry reservoir that would temporarily store excess flood water outside of the Elbow River and release it back into the Elbow River when the risk of flooding subsides.

The Springbank Project would work in concert with the Glenmore Reservoir in Calgary. Their combined active flood storage capacity would accommodate excess water volumes that caused the 2013 flooding. The 2013 flood was approximately a 1-in-200-year event (0.5% Annual Exceedance Probability).

The Springbank Project would store flood waters outside of the Elbow River valley, reducing environmental impact to the river corridor. At the same time, it would provide benefits to downstream communities, including a reduction in flood risk on the Bow River and South Saskatchewan River (e.g. Siksika Nation, Tsuut'ina Nation, Medicine Hat).

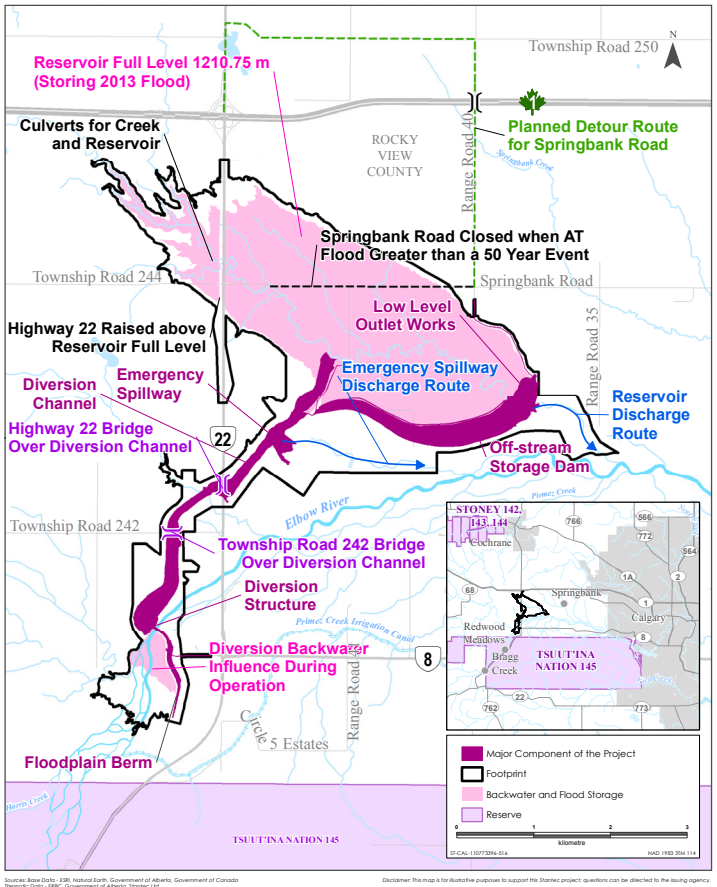
## What are the key components?

### The Diversion Channel

- The diversion channel would carry flood waters approximately 4.5 kilometres (km) from the diversion structure to the storage reservoir.
- Maximum diversion capacity of 600 $m^3/s$ includes 25% extra capacity to accommodate debris and sediment.
- The channel would look similar to an irrigation canal with side slopes vegetated with grasses suitable to their location in the landscape.
- Erosion protection would be provided where high velocities are anticipated, and at the channel in the left outlet.
- The channel would carry some storm water from the local watershed.
- Pipelines would cross underneath the diversion channel.
- Wildlife passage corridors would be maintained and wildlife-friendly fencing would be used to delineate project boundaries.

### The Diversion Structure

- A floodplain berm would capture Elbow River flow in the floodplain and direct it to the diversion structure.
- The diversion structure would be a gated structure on the Elbow River that controls how much water is diverted and how much is allowed to continue downstream.
- The structure's service spillway gates would raise backwater to drive the excess floodwaters into the diversion channel, and ultimately to the storage reservoir.
- The backwater created by the diversion structure would not affect lands upstream of the project footprint, such as Redwood Meadows.



**Information regarding the Springbank Project can be found on the Government of Alberta website: http://alberta.ca/springbank-road.cfm**

### The Storage Dam

- The dam would be earthen and built using the material excavated from the diversion channel and within the storage pool area.
- It would have a terraced profile with a grass surface of species suitable to the landscape.
- At its tallest, it would be approximately 27 m high.

### The Storage Reservoir

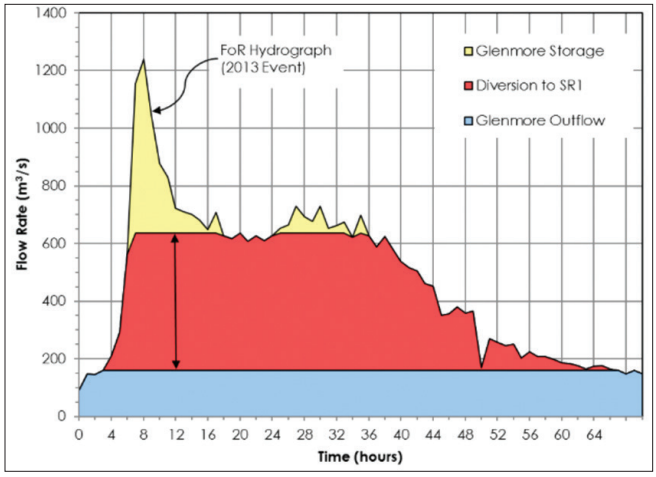
- The reservoir would have an active flood storage capacity of 77,771,000 $m^3$ of flood water.
- The Springbank Project would be a dry reservoir, which means there would be no permanent pool and would only store excess flood water temporarily.

### Low Level Outlet Works

- The storage dam's outlet would release the stored flood water into the existing Unnamed Creek, which would then carry it back to the Elbow River.

## How big is the Springbank Project?

The Springbank Project is sized to reduce flows downstream of the Glenmore Reservoir to 170 m3/s during an equivalent of the 2013 flood event. The graph below shows how the required storage was determined.




## How would the Springbank Project work?

### Normal Operation

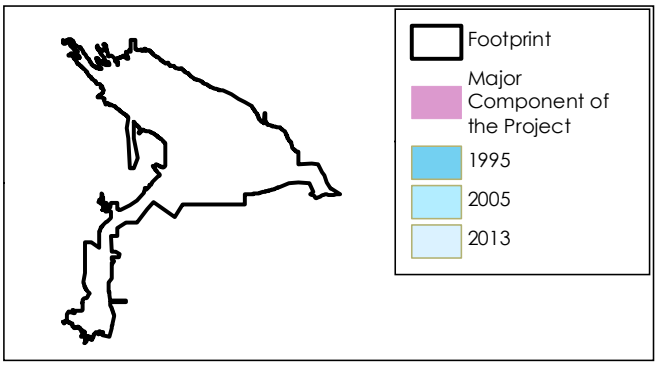
During normal operations, the service spillway gates would lay flush with the river bed and the diversion inlet gates would be closed. Flow in the Elbow River would not be hindered and fish would be able to pass through the diversion structure.

### Flood Operation

- Alberta Environment and Parks operators would be dispatched to the site during a forecasted flooding event. While operating, the service spillway gates would raise to build backwater at the diversion structure and the diversion inlet gates would open to divert flood water into the diversion channel.
- Excess flood flow would be diverted into the Springbank Project until the diversion capacity of 600 $m^3/s$ is reached. At that point, the service spillway would let the excess flood flow pass downstream to be captured by the Glenmore Reservoir. This would also happen if the Springbank Project became full and could not accept additional flood volume.

### How often would it fill?

- The Springbank Project would have been operated eight times in the last 108 years, had it been present on the Elbow River. In the last 20 years, it would have operated in 1995, 2005 and 2013. This map compares how much the reservoir would have filled during those recent flood events.



# Springbank Off-Stream Reservoir Project

## Project Information Handout

**The Springbank Off-stream Reservoir, or Springbank Project, is a dry reservoir that would store water temporarily during a flood.**

**The Springbank Project would work in tandem with the Glenmore Reservoir in Calgary.**

## How it works

During a flood, a diversion channel would carry water from the Elbow River to the off-stream reservoir, which would have a storage capacity of 77.8 million $m^3$ or about 31,000 Olympic-sized swimming pools. When peak waters have passed, an outlet structure would safely release the water back to the Elbow River in a controlled manner.

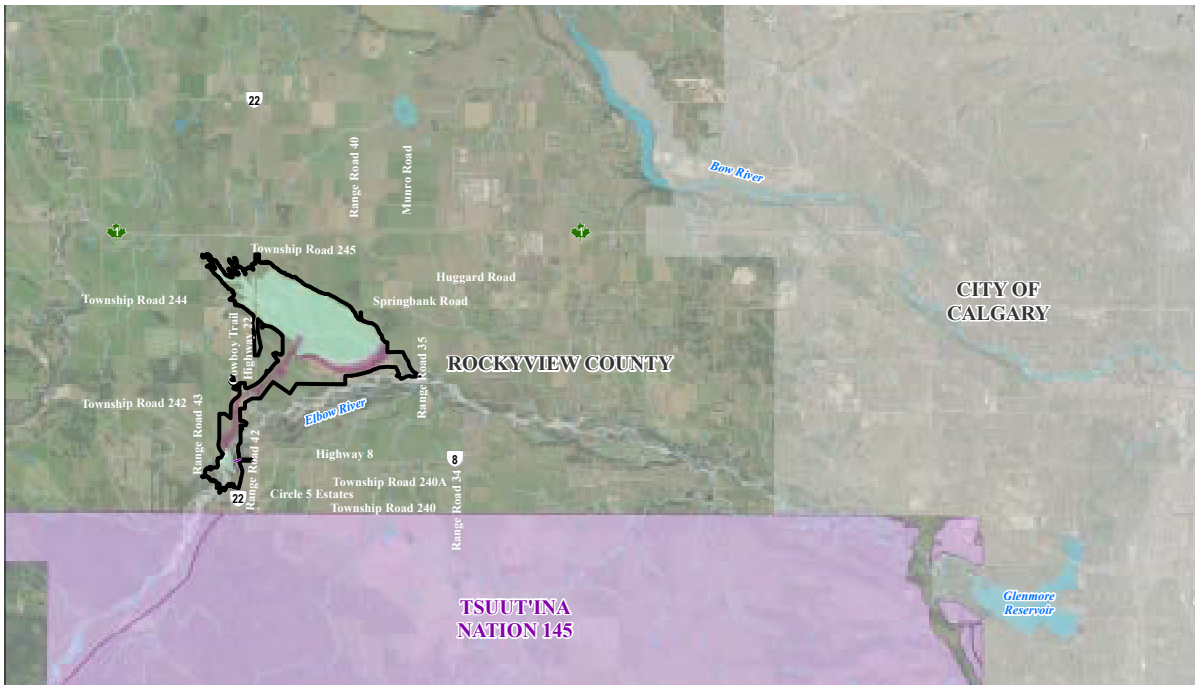
The Springbank Project would work together with the Glenmore Reservoir, which has 10 million $m^3$ of available flood storage, to achieve the level of protection required.

## Project benefits

A flood damage assessment for the City of Calgary found that there is up to $680 million at risk on the Elbow River, and $2 billion at risk downstream on the Bow River, should a 2013-level flood event take place again.

The Springbank Off-stream Reservoir, combined with the Glenmore Reservoir in Calgary, will:

- Provide protection against a flood event similar to 2013 for downstream communities along the Elbow River.
- Store flood waters off-stream.




## Location

The reservoir would be approximately 15 km west of Calgary, north of the Elbow River and predominantly east of Highway 22.

**Information regarding the Springbank Project can be found on the Government of Alberta website: http://alberta.ca/springbank-road.cfm**

## Project status

The Canadian Environmental Assessment Agency (CEAA) requires a federal environmental assessment (EA) in additional to the provincial environmental impact assessment (EIA) for Alberta Environment and Parks. The requirements of both assessments will be combined and submitted as one report in October 2017.

Field programs for the environmental assessments are completed.

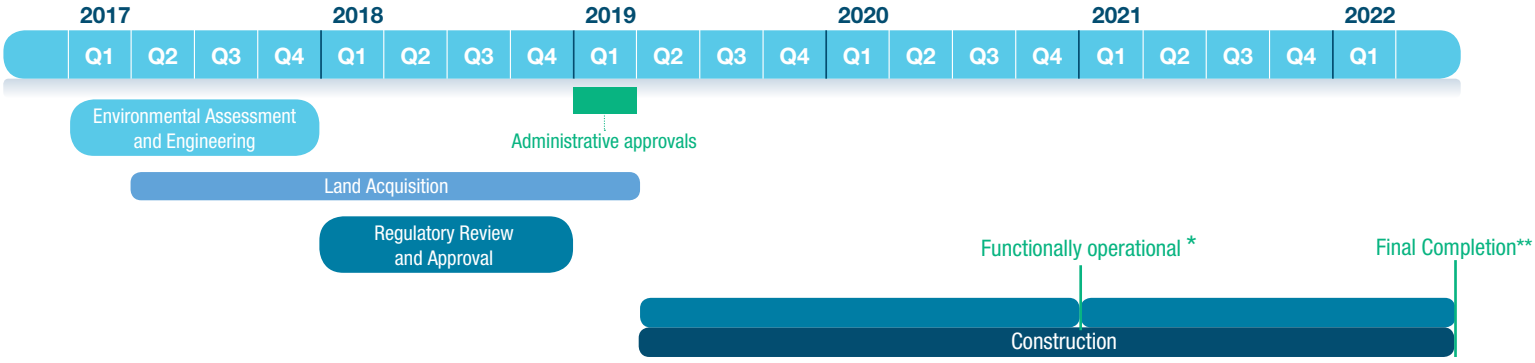
- The project team continues to assess potential effects of the project, how to mitigate them, and what effects remain after mitigation.
- Traditional use studies have been completed by several Indigenous communities and will be incorporated into a report once received.
- After assessing a project alternative as required by regulations, the Springbank Project remains the best solution for providing protection against a 2013-level flood event for downstream communities along the Elbow River: it has shorter timelines to be built, will have less environmental impact, is more financially viable, and will better protect Calgary due to its location further downstream.

In addition, project design has advanced, including mitigation strategies for environmental considerations; scenarios have been developed for how the land could be used after the project is constructed; and road network modifications have been chosen.

As with any major infrastructure project of this size and scope, there are a number of steps that must be undertaken to ensure the project is designed responsibly. The Government of Alberta respects the regulatory process, which is in the control of regulators, and will take whatever time is required to make sure that Albertans in Calgary and other communities in southern Alberta are appropriately protected from the impact of future floods.

## Project timeline

Estimated cost is $432 million, including the intention to purchase land outside of the project footprint (approx. 3,200 acres). Re-sale of this land would be accounted to cost recovery of the project.




* **Functionally Operational:** When the Springbank Project will be able to accommodate 1:100 year flood event.

** **Final Completion:** When the Springbank Project will be able to accommodate water volumes equal to the 2013 flood.

## Feedback

The feedback we have heard so far has been documented and provided to the design team. We will continue to have discussions with stakeholders and record how the project will affect them, building on what we've heard so far. If you have questions or comments, email **springbank-project@gov.ab.ca** at any time.

# Welcome to the Springbank Off-stream Reservoir Open House

# Springbank Off-stream Reservoir Project

## What's New

This open house is intended to share information about the Springbank Off-stream Reservoir Project and how it has progressed Here's what is new:

- The Canadian Environmental Assessment Agency (CEAA) requires a federal environmental assessment (EA) in additional to the provincial environmental impact assessment (EIA) for Alberta Environment and Parks. The requirements of both assessments will be combined and submitted as one report in October 2017.
- Field programs for the environmental assessments are completed.
    - The project team has assessed potential effects of the project, how to mitigate them, and what effects remain after mitigation.
    - Traditional use studies have been completed by several Indigenous communities and will be incorporated into a report once received.
    - After assessing a project alternative as required by regulations, the Springbank Project remains the best solution for providing protection against a 2013-level flood event for downstream communities: it has a larger catchment area, is more environmentally friendly, faster to develop, and remains the more cost-effective solution.
- Project design has advanced, including mitigation strategies for environmental considerations.
- Scenarios have been developed for how the land could be used after the project is constructed.
- Road network modifications have been chosen.
- Benefit/cost analysis has been updated.

# Springbank Off-stream Reservoir Project

## Listening and Learning

**Engagement allows those potentially affected by a project to:**

- Become informed.
- Ask questions and hear answers.
- Raise concerns and have them addressed.
- Provide input into the project.

The project team has documented over 1500 conversations with stakeholders.

This input has been shared with the project team, incorporated into the project design and included in the environmental report where appropriate.

The size of the words in this word cloud show the relative frequency an issue was raised by stakeholders.

Alberta Government

# Springbank Off-stream Reservoir Project

## What is the Springbank Off-stream Reservoir?

The Springbank Off-stream Reservoir, or Springbank Project, is a dry reservoir that will temporarily store excess flood water and release it back into the Elbow River when the risk of flooding subsides. The Springbank Project will work in tandem with the Glenmore Reservoir in Calgary. Together, the combined storage capacity will accommodate the excess water volume that caused the 2013 flooding.

# Springbank Off-stream Reservoir Project

## Springbank Project Benefits

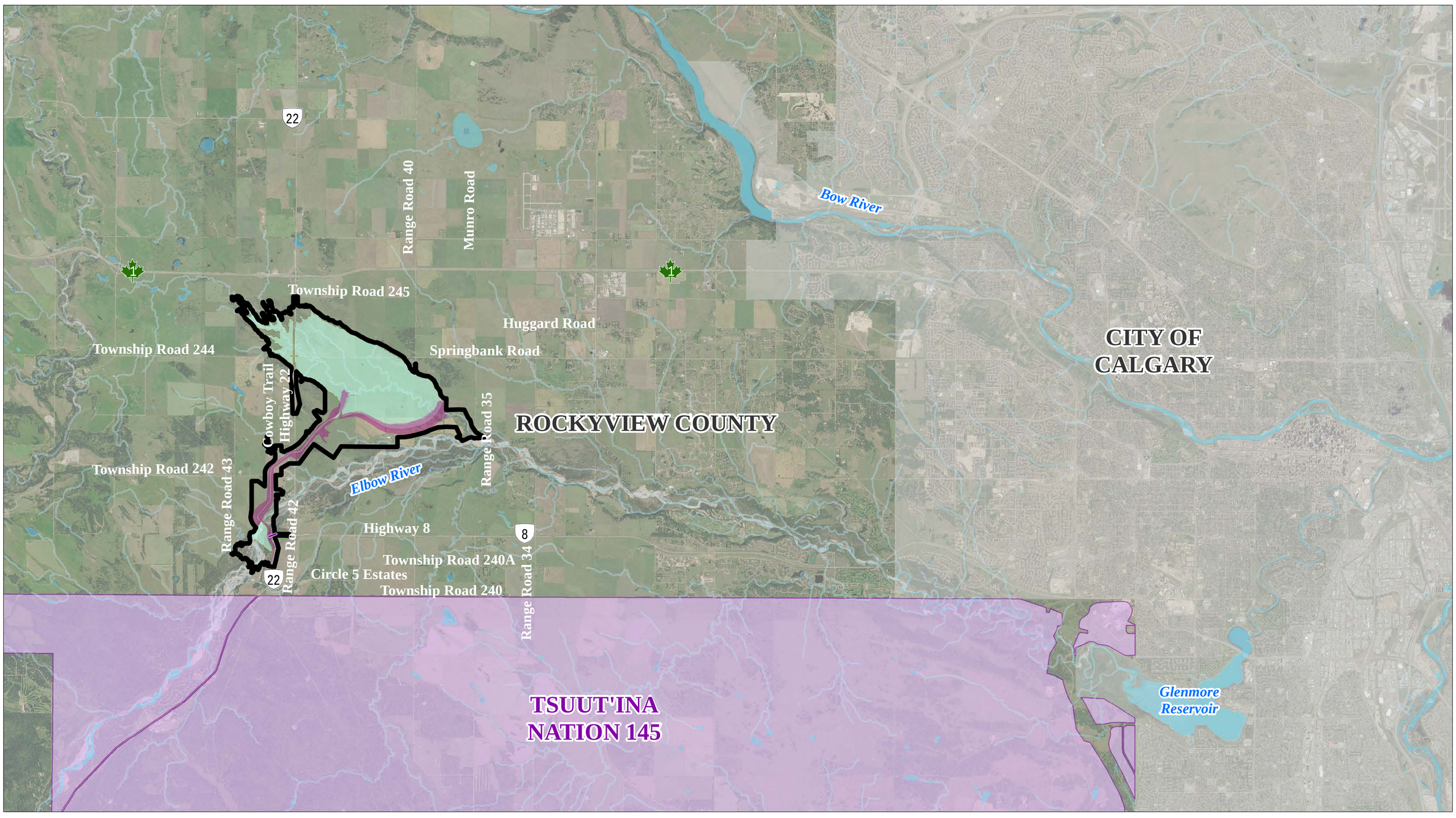
A flood damage assessment for the City of Calgary found that there is up to $680 million at risk on the Elbow River, and $2 billion at risk in the City of Calgary, should a 2013-level flood event take place again.

**The Springbank Off-stream Reservoir, combined with the Glenmore Reservoir in Calgary, will:**

- Provide protection against a flood event similar to 2013 for downstream communities along the Elbow River.
- Store flood waters off-stream.

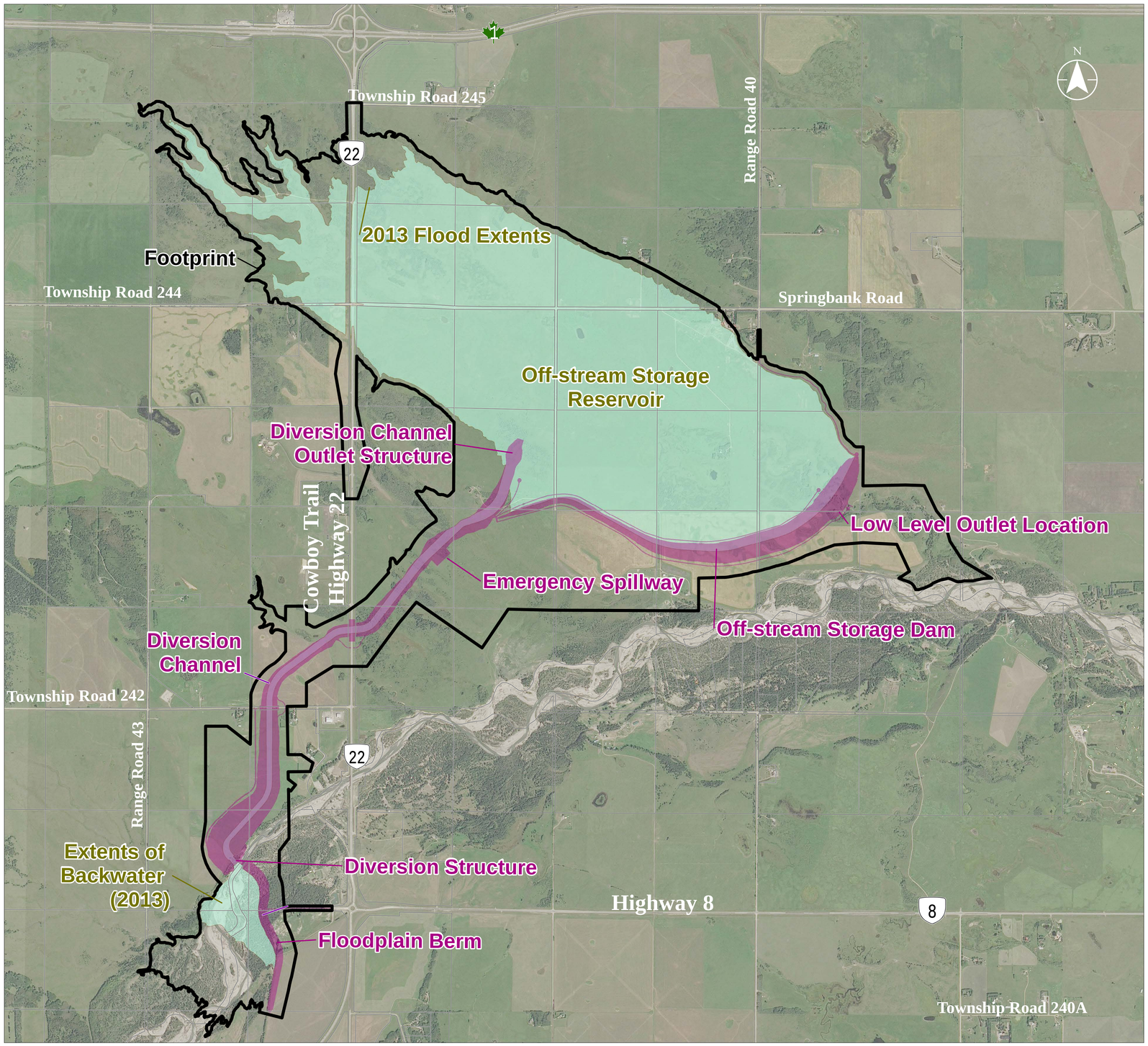
# Springbank Off-stream Reservoir Project

## Where is the project located?




The Springbank Project is located approximately 15 km west of Calgary near Springbank Road, north of the Elbow River and predominantly east of Highway 22.

# Project Components

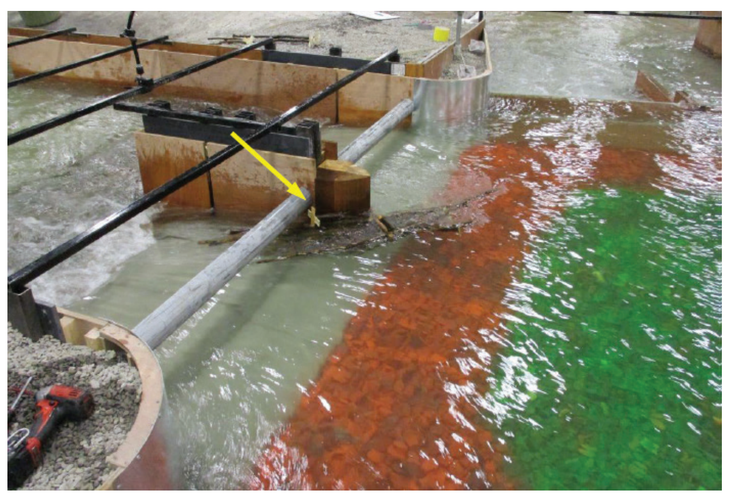


# Springbank Off-stream Reservoir Project

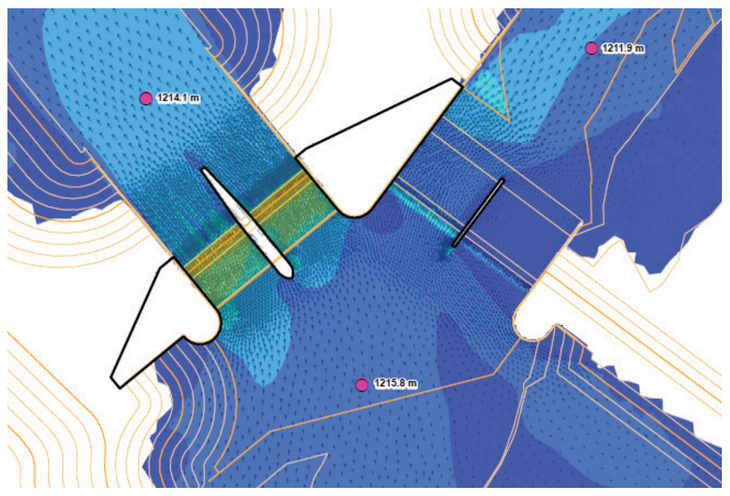
## Engineering Assessment and Design

**Engineering assessment and design work has progressed, engineering continues. Details are provided in Engineering Information Handout.**

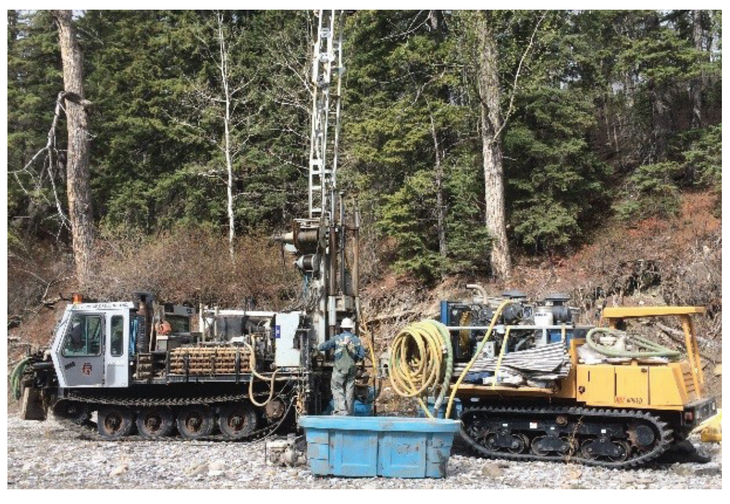
- A 1:16 scale model of the diversion structure was built in a warehouse lab to evaluate hydraulic performance under sediment and debris loads. The design was refined based on model results.



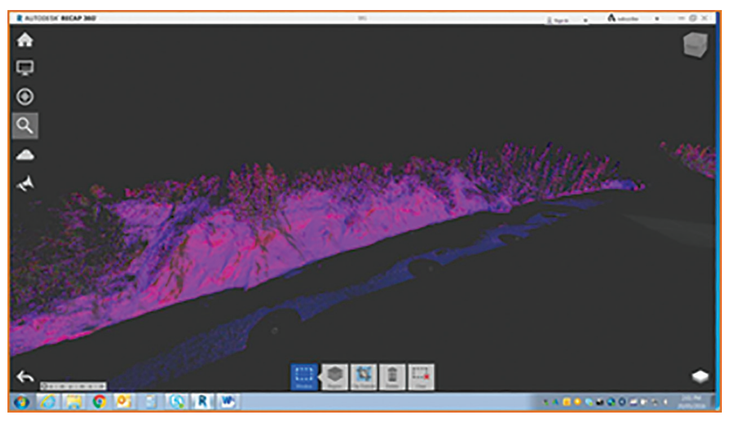
- The field- and laboratory-based geotechnical investigation has informed the design of all components.




- Structural analysis refined dimensions and composition of key components.

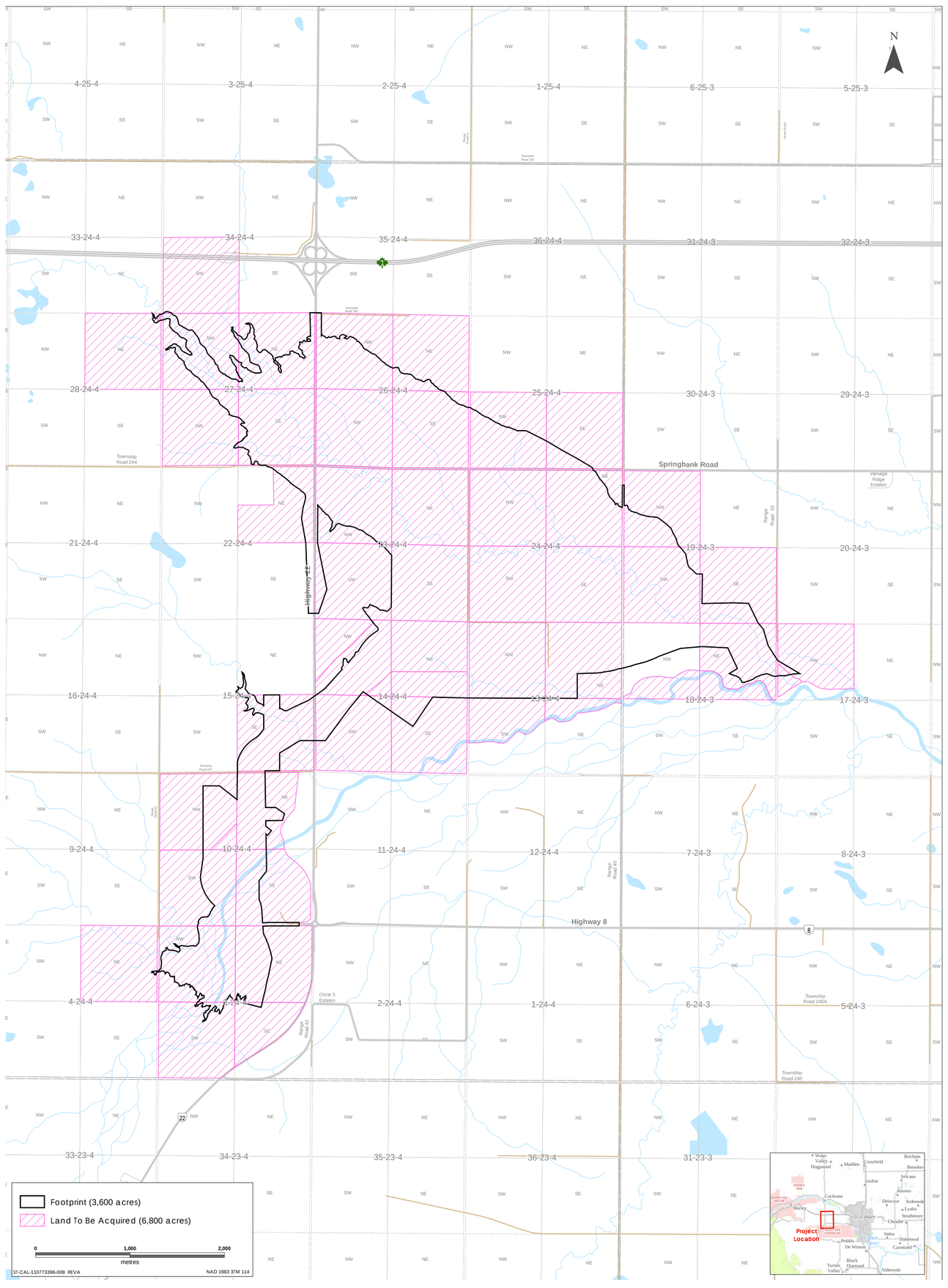


- Environmental assessment informed the design of mitigations.



# Springbank Off-stream Reservoir Project

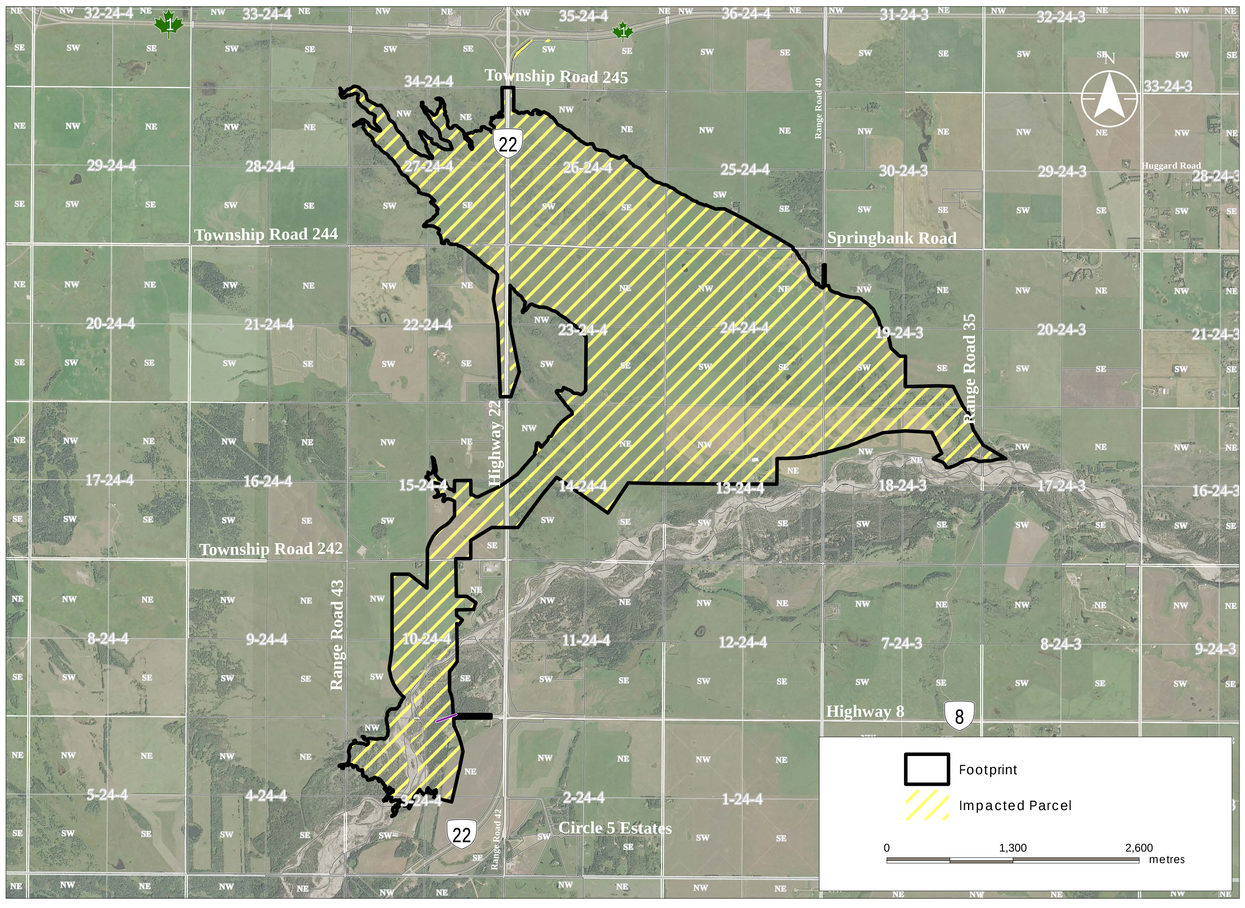
## Land Acquisition




To secure the land for the project footprint (~3,610 acres), the Government of Alberta is planning to acquire approximately 6,800 acres, so that landowners are not required to divide and sell only certain portions of sections. Land not required for the project is planned to be re-sold following construction.

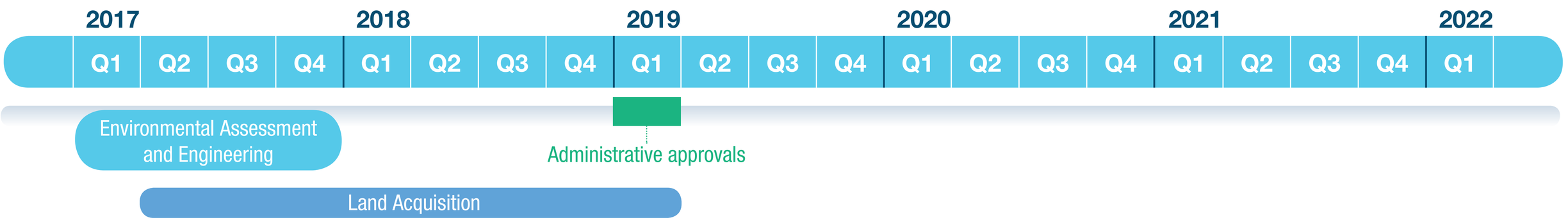
# Land Requirements

- The project footprint is still approximately 3,610 acres and includes:
  - land for road allowances, structures and the maximum extent of any backwater during flood events, and
  - work space required to construct the project and for operation and maintenance.



# Springbank Off-stream Reservoir Project

## Project Timeline




### COST ESTIMATE

| | |
|---|---|
| Dam | $202M |
| Roads and Bridges | $21M |
| Land Procurement | $140M *** |
| Engineering and Consulting | $38M |
| Contingency | $31M |
| **TOTAL** | **$432M** |
| **NET COST** | **$372M** *** |

* **Functionally Operational:** When the Springbank Project will be able to accommodate 1:100 year flood event.

** **Final Completion:** When the Springbank Project will be able to accommodate water volumes equal to the 2013 flood.

*** Does not include the estimated $60 million the government will recover from the sale of the surplus land following construction.

# Springbank Off-stream Reservoir Project

## Operations

- Alberta Environment and Parks (AEP) will own and operate the Springbank Project, once constructed.

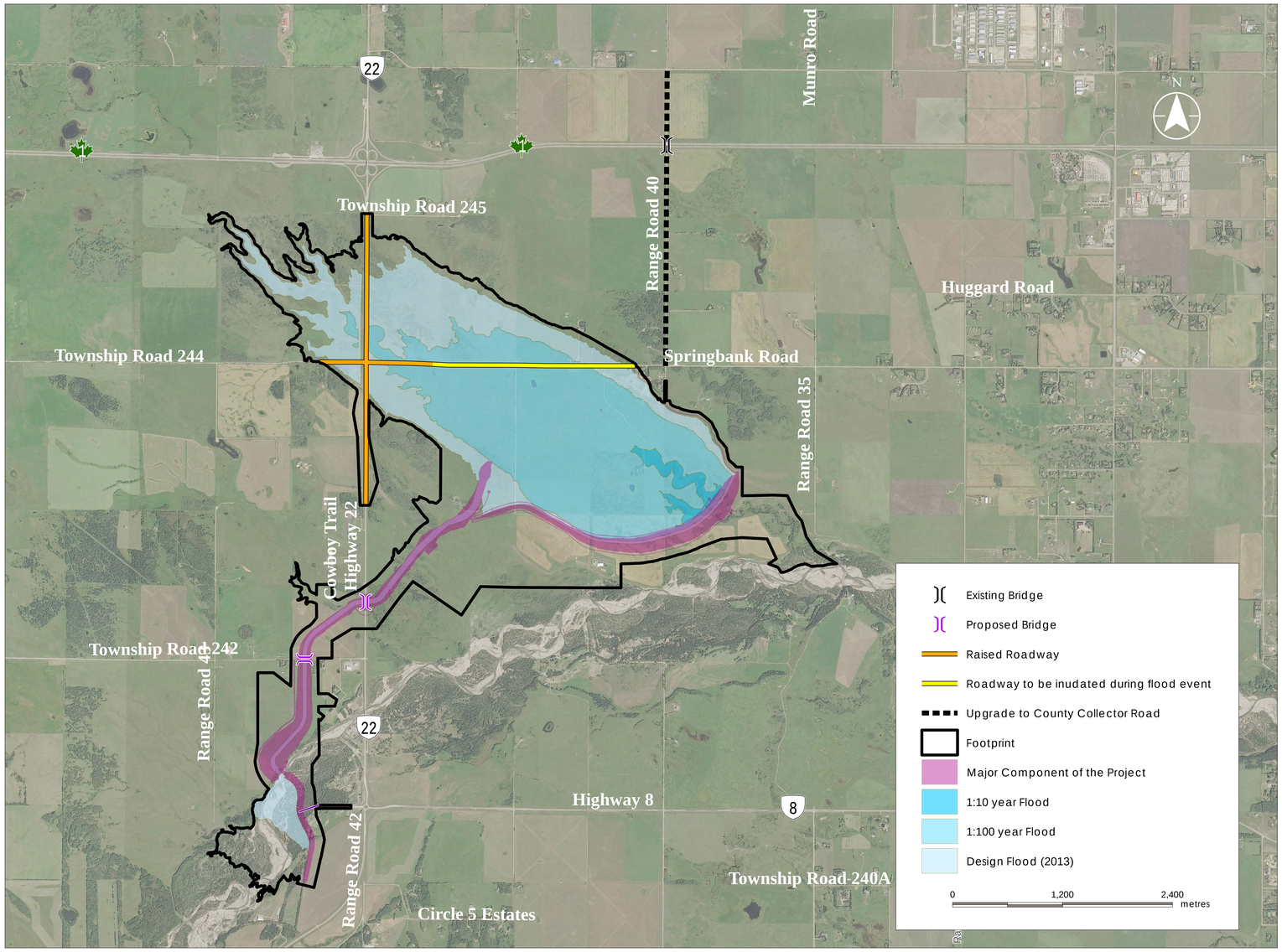
  When there is a need for flood operation, AEP will coordinate with the City of Calgary, which owns and operates the Glenmore Reservoir, so that the two reservoirs work in tandem.

- During normal operations the service spillway gates lay flush with the river bed and the diversion inlet gates are closed. Flow on the Elbow River is not hindered and fish are able to pass though the diversion structure.

  When activated, flows are diverted into the Sprinbank Project until the diversion capacity of 600$m^3/s$ is reached; and at that point, the service spillway lets the excess flood flow pass downstream to be captured by Glenmore Reservoir. This would also happen if the Springbank Project became full and could not accept additional flood volume.

# Springbank Off-stream Reservoir Project

## Roads




### Recommended road network:

- Raise Highway 22 and shift west to accommodate future twinning
- Retain Springbank Road with raised intersection at Highway 22
- New bridge crossings over the diversion channel along Highway 22 and Township Road 242

### Why is this the recommended plan?

- Least potential environmental and historical resources impact
- Maintains key commercial and emergency routes
- Incorporates existing infrastructure
- Most cost effective
- Highway 22 and Township Road 242 will remain open during construction

Preliminary technical design subject to approval.

# What is an EIA?

**Environmental Impact Assessments (EIAs) typically include:**

- A detailed description of the project including the design
- Description of project alternatives considered
- The location and environmental setting for the project
- Baseline environmental, social and cultural information
- The potential positive and negative environmental, health, social, economic and cultural effects of the proposed project
- Plans to mitigate adverse effects and enhance benefits
- The potential residual effects following the implementation of mitigation measures
- An assessment of cumulative effects
- Information on stakeholder and Indigenous consultation

Federal and provincial regulations require that project proponents prepare an environmental assessment. This allows regulators to make an informed public-interest decision about if and how the project should proceed.

# Springbank Off-stream Reservoir Project

## Studies for the EIA were conducted throughout 2016 and into 2017.

These studies included the collection of field information and the modelling of expected effects due to the project. The project team is currently preparing the assessment report, including the effects of the project on Valued Components (VCs), which are:

- air quality and climate
- the acoustic environment
- hydrogeology
- hydrology (surface water)
- water quality
- aquatic ecology
- terrain and soils
- vegetation and wetlands
- wildlife and biodiversity
- land use and management
- historical resources
- traditional ecological knowledge and land use
- public health and safety
- infrastructure and services
- economy and employment

# Springbank Off-stream Reservoir Project

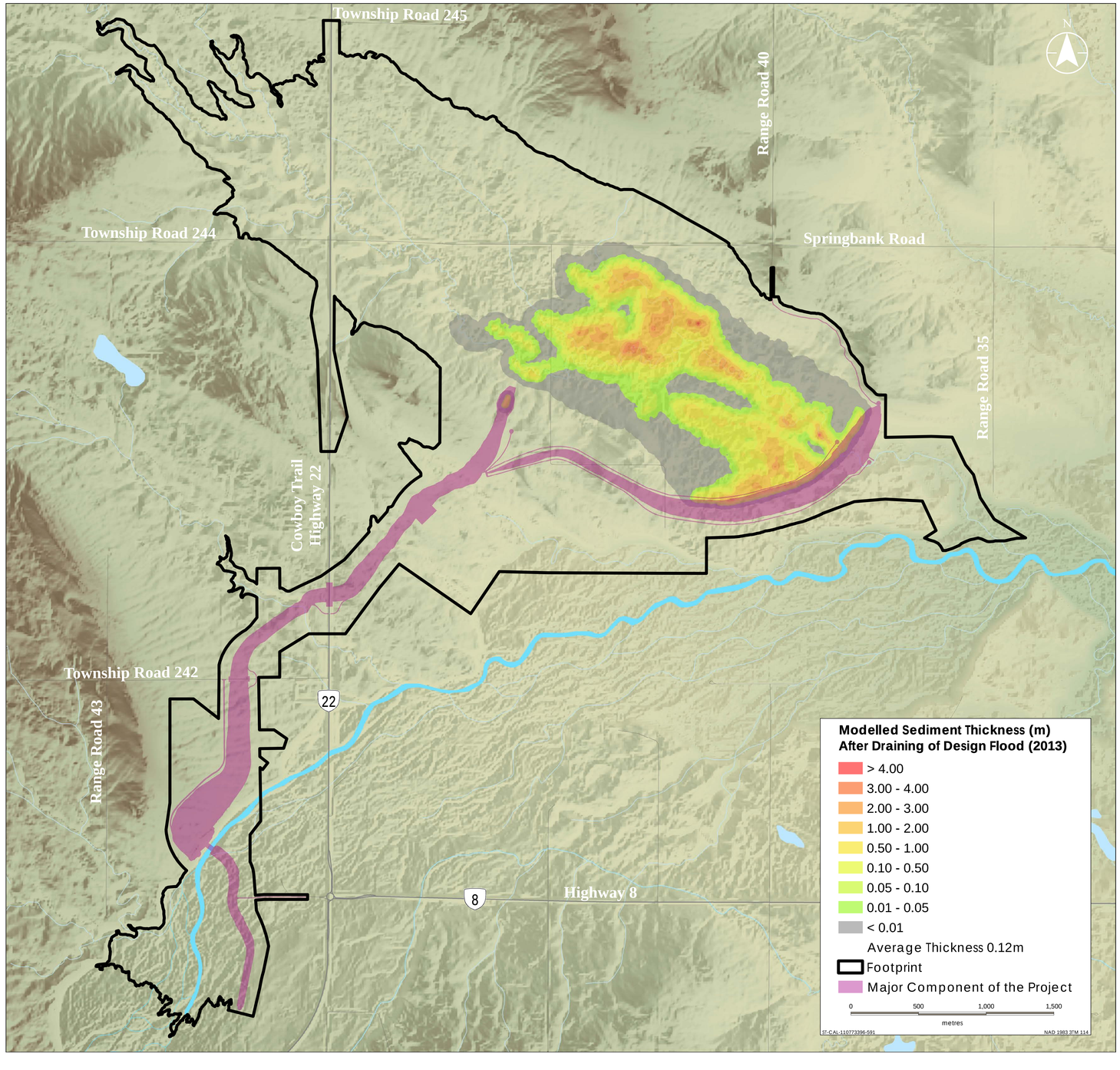
## Environmental Concerns: What we heard

Stakeholders raised concerns about the environmental effects of the Springbank Project, including:

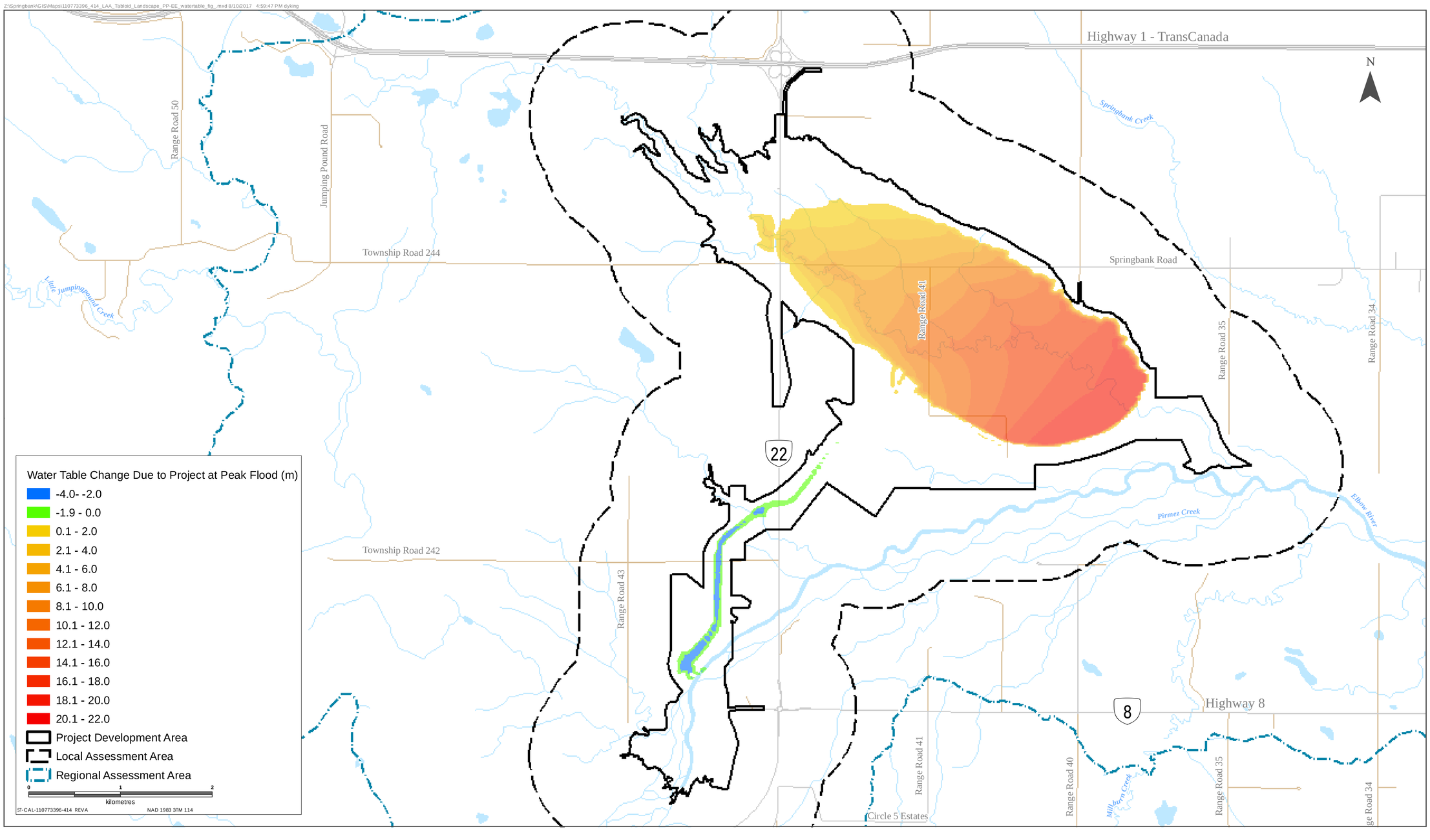
- Air quality impacts
- Feasibility
- Land and soil impacts
- Project alternatives
- Traditional land use
- Wildlife and fish impacts
- Water quality
- Watershed impacts

All concerns have been documented and considered by the project team in the environmental assessment and design process.  These concerns will be included in the environmental report submitted to the regulators.

# Modelled Sediment Thickness (m) After Draining of Design Flood (2013)



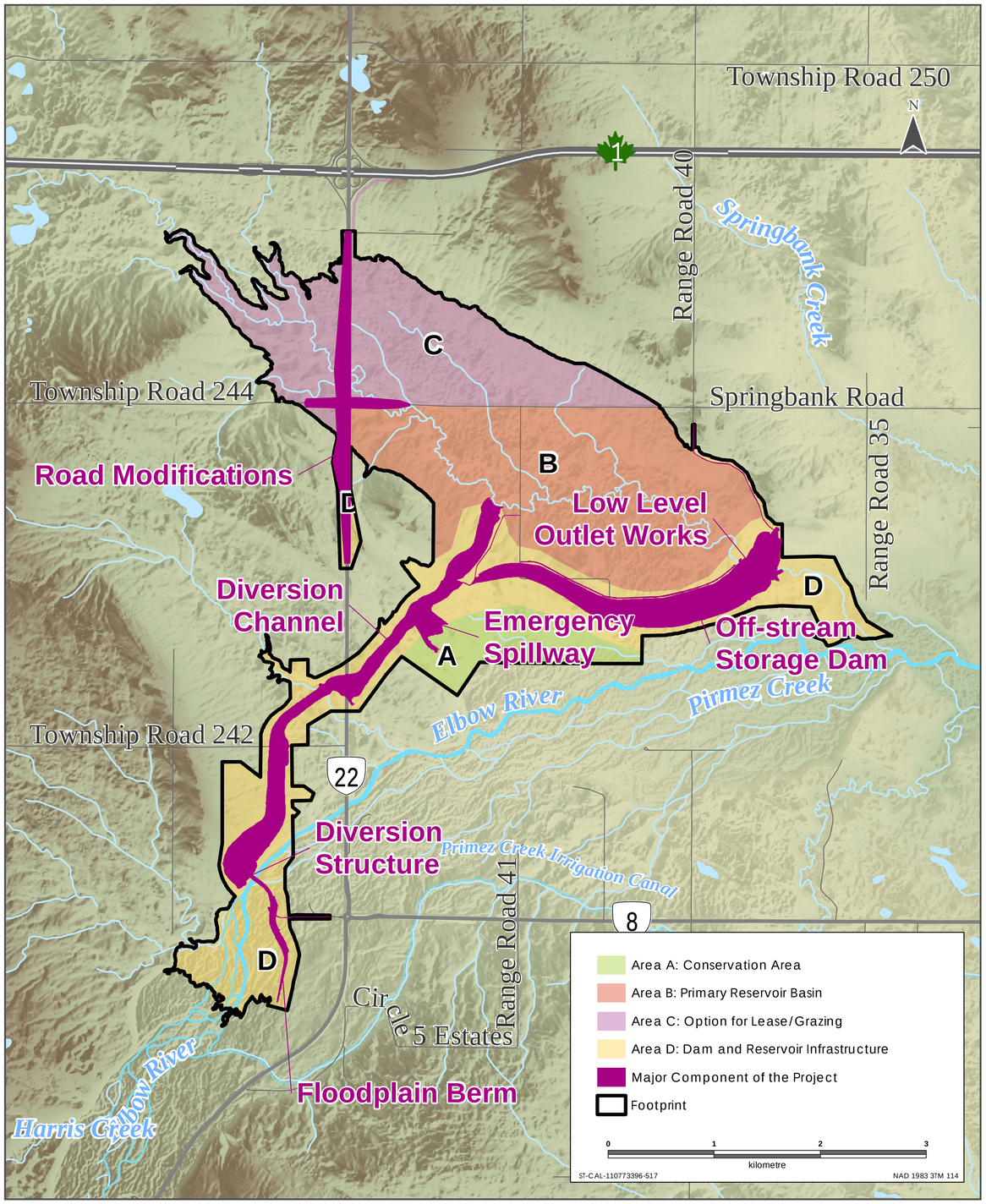
# Ground Water



# Alternative Option Comparison

| Parameter | Springbank Project | McLean Creek Dam Option |
|---|---|---|
| **Catchment Area** | 868 km² | 695 km² |
| **Geohazard** | Dam embankment: low risk of earthquake damage | Larger dam embankment and so possibly greater susceptibility to earthquake damage |
| **Project Timeline** | Operational 2020 | Operational 5.5 years from decision to move forward |
| **Environmental Issues** | • Key Wildlife and Biodiversity Zone<br>• Fish passage at the diversion structure may be affected by low flows in the Elbow RiverOff-stream reservoir does not affect fish habitat on the Elbow River<br>• Flow through river structure will have minimal impact on river morphology<br>• Directly impacts 22 acres of wetlands | • Key Wildlife and Biodiversity Zone, Grizzly Bear Zone (key habitat)<br>• The dam creates a permanent barrier to fish movement on the Elbow River include Bull Trout, a federal species at risk<br>• The dam creates a permanent upstream pond changing the habitat from a riverine one to a lake one<br>• Blockage of river sediment transport by the dam will result in erosion and reshaping of river downstream<br>• Directly impacts 67 acres of wetlands |
| **Flooding Risk During Construction** | • Minimal risk to downstream communities during construction | • Potentially significant risk downstream if flood were to exceed the 1:50 year event, particularly during the first two years of dam construction |
| **Cost** | $372 million (including the estimated $60 million the government will recover from the sale of surplus land following construction) | $406 million |
| **Geotechnical Factors** | No major foreseeable geotechnical issues. Dam construction will be off-stream away from the geotechnical effects of the Elbow River valley | The geotechnical issues associated with the McLean Creek option are significantly more complex than the Springbank Project |

# Future Land Use

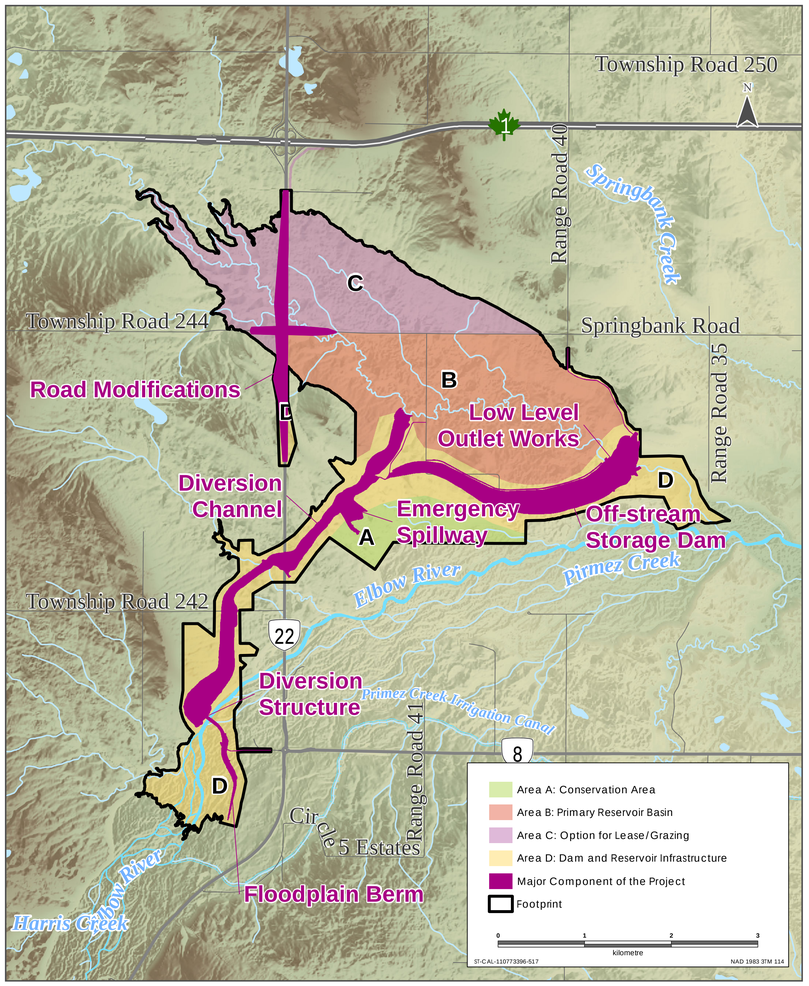



The primary purpose of the Springbank Project is to mitigate flooding along the Elbow and Bow Rivers downstream of the facility. During non-flood conditions, there are opportunities to use the land for other purposes. These are outlined in a Land Use Plan.

When proposing secondary land uses it is critical to ensure compatibility with the primary use of the area. The project team evaluated potential future land uses for each area based on the following factors:

- Public benefit
- Alignment with legislation and policy
- Desired flexibility of land use
- Frequency of flood events
- Minimizing potential land use conflicts
- Challenges of implementation
- Restoration and reclamation required after a flood event
- Risk to health, safety, and environment
- Cost

# Future Land Use




## The Land Use Plan divides the project footprint into four distinct areas:

**Area A - Conservation Zone:** The area south of the reservoir and diversion canal, north of the Elbow River, would provide low-impact recreational opportunities and have limited improvements beyond restoration after construction.

**Area B – Primary Reservoir Basin:** This area would be maintained for the intended functionality of the Springbank Project. No public access would be permitted. During non-flood periods, this zone may provide opportunities for scientific study of flooding and ecological resiliency, which would provide for ongoing improvement to the stewardship of the lands within this area.

**Area C – Grazing:** The area north of Springbank Road may remain open to grazing.

**Area D – Dam and Reservoir Infrastructure:** These lands would be owned and operated by the Government to support the operations and maintenance of the Springbank Project. No public access would be permitted.

This approach controls public access in areas in and around reservoir, provides opportunities for the public to connect with nature through low impact recreation and scientific research on landscape flood resiliency.

The Sprinbank Project application to the regulators will include an analysis of land use after construction. If the project is approved, Alberta Environment and Parks will conduct a more detailed analysis and make final decision.

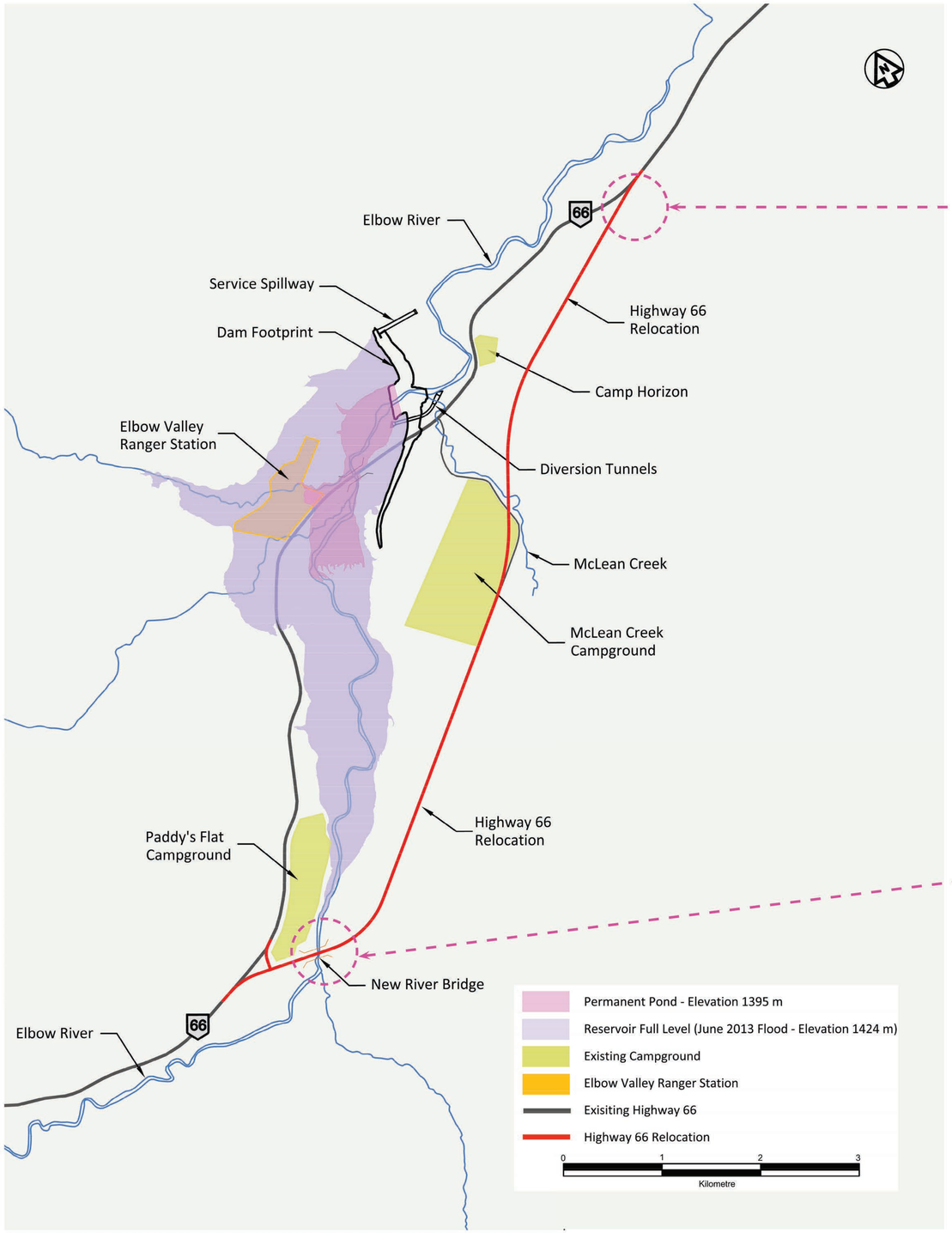
# Springbank Off-stream Reservoir Project

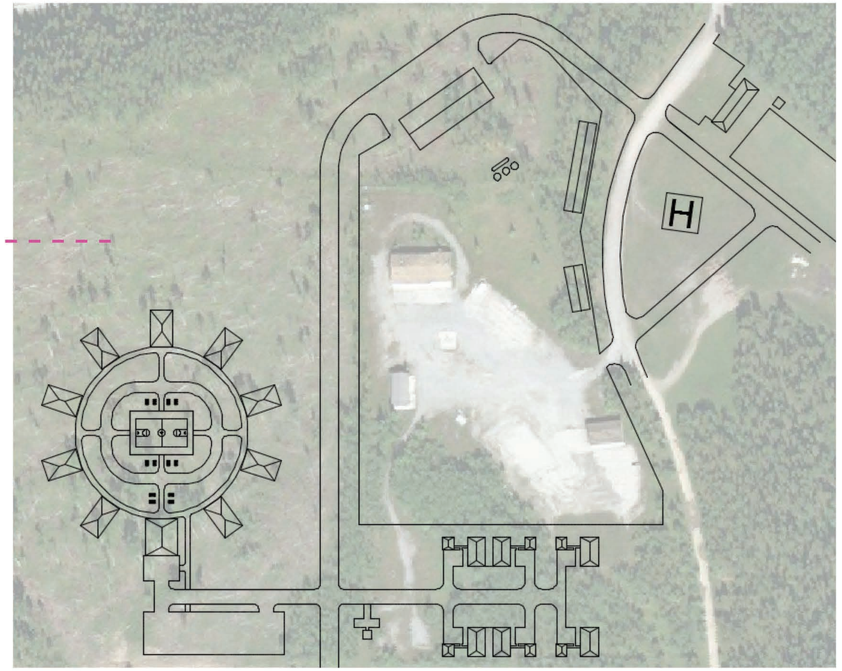
## The Preferred Project

With additional investigation into the McLean Creek option, the Springbank Project remains the best solution for protection against a 2013-level flood event for downstream communities along the Elbow River. The Springbank Project:

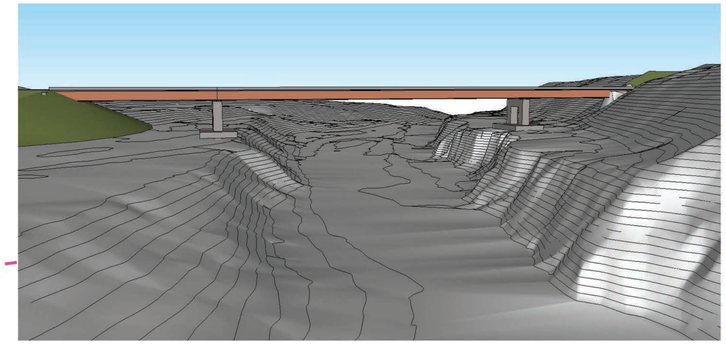
- Has shorter timelines to be built.
- Will have less environmental impact.
- Is more financially viable.
- Will better protect Calgary due to its larger catchment area.

# McLean Creek Dam Option

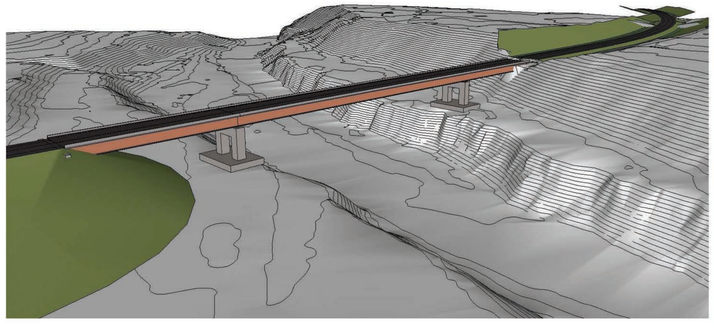


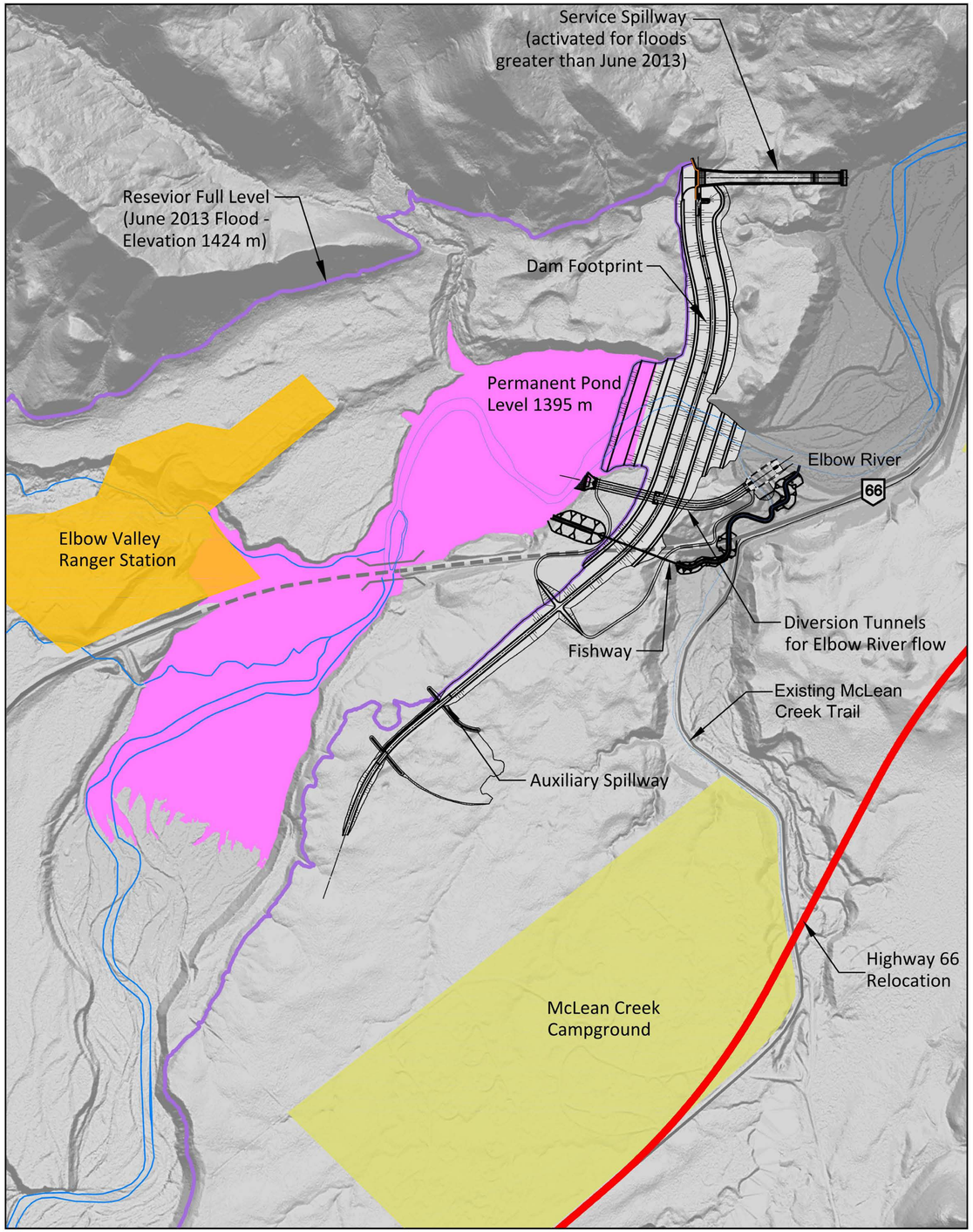

Relocated Elbow Valley Ranger Station

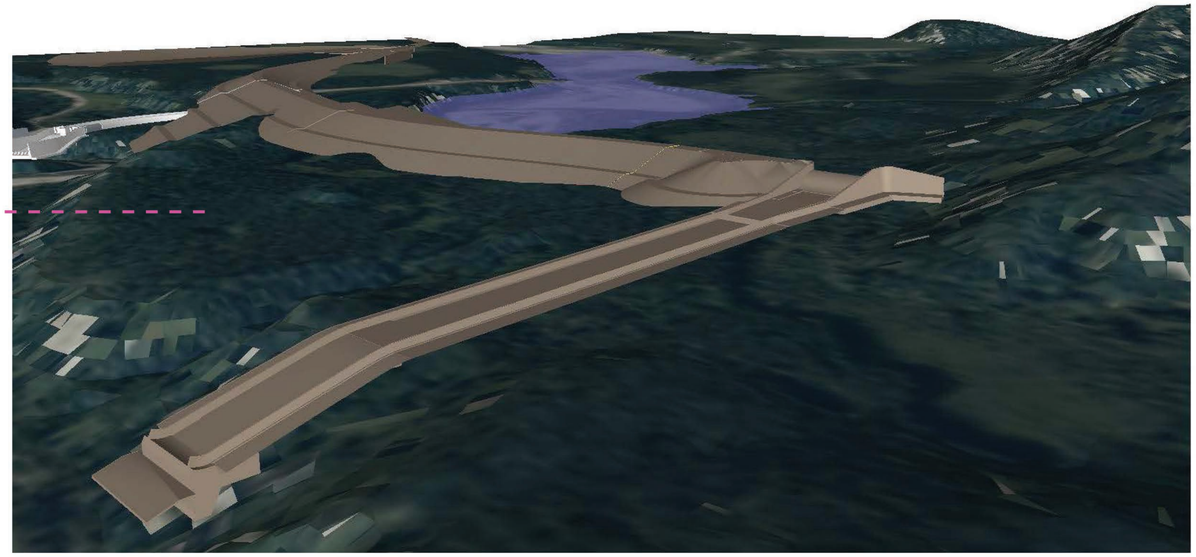


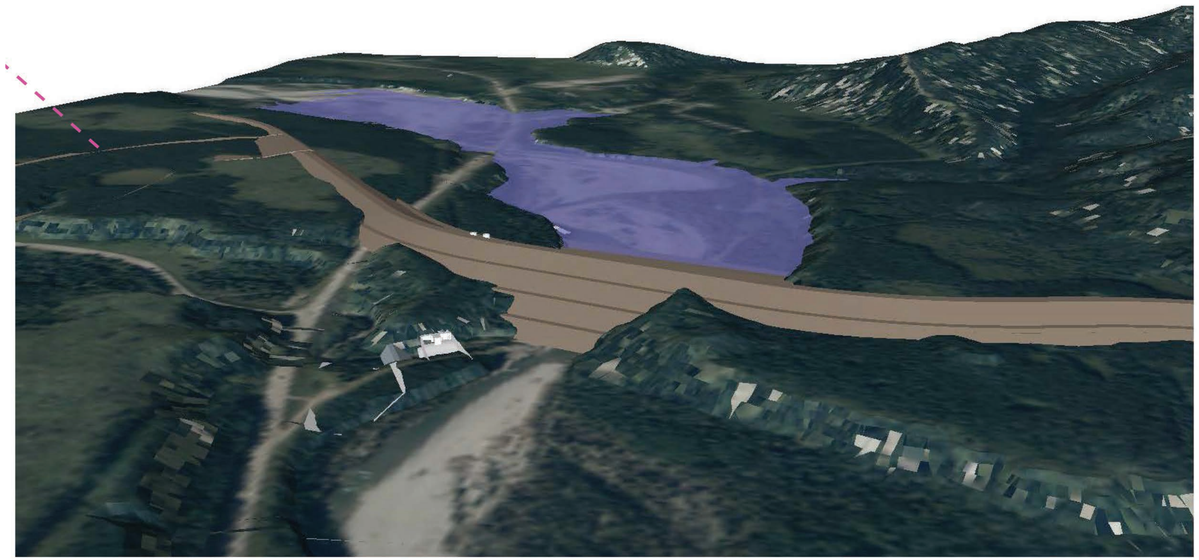
Relocated Highway 66 Bridge



# McLean Creek Dam Option

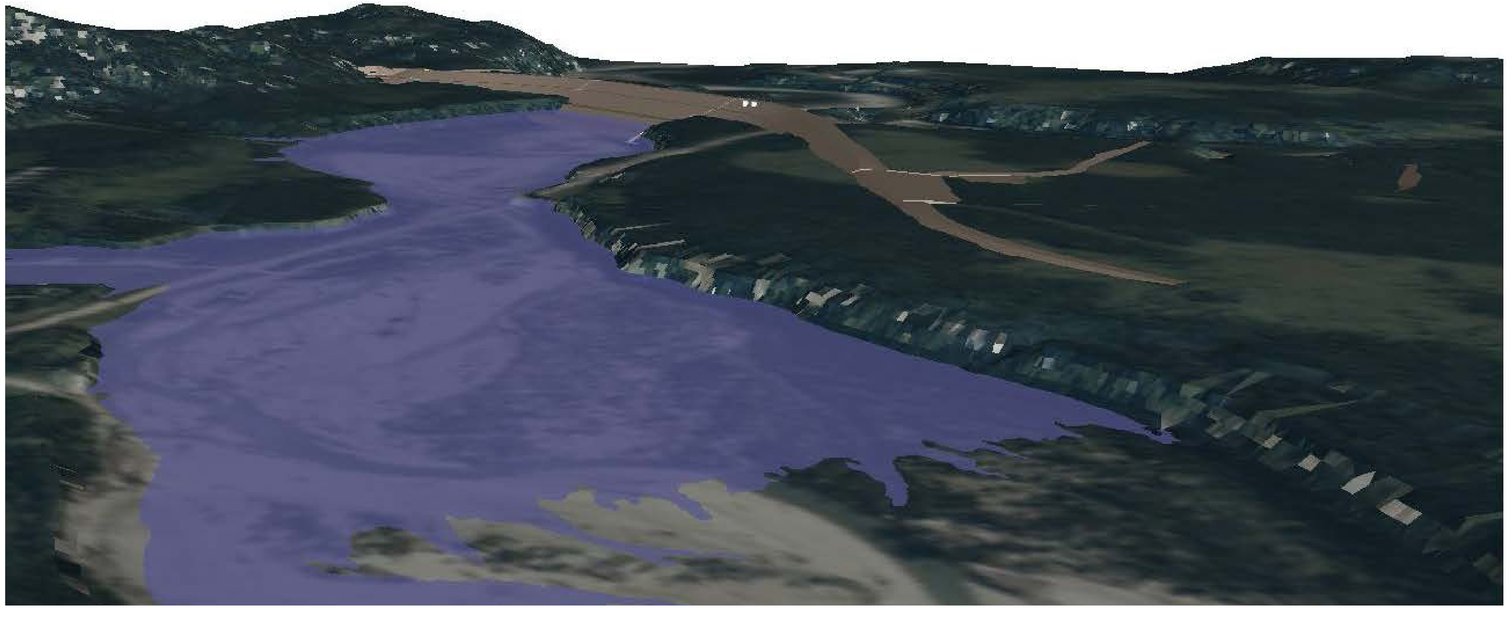




# McLean Creek Dam Option

| COST ESTIMATE | |
|---|---|
| Dam | $200M |
| Hwy 66 Relocation | $34M |
| Facility Relocation | $23M |
| Environmental Mitigation | $14M |
| Engineering and Consulting | $54M |
| Contingency | $81M |
| TOTAL | $406M |



McLean Creek Dam permanent pond

# Benefit/Cost Ratio

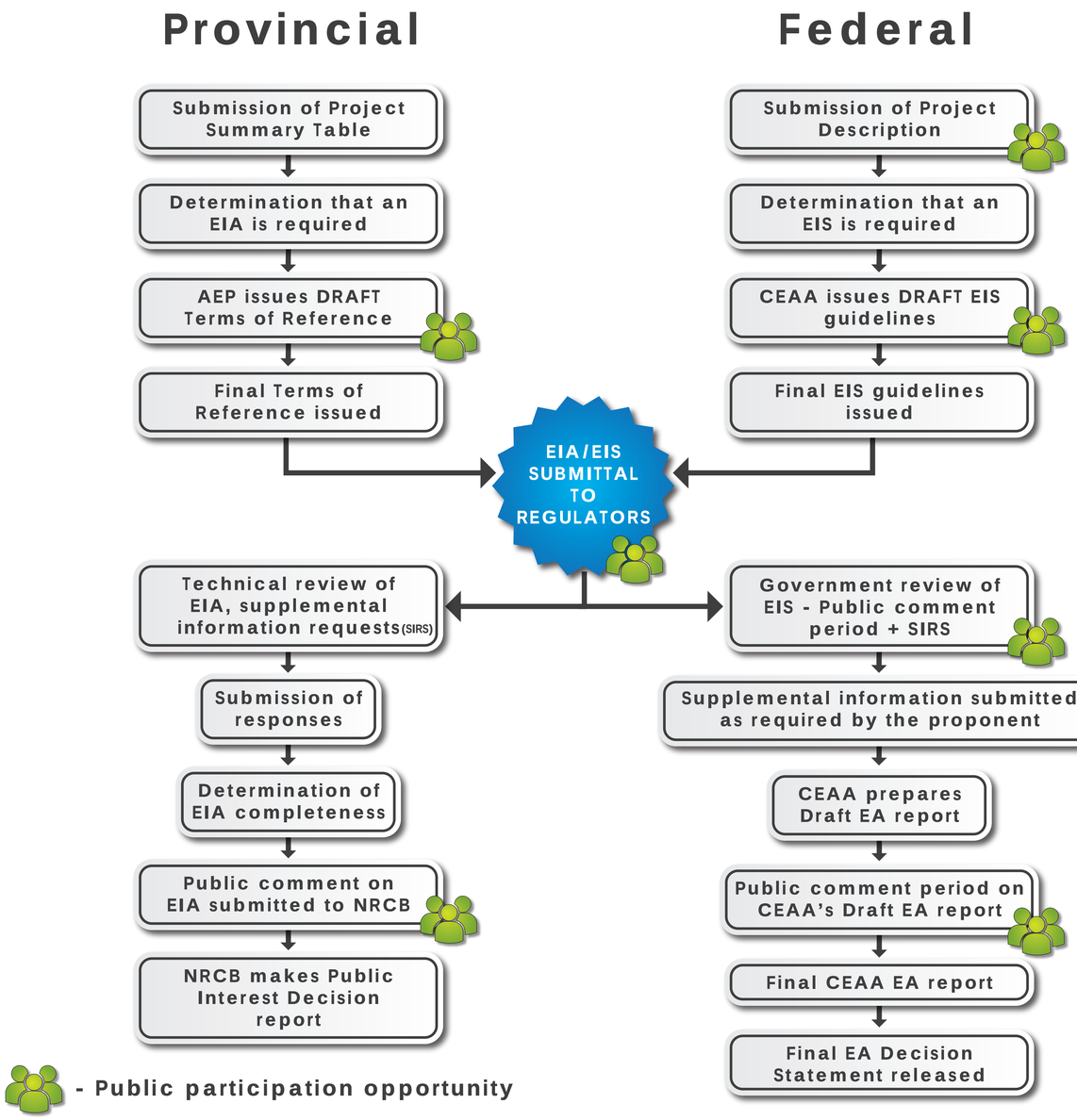
The purpose of the benefit/cost analysis is to provide a comparison of project benefits, in terms of damages averted, to project costs including capital and operating costs, to determine if options under consideration are economically viable, and which one provides the more economically efficient solution.

The benefit/cost ratio of a project is the ratio of net present value of the benefits (average annual damages) over the net present value of the costs. This value is the indicator of economic efficiency. Where the benefits exceed costs, the ratio would be greater than 1.0, and where benefits are less than costs then the ratio would be less than 1.0. An economically efficient project would have a benefit/cost ratio greater than 1.0. At a benefit/cost ratio of 1.0, the project is at a breakeven point.

| Indicator | Springbank Project | McLean Creek Dam Option |
|---|---|---|
| **Present Value Benefits** | $653,008,000 | $578,997,000 |
| **Present Value Costs** | $388,942,000 | $404,771,000 |
| **Net Present Value** | $264,066,000 | $174,226,000 |
| **Benefit/Cost Ratio** | 1.68 | 1.43 |

As evidenced, both projects yield a positive benefit/cost ratio with the Springbank Project scoring higher than the McLean Creek Dam Option by a margin of 0.25 (1.68 vs 1.43). If a land value was included in the McLean Creek Dam Option costs, the benefit/cost ratio would decrease to 1.25.

# Regulatory Process: One EIA - 2 Reviews




The Canadian Environmental Assessment Agency (CEAA) and the Natural Resources Conservation Board (NRCB) encourage people to participate in project reviews. The NRCB notifies potentially affected communities about the review in accordance with its rules of practice. CEAA posts projects on their website that are currently open to public participation.

CEAA has made funding available through its Participant Funding Program to assist the participation of the public and Indigenous groups in the federal assessment of the Springbank Project. The deadline for applications was March 27, 2017.

Check the CEAA website (www.canada.ca/en/environmental-assessment-agency.html) and NRCB website (www.nrcb.ca) for more information about how to participate in the regulatory process.

1. **EIA** - Environmental Impact Assessment
2. **NRCB** - Natural Resources Conservation Board
3. **CEAA** - Canadian Environmental Assessment Agenda
4. **EIS** - Environmental Impact Studies
5. **EA** - Environmental Assessment
6. **AEP** - Alberta Environment and Parks

# Springbank Off-stream Reservoir Project

## Summary of Engagement

- Ongoing small group and one-on-one meetings with affected landowners
- 3 facilitated presentations to landowners
- Ten public open houses (Springbank area, Calgary, Bragg Creek, Cochrane)
- Engagement with Indigenous communities including the Tsuut'ina Nation, Siksika Nation, Blood Tribe/Kainai, Piikani Nation, Stoney Nakoda (Bearspaw Nation, Chiniki Nation, the Wesley Nation) Ermineskin Cree Nation, Louis Bull Tribe, Montana First Nation, Samson Cree Nation, Foothills Ojibway First Nation, Métis Nation of Alberta Region 3, Ktunaxa National Council, and Métis Nation British Columbia.
- Over 40 meetings to-date with stakeholders including Bow River Basin Council, Elbow River Watershed Partnership, Alberta Environment and Parks Water Collaborative, the Calgary River Communities Action Group, Calgary Regional Partnership, Western Irrigation District
- Meetings with Rocky View County Administration
- Meetings with City of Calgary Administration
- Meetings with affected industry and utilities
- Ongoing project email and phone inquiries

# Springbank Off-stream Reservoir Project

## Contact Us

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**Phone:** 780-644-8354
**Website:** alberta.ca/springbank-road.cfm

# Springbank Off-stream Reservoir Project

## Privacy Statement

Personal information is being collected by Alberta Transportation under the authorization of Section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and is managed in accordance with part 2 of the FOIP Act.

Your name and email address will be used for contact purposes to send updates. Your postal code is being collected for analysis of location to the river and to the proposed Springbank Off-stream Reservoir Project. Your personal information will be shared with the Department of Environment and Parks, the Canadian Environmental Assessment Agency, and to anyone viewing this sheet during sign-in.

Should you wish to have your personal information removed, corrected or have concerns pertaining to the Springbank Off-stream Reservoir Project, please contact Mark Svenson, Alberta Transportation, Environmental Coordinator at (780) 644-8354 or springbank-project@gov.ab.ca.

# Attachment 2 OPEN HOUSE ISSUES BRIEF

[communica]

February 25, 2015

# SPRINGBANK OFF-STREAM RESERVOIR (SR1)

OPEN HOUSE ISSUE BRIEF

Prepared by:

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## Open House Issue Brief – Issues, Concerns and Survey Results

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# Springbank Off-Stream Reservoir January Open Houses – SIM Issue Brief

## Overview

With hundreds of open house attendees participating in both the Calgary open house on January 27, 2015, and the Cochrane open house on January 28, 2015, to discuss the Springbank Off-Stream Reservoir (SR1) Project, a remarkable number of attendees completed a survey to provide feedback and had their concerns recorded by the SR1 project team members on record of contact (ROC) forms.

### Attendance

Approximately 305 attendees were counted as attending the Calgary open house on January 27. Fewer attendees, at 205, arrived at the Cochrane open house on January 28. The number of individuals who signed in at the registration desk was fewer. The following list displays information on the attendees location based on the postal codes gathered from those who signed in:

**Cochrane open house**

- T3Z – 112 recorded (Redwood Meadows and parts of Springbank)
- T0L – 20 recorded (Bragg Creek)
- T4C – 20 recorded (Cochrane)
- T2S – 8 recorded (Elbow Park/Britannia/Parkhill/Mission)

**Calgary open house**

- T2S – 107 recorded (Elbow Park/Britannia/Parkhill/Mission)
- T3Z – 46 recorded (Redwood Meadows and parts of Springbank)
- T3H – 17 recorded (Discovery Ridge/Signal Hill/Aspen Woods/Patterson/Cougar Ridge)
- T3E – 13 recorded (Lakeview/Glendale/Killarney)
- T2T – 13 recorded (Altadore/Bankview/Richmond)
- T0L – 6 recorded (Bragg Creek)

### Records of Contacts

The total for each type of communication or record of contact are listed below:

| | Calgary | Cochrane | Online | Sub Total |
|---|---|---|---|---|
| **Survey** | 146 | 55 | 56 | 257 |
| **Record of Contact Form** | 156 | 115 | N/A | 271 |
| **Total** | | | | 528 |

## 1. Issues and Concerns Analysis

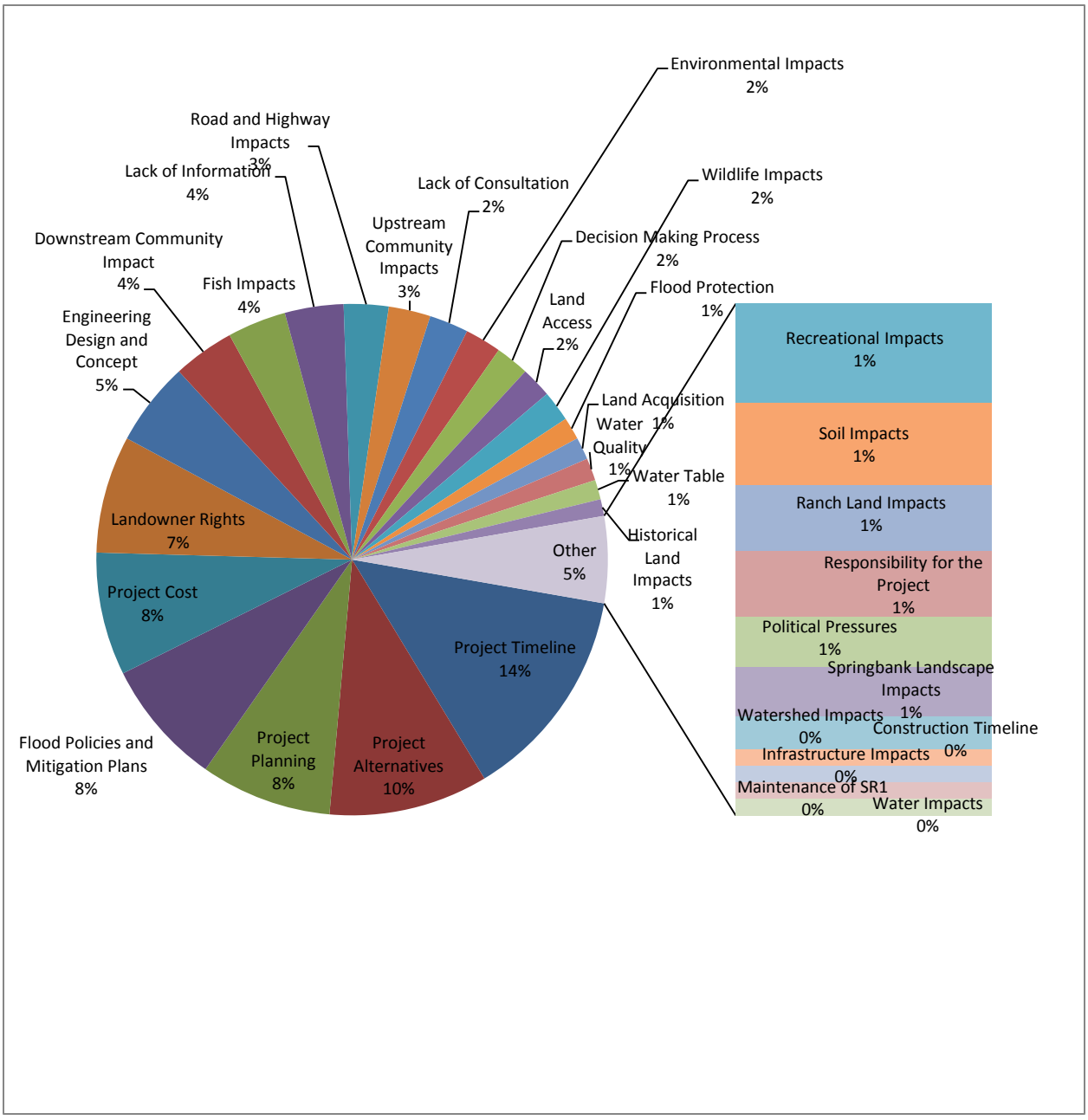
Each time a specific issue or concern was raised by an attendee or survey respondent, the topic of that issue or concern was linked to the communication summary to assist in quickly identifying the most common occurring issues and concerns.

A total of **34 issue or concern topics** were identified. The following graph demonstrates list of most occurring to least occurring from both the Calgary and Cochrane open houses:

| | **Issue or Concern** |
|---|---|
| **1** | Project Alternatives |
| **2** | Project Cost |
| **3** | Project Planning |
| **4** | Project Timeline |
| **5** | Upstream Community Impacts |
| **6** | Lack of Information |
| **7** | Engineering Design and Concept |
| **8** | Landowner Rights |
| **9** | Flood Policies and Mitigation Plans |
| **10** | Lack of Consultation |
| **11** | Downstream Community Impact |
| **12** | Road and Highway Impacts |
| **13** | Decision Making Process |
| **14** | Environmental Impacts |
| **15** | Fish Impacts |
| **16** | Land Acquisition |
| **17** | Flood Protection |
| **18** | Wildlife Impacts |
| **19** | Land Access |
| **20** | Springbank Landscape Impacts |
| **21** | Political Pressures |
| **22** | Water Quality |
| **23** | Soil Impacts |
| **24** | Ranch Land Impacts |
| **25** | Recreational Impacts |
| **26** | Historical Land Impacts |
| **27** | Water Table |
| **28** | Watershed Impacts |
| **29** | Responsibility for the Project |
| **30** | Infrastructure Impacts |
| **31** | Maintenance of SR1 |
| **33** | Construction Timeline |
| **34** | Pipeline Disturbance |

### 1.1 Calgary – Specific Issues and Concerns Identified

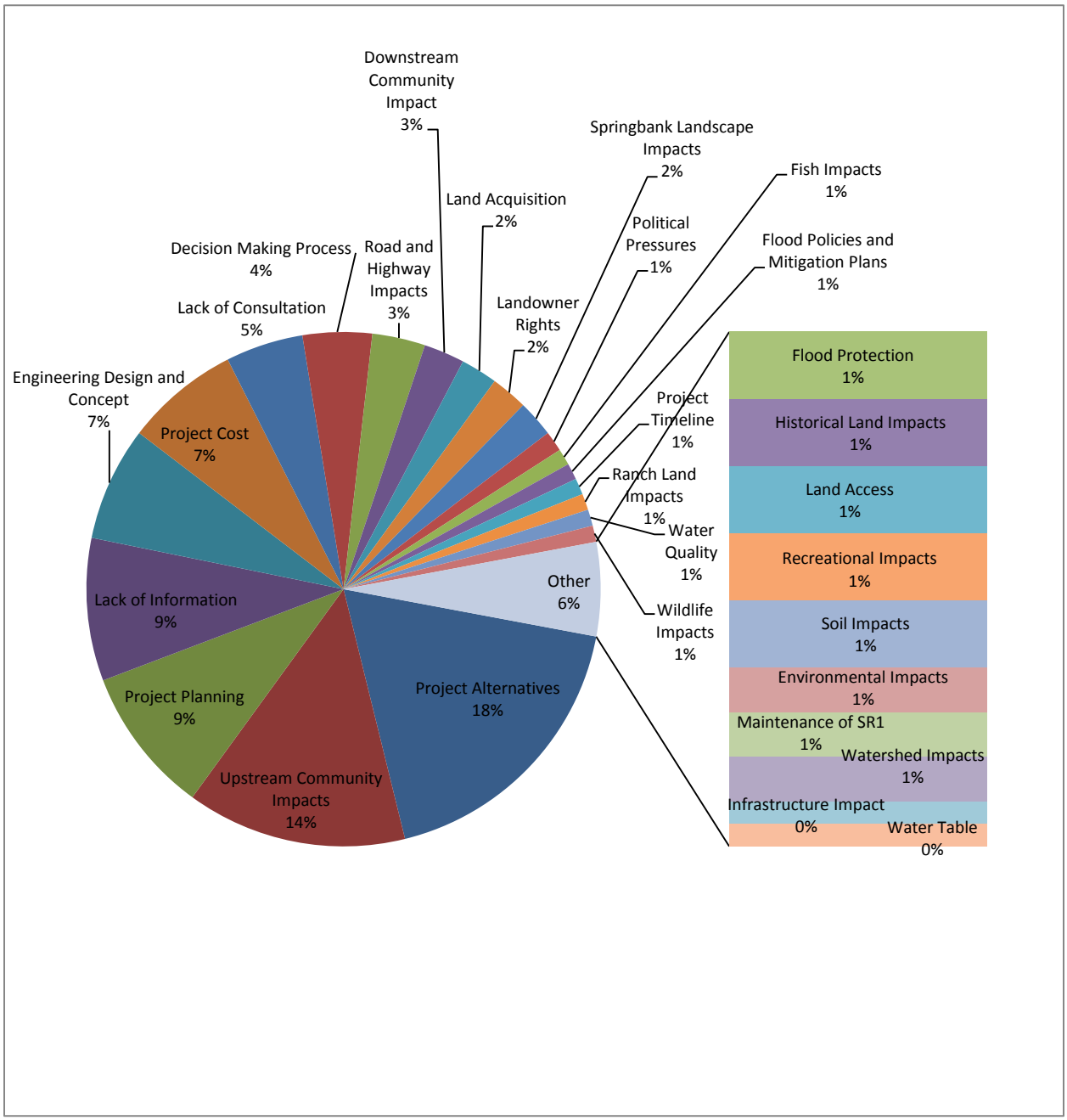
Calgary's open house brought a greater sense of urgency for the Project to proceed in order to protect the economy, downtown Calgary, and homes on Calgary's flood plain. This is evident in the "Project Timeline" issue, as it was most commonly occurring. In addition, individuals who attended the Calgary open house were concerned with how the Government was consulting with landowners, other Provincial wide flood mitigation plans, expediting flood mitigation projects, and the project cost to tax payers. The McLean Creek Reservoir and the Glenmore Diversion Tunnel were common project alternative suggestions. The following graph breaks down the issues and concerns raised on January 27, 2015:




Calgary - Issues Identified

### 1.2 Cochrane – Specific Issues and Concerns Identified

The results from the January 28 open house were much different from the day before. The most commonly occurring issue raised was to cancel SR1 and proceed with the McLean Creek Reservoir project. Almost **70%** of the issues raised related to opposition to the plans and consultation process of SR1 (Project Alternatives, Upstream Community Impacts, Project Planning, Lack of Information, Engineering Design and Concept, Project Cost, Lack of Consultation). The following graph identifies these stakeholders' concerns:




Cochrane - Issues Identified

### 1.3 Issues and Concerns Summary

The majority of the issues identified were in opposition to the Project or in concern to project management. Many of the open house attendees expect a respectful and transparent consultation process combined with a thorough decision making and Environmental Impact Assessment process. The majority of the attendees expressed concern for the Government's disregard for the Redwood Meadows and Bragg Creek communities. In addition to their project management concerns, many brought forward comments on the engineering design and concept in relation a dry dam and the impact it would have on land after a flood and the impacts it would have on fish. Survey respondents inquired why flood protection for the City of Calgary was focused on the Elbow River, and not the Bow River. Overall, the issues and concerns relating to SR1 are dynamic and pressing.

## 2. Questionnaire Analysis

Analytics were developed for questions 1 through 5 and 7. Question 6 was omitted for analysis because it was a general question and comments writing field.

### 2.1 Question 1

Word of mouth methods of communication was the most common way stakeholders were informed by the open house, followed by newspaper/media advertisements and emailed invitations. CRCAG played a significant role in advertising the open houses. Some online respondents explained they never heard of the open houses and expressed disappointment in the lack of information.

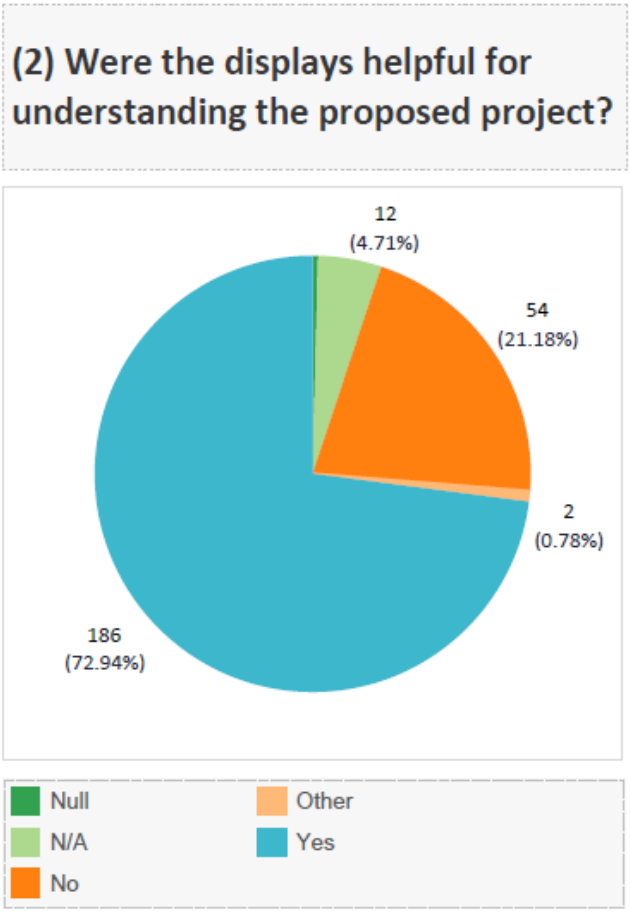
Question 1 - Methods of Communication

### 2.2 Question 2

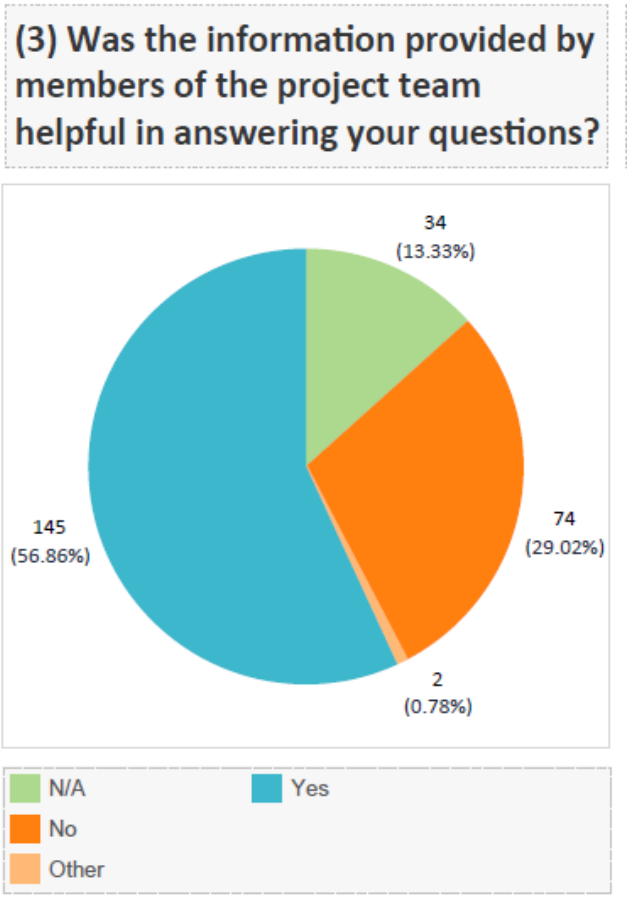
73% of attendees found the open house displays helpful, but provided comments that they were not detailed enough. 21% stated the displays were not helpful. A few attendees answered both yes and no, with the most comments regarding better maps and more information on project alternatives.

### 2.3 Question 3

57% of attendees found the project team helpful. Several survey respondents identified the Stantec team members as most helpful. 43% of respondents felt the answers from team members were not helpful, with negative comments about being deferred to other team members and several responses of "I don't know." Many attendees stated the team members avoided talking about the McLean Creek Reservoir Project and inquired why the government would not provide more information on project alternatives.



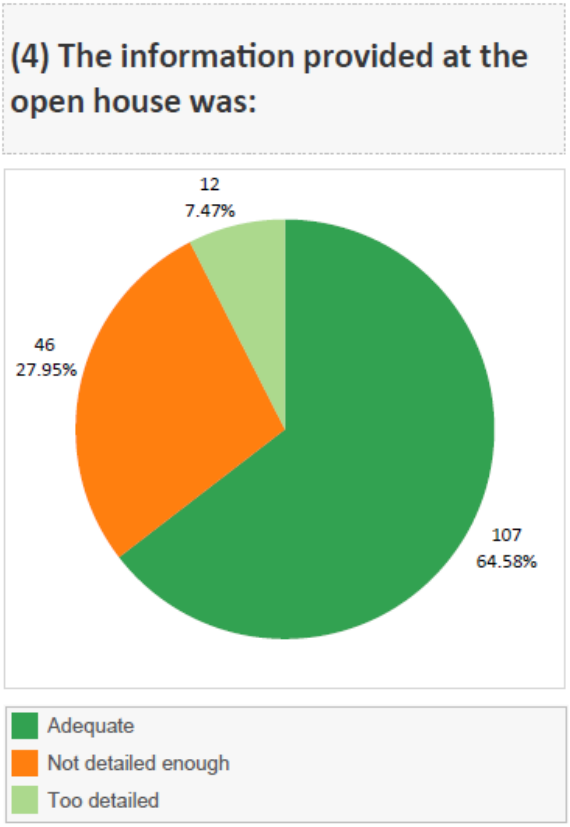

Question 2 - Displays




Question 3 – Project Team

### 2.4 Question 4

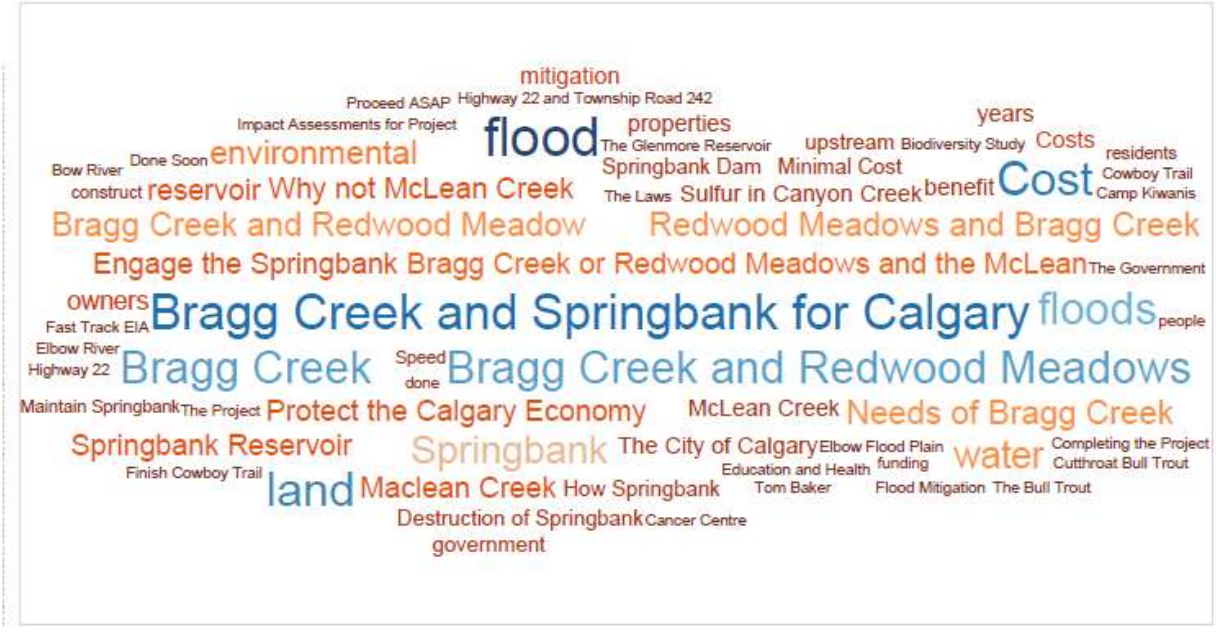
The majority of attendees, at 64%, found the information from the open house adequate, stressing a lack of information on project alternatives. Many attendees noted that the Government should have more concrete information to present at open houses. Landowners and SR1 affected individuals expressed concern that the open house contained no new information. The majority of respondents felt that SR1 was already approved and expressed extreme concern about lack of consultation.




Question 4 - Information Provided

### 2.5 Question 5

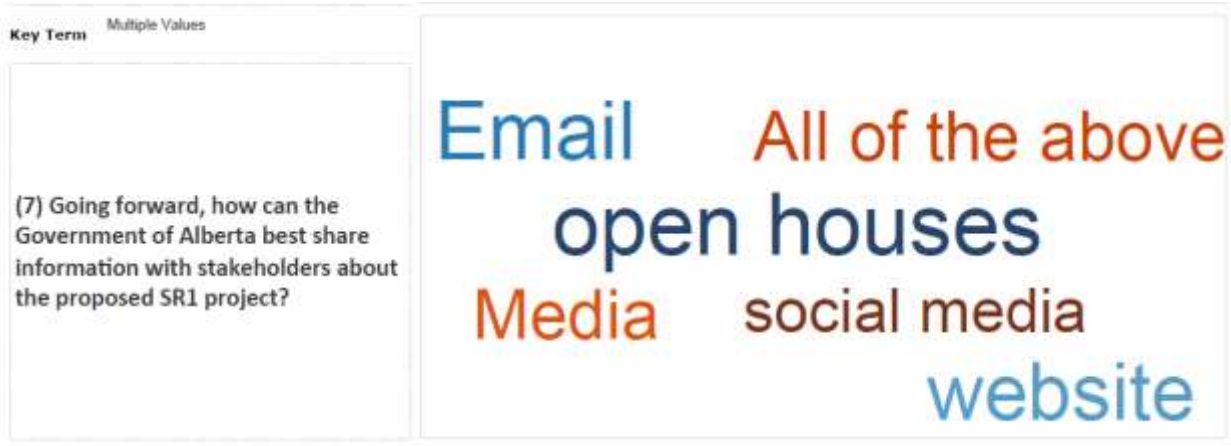
The responses to question 5 were dynamic and detailed. The following word cloud identifies the most commonly occurring words in the attendee's top three priorities for the Alberta Government. In both questions 5 and 6, respondents inquired about the plans for protecting Bragg Creek and Redwood Meadows and expressed strong opposition to SR1. Many respondents noted the current financial state of the province and inquired why the Tom Baker Cancer Centre and educational budgets were being cut while SR1 proceeds.




Question 5 - Common Words Identified

### 2.6 Question 7

The majority of attendees preferred to receive information by all means of communication possible. Many requested a combination of communication methods, such as direct emails, additional open houses to be held in the Springbank community, and all media types. One word answers were rare.




Question 7 - Communication Methods

## Conclusion

The issues and concerns raised in both the record of contact forms and the surveys developed trends specific to each day. Attendees of the Calgary open house focused on the project timelines and project management elements, highlighting consultation processes and landowners rights as additional concerns. Attendees of the Cochrane open house almost entirely focused on project alternatives and project management elements, including a lack of respect for landowners. Both open houses raised concerns regarding lack of information and many attendees indicated the Government of Alberta gave the message that SR1 was already approved.

In accordance with these trends, the questionnaire confirmed these issues and concerns, with many respondents indicating a project alternative open house held in Springbank was necessary before a decision is made. Overall, the amount of detail provided in the surveys was substantial, indicating that further discussion is needed to addresses the issues and concerns raised.

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April 10, 2015

# March 2015 Open House

# Springbank Off-stream Reservoir (SR1)

# Issue Brief and Comparative Analysis

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## Overview

The March 10 and 17 open houses for the Springbank Off-stream Reservoir (SR1) project attracted as many attendees as the January open houses. Attendees continued to ask questions and provide input regarding the design and decision making processes related to SR1 as well as other flood mitigation projects under consideration.

## 1. Records of Contact

The March open houses resulted in similar numbers of Record of Contact (ROC) forms received and exit surveys completed. A total of **979** comments on SR1 were recorded during the public input period between the four open houses in January and March.

| JANUARY 2015 | Calgary | Cochrane | Online | Sub Total |
|---|---|---|---|---|
| **Attendance** *(approximate door count)* | 300 | 200 | N/A | N/A |
| **Exit Survey** | 146 | 55 | 56 | 257 |
| **Record of Contact Form** | 156 | 115 | N/A | 271 |
| **Total** | | | | 528 |

| MARCH 2015 | Springbank | Bragg Creek | Online | Sub Total |
|---|---|---|---|---|
| **Attendance** *(approximate door count)* | 230 | 340 | N/A | N/A |
| **Exit Survey** | 84 | 148 | 24 | 256 |
| **Record of Contact Form** | 108 | 87 | N/A | 195 |
| **Total** | | | | 451 |

Many of the same attendees went to the January and March open houses; however, with the change in location, many new attendees met with the SR1 Project Team in March to provide their input and ask questions. Not all attendees signed in at the registration desk; therefore, the number of individuals who signed in was less than the approximate door count.

## 2. Attendance

The following list displays information on the attendees location based on the postal codes gathered from those who signed in.

**Springbank Open House**

- T0L – 24 recorded (Bragg Creek)
- T3Z – 104 recorded (Redwood Meadows and parts of Springbank)
- T3H – 5 recorded (Discovery Ridge/Signal Hill/Aspen Woods/Patterson/Cougar Ridge)
- T4C – 5 recorded (Cochrane)
- The remaining attendees were from Calgary and surrounding area

**Bragg Creek Open House**

- T3Z – 96 recorded (Redwood Meadows and parts of Springbank)
- T0L – 146 recorded (Bragg Creek)
- The remaining attendees were from Calgary and surrounding area

## 3. Issues and Concerns Analysis

In comparison to the issues and concerns raised during the January open houses, a slight shift in focus occurred once the preliminary cost-benefit analysis of flood mitigation projects was released. Stakeholders are still concerned with the lack of consideration for other flood mitigation projects, the impact to upstream communities if SR1 is built, and discrepancies in project cost, which corresponds with their concern of project planning and decision making. In addition, many survey respondents selected the EIA process as an important concern. The table below demonstrates these trends:

| | Issue or Concern - JANUARY 2015 | | Issue or Concern - MARCH 2015 |
|---|---|---|---|
| **1** | Consideration of Other Flood Mitigation Projects | **1** | Consideration of Other Flood Mitigation Projects |
| **2** | Project Cost | **2** | Upstream Community Impact |
| **3** | Project Planning | **3** | Project Cost |
| **4** | Project Timeline | **4** | EIA Process |
| **5** | Upstream Community Impacts | **5** | Project Planning and Decision Making |
| **6** | Lack of Information | **6** | Land |
| **7** | Engineering Design and Concept | **7** | Public Engagement |
| **8** | Landowner Rights | **8** | Better Mitigation Plans |
| **9** | Flood Policies and Mitigation Plans | **9** | Social or Community Impacts |
| **10** | Lack of Consultation | **10** | Historical Land |
| **11** | Downstream Community Impacts | **11** | Road and Highway |
| **12** | Road and Highway | **12** | Downstream Community Impacts |
| **13** | Decision Making Process | **13** | Engineering Design and Concept |
| **14** | Environmental Impacts | **14** | Wildlife |
| **15** | Fish | **15** | Timelines |
| **16** | Land Acquisition | **16** | Environment |
| **17** | Flood Protection | **17** | Maintenance of SR1 |
| **18** | Wildlife | **18** | Water Table |
| **19** | Land Access | **19** | Watershed |
| **20** | Springbank Landscape Impacts | **20** | Infrastructure |

Table 1: Issues and Concerns Open House Comparison

Many stakeholder issues or concerns are not related to the Environmental Impact Assessment of SR1. Of the top 20 issues and concerns recorded between January and March, 2015, **70%** are related to either administrative issues or socio-political concerns. The remaining 30% are related to engineering design and concept comments, road and highway concerns, and EIA considerations such as wildlife, fish and various environmental impacts.

## 4. Questionnaire Analysis

During the March open houses, attendees were asked to complete an optional exit survey for their comments to be compiled and submitted as part of the Environmental Impact Assessment application. This questionnaire analysis shows the results of each question asked, including general comments made.

**Question 1 -** *Of the following list of issues or concerns, please rate your **top 5 priorities** for the Alberta Government to address regarding the proposed Springbank Off-stream Reservoir Project (1 = most important, etc.)*

Regardless of priority, the following list ranks 10 of the most commonly selected issues or concerns from most selected to least selected. This table corresponds with the results from the overall issues and concerns table. Out of these top 10 issues, consideration of other projects and upstream community impacts make up **45%** of the responses.

| | **Issues and Concerns Priority List** | | |
|---|---|---|---|
| **1** | Consideration of Other Flood Mitigation Projects (McLean Creek or Calgary Underground Diversion Tunnel) | **6** | Land Impacts |
| **2** | Upstream Community Impacts – Bragg Creek and Redwood Meadows Flood Mitigation | **7** | Public Engagement |
| **3** | Project Cost | **8** | Better Flood Policies and Mitigation Plans |
| **4** | Environmental Impact Assessment Process | **9** | Social or Community Impacts |
| **5** | Project Planning and Decision Making | **10** | Historical Land Impacts |

Table 2: Issues and Concerns Top Priorities

The following word cloud displays the frequency of the issue or concern based off the selection of priority. Each priority, ranked one through five, is colour coded. The larger the word, the more frequently it occurred.

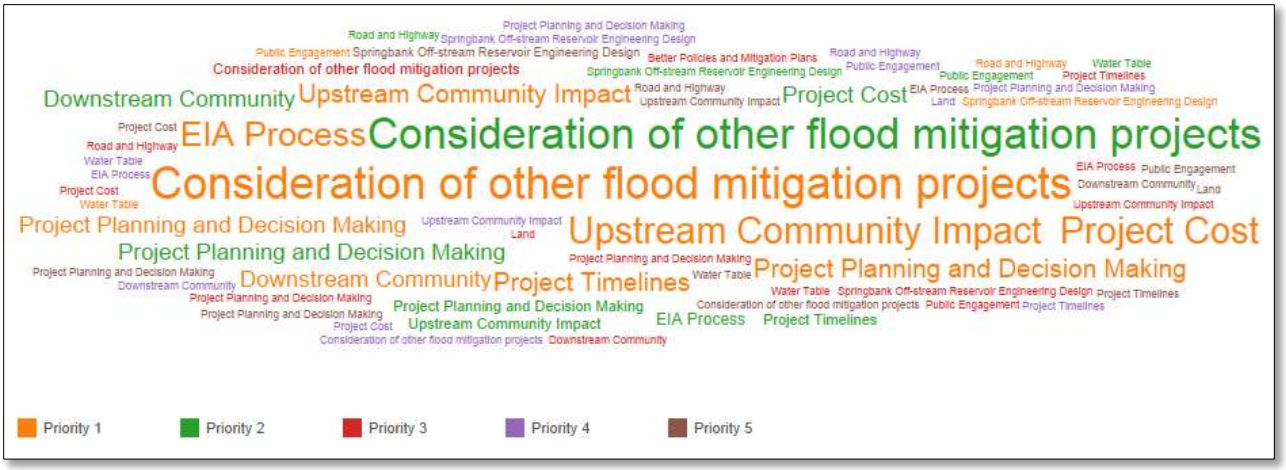


Figure 1: Word Cloud – Concerns by Priority



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**Question 2 -** *Do you support the Springbank Off-stream Reservoir Project?*

The majority of respondents, at **84%** stated they did not support SR1.

**12%** of the survey respondents were undecided because they questioned the accuracy of the information provided and had additional unanswered questions before they made a decision.

Those in support of the project were concerned that the project would be delayed. Figure 2 displays the final results.

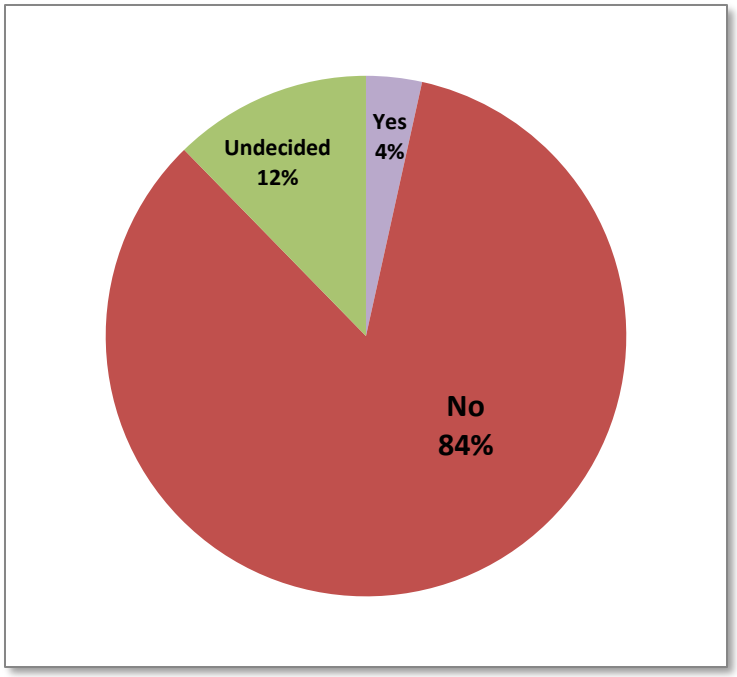


Figure 2: Support for SR1

**Question 3 -** *The information provided at the open house was:*

**41%** of respondents found the information at the open house inadequate.

A total of **68%** of respondents found the open house information either adequate or inadequate, with a few selecting both. These selections were followed by comments regarding lack of new information from the January open houses to the March open houses. Figure 3 displays the results.

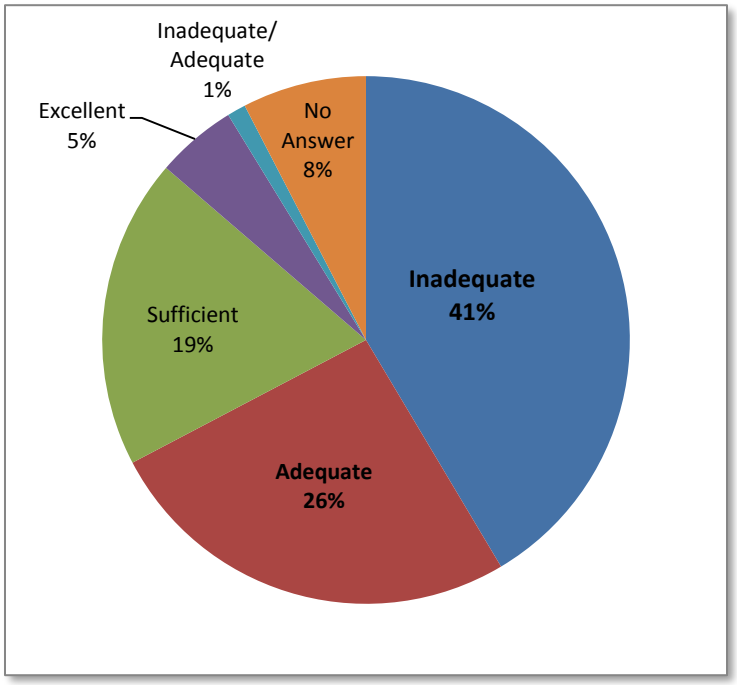


Figure 3: Information Provided at the Open House

**Question 4 -** *What communication methods can the Government of Alberta use to share information with stakeholders about the proposed Springbank Off-stream Reservoir Project?*

**20%** of survey respondents indicated they preferred the Government of Alberta to use all possible communications methods to relay information related to SR1. However, **27%** prefer face-to-face methods through open houses and meetings, in order for the stakeholders to ask questions and be part of meaningful dialogue regarding the project. Radio, interest groups and by billboards were the least common preferred method of communication.

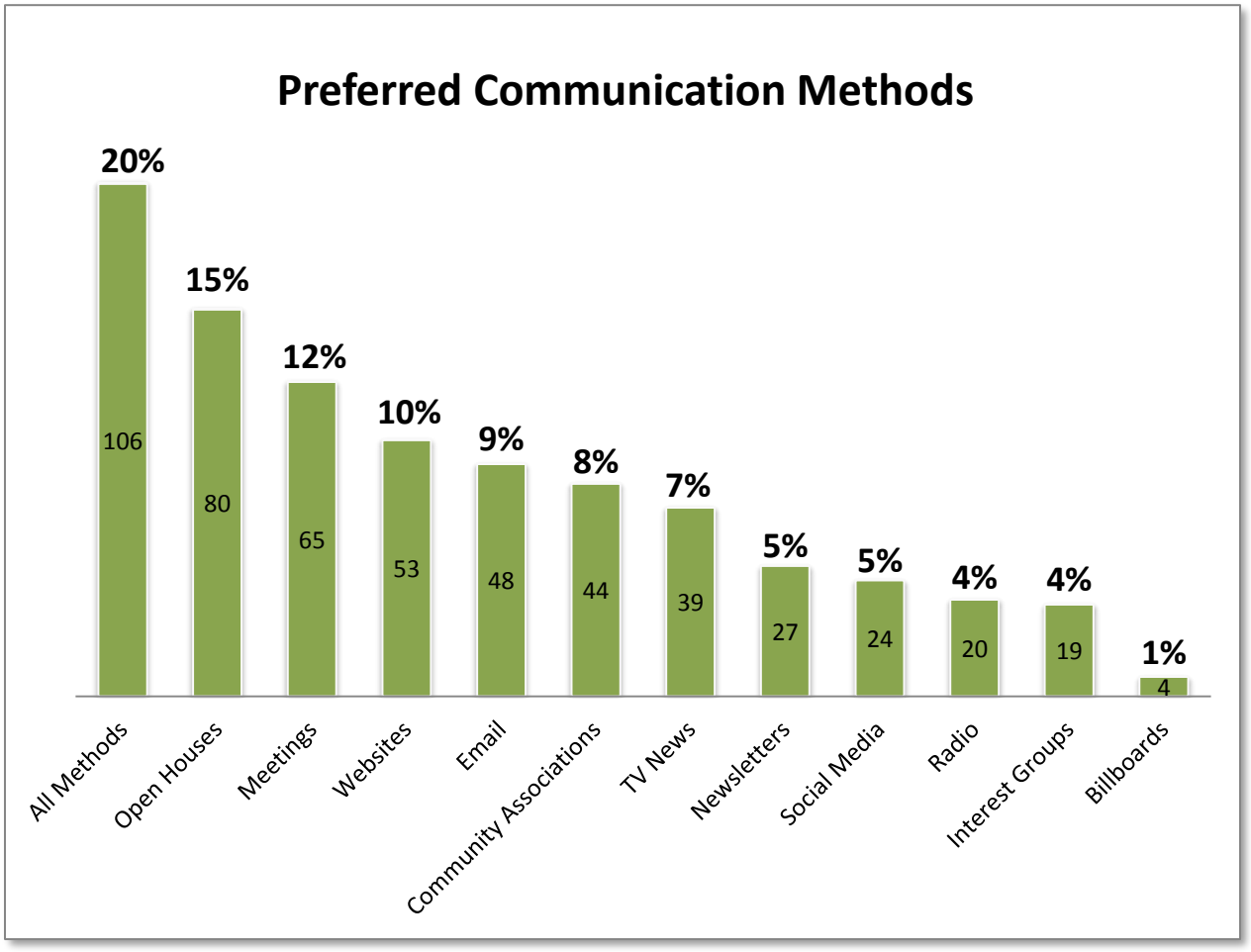


Figure 4: Preferred Communication Methods for Stakeholders from the Government of Alberta

**Question 5 -** *Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?*

Additional comments and questions regarding SR1 mainly focused on project management, including project costs, requests of an accurate cost-benefit analysis of all flood mitigation proposals, and requests for consideration of Bragg Creek and Redwood Meadows. There were also many requests for clarification on the number of acres required for SR1.

The tone of the survey was recorded based off the respondents' comments and their answer to Question 2 regarding their support of the project. The results indicate that **73%** of the surveys implied a negative tone. Accordingly, the positive and neutral tones correspond with the survey respondents' support or desire to receive accurate and additional information on the project. Figure 5 displays the results.

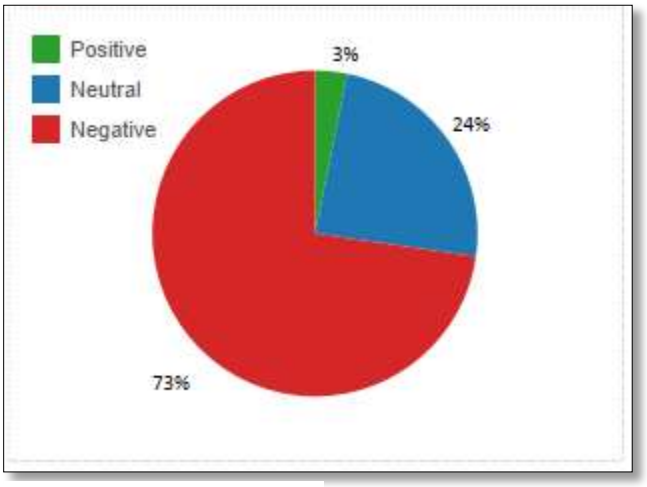


Figure 5: Survey Tone

The following word cloud displays the trends of common words or phrases that are categorized by the tone of the survey response and whether that respondent supported or did not support SR1. The more frequent a particular phrase was mentioned, the larger the word will appear. The most common phrase, associated with protecting Bragg Creek and Redwood Meadows corresponds with the results from the issues and concerns ranking from Question 1. See Figure 6 below.

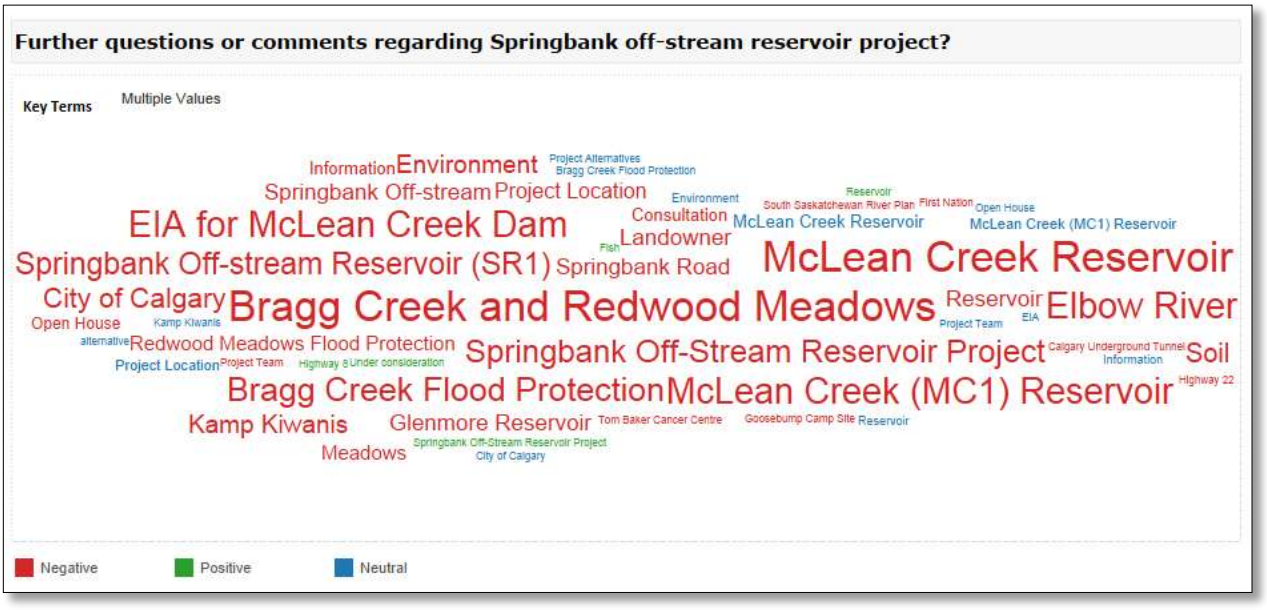


Figure 6: Word Cloud – Survey Tone and Common Phrases

## Conclusion – Summary of the January and March, 2015 Open Houses

The results of the open house surveys from both January and March indicate that the majority of issues and concerns raised by the stakeholders of SR1 are focused on the administrative and decision making elements of the project. A shift occurred in the issues and concerns raised from January to March:

- Engineering Design and Concept comments decreased from the 7th most common issue raised to the 13th.
- Consideration and requests for other flood mitigation projects, specifically for the McLean Creek Dam (MC1) increased.
- A concern for the Environmental Impact Assessment (EIA) process became a new issue. This trend is to be expected as EIA activity progresses and detailed information about the studies becomes available.
- Supporting the increase in issues related to the EIA, a greater concern regarding the environmental impacts SR1 will have on the watershed, water table, water quality and the grizzly bear population increased.

Open house attendees continued to express concern regarding landowner rights, lack of consultation and information provided to stakeholders, which contributed to their project planning and decision making concerns. Open house attendees and respondents also brought information for the government's attention regarding why MC1 should be considered over SR1. Some information included comparative examples between Alberta flood mitigation proposals with the South Saskatchewan Regional Plan.

Finally, with the release of the cost-benefit analysis for MC1 and SR1 between January and March, the majority of open house attendees and survey respondents indicated the results were inaccurate and the project costs were underestimated.

Overall, stakeholders of SR1 requested more face-to-face meetings, open houses and interactions to address their questions and concerns as the project moves forward.

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# May 2016 Open House Issue Brief

*Springbank Off-stream Reservoir (SR1) Project*

**Prepared by**
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May 31, 2016

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## 1. OVERVIEW

The May 10 and 11 open houses for the Springbank Off-stream Reservoir (SR1) project attracted a similar attracted a new group of attendees – Calgarian homeowners who were impacted by the June 2013 flood. Attendees continued to ask questions and provide input regarding the design and decision making processes related to SR1 as well as other flood mitigation projects under consideration.

## 2. RECORDS OF CONTACT

The May 2016 open houses resulted in a similar number in attendees as compared to the March 2015 open houses, however this year the percentage of attendees who provided comments by the exit survey significantly increased. Additionally, a record of over 200 surveys were submitted online following the open house events.

The May open houses resulted in a total of **698** public comments recorded for the SR1 Environmental Impact Assessment (EIA). In comparison to the 2015 open houses, which resulted in a total of **979** comments, the May open houses proved that SR1 continues to be a project of interest to the public. There was a significant increase in exit surveys completed, with a total of **555** received. The following charts compare the March 2015 open houses to the May 2016 open houses:

| MAY 2016 | Springbank | Calgary | Online | Sub Total |
|---|---|---|---|---|
| **Attendance** *(approximate door count)* | 250 | 300 | N/A | N/A |
| **Exit Survey** | 129 | 213 | 208 | 555 |
| **Record of Contact Form** | 98 | 36 | N/A | 134 |
| **Total** | | | | 698 |

| MARCH 2015 | Springbank | Bragg Creek | Online | Sub Total |
|---|---|---|---|---|
| **Attendance** *(approximate door count)* | 230 | 340 | N/A | N/A |
| **Exit Survey** | 84 | 148 | 24 | 256 |
| **Record of Contact Form** | 108 | 87 | N/A | 195 |
| **Total** | | | | 451 |

## 3. ATTENDANCE

The following list displays information on the attendees location based on the postal codes gathered from those who signed in.

### 3.1. Springbank Open House

T3Z 97 recorded (Redwood Meadows and parts of Springbank)
T4C 14 recorded (Cochrane)
TOL 5 recorded (Bragg Creek)
T0M 2 recorded (Cremona)
T3H 3 recorded (Discovery Ridge/Signal Hill/Aspen Woods/Patterson/Cougar Ridge)
T1X 1 recorded (Chestermere)
T1W 1 recorded (Canmore)

### 3.2. Calgary Open House

T2S 158 recordings (Elbow Park/Britannia/Parkhill/Mission)
T3Z 15 recordings (Redwood Meadows and parts of Springbank)
T2T 14 recordings (Altadore/Bankview/Richmond)
T3H 5 recordings (Discovery Ridge/Signal Hill/Aspen Woods/Patterson/Cougar Ridge)
T2Z 3 recordings (Douglas Glen / McKenzie Lake / Copperfield / East Shepard)
T4C 3 recordings (Cochrane)
T0L 2 recordings (Bragg Creek)
T1X 1 recording (Chestermere)
T4B 1 recording (Airdrie)

## 4. ISSUES AND CONCERNS ANALYSIS

The May open houses continued to interest the public. In particular, the Calgary River Communities Action Group (CRCAG) actively promoted the open houses and encouraged their members to complete an exit survey so the voices of those impacted by the June 2013 floods would be considered part of SR1's EIA. As a result, the issues and concerns differ significantly from 2015.

The table below compares the May 2016 open house issues raised with those from March 2015.

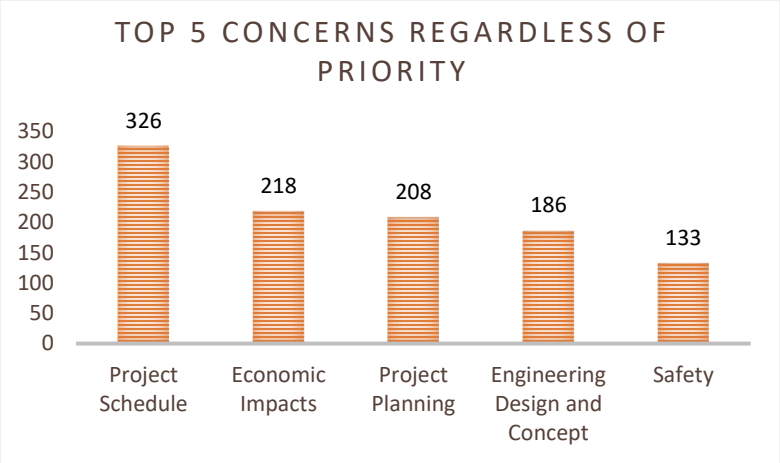
| | Issue or Concern – MAY 2016 | | Issue or Concern - MARCH 2015 |
|---|---|---|---|
| **1** | Project Alternatives | **1** | Project Alternatives |
| **2** | Engineering Design and Concept | **2** | Upstream Community Impacts |
| **3** | Project Cost | **3** | Project Cost |
| **4** | Road and Highway | **4** | EIA Process |
| **5** | Project Planning | **5** | Project Planning and Decision Making |
| **6** | Project Timeline | **6** | Land |
| **7** | Land Impacts | **7** | Public Engagement |
| **8** | EIA Process | **8** | Better Mitigation Plans |
| **9** | Lack of Information | **9** | Social or Community Impacts |
| **10** | Support | **10** | Historical Land |
| **11** | Downstream Community Impacts | **11** | Road and Highway |
| **12** | Economic Impacts | **12** | Downstream Community Impacts |
| **13** | Wildlife | **13** | Engineering Design and Concept |
| **14** | Decision Making Process | **14** | Wildlife |
| **15** | Land Access | **15** | Timelines |
| **16** | Land Acquisition | **16** | Environment |
| **17** | Safety | **17** | Maintenance of SR1 |
| **18** | Upstream Community Impacts | **18** | Water Table |
| **19** | Water Quality | **19** | Watershed |
| **20** | Construction Timeline | **20** | Infrastructure |

## 5. EXIT SURVEY ANALYSIS

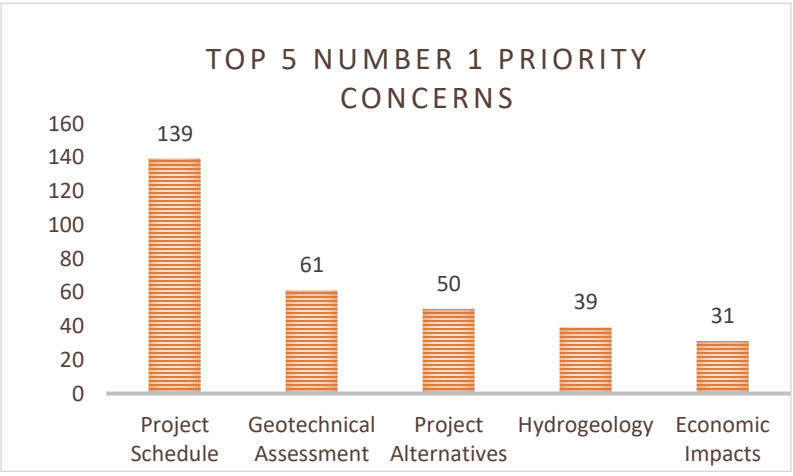
### 5.1. Question 1

*Please select your top 5 priorities for the Government of Alberta to address regarding the Environmental Impact Assessment for the Springbank Off-stream Reservoir Project.*

During the open houses, attendees were asked to select their top five issues or concerns regarding the EIA for SR1. The chart to the left displays the most commonly selected issues. This chart will correspond with the word cloud. The word cloud below highlights the most common words in a larger and darker colour. The less common the issues was selected, the smaller and lighter coloured the word will appear.

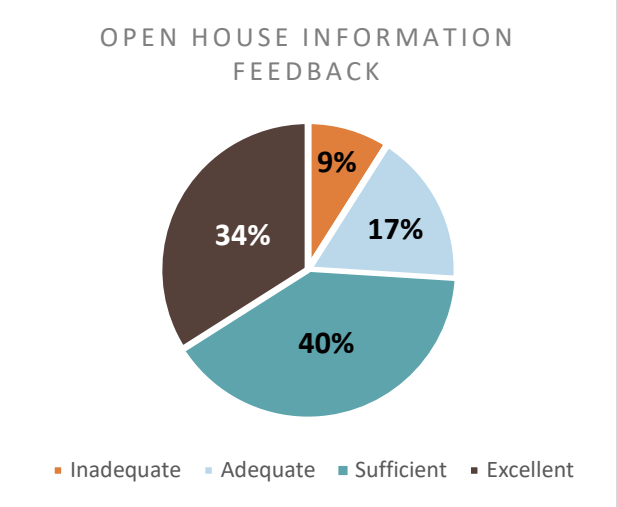


Some respondents ranked their priorities, explaining to the Government which topics that are the most important to them. Accordingly, the graph to the left demonstrates the top five concerns exit survey respondents selected as their number one priority.



### 5.2. Question 2

*The information provided at the open house was (select) inadequate, adequate, sufficient or excellent.*



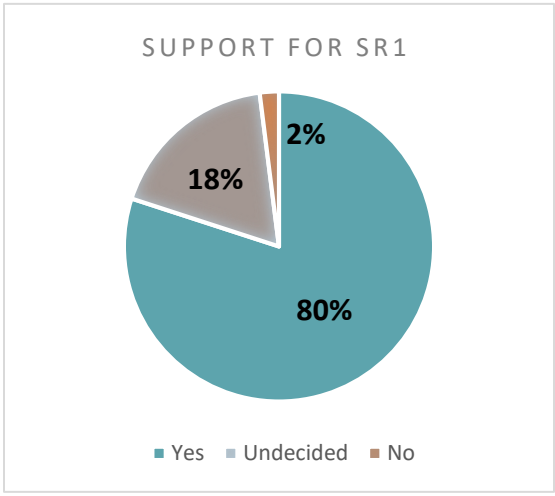

The results of Question 2 differed from the Springbank open house to the Calgary open house. Generally, Springbank attendees found the open house only adequate, mentioning there was inconsistent information and gaps in information presented. The Calgary attendees generally felt the information was excellent and noted the team members we helpful in answering their questions. The chart to the right displays the overall results.

In March 2015, 41% of respondents noted the open house was inadequate, while only 24% found the open house excellent or sufficient.

### 5.3. Question 3

*Do you support the Springbank Off-stream Reservoir Project?*

An overwhelming number of attendees who attended the open house expressed support for the Project. Of note, at the Springbank open house, approximately __ of attendees indicated they support SR1 as well.




### 5.4. Question 4

*Rate the Government of Alberta's efforts to engage and share information with stakeholders about the Springbank Off-stream Reservoir Project.*

A slight majority of respondents at 67% selected either excellent or good regarding the Government's efforts to share information. There was not one category that was selected more frequently than the other. Last year, we asked respondents to select preferred communication methods to relay information, which open houses, meetings and by the website was noted as most preferred next to all methods possible. This year, survey respondents indicated the Government should use more avenues and provide more time when adverting for Project open houses.

### 5.5. Question 5

*Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?*

The majority of respondents indicated they felt the Government's decision making process was taking too long and that SR1 construction should begin as soon as possible. Those in support of SR1 are concerned another flood may occur before the Project is completed. Additionally, many Calgarians stated the Government needs to consider the full social and economic impact of another flood as part of the cost-benefit analysis of moving forward with SR1. Accordingly, many Calgarians noted the cost of SR1 would be less than another flood impacting downtown Calgary.

Those not in favour of SR1 stated they did not believe the costs of SR1 presented by the Government was accurate. The respondents implied that transportation, infrastructure and land acquisition costs will significantly increase over time. There are still many concerns regarding how and why the Government chose SR1 over MC1.

The tone of the survey was recorded based off the respondents' comments and their answer to Question 3 regarding their support of the Project. The results indicate that **80%** of the surveys implied a supportive or positive tone. The word cloud displays the trends of common words or phrases that are categorized by the tone of the survey response and whether that respondent supported or did not support SR1. The more frequent a particular phrase was mentioned, the larger the word will appear. Supportive words are in blue, non-supportive in orange, and undecided in grey.

## 6. CONCLUSION AND SUMMARY OF TRENDS

Many attendees spoke with Project representatives during the open house, however not a lot of feedback was provided one-on-one. Rather, many opted to completing the exit survey as a way of submitting the comments for the Government to consider. With large attendance numbers in support of SR1, areas of interest remained about engineering design and concept and road and highway alterations. Those not in favour frequently discussed Project alternatives to SR1 and the Project cost. The following word cloud highlights the most frequently raised topics.

The results of the open house surveys from May 2016 differ dramatically from what was submitted in March 2015:

- Engineering design and concept increased from 13th most common topic to the second.
- Road and Highway discussions increased, focusing on the cost of highways alterations and possible locations of roads to accommodate SR1.
- Greater discussion on Project timeline, with equally strong viewpoints that SR1 should move forward quicker or abolished completely.
- An increase of awareness regarding the impact SR1 would have on Springbank land, including agriculture and historical ranch land impacts, contrasted by an opinion that all social and economic impacts another flood would have on the City of Calgary.

As SR1 continues through the EIA, proponents of the Project will continue to promote speedy flood mitigation for the City of Calgary, while landowners and residents of Bragg Creek and Redwood Meadows will strategically attempt to delay the regulatory process. While landowners reluctantly move through the process of EIA activity on their land, all those opposed to SR1 are lobbying CEAA to intervene and complete their own EA for SR1.

To the general public, however, understanding that SR1 is the only flood mitigation project moving forward continues to cause confusion; those either positively or negatively impacted by the June 2013 flood continued to look for flood mitigation answers at the SR1 open houses. While the Government solely moves forward on SR1, streamlining the flood mitigation message for the City of Calgary and impacted landowners will be of utmost importance.

For any questions or comments on this issue brief, please contact:

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# August 2017 Open House Issue Brief

*Springbank Off-stream Reservoir (SR1) Project*

**Prepared by**
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September 18, 2017

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## 1. OVERVIEW

Open Houses for the Springbank Off-Stream Reservoir (SR1) Project took place on August 16 and 22, 2017 in Springbank, and August 17 and 29, 2017 in Calgary. Awareness of the Open Houses was achieved through the following methods:

- An invitation was sent by Alberta Transportation via email to affected landowners on July 31. A reminder email was sent on August 11.
- On August 10t an email invitation was sent from the project email address to 549 stakeholders and members of the public who provided contact information to receive Project updates.
- 476 invitation postcards were sent via postal code through Canada Post unaddressed admail to the project area on August 7.
- Advertisements ran in the Calgary Herald (August 2, 9, and 16) Calgary Sun (August 2, 9, and 16), Cochrane Eagle (August 3 and 10), Rocky View Weekly (August 1, 8, and 15).
- A road sign was set up at the Springbank Park for All Seasons (August 9 – 23)
- A road sign was set up in Calgary on the north side of 32 Ave SW, west of 14 St SW (August 11 - 30)
- Information was published on the Alberta Environment and Parks Project web site on August 4.
- A media announcement was issued by Alberta Environment and Parks on August 11. (http://aep.alberta.ca/water/programs-and-services/flood-mitigation/flood-mitigation-projects/springbank-road.aspx).

The Open Houses attracted Springbank landowners directly affected or adjacent to the Project footprint, and Calgary homeowners and residents who were impacted by the June 2013 flood. The Open House attendees continued to ask questions and provide input regarding the decision-making processes related to SR1 and the Project schedule, as well as other flood mitigation projects under consideration.

## 2. RECORDS OF CONTACT

The following tables compare the May 2016 Open Houses with the August 2017 Open Houses:

May 2016

| | Springbank | Calgary | Online | Total |
|---|---|---|---|---|
| **Attendance** | 250 | 300 | N/A | 550 |
| **Exit Survey** | 129 | 213 | 208 | 550 |
| **Record of Contact Form** | 98 | 36 | N/A | 134 |
| **Total** | 477 | 549 | 208 | |

August 2017

| | Springbank | Calgary | Total |
|---|---|---|---|
| **Attendance** | 207 | 274 | 481 |
| **Exit Survey** | 90 | 120 | 210 |
| **Record of Contact Form** | 227 | 183 | 410 |
| **Total** | 524 | 577 | |

The August 2017 Open Houses resulted in a lower number of attendees than the May 2016 Open Houses. The percentage of attendees who provided comments via the exit survey significantly decreased. A website link to an online survey was provided on the exit surveys for the May 2016 Open Houses; the option to submit online surveys was not provided during the August 2017 Open Houses. This is one of the factors attributed to the decline in feedback via the exit survey. However, as a percentage, fewer attendees stopped to fill out the exit survey.

The August 2017 Open Houses resulted in a total of **620** recoded public comments. In comparison to the May 2016 Open Houses, which resulted in a total of **684** comments, the August 2017 Open Houses proved that SR1 continues to be a project of interest to the public. Many Open House attendees were encouraged by Project representatives to complete an exit survey to have comments recorded for consideration in the EIA. Those impacted by the June 2013 flood were encouraged by the Calgary River Communities Action Group (CRCAG) to attend the Open Houses and complete an exit survey. There was a significant decrease in exit surveys, with a total of **210** received, while the number of Records of Contact (ROCs) increased.

## 3. ATTENDANCE

The following list of postal codes was gathered from those who signed in at each of the Open Houses.

### 3.1. Springbank Open Houses

T0L 7 recordings (Bragg Creek)
T2E 1 recording (Bridgeland / Greenview / Zoo)
T2G 2 recordings (Inglewood / Burnsland / Chinatown / East Victoria Park / Saddledome)
T2J 2 recordings (Queensland Downs / Lake Bonavista / Willow Park / Acadia)
T2P 1 recording (City Centre / Calgary Tower)
T2S 8 recordings (Elbow Park / Britannia / Parkhill / Mission)
T3B 1 recording (Montgomery / Bowness / Silver Springs / Greenwood)
T3E 1 recording (Lakeview / Glendale / Killarney / Glamorgan)
T3H 1 recording (Discovery Ridge / Signal Hill / Aspen Woods / Patterson / Cougar Ridge)
T3R 1 recording (Calgary Northwest)
T3Z 23 recordings (Redwood Meadows)
T4C 4 recordings (Cochrane)
T8A 1 recording (Sherwood Park West)

### 3.2. Calgary Open Houses

T0C 1 recording (Stettler)
T0L 2 recordings (Claresholm)
T2B 1 recording (Forest Lawn / Dover / Erin Woods)
T2J 1 recording (Queensland Downs / Lake Bonavista / Willow Park / Acadia)
T2S 47 recordings (Elbow Park / Britannia / Parkhill / Mission)
T2T 1 recording (Altadore / Bankview / Richmond)
T3Z 3 recordings (Redwood Meadows)
T5J 1 recording (Edmonton North Downtown)

## 4. ISSUES AND CONCERNS ANALYSIS

The August 2017 Open Houses continued to interest the public. In particular, the CRCAG actively promoted the Open Houses and encouraged its members to complete an exit survey to ensure the comments and concerns of those impacted by the June 2013 flood would be considered in the EIA. As a result, the issues and concerns differ significantly from May 2016.

The following table compares the issues from the August 2017 Open Houses with the May 2016 Open Houses.

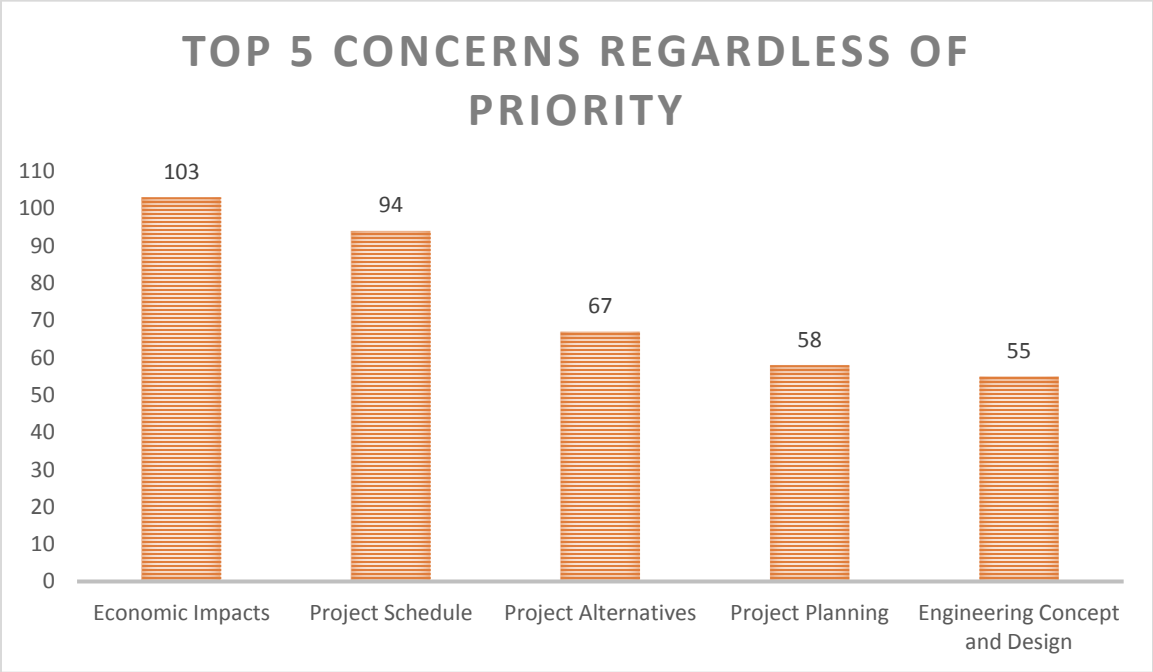
| | Issue or Concern - August 2017 | | Issue or Concern - May 2016 |
|---|---|---|---|
| **1** | Project Alternatives | **1** | Project Alternatives |
| **2** | Engineering Design and Concept | **2** | Engineering Design and Concept |
| **3** | Project Cost | **3** | Project Cost |
| **4** | Environment | **4** | Road and Highways |
| **5** | Land Acquisition | **5** | Project Planning |
| **6** | Bragg Creek /Redwood Meadows | **6** | Project Timeline |
| **7** | Land Impacts | **7** | Land Impacts |
| **8** | Project Planning | **8** | EIA Process |
| **9** | Economic Impacts | **9** | Lack of Information |
| **10** | Flood Protection | **10** | Expression of Support |
| **11** | Project Timeline | **11** | Downstream Community Impacts |
| **12** | Public Engagement and Input | **12** | Economic Impacts |
| **13** | Flood Mitigation | **13** | Wildlife |
| **14** | Water Quality | **14** | Project Decision Making |
| **15** | Recreational | **15** | Land Access |
| **16** | Landowner Rights | **16** | Land Acquisition |
| **17** | Road and Highways | **17** | Safety |
| **18** | Safety | **18** | Upstream Community Impacts |
| **19** | Wildlife | **19** | Water Quality |
| **20** | Downstream Community Impacts | **20** | Construction Timeline |

The word cloud below highlights the most frequently discussed topics raised during discussions with Project representatives during the Open Houses. Tithe most common concerns in a larger and darker colour. The less often the issues were selected, the smaller and lighter coloured the word will appear.

## 5. EXIT SURVEY ANALYSIS

### 5.1. Question 1

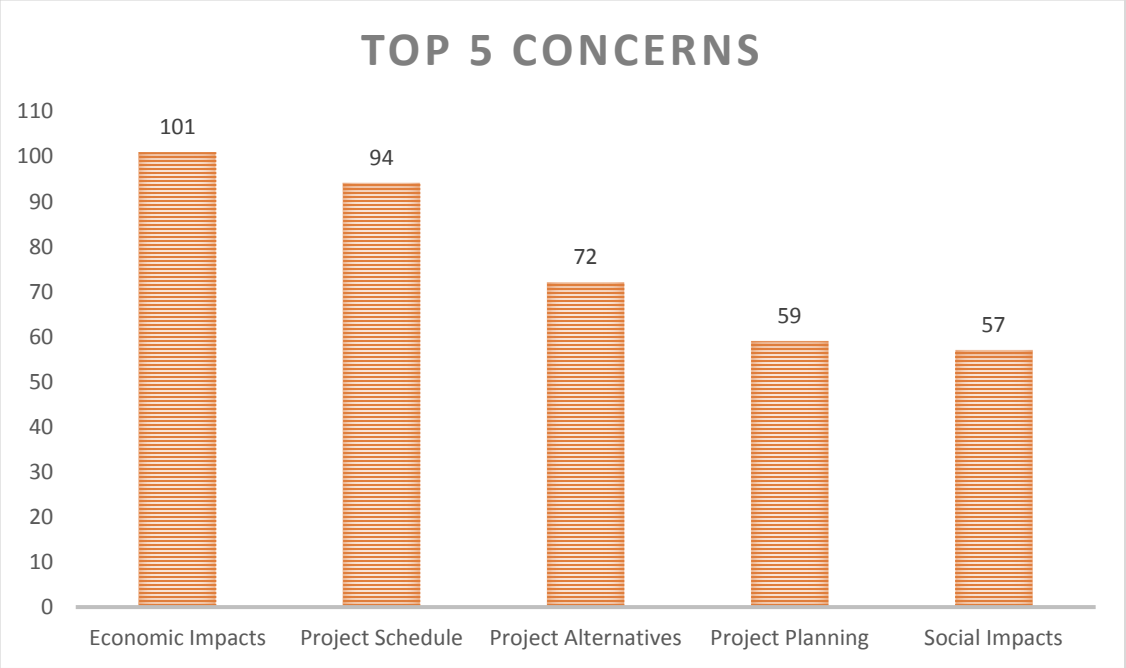
*Please select the top 5 priorities for the Government of Alberta to address regarding the EIA for the Springbank Off-stream Reservoir.*




During the Open Houses, attendees were asked to select their top five issues or concerns regarding the EIA for SR1. The chart above displays the most commonly selected priority concerns. The chart is based on the frequency of concerns selected. Of the Open House attendees that completed an exit survey, 56 per cent were in favour of SR1; therefore, economic impacts, project schedules and project alternatives correspond with the concerns over impacts to Calgary if another flood were to occur, that the Project should be built faster and the exploration of alternative flood mitigation options. Project planning most often correlated with comments relating to the pace at which the Project was progressing. Many attendees suggested the Project was not progressing quickly. Furthermore, engineering design and concept most often correlated to comments regarding how SR1 would operate, including channel and outlet impacts.

The chart on the previous page corresponds with the word cloud below. The larger blue words were the most common concerns with the darker concerns being selected most often. The green words were selected less frequently.

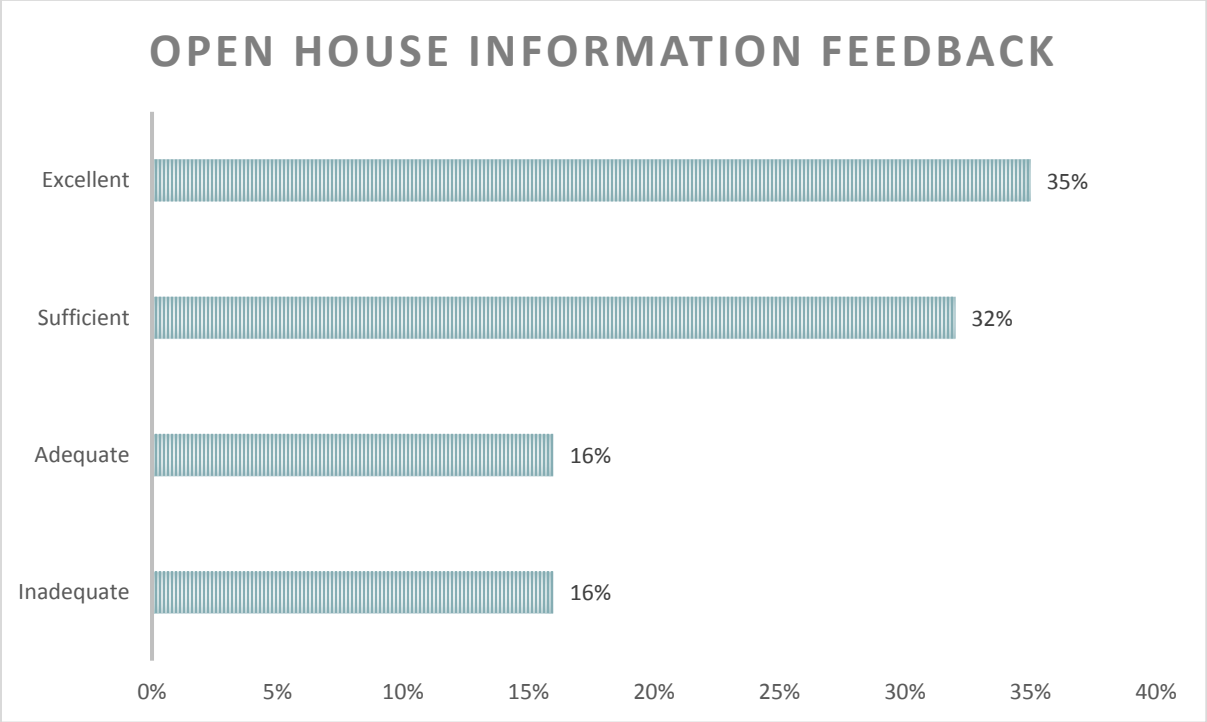
Question 1 requested that attendees rank their top five concerns in order of priority; accordingly, the chart on the following page demonstrates the top five concerns respondents selected as their number one priority. For example, if a respondent wrote a number beside the concern, the chart shows the most common concerns that were selected as number one.



### 5.2. Question 2

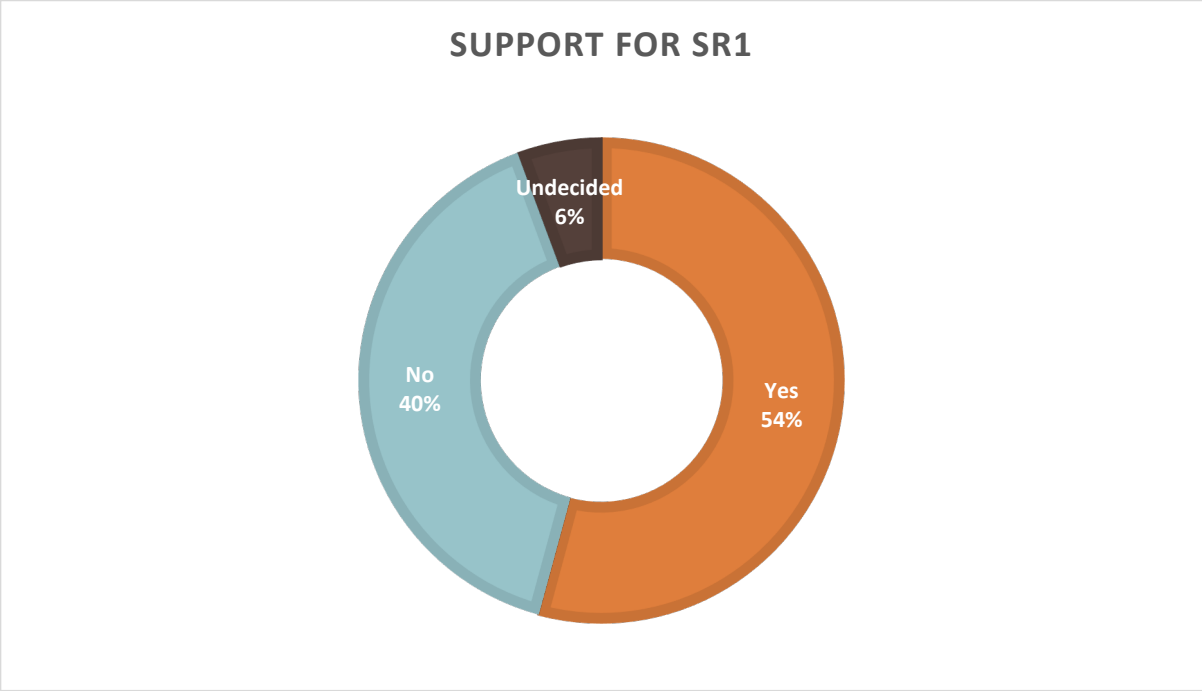
*The information provided at the Open House was (select) inadequate, adequate, sufficient or excellent.*

The results of Question 2 differed from the Springbank Open House to the Calgary Open House. Generally, Springbank attendees found the Open House adequate or sufficient, mentioning there was inconsistent information and gaps in information presented. The Calgary attendees generally felt the information was excellent and noted Project representatives were helpful in answering their questions. The chart below displays the overall results.



### 5.3. Question 3

*Do you support the Springbank Off-stream Reservoir Project?*

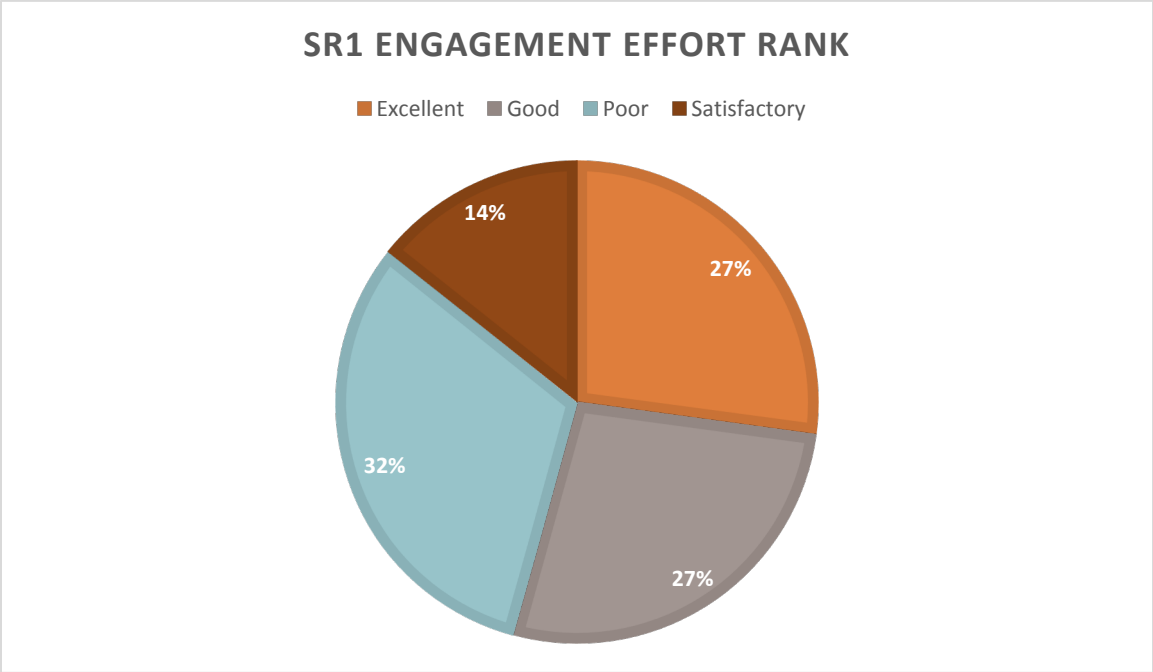



There was a considerable decrease in the amount of support for the Project as well as an increase in opposition. In comparison, during the May 2016 Open House 80 per cent of attendees were in favour of SR1, and 18 per cent were opposed.

- During the Springbank Open Houses 75 per cent of the attendees indicated they were opposed to SR1, while 25 per cent were in favour.
- During the Calgary Open Houses 14 per cent of the attendees indicated they were opposed to SR1, while 86 per cent were in favour.

### 5.4. Question 4

*Rate the Government of Alberta's efforts to engage and share information with stakeholders about the Springbank Off-stream Reservoir Project.*




The majority of respondents stated the engagement efforts of Alberta Transportation were excellent or good, while the largest percentage of respondents stated the engagement efforts were poor. There was not an overwhelming majority response to any one category. In 2015, respondents were requested to select their preferred communication methods to relay information; Open Houses, meetings, and the website were noted as the most preferred. During the August 2017 Open Houses, survey respondents indicated Alberta Transportation should provide more time when advertising for Project Open Houses.

### 5.5. Question 5

*Do you have any further questions or comments for the Government of Alberta regarding the proposed Springbank Off-stream Reservoir Project?*

The majority of respondents indicated they felt the Project progress was taking too long and that SR1 construction should begin as soon as possible. This sentiment relates to respondents' selection project schedule concerns in Question 1 of the exit survey. Those expressing support for SR1 were concerned another flood may occur before the Project is completed, which relates to the economic impacts concern.

Many Calgarians stated Alberta Transportation should consider the full social and economic impact of another flood as part of the cost-benefit analysis of moving forward with SR1. Accordingly, many Calgarians noted the cost of SR1 would be less than another flood impacting downtown Calgary.

Those attendees opposed to SR1 stated they did not believe the costs of SR1 and the McLean Creek Dam presented by Alberta Transportation inaccurate. They believe the Government's land value assessments were inaccurate. The respondents suggested the Project would only provide flood mitigation to downstream area residents. Many concerns remain regarding how and why the Government chose SR1 over the Mclean Creek Dam.

The tone of the survey was recorded based on the respondents' comments and their responses to Question 3 regarding their support for the Project. The results indicate that **54 per cent** of the surveys implied a supportive or positive tone. The word cloud above displays the trends of common words or phrases that are categorized by the tone of the survey response and if the respondent was in support or opposition to SR1. The more frequent a particular phrase was mentioned, the larger the word will appear. Supportive comments are indicated in blue, opposed comments are indicated in orange, and undecided comments are in grey.

## 6. CONCLUSION AND SUMMARY OF TRENDS

Many attendees spoke with Project representatives during the Open Houses and feedback was provided one-on-one. Additionally, many attendees opted to complete an exit survey as a way of submitting their comments for the Government's consideration. With the slight majority of attendees in favour of SR1, areas of interest were regarding Project timelines and economic impacts. Those opposed to the Project frequently discussed alternatives to SR1, land acquisition, and Project cost.

The results of the Open House surveys from August 2017 are fairly consistent with what was submitted in May 2016:

- Road and Highway discussions remained a topic of local interest, focusing on the access to Springbank and Bragg Creek and possible locations of roads to accommodate SR1.
- Discussions regarding Project timeline, with equally strong viewpoints that SR1 should progress more expeditiously or be cancelled completely.
- Awareness regarding the impact SR1 would have on Springbank land, including impacts on agriculture and historical ranch land, contrasted by an opinion regarding the social and economic impacts another flood would have on the City of Calgary.
- Many attendees opposed to the Project indicated the public opinion had not been considered, alternatively the attendees in favour of the Project suggested too much discussion had occurred.

As SR1 continues through the provincial and federal environmental assessment processes, proponents of the Project will continue to promote speedy flood mitigation for the City of Calgary, while landowners and residents of Bragg Creek and Redwood Meadows continue to strategically attempt to delay the regulatory process.

Whether in support or opposed to the Project, stakeholders were generally confused about the selection of SR1 and continue to seek flood mitigation information, beyond just SR1, at open houses. While the Government moves forward on SR1, streamlining the overall flood mitigation message is of utmost importance to respondents.

For any questions or comments on this issue brief, please contact Amelia Trochim or Megan Young of Communica Public Affairs Inc.

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