# ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT
## Changes to EIA Conclusions



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# CHANGES TO EIA CONCLUSIONS

| Valued Component (VC) | What is the Change | What our Conclusion was in the Environmental Impact Assessment (EIA) | What our Conclusion is Now | Why did this Change? |
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| **Vegetation and Wildlife** | Change in duration classification | The assessment of post-flood operations stated effects would be medium-term on vegetation and wetlands (Volume 3B, Section 10.2.5, Table 10-13) and short-term on wildlife and biodiversity (Volume 3B, Section 11.3.7, Table 11-7), sora (Volume 3B, Section 11.3.7, Table 11-9), and migratory birds (Volume 3B, Section 11.3.7, Table 11-11). | In the response to Round 2 Alberta Environment and Parks (AEP) Question 101a, the duration characterization was changed from "medium-term" for vegetation and wetlands to "short-term to long-term". For wildlife and biodiversity the duration characterization was changed from "short-term" to "short-term to long-term".<br><br>Duration as defined in the EIA (Volume 3A, Section 10.1.5, and Section 11.1.5) is "*The period of time required until the measurable parameter or the VC returns to its existing condition, or the residual effect can no longer be measured.*<br><br>*Short Term: residual effect is limited to the construction phased or otherwise*<br><br>*Long Term: residual effect extends for the life of the Project."*<br><br>Updated versions of Tables 10-13, 11-7, 11-9 and 11-11 are provided in Round 2 AEP Question 101 Table 101-1 to Table 101-4 with the revisions highlighted in red in response to Round 2 AEP Question 101.<br><br>The response to AEP Question 101a acknowledges that during construction the Project will result in the alteration and loss of habitat, including native grassland. The permanent and long-term loss of habitat, such as native grassland, will occur where there is overlap with permanent Project structures (e.g., diversion channel). However, reclamation of the construction area will result in changes that will vary. Grasslands are expected to re-establish within three years but resemble early seral communities for 12 years or more beyond construction. Tree and shrub communities will become grassland with trees and shrubs establishing naturally in time.<br><br>The response also acknowledges that sediment deposition will reduce habitat suitability, depending on sediment depth during post-flood operations. Although this sediment deposition will temporarily reduce habitat suitability in the reservoir, it is expected these areas will be recolonized by vegetation from the surrounding area and seeded if revegetation targets are not met. Areas that might receive deeper sediment (e.g., 10 cm to 100 cm or greater than 1 m) would require a longer recovery time for habitat to become suitable for wildlife.<br><br>With this change, the significance conclusions remains the same as in the EIA. | This is an errata and the duration characterization was changed to match the definition provided in Volume 3A, Section 10.1.5, Table 10-2 and Volume 3A, Section 11.1.6, Table 11-5. |

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| **Surface Water Quality – Total Suspended Sediment (TSS)** | Change in TSS conclusions | The EIA (Volume 3B, Section 7.5) and the response to Round 1 AEP IR309 conclude that the effects of the Project on water quality as a result of suspended sediment is not significant. Although this determination did not address all of the criteria for the significance in the definition for water quality in Volume 3A, Section 7.1.7, the initial conclusion was, in part, based on the fact that the peak sediment concentrations at the end of (late) release from the reservoir would be substantially lower than the peak sediment concentrations in the river during the respective floods without the Project.<br><br>Further, it is stated in the EIA that:<br>1. sediment peaks occurring at the end of (late) release from the reservoir would only occur for a short time<br>2. the reservoir operation would be an irregular and infrequent event<br>3. elevated suspended sediments could be further mitigated through varying the release rates | The response to Round 2 AEP Question 67 outlines that additional modelling has been undertaken to assess the effects of sediment release from the Project on water quality, by evaluating two release timings (early and late). Using the significance definition for water quality in Volume 3A, Section 7.1.7, this updated assessment identifies that the potential exceedance of the TSS guidelines during water releases are considered significant, based on the TSS modelling results (see response to Round 2 AEP Question 65).<br><br>Table 67-1 updates Table 7-4 from the EIA (Volume 7B, Section 7.4.5) and presents an assessment of the Project residual effects, specifically on the change in suspended sediment transport based on the updated model results and analysis. Red text in the table indicates a modification to the table compared to Table 7-4. As indicated in Table 67-1, although the TSS exceedances result in a significant effect on water quality, they are predicted to occur infrequently and are reversible. The magnitude and duration of the Project residual effects are reduced during the more frequent events such as the 1:10 year flood. Project residual effects increase during the less frequent, larger magnitude floods, such as the 1:100 year and design floods.<br><br>The effects associated with TSS and the early release scenario are also presented in the response to Impact Assessment Agency of Canada (IAAC) Round 2 Question 4-01. | Alberta Transportation was asked by Fisheries and Oceans Canada (DFO), the IAAC, and AEP (obtained through the first round of information requests) to explore the possibility of releasing water from the reservoir earlier than the timing described in the EIA. Revised modelling was undertaken to assess the effects of an earlier release of water from the reservoir on fish and aquatic biota.<br><br>Alberta Transportation is introducing a new operational rule for releasing flood waters from the reservoir earlier, at a time when the flows in Elbow River are below 160 $m^3/s$ (following the peak of flood flow in Elbow River).<br><br>The conclusions related to surface water quality effects related to TSS have changed because they are now based strictly on the definition in the EIA (Volume 3, Section 7.1.7).<br><br>Further, based on the new modelling, it is expected that an earlier release time will result in reduced sediment deposition within the reservoir due to the reduced amount of time that water spends in the reservoir. As a result, TSS concentrations in Elbow River will be greater in early release than in late release. |
| **Hydrology** | Change in river processes resulting from reduction in flooding | In the response to Round 1 Natural Resources Conservation Board (NRCB) IR62, Alberta Transportation characterized the direction of the effect on hydrology as positive.<br><br>The basis of the positive direction was that flow reductions would have a positive socio-economic effect on communities downstream of the Project by reducing potential damage to infrastructure and potential damage to personal and business buildings and contents. Effects on human health would be reduced. These reductions would also have a positive effect on natural features (e.g., soils, vegetation, wildlife) downstream of the Project by the substantial reduction of adverse effects relative to a flood without the Project: the Project will reduce the disturbance and/or destruction of riparian and adjoining areas along Elbow River, while still allowing flood flows of 160 $m^3/s$ that will maintain river ecological functions. | In the response to Round 2 NRCB Question 14a, the effects characterization for direction was revised to say the overall effect on ecological and geomorphic processes of reducing the flood peak, for extreme floods, to 160 $m^3/s$ for flows up to 760 $m^3/s$ (thereby, reducing flows by up to 600 $m^3/s$) is neutral, although effects on some individual processes could be adverse.<br><br>The response discusses five ecologically important geomorphic processes that may be incrementally altered by decreasing peak flood flows in Elbow River: (1) overbank deposition, (2) bank erosion rates, (3) channel morphology, (4) scour and maintenance of large pools, and (5) maintenance and formation of side channels. An analysis is provided for individual effects descriptions for each process (see Table 14-1 in NRCB Round 2 Question 14a., in addition to the overall effects characterization. | The change is the result of examining the effects of reduced flooding on hydrology by looking at five specific riverine processes and leaving out consideration of possible socio-economic benefits associated with reduced flooding. |

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| **All VCs** | Changes to low-level outlet works (LLOW) and installation of erosion control measures in unnamed creek; change in construction footprint | The location of the LLOW presented in the EIA was aligned with the unnamed creek and required limited intake and exit channels to connect with the existing unnamed creek stream channel.<br><br>The original design in the EIA did not include any alterations to the existing unnamed creek beyond the immediate dam and low-level outlet. | The revised LLOW is approximately 190 m southwest from the original design location. The revised location is located upland from the unnamed creek and requires the construction of channels from the unnamed creek (in the reservoir) to the LLOW and from the LLOW back to the unnamed creek (outside the reservoir). In addition, a mid-slope gate tower was added to the design to provide for a second (back-up) gate to improve operations reliability.<br><br>The construction area at the downstream end of the unnamed creek has slightly increased by 4.8 ha compared to what was identified in the EIA. This is a minor change in the construction area footprint that does not extend outside of the Project development area (PDA).<br><br>Although there is a change to the LLOW and a slight increase in the disturbance footprint, this does not alter the EIA conclusions for air quality, acoustics, public health, groundwater and soils and terrain.<br><br>For vegetation and wetlands, although the small increase in construction areas has the potential to affect rare plants that have not been detected and has a potential for a small increase in effect to traditional use plants, the EIA conclusions remain unchanged.<br><br>The structural changes will result in an additional direct loss of wildlife habitat. However, the small change in the construction footprint will not change the EIA conclusions for change in habitat or change in mortality risk. The installation of additional riprap along the unnamed creek has potential to add a small incremental barrier to local wildlife movement in the PDA, but this would not change the EIA conclusions.<br><br>For both historical resources and traditional land and resource use, there is the potential of additional historical and traditional and cultural sites to be disturbed. Alberta Transportation will complete all required Historic Resources Impact Assessment (HRIA) investigations in this area prior to construction. Alberta Transportation continues to work with Indigenous groups to identify suitable mitigation for cultural sites affected by the Project.<br><br>These changes have led to a positive change for hydrology, water quality and aquatic ecology. The structural changes to the low-level outlet and the erosion protection measures proposed for the unnamed creek will reduce erosion along unnamed creek and reduce the risk of sediment input in Elbow River. The reduction in sediment in Elbow River will benefit the fish population. | The LLOW was moved based on further engineering review of the foundation soils.<br><br>As a result of feedback from regulators, Indigenous groups and stakeholders, Alberta Transportation has revised the design to include measures to reduce erosion along the full length of the unnamed creek and to further mitigate sediment mobilization in the unnamed creek and reduce sediment input into Elbow River. |

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| **Soils and Terrain, Vegetation and Wildlife** | | In the EIA, it is assumed that the riprap along approximately 2.5 km of the diversion channel length would be infilled, covered with topsoil and reseeded. The portions of the diversion channel excavated through rock at the upstream end and the downstream end where exposed riprap is required for energy dissipation cannot be infilled and reseeded. | For operations and maintenance reasons, the length of the diversion channel where the riprap will be infilled, covered with topsoil, and reseeded has been reduced to two key areas for riprap (under bridges) and four key areas for revegetation totaling approximately 1.8 km in length (a reduction from 2.5 km).<br><br>Reducing the revegetated areas within the reservoir may lead to a small reduction in the amount of topsoil that could erode during a flood. There will also be a small reduction in the revegetated area of the diversion channel. For both soils and terrain and vegetation, this change does not alter the EIA conclusions.<br><br>The revegetation areas are identified as areas where wildlife would be more likely to cross the diversion channel (through a review of wildlife camera data, wildlife winter tracking data, and information provided by Indigenous groups). The change in the extent of revegetation along the diversion channel will not change conclusions from previously assessed residual effects on wildlife movement. | The length of the diversion channel that would be revegetated was reduced for operation and maintenance reasons. |
| **Groundwater** | Change in extent of groundwater drawdown near the diversion channel resulting from updated modelling | Modelling described in the Hydrogeology Technical Data Report (TDR) Update in the response to Round 1 NRCB IR42, Appendix 42-1, found that the net change in hydraulic head attributable to the Project during dry operations are limited to areas within and adjacent to the diversion channel (as shown in Figure 5-7 of the TDR). In southwestern areas of the diversion channel (near the inlet structure), net negative changes in groundwater levels are predicted due to the incision of the diversion channel into the ground surface below the groundwater table level. Excavation of the diversion channel results in seepage at the face, causing localized lowering of the groundwater table as groundwater discharges into the dry channel. The extent of the changes in potentiometric head (i.e., the elevation of the water table) are limited to near the diversion channel and well within the LAA. Conclusions are considered to be not significant. | As outlined in the response to Round 2 AEP Question 48, updated groundwater modelling shows that the drawdown extends farther from the diversion channel than previously modelled (as shown in Figure 48-1). However, the effect of this drawdown remains not significant (consistent with previous conclusions) because the drawdown would not decrease the yield of groundwater supply wells to the point where they would no longer be able to be used. | The change is a result of the updated groundwater modelling completed for the Round 2 AEP information questions: 47, 48, 49, 50, 54 and 56.<br><br>A review of modelling completed for the earlier Round 1 provincial information requests along the diversion channel revealed that nodes had been set as fixed seepage nodes such that the nodes remained active even as the water level surrounding the channel decreased. This resulted in artificially high hydraulic heads at the perimeter of the diversion channel.<br><br>As part of updated modelling for the Round 2 AEP information questions, the application of seepage nodes was corrected, allowing the model to determine which seepage nodes should remain active as the water level drawdown progresses. |