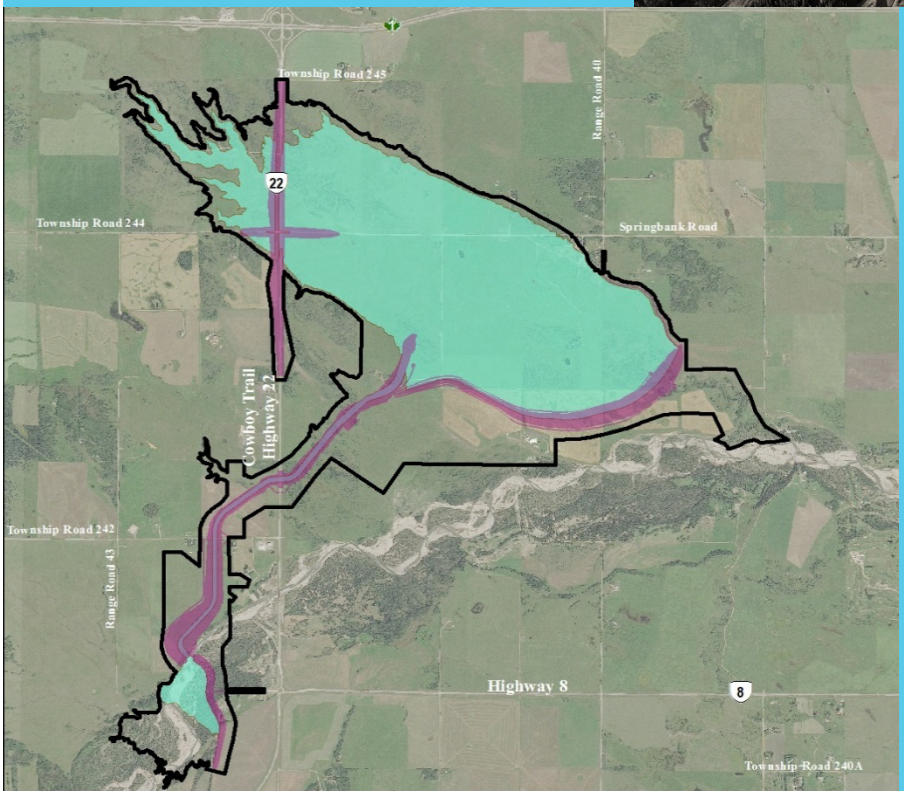
Alberta Transportation
Springbank
Off-stream Reservoir
Project



Response to
Part B
IAAC Follow-up Questions

April 2021

Alberta Transportation

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PART B

With respect to the comment indicating that there is the possibility of water being held longer for emergencies and other unplanned events, some more information is required to understand the potential effects of such circumstances.

Question 1

Request: In what circumstances would water be held longer than the late release scenarios? Provide all circumstances in which this may occur and discuss the likelihood of such an event/circumstance occurring.

Response

The only circumstances under which the water would be held longer than in the late release scenario would be an emergency scenario when a release could result in substantial harm to human health, the environment, or critical infrastructure. An example of would be if the City of Calgary was requesting delayed release due to an emergency such as damage caused to downstream infrastructure such as the Glenmore dam.

This type of scenario would be considered an unforeseen event or malfunction and would be a very low probability event. SR1 is designed to reduce flood risk and damage for events up to the 1:200 flood event with benefits extending to floods up to a 1:500 year event. As a result, damage to downstream infrastructure is considered very unlikely for events up to the design event. Therefore, a scenario that considers protection of damaged infrastructure is likely to have a recurrence interval exceeding this design event and probably beyond a 1:500 year interval.

Based on the timing and recovery from the 2013 flood event, it is reasonable to assume that mitigation measures for damaged infrastructure downstream could be implemented within six months from reservoir filling. Based on slope stability analyses performed for the dam design, retention of water in the reservoir for greater than 90 days will require a slower drawdown rate (0.1 metres per day), rather than the normal operating condition (0.6 metres per day). At this slower drawdown rate under this scenario, the reservoir would take up to 240 days to empty from the full service level (Design Flood). This would result in an increase in release time from the 61.5 days discussed in the response to IAAC Round 2 IR4-01 to approximately 330 days. An additional operational limitation on flow releases would be a consideration of environmental flows, specifically the relative discharge in the Elbow River at the time of release from the reservoir.

If these extended-release emergency situations were cause for concern, AEP dam operators would work with regulators to manage releases for the optimal outcomes.

Question 2

Request: What is the worst case scenario and how long would water be held in the reservoir?

Response

See the response Part B Question 1.

Question 3

Request: Discuss the potential effects associated with water being held in the reservoir longer than predicted. In terms of the criteria set out in Appendix A of the Draft EA Report, discuss the potential for significance of effects to areas of federal jurisdiction in such a circumstance.

Response

Potential effects associated with water being held in the reservoir longer than predicted are discussed below for the IAAC Valued Components as listed in Appendix A of the Draft EA Report and are based on the scenario described in the response to Question 1 with a total drawdown time of approximately 330 days. This is assumed to be a very low probability scenario.

FISH AND FISH HABITAT

HYDROLOGY

In the low probability event that water is held in the reservoir beyond the duration modelled in the late release scenario, the rate of water release from the reservoir back into the Elbow River will need to consider additional factors to ensure potential downstream effects are reduced. The extended period of time that water is held in the reservoir would result in additional volumes of fine sediment deposition in the reservoir than modelled in the late release scenario. The reduction in the rate that water would be released from the reservoir may also reduce the volume of sediment resuspended during reservoir drawdown, reducing total suspended sediment (TSS) concentrations in the water released from the Project, but increasing the remaining volume of sediment deposited in the reservoir. Flows in the Elbow River would likely be lower than what was previously modelled in the late release scenario. Release rates from the reservoir would be restricted based on stability of the dam embankment slopes following the flood and in consideration of the flow in the Elbow River at the time release was initiated. In consideration of the time of year and the likelihood that release rates would be reduced, it is unlikely that flows released during this scenario would result in geomorphic changes.

SURFACE WATER QUALITY

Where water is held for a period longer than the late release scenario to accommodate emergency repairs, water quality is expected to reflect the seasonal conditions. However, physio-chemical and biological processes are dynamic and therefore surface water quality monitoring will be conducted throughout the duration water is in the reservoir to document any changes to water. In general, water quality associated with reservoir water release is expected to be regulated by the following processes:

Larger volume diversion (i.e., where reservoir drawdown is complete before the next freshet season):

- Water temperatures will decrease because of seasonal weather changes and winter ice.
- Dissolved oxygen levels will be influenced by cooler water temperatures which increases oxygen holding capacity. However, once ice is on the reservoir, natural reaeration will cease and bacterial respiration related to vegetation decay will consume oxygen through the winter months.
- Total suspended sediments will settle and water will clarify over time.
- Many constituent levels such as total metals and particulate bound nutrients will settle with sediment deposition in the reservoir reducing these concentrations in the water column.
- Dissolved organic carbon and total dissolved solids are expected to increase in concentration as vegetation breaks down.
- Nutrient cycling will continue under ice conditions and dissolved nutrient concentrations will increase over time.
- Low dissolved oxygen and increased dissolved carbon dioxide levels may lower redox and pH at the sediment-water interface which may in turn increase the mobility of some constituents (e.g., nutrients and dissolved metals).
- Methylmercury generation is expected to equilibrate with bacterial de-methylation processes in the weeks after reservoir filling and remain stable through the period of drawdown (Hall et al 2005, Ullrich et al 2001).

Changes to water quality associated with holding water to accommodate emergency repairs would be considered as follows:

- Changes are predicted to be of low magnitude or intensity; although some aspects of water quality may change more than others or in a negative direction over time (e.g., dissolved oxygen), other parameters will improve in the reservoir (e.g., suspended sediments, total nutrient concentrations). Additionally, reservoir release rates will be low during an extended drawdown period and water will be readily assimilated into Elbow River.

- Changes are considered local in geographical extent (i.e., within the extent of the LAA) as release rates would be considerably lower than the EIA and will be assimilated more readily in Elbow River than predicted.
- Changes are predicted to be short term in duration (i.e., no more than one-year)
- Changes are predicted to be intermittent in frequency (i.e., holding water for an extended period for emergency repairs would rarely happen and only under extreme circumstances).
- Changes are predicted to be reversable as any effects to water quality would be ameliorated once the reservoir is drawn down and the low release quantities are assimilated in Elbow River downstream of the reservoir.

In conclusion, any residual effects to water quality due to delays in reservoir drawdown associated with emergency repairs would be considered not significant based on criteria set out in Appendix A of the Draft EA Report "*Table 8 Decision Tree for Determining Overall Significance of a Residual Effect.*"

FISH AND FISH HEALTH

A delay in reservoir water drawdown or an extended release of flood water is not expected to result in further geomorphic changes. Therefore, a delayed release would not result in further HADD from what is already estimated for the Project and does not change fish habitat predictions set forth in the EIA.

In the low probability event that water is held in the reservoir beyond the duration modelled in the late release scenario, the potential effects to fish would consider timing of water release relative to the life stages of fish species. Generally, a delay in initiation of reservoir water release could result in reservoir water being introduced to the Elbow River in fall, winter, or spring and result in potential effects to fish that differ from the effects that were predicted in the modelled late release scenario. However, the difference in potential effects do not represent substantial changes to the effects assessment conclusions, given the low likelihood of occurrence and the proposed implementation of mitigation and offsetting requirements of the *Fisheries Act*.

A delay to fish rescue efforts, or the need to initiate fish rescues prior to reservoir water drawdown, may occur if water is retained in the reservoir for a longer duration. Fish rescue effectiveness (i.e., time to capture fish, success in captures) may decrease if water cannot be drawn down to facilitate access. Extended retention time could result in increased predation or additional effects on fish health as a result of retention in the reservoir. The potential loss of fish as a result of entrainment is expected to be low relative to the overall population in the Elbow River (within the context of the LAA). The assessment conclusions for fish mortality do not rely on the outcome of fish rescues given the proportional loss and frequency of operation. Fish entrainment as a result of flood operation will be offset through the *Fisheries Act* authorization to counterbalance the potential loss of productivity associated with effects to fish that are retained in the reservoir. The need for additional retention time does not influence the estimated loss for inclusion in the offset measures plan of the Fisheries Act authorization (i.e., the offsetting

quantities will be proportional to entrainment, and do not rely on the success of rescues). As such, the potential need for additional retention time or a delayed release does not result in a change in the assessment of fish mortality given that the effects will be mitigated and offset to an appropriate scale.

Four general timing windows, or biologically significant periods (BSPs), have been developed for the Project to represent life stages of key species in the Elbow River (EIA Volume 3A, Section 8.2.2.3) and are presented again below for purposes of discussion of general release scenarios:

- BSP-1, April 2 – June 15: includes bull trout incubation, fry, juvenile, adults; brown trout fry, juvenile, adults, rainbow trout incubation, fry, juvenile, adult, migration, spawning; mountain whitefish fry, juvenile, adult)
- BSP-2, June 16 – September 25: includes bull trout migration, spawning, incubation, juvenile, adult; brown trout fry, juvenile, adult; rainbow trout incubation, fry, juvenile, adult; mountain whitefish fry, juvenile, adult, spawning
- BSP-3, September 26 – December 1: includes bull trout incubation, migration, spawning; brown trout incubation, fry, juvenile, adult, migration, spawning; rainbow trout fry, juvenile, adult; mountain whitefish incubation, fry, juvenile, adult, spawning
- BSP-4, December 2 – April 1: includes bull trout incubation, fry, adult; brown trout incubation, fry, juvenile, adult; rainbow trout fry, juvenile, adult; mountain whitefish fry, juvenile, adult

Delayed water release to the Elbow River could extend into BSP 3, BSP 4, and BSP 1 (i.e., fall and winter, and into the following spring), which includes the fall spawning period and egg incubation for fall-spawning fish species, fry emergence, and spring spawning activity. Release rates could result in a change to spawning behaviour, if the water is released at a rate that influences the dynamic physical habitat characteristics (i.e., velocity, depth). These effects could be mitigated through reduced rates of release if conditions permit at the time of operation. Although an extended duration of release has the potential to interact with additional life stages of fish than predicted in the EIA, the effects to water quality are expected to decrease as time progresses. An extended retention time in the reservoir could lead to further settlement of sediments, decreased water temperatures, improved oxygen holding capacity, and decreased concentration of constituents such that effects to fish are lower relative to an early release scenario.

Bull trout are predominantly located in the upstream portions of the Elbow River, between Bragg Creek and Elbow Falls in the LAA (i.e., upstream of the Project). Spawning is also predominantly located in the upstream areas, based on historical spawning surveys (Popowich and Eisler 2008), and more recent spawning surveys for the Project (Round 2 AEP IR 69, Appendix 69-2 and 69-3, Round 3 AEP IR 2, Appendix 2-1). Bull trout have been historically documented downstream of the Project in low numbers (Round 2 AEP IR 69, Appendix 69-1; Popowich and Paul 2006), and more recent surveys suggest that bull trout occurrence downstream of Bragg Creek is very low (Round 3 AEP IR 2).

A delay to reservoir water release is not predicted to affect bull trout spawning activities, egg incubation, or fry emergence because spawning activities are predominantly located in the upstream portions of the Elbow River. Reservoir water drawdown could interact with bull trout (i.e., adult and juvenile life stages) if bull trout occur downstream of the Project. Adult and juvenile life stages of bull trout can occupy a range of physical habitats (Addley et al. 2003), and the rate of reservoir water release associated with a delayed scenario is not expected to alter physical habitat in a manner that affects these life stages. The water quality characteristics of reservoir water not expected to result in additional effects that have not been considered in the modelled release scenarios. Potential effects to bull trout or its habitat in the downstream reaches will be appropriately characterized in the *Fisheries Act* authorization and offsetting plan.

The Project includes mitigation measures and offsetting to account for the potential loss of fish and effects in the river as a result of flood water release. It is expected that the mitigation measures and offsetting proposed for the project would appropriately account for the change in effects that could result from further delay in reservoir water release.

MIGRATORY BIRDS

If flood water is retained in the off-stream reservoir for 330 days, this will result in an increase of approximately 270 days where flood operations would temporarily render upland and wetland habitats inaccessible within the reservoir. However, increasing the amount of time open water is available in the reservoir will also create potential feeding or staging habitat for migratory birds during the late summer breeding and fall migration periods. This potential increase in open water habitat availability will decline as ice forms over the winter months.

The relatively slow release of flood water would also create pools of water and soft soil for a longer period of time during late summer/fall or the following spring that may be attractive to wading birds, which feed on macroinvertebrates. The potential adverse effects of retaining water for an extended period on upland and wetland habitat types could include full loss of existing vegetation from the design flood extent within the reservoir. Most of the upland plants observed in the reservoir are not tolerant of flooding and associated anoxic soil conditions. Flood tolerance of wetland plants varies by species; however, inundation for a duration of 330 days, would be longer than the maximum natural drawdown time, 119 days (Hauer et al. 2002) for all but semi-permanent and permanent wetlands, which are 280 and 365 days, respectively (Table 1). Marsh and swamp wetlands are classified in Alberta by the duration of flooding (Alberta Environment and Sustainable Development 2015) and flood duration varies seasonally and yearly in response to climatic conditions. Sediment accumulation deeper than 10 cm to 1 m may also result in vegetation loss.

Table 1 Wetland Flood Duration

Wetland Class	Wetland Permanence	Flood Duration (days)[1]	
		Minimum	Maximum
Waterbody	Ephemeral	6	6
Marsh-Graminoid	Temporary	7	28
	Seasonal	35	119
	Semi-permanent	126	280
Swamp-Shrubby	Temporary	7	28
	Seasonal	35	119
Shallow Open Water	Permanent	365	365

NOTE:

[1] Flood duration times obtained from Hauer (et al 2002.) for temporary to permanently flooded wetlands. Flood duration for ephemeral waterbodies estimated from Alberta Environment and Sustainable Development (2015).

Application of seed mixes should be effective at establishing vegetation cover following water removal and drying of the soil surface layer. Application of additional species, and possibly seed mixes, would help increase plant diversity, establishment of different habitat types and manage weeds. As such, the abundance of migratory bird habitat will decrease in the PDA; however, application of mitigation (i.e., reclamation) is expected to reduce potential effects on migratory birds as vegetation communities reestablish over time.

Extending the reservoir holding time is not expected to increase mortality risk to migratory birds as the primary concern is related to the initial flood inundation of active nests. In addition, there is proposed mitigation to reduce potential mortality risk with the implementation of the migratory bird salvage program prior to flood operations. Based on the results of the water quality assessment, the potential effects of methylmercury on migratory bird health are not expected to change from the predictions presented in the EIA.

Overall, the residual effects on migratory birds are moderate in magnitude, site-specific, short-term (temporary) and intermittent in frequency as defined in Appendix A of the Draft EA Report; however. Project residual effects on migratory bird species at risk are considered low magnitude because there is very little suitable habitat for species at risk in the off-stream reservoir PDA and holding water longer in the reservoir is not expected to disrupt the management or recovery of migratory bird species at risk.

Residual effects on migratory birds due to delays in reservoir drawdown associated with emergency repairs would be considered not significant based on criteria set out in Appendix A of the Draft EA Report "Table 8 Decision Tree for Determining Overall Significance of a Residual Effect."

HEALTH AND SOCIO-ECONOMIC CONDITIONS OF INDIGENOUS PEOPLES

AIR QUALITY

In the context of air quality, sediment in the reservoir has been identified as a potential source of windblown dust. Fugitive particulate matter emission rates depend upon the properties of the surface material (e.g., sediment particle size distribution, moisture content, vegetation cover, surface roughness), the occurrence and history of surface disturbances, and meteorological conditions (e.g., wind speed, temperature, and relative humidity). Wind erosion emissions are generated when the wind exceeds a threshold wind friction velocity defined based upon both the characteristics of the soil subject to erosion and the size (area) of sediment.

In the low probability event that water is held in the reservoir beyond what was assumed for the late release scenario, the extended holding period and the reduction in the rate that water would be released from the reservoir are likely to result in additional volumes of sediment deposition in the reservoir. This would likely result in an increase to the estimated area of sediment coverage and an increase in the proportion of fine sediment (clay and silt) relative to what was assumed in the EIA.

There is considerable uncertainty associated with the ability to accurately estimate fugitive dust emissions and this results in uncertainties in the associated particulate matter concentration predictions. Based upon this uncertainty, several fugitive dust emission scenarios were evaluated for the EIA for the design and 1:100 year floods and to evaluate variation in sediment size and sediment textures. The air quality model result for these scenarios indicated the potential for fugitive dust emissions to affect air quality and that mitigation, monitoring and adaptive management are important to ameliorate unacceptable effects.

Overall, in consideration of the low probability of holding water in the reservoir beyond what was assumed for the late release scenario, the proposed mitigation measures of revegetation and dust control, Alberta Transportation's commitment to monitor and adaptively manage and enhance dust control efforts as required to minimize wind erosion risk, it is expected that fugitive dust emissions would not have significant adverse effects on ambient air quality.

HEALTH

The unlikely event where water is held in the reservoir beyond what was assumed for the late release scenario could result in human health risks through accumulation of sediment and windblown dust. However, Alberta Transportation has provided mitigation measures that could be implemented to reduce windblown dust (see Air Quality section for details). Based upon ambient air quality monitoring, the dilution ratio, chemical application rate or time between reapplications of a chemical stabilizer should be adjusted to achieve and maintain high levels of fugitive dust control. These mitigation measures are expected to be effective in reducing concentrations of $PM_{2.5}$ to levels below the applicable benchmarks and reduce the risk to human health. Alberta Transportation's commitment to monitor and adaptively manage and

enhance dust control efforts as required to minimize wind erosion risk, it is expected that fugitive dust emissions would not have significant adverse effects on human health.

The potential pathway between groundwater and human health receptors will not change as a result of water being held beyond the late scenario timeframe. The Groundwater Monitoring Program will be in place during flood/post-flood operations. Holding the water in the reservoir beyond what was assumed for the late release scenario will not change the proposed monitoring and mitigation measures described in the draft Groundwater Monitoring Plan.

During a flood, if a local landowner has issues or concerns regarding their groundwater well, they can contact the Community Liaison who will direct the issue or concern to the Alberta Environment and Parks (AEP) team. AEP will investigate the issue or concern and where appropriate (i.e., fugitive dust, groundwater quality is associated with flood and post-flood operations), mitigation will be implemented expeditiously.

SOCIO-ECONOMICS

There are no Indigenous businesses infrastructure, community social services and physical community infrastructure, medical and social services associated with SR1. In the unlikely event that holding the water in the reservoir beyond what was assumed for the late release scenario, the Land Use Area (as identified in the response to IAAC IR4-01), would not be accessible for recreational activities. Potential impacts to use of lands and resources for traditional purposes by Indigenous peoples is discussed below.

Alberta Transportation has indicated that safety is paramount, and as stated in the U*pdated Guiding Principles and Direction for Future Land Use* (IAAC 4-05, Appendix 5-1), the Government of Alberta will take reasonable steps post flood, in compliance and consistent with the regulatory approvals for the Project, to ensure that the reservoir is safe so that secondary uses can resume.

CURRENT USE OF LANDS AND RESOURCES FOR TRADITIONAL PURPOSES BY INDIGENOUS PEOPLES

A delay to water release from the reservoir beyond the predicted late release scenario would inhibit access by First Nations to the Land Use Area (LUA) for the exercise of treaty rights and traditional uses. As outlined in response to IAAC IR4-05, Alberta Transportation has developed the *Updated Draft Guiding Principles and Direction for Future Land Use* that will be used to determine and prioritize future uses of the LUA. These *Guiding Principles* recognize that primary and overarching use of the Project is for flood mitigation and that operation of the Project may render the LUA inaccessible for an undetermined amount of time following filling of the reservoir and release of water.

Should the Project be approved, the Land Use Plan will be finalized by Alberta Environment and Parks with input from First Nations and other stakeholders. The Government of Alberta will work with First Nations to develop a First Nations Land Use Advisory Committee to guide and facilitate

the implementation of the principles of the Land Use Plan. Alberta Transportation anticipates that any limits on access to the LUA due to extending reservoir holding time will be managed through the First Nations Land Use Advisory Committee.

Potential effects to the availability of traditional resources for current use resulting from a delay in water release from the reservoir could occur through changes in wildlife, fish, and plant habitat, wildlife health and movement, and wildlife and fish mortality. While a delayed release of water from reservoir will extend the time that habitat is inundated, it is not anticipated to change the Project interactions and pathways for effects described in the EIA, Volume 3B, Section 14.2.2.1. The long-term persistence or viability of wildlife and fish species in the RAA are unlikely to be affected, nor would the Project result in loss of vegetation communities or wetland function in the LAA. Wildlife habitat would be temporarily inaccessible while the reservoir was filled, however, the amount of wildlife habitat affected during flood operations is relatively small compared to the availability of wildlife habitat remaining in the RAA. Many traditionally harvested plant species are unlikely to survive prolonged flooded conditions, and mortality of traditional plant use species found in upland plant communities is expected. However, these species are widespread and are expected to re-establish by natural recruitment; permanent loss of traditional plant use species is not predicted. As noted above, additional retention time may result in additional fish mortality, however, fish entrainment as a result of flood operation will be offset through the Fisheries Act authorization to counterbalance the potential loss of productivity associated with effects to fish that are retained in the reservoir.

Overall, residual effects on current use of lands and resources for traditional purposes due to delays in reservoir drawdown are predicted to be site-specific, short term and reversible as defined in Appendix A of the Draft EA Report. The magnitude of residual effects on current use of lands and resources for traditional purposes is predicted to be moderate as some behaviors may be modified by extending the time water is held in the reservoir, but current use is not expected to be compromised because residual effects are expected to be managed through participation in the First Nations Land Use Advisory Committee.

Residual effects on current use of lands and resources for traditional purposes due to delays in reservoir drawdown associated with emergency repairs would be considered not significant based on criteria set out in Appendix A of the Draft EA Report "Table 8 Decision Tree for Determining Overall Significance of a Residual Effect."

PHYSICAL OR CULTURAL HERITAGE AND HISTORICAL, ARCHAEOLOGICAL, PALEONTOLOGICAL OR ARCHITECTURAL SITES OR STRUCTURES OF IMPORTANCE

A delay to water release from the reservoir beyond the predicted late release scenario is not expected to result in additional effects to Indigenous physical or cultural heritage and historical, archaeological, paleontological or architectural sites or structures of importance beyond what was assessed in the EIA, Volume 3B, Section 13 and Volume 3B, Section 14. Retaining water in the reservoir for a longer period is not expected to change the Project interactions or pathways for effects described in Volume 3B, Section 14.2.4.1. Cultural sites and areas—including, but not

limited to, harvesting sites and areas, sites and areas for cultural or spiritual practices, or archaeological or palaeontological sites and areas—could be affected in the flood and post-flood operation phase by direct physical disturbance of sites and areas through reservoir filling or draining, sediment deposition, or sediment removal. Following a flood, cultural sites and areas are expected to be restored to dry operation conditions in the portions of the PDA covered by sediment (in the reservoir) of less than 3 cm; however, sites in areas with greater sediment deposition are more likely to be affected by sediment deposition.

Alberta Transportation has conducted a Historical Resources Impact Assessment (HRIA) for the Project (EIA, Volume 3A, Section 13) and no sites of high significance, such as burial sites, effigies, medicine wheels, or tipi rings have been identified in the PDA to date. The longstanding historic period occupation of the SR1 area and ongoing cultivation and ranching have disturbed many of the precontact sites' contexts and limits the interpretive value of those sites. Overall, the results of the HRIA indicate that the Project area does contain some sites of moderate to high heritage value that will require mitigation. However, in general terms, much of the area has been affected previously by cultivation, and none of the identified sites have sufficient heritage value to mandate complete avoidance.

In Alberta, historical resources are regulated under the Alberta *Historical Resources Act* (*HRA*) and Alberta Transportation must comply with the terms of the Act and direction from Alberta Culture, Multiculturalism, and Status of Women (ACMSW) regarding mitigation of historical resources. Site-specific *HRA* approval has been issued for 14 sites identified under Archaeological Permit 2016-012 (HRA File no: 4825-15-0004-002). However, an additional six sites of moderate to high heritage value still have outstanding requirements for additional study (controlled excavation); it is anticipated that these will be subjected to additional studies in 2021. As is required by the *HRA*, Alberta Transportation will obtain all necessary approvals from ACMSW prior to construction.

Through Traditional Use Studies (TUS) several Indigenous groups have identified cultural sites or sites of importance. Under the *HRA*, any specific concern raised by Indigenous groups relative to physical and cultural heritage sites of importance must be addressed if the site of concern is within the Project footprint and will experience a Project-related effect. Alberta Transportation has offered each Indigenous group that has identified cultural sites in the PDA an opportunity to participate in site visits with representatives of ACMSW to determine if these sites are considered historical resources under the *HRA*. If so, Alberta Transportation would follow requirements the *HRA* and guidance from ACMSW in mitigating these sites. If they are not considered to be historical resources under the *HRA*, Alberta Transportation is committed to working with Indigenous groups to appropriately record, mitigate or commemorate these sites. In the fall of 2020, Alberta Transportation facilitated site visits with Kainai First Nation and Siksika Nation and ACMSW. Alberta Transportation is working with Piikani Nation and Stoney Nakoda Nations to conduct similar site visits in 2021.

Overall, residual effects on Indigenous physical or cultural heritage and historical, archaeological, paleontological or architectural sites or structures of importance due to delays in reservoir drawdown are predicted to be site-specific, short term and reversible (as defined in Appendix A of the Draft EA Report) for sites covered by sediment of less than 3 cm. Residual effects are predicted to be site-specific, medium to long term, and partially reversible or irreversible (as defined in Appendix A of the Draft EA Report) for sites covered by sediment of more than 3 cm. However, as noted above, Alberta Transportation will be required to obtain site-specific approval from ACMSW for all sites considered historical resources under the *HRA* prior to Project construction. For cultural sites not considered historical resources under the *HRA*, Alberta Transportation has committed to working with Indigenous groups to determine appropriate measures to record, mitigate, or commemorate these sites. Alberta Transportation also anticipates that in the event that specific sites are affected by a delay in water release from the reservoir, the First Nations Land Use Advisory Committee will provide guidance on mitigation or restoration of these sites. Therefore, the magnitude of residual effects on Indigenous physical or cultural heritage and historical, archaeological, paleontological or architectural sites or structures of importance due to additional retention time is predicted to be moderate, as access to or use of specific sites may be altered but is not expected to be compromised for Indigenous groups.

Residual effects to Indigenous physical or cultural heritage and historical, archaeological, paleontological or architectural sites or structures of importance due to delays in reservoir drawdown associated with emergency repairs would be considered not significant based on criteria set out in Appendix A of the Draft EA Report "Table 8 Decision Tree for Determining Overall Significance of a Residual Effect."

FEDERAL LANDS

The federal lands included within the EIA are the Tsuut'ina Nation Reserve 145 and the Stoney Nakoda Nations Reserves 142, 143 and 144, due to their proximity to the Project. The effects that water being held in the reservoir longer than the late scenario could have on these federal lands have been discussed in the above sections. The potential effects of this delay was considered on health and socio-economic conditions of Indigenous peoples, current use of lands and resources for traditional purposes by Indigenous peoples, and physical or cultural heritage and historical, archaeological, paleontological or architectural sites or structures of importance. As stated above, the longer delay in releasing the water would not have a significant effect on Indigenous peoples on federal lands.

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Question 4

Request: Discuss what additional mitigation, monitoring, and follow-up measures would be employed, what regulatory bodies would be contacted, and any additional measures the Proponent would be taking should one of these circumstances occur.

Response

In the very unlikely event this were to occur, the frequency of monitoring and mitigation may change as a result of holding water longer, however, the same mitigation, monitoring and adaptive management approach and commitments presented in the EIA and responses to provincial and federal information requests would apply to the scenario where water is held in the reservoir beyond what was assumed for the late release scenario presented as part of the Project update in Round 2 federal responses. Prior to finalizing the existing draft monitoring plans, Alberta Transportation will review the provincial and federal decision reports and incorporate any additional monitoring and mitigation requirements. In addition, final plans will be developed in discussion with regulators and consultation with Indigenous groups.