



Impact Assessment Agency of Canada (IAAC/CEAA)
National Resources Conservation Board (NRCB)

Delivered by email

Attention: Laura Friend (NRCB)
Jennifer Howe (IAAC / CEAA)

February 15, 2021

Re: SR1 Project and Migratory Birds (CEAA Conditions Section 4)

Our comments address CEAA's draft conditions of January 4, 2021 along with Package 4-Technical Review Round 2, March 23, 2020 and July 2020, and the Proponent's land-use plan from October 2020 (Question 4-05) among other items from the Proponent's prior submissions. We have not had the opportunity to adequately review the most recent December 18, 2020 Project Design given the holidays and requirement to comment on CEAA draft conditions by February 3, 2021. We remind regulators that we are community volunteers who spend inordinate amounts of time keeping up to date with submissions. We also express dismay that the NRCB Pre-hearing took place before the latest design was released. We did not have any indication that this updated design was imminent and it has created additional work for our volunteers. Additionally, the February 3, 2021 deadline for CEAA comments on conditions proposed on January 4, 2021 does not allow adequate time for robust review and comment. The CEAA deadline should at least include the expert evidence that arises at the NRCB hearing. To omit this evidence may result in missed-opportunities to improve Project outcomes.

"No Project" Comparisons

The baseline comparison for the Proponent is the "no project" or "without the project" scenario, which was never contemplated. Regarding migratory birds, we ask Regulators to require a discussion of the MC1 alternative vs SR1. SR1 requires an extensive pre-flood clearing effort to remove nests that may or may not be feasible. Is pre-flood nest clearing contemplated for any areas upstream of SR1 that would have been protected by MC1? Would MC1 have required pre-flood clearing bird rescue activities? That is not discussed anywhere. Further, the SR1 project creates an unstable environment as a result of the flood/dry cycle along with sediment deposition and accumulation. From a biodiversity perspective, the entire ecosystem post-flood, and perhaps post-construction will be simplified.

Regarding the CEAA proposed conditions, it appears that the various agencies have commented on their particular areas of expertise. In some cases, it appears that these conditions are at odds with one

another. For instance, grading the reservoir for fish drainage is at odds with maintaining the natural habitat which is currently home to migratory birds.

Focus on the Reservoir:

The Proponent and regulators have focused on the reservoir operations and consequences on migratory birds. The reservoir accounts for approximately 50% of the project footprint. The remainder of the footprint is diversion channel and emergency spillway, which does not appear to be conducive to any migratory bird activity, the diversion inlet area, which will be reconstructed from its native state, and the outlet, which the Proponent is requiring erosion protection.

Diversion Channel:

Today, this land is in its native state. It is mostly native grasslands. From this rich and vibrant native state, it will go to 1800 acres or so of bedrock and riprap, with the balance seeded. This a tremendous loss. It would be reasonable to expect that activation of the emergency spillway would also cause harm to migratory birds.

Has the proponent considered that changes (fill, topsoil, etc.) to the diversion channel may make impact migratory birds?

Inlet Area:

The current and proposed images of this area show the large amount of construction and deviation from the natural state of the river. This area must be a rich and diverse environment for migrating birds.

Current State:



Original

Location 1 Original - 61m elevation

Future State:



Unnamed Creek:

The unnamed creek is a riparian ecosystem that appears to be changed fundamentally by the SR1 Project. There has been very little talk of this important element of the Project. It was originally planned to be in its natural state but is not requiring erosion protection. See the google earth image:



How, exactly, is the Proponent going to add erosion protection to this area and what are the impacts?

SR1 Maintenance

There is little clarity regarding the annual operations of the project and its impact on migratory birds.

- Will trees/ vegetation be allowed to grow on the downside slope of the embankment and along the diversion channel where there is no riprap? If not, how will this be managed?
- What is the frequency of inspection and types of vegetation management and is it consistent with URBR guidelines as outlined below?

The Proponent has a very low budget for SR1 maintenance but nothing in the way of detail has been provided.

Based on USBR standards of embankment maintenance, all growth on an embankment should be discouraged. It is likely that similar rules apply to the diversion channel. How about the floodplain berm? Is it to be mowed and kept free of burrowing animals and vegetation? How can regulators assess the Project's implications when the maintenance plans are unclear?

It appears that, according to USBR¹, the following should apply for the downstream embankment slope [emphasis added]. None of these activities seem consistent with encouraging migratory birds.

*If the downstream zone of an embankment consists of rock or cobble fill, no special surface treatment of the slope is necessary. Downstream slopes of homogeneous dams or dams with outer sand and gravel zones should be protected against erosion caused by wind and surface runoff using a layer of rock, cobbles, or sod. **Because of concerns with burrowing animals and the difficulty of obtaining adequate slope protection using vegetative cover at many damsites, especially in arid regions, slope protection using cobbles or rock is preferred and should be used where the cost is not prohibitive.** Figure 2.2.5.4-1 shows the downstream cobble slope protection at Jordanelle Dam. Layers 24 inches in normal thickness are easier to place; however, a 12-inch-thick layer usually affords sufficient slope protection. Often, this type of material can be obtained by separating oversized materials from borrow areas or aggregate processing. If grasses or other vegetation are planted, those suitable for a given locality should be selected, and a layer of topsoil is usually required. The advice of an agronomist should usually be obtained to ensure success. **Vegetation that will conceal seeps, animal burrows, etc., should not be used. Exit surfaces to internal drainage layers should not be covered by vegetation. Any vegetative covers should be maintained in a condition that will not conceal deleterious conditions. Slopes should be flat enough to allow access for maintenance equipment.***

¹ <https://www.usbr.gov/tsc/techreferences/designstandards-datacollectionguides/finalds-pdfs/DS13-2.pdf> 2.2.5.4
Downstream Slope Protection

Migratory Birds and Sedimentation

There are many uncertainties regarding the post-flood activities proposed by the Proponent:

4.6: The Proponent shall remove sediment and debris in the off-stream reservoir within seven days after the draining of the reservoir. If it is not technically feasible for the Proponent to remove sediment and debris within seven days after the draining of the reservoir, the Proponent shall develop and implement additional mitigation measures, in consultation with relevant authorities, to avoid harm to migratory birds and their nests or eggs.

The condition to remove sediment and debris within seven days of reservoir draining from the reservoir needs to be explored further. We ask the Regulator require the Proponent to describe the alternative approaches to sediment management as this is one of the most contentious and significant outcomes of the SR1 Project. We remind regulators that this sediment deposition was NOT considered in the original decision to choose SR1. It was an afterthought that only became clear in the IR process in June 2019. It does not appear that regulators or the Proponent are taking this outcome seriously enough. Independent experts need to be consulted to determine the best approach to sediment management.

The sediment removal and recontouring processes both need to include heavy equipment and thousands of trucks. The sediment is a lose/lose outcome if it is removed and if it remains on the site. If it is moved to a new location (thousands and thousands of trucks, excavators, earthmovers) it will create dust, and that moving equipment generates air pollution and noise. If the sediment is moved, where to? On the SR1 site? Off-site? If it is left onsite, it undoubtedly be moved around and has negative outcomes for dust within the community and biodiversity in the SR1 area.

One factor missing from the discussion so far are cost of sediment management.

Are there contamination concerns with sediment storage? Specifics are required here as the Proponent has not put forward any evidence, comparable project, or expected future state for anyone to comment on. Right now, the entirety of sediment management is purely hypothetical.

There needs to be a framework applied to this decision. There are several variables, examples below for discussion:

1. Time limits for sediment management
 - a. Within 7 days (as proposed by CEAA)
 - b. As dries (7 days + daily management as flood water received)
 - c. When dry (7 days + - up to ? days)
2. Quantity of sediment to be managed (% of total sediment deposited)
3. Approach to sediment management (recontouring for drainage, removal, combination)

Time Limits for Sediment Management

| | Summary of Benefits / Drawbacks | Feasibility / Resources | Environmental Impacts | Societal Impacts (Dust, Noise, Traffic) |
|---------------|---------------------------------|-------------------------|-----------------------|---|
| Within 7 Days | | | | |

| | | | | |
|---|--|--|--|--|
| As Sediment Dries (7 days+ up to ?? days) | | | | |
| Once Dry (timing not estimated – need Proponent to clarify) | | | | |

Quantity of Sediment Managed

| | Cost (by flood size / sediment quantity) | Sediment Removed / Moved | Feasibility / Resources | Environmental Impacts | Societal Impacts (Dust, Noise, Traffic) |
|---|--|--------------------------|-------------------------|-----------------------|---|
| Removal of sediment and debris (90%+) | | Design: 2170kt | 160,000 truckloads @25t | | |
| Partial removal of sediment and debris (50%+) | | Design: 1150kt | | | |
| Minimal removal of sediment and debris (<15%) | | Design: 345kt | | | |

Approach to Sediment Managed

| Acres Impacted; Design: 600+ 1:200: 1:100: 1:10: | Summary of Benefits / Drawbacks | Resources Required (machine hours by type) | Environmental Impacts | Societal Impacts (Dust, Noise, Traffic) |
|---|---------------------------------|--|-----------------------|---|
| Removal | | | | |
| Recontouring for drainage | | | | |
| Combination | | | | |

The second part of condition 4.6 states that if “that is not technically feasible within seven days” that additional mitigation measures shall be implemented. If what is not technically feasible? Sediment removal within the reservoir or sediment removal in the seven-day timeline? Clearly, this is an important distinction. This is quite an open-ended condition and we request clarity on what these additional mitigation measure may entail. In our view, it is not acceptable to wait until the project is in operation or under construction for such an important determination. Will sediment removal be required, or not? If the condition is subject to interpretation, we have no doubt the operator will take the least costly option.

Flood Forecasting

4.8.1:Flood Forecasting:

In IR451, the Proponent states “snowmelt was determined not to have a major effect on peak flow.”

While the 2005 flood was rainfall dominated, Alberta Transportation’s assertion that snowmelt did not contribute to the 2013 flood levels is false. Dr John Pomeroy conducted a post-mortem on the 2013 flood.² Much uncertainty persists with regard to flood modelling in Rockies in the future.

We know the atmospheric water capacity is increasing at 7% per decade, thus the likelihood of extreme precipitation events is increasing. There have been revised GCM (general circulation models) looking at extreme precipitation events.³ The upper level Omega blocks that created both last year’s June 20th rainfall and the 2013 event are moving northward from their previous position over Montana and Wyoming and are increasing in intensity because of weakening jet streams in the warming upper atmosphere. Moist air from the Gulf of Mexico is now reaching Alberta fuelling these extreme precipitation events and 2013 flood events will become more frequent.

In AMEC’s 2014 report⁴, the following statement is made:

Recent severe flooding in the Bow River watershed has been the result of precipitation from multi-day storms with low annual probabilities falling on snow. In these low probability events, approximately 70% of the resulting runoff originates directly from rainfall, with the remaining approximately 30% originating from snowmelt. These storms have occurred in late spring, while snowmelt is occurring and while stream flows are elevated by normal seasonal snowmelt.”

Bottom Line: precipitation predictions need to wide error bars and planning needs to include the high values of those error bars. No one predicted the 2013 flood until it was upon us. A resident of Redwood Meadows describes that at 8am, on Thursday morning of the now infamous flood, the height of the flood was the same as the 2005 flood. No one had any idea that it would go higher. By noon all residents in Redwood Meadows were evacuated, and the traffic circle was blocked for any traffic going south to Redwood Meadows and Bragg Creek. The water was flooding the traffic circle, breaching in three places in Redwood Meadows, and flooding Bragg Creek Hamlet. It all happened extremely fast within the additional four hours compared to the relatively manageable 2005 flood. This actual four hours is nowhere near the hypothetical 48-hour time frame allowed in the Proponent’s plans. It is likely that in the future, there will continue to be minimal time to evacuate people and animals, particularly due to

² The 2013 flood event in the Bow and Oldman River basins; causes, assessment, and damages. John Pomeroy et al

³ The Federal government report by Zhang, X., Flato, G., Kirchmeier-Young, M., Vincent, L., Wan, H., Wang, X., Rong, R., Fyfe, J., Li, G., Kharin, V.V. (2019): Changes in Temperature and Precipitation Across Canada; Chapter 4 in Bush, E. and Lemmen, D.S. (Eds.) Canada’s Changing Climate Report. Government of Canada, Ottawa, Ontario, pp 112-193 predicts increasing precipitation events but could not create a statistically credible prediction given their input data.

⁴ <https://open.alberta.ca/dataset/8106746d-34af-4f2a-b104-3ff4cbfc65ab/resource/05b643dc-5d8b-42a3-9a16-01ed10709531/download/2014-volume-2-general-information.pdf>

climate change. We ask regulators to consider the limits of flood forecasting when evaluating wildlife and bird rescue plans.

The Proponent does not provide enough specificity for forecasting imminent flood, which is the catalyst for wildlife clearing activities. What are the parameters / inputs for flood projections? What margins of error for precipitation forecasts will be included? To our knowledge, no one predicted the 2013 floods until they were upon us. It would seem that it is best to be conservative when incorporating precipitation forecasts, but how conservative?

1. What is the margin of error that will be applied to precipitation forecasts over time? One month out? Two weeks? One week? 3 days?
2. It appears that snowmelt was not considered in flood projections for SR1, so is the Proponent convinced that snowmelt is not a factor in floods? We ask for a review of their data supporting this assertion.
3. How important are river flow rates in predicting flood or are they a lagging indicator?
4. At what point in 2013 would wildlife rescue efforts have been initiated? Concluded?

Rescue Operations

The Proponent persists with a “we will figure it out” approach to wildlife management. Overall, this cavalier approach to something as important as mass mortality of wildlife within SR1 is not acceptable. In our view, it is best to assume the worst-case scenario is NO wildlife is removed prior to flood. If wildlife mortality is a concern, the Proponent should DETER wildlife from entering the footprint in the first place. This creates a wildlife dead zone and someone needs to decide if that is better than a zone with dead wildlife. We look to the regulators to provide leadership on this matter as the Proponent continues their optimistic assessments of wildlife rescue activities and their ability to forecast flood.

4.8.2: Rescue Operations: We contend that migratory bird clearing operations are optimistic, rather than realistic and request that CEAA require a preliminary migratory bird clearing plan prior to the final CEAA and NRCB reports.

Location of Clearing Activities:

CEAA states that rescue operations will be necessary for the reservoir, but what about the diversion channel and unnamed creek? Would it be better to say all within the Project footprint?

Will clearing take place in all the following areas, or just a select few areas of the reservoir:

- Inlet / Floodplain Berm?
- Vegetated areas of the diversion channel and emergency spillway?
- The full reservoir (or just the parts closest to the embankment)?
- The embankment waterside slope?
- The unnamed creek?

Clearing Logistics:

Regarding the removal of vulnerable wildlife in advance of flood, we would like to remind regulators that floods are preceded by an intense period of rain, such as in 2013 and 2005. Removing wildlife during these significant rain events must be carefully evaluated for safety, efficacy and logistical reasons.

1. We do not see wildlife clearing activities in Figure 1-1 Operational Flow Chart for the Project. Where is this step and who is responsible?
2. By what methods will floods be forecasted for wildlife removal planning and using that forecasting method, in how many of the last 20 years would SR1 have been cleared of wildlife?
 - a. At what point in the spring will the Proponent arrive at these projections and if flooding is a risk for that year, what arrangements are made with which groups to perform removals? When? How much is the cost?
 - b. The Proponent's view seems to be that floods can be predicted with enough time to clear vulnerable wildlife from the reservoir (and diversion channel?) footprint. It seems that, at best, 2-3 days notice will be provided before a flood.
3. Based on historical river flow rates and historical rain events, how many times would migratory bird clearing mitigations have been required? Would it have been required this year given the substantial rain received in June? Is it realistic for a large team of experts to be brought in to remove wildlife with little or no notice in the 24-72 hours before reservoir use to clear migratory birds?
 - a. Who does this team of wildlife experts consist of?
 - b. Will they be on retainer to work on a moment's notice or are they volunteers?
 - c. How many volunteers or employees will be required to remove wildlife? Will volunteers need liability insurance?
 - d. Who will coordinate this group? Is this a full-time role?
 - e. Which wildlife is priority, if time is of the essence?
 - f. Will this team be on standby each spring, at taxpayer expense, when rainfall and snowmelt are expected?
 - g. Is 2-3 days adequate for wildlife removal? What percentage of wildlife can be removed during that timeline? How much wildlife can be removed in 1 hour? 6 hours? 12 hours?
 - h. Do rescue teams work overnight?
 - i. What assumptions are required to arrive at a clearing and relocation mitigation within the 2-3 days notice?
 - j. How successful are they likely to be in removing wildlife during this time, given the difficult working conditions (rain & associated groundwater challenges) and large footprint?
 - k. Will vehicles be required to access various locations in the reservoir? Will roads be required to provide access? Where is the planning for these roads?

- l. How many nests can be rescued by one person in on hours under expected working conditions in a rain event? How many birds per vehicle?
 - m. Where will birds be relocated to? Wildlife centres? Other crown lands? Are these within 5km? 10km? 100km?
 - n. How much notice will be given to this team to exit the reservoir prior to use? If the gates are open, the rescuers cannot safely operate.
 - o. Will they remove this wildlife from the entire reservoir footprint or are they able to predict the level of flood (1:10 to 1:100 year flood) with accuracy such that not all wildlife will be removed? How will priority areas be identified?
4. During rescue operations, what migratory birds are targeted for rescue? Which ones will be left to be inundated?
 5. Is there a risk that this wildlife rescue team will delay SR1 operations by their presence in the reservoir?
 - a. What road accesses will this team use and what will be the proximity of roads to the wildlife areas? Is it realistic for this team to walk to and from vehicles and how many nests can one person save given the location?
 - b. If SR1 use is imminent, what is the evacuation procedure for the wildlife rescue team and how long will this evacuation take?
 - c. Does sediment accumulation over time impact the effectiveness of this rescue mission? Can the team walk in the sediment once it is wet? Can they drive vehicles in sediment once it is wet?
 6. Is it realistic for this team to grab the amphibians if they see any, as proposed by the Proponent?
 - a. Can all amphibians survive flood events within the reservoir?
 7. Is wildlife removed pre-flood planned to be returned to the SR1 area post-flood? Why or why not and where will wildlife be settled?
 8. Will this clearing of nests change the migratory patterns of birds over time?
 9. If the emergency rescue of wildlife pre-flood is not realistic or is unsuccessful, what is the backup plan for wildlife management in the SR1 footprint?
 - a. Will dens and nests be cleared each year in May or early June, or just years where the Proponent believes that AEP can accurately forecast flood?
 - b. Will wildlife instead be deterred from entering the SR1 footprint each year until flood risk has passed?
 10. What are the predictions of bird mortality (by species and life stage) under the various flood scenarios, early and late release, if they are not removed from the SR1 reservoir?
 11. Who are bird rescue personnel are and where are they located?
 - a. Will hotels be required?
 - b. Will they be on standby during a flood?
 - c. How many person-hours of rescue will be required under various flood conditions?

- d. What is the operational cost of this rescue effort (which should be a component of the Proponent's cost estimate)?

4.9: The Proponent shall conduct inventories of potential migratory bird habitat, including the collection of information on breeding bird densities and the presence of ground nesting birds, as well as mapping of important habitat features, shrublands, wetlands and grassland within the reservoir footprint every five years starting the first year of operation, and update the migratory bird protocol referred to in condition 4.8 based on the results of the inventory.

Two concerns:

1. We are not clear on the rationale for a survey every 5 years. For instance, if a survey is done in 2025 and 2030, but a flood takes place in 2026, how are the specific set of consequences caused by SR1 measured? We request that a survey be done prior to construction, in the year post-construction, each flood year and the 3 years post flood. Detailed reports on the bird populations should be prepared in the years post-flood. A consistent report every 5 years will not truly indicate what the impact of SR1 is on the bird population. Should there not be a migratory bird survey pre-construction to measure the effect of the Project on the migratory bird populations?
2. The bird surveys only focus on the reservoir. The diversion channel accounts for approximately 50% of the project footprint and the balance of the footprint is the floodplain berm and large earthen embankment. Where is the consideration for these elements? Should migratory bird surveys be commissioned for the entirety of the Project? Is there a statement by regulators that migratory birds are permanently displaced from the diversion channel given it is now largely riprap? Are migratory birds expected to still nest in the areas that are not rip rap? What about the earthen embankment and floodplain berm?
3. The Proponent should identify the cost of a bird survey on the 4000 acres of SR1 along with an indication of the resources required. Is this volunteer-run? If not, is this an independent party?

Proposed condition: The Proponent shall conduct inventories of potential migratory bird habitat, including the collection of information on breeding bird densities and the presence of ground nesting birds, as well as mapping of important habitat features, shrublands, wetlands and grassland within the reservoir footprint prior to construction and every five years IN DRY YEARS starting the first year of operation. In a flood year, the impact of the Project on migratory birds should be assessed fully with a complete report on the success of rescue operations (estimated birds/nests rescued from the Project area, mortality during rescue and transport, details of the rescue effort – man hours, working conditions, resources required, cost, etc.). Further, bird surveys should be conducted in each year post-flood for at least three years to assess the impact of the Project flood condition operations on migratory birds. Post-flood bird surveys shall include a review of the sediment deposition on migratory bird quantities and behaviour. Migratory bird protocols referred to in condition 4.8 based on the results of the inventory.

In summary, we content that the Proponent has not provided sufficient detail for regulators to fairly assess the environmental impact of the Project. Rescue operations continue to be optimistic, not realistic, and the more detail needs to be provided by the Proponent to flesh out these issues.

Once again, thank you for your consideration of our concerns.

Regards,

Karin Hunter

President, Springbank Community Association