Water Act File No. 00384210
NRCB Application No. 1601

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1 Acronyms

The following acronyms are used in this Supplemental Information Request.

AAAQO	Alberta Ambient Air Quality Objectives
AEP	Alberta Environment and Parks
BGC 2014	BCG Engineering Ltd.
BMA	Bear Management Area
CAC	Criteria Air Contaminants
CDA	Canadian Dam Association
CO	Carbon Monoxide
dBA	A-Weighted Decibels
e.g.	For example
EIA	Environmental Impact Assessment
EPP	Emergency Preparedness Plan
ERP	Emergency Response Plan
hr	Hour
i.e.	That Is
IDF	Inflow Design Flood
K	Hydraulic Conductivity
km	Kilometre
km/hr	Kilometer Per Hour
LSA	Local Study Area
LWD	Large Woody Debris
m	Metre
m^2	Square metre
m^3	Cubic meter
m/s	Meter Per Second
MD	Municipal District
MEMP	Municipal Emergency Management Plan
NO	Nitric Oxide
NOx	Nitrogen Oxides
NO_2	Nitrogen Dioxide
NW	North West
$PM_{2.5}$	Particulate Matter less than 2.5 micrometers in diameter
PMF	Probable Maximum Flood
PMP	Probable Maximum Precipitation
PPM	Parts Per Million
RSA	Regional Study Area
SSRP	South Saskatchewan Regional Plan
SO_2	Sulphur Dioxide
T	Transmissivity
TEK	Traditional Ecological Knowledge
TOC	Town of Canmore
TOR	Terms of Reference
TRV	Toxicity Reference Values
VOC	Volatile Organic Compound
vs	Versus

2 Natural Resources Conservation Board

The responses to questions in Section 2 will not be considered as part of the EIA completeness decision made by Alberta Environment and Parks.

2.1 General

1. Volume 1, Section 3.2.1, Page 3-3

The Town of Canmore states *the Stoney Nakoda have received the Project notification and information package, and requested additional information from the Town of Canmore that was provided on November 11, 2015. A Stoney Nakoda consultation representative did indicate that they were interested in meeting to discuss the Project, but as of the date of EIA submission a meeting had not yet been scheduled.*

a. Provide an update on consultation efforts with the Stoney Nakoda. Has the Town of Canmore followed up regarding a meeting to discuss the Project?

b. Did the Stoney Nakoda provide the letter of non-objection? If not, is it an issue for future project development?

2. Volume 1, Section 4.2.1, Page 4-10

The Town of Canmore states that *the hazard and risk assessments prepared by BGC Engineering Ltd. (BGC 2014b) indicated that individual risk of loss of life and group risk of loss of life are very high and outside of generally accepted thresholds.* Provide information to support the following:

a. Probabilities for the risk of loss of life and group risk of loss of life absent the Project.

b. The probability of loss of life and group loss of life for an event similar to the 2013 flood (absent the project).

3. Volume 1, Section 4.2.1, Page 4-10

The Town of Canmore indicated that design options were derived with the project goal to *reduce the probability of death of an individual to less than 1 in 10,000 years for each of the 181 properties that exceed this threshold; and reduce risk of group loss of life into the as-low-as – reasonably-practicable zone.*

a. Provide a reference for generally acceptable risk of death to be less than 1 in 10,000 years.

b. Provide details supporting a definition of *as-low-as-reasonably practicable zone*.

4. Volume 1, Section 9.2.6.1, Page 9-8
Volume 1, Section 9.2.6.2, Page 9-9

a. Explain the relationship of the emergency response program (page 9-8) to the Municipal Emergency Management Plan (MEMP, page 9-8), the Emergency Preparedness Plan (EPP, page 9-9) and the Emergency Response Plan (ERP, page 9-9).

5. Volume 1, Section 9.2.6.2, Page 9-9
Volume 1, Section 9.2.6.2, Page 9-10
Volume 1, Section 13, Page 13-1

The Town of Canmore is developing an EPP (Emergency Preparedness Plan) and an ERP (Emergency Response Plan) (page 9-9).

The development of these plans is not specifically listed in the Commitments section (section 13).

a. Confirm if the development of an Emergency Preparedness Plan and an Emergency Response Plan are a commitment from the Town of Canmore, and if they are, indicate the timeline for meeting this commitment.

6. Volume 1, Section 4D, Appendix 4D, Table 25, Page 26

The Town of Canmore states that *the permeability coefficient for the alluvium is ranging between 2*10-5 m/s and 4*10-4 m/s* (hydraulic conductivity values for all wells are shown in Table 25).

a. Confirm that the hydraulic conductivity (K) values in Table 25 are correct. Calculations using the formula T(transmissivity) = k(hydraulic conductivity) b(saturated thickness) and transmissivity information from Table 25 and saturated thickness information from Table 22 suggests that the hydraulic conductivity values in Table 25 may be one order of magnitude too low.

b. If the hydraulic conductivity values are underestimated, what are the impacts on the geotechnical modeling of the structure?

7. Volume 1, Appendix 8A, Section 3.1, Page 4
Volume 1, Section 5.2, Page 10
Volume 1, Section 5.3, Page 12

The Town of Canmore states that *due to the large size of the study area and the density of vegetation within the study area, vegetation sound absorption was included in the model. A ground absorption coefficient of 0.5 was used…. … trees were also included in the noise model. (s 3.1)*

The Town of Canmore also states that *those receptors with increases greater than 1.0 dBA are all located directly adjacent to the [proposed] site access road and the increased noise levels will be the result of haul trucks using the site access road. (s 5.2 and 5.3).*

a. Why is it appropriate to use trees and a ground absorption coefficient of 0.5 for modelling the noise from the haul trucks using the site access road to the receptors located adjacent to the site access road?

b. If not appropriate, then provide noise calculations for some receptors located adjacent to the site access road using a ground absorption coefficient for residential areas and no trees for the baseline, construction and maintenance cases. (R-093 and R-120 may be appropriate receptors to use as the modelling shows they will have the greatest increase in noise.)

2.2 Air

8. Volume 1, Section 8.2.4.1, Page 8-3
Volume 1, Section 8.2.4.5, Page 8-8

The Town of Canmore states *the Lafarge monitoring station is an industrial site that monitors air quality from the operations of the Lafarge Exshaw Cement Plant, a limestone quarrying operation; elevated $PM_{2.5}$ is common at such industrial sites. (s. 8.2.4.5.)*

The Town of Canmore also states *The Lafarge monitoring station, located approximately 12 km southeast of the Project, was used as it is the closest ambient air quality monitoring station that monitors NO_2 and $PM_{2.5}$. (s. 8.2.4.1).*

a. Why is it appropriate to use the Lafarge monitoring station data (that is suspected to have elevated $PM_{2.5}$) as ambient air quality data at the site of the Project?

9. Volume 1, Section 8.2.1 to 8.2.4.5, Pages 8-1 to 8-8
Volume 1, Section 4.2.3, Page 4-12

a. Explain how the construction and operation of this Project is affected by the South Saskatchewan Region Air Quality Management Framework for NO_2 and $PM_{2.5}$.

10. Volume 1, Section 8.2.6.4, Tables 8.2-9, Page 8-14
Volume 1, Section 8.2.6.4, Table 8.2-10, Page 8-14
Volume 1, Section 8.2.6.5, Page 8-15; Air Quality Spreadsheet « Scaling of Modelling »

The Scaling of Modelling spreadsheet indicates that road dust was included in the modelling, but at a 30% suppression of the total release amount of $PM_{2.5}$ in Table 8.2-9. In the footnote to Table 8.2-9, the Town of Canmore states *the total release takes into account the natural mitigations and any other applied dust control methods.* Table 8.2-10 indicates that the largest source of $PM_{2.5}$ is road dust. Section 8.2.6.5 includes the modelling assumption from the Town of Canmore that *road dust was not included as it will be mitigated with water as dust suppression.*

a. In the air quality modelling, why is it appropriate to further suppress the road dust source amount after mitigation measures?

11. Volume 1, Section 8.2.6.4, Tables 8.2-9, Page 8-14
Volume 1, Section 8.2.6.4, Table 8.2-10, Page 8-14

Road dust amount of $PM_{2.5}$ in Table 8.2-10 does not match any of the $PM_{2.5}$ numbers in its source, Table 8.2-9.

a. What is the correct value for $PM_{2.5}$ in Table 8.2-10?

12. Volume 1, Section 8.2.6.5, Page 8-15

For air quality modelling, the Town of Canmore assumes *the closest residence is 450m from the construction of the Structure;* however, there are multiple receptors located adjacent to the site access road.

a. How has the actual distance from the haul route to the receptor (not the distance from the structure) been considered regarding the air quality effects of the haul route on the receptors adjacent to the haul route?

13. Volume 1, Section 8.2.7.1, Table 8.2-12, Page 8-17

a. Confirm if 6 excavators are required to fill 6 tandem trucks during maintenance of rock and woody debris removal.

14. Volume 1, Section 8.2.7.1, Table 8.2-15, Page 8-18

Equipment emissions in Table 8.2-15 (NOx and $PM_{2.5}$) do not match the totals in Table 8.2-13 (p8-17).

a. What are the correct values for NOx and $PM_{2.5}$ in Table 8.2-15?

b. How do these NOx and $PM_{2.5}$ values change the *Summary of Criteria Air Contaminants Emissions for Maintenance Case of the Project* in section 8.2.7.1?

2.3 Water

15. Volume 1, Section 6.5.1.1, Page 6-10

The Town of Canmore states *precipitation and temperature in the surface water RSA and LSA were estimated using…and is based on data from 1961 to 1990.*

a. Provide justification and support that 30-year normal averages remain precise and accurate in 2016.

16. Volume 1, Section 6.5.1, Page 6-13

The Town of Canmore states that the baseline case includes the debris net installed after the 2013 debris flood event.

a. Clarify why it is appropriate to include the debris net in the baseline case when estimates for flow regimes, debris and sediment yield, transport, and deposition, peak discharges, and meteorological conditions are based on data prior to installation of the debris net (i.e., 2013 or earlier) and given that the debris net will be removed if the debris retention structure is constructed.

17. Volume 1, Section 6.6.3.2, Page 6-50

The Town of Canmore states *cumulative effects between the operation of the Structure and existing channel improvements are not anticipated.*

a. Explain how increased or maintained flow velocities and decreased sediment contributions from bank erosion as a result of the combination of concentrated flow from the outlet structure and articulated concrete mats may result in changes on Cougar Creek interactions with the Fan, Policeman Creek or the Bow River.

18. Volume 1, Section 6.6.3.2, Page 6-51

The Town of Canmore states *during normal and low-flow conditions, streamflows in Cougar Creek will effectively be the same in both Baseline and Application cases.*

a. Explain how the cut-off wall will change surface water discharge at the structure during normal and low flow conditions as a result of shallow groundwater interception and release at the outflow.

b. Provide surface water discharge estimates at the structure for the Baseline and Application cases (i.e., without the cut-off wall and with the cut-off wall and outflow).

c. Explain if increased shallow groundwater inputs during peak flows or flood events have been taken into consideration when estimating surface water volumes at the structure during the operational phase.

2.4 Terrestrial

19. Volume 1, Section 3.3.3, Page 3-7
Volume 1, Section 4.5, Page 4-47
Volume 1, Section 4.6, Page 4-48
Volume 1, Section 8.3.5, Page 8-25
Volume 1, Section 11, Page 11-5
The Town of Canmore is considering paving the access road on the east side of Cougar Creek, but this was not confirmed at the time the EIA was submitted.

a. Has the Town of Canmore made a decision on paving the access road on the east side of Cougar Creek?

b. If yes, provide the decision, any relevant explanation, and a description of changes required to any portion of the EIA as a result of the decision.

c. If no, provide the expected timeline and considerations for making this decision.

20. Volume 1, Section 4.9.5.4, Page 4-57
The Town of Canmore states it *will work with AEP to identify areas within No Man's Land for selective revegetation* but this is not considered part of the project.

a. Clarify why this work is being included in the EIA if it is not part of the Project.

21. Volume 1, Section 7.2, Page 7-2
The Town of Canmore states that *selected areas within No Man's Land downstream of the structure will also be revegetated.*

a. What criteria will be used to determine which sections of No Man's Land will be revegetated?

22. Volume 1, Section 7.3.3.3, Page 7-12
The Town of Canmore provides wildlife habitat use transect survey information.

a. Provide an overlay of the wildlife habitat corridors as delineated in the Wildlife Habitat Patch Guidelines for the Bow Valley.

23. Volume 1, Appendix 7C, Section 7C.3.2.2, Page 7C-16
The Town of Canmore states that the findings of the remote camera survey from the first year of work were unavailable for the environmental impact assessment. Further the Town states that preliminary findings from *Alberta Environmental and Parks (AEP) indicate very high numbers of humans detected within the local study area relative to animals.*

a. When will the results of the AEP camera survey results be available?

b. If available, provide the results.

2.5 Approvals

24. Volume 1, Section 4.2.2, Page 4-12

The Town of Canmore states *AEP will establish a number of conditions for the land sale that will preserve the values of the surrounding wildland park.*

a. Describe the park values being preserved and the nature of any conditions that will ensure preservation.

25. Volume 1, Section 4.2.5, Page 4-13
Volume 1, Section 7.2.5.2; Page 7-4

The Town of Canmore makes reference to the Bow Corridor Ecological Advisory Group – Wildlife Corridor Habitat Patch Guidelines for the Bow Valley (updated 2012).

a. Provide specific information and analysis as to implications, compatibility and residual effects relevant to guidelines as set in the Habitat Patch Guidelines.

26. Volume 1, Section 4.9.2.2, Page 4-53

The Town of Canmore states it will follow AEP direction guidelines for managing woody debris and merchantable timber and will follow the Town of Canmore's FireSmart strategy.

a. Clarify the manner in which these guidelines will be incorporated into the Project given the applicable regulations apply to Crown land and may not be applicable if the Project land is sold to the Town.

b. Describe any implications related to adherence to FireSmart guidelines on Project construction and operation.

2.6 Errata

27. Volume 1, Section 8.2.6.3, Table 8.2-6, Page 8-10

Footnote on Power Rating is not listed at the bottom of the table.

a. Provide footnote on Power Rating.

28. Volume 1, Section 9.2.4.2, Page 9-6
Volume 1, Section 11, Page 11-6
Confirm that the description of the third mitigation listed on page 11-6, *Maintaining access to the trails downstream*…., is consistent with the access description on page 9-6.

3 General

3.1 Public Engagement and Aboriginal Consultation

29. Volume 1, Section 3.2.1, Page 3-2
The Town of Canmore indicates *no specific concerns regarding the Project were raised at any of the meetings.* That being said, there would have been other communication besides meetings.

a. Provide a list of any concerns brought up at any time during consultation including any non-project specific concerns/issues.

30. Volume 1, Section 3.2.1, Page 3-2

a. How were the notification letters and plain language information packages delivered to the First Nations? What type of delivery verification is available for this?

b. The Town of Canmore indicates notification that the proposed TOR was provided to the First Nations. What type of delivery verification is available for this?

31. Volume 1, Section 3.2.1, Page 3-2
Volume 1, Section 8.7.4, Page 8-73
The Town of Canmore indicates *no specific TEK was provided by any of the First Nations consulted on the Project to date of the EIA submission.*

a. Was there any TEK provided? If any TEK was provided by any of the First Nations describe the TEK that was provided.

32. Volume 1, Section 3.2.1, Page 3-3
Volume 1, Section 8.7.4, Page 8-74
Volume 1, Section 8.8.6, Page 8-77
The Town of Canmore indicates *Tsuut'ina Nation, Blood Tribe, Piikani Nation, and Siksika Nation have all provided the Town with letters of non-objection confirming that the Project is not expected to adversely affect TLU or Treaty rights*. This statement is more of an assumption. The letters submitted by these four Nations do not explicitly state this.

a. Clarify what was indicated in the letters.

33. Volume 1, Section 3.2.1, Page 3-3
The Stoney Nakoda requested additional information.

a. What information was requested?

34. Volume 1, Section 3.2.1, Page 3-3

a. Clarify why a meeting has not yet been scheduled with the Stoney Nakoda.

35. Volume 1, Section 3.2.1, Page 3-2

Contradiction in statements regarding First Nation views on reclamation *no specific views on reclamation were provided on page 3-2* versus *no specific views on reclamation were provided other than a preference for reclamation with native species* on pages 3-10 and 8-73.

a. Clarify the inconsistent statements.

36. Volume 1, Section 7.4.4.3, Page 7-56

It was indicated that this project may result in direct and indirect mortality to wildlife populations.

a. Were these potential affects discussed with First Nations? If so, was there any discussion about mitigation for these concerns? If not, justify why these potential effects were not discussed with First Nations.

37. Volume 1, Section 7.2.2, Page 7-3
Volume 1, Section 7.3.2.3, Page 7-10

It was indicated that this project may result in direct loss of rare plants and traditionally used species.

a. Were these potential effects discussed with First Nations? If so, was there any discussion about mitigation for these concerns? If not, justify why these potential effects were not discussed with First Nations.

38. Volume 1, Section 3.2.2, Page 3-3

The Town of Canmore initiated public engagement activities on July 18, 2013 with a focus on residents directly affected by the 2013 flood. No other information on public consultation activities is provided.

a. Provide a list of communities and stakeholders that were identified for public engagement activities.

b. How were these specific groups chosen?

c. What issues were presented to the Town of Canmore from public interest groups, stakeholders, etc.? How did the Town go about resolving these issues? Was any of the input received included in the EIA and if so what input?

39. Volume 1, Section 3.2.2, Page 3-3

The Town of Canmore has accepted feedback from residents (both those directly affected and others) by e-mail, mail, online surveys, and in person at public meetings.

a. What specific issues were received by e-mail, mail, online surveys, and in person at public meetings?

b. What was the Town of Canmore's response to each type of issue?

c. Were any issues unable to be resolved and/or are still ongoing?

3.2 Socio-Economic

40. Volume 1, Section 3.3, Page 3-5

The Town of Canmore states that *detailed assessments, including the assessment of baseline conditions for each indicator, are included in Sections 6, 7, and 8.*

a. Reference the specific areas in Sections 6, 7 where socio-economic effects are specifically addressed.

41. Volume 1, Section 8.5.2, Page 8-45
Volume 1, Section 8.5.4.2, Table 8.5-2, Page8-48
Volume 1, Section 8.5.4.3, Page 8-50

The Town of Canmore states *other communities in the RSA include Exshaw, Lac de Arcs, Harvie Heights, and Dead Man's Flats.* However, on page 8-45 the Town of Canmore States *The RSA includes the Town of Canmore and the hamlets of Exshaw, Lac de Arcs, Harvie Heights, and Dead Man's Flats as well as parts of the MD of Big Horn No.8, the Kananaskis Improvement District and a small portion of Banff National Park.*

a. The hamlets of Exshaw, Lac de Arcs, Harvie Heights, and Dead Man's Flats are within the MD of Big Horn No.8. List what other parts of the MD of Big Horn No.8 the Town of Canmore is referencing on page 8-45.

b. On Page 8-45 the Kananaskis Improvement District and a small portion of Banff National Park is included in the RSA. However, these areas are not referenced on page 8-50 under *Section 8.5.4.3 Regional Socio-economic conditions*. Clarify if the Kananaskis Improvement District and a small portion of Banff National Park is included in the RSA. Update the required sections to reflect this so they are consistent.

c. The Kananaskis Improvement District and a small portion of Banff National Park are part of the RSA as stated on page 8-45. Update Table 8.5-2 so these areas are represented and include population numbers. If no population numbers are available indicate this in Table 8.5-2. In addition, if no population numbers exist explain how the socio-economic effects for these two areas were accounted for in the EIA and what the predicted effects to these areas might be.

42. Volume 1, Section 8.2.5, Page 8-8

Section 8.5.5.4 points to section 8.2 for additional mitigation measures to manage dust. On page 8-8 the Town of Canmore states *Mitigation measures, including best practice standards, employed to reduce soil erosion and minimize the duration of soil exposure, will reduce the overall volume of airborne particulate matter.*

a. Clarify if mitigation measures as it appears in the statement above is only referencing water as a dust suppressant. If there are other mitigation measures included explain them.

b. What are the best practices the Town of Canmore is referencing? Are these best practices discussed in the EIA? If not, list the best practices and explain how these will be used to reduce soil erosion , minimize the duration of soil exposure, and reduce the overall volume of airborne particulate matter.

43. Volume 1, Section 8.5.5.5, Page 8-60

The Town of Canmore states *rental housing continues to be a challenge in Canmore for both affordability and availability, and would likely not be the primary form of accommodation for the Project employees.*

a. Confirm what the primary form of accommodation will be for the Project employees.

44. Volume 1, Section 8.5.5.5, Table 8.5-9, Page 8-62

The Town of Canmore does not indicate any passes for logging trucks in Table 8.5-9.

a. Explain why no passes was recorded for logging trucks. Is it possible for this value to be estimated? If so, provide this value.

45. Volume 1, Section 8.5.5.5, Page 8-62

The Town of Canmore states *it is expected that the mitigation measures provided will be able to accommodate the increased volume.*

a. Reference in this statement where the provided mitigation measures can be found.

3.3 Emergency Response Plan

46. Volume 1,Section 4.1.3, Page 4-2
Volume 1, Section 4.9.4, Page 4-56

With reference to the following statement: *A small maintenance area with an impervious liner will be established on a dry area of the creek bed for use during construction* (Section 4.1.3) and *Limiting maintenance and refueling to the designated maintenance area during construction. The designated maintenance area will have an impervious barrier to contain potential spills* (Section 4.9.4).

a. To avoid accidental product release, will refueling equipment have break-away couplings? If the equipment is not to have break-away couplings, provide rationale as to why this was not considered as a mitigation measure.

47. Volume 1, Section 9.2.4.3, Page 9-6

Provide a discussion on the risk assessment of the potential impact of the proposed structure to highway infrastructure.

a. Compare and quantify the existing risk (i.e. no structure) versus the addition of the proposed structure. Include in this discussion the likelihood of failure for the highway/bridge culverts with the proposed structure in place, and whether the consequence would be higher.

b. Provide a discussion on the Town's commitment related to maintenance of the proposed structure. Comment on how maintenance or lack of maintenance might impact highway/bridge infrastructure.

c. Provide a discussion on potential impacts to highway/bridge infrastructure under snow/ice conditions (aufeis).

d. Describe how the outlet under the dam will be cleaned of silt/small debris and whether this plan poses any risk to highway/bridge infrastructure.

3.4 Waste Management

48. Volume 1, Section 4.1.7, Pages 4-3
Volume 1, Section 4.1.7, Page 4-4

a. Explain what will be done with flood sediment that may build up behind or downstream (in the fan area) of the structure.

49. Volume 1, Section 4.4.7.4, Page 4-33
Volume 1, Section 4.4.7, Page 4-34

a. Explain if sediment will have to be removed from behind the structure or in the inundation area.

50. Volume 1, Section 4.8, Table 4.8-1, Page 4-51

a. Clarify if drill cuttings generated during the grouting phase will be stable/solid enough for disposal at Francis Cook.

51. Volume 1, Section 4.8, Page 4-50
Volume 1, Section 4.8, Page 4-51

a. Explain what will be done with sediment that accumulates in the fan area after a flood event.

3.5 Transportation

52. Volume 1, Section 7.4.1.4, Page 7-18

a. How will a speed limit of 20 km/hr be enforced? Who will be responsible for overseeing this requirement?

4 Air

4.1 Emissions management

53. Volume 1, Section 8.2.6.4, Table 8.2-10, Page 8-14
Table 8.2-10 lists the total CAC emissions for the construction phase of the project; however, it does not outline the other source parameters required by the dispersion model.

a. Provide an updated table listing the emission source parameters (i.e., flow rate, exit height, exit velocity etc.) used in the modelling for each source and all emission scenarios.

b. Provide explanation and justification for the choice of model parameters.

c. The model output files indicate that the model was run for a point source, however, the emissions from the project are non-point area or mobile sources. Provide justification for this approach.

54. Volume 1, Sections 8.2.6.4, Page 8-11
Volume 1, Section 8.2.6.5, Page 8-15 and supplemental info *PM25 Calculation.xlsx* spreadsheet and model output files

Section 8.2.6.4 describes how the emissions were calculated for the various scenarios and Section 8.2.6.5 presents the model results. *PM25 Calculation.xlsx* was provided as a supplement to the EIA report outlining post-processing of the model results. It is unclear what some of the assumptions were for deriving the calculations in the provided spreadsheet and how these relate to the emissions information provided in the EIA and the results of the model output files.

a. Connect the spreadsheet information back to the information in Section 8.2 of the EIA and clarify how these calculations are related to the output files.

b. Provide references or justification for any assumptions and scaling factors used in the calculations found in *PM25 Calculation.xlsx.*

c. The maximum predicted concentrations used for calculations in *PM25 Calculation.xlsx* were those predicted at distances of 450m to 650 m rather than the maximum predicted concentrations. Provide justification for this approach.

4.2 Dispersion Modelling

55. Volume 1, Section 8.2.6.5, Page 8-15

The air dispersion modelling results are presented for NOx and compared to the AAAQO of 300 $\mu g/m^3$ for NO_2.

a. Confirm the results presented and compared to the AAAQO are NO_2.

b. What NOx to NO_2 conversion method was used for the modelling assessment?

c. The submitted AERSCREEN model output file for NO_2 indicates the Ozone Limiting Method was applied for NOx to NO_2 conversion with an ozone background concentration of 0.03 PPM. Provide justification for the use of this value compared to the ozone time series for rural land use, provided in Appendix E of the Alberta Environment and Parks *Air Quality Model Guideline.*

56. Volume 1, Section 8.2.6.5, Page 8-15

The air dispersion modelling results are presented. As per the Alberta Environment and Parks *Air Quality Model Guideline,* a baseline value for the same substance must be added to the predicted value before comparison to the AAAQO.

a. Do the results presented include the addition of baseline concentrations? Provide updated results, if necessary, of the maximum predicted concentrations with the addition of a representative baseline value.

4.3 Air Quality Assessment

57. Volume 1, Section 8.2.2, Page 8-2 and supplemental model output files

The Town of Canmore states, *potential Project effects on air quality are expected to be localized, and therefore the local and RSAs have been combined into a single 24 km x 24 km RSA. The RSA was chosen to include communities near the Project footprint.* However, the submitted AERSCREEN model output files indicate maximum predicted concentrations to a distance of 5000 m (5 km), which does not encompass the entire study area.

a. Provide updated model results for the entire 24 km x 24 km study area using the receptor spacing outlined in the *Alberta Environment and Parks Air Quality Model Guideline*.

58. Volume 1, Section 8.2.4.3, Page 8-4
Volume 1, Section 8.2.6.5, Page 8-15 and supplemental model output files

The Town of Canmore states in Section 8.2.4.3, *the Town of Canmore and the Project are located in the Canadian Rocky Mountains. The area surrounding the Project has significant changes in elevation with a downward slope from the northeast to the southwest. Additionally, it is stated in Section 8.2.6.5, AERSCREEN is able to generate site-specific worst-case data incorporating complex terrain algorithms*. However, the submitted AERSCREEN model output files indicate that the predicted concentrations were calculated assuming Flat Terrain.

a. Provide updated model results using complex terrain mode incorporating digital elevation model (DEM) terrain information.

59. Volume 1, Section 8.2.4.1, Page 8-3
Volume 1, Section 8.2.4.5, Page 8-8

In Section 8.2.4.1 the Town of Canmore states, *the Lafarge Monitoring station, located approximately 12 km southeast of the Project, was used as it is the closest ambient air quality monitoring station that monitors NO_2 and $PM_{2.5}$.* In Section 8.2.4.5, it is stated, *the Lafarge monitoring station is an industrial site that monitors air quality from the operations of the Lafarge Exshaw Cement Plant, a limestone quarrying operation; elevated $PM_{2.5}$ is common at such industrial sites.* The Lafarge Monitoring station is not representative of ambient air quality conditions at the proposed Project and is inappropriate for determining baseline values of ambient concentrations for this assessment.

a. Provide updated baseline concentrations from a representative monitoring station, elsewhere in the province, determined using the procedure outlined in the Alberta Environment and Parks *Air Quality Model Guideline, Section 4.2.*

5 Water

5.1 Hydrogeology

60. Volume 1, Section 6.5.2.2, Figures 6.5-8, Page 6-29
Volume 1, Section 6.5.2.2, Figure 6.5-10, Pages 6-30

The Town of Canmore states *there are relatively steep hydraulic gradients down alluvial fans as indicated by the tight contour spacing (Figure 6.5-10). Near the Structure, the Cougar Creek Fan has a 4% to 6% hydraulic gradient.*

a. What is the natural groundwater flux at the location of the Structure?

b. Under the natural condition, approximately how much percent of recharge for LSA alluvial fan will the above flux count? Consider the majority of the LSA is urban area which means there will be a low recharge rate across the cement streets.

c. Since the groundwater flow will be cut-off by the cement wall to prevent seepage under the dam, what will the contour (Figure 6.5-10) in LSA looks like after the Structure is constructed and the recharge to LSA alluvial fan groundwater is reduced?

d. Similarly, how many meters will the groundwater levels drop in Figure 6.5-8 and Figure 6.5-9 after the Structure is constructed?

e. Since the fresh water recharge to LSA alluvial fan aquifer will be reduced due to the project, groundwater quality will be degraded. What is the impact of groundwater level decrease and groundwater qualities degrade on existing groundwater users in LSA?

61. Volume 1, Section 6.6.6.2, Page 6-60

Town of Canmore states *the main source of potential long-term impact from the Structure to the groundwater system is from installation of a cut-off wall and grout curtain within the Valley/Fan Aquifer and uppermost bedrock. No impact on downstream groundwater quantity is anticipated. Impacts to groundwater quality due to long-term normal operation of the Structure are not anticipated.*

a. Provide the basic calculation/simulation to support the no impact claims.

62. Volume 1, Section 6.9, Page 6-63

Because the Structure is designed to allow groundwater flow to pass through, impacts are limited to the immediate vicinity of the Structure where water levels in the Valley/Fan Aquifer may be locally altered.

a. If the maximum groundwater level at the upstream side of the Structure is 1421.15 masl (Table 30, Appendix 4A), what is the average groundwater level at the downstream side of the Structure? What is the groundwater level difference between the two sides of the structure in no-flood condition?

63. Volume 1, Section 3.3.1, Page 3-5

a. Provide rationale for not including river hydraulics as a consideration.

b. How does removal of debris and aggregate change the hydraulic characteristics in Cougar Creek, Bow River and Policeman Creek?

64. Volume 1, Section 6.6.6.2, Page 6-61
Volume 1, Section 6.6.6.3, Page 6-62

With reference to the following statement: TOR (Section 3.2.2) *[C] Describe the nature and significance of the potential Project impacts on groundwater.*
The significance of potential effects and residual effects of the Project on groundwater is not provided.

a. Did the Town of Canmore conduct a significance evaluation? If so what were the results? If not, provide rationale for not providing this significance evaluation.

65. Volume 1, Section 12, Page 12-1

The Town of Canmore states *samples will be taken once before construction, annually during construction and annually until the conclusions of the hydrogeology assessment are verified.*

a. Justify why sampling would only occur *annually*. Monitoring of major construction projects normally occurs at a much greater frequency than one time per year.

5.2 Hydrology

66. Volume 1, Section 6.6.3.2, Page 6-51

The Town of Canmore states *coarse sediment (i.e., gravel to boulder size) that passes through the Structure will likely deposit upstream of the Cougar Creek and Bow River confluence, while the Structure will still allow normal stream bed load to reach the Bow River (BGC 2014f).*

a. How will the bolder size sediment pass through the Structure if the Structure outlet and attached rake are limiting the debris and large bed load through the Structure? What is the size of the normal stream bed load?

67. Volume 1, Section 6.6.3.2, Page 6-52

The Town of Canmore states *while topsoil and underlining parent material will experience erosion during a flood event, impacts to slope stability are not anticipated due to the underlying bedrock that will experience minimal water erosion.*

a. Was any investigation on the fracked bedrock within the inundation area performed? If so, what were the findings to support this conclusion, i.e. *impacts to slope stability are not anticipated*? If not, justify why no investigation was completed.

b. Was any study on slope stability based on the investigation data completed for a potential slope slide into the inundation area for the flood events? If so, what were the findings to support this conclusion, i.e. *impacts to slope stability are not anticipated*? If not, justify why no such study was completed.

68. Volume 1, Section 6.6.3.3, Table 6.6-4, Page 6-53

Note 2 of the Table states *the Structure is intended to remain in place forever and as such assessing the reversibility, as is done with projects that are decommissioned and reclaimed, is not applicable for the Structure.*

The term of "Irreversible" means "Baseline condition cannot be re-established upon reclamation" as stated in Table 6.6-1 on Page 6-46.

a. Should "Irreversible' be used for the indicators rather than "n/a" with Permanence of Criteria if we emphasize "Baseline condition cannot be re-established"? Discuss.

69. Volume 1, Section 6.2.1, Page 6-2

Justification of not providing mean and minimum flows analysis is understandable as mentioned in Article 6.2.1 *(typical EIA indicators (e.g., mean flows, minimum flows) for hydrology do not apply and have not been considered as part of the assessment.).*

a. Provide a description of the flow characteristics of Cougar Creek including seasonal variation of flow in Article 6.5.1 that will be valuable to understand the nature of the creek.

b. Explain surface and subsurface flows observed along the Creek and when these flows (surface and subsurface) reach the Bow River.

c. Explain past major flood events observed in Cougar Creek, when those events have occurred, and what were the flood magnitudes.

70. Volume 1, Section 6.3.1.1, Page 6-5

The Town of Canmore states *the downstream portion of the surface water RSA includes any areas that may have been affected by Cougar Creek flows in the past or could potentially be affected if a flood event were to cause Cougar Creek to change its flow path.*

a. Explain how the potential changed flow path was determined, what can cause this change and show the location of this potential flow path.

71. Volume 1, Section 6.5.1, Table 6.5-4, Page 6-15

a. Provide the peak discharge for 1-10 year return period flood.

72. Volume 1, Section 6.5.1.1, Page 6-16

a. Provide design flood/discharge information for the articulated concrete mats.

73. Volume 1, Section 6.5.1, Page 6-27

The Town of Canmore states *for instance, following the June 2013 flood event, it was estimated that bed load transported to the Bow River was likely an order of magnitude less than what was deposited onto the Cougar Creek Fan (BGC 2014f).*However, the article does not provide any quantitative debris and sediment data.

a. Provide data on debris and sediment yield.

74. Volume 1, Section 6.6.3.2, Page 6-50

a. Does Town of Canmore have any information (e.g. from modelling result, flood inundation study) on potential water levels, discharges, flood extents of Cougar Creek during floods larger than 1 in 30 year events for the with and without the Retention structure in place case to provide understanding on how the structure will help during those flood events? If yes, then provide comparisons of water levels, discharges and flood extents for with and without the Retention Structure cases. Provide this information for key locations on Cougar Creek (including the reach within the Town, at Highway crossing and Rail crossing) and at other points of interest within the Town/outside the Town that have potential to get flooded.

b. If the above mentioned information is not available, describe how the Retention Structure will reduce the flooding in terms of water level, discharge, and flood extent, and how these impacts were estimated or predicted.

75. Volume 1, Section 6.6.32, Page 6-52

The Town of Canmore states *slope erosion in the inundation area is anticipated during high flow events.... Following erosion in the inundation area, coarse sediment that passes the Structure will deposit upstream of the Cougar Creek and Bow River confluence.*

The inundation area covers 58,742 m^2 surface area at the maximum impoundment height.

a. Discuss the anticipated volume of eroded sediment and debris volume from the inundation area slope due to large floods and quick draw down process.

76. Volume 1, Section 10.2, Page 10-3

a. Provide information on the design discharge of the emergency bypass pipe.

77. Volume 1, Section 6.5.1.1, Page 6-14

The Town of Canmore states *upon leaving the Upper Cougar Creek Reach, Cougar Creek flows southwest through No Man's Land.*

a. Confirm that the term "No Man's Land", is an acceptable term, recognized by the Town. If this is not an official term, justify why this term is being used in the EIA.

5.3 Surface Water Quality

78. Volume 1, Section 6.3.1.1, Page 6-5

The Town of Canmore states *the downstream portion of the surface water RSA includes any areas that may have been affected by Cougar Creek flows in the past or could potentially be affected if a flood event were to cause Cougar Creek to change its flow path.*

a. What is the base to delineate the NW boundary of the downstream portion of RSA (Figure 6.3-1)? Is it based on the watershed boundary, street elevation, inundation area, or others? This boundary cuts into the middle of the Town.

79. Volume 1, Section 6.5.1.1, Page 6-22

The Town of Canmore states *these contributions are limited due to the tendency of debris and sediment to settle in the alluvial fan, and infrequent considering that flood events are required to transport sediment and debris to downstream aquatic habitats.*

It seems there is more qualitative analysis than quantitative assessment due to lack of monitoring data and measurements on flow and sediment. The related modelling work also needs the monitoring data for validation and calibration.

a. Justify why the level of data currently used for flow and sediment analysis of the EIA was sufficient.

80. Volume 1, Section 6.5.1.2, Page 6-26

The Town of Canmore states *the Bow River Basin Council (BRBC) has assessed the entire Bow River basin and compiled a BowRiver Basin State of the Watershed Summary, 2010 report (BRBC 2010).*

a. Did BRBC update the result of surface water quality quoted in this paragraph since 2010? If BRBC updated the result, update the assessment of the relevant indicators of water quantity, water quality, landscape, and biological communities.

81. Volume 1, Section 6.5.1.2, Page 6-27

The Town of Canmore states *while Cougar Creek is prone to debris flows, most debris and sediment transported during flood events is either trapped by the debris net or deposited on the Cougar Creek Fan rather than passing through to the Bow River confluence.*

a. Justify the current monitoring data on debris and sediment was sufficient to support this judgment.

82. Volume 1, Section 6.6.4.2, Page 6-55

The Town of Canmore states *during construction, effective ESC measures will mitigate effects on water quality around the construction site. Effective spill control and equipment refueling measures will also be employed to protect surface water quality. Impacts to water quality during construction are considered negligible.*

a. Can the detailed effective ESC measures be described and emphasized here to conclude *the negligible impacts to water quality during construction* due to those effective measures?

83. Volume 1, Section 6.6.4.2, Page 6-55

The Town of Canmore states *during operation, the Structure is designed to attenuate flows and store some of the larger rock and woody debris mobilized out of the watershed. The water and smaller sized sediments, including suspended sediments will pass through the Structure. The resultant downstream water quality with the Structure in place will be the same as if the Structure was not present.*

a. Will the resultant downstream water quality with the Structure in place be the same as if the Structure was not present? Justify how this conclusion was reached.

84. Volume 1, Section 12, Page 12-1

In "Aquatic Monitoring" section, the Town of Canmore states *these predictions will be verified by water level and water quality monitoring at a well in the Valley/Fan Aquifer downstream of the Structure.*

a. Justify why the level of data currently used for flow, debris, and sediment analysis of the EIA was sufficient. Besides TH-3 well observation and sampling, Canmore needs to consider other monitoring program on sediment/debris transport rate and flow measurements for certain rainfall events to validate the related hydrology and sediment analysis. In the report we often read such description and explanation *as lack of site-specific data (Page 5-10), no hydrometric monitoring data available (Page 6-10), no meteorological monitoring data available (Page 6-10),no meteorological monitoring data (Page 6-10), The exact quantities of debris and sediment generated in the Cougar Creek watershed and transported downstream are not known (Page 6-13), Surface water quality of Cougar Creek has rarely been the focus of studies; therefore, historical data and information is limited from a surface water quality and aquatic ecology perspective (Page 6-13).*

85. Volume 1, Section 12, Page 12-1

In Aquatic Monitoring section, the Town of Canmore states *samples will be taken once before construction, annually during construction and annually until the conclusions of the hydrogeology assessment are verified.*

a. Provide the reference to support an "annual" frequency of sampling for water quality during the Project construction, rather than bi-annually or quarterly, even monthly.

86. Volume 1, Section 6.5.1.1, Page 6-18

The Town of Canmore states *groundwater chemistry results from the eight monitoring wells are considered representative of surface water, as flowing water within the creek alternates between surface flow and shallow subsurface flow over its course.*

a. Clarify that this statement does not refer to all water quality variables such as suspended sediments, turbidity and associated adsorbed substances – which may be higher in surface water compared to groundwater.

87. Volume 1, Section 6.5.1.1, Page 6-18

The Town of Canmore states *Routine analyses included: …… carbon trioxide.*

a. Does the Town of Canmore mean Carbon Carbonate rather than *carbon trioxide*? Explain why this variable is included here as it is not normally used in surface water quality monitoring.

88. Volume 1, Section 6.5.1.1, Page 6-18

The Town of Canmore states a *review of the general and inorganic parameter (routine) data indicates no exceedances above the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 2003).*

a. Provide the more up-to-date guideline document namely: Environmental Quality Guidelines for Alberta Surface Waters (2014), found on the AEP website. Ensure all current guidelines are met for the routine data and make any changes, if needed, to Table 6.5-6, page 6-20.

89. Volume 1, Section 6.5.1.1, Page 6-18

The Town of Canmore states *for total metals, several parameters from the August 2015 sampling program were found to exceed the Canadian Council of Ministers of the Environment (CCME) protection of aquatic life guidelines at several of the monitoring wells.*

a. Provide the more up-to-date guideline document namely: Environmental Quality Guidelines for Alberta Surface Waters (2014). Review metals data against the 2014 document. Update and make all required changes to Table 6.5-7, page 6-21.

5.4 Aquatics

90. Volume 1, Section 6.2.3, Page 6-3

The Town of Canmore states *the Structure is an area of Cougar Creek that does not support fish, provide fish habitat, or contribute directly to habitat value to Policeman Creek or Bow River. For the purpose of this EIA, the assessment of the aquatic ecology is focused on Policeman Creek and Bow River, both known to be fish-bearing watercourses.*

a. Notwithstanding the limited surface flow and discontinuous nature of flow in Upper Cougar Creek, we have no information that I am aware of from any fish sampling efforts in this area to be confident that fish are not present. We have examples from many other waterbodies (rivers and streams), that show fish can and do exist in and above areas of low and/or discontinuous flow. To fill this data gap, Fisheries Management requests that a field assessment be conducted in upper Cougar Creek in the area of the proposed structure and potential inundation. Based on the opinion of a qualified aquatic/fisheries biologist, if conditions are suitable, we would request fish sampling in this area likely with a backpack electrofisher. If the biologist determines conditions are not suitable for sampling, then we would request a written habitat assessment accompanied by photos of typical habitat. As we have two Threatened fish species in nearby drainages (Westslope Cutthroat Trout and Bull Trout) and we have found both of these species above areas of extensive sub-surface flow, we believe fish sampling in Upper Cougar Creek should be conducted.

91. Volume 1, Section 6.5.1.2, Page 6-22

Between Lake Louise and Calgary, the Bow River features four hydroelectric dams operated by TransAlta: Seebe Dam, Interlakes Dam, Ghost Dam, and Bearspaw Dam. The Interlakes Dam is on the Kananaskis River between Upper and Lower Kananaskis Lakes and not on the Bow River. The two facilities on the Bow River near Seebe are called Kananaskis and Horseshoe.

a. Shouldn't *Seebe Dam, Interlakes Dam* be replaced with *Kananaskis Dam, Horseshoe Dam*? Update the required pages to reflect this change. More information can be found here: http://www.transalta.com/facilities/plants-operation

92. Volume 1, Section 6.6.5.1, Table 6.6-7, Page 6-56

In Table 6.6-7 one of the indicators is *sediment load and woody debris contribution from Cougar Creek to Policeman Creek.* As Policeman Creek drains into the Bow River approximately 100 m upstream of the Cougar Creek confluence, it is not clear on how sediment and woody debris would normally be distributed from Cougar Creek to Policeman Creek.

a. Is this because the floodplains of both Cougar and Policeman overlap at the Bow River confluence?

b. In the *Measurable Parameter* column it states *deposition in downstream aquatic habitats from Cougar Creek* so it may just be a matter of changing the Indicator to *Sediment load and woody debris contribution from Cougar Creek to Bow River/Bow River floodplain*? If this is changed, it would also have to be changed in the subsequent section 6.6.5.2.

93. Volume 1, Section 4.4.1, Page 4-19

With the removal of debris and aggregate, explain the impacts of fine sediment on Cougar Creek and receiving water bodies.

a. Will the removal of debris and aggregate increase fine sediment loading and transport downstream on the Bow River to areas outside of the RSA (i.e. Ghost and Bearspaw Reservoirs). Explain why or why not.

94. Volume 1, Section, 6.5.1.2, Page 6-27

The Town of Canmore states *it was estimated that bed load transported to the Bow River was likely an order of magnitude less than what was deposited onto the Cougar Creek Fan (BGC 2014f).*

This paragraph describes the existing conditions as it relates to the type of material and estimation of volume of material moved to both the Cougar Creek Fan and the Bow River.

a. Provide information that would support how much material will be permitted to move to the Bow River post-construction and how impacts to the aquatic environment will be mitigated.

95. Volume 1, Section 6.6.5.3, Table 6.6-8, Page 6-58

Reclaimed woody debris from behind the Structure could be made available for habitat enhancement; therefore, resulting in negligible consequence.

a. Provide an indication of consequence rating should woody debris not be placed back in Policeman Creek.

96. Volume 1, Section 12, Page 12-1

Town of Canmore states *sediment and debris transport regimes to the Bow River are not anticipated to be impacted as a result of the Structure. Coarse sediment (i.e., gravel to boulder size) that passes through the Structure will likely deposit upstream of the Cougar Creek and Bow River confluence, while the Structure will still allow normal stream bed load to reach the Bow River (BGC 2014f). (page 6-51).* No monitoring program was proposed to verify this prediction.

a. Will Town of Canmore consider adding Sediment and Debris transport monitoring program during peak floods at Cougar Creek, at Cougar Creek and Bow River confluence and at Bow River downstream of the confluence? If the monitoring program is not going to be considered then explain the reason for not considering it.

Moreover, the Town of Canmore states *there are no hydrometric monitoring stations on Cougar Creek to characterize the existing flow regime….. Records from stations identified cannot be transferred reliably to the Cougar Creek (Page 6-14).*

b. Will Town of Canmore consider adding flow monitoring program to verify the flow estimations done for the Cougar Creeks during the EIA process? If the monitoring program is not going to be considered then explain the reason for not considering it.

97. Volume 1, Section 6.2.3, Page 6-3

The Town of Canmore states *the Structure is an area of Cougar Creek that does not support fish, provide fish habitat, or contribute directly to habitat value to Policeman Creek or Bow River.*

a. Clarify the term "directly" as Cougar Creek does provide direct value to habitat in Policeman Creek and the Bow River via supply of LWD, debris, finer sediments, and gravel recruitment.

98. Volume 1, Section 6.5.1.2, Page 6-22

The Town of Canmore states *these contributions are limited due to the tendency of debris and sediment to settle in the alluvial fan and infrequent considering that flood events are required to transport sediment and debris to downstream aquatic habitats.* On page 6-16 it provides an estimate of 9000 m^3 was deposited in the Bow River from Cougar Creek during the 2013 flood. On page 6-37 it also suggests the bedload transported to the Bow River is mainly deposited in the Cougar Creek fan.

a. Explain how 9000 m^3 of debris transported to the Bow River is 'limited', and whether this amount can have a significant impact or not on the Bow R/Policeman's Creek floodplain.

99. Volume 1, Section 6.6.5.1, Page 6-57

The Town of Canmore states w*hile deposition of gravels into key habitat remains possible, the probability of this occurring is very low and is considered to have a negligible effect on the key aquatic habitat.*

a. Clarify this statement relative to the issue of a potential benefit of supplying spawning gravel recruitment.

100. Volume 1, Section 6.8, Page 6-63

The Town of Canmore states *it is not expected that the construction and operation will have any residual effects on surface water quality or aquatic ecology of the aquatic resources in the RSA.*

a. The above statement refers to the RSA. Explain and justify if the same statement holds true for the LSA or not.

101. Volume 1, Section 11, Page 11-4

The Town of Canmore states c*leaning equipment before arrival onsite to prevent the spread of terrestrial and aquatic weeds seeds and other biota of concern.*

a. Is the Town of Canmore going to ensure that equipment to be used in the Bow River will be decontaminated for Whirling Disease? If so explain what measures will be used for decontamination. If not, justify why not.

6 Terrestrial

6.1 Land Use and Land Management

102. Volume 1, Section 4.4.5.1, Figure 4.4-8, Table 4.4-1, Page 4-27

The Town of Canmore states they will *channel reinforcement to improve areas over the articulated concrete mats at the boundary of Bow Valley Wildland Park in preparation for the project construction.*

a. Define stone pitching and how this will be completed, since there are different interpretations…i.e. grouting or cement between boulders.

b. Explain improvements to be made on the concrete mats.

103. Volume 1, Section 4.9.1.2, Page 4-52

a. Confirm the definition of LSA is the same prior to this section. The formal definition appears in Section 6.3 (Page 6-4).

104. Volume 1, Section 4.4, Figure 4.4-8

Clarify the construction step timing, including month and year, for:

a. Rock blasting activities.

b. Vegetation clearing required for the access road.

c. Any other vegetation clearing required.

105. Volume 1, Section 6.3.2, Figure 6.3-1, Page 6-7

Local Study Area (LSA) shown on Figure 6.3-1 does not show much detail of the LSA.

a. Provide a Figure of LSA showing the points of interest as shown in Appendix 4F Figure 17.

106. Volume 1, Section 3.3.3., Page 3-8

The EIA refers to surface land dispositions in the area being for conservation and flood mitigation.

a. Provide a list of dispositions that are for conservation purposes.

107. Volume 1, Section 4.9.7.1, Page 4-60

Recreational access will be maintained during construction and operation of the Project.

a. Elaborate on how this will be accomplished during construction; will a new trail be constructed?

b. What will be the impacts of additional fragmentation on the LSA/RSA and how will the impacts associated with the new trail be managed or reduced?

6.2 Conservation and Reclamation

108. Volume 1, Section 4.9.2.3, Page 4-54
Volume 1, Section 4.9.5, Page 4-56

The Town of Canmore states they will develop Re-Vegetation Plans with AEP. In addition, the Town of Canmore states *soil disturbance will occur during construction. Proper soil handling techniques are important to minimizing Project effects to soils as described in Section 7.*

a. Provide Re-vegetation Plans with wildlife (bear smart, habitat, cover, forage etc.) and Fire Smart strategies included. Explain the re-vegetation strategies using maps and sketches since each area identified for reclamation has its own specific characteristics.

b. Identify and provide rational for soil placement and storage. Soil mapping and sketches can be used to identify specific details of reclamation. Explain erosional mitigation strategies that will be used to ensure the conservation of soils. Explain what is meant by *proper soil handling techniques.*

c. What soil handling procedures will be employed by the Town of Canmore to maintain soil integrity?

d. Provide reclamation area planning detail derived from control (pre-disturbance site data) sampling. Area specific intensive local sampling assessments should support reclamation plans.

109. Volume 1, Section 4.9.5.1, Pages 4-56
Volume 1, Section 4.9.5.1, Table 4.9-1, Page 4-57

The Town of Canmore makes general reference to reclamation materials, imported soils and procedures on areas to be reclaimed.

Provide more reclamation details on the following concerns for top soil distribution:

a. Potential seed banks (tree/shrub/forbs/grass) in imported soils can be problematic with the introduction of unwanted vegetation species. The introduction of weeds is in addition to this concern.

b. Potential for increased negative soil characteristics (i.e. chemical composition) is greater for imported soils especially if proper screening is not undertaken.

c. Admixing of soils (top & sub-soils).

d. Erosion matting and tackifiers.

110. Volume 1, Section 4.9.5.5, Page 4-58

The Town of Canmore references that they will use an "Adaptive Management Approach" and will evaluate success and adjust accordingly. The Town of Canmore also does not tie in how their reclamation of No Man's Land will achieve their stated wildlife objectives.

a. What does "adaptive management approach" mean in this context? Provide more details on the evaluation program such as how will this be measured? Does the Town of Canmore have any standards? What is success? Are there any timelines? Elaborate

b. Explain how the reclamation of No Man's Land will be used to achieve wildlife objectives.

111. Volume 1, Section 4.9.2.2, Page 4-53
Volume 1, Section 7, Page 7-27

a. Provide the timber harvest volumes for merchantable vs non-merchantable volumes.

b. Provide details what is proposed with the timber salvage.

c. Provide details what is proposed with the woody debris (chipped, firewood, mulch etc….)

d. How will the Town of Canmore work with Agriculture and Forestry?

112. Volume 1, Section 4.9.2.2, Page 4-53
Volume 1, Section 7, Page 7-27

Within the EIA there is no linkage between the Town of Canmore working with Agriculture and Forestry (specifically or generally) for timber operations or required hauling forms and timber volumes.

a. How will the Town of Canmore manage timber resource within the road and project area in accordance with legislation?

b. Indicate where short-term storage of log decks and woody debris will occur.

c. Estimate timber volumes/weights for transport hauling forms.

d. Timber harvest operations and design (e.g. wind firmness in tree retention areas).

e. Where will the wood be transported? Is the Town of Canmore aware of export permits if transport is to occur "out of province".

f. How will woody debris be managed and disposed? Based on the method of disposal are there any applicable permits/licenses required?

113. Volume 1, Section 4.1.6, Page 4-3

The Town of Canmore states *Reclamation materials will be sourced from a residential development in the Three Sisters area.*

a. Provide physical and chemical data on the Three Sisters soil to ensure it is similar to soil near the proposed structure.

114. Volume 1, Section 4.9.5.1, Pages 4-56
Volume 1, Section 4.9.5.1, Table 4.9-1, Page 4-57

a. Clarify material balances between salvaged soil at the site and the amount of soil that will come from Three Sisters (indicated in Section 4.1.6).

115. Volume 1, Section 4.9.7.2, Page 4-60

a. Describe how the Town of Canmore would deal with soil erosion/reclamation of the inundation area should a maximum flood event occur.

116. Volume 1, Section 5.2.3, Page 5-4

The Town of Canmore states *the Project can be initially divided into three stages: construction, operation, and reclamation.*

a. Will the Project go through the reclamation stage after operation stage? If so, it sounds like the project decommission or closure. Clarify.

b. Based on the description in Table 4.4.1, this reclamation is only "Grading, shaping and vegetation planting in selected areas between the Structure and the articulated concrete mats". Should the proper sequence be construction, reclamation, and operation? Explain why or why not.

6.3 Terrain and Soils

117. Volume 1, Section 4.1.6, Figure 4.1-2, Page 4-3

The Town of Canmore states aggregate for fill will be imported from operators and residential developments.

a. Provide a Soil Importation Strategy for insuring weed/contaminant free fill or aggregate.

b. Provide a strategy and sketch plan for the placement and storage of soil.

118. Volume 1, Section 4.4.7.4, Page 4-33

The Town of Canmore states aggregate and debris will be removed from behind the dam structure as post flood maintenance.

a. The extraction of aggregate from a water course is normally covered under a Surface Materials Lease (SML). This resource within a water body is considered non-transferable in terms of ownership. How will this be managed within the Park?

b. Explain how the aggregate will be handled and utilized.

119. Volume 1, Section 7.4.2.4, Page 7-22

Filling of the inundation area to test the dam has not been accounted for in this EIA.

a. What impacts to vegetation, terrain and soil quantity within the inundation area will be expected as a result of testing of the dam post-construction?

b. Have the potential effects of testing (filling inundation area) on vegetation, terrain, and soil quantity been evaluated? If so, provide to the section of the EIA report that provides this information. Provide the rationale if the potential effects of testing have not been evaluated.

6.4 Vegetation

120. Volume 1, Section 4.9.5.2, Page 4-57

Provide more details on soil handling procedures and vegetation management regarding re-vegetation of the access road which address the following:

a. Vegetation strategies.

b. Seed mixes and seed certs.

c. Best soil and vegetation management practices.

d. Erosion control methods (specific details not conceptual ideas).

121. Volume 1, Section 4.9.5.3, Page 4-57

Provide more details on soil handling procedures and vegetation management regarding revegetation of the structure which address the following:

a. Vegetation strategies.

b. Seed mixes and seed certs.

c. Best soil and vegetation management practices.

d. Erosion control methods (specific details not conceptual ideas).

122. Volume 1, Section 4.9.5.4, Page 4-56
Volume 1, Section 4.9.5.4, Page 4-57

The Town of Canmore states No Man's Land is not part of the structure project, however, including the lands within the project scope and future planning qualifies the lands as a part of the structure project. TOC proposes many conceptual measures to be in place for No Man's Land.

Provide more details on soil handling procedures and vegetation management regarding revegetation of No Man's Land which addresses the following:

a. Vegetation strategies.

b. Seed mixes and seed certs.

c. Imported soils to create islands. (not sure what objective this represents)

d. Erosion control methods (specific not conceptual).

Vegetation strategy - Provide more details referring to the wildlife corridor which addresses:

e. Explain through maps/sketches where trees, shrubs, forbs, grasses for cover, habitat, forage etc. will be located. Explain how these objectives will be achieved.

f. Explain erosion concepts and application.

g. Explain vegetation maintenance and monitoring program.

h. Explain weed program (contract/timing etc….)

123. Volume 1, Section 4.9.5.6, Page 4-59

a. Will qualified inspectors/ environmental monitors be used to ensure mitigation measures such as equipment cleaning and reclamation procedures are followed?

b. How will the Town of Canmore ensure the use of organic matter (i.e. straw) will be weed free?

124. Volume 1, Section 7, Page 7-47
Volume 1, Section 7, Page 7-48
The Town of Canmore states, *of the eight rare plants observed during the field surveys, two were identified within the project footprint.*

a. Provide mitigation plans for re-location or replacement for:
   - Ramalina sinensis (Lichen within the access area) and
   - Braya humilis (Forb within the inundation area) OR

b. If it is the intention of the TOC to not re-locate or replace the rare plants, provide rational why no effort would be considered.

125. Volume 1, Section 3.3.2, Page 3-6
The Project will have no impact on wetlands, riparian communities, or old growth forests. Project impacts on all other vegetation indicators are predicted to have final environmental consequence ratings of negligible or low.

a. Advise of any impacts outside of the Project i.e. downstream on the Bow River.

b. If the deposition of debris and aggregate contribute to healthy riparian zones in river systems, what is the extent of the impact on the Bow River when removing contributing material from Cougar Creek.

126. Volume 1, Section 4.9.2.2, Page 4-53
With reference to the following statement, *preferentially conducting vegetation clearing outside of sensitive wildlife periods including:…*
Tree clearing is not permitted within the migratory bird window under the Migratory Bird Act.

a. Is the Town of Canmore aligning with the *Migratory Bird Act* and Alberta Environment and Parks policy by planning tree clearing activities outside the migratory bird window? If not explain why.

6.5 Wildlife

127. Volume 1, Section 7.4.1.4, Page 7-18
The Town of Canmore states *conducting a den site investigation on the proposed footprint areas before initiating winter season clearing between November and mid-April* will occur to mitigate for the bear den found within the local study area (LSA) (as noted on page 7-57) and other dens/burrows that may be within the footprint.

a. Describe what actions will occur if any den or burrow is found to be active during the site investigation.

128. Volume 1, Section 7.4.4.3, Page 7-55
The Town of Canmore states they *will adhere to Bear Smart behaviours to reduce human-bear interactions.* Bear Smart behaviours include a wide range of actions, some of which are not relevant to the project.

a. Describe the Bear Smart actions that will be employed throughout the project duration, include a discussion regarding the on-site lunch shelter for the workers.

129. Volume 1, Section 7.4.4.4, Page 7-60

The Town of Canmore outlines the potential for direct wildlife mortality due to removal of nuisance wildlife, particularly the relocation or euthanasia of bears.

a. *The proponent states the magnitude of potential effects on bears are considered negligible in the LSA since removal of any nuisance bears are unlikely to cause a detectable change in their populations.* Provide evidence to support this assumption, particularly as it relates to the statement from the grizzly bear recovery plan that the known human caused mortality rate excluding relocations in this BMA is slightly over the 4% threshold estimate to allow for population growth…and…when relocated bears are factored into the mortality estimates for the bear management area (BMA), the mortality rate is substantially over the thresholds (taken from the Alberta Grizzly Bear Recovery Plan, 2016, Alberta Environment and Parks, page 22).

b. Provide rationale for why the Removal of Nuisance Wildlife sub-section (page7-60) does not follow Alberta Environment and Parks policy for responding to human-bear conflicts as described in the Grizzly Bear Response Guide (Government of Alberta 2016) and the Black Bear Response Guide (Government of Alberta 2016), particularly in relation to the escalation of preventative actions to response actions.

130. Volume 1, Section 7.4.1.4, Page 7-17

The Town of Canmore states that vegetation clearing will preferentially be conducted outside of sensitive wildlife periods including, the early nesting period and migratory nesting period.

a. Clarify what situations are anticipated to trigger a referral or further communication with a government body.

b. What action will the proponent take if evidence of breeding or nesting is found during any nest surveys?

131. Volume 1, Section 7.3.3.3, Page 7-13
Volume 1, Appendix 7C, Page 7C-10

The proponent states that *bighorn sheep are confirmed to be using the wildlife LSA* (page 7-13) as supported by observation of bighorn sheep pellets during the wildlife habitat use transect survey (Table 7C-3) and tracks during the winter tracking survey (Table 7C-5) and cites that *larger activities that accumulate over time have a larger impact on populations (page 7C-10).*

a. Provide rationale for lack of mitigation measures for project disturbance and creation of new access road within a Provincial Mountain Goat and Sheep Range, when this is in contrast with the recommended land use guidelines for mountain goat and bighorn sheep ranges in Alberta (as found in Appendix 3 of Management Plan for Bighorn Sheep in Alberta, 2015).

132. Volume 1, Section 7.4.1.4, Page 7-17

Provide rationale for how the mitigation of *limiting clearing and construction activities from 7 am to 7 pm* will minimize disturbance to animals. In particular, discuss the probability of disturbing birds that are breeding or nesting and the increase of large mammals use of the wildlife corridor at dawn and dusk, which at certain times of the year fall within the daily construction timing.

133. Volume 1, Section 4.4.6, Page 4-30
Volume 1, Section 4.4.7, Table 4.4-2, Page 4-31

Section 4.4.6 explains that a storage level of 10 m for 10 days will be used for testing.

a. Provide mitigation measures to reduce potential effects (connectivity and safety) to human and wildlife movement into the canyon for the duration of testing.

134. Volume 1, Section 7.4.1.4, Page 7-17
Volume 1, Section 7.4.4.4, Page 7-60

Mitigation measures have not been identified on Page 7-17 and 7-60 to reduce the potential effects of the Structure and Access Road on habitat connectivity. Mitigation tends to focus on reduced speeds and daytime construction hours.

Facilitating wildlife movement through the potential Project barrier is critical.

a. Provide information on how wildlife will move through the canyon and bypass and/or go over the Structure? Will wildlife use the hikers trail on the east side of the creek or the access road?

b. Will non-project human activity be restricted on the access road to facilitate wildlife use of the road?

c. Has the Town researched other similar projects to compare wildlife connectivity with such structures? If so, what learnings have been incorporated into the Project design/operation.

135. Volume 1, Section 7.4.4.4, Page 7-59

The Town of Canmore states *potential barriers to movement due to the Project include the Structure and Access Road as well as any additional human activity resulting from construction and operation of the Project* .This statement acknowledges wildlife movement along the creek.

The Town of Canmore also states *the magnitude is low as connectivity is expected to be affected only during periods of high volume traffic.*

In addition, the confidence rating is medium (based on a good understanding of cause-effect using data from elsewhere).

a. Does this relate to the potential effect of the Structure on habitat connectivity? Provide references to wildlife studies in regards to these structures elsewhere that provide the rationale for the confidence rating.

136. Volume 1, Section 7.4.1.4, Page 7-17

a. How will the construction zone and laydown areas take into account sensitivity of the regional (cross-channel) corridor to minimize impacts during the construction period ?

137. Volume 1, Section 7.2, Page 7-1

a. Will there be lighting associated with the project site during the construction phase? If so, what measures will be taken to avoid impacts to nocturnal wildlife habitat use and movements in the vicinity of the construction zone?

138. Volume 1, Section 4.9.2.2, Page 4-53

In regards to timber clearing and salvage, the EIA suggests that dens site investigation will be conducted before initiating any winter season clearing between November and mid-April.

a. What will be the procedure if active dens are located?

139. Volume 1, Section 7.4.1.4, Page 7-17

a. Given the special importance of this area for wildlife, what start-up training or orientation will be provided to all construction and oversight workers with regard to wildlife-friendly/low impact procedures?

140. Volume 1, Section 7.4.4.3, Page 7-55

a. Describe the specific actions that will be taken during construction activities to avoid the food conditioning of bears, wolves and coyotes on the project site?

141. Volume 1, Section 7.4.4.3, Page 7-56

a. Has indirect mortality as a result of wildlife displacement from the regional corridor been assessed? For example, wildlife may avoid the project construction zone and cross the channel closer to the residences, or use less favourable areas that involve additional road crossings.

142. Volume 1, Section 7.7, Page 7-77

The impacts to along-channel movement are suggested as being associated with construction activities and traffic. Data collected at the debris net site in the winter of 2013/14 shows substantial up and down channel movement at this pinch point (cougar, coyote, elk, fox, deer) which will be impacted by the structure itself. The ability to retain this important movement route is entirely dependent on the structure design and mitigation success in facilitating wildlife movement.

a. What mitigations will be implemented to facilitate wildlife movement along Cougar Creek at the Structure site?

6.6 Biodiversity and Fragmentation

143. Volume 1, Section 5.2.7, Page 5-8
Volume 1, Section 6.6.3.3, Page 6-53
Volume 1, Section 6.6.5.3, Page 5-58

Volume 1, Section 6.6.6.3, Page 6-61
Volume 1, Section 7.4.3.5, Page 7-51
Volume 1, Section 7.4.4.4, Page 7-63
With reference to the following statement: *Permanence describes the potential for the recovery or reversibility of an effect. Permanence is classified as effects that are reversible in the short-term (within 1 year), reversible in the medium-term (1 to 10 years), reversible in the long-term (greater than 10 years), or irreversible (permanent)* (Page 5-8).

As noted in Section 5.2.7, effects criteria for some disciplines were refined. For hydrology, groundwater and aquatics, permanence is considered not applicable because the Structure will be *in place forever.* However for the vegetation assessment permanence is considered 'permanent' and the wildlife assessment described permanence as irreversible.

Irreversible, permanent and 'forever' are the same when related to the Project.

a. Explain why the approach is non consistent between the disciplines.

6.7 Mitigation and Monitoring

144. Volume 1, Section 11, Page 11-1
Volume 1, Section 11, Page 11-2
Volume 1, Section 11, Page 11-3
Volume 1, Section 11, Page 11-4

a. Clarify how TOC will work with Agriculture and Forestry for the management of timber harvest operations.

b. Provide woody debris management plans and rational as per Department Directive.

c. Provide further details regarding the TOC's Fire Smart strategies.

d. Provide further details on how grading will be utilized to prevent increased run-off on slopes.

e. Provide planning/ mapping detailing how natural drainage will be achieved using properly sized culverts. Use mapping and sketches to illustrate the number and where these culverts will be located.

f. Provide signage plan outlining:

- Sign prototype (dimensions, messaging/wording, sign location etc.)
- Signs - Explain how education and enforcement will be achieved.

g. Provide linkage of wildlife corridor and habitat patch strategies to the re-vegetation planning.

h. Provide rational and more details behind mitigative measures, such as wind barriers, vegetative buffers, sediment control etc.

145. Volume 1, Section 12, Page 12-1

The soil and monitoring program lacks sufficient detail.

a. What are the standards, criteria, goals, and objectives of both the vegetation and soil monitoring program?

7 Health

146. Volume 1, Section 9.1.1.1, Page 9-1

The Town of Canmore states *the first part of the human health risk assessment process is the problem formulation stage whereby a conceptual model is developed that describes the project and its interactions with the surrounding human population and the environment.* The conceptual model also assists in determining which of the chemicals, pathways and receptors are significant and have the greatest potential to contribute to health risk (Alberta Health and Wellness, 2011). However, no conceptual model is presented or described in the human health risk assessment.

Reference: *Alberta Health and Wellness, 2011. Guidance on Human Health Risk Assessment for Environmental Impact Assessment in Alberta*

a. Provide a comprehensive conceptual model for the project and its surrounding area, or provide rationale as to why a conceptual model is not required or relevant to this application.

147. Volume 1, Section 9.1.1.1, Page 9-1
Volume 1, Section 9.1.1.1, Page 9-2

The Town of Canmore states that the human health risk assessment is focused on the potential effects of air emissions on human health, and references the Air Quality Assessment (Section 8.2). Chemicals of concern related to air emissions are said to include SO_2 compounds, CO, VOCs, NO_x and $PM_{2.5}$, although the air quality assessment appears to address only NO_2 and $PM_{2.5}$. Little discussion or rationale is provided with respect to the identification of potential chemicals of concern and the selection of those included in the air quality assessment or the human health risk assessment.

a. Provide a complete inventory of chemicals potentially emitted from vehicles, equipment and other sources associated with the project.

b. Provide a detailed description of the screening process undertaken to identify chemicals of concern from a health standpoint.

c. Provide a list of those chemicals specifically addressed in the air quality assessment and the human health risk assessment, and provide justification for any chemicals of concern, identified as a result of the above screening, that were subsequently excluded from the modelling and health assessment.

148. Volume 1, Section 9.1.1.1, Page 9-2

The Town of Canmore states *the Structure is located within the Town of Canmore boundaries; therefore, the Town's residents were considered to be receptors for the purposes of the human health risk assessment.* The Town also states (Section 9.1.1.2) that: *the screening model was completed for the closest residences to the Structure, which are approximately 450 m away.*

a. Given that several other communities have been identified in the air quality RSA, provide rationale as to why only the Town residents were considered in the human health risk assessment.

b. Explain why the screening air quality modelling was only completed for the closest residences to the Structure, and provide evidence to demonstrate that receptors at other locations could not be exposed to higher predicted concentrations of chemicals of concern, given local topography and meteorological conditions.

c. Provide a figure showing the location of the nearest or critical receptor(s), as well as other relevant receptors in the vicinity of the project.

149. Volume 1, Section 9.1.1.2, Page 9-2

The human health risk assessment references the air quality assessment, in which baseline and predicted project emissions are compared to Alberta Ambient Air Quality Objectives (AAAQO). The human health risk assessment does not contain a toxicity assessment for the identified chemicals of concern.

a. Complete a toxicity assessment for the identified contaminants of concern, and provide justification for the use of AAAQO as appropriate toxicity reference values (TRVs) or exposure limits for human health. Given the duration of the construction phase of the project, ensure that the potential effects of both acute and chronic exposures are considered.

150. Volume 1, Section 9.1.1.2, Page 9-2

The human health risk assessment references the air quality assessment, but does not itself provide any information on potential human health impacts under baseline conditions.

a. Provide a table of results of the Baseline Case assessment, expressing potential human health impacts in the form of estimated hazard quotients or exposure ratios for all identified chemicals of concern for relevant receptors.

b. Provide a discussion of the significance of predicted human health impacts, if any, associated with baseline conditions.

151. Volume 1, Section 9.1.1.2, Page 9-2

The human health risk assessment again references the air quality assessment, but does not itself provide any information on potential human health impacts associated with construction activities. The referenced air quality assessment does not include a formal presentation of the results of the air modelling; the results of the modelling, which appear to form the basis for the conclusions of the health risk assessment, are instead summarized in the text at the end of Section 8.2.6.5.

a. Provide a table of results for the Construction Case assessment, expressing potential human health impacts in the form of estimated hazard quotients or exposure ratios for all identified chemicals of concern for relevant receptors.

b. Provide a discussion of the significance of predicted human health impacts, if any, associated with construction activities.

152. Volume 1, Section 9.1.1.2, Page 9-2

There does not appear to have been an evaluation, either in the human health risk assessment or in the air quality assessment, of the effect of construction emissions combined with baseline concentrations on air quality at the identified receptor location(s). For example, it appears, based on the limited information provided, that baseline concentrations of $PM_{2.5}$ exceed, or are close to, the referenced guidelines (depending on the percentile of the data set used), and that incremental concentrations of $PM_{2.5}$ due to construction alone are themselves approximately 58% of the referenced guideline value. This suggests that the combined effect of baseline and construction conditions could be well above the referenced guidelines.

a. Provide a table of results for an assessment of the Construction Case combined with the Baseline Case, expressing potential human health impacts in the form of estimated hazard quotients or exposure ratios for all identified chemicals of concern for relevant receptors, or provide justification as to why such an assessment is not required.

b. Provide a discussion of the significance of predicted human health impacts, if any, associated with construction activities in combination with baseline conditions.

153. Volume 1, Section 9.1.1, Pages 9-1
Volume 1, Section 9.1.1, Page 9-2
Volume 1, Section 9.1.1, Page 9-3

The human health risk assessment does not include an evaluation of uncertainties.

a. Provide an evaluation of the uncertainties associated with the human health risk assessment. In particular, discuss the potential for human health impacts to be greater than those predicted in the assessment.

154. Volume 1, Section 9.1.1, Pages 9-1
Volume 1, Section 9.1.1, Page 9-2
Volume 1, Section 9.1.1, Page 9-3

The conclusions of the human health risk assessment are dependent on the air dispersion modelling results. Through the SIR process, additional air modelling may be required for the air quality portion of the application, thus generating new predicted air concentration data.

a. In the event that new or additional air concentration data are generated for any chemical of concern, compare the results to health based TRVs and discuss the potential health impacts, or provide justification for not completing these steps.

8 Incidents, Malfunctions and Retention Structure Safety

155. Volume 1, Section 4.1.1, Page 4-1

Until the Project, or other flood mitigation offering similar risk reduction, is complete, no new development will occur on the Cougar Creek alluvial fan (Section 4.2.5).

a. Clarify how this potential new development would affect the proposed Structure (e.g. consequence classification, design and operation).

156. Volume 1, Section 4.1.11, Page 4-5

a. For completeness, provide bonding (e.g. materials) requirements that will be included in the construction documents.

157. Volume 1, Section 4.1.2, Page 4-2

a. Provide the evacuation procedures that will be initiated for a major flood event that is beyond the design parameters of the structure.

158. Volume 1 Section 4.2.1, Page 4-9
Volume 1, Section 4.2.1, Page 4-10
Volume 1, Section 4.2.1, Page 4-11

With respect to alternatives considered, Option D (no further mitigation) was rejected.

a. How does the historical and predicted natural flood scenario compare with the dam failure scenario? I.e., how would a natural landslide dam flooding event compare to the failure of the proposed dam holding back 760, 000 m^3 of water and debris? Provide a figure comparing the 2 scenarios (E.g. Drawing 11 in BGC [2014] vs. Figure 10.3-2 and 10.3-3 in the EIA).

159. Volume 1, Section 4.4, Page 4-10
Volume 1, Appendix 4B,Section 05.01.03, Page 55
Volume 1, Appendix 4B, Section 09.03/09.04, Page 88
Volume 1, Appendix 4B, Section 09.04/09.05, Page 89
Volume 1, Appendix 4B, Section 09.05/09.06, Page 90

a. Provide the same level of detail for the Tunnel Option as for the Bottom Outlet Structure Option if the Tunnel Option will be included in the procurement process. This includes any specific environmental impacts.

160. Volume 1, Section 4.4, Page 4-19

a. Explain how the project is designed to work in conjunction with the articulated concrete mats portion of Cougar Creek within Canmore.

161. Volume 1, Section 4.4.1, Page 4-19

a. Clarify that the expected condition is a *debris flood* (i.e., not a debris flow) and this condition is the basis for the proposed Structure.

162. Volume 1, Section 4.4.1, Page 4-20

a. Provide information on the expected erosion that will occur downstream of the stilling basin during operation of the Bottom Outlet Structure and Spillway.

163. Volume 1, Section 4.4.1, Page 4-20

Section 4.4.1 indicates that the bottom outlet structure and spillway include measures to protect them from abrasion however no such measures are discussed for the stilling basin.

a. Provide information on abrasion protection requirements for the stilling basin including against impact damage to the piers and baffles.

164. Volume 1, Section 4.4.2, Page 4-20

a. Provide information (population at risk, loss of life, environmental, cultural values, infrastructure, and economics as per Table 2.1 in the CDA guidelines) to support the selection of the very high consequence classification for the structure.

165. Volume 1, Section 4.4.2, Page 4-20
Volume 1, Appendix 4B, Section 01, Page 28
Volume 1, Appendix 4B, Section 06.01.05, Page 66

Section 4.4.2 indicates that *the Structure is not intended to permanently hold water, but at full impoundment it has been classified by the Town of Canmore as a "very high consequence dam" and has been designed to meet the CDA guidelines for this classification.* Based on the CDA guidelines, the Structure meets the definition for a Dam as is acknowledged by the above.

a. Clarify the relevance of the statement in Appendix 4B (e.g. Executive Summary) which states *considering a dry dam and an empty retention basin, the structure is not to be seen as a water retaining structure or water storing structure, but still as a water diversion structure.*

166. Volume 1, Section 4.4.3, Page 4-21

The physical model study appears to have considered a spillway and stilling basin with a constant width of about 90 m (1/30 scale, 3 m wide model) however the proposed Structure transitions from a width of 100 m at the top of the dam to 30 m as it enters the stilling basin.

a. Explain how this difference has been accounted for in the Structure design.

167. Volume 1, Section 4.4.3.1, Page 4-22

a. For the Tunnel Option, explain if there are data limitations and knowledge gaps that will need to be addressed. Specifically explain what these data limitations and knowledge gaps are and how they will be addressed.

168. Volume 1, Section 4.4.4.3, Page 4-25

a. For the Tunnel Option, explain if abrasion is a concern. If so, how will abrasion be addressed?

169. Volume 1, Section 4.4.6, Page 4-30

a. Clarify when the Testing and Commissioning (section 4.4.6) will be conducted.

b. Provide details on how long it would take to impound the required volume of water and any associated risks (e.g. flood) and mitigation measures.

170. Volume 1, Section 4.4.5.1, Page 4-26
Volume 1, Section 4.4.5.1, Page 4-27

a. Provide details on the criteria (e.g. flood event) that will be used to design the temporary diversion works required.

b. Provide details of the proposed diversion works including cofferdams through the course of construction.

c. Explain if temporary care of water and dewatering provisions will be required to facilitate construction.

171. Volume 1, Section 4.4.5.3, Page 4-30

a. Provide plans to address future decommissioning and restoration, if any, in accordance with applicable regulations at that time.

172. Volume 1, Section 4.4.6, Page 4-30

a. For the water storage test, explain the selection of a target test level of 10 m and duration of 10 days.

b. Explain the risks associated with using explosives to remove the winging gate (due to unforeseen complications), and clarify if there are other options. If there are other options explain why using explosives was considered as the best option.

173. Volume 1, Section 4.4.7.1, Table 4.4-3, Page 4-32

a. Clarify whether the values in the table account for solids contributing to fill the impoundment or if they assume water only.

174. Volume 1, Section 4.4.7.4, Page 4-34
The post-flood maintenance plans indicate that *after a flood event, rock and woody debris will be removed from behind the Structure.*

a. Clarify the loss of storage threshold that would require the removal of rocks and woody debris.

175. Volume 1, Section 10, Figure 10.3-2 , Page 10-8
Volume 1, Section 10, Figure 10.3-3, Page 10-9
The scale of the map is not sufficient to provide the full extent of the inundation area. Based on the modeled flows and depths, the water would be expected to reach the Bow River.

a. Provide figures that show the extent, routes and the locations of confluence with the Bow River.

176. Volume 1, Appendix 4B, Section 04.06.01, Page 49

a. Clarify if increasing the discharge capacity of the existing culverts at Elk Run Blvd, Highway 1, and Highway 1A would reduce the flood risk and provide an opportunity to enhance the proposed Structure design.

177. Volume 1, Appendix 4B, Section 06.01.04, Page 66

a. Provide precedent for the design life of the structure being at least 500 years.

b. Explain the comment *regardless of the level of protection of at least 2000 years.*

178. Volume 1, Appendix 4C, Section 06.02.01, Page 28
Volume 1, Appendix 4C, Section 08.02.03, Page 52
Volume 1, Appendix 4C, Section 07.01, Page 39
Volume 1, Appendix 4C, Section 04.02, Page 21

a. Provide a rationale for using rainfall-runoff modelling as the only approach for estimating the 1:1000 year flood.

b. Provide a discussion of the persistence of snow in the basin and how that might affect flood discharges.

c. Provide a rationale for excluding snowmelt from the rainfall-runoff modelling for return period events, while considering it for the PMF.

d. Provide a rationale for transposing Kananaskis precipitation IDF values to the basin without adjustment for the difference in elevation between the station and the catchment.

179. Volume 1, Appendix 4C, Section 04.01.01, Page 17
The Town of Canmore states *the design storm event to be selected and determined for hydrologic calculations at Cougar Creek shall be characterized as rather long-duration and widespread precipitation event than as local and short duration heavy rainfall.*

a. Explain how the analysis focusing on events of 24 hours and less meets this objective.

180. Volume 1, Appendix 4C, Section 06.04.01, Page 33
The Town of Canmore states *in order to get a better understanding of the behavior of the Cougar Creek watershed, the June 2013 storm was back calculated based on observations at the Elk Run Boulevard and records from rain gauges in the Marmot Basin.*

a. Provide the observations at Elk Run Boulevard.

b. Discuss how well the simulation reproduced those observations.

181. Volume 1, Appendix 4C, Section 07.02, Page 42

The Town of Canmore simulated both a steady rainfall and one unsteady rainfall scenario, and concludes that *the synthetic and steady rainfall scenario represents a more conservative load case. Because the characteristic of future storm events is not known, standard practice is to idealize design events as done herein.*

a. Provide Canadian support for the assertion that standard practice is to use steady rainfall for design events.

182. Volume 1, Appendix 4C, Section 08.02.01, Page 50

The Town of Canmore states that *because extreme storm events, for example with a return period of 500 years, may have occurred within the last 30 years, these kind of events have to be excluded* and excludes the 2013 storm from the statistical analysis.

a. Provide additional discussion on why extreme events should be excluded from a statistical analysis aimed at estimating the PMP.

183. Volume 1, Appendix 4F, Section 07.01, Page 30

The Town of Canmore states that *flood-wave and inundation calculations were reduced to pure water.*

a. Provide a discussion of the potential inaccuracy in the model due to this assumption and the consequences of that inaccuracy for dam classification.

9 Approvals

The responses to questions in Section 9 will not be considered as part of the EIA completeness decision made by Alberta Environment and Parks.

9.1 Water Act

184. Volume, Section, 4.7.2 Page 4-50

Water diversion will consider vehicle traffic inside the creek during construction so that no water is flowing over areas used by vehicles for construction access.

a. Provide further detail regarding vehicle traffic and access points and routes especially as it relates to Cougar Creek. Is the Water Act Code of Practice for Watercourse Crossings applicable? Explain why or why not.

185. Volume 1, Section, 6.6.2, Page 6-47

5th bullet: *to maintain drainage as much as practical.*

a. The alteration of drainage may be considered an activity under the Water Act and may or may not require prior authorization under the Water Act. If it is not practical to maintain drainage, explain or identify those measures to be taken to prevent or mitigate impacts to the aquatic environment.

186. Volume 1, Section 6.6.4.2, Page 6-54
Volume 1, Section 6.6.4.2, Page 6-56

a. Provide the definition and a description of *Temporary Water Management Measures.*

b. Provide information that identifies the mitigative measures that will be implemented to reduce impacts to the aquatic environment while carrying out temporary water management measures and as a result of the alteration of surface and subsurface drainage pathways. Activities associated with this may require authorization under the Water Act.

10 Errata

187. Volume 1, Appendix 7A, Section 3.2.3 – Soil Suitability for Reclamation in the Local Study Area, Page 7A-10
Change the word oil to soil in the second paragraph, first sentence.

188. Volume 1, Appendix 7A, Attachment 7A – Soil Inspection Locations
Provide a legend to define the abbreviations used to describe the various soil parameters.

189. Volume 1, Appendix 7A, Page 7A-10
Volume 1, Appendix 7A, Page , 7A-11
Attachment 7C and 7D are mixed up in the text of this section and will need to be corrected.

190. Volume 1, Section 4.4, Figure 4.4-4
The figure titled *Seepage Control Seal Wall, Cut Off and Grout Curtain* is dated June 6, 2013, which seems to be an incorrect date. Provide the correct date and update the required sections.

191. Volume 1, Section 6.6.3.2, Page 6-52
Provide the definition of *steady-state conditions.*

192. Volume 1, Section 3.2.1, Page 3-1
The Town of Canmore states *A Consultation Plan prepared by the Town of Canmore to fulfill requirements for Level 3 extensive consultation was approved by the ACO on October 1, 2105.*

Date should be "October 1, 2015", not "October 1, 2105"

193. Volume 1, Section 6.5.1.1, Table 6.5-4, Page 6-15
In the 4th column, the unit of Peak Discharge is m^3.

Should this unit be m^3/s? If so, update Table 6.5-4 to reflect this.

194. Volume 1, Section 6.8, Page 6-62
In Section 6.8 the Town of Canmore states *due to the lack of cumulative effects anticipated for all aquatic disciplines, no additional mitigation measures are proposed.*

Do the mitigation measures during the Project construction such as ESC belong to the contents of this section? Should be re-arranged into Section 6.7 as Section 6.7.2? Explain the rationale.

195. Volume 1, Section 3.2.1, Page 3-1
The Town of Canmore indicates that the First Nation consultation plan was approved on October 1, 2105.

Confirm this date should be October 1, 2015. In addition, update this section so it reflects the correct date.

196. Volume 1, Section 1.4.3, Page 1-10
With reference to the following statement: *Because the Project will permanently remove aggregate, the residual effect on aggregate resources is negative in direction and the final environmental consequence rating is predicted as low.*

In reference to the use of 'aggregate' in statements regarding the removal of flood debris for maintenance purposes, can we use the term 'flood debris' or 'debris'. Aggregate may be misleading to mean 'construction aggregate' opposed to unsorted flood debris that contains woody material as well as large and small rocks. Alberta Parks has received concerns from First Nation groups that aggregate or gravel will be removed from behind the Structure and be sold for profit by the Town of Canmore. This is not the case.

Going forward, can we refer to the material removed from the Structure as 'flood debris' or 'debris'.

197. Volume 1, Section 4.1.4 Page 4.3

With reference to the following statement: *a single gravel road within the park to the site (right bank).*

The 'single gravel road' within the Bow Valley Wildland Park should be referred to as a route, pathway or trail (as an extension of the pedestrian pathway outside the park or a transition to Alberta Parks trails). This will reduce the potential perception that there is a portion of access road (gravel road) to the Structure within the wildland park that has not been included in the Deregulation and Land Sale Proposal.

Going forward can we refer to the route that maintenance vehicles will take to the Project as a 'trail'?

198. Volume 1, Section 4.1.3, Page 4-4

With reference to the following statement: During operations, rock and gravel removed from behind the Structure will be transported to gravel and concrete producers in Exshaw **for reuse**.

Avoid confirming that flood debris will be 'reused' by concrete producers in Exshaw. This relates to the issues noted by First Nations in Question #2. Table 4.8-1 does not mention *for reuse* in a similar statement.

199. Volume 1, Section 6.5.1, Table 6.5-4, Page 6-15

Correct the unit of peak discharge in Table 6.5-4

200. Volume 1, Section 6.5.1.1, Tables 6.5-6, Page 6-20
Volume 1, Section 6.5.1.1, Table 6.5.7, Page 6-21

The Town of Canmore in these two tables has superscripts that are not explained, in the first table '*LT'* and in the second table, a superscript '1'.

a. Clarify the two superscripts with text under both tables.