Table of Contents

LIST OF FIGURES

Abbreviations

AEP	Alberta Environment and Parks
CEA Agency	Canadian Environmental Assessment Agency
CEO	chief executive officer
EIA	environmental impact assessment
EIS	environmental impact statement
FFA	flood frequency analysis
IDF	inflow design flood
IFE	imminent flood emergencies
IR	information request
LAA	local assessment area
LUA	land use area
MT	mud transport
NRCB	Natural Resources Conservation Board
PDA	Project development area
PLC	programable logic controller
PLUZ	public land use zone
Project	Springbank Off-stream Reservoir
RAA	regional assessment area
ST	sand transport
TSS	total suspended solids
TVM	total variability metric
WSC	Water Survey of Canada

Errata
May 2019

10 ERRATA

Question 538

Volume 1, Section 1.3.1, Page 1.10
Volume 1, Section 7.4, Table 7-3, Page 7.12

Section 1.3.1 states that Tsuut'ina Nation is located 619 m south of the southernmost part of the PDA. Whereas Table 7-3, Page 7.12 references a distance of 395 m in the first column but then states in the second column that the closest point of the Project to the Tsuut'ina Reserve is 930 m.

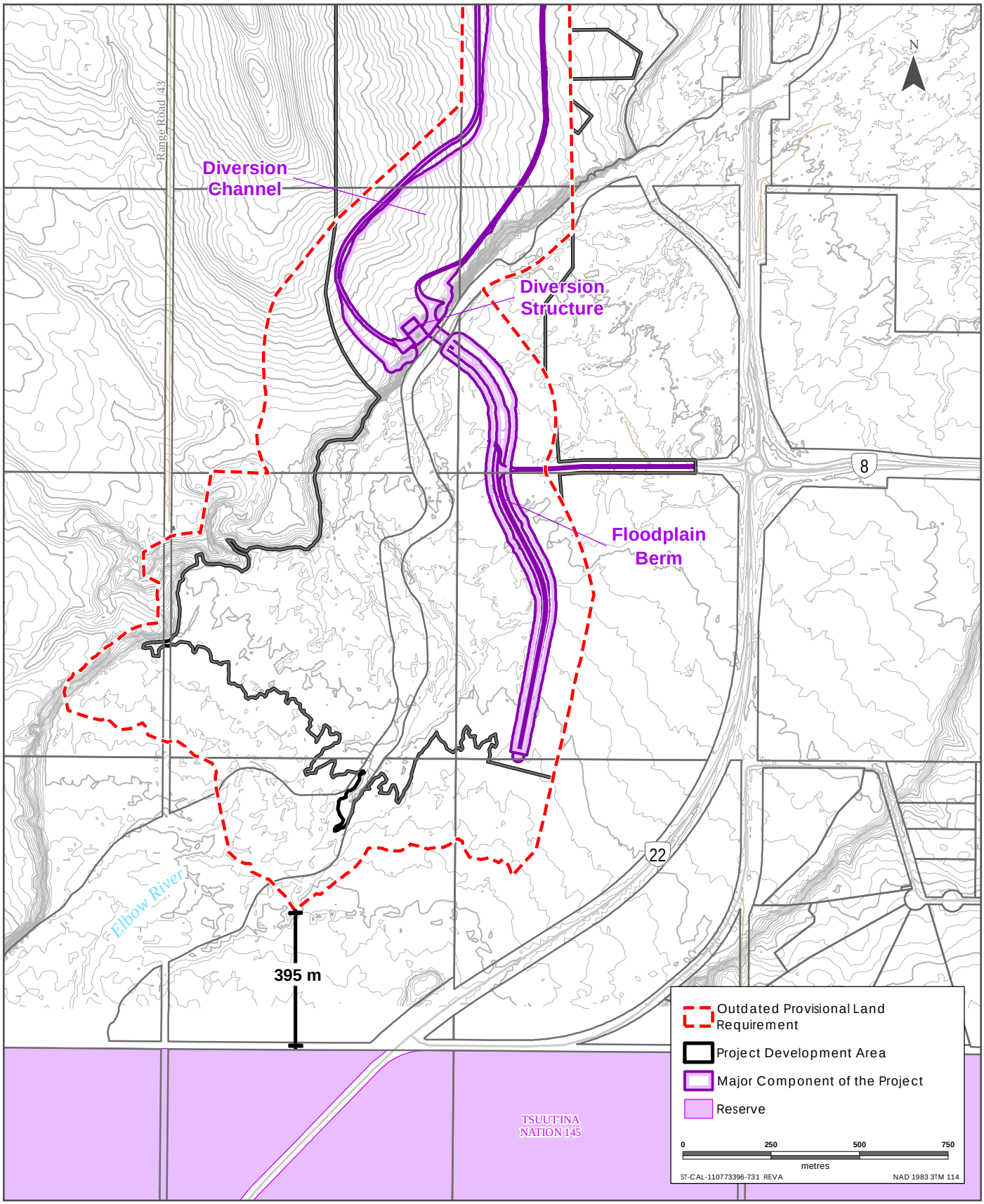
a. Clarify the distance between the PDA and the Tsuut'ina Nation. Update the sections as required so that the correct distance is used.

Response 538

a. The 395 m distance is cited in the Project Description (Alberta Transportation 2016). Figure IR538-1 shows the outdated boundary of the Project (Provisional Land Requirement) that was used to calculate that distance. The initial Project design in March 2015 identified possible additional lands that might be needed for Project operation. Later revisions indicated that such lands were not necessary.

   Figure IR538-2 shows the correct and different valid four distances of various Project features from the Tsuut'ina Nation Reserve. Each of these ways of measuring distances is used in the EIA and not only is the PDA referenced. The following is a description of these distances:

   - 1,680 m is the distance along the Elbow River from the border of the Tsuut'ina Nation Reserve lands to the extent of the backwater in the event of a diversion of the design flood.
   - 1,130 m is distance to backwater extent at the design flood; this is the same scenario as the 1,680 m distance, but it is not a possible flow path for water.
   - 819 m is the distance from the closest Project structure (the terminus of the floodplain berm) to the border of the Tsuut'ina Nation Reserve lands.
   - 619 m is the distance of Tsuut'ina Nation Reserve lands from the PDA



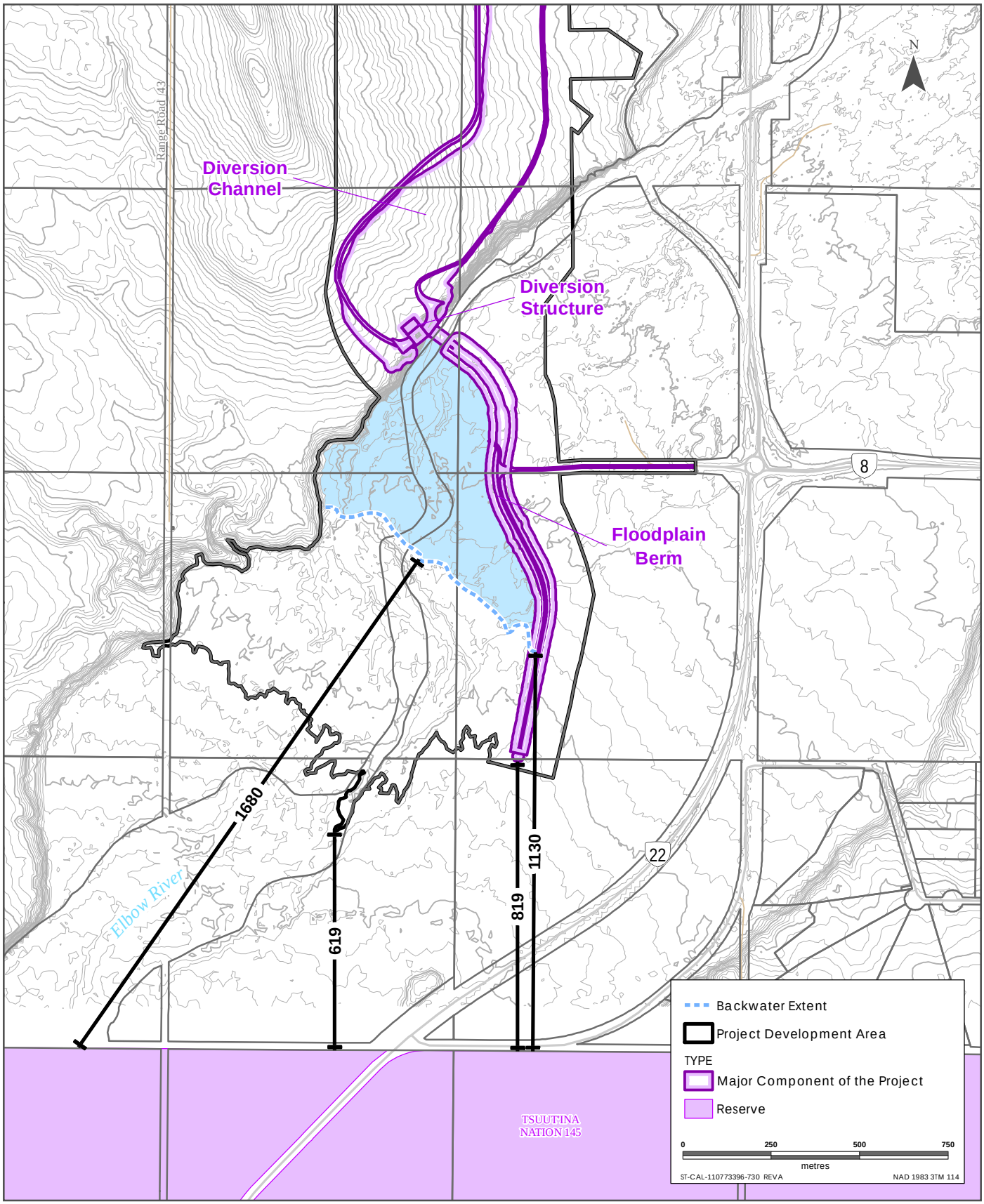
Sources: Base Data - Government of Alberta, Government of Canada, Thematic Data - Stantec Ltd.

Outdated 395 m Distance of Tsuut'ina Nation Boundary from the Project Area

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT ENVIRONMENTAL ASSESSMENT

Figure IR538-1



Sources: Base Data - Government of Alberta, Government of Canada, Thematic Data - Stantec Ltd.

Distances of Tsuut'ina Nation Boundary from Project Features

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT ENVIRONMENTAL ASSESSMENT

Figure IR538-2

The following corrections should be made in the EIA:

Environmental Impact Statement (EIS) Summary, Section 6.10.1, Page 6.63. The following sentence needs to be revised as shown: "There is one First Nations reserve in the LAA: Tsuut'ina Nation 145 is ~~400~~ 619 m to the south of the PDA."

EIS Summary, Section 7.1, Table 7-1, Page 7.4. The following sentence needs to be revised as shown: "The Tsuut'ina Nation (Reserve 145) is located 619 m ~~395 m~~ south of the PDA."

EIS Summary, Appendix B, Table B-10, Page B.36. The following sentences needs to be revised as shown: "The closest north-south Project structure (the terminus of the flood plain berm) ~~point of the project~~ to the Tsuut'ina Reserve is 819 ~~930~~ m. ~~This is~~ The distance from the reserve to the edge of backwater on the river in the event of a flood of the 2013 flood magnitude, as measured north-south, ~~The closest point of a physical SR1 component to the Tsuut'ina Reserve~~ is 1130 m"~~, the distance from the Tsuut'ina Reserve to the flood plain berm."~~

Volume 1, Section 1.3.1, page 1.10. The following sentence needs to be revised as shown: "The nearest Indigenous communities (both in Treaty 7) are Tsuut'ina Nation, located 619 m south of southernmost part of the PDA~~,~~ and Stoney Nakoda Nation, 28 km to the northwest."

Volume 1, Section 7.4, Table 7-3, Page 7.12 (third row of table): The following sentence needs to be revised as shown: "The closest north-south Project structure (the terminus of the flood plain berm) ~~point of the project~~ to the Tsuut'ina Nation Reserve is 819 ~~930~~ m. ~~This is~~ The distance from the reserve to the edge of backwater on the river in the event of a flood of the 2013 flood magnitude, as measured north-south, ~~The closest point of a physical SR1 component to the Tsuut'ina Reserve~~ is 1130 m~~, the distance from the Tsuut'ina Reserve to the flood plain berm."~~

Volume 1, Section 7.4, Table 7-3, Page 7.12 (fourth row): The following sentence needs to be revised as shown: "At its closest point ~~the back-up water~~ the closest backwater extent at the design flood would be approximately 1,130 m, north from the Tsuut'ina Nation Reserve."

Volume 3A, Section 12.2.2.1, Page 12.13. The following sentence needs to be revised as shown: "There is one First Nations reserve in the LAA: Tsuut'ina Nation 145 is 619 ~~400~~ m to the south of the PDA."

Volume 3A, Section 12.4.2.1, Page 12.27: The following sentence needs to be revised as shown: "Tsuut'ina Nation 145 is 619 ~~400~~ m to the south of the PDA~~."~~

Volume 3B, Section 18.4, Page 18.4. The following sentences occur. The first two sentences provided context for the indicated revision to the third sentence: "During a flood, it is expected that some water will back-up upstream of the diversion structure. However, modeling studies have shown that the back-up of water would not reach the Tsuut'ina Nation Reserve upstream even in a design flood. At its closest point, the back-up water

would be approximately 1,680 ~~1,100~~ m from the Reserve, as measured along the Elbow River."

Volume 3C, Section 1.1.4, Table 1-1 (sixth cell down under "Description"), Page 1.6. The following sentence needs to be revised as shown: "The Tsuut'ina Nation (Reserve 145) is located 619 m to the ~~395 m~~ south of the PDA." Coincidentally, the next sentence is also not correct, although not related to this specific errata, and should be revised as shown: "The Stoney Nation (Reserves 142, 142B, 143 and 144) is also located near the PDA.". For a correction to this statement, see the response to IR136, where the reserve numbers distances range from 11 km to 186 km.

Volume 3C, Section 1.1.5, Page 1.11. The following sentence needs to be revised as shown: "A dominant land use in the region is the Tsuut'ina Nation Reserve, which is 819 m to the south of the closest Project structure (the terminus of the flood plain berm) ~~about half kilometre south of the Project site~~"

Volume 3D, Section 3, Page 3.55 and Page 3.56. The following sentence needs to be revised as shown: "~~Although~~ The PDA is ~~adjacent~~ 619 m north of ~~to~~ the Tsuut'ina Nation Reserve and the nearest Project structure is 819 m north of the Tsuut'ina Nation Reserve~~, none of the proposed Project facilities are located directly on the reserve lands~~."

REFERENCES

Alberta Transportation. 2016. Springbank Off-Stream Reservoir Project, *Canada Environmental Assessment Act, 2012,* Project Description. Alberta Transportation. Edmonton, Alberta.

Question 539

<u>Volume 1, Section 1.3.2.1, Figure 1-8, Pages 1.12 and 1.13</u>
<u>Volume 4, Section 5.1.3, Page 5.1</u>

Regarding Area C, Alberta Transportation states in Volume 1 that *the land would be publicly owned and privately stewarded*. In Volume 4 Alberta Transportation then states that *these lands will remain under private ownership and management.* These statements are contradictory.

a. Clarify which statement is correct. Update the required section to correct for the discrepancy.

Response 539

a. A draft post-construction land use document for the Project is provided in the response to IR2, Appendix IR2-1. This document provides the draft principles of future land use for the Project development area (PDA), which was developed through the engagement process and includes feedback received by First Nation and stakeholders. The principles apply to the land use area (LUA) outlined in yellow in Figure 1 of Appendix IR2-1. The primary use of all lands within the PDA, including the LUA, is for flood mitigation. In light of the primary use, the safety of anyone with access or land users will be an overriding factor. Secondary uses such as vegetation management and First Nations' traditional activities will take place within the LUA. Further details can be found in Appendix IR2-1.

Question 540

Volume 1, Section 3.2, Figure 3-1, Page 3.3
Volume 1, Section 3.3.4, Page 3.28

Figure 3-1 is referenced in the EIA as the location for a designated spoil location, but this Figure contains no such information.

a. Provide the correct figure reference for the designated spoil location. Update the section so the correct figure is referenced.

Response 540

a. The correct location for the figure is Volume 4, Appendix D, Figure 2-2.

Question 541

Volume 1, Section 3.6.1, Table 3-9, Page 3.37

Alberta Transportation uses two different terms *Minimum Reservoir Draining Time* and *Release Time* to describe time to release water from the reservoir. A single term should only be used consistently throughout the EIA to describe this item.

a. Select one term and update the required sections.

Response 541

a. Release time is the correct phrase. The following are locations in the EIA where this phrasing should be used:

- Volume 1, Page 3-36. Text reads, "Table 3-9 shows the estimated reservoir draining times associated with different flood magnitudes." It should be, "Table 3-9 shows the estimated release time to drain the reservoir associated with different flood magnitudes."
- Volume 1, Table 3-9. Caption should be "Estimated Release Time to Drain the Reservoir for Different Flood Scenarios. Second column title should be "Estimated Release Time to Drain the Reservoir"
- Volume 3B, Section 10, Table 10-2 (page 10.3). The fifth column head should be, "Release Time to Drain the Reservoir"
- Volume 3B, Section 11, Table 11-1 (page 11.1). The fifth column head should be, "Release Timer"

Question 542

<u>Volume 2, Section 2.0, Page 2.1</u>

Alberta Transportation states *The Project meets the requirement for a mandatory activity under (c), (d), and (e) of the Regulation.*

a. In the bullets this statement is referencing there is only (a), (b), and (c). Confirm that (c), (d), and (e), are supposed to be (a), (b), and (c). Update the section so that the correct numbering is reflected.

Response 542

a. To confirm, the bullets listed (a), (b) and (c) should read (c), (d) and (e). The bullets to which the statement is referencing should read:

"(c ~~a~~) dam greater than 15 metres in height when measured to the top of the dam

(i) from the natural bed of the watercourse at the downstream toe of the dam, in the case of a dam across a watercourse or

(ii) from the lowest elevation at the outside limit of the dam, in the case of a dam that is not across a watercourse;

(d~~a~~) water diversion structure and canals with a capacity greater than 1.5 cubic metres per second;

(e~~a~~) water reservoir with a capacity greater than 30 million cubic metres;"

Question 543

Volume 2, Section 4.0, Page 4.1
Volume 3D, Table of Contents, Page 1.i

Alberta Transportation states *Volume 3D assesses the environmental effects of accidents and malfunctions and the effects of the environment on the Project*.

a. **Does Alberta Transportation mean to say the *effects of the project on the environment* instead of *effects of the environment on the Project*? If so, correct this statement and update the section. In addition, update Volume 3D so the correct title is referenced throughout the EIA. If this is not an error explain what is meant by this statement as Volume 3D addresses Accidents and Malfunctions of the Project. Some of the categories listed in Volume 3D address a dam failure, hazardous materials spills, a fire, etc. which all appear to be impacts to the environment as a result of this project.**

Response 543

a. The statement is correct, but unclear. It should be replaced by the following sentence: "Volume 3D contains three separate sections, including an assessment of two separate scenarios: 1) the environmental effects of accidents and malfunctions and 2) the effects of the environment on the Project. The additional third section is the Summary of Environmental Effects." The original statement is referring to Section 1 and Section 2 in Volume 3D.

   Effects of the environment on the Project (Volume 3D, Section 2) addresses the requirement of The Alberta Environment and Parks (AEP) Terms of Reference (TOR) for the Project (Section 3.1.2 [B]) and the Canadian Environmental Assessment Agency (CEA Agency) Guidelines Section 6.6.2. The AEP TOR requires that the environmental impact assessment identifies stages or elements of the Project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events and discusses the potential impacts over the life of the Project. The CEA Agency Guidelines requires an analysis of how local conditions and natural hazards, such as severe or extreme weather conditions and external events could adversely affect the Project.

Question 544

Volume 2, Section 7.1.1, Page 7.1
Volume 3A, Section 9.1.4.2, Page 9.5

Volume 2 states that construction will take place over a 27-month period while Volume 3A, Section 9.1.4.2 states that construction will take place over a 36-month period.

a. The statements reference two different construction timelines. Clarify the construction timeline and update the sections as required so that the correct timeline is used.

Response 544

a. The correct construction duration is 36 calendar months. Corrections should be made at the following locations:

- Volume 2, Section 7.1.1, Page 7.1.
- Volume 3A, Section 3.1.5, Table 3.8. Row labelled as "duration", third column

Question 545

Volume 3A, Section 9.2.4, Figure 9-6, Page 9.26

Alberta Transportation refers to Tables D7-15 and D7-16 for Agricultural Land Capability Class descriptions in the footnote on Figure 9-6. These tables cannot be located.

a. Provide the correct table references.

Response 545

a. The correct cross reference is Volume 4, Appendix G, Table 3-12 and Table 3-13.

Question 546

Volume 3A, Section 9.5, Page 9.43

Alberta Transportation states that *There is a reduction in the areal extent of land rated as agricultural capability class 3 (mode) by 7% of the LAA during construction and dry operations (Table 9-13)*. However, the changes in extent of agricultural land capability are presented in Table 9-14.

a. Table 9-13 is the incorrect reference. Correct the table reference.

Response 546

a. The correct table cross reference is Table 9-14.

Question 547

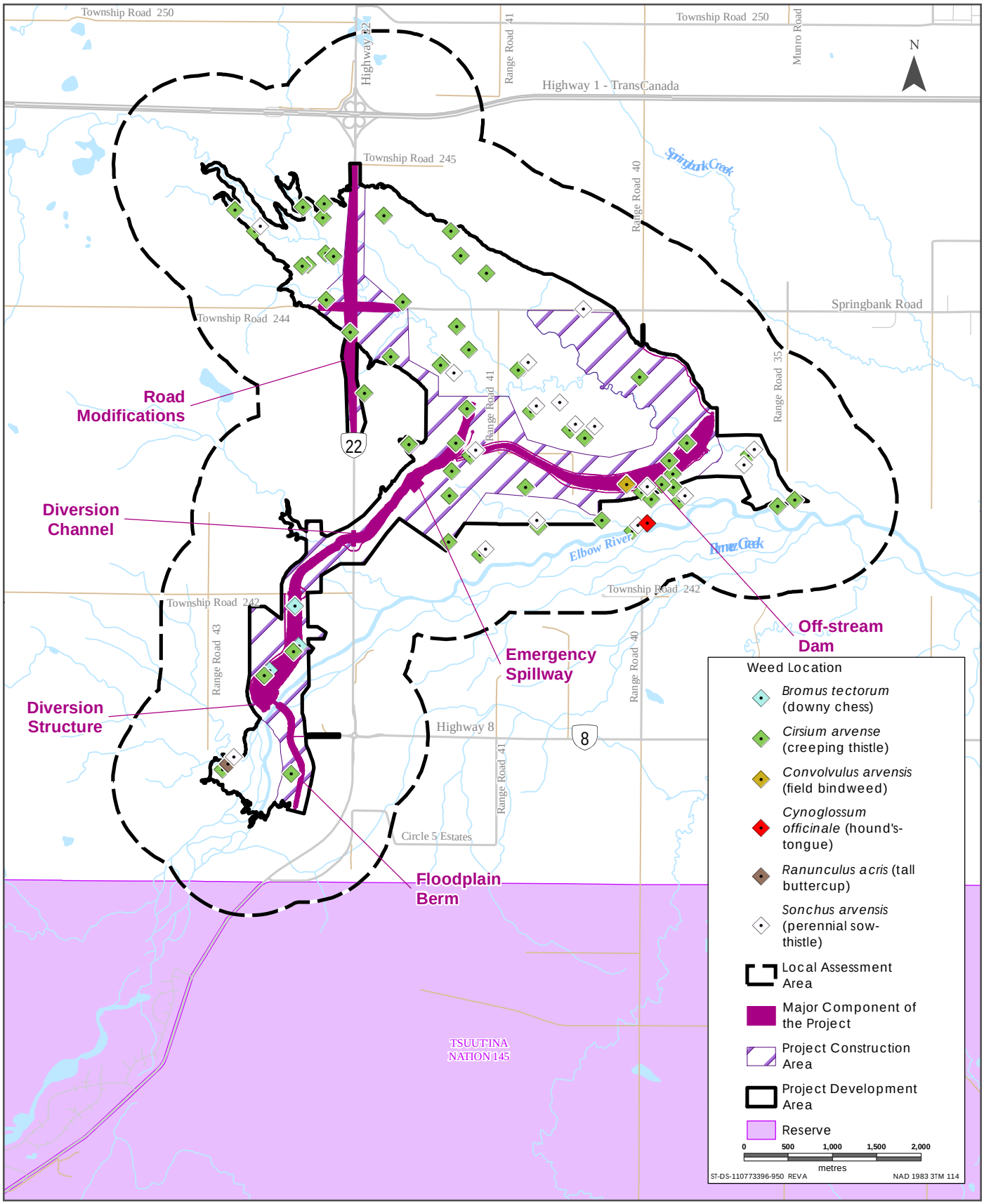
Volume 3A, Section 10.2.2.3, Figure 10-5, Pages 10.34 and 10.35

Reference is made to the presence of hound's tongue, but no point for this species can be located on Figure 10-5.

a. Point out the presence of Hounds Tongue on Figure 10-5.

Response 547

a. Figure 10-5 in Volume 3A, Section 10 does not show the presence of hound's tongue. See Figure IR547-1 for the location of hounds tongue.



Sources: Base Data - Government of Alberta, Government of Canada, Thematic Data - Stantec Ltd.

Location of Hound's Tongue

Stantec

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT ENVIRONMENTAL IMPACT ASSESSMENT

Figure IR547-1

Question 548

Volume 3A, Section 10.3, Table 10-11, Page 10.39

In the concordance table, Volume 3A, Section 10.3, Table 10-1 is indicated as the location of information related to identifying key vegetation indicators used to assess the Project impacts and the rationale for the indicator's selection. However, section 10.3 does not contain a table 10-1. It does contain Table 10-11 which describes key mitigation measures, but not indicators.

a. Clarify the location of the information on key vegetation indicators and the location of the rationale for their selection?

Response 548

a. In the vegetation assessment, the potential environmental effects (landscape diversity, plant community diversity, species diversity, and wetland functions) are used as equivalent to key indicators and the identification of these is in Section 10.1.3, Table 10-1. The rationale for their selection is discussed in Section 10.1.3.

Question 549

Volume 3A, Section 15.3.3, Page 15.27

Alberta Transportation states *Groundwater quantity and quality are not expected to be materially affected due to the limited extent and duration of Project effects on groundwater. Therefore, it is anticipated that there will be no effects on the ability of Tsuut'ina Nation to use groundwater in the Elbow River Alluvial Aquifer or the Elbow River for drinking water; effects to functioning of the identified wells on the Tsuut'ina Nation reserve within the hydrogeology RAA are not anticipated (See Section 14.3.23).* There is no Section 14.3.23.

a. Provide the correct section reference.

Response 549

a. The correct cross reference is Section 14.3.2.3, where the following statement is made: "Effects will be limited to the LAA and the Project will not decrease the yield of groundwater supply wells to the point where they can no longer be used (see Section 5.4). In respect of these conclusions, it is anticipated that there will be no effects on the ability of Tsuut'ina Nation to use groundwater in the Elbow River alluvial aquifer or Elbow River for drinking water; effects to functioning of the identified wells on the Tsuut'ina Nation Reserve within the hydrogeology RAA are not anticipated."

   The same incorrect cross reference is also in Section 14.8.5.

Question 550

Volume 3B, Section 3.2.5.3, Table 3.2-4, Page 3.17

The table reference footnotes are missing for *c* and *d*.

a. Correct the footnote to include the missing references.

Response 550

a. The following are the missing footnotes to Table 3.2-4:

- "c. Concentration represents the 9th highest 1-hour concentration"
- "d. Concentration represents the 3-year average of the annual 8th highest 24-hour average concentrations"

Question 551

Volume 3B, Section 5.0, Page 5.1

Alberta Transportation states groundwater *quantity quality*. There appears to be a word missing between quantity quality.

a. Add the missing word and update the section.

Response 551

a. The sentence should read as follows "The assessment focuses on the effects of the diversion on groundwater quantity and quality."

Question 552

Volume 3B, Section 6.4.1.1, Page 6.14

Alberta Transportation states *The hydrographs used in the analytical assessment are primarily based on hydrographs sourced from the WSC for the WSC Station 07BJ004 Bragg Creek*.

a. WSC station number is incorrect. The correct number is 05BJ004. Update this section so that the correct number and name of the station is referenced.

Response 552

a. The correct Water Survey of Canada (WSC) station number is 05BJ004.

Question 553

Volume 3B, Section 6.4.3.3, Figure 6-20, Page 6.45

a. Provide the y-axis label for the top plot of Figure 6-20 as it is missing.

Response 553

a. The y-axis should be labelled as follows: "Suspended Sediment Concentration (mg/L).

Figure IR553-1 is a revised version of Figure 6-20.

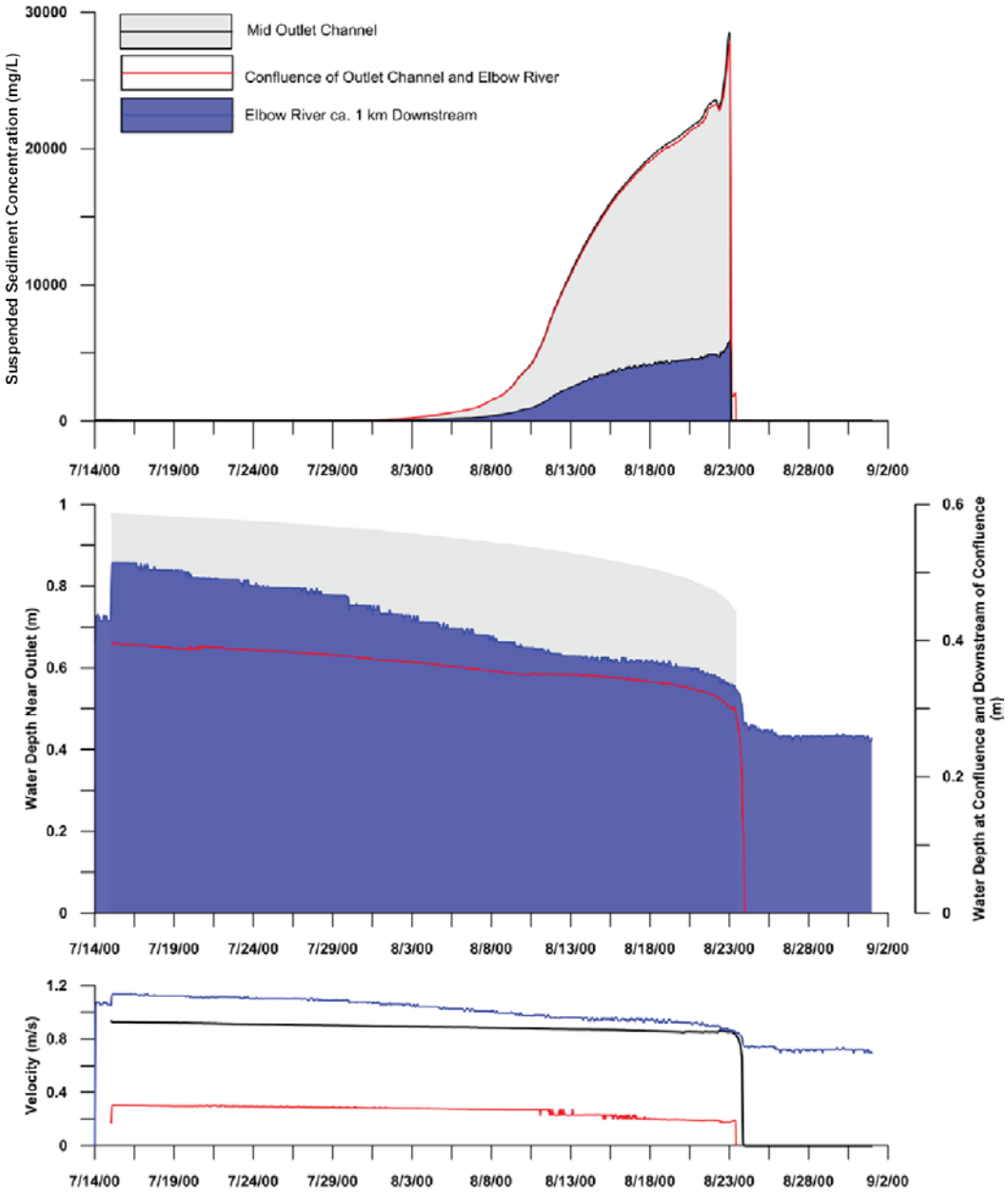


Figure IR553-1 Suspended Sediment Concentration in the Low-level Outlet and its Confluence with Elbow River for the 1:100 Year Flood (revision to Volume 3B, Section 6, Figure 6-20)

Question 554

Volume 3B Section 6.4.1.4, Page 6.17
Volume 4, Appendix J, Section 2.4.2, Table 2-9, Page 2.34

Alberta Transportation indicates that the design full service level of the reservoir is 77,200 dam³ in Volume 3B and 84,500 dam³ in Volume 4, Appendix J.

a. What is the correct full service volume? Update the required section so that the correct full service volume is indicated and consistent throughout the EIA.

Response 554

a. The correct volumes are as follows:

- The capacity of the off-stream reservoir is 77,771,000 m³ (also sometimes equivalently written as 77,771 dam³
- The capacity of Glenmore Reservoir is 10,000,000 m³
- The combined capacity of the off-stream reservoir and Glenmore Reservoir is 87,771,000 m³

The following corrections are required in the EIA:

Section 6.4.1.4, Page 6.17. The following sentences should have this correction: "The second criterion is based on the length of time to drain the reservoir using the engineering design full service volume of approximately 77,771 ~~77,200~~ dam³). For this volume, the length of time to drain the reservoir is estimated to be 40 days."

Section 6.4.3.1, Table 6-6, Footnote 4, Page 6.28. The following sentence should have this correction: "Based on full service volume of 77,771 ~~77,220~~ dam³ and assuming a sediment density of 2,650 kg/m³"

Volume 4, Appendix J, Section 2.4.2, Page 2.37. The following sentences should have this correction: "The second criterion is based on the length of time to drain the reservoir using the engineering design full service volume of approximately 77,771 ~~84,500~~ dam³. Under this volume, the length of time to drain the reservoir is estimated at approximately 40 days."

Question 555

Volume 3B, Section 6.4.3.1, Page 6.27
Volume 3B, Section 6.4.3.1, Table 6-6, Page 6.28

Alberta Transportation states in Section 6.4.3.1 that *This mass is minimal compared to the larger floods and is indicative of the relative size of the 1:10 year flood. Volumetrically, the deposited sediment remaining in the reservoir after release is estimated as 0.5% of the full-service volume (Table 6-6)*.

a. Table 6-6 lists loss of retention volume due to sediment remaining in the Reservoir for a 1:10 year flood as 0.0%. What is the correct percentage? Correct the number and update the table or the explanation so that both percentages are same.

Response 555

a. The correct percentage is 0.0%. The value 0.5% in the second paragraph on Page 6-27 is incorrect.

Question 556

Volume 3B, Section 9.2.3.1, Page 9.7
Volume 4, Appendix D, Section 6.2, Page 6.2

Alberta Transportation states that *Sediment is expected to be dominantly in the sand size class*, whereas Volume 4 Appendix D indicates that a different composition for sediment: *The fine fractions (sand/silt/clay) are likely to stay in suspension longer, settle out and be deposited in the reservoir*.

a. Clarify the expected grain size and composition of post-flood sediment.

Response 556

a. As stated in Volume 3B, Section 9.2.3.1, sediment deposited in the reservoir will be dominantly of the sand class but will also include fine fractions (i.e., silt/clay). The suspended sediment transport modelling used the following grain sizes: 20.56 mm (gravel), 0.36 mm (sand), and 0.063 mm (silt/clay).

Question 557

Volume 3B, Section 9.2.3.3, Page 9.11

Alberta Transportation states that *Effects were included in those presented in Table 9-10*. Table 9-10 does not exist in Volume 3B, Section 9.

a. Provide the correct table reference.

Response 557

a. The correct table reference is Volume 3B, Section 9. Table 9-5.

Question 558

Volume 3B, Section 10.2.1, Page 10.3

Reference is made to Volume 3B, Section 6.5.1.3 for information on sediment deposition but no such section exists.

a. Section 6.5.1.3 does not exist. What is the correct section? Update the section so the correct reference is referred to.

Response 558

a. The correct cross reference is Section 6.4.3.

Question 559

Volume 3C, Section 1.2.1.2, Page 1.17
Volume 3A, Section 3.4.3, Page 3.46

Alberta Transportation states *Project mitigation measures are identified in Volume 3A, Section 3.4.3*. Section 3.4.3 *Air Emissions Rates* provides a discussion of contaminant emission into air for the Project.

a. Provide the correct section reference.

Response 559

a. The correct cross reference is Volume 3A, Section 3.4.4.

Question 560

Volume 3D, Table 3-1, Pages 3.9 to 3.12

a. Delete the duplicated points stated on Pages 3.11 and 3.12 (repetitive with points on Pages 3.9 and 3.10).

b. Revise the wording in the column Significance of Residual Effect(s) once the Conclusions have been reworded in other sections.

Response 560

a. The following three statements are duplicates and should be removed from Table 3-1, pages 3-11 and 3-12:

   "Water will be discharged in a manner to avoid erosion using silt fences, turbidity barriers, containment berms and settling ponds. Dewatering will be in accordance with the terms and conditions of Environmental Protection and *Enhancement Act*, *Water Act* and the federal *Fisheries Act* and *Navigable Waters Protection Act.*"

   "Construction dewatering may be minimized through diligent construction planning."

   "Regional-scale effects on groundwater quantity can be mitigated by allowing seepage in the dry diversion channel to infiltrate back into the subsurface, or flow back into the Elbow River via surface water drainage pathways. Silt fences and turbidity barriers will be used to control TSS and to ensure the water quality from care of water system discharges is made equal to or better than the initial water quality by carrying out frequent water quality testing."

b. No revisions to the column entitled "Significance of Residual Effects" are required due to the removal of the duplicated statements identified in a.

Question 561

Volume 4, Appendix A, Table A-1, TOR 3.4.2[E], Page A.23

Alberta Transportation is to *Describe impacts on other surface water users resulting from the Project. Identify any potential water use conflicts*. The reference Volume 3A, Section 6.4.2 is not available.

a. Update the reference so it is linked to the correct section in the EIA.

Response 561

a. As stated in the response to IR58: "Figure 1R58-1 shows the location of each water licence identified in Volume 3A, Section 6.2.2.6, Table 6-9. In some instances, there are multiple licences at the same location and that has been indicated numerically.

   The surface water withdrawal licence data illustrated in Figure IR58-1 was provided by Alberta Environment and Parks (J.Yan. Applications Analyst, pers comm. April 4, 2017), and has not been verified."

Question 562

Volume 4, Appendix A, Table A-1, TOR 10 [A]g), Page A.47

The concordance table references Volume 3C, Section 4.0 which does not exist.

a. Update the concordance table and the reference so that the correct reference is listed.

Response 562

a. The reference to Volume 3C, Section 4 occurs in the October 2017 EIA) for terms of reference (TOR) item TOR10 [A]g and is on page A.35.

   The correct document to refer to is the March 2018 EIA where TOR Item TOR10 [A]g is cross referenced to Volume 3C, Section 2.1.1 on page A.47.

Question 563

Volume 4, Appendix A, Table A-1, TOR 2.7.2[A]b), Page A.11

The concordance table reference for this TOR is Volume 3A sections 6.4.2, 6.4.4, 10.2 and Volume 3B sections 6.4.2, 6.4.4, 10.2.4. Volume 3A sections 6.4.2 and 6.4.4 do not exist.

a. Update the concordance table so that the appropriate reference is listed or delete this reference.

Response 563

a. The correct cross references for Volume 4, Appendix A, Table A-1, TOR 2.7.2[A]b), Page A.11 TOR 2.7.2[A]b), Page A.11 are the following: Volume 1, Section 7, Table 7-3 (page 7.18, first row); Volume 3A, Section 6.5.2; Volume 3B, Section 8.2.2; 8.4.2.1; 8.4.4.2.

Question 564

Volume 4, Appendix A, Table A-1, TOR 3.4.1[C], Page A.21

The concordance table reference for this TOR is at Volume 3A, Section 6.2.2.8. However, there is no section by that number.

a. Update the concordance table so that the correct reference is listed.

Response 564

a. The concordance table provided in Volume 4, Appendix A, Table A-1, TOR 3.4.1[C], Page A.21 does not reference Section 6.2.2.8 as noted in this question. The concordance table references Section 6.2.2.6 which is a section entitled "Water Licences." The section provides an inventory of surface water licences.

Question 565

Volume 4, Appendix D, Table 4-2, Pages 4.7 and 4.8

a. Identify the units for the numbers shown in Table 4-2.

Response 565

a. All units are hectares.

Question 566

Volume 4, Appendix D, Section 4.4.2, Page 4.11

The first sentence of this section refers to Table 5-3, which does not exist in Volume 4, Appendix D.

a. Provide the correct table reference.

Response 566

a. The correct cross reference is Table 4-3.

Question 567

Volume 4, Appendix E, Section 3B.3.2, Table 3B-8, Page 3B.3.3.

The title of Table 3B-8 reads *Mean Monthly and Annual Total Precipitation, Rainfall and Snowfall at Fort Springbank Airport (1980-2010).* The airport is the Springbank Airport.

a. Confirm the airport is the Springbank Airport.

Response 567

a. Fort Springbank Airport is the incorrect name. The correct name to be referenced in the title of Table 3B-8 is the Springbank Airport.

Question 568

Volume 4, Appendix G, Technical Data Report, Section 1.2.6, Page 1.6

Alberta Transportation states that *Land Use within the LAA is further explored in Volume 4, Appendix M*, however Land Use is explored in Volume 4, Appendix N.

a. Correct the reference so the appropriate appendix is referred to.

Response 568

a. The correct cross reference is Volume 4, Appendix N.

Question 569

Volume 4, Appendix G, Technical Data Report, Section 3.0, Pages 3.5 to 3.31

The references throughout the section state that supporting information is provided in Section 5.4 (i.e. soil series site data and analytical methods and quality assurance reports). Section 5.4 does not exist in Volume 4 Appendix G.

a. Update the references throughout the section.

Response 569

a. There are several cross-referencing updates in Volume 4, Appendix G, Technical Data Report, Section 3.1. Corrections are provided below:

- Section 3.1.2, second paragraph. "Section 5.4" should instead read "Section 3.2, Soils Results."
- Section 3.1.2, last sentence in section. "Section 5.4" should read "Attachment C Soils Data Attachment, C.2 Soil Horizon Attachment, and C.3 Soil Site Attachment."
- Section 3.1.3, next to last sentence in the section. "Section 5.4" should read "Analytical methods are provided in Attachment C Soils Data Attachment and C.5 Maxxam Analytics COC Documents"
- Section 3.1.4.2 (page 3.8), next to last paragraph in the section. "Section 5.4" should read "Attachment C, Soils Data Attachment and C.1, Soil Map Unit Description Tables."
- Usage 5. Section 3.2.5, last sentence in section. (page 3.31). "Section 5.4" should read "Attachment C, Soils Data Attachment, C.1, Soil Map Unit Description Tables"

Question 570

Volume 4, Appendix G, Technical Data Report, Section 3.1.5.5, Page 3.14

Alberta Transportation states that *Susceptibility to soil compaction is dependent on soil physical properties…Generally, compatibility increases with higher clay content, higher soil moisture content and lower organic matter content*.

a. Correct the spelling mistake as *compatibility* is a typo.

Response 570

a. In the quoted sentence, "compatibility" is the incorrect word. The correct word is "compaction." The sentence should read, "Generally, compaction increases with higher clay content, higher soil moisture content and lower organic matter content."

Question 571

Volume 4, Appendix J, Section 2.2.5, Page 2.14

Alberta Transportation states *However, the overall pattern of degradation/aggradation.*

a. The sentence is not complete. Complete the sentence and update the section.

Response 571

a. The sentence could not be located at the reference provided; however, it is in Volume 4, Appendix J, Section 2.4.3, Page 2-40. The sentence should read, "However, the modelling of MT and ST modules separately and combining the results is able to produce the similar overall pattern of degradation/aggradation as running the modules together."

Question 572

Volume 4, Appendix J, Section 2.4.2, Table 2-9, Page 2.34

Table 2-9 *Flow and Volume Estimates at Brag Creek and Sarcee Bridge for Modelled Floods* includes three column headings with *FFA*.

a. Define this abbreviation.

Response 572

a. FFA = flood frequency analysis

Question 573

Volume 4, Appendix J, Section 2.4.2, Page 2.37

Modeling of sediment transport was based on a combination of field collected data and site specific mathematical relationships between discharge and the.

a. This sentence is incomplete. Complete the sentence and update the section.

Response 573

a. The text should read "Modelling of sediment transport was based on a combination of field collected data and site-specific mathematical relationships between discharge and the concentration of suspended sediment".

Question 574

Volume 4, Appendix J, Section 2.4.2, Page 2.37

Alberta Transportation states *This threshold was based on a maximum design release rate of 27 m³/s and the effective discharge for suspended sediment transport of between 35 and 50 m³/s (see Volume 4 Appendix J Hydrology for more detail)*.

a. Volume 4, Appendix J, Hydrology was referenced within Volume 4 Appendix J, Hydrology. This is not the correct reference. Provide the correct reference.

Response 574

a. The cross reference is incorrect. No cross reference is needed in this context since the Hydrology Technical Data Report provides all analyses conducted. The following should be deleted: "(see Volume 4, Appendix J Hydrology for more detail)."

Question 575

Volume 4, Appendix J, Section 2.4.2, Page 2.37
Volume 3B, Section 6.4.1, Page 6.17

Alberta Transportation identified that *the second criteria for release is based on the length of time to drain the reservoir using the engineering design full service volume of approximately 84,500 dam³.*

In Volume 3B, Section 6.4.1, Page 6.17 Alberta Transportation identified that *the second criteria is based on the length of time to drain the reservoir using the engineering full service volume of approximately 77,200 dam³*. The two statements use different full service volumes.

a. Why are the full service volumes different? Clarify what the full service volume should be. Correct the required section so that the correct full service volume is indicated.

Response 575

a. The correct full service volume is 77,771,000 m³ (also sometimes equivalently written as 77,771 dam³).

The following corrections are required in the EIA:

Section 6.4.1.4, Page 6.17. The following sentences should have this correction: "The second criterion is based on the length of time to drain the reservoir using the engineering design full service volume of approximately 77,771 ~~77,200~~ dam^3). For this volume, the length of time to drain the reservoir is estimated to be 40 days."

Section 6.4.3.1, Table 6-6, Footnote 4, Page 6.28. The following sentence should have this correction: "Based on full service volume of 77,771 ~~77,220~~ dam^3 and assuming a sediment density of 2,650 kg/m^3"

Volume 4, Appendix J, Section 2.4.2, Page 2.37. The following sentences should have this correction: "The second criterion is based on the length of time to drain the reservoir using the engineering design full service volume of approximately 77,771 ~~84,500~~ dam^3. Under this volume, the length of time to drain the reservoir is estimated at approximately 40 days."

Question 576

Volume 4, Appendix J, Section 2.4.3, Page 2.40

However, the overall pattern of degradation/aggradation

a. This sentence is incomplete. Complete the sentence and update the section.

Response 576

a. This information request (IR) is the same as IR571, see response below.

The sentence could not be located at the reference provided. It is in Volume 4, Appendix J, Section 2.4.3, Page 2-40. The sentence should read, "However, the modelling of MT and ST modules separately and combining the results is able to produce the similar overall pattern of degradation/aggradation as running the modules together."

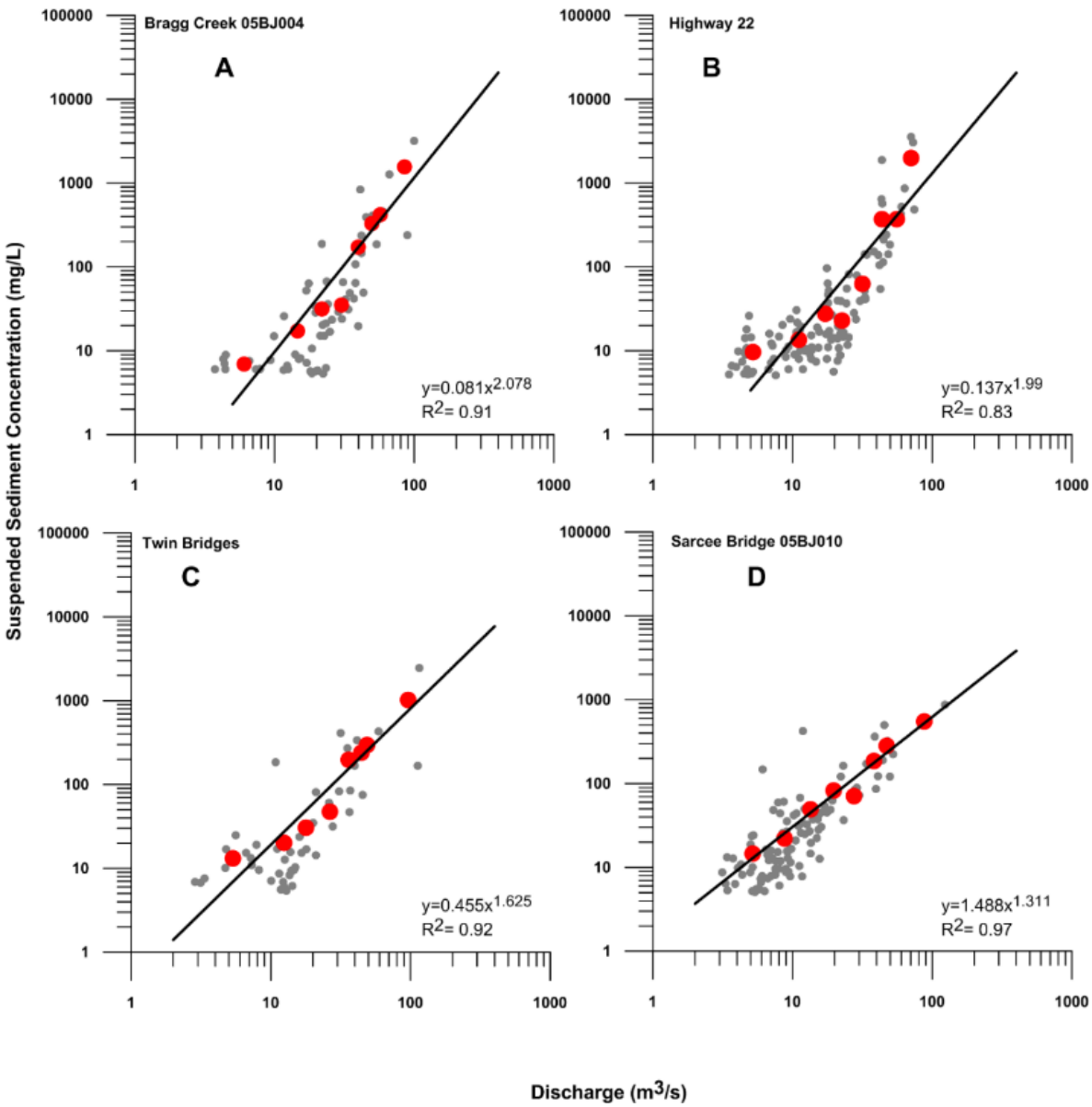
Question 577

Volume 4, Appendix J, Figure 3-12, Page 3.23
Volume 4, Appendix J, Figure 3-14, Page 3.26

a. Provide legends for the grey and red circles used in the plots.

Response 577

a. See Figure IR577-1 for the explanation of grey and red circles in Figure 3-12 and Figure IR577-2 for explanation of the same in Figure 3-14.

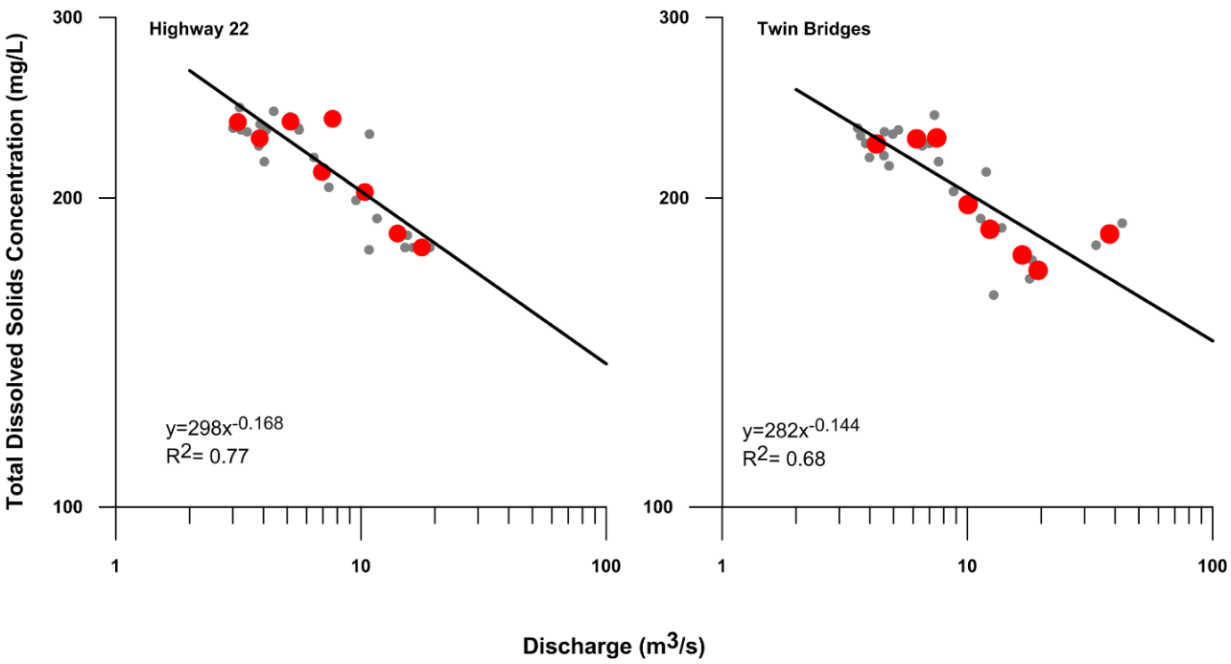


NOTES:

Gray circle – Suspended sediment concentration for associated discharge rate (flow in Elbow River).

Red circle – Average suspended sediment concentration for associated average discharge rate (flow in Elbow River).

Figure IR577-1 Suspended Sediment Concentration, Discharge Rating Curves (additional information added to Volume 4, Appendix J, Figure 3-12)



NOTES:

Gray circle – Total Dissolved Sediment Concentration for associated discharge rate (flow in Elbow River)

Red circle – Average Total Dissolved Sediment Concentration for associated average discharge rate (flow in Elbow River)

Figure IR577-2 Total Dissolved Sediment Concentration, Discharge Rating Curves (additional information added to Volume 4, Appendix J, Figure 3-14)

Question 578

<u>Volume 4, Appendix J, Section 3.3.4.1, Page 3.35</u>

Alberta Transportation states *The long-term data sets were sourced from Alberta Environment and Parks and the City of Calgary water quality data bases (see Appendix D4 for detail)*

a. Appendix D4 is not available in the EIA. Provide the correct appendix.

Response 578

a. See the response to IR79, as follows: "The material referenced was incorrectly labelled as Appendix D4. It should have referenced Appendix K – the Surface Water Quality Data Report. In Appendix K, Table 2-2 lists the site locations and years of data collected. Figure 2-1 in Appendix K shows the site locations. The table is duplicated here, without revision, as Table IR79-1. The figure is duplicated here, without revision, as Figure IR79-1."

Question 579

Volume 1, Section 7.4, Table 7-5, Page 7.47
Volume 1, Section 7.4, Table 7-7, Page 7.54

Alberta Transportation states a request in the Siksika Nation table to *begin a process that would work concurrently with the study of the physical reservoir, toward a community benefits agreement for Kainai.* Based on the text this request appears to be for Kainai First Nation, not Siksika Nation. The request could not be found in the Kainai Treaty 7 First Nation table (Table 7-7).

a. Clarify the discrepancy between Table 7-5 and Table 7-7. Update the Tables as required so the correct First Nation is identified.

Response 579

a. The request was made in the Joint Kanai and Siksika Interim Traditional Use Study Report submitted confidentially to Alberta Transportation March 13, 2017. The following corrections are needed.

Table 7-5 on page 7.49, the following cell should be revised as follows:

Issues, Concerns and Recommendations	Responses and Outcomes
• Establish ASAP the following: who will be employed in the development of the proposed project, what community benefits will be available, and what steps will be taken to address and accommodate future impacts to Siksika interests. • Begin a process that would work concurrently with the study of the physical reservoir, toward a community benefits agreement for ~~Kanai~~ Siksika.	• Alberta Transportation will follow government procurement policies and procedure with respect to labor, and goods and services. Alberta Transportation is willing to discuss possible economic opportunities with the Siksika First Nation.

Table 7-7 on page 7.60 should have a new cell, added as follows:

Issues, Concerns and Recommendations	Responses and Outcomes
• Establish ASAP the following: who will be employed in the development of the proposed project, what community benefits will be available, and what steps will be taken to address and accommodate future impacts to Kainai interests. • Begin a process that would work concurrently with the study of the physical reservoir, toward a community benefits agreement for Kainai.	• Alberta Transportation will follow government procurement policies and procedure with respect to labor, and goods and services. Alberta Transportation is willing to discuss possible economic opportunities with the Kanai First Nation.

Question 580

Volume 4, Appendix B, Section 3.1.4, Page 3.21

Alberta Transportation mentions a meeting request with Stoney Nakoda Nations Chiefs and their Chief Executive Officers to provide a project update in July 2014. However, this statement was included in the time period of June 27, 2016 – September 15, 2016.

a. Clarify when this request was made.

Response 580

a. This request was made by email on July 28, 2016 from Dallas Maynard, DEMA Land Services, to Bill Snow, Consultation Manager, Stoney Tribal Administration, and Stoney Nakoda Nation Chief Executive Officers (CEOs) Lyndsay Blackett (Chiniki), Hopeton Louden (Wesley) and Rob Shotclose (Bearspaw).

Question 581

Volume 3A, Section 7, Page 7.1

Alberta Transportation's definition of *surface water quality as Surface water quality refers to the chemistry of water in watercourses* does not include other key aspects. A broader definition would include chemical, physical, biological and radiological characteristics of water in watercourses, and would also include parameters such as temperature, sediment (turbidity), and algae/ bacteria.

a. Confirm Alberta Transportation agrees with this definition.

Response 581

a. Alberta Transportation agrees with the broader definition of surface water quality presented above. The assessment did consider the chemical, physical and biological characteristics of surface water quality.

Question 582

Volume 3A, Section 7.3, Page 7.13

There is an *Error! Reference source not found* in the first paragraph of this section.

a. Provide the correct reference.

Response 582

a. "*Error! Reference source not found*" should be replaced by "Table 7-3."

Question 583

Volume 3A, Section 7.2.2, Page 7.10
Volume 3A, Section 7.4.2.1, Page 7.14

Alberta Transportation indicated that *For a description of changes in turbidity conditions in the Elbow River and the outlet channel based on continuously collected data since 2015, see Volume 3A, Section 6 Hydrology.* The information could not be found in that section.

a. Provide the correct reference.

Response 583

a. The correct cross references are Volume 3B, Section 6.2, Page 6.3 and Volume 4, Hydrology Technical Data Report, Section 2.3.4; Section 3.3.2.1, Page 3.25.

Question 584

Volume 3A, Section 7.4.2.2, Page 7.15

Alberta Transportation indicated that *For more information on construction mitigation measures see Volume 3A, Section 8.4.7.* However, this section does not exist.

a. Provide the correct reference to find construction mitigation measures.

Response 584

a. The correct cross reference is Volume 3A, Section 8.4.3, page 8.51.

Question 585

Volume 3A, Section 7.2.2, Page 7.10
Volume 4, Appendix K, Section 3.1, Page 3.1

Alberta Transportation indicated that *There are no approved wastewater discharges to the Elbow River upstream of Glenmore Reservoir*.

a. Review this statement as there are point sources in this area.

Response 585

a. The sentence appears in both Volume 3A, Section 7.2.2, page 7.10 and in Volume 4, Appendix K, Section 3.1, page 3.1 and should be revised as follows: "~~There are no approved wastewater discharges to the Elbow River upstream of Glenmore Reservoir.~~ There are the following wastewater sources upstream of Glenmore Reservoir:

- Bragg Creek Wastewater Treatment Plant
- Calaway Park Lagoon
- Redwood Meadows Lift Station and Lagoon
- Wintergreen Wastewater Treatment Plant

Question 586

Volume 3B, Section 7.2.2.1, Page 7.7

Alberta Transportation states that *Based on quantitative analysis, the following parameters were very similar to suspended sediment in data patterns: total phosphorus, total coliforms, dissolved phosphorus, total dissolved phosphorus, and total organic carbon.*

a. In this statement, what is the difference between dissolved phosphorus and total dissolved phosphorus? If there is no difference, revise the statement.

Response 586

a. There is no difference between dissolved phosphorus and total dissolved phosphorus for this assessment. The following text in Volume 3B, Section 7.2.2.2, Page 7.7 should be revised as follows:

"Based on a quantitative analysis, the following parameters were very similar to suspended sediment in data patterns: total phosphorus (see Figure 7-3), total coliforms, dissolved phosphorus, ~~total dissolved phosphorous~~, and total organic carbon."

Question 587

Volume 4, Appendix K, Section 2.2.4.4, Page 2.22

Equation 3 shows a parameter TVM that was not defined in the preceding text.

a. Clarify the TVM parameter in equation 3.

Response 587

a. TVM = total variability metric

Question 588

Volume 4, Appendix K, Section 2.2.4.6, Page 2.29

Alberta Transportation states that *Out of the nitrogen species, nitrate and nitrite are available for plant uptake, while ammonia … need oxidation before they can be used.*

a. Confirm ammonia is also considered readily available as a nutrient for plant uptake.

Response 588

a. Ammonia is also considered readily available as a nutrient for plant uptake. The sentence referenced in Volume 4, Appendix K, Section 2.2.4.6, Page 2.29 should state "Out of the nitrogen species, nitrite, nitrate and ammonia are readily available for plant uptake, while organic nitrogen is not readily available for plant and algae growth."

Question 589

Volume 4, Appendix K, Section 3.2, Figure 3-2, Page 3.5

The graph is supposed to show the seasonal variation for the Elbow River mainstem and at the Glenmore Reservoir. The Glenmore Reservoir bars are missing.

a. Add the Glenmore Reservoir bars and provide the updated graph.

Response 589

a. Figure IR589-1 provides the requested additional information.

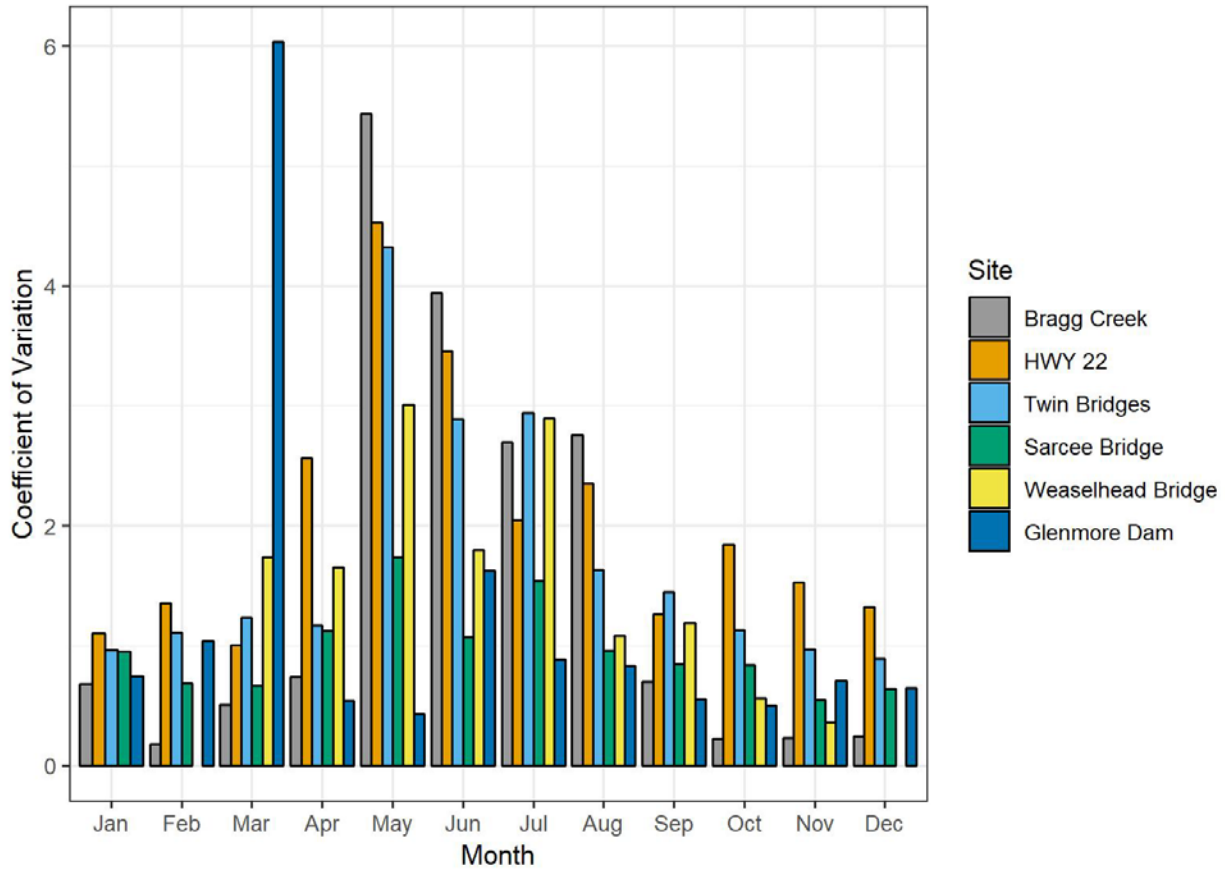


Figure IR589-1 Seasonal Variation Metrics of Total Suspended Sediment in the Elbow River Mainstem and in the Glenmore Reservoir from 1979 to 2016

Question 590

<u>Volume 4, Appendix K, Section 3.2.2.2, Page 3.34</u>

Alberta Transportation indicated that *Water temperature and dissolved oxygen conditions change similarly in response to the diversion of flood water and retention in the reservoir prior to release back into the Elbow River.*

a. Clarify this statement as the temperature and dissolved oxygen changes are normally inversely proportional.

Response 590

a. The sentence should state "Water temperature and dissolved oxygen have the potential to change spatially and seasonally in the existing environment."

Question 591

EIS Summary, Section 6.4.2.1, Page 6.20

Alberta Transportation identified that *Sediment and erosion control measures as detailed in Section 5.6.2.1, Aquatic Ecology will be used.* That section is not within the EIS Summary report.

a. Update the reference.

Response 591

a. The section number provided is not correct. The sentence should read "Sediment and erosion control measures—as detailed in Volume 3A, Section 8.4.3.4, Aquatic Ecology—will be used."

Question 592

Volume 3B, Section 7.2.2.1, Page 7.7
Volume 3B, Section 7.2.2.1, Figure 7-2, Page 7.9

Alberta Transportation states *that suspended sediment concentrations in the upper Elbow River mainstem were [...]* and refers to Figure 7-2. However, the figure refers to Total Suspended Solids concentration instead of suspended sediment.

a. Clarify if suspended sediment and total suspended solids are used interchangeably in this report.

Response 592

a. The terminology "total suspended sediments" and "total suspended solids" are used interchangeably in the surface water quality assessment.

Question 593

Volume 4, Appendix K, Section 3.2, Figure 3-3, Page 3.6

The figure has a legend for different lines and areas in the graph.

a. Include a legend for the black dots.

b. Explain why all five dots for the month or May are outside the Lowess 95% confidence interval area.

c. The figure heading indicates that it applies for the summer season; however, the 'x' axis includes months for a full year. Clarify this discrepancy.

Response 593

a. Figure IR593-1 provides the requested information.

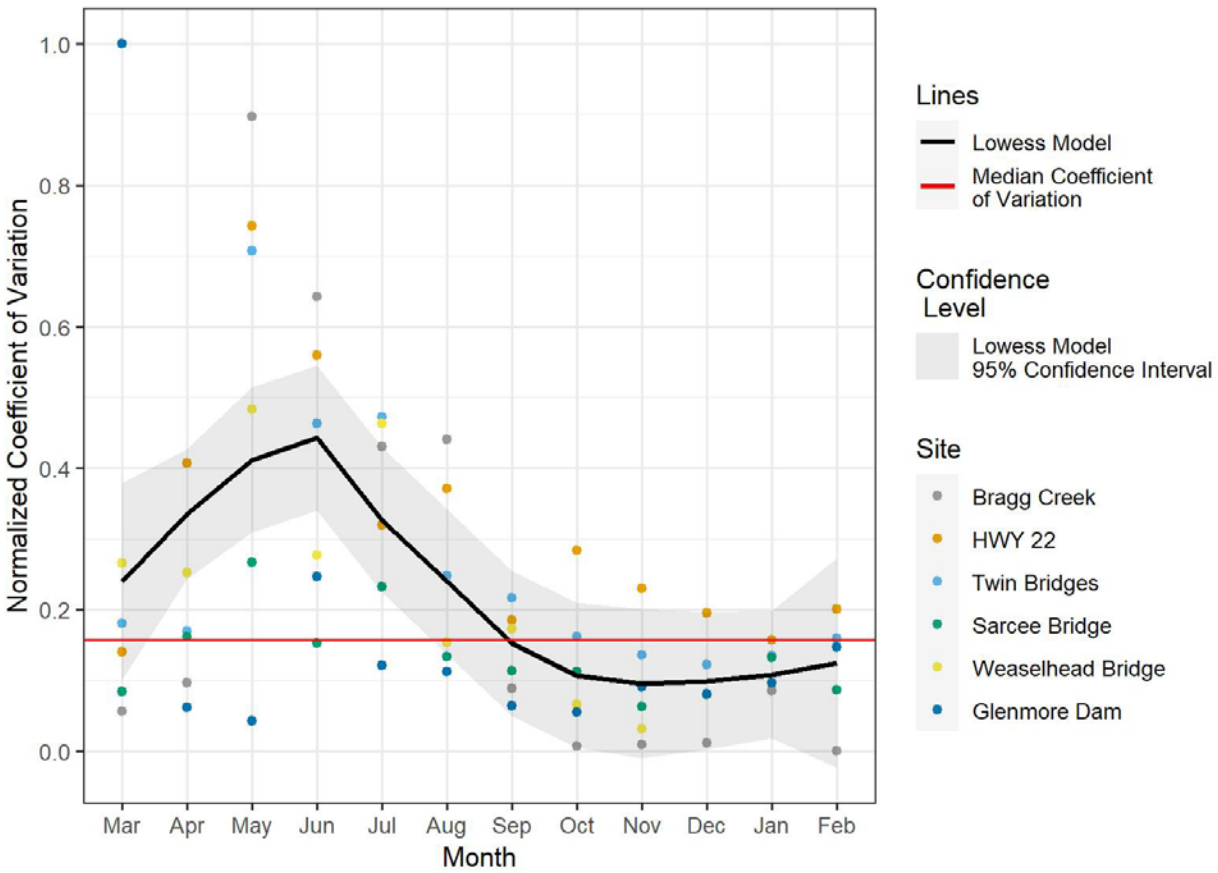


Figure IR593-1 Monthly Total Suspended Sediment Seasonal Variability Metric (using data from 1979 to 2016)

b. The Lowess Model curve and the 95% confidence boundaries reflect the central tendency and spread of the monthly coefficient of variations over time. The line representing the Lowess model curve (termed the locally weighted scatterplot smoothing model) and the accompanying 95% confidence intervals are smoothened to better show relationships in the data. Thus, the outside boundary of the 95% confidence interval for any one month reflects the confidence interval of the previous and post months as well. As a result, not all points fall within the 95% confidence interval.

   All the coefficient of variation points outside the 95% confidence interval for May is a result of the spread in the data (i.e., variability) for May, which was considerably greater than previous and post months.

c. The reference to “summer” in the title for Figure 3-2 (Volume 4, Appendix K, Section 3) is regarding the area within the 95% confidence interval during summer (i.e., the area shaded yellow). This was done to provide an example on how the seasonal variation metrics for each parameter were compared to the seasonal variation metric for total suspended sediments according to season. (note: the yellow area is removed in Figure IR593-1 provided in response a to avoid confusion).

ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT
RESPONSE TO NRCB AND AEP SUPPLEMENTAL INFORMATION REQUEST 1, JULY 28, 2018

Errata
May 2019